



Traffic Impact Assessment

Sydney International Equestrian Centre, Horsley Park

Reference: 18.258r01v07 TRAFFIX TIA Report
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1. Introduction

TRAFFIX has been commissioned by Creative Planning Solutions on behalf of the NSW Office of Sport to undertake a Traffic Impact Assessment (TIA) in support of permanent approval to host large events at the Sydney International Equestrian Centre on weekends. These events are not associated with equestrian activities.

This report is submitted as part of a Development Application (DA) for submission to Fairfield City Council pursuant to Clause 11 (2) of the State Environmental Planning Policy (Western Sydney Parklands) 2009. This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE) prepared separately.

The report is structured as follows:

- ➊ Section 2: Describes the site and its location
- ➋ Section 3: Documents existing traffic conditions
- ➌ Section 4: Describes the proposal
- ➍ Section 5: Assesses the parking and transport requirements
- ➎ Section 6: Discusses the traffic impacts of the proposal
- ➏ Section 7: Discusses vehicular access requirements
- ➐ Section 8: Presents the overall study conclusions.



2. Location and Site

The site is situated within the sector bounded by the Western Sydney Parklands to the east, Saxony Road to the south, the M7 Motorway to the west and The Horsley Drive to the north. The subject site is approximately 6 kilometres south the junction of the M7 and M4 Motorways and approximately 13 kilometres north-west of Liverpool CBD.

The site currently accommodates 15 Equestrian Arenas, two cross country tracks, a steeplechase track, stables, offices and car parking.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**, which provide an appreciation of the general character of roads and other key attributes in proximity to the site. Reference should also be made to the photographic record in **Appendix A**.

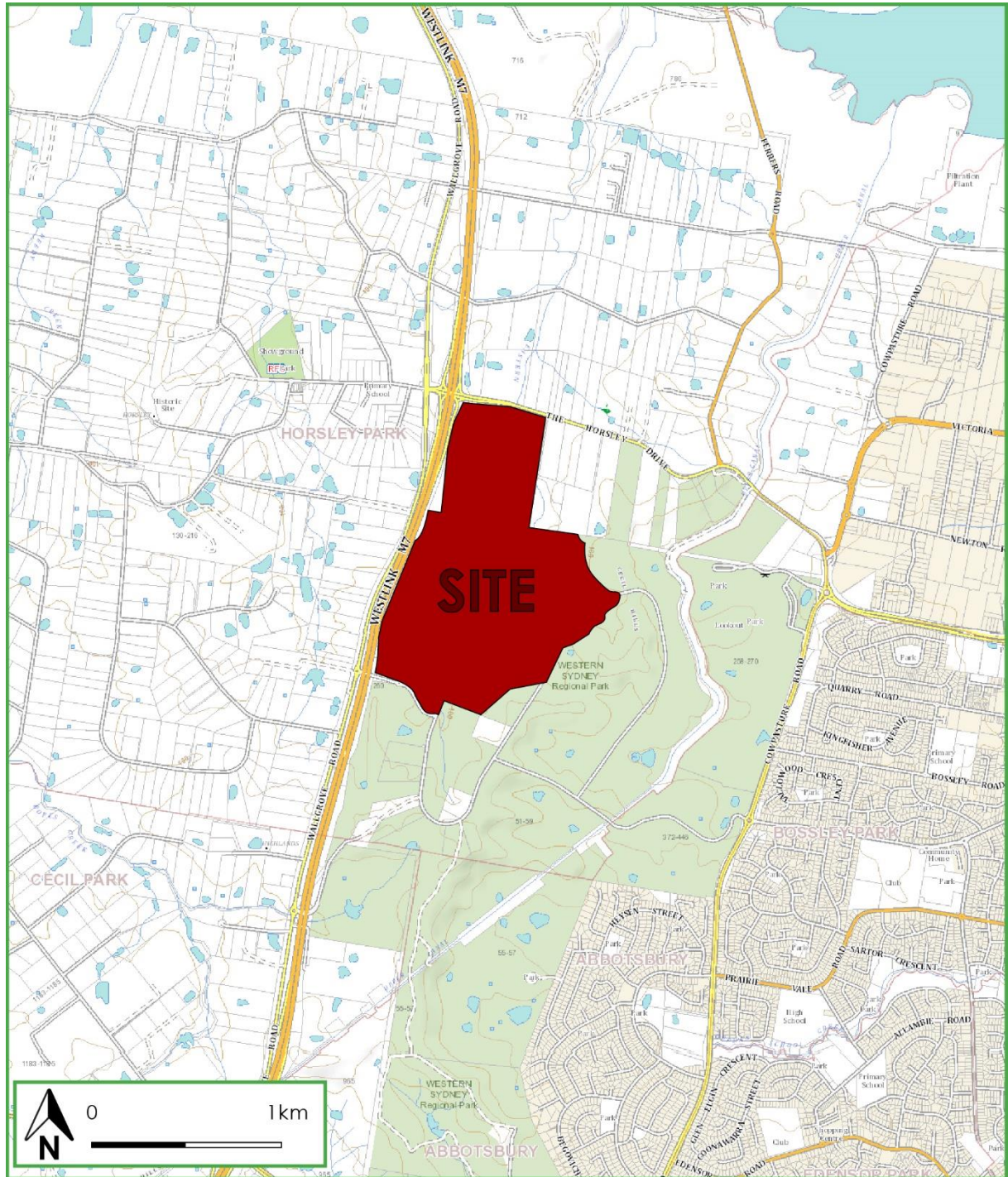


Figure 1: Location Plan

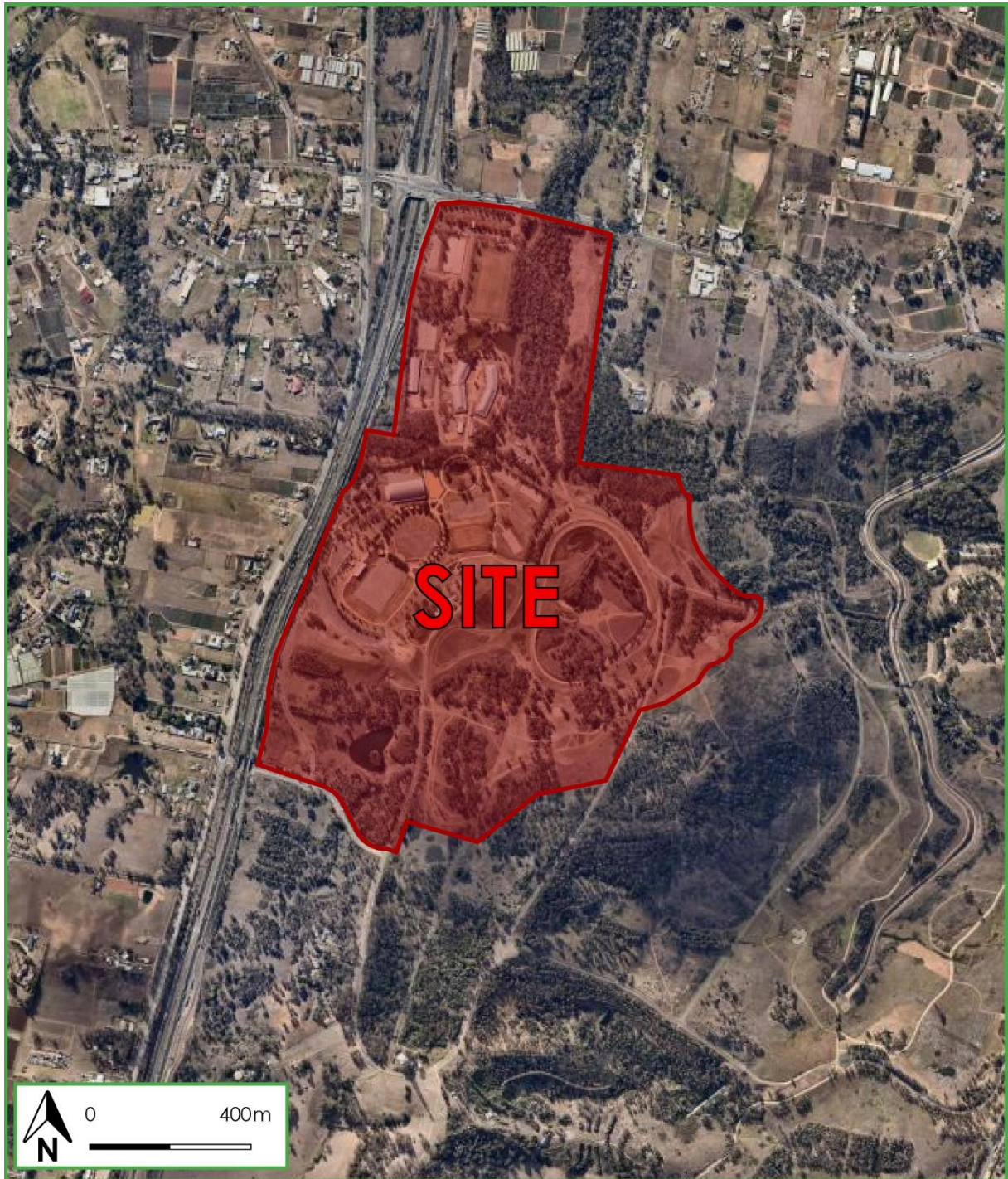


Figure 2: Site Plan



3. Existing Traffic Conditions

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- ② M7 Motorway: an privately operated tollway (6009) that runs in a north south direction between the M2 Motorway in the north and the M5 Motorway in the south. The M7 Motorway is subject to a variable speed zoning and carries two lanes of traffic in each direction within a divided carriageway.
- ② The Horsley Drive: a State Road (MR 609) that runs in an east west direction between Liverpool Road (Hume Highway) in the east and Arundel Road in the west. It is a State Road between Liverpool Road in the east and Smithfield Road in the west and continues as a State Road between Elizabeth Street in east and Wallgrove Road in the west. It is also a Regional Road (SR 2105) between Smithfield Road in the east and Elizabeth Street in the west and a local road between Wallgrove Road and Arundel Road. It is subject to a 70km/h speed zoning east of Wallgrove Road with two lanes of traffic in each direction and a 60km/h speed zoning west of Wallgrove Road with one lane of traffic in each direction. Kerbside parking is permitted along the Horsley Drive west of Wallgrove Road, however no parking is permitted on either kerbside east of Wallgrove Road in the vicinity of the site.
- ② Wallgrove Road: a State Road (MR 515) that runs in a north-south direction between Great Western Highway in the north and Elizabeth Drive in the south. It carries a single lane of traffic in each direction, with no parking along either kerbside and is subject to an 80km/h speed zoning in the vicinity of the site.
- ② Saxony Road: a local road that runs in an east west direction between Border Road in the east and Wallgrove Road in the west. It carries a single lane of traffic in each direction, with no parking along either kerbside and is subject to 50km/h speed zoning in the vicinity of the site.



It can be seen from **Figure 3** that the site is conveniently located with respect to the arterial and local road systems serving the region. It is therefore able to effectively distribute traffic onto the wider road network, minimising traffic impacts.

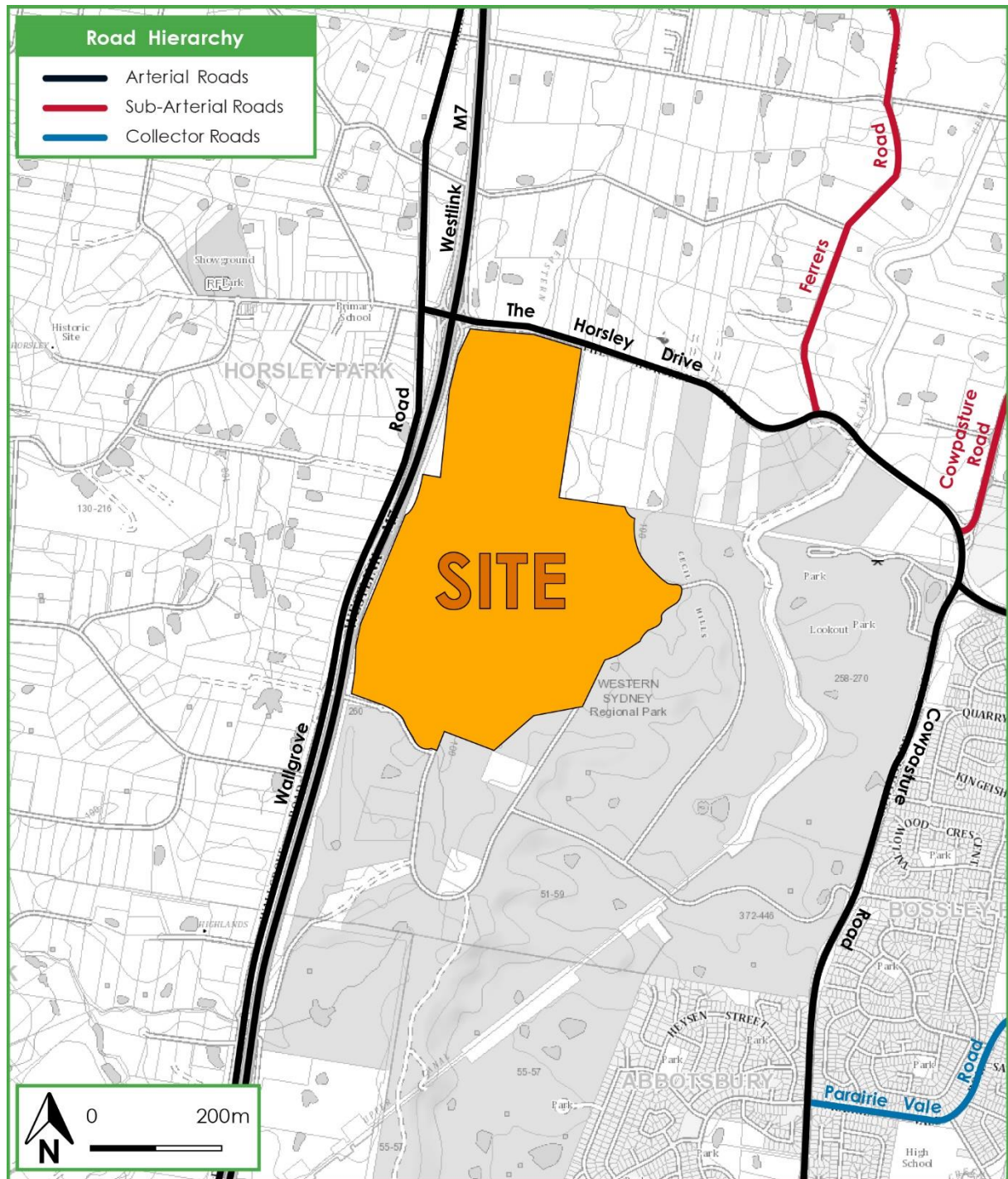


Figure 3: Road Hierarchy



3.2 Key Intersections

The key intersections in the vicinity of the site are shown below and provide an understanding of the existing road geometry and alignment.



Figure 4: Intersection of Wallgrove Road with Saxony Road

It can be seen from **Figure 4** that the intersection of Wallgrove Road and Saxony Road form a 3-way roundabout intersection to the south-west of the site. No restrictions are applied to any movements and all approach and exit lanes provide one lane at the intersection.

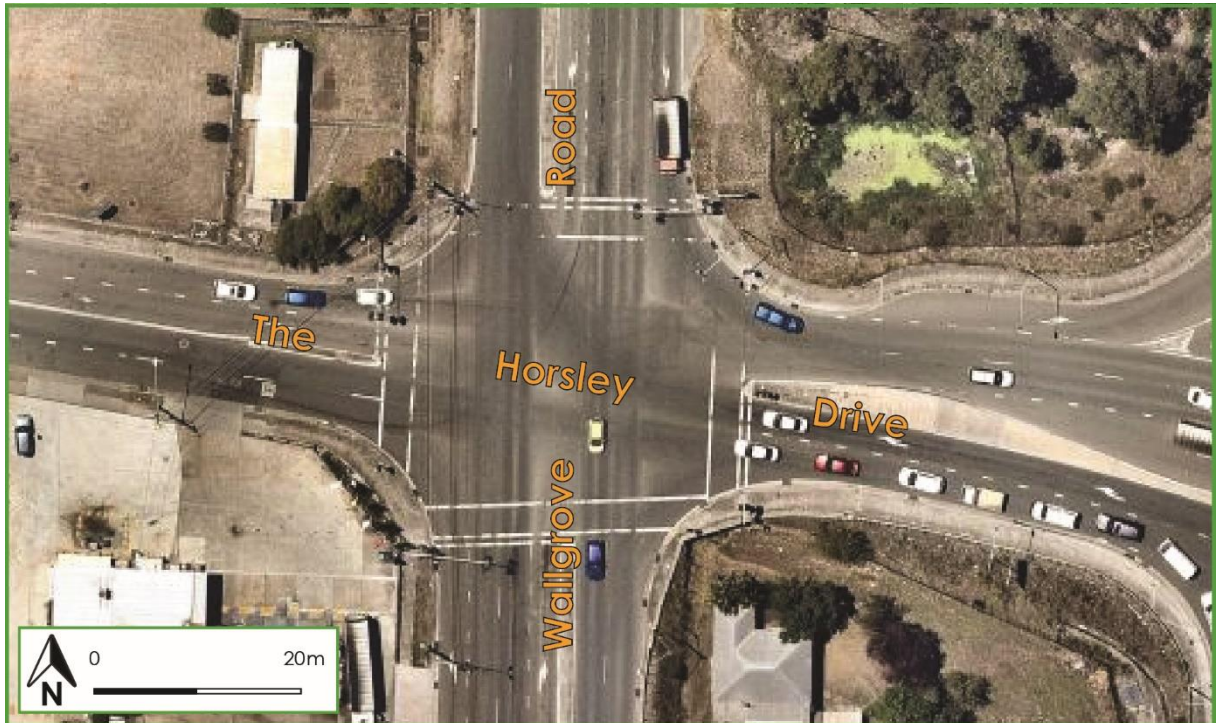


Figure 5: Intersection of Wallgrove Road and The Horsley Drive

It can be seen from **Figure 5** that Wallgrove Road and The Horsley Drive form a 4-way signalised intersection to the north-west of the site. **Figure 5** also shows that pedestrian signals are provided across all approaches. No restrictions are applied to any movements at the intersection. All approaches from Wallgrove Road provide four lanes, and all other approaches and exits provide two lanes at the intersection.

3.3 Public Transport

The site office is approximately a 2.7 kilometre walk from the nearest bus stop, which has three services per day on weekends and the closest railway station is Rooty Hill which is 8.5 kilometres (as the crow flies) from the site. This would prevent current public transport service from being an option for to attend any events held on site.



4. Description of Proposal

A detailed description of the proposal is provided in the Statement of Environmental Effects prepared separately. In summary, the proposal for which approval is sought comprise the following components:

- ② The site proposes to run large non-equestrian events with up to 6,000 attendees. These events have been held previously however approval for these events were granted for each individual event through a development application to Council. This application is to allow the Sydney International Equestrian Centre to run non-equestrian events without individual consents.
- ② A parking provision in excess of 3,400 parking spaces is available on site using a combination of formal and informal parking areas. This parking is managed by supervisors at the centre as visitors progressively arrive on site.

The parking and traffic impacts arising from the proposal are discussed in Sections 5 and 6, respectively and reference should also be made to the Centre Map attached in **Appendix B**.



5. Parking and Transport Requirements

5.1 Modal Split

As attendees to the events may not all drive an assessment has been made of the modal choice of people attending sports and recreation events within the Fairfield LGA based on the Household Travel Survey 2011 – 2012. The results of which are shown in **Table 1**.

Table 1: Modal Choice of Households Attending Sports and Recreation events in Fairfield LGA

Transport Mode	Percentage of Trips
Public Transport	6.9%
Vehicle Driver	42.1%
Vehicle Passenger	35.5%
Walk Only	15.5%

Table 1 shows that at least 77.6% of people attending sports and recreation activities drive or are a passenger in a vehicle. However, the location of the site and the types of events would make walking a less attractive option for most attendees. As such it is assumed that there will be no people walking to or from the site. The people who have 'walk only' as a mode are assumed to be distributed in the same ratio as the other travel modes. The modified distribution is shown in Table 2 below with the 'walk only' distributed to the other modes.

Table 2: Modal Choice with 'Walk Only' redistributed to other modes

Transport Mode	Percentage of Trips
Public Transport	8.2%
Vehicle Driver	49.8%
Vehicle Passenger	42.0%

Table 2 shows that more than 90% of people attending sporting events are either drivers or passengers in vehicles. Therefore, up to 10% of attendees will be arriving by public transport to the site. Since the site has very limited public transport access to accommodate the 10% of attendees arriving by public transport the events can provide shuttle buses. The shuttle buses could be accessed from the Horsley T-Way bus stop and the nearby railway station at Rooty Hill.



5.2 Planning Controls

The State Environmental Planning Policy (Western Sydney Parklands) 2009 and Fairfield City Council Development Control Plan 2013 do not contain specific parking requirements for the type of events that are proposed to be held on the site. The Roads and Maritime Services *Guide to Traffic Generating Developments 2002* does not contain specific requirements for large events either and as such the following assessment is based on first principles.

5.3 Parking Analysis and Requirements

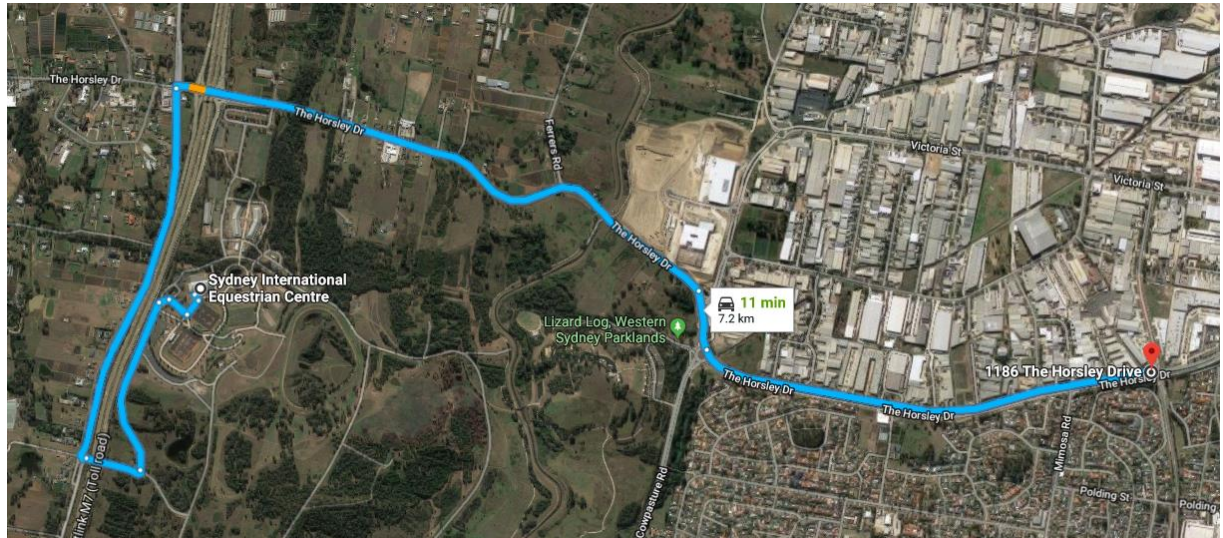
To determine the parking required to accommodate the attendees driving to the site a vehicle occupancy rate is required to determine the how attendees there are per vehicle. The Household Travel Survey 2011-2012 for sports and recreation trips to the Fairfield Local Government Area was used to determine the vehicle occupancy rate, which was found to be 1.8 attendees per vehicle. This is a highly conservative assessment to ensure sufficient parking is available for all types of events held at the site. Typical these events generally have a much higher vehicle occupancy rate with approximately three (3) attendees per vehicle. As such, the development is accommodating significant additional capacity to ensure sufficient parking is provided for all events. Assuming that the maximum attendance is 6,000 people with 10% catching public transport unable to attend without any alternative transport option results in a maximum of 5,400 attendees to the site. Therefore, for a maximum attendance of 5,400 the site would require 3,000 parking spaces.

5.4 Alternative Transport Options

If alternative transport options such as shuttle buses to and from Rooty Hill Railway Station and Horsley T-way at Wetherill Park were to be provided the event would be able to accommodate an additional 10% of attendees who could catch public transport to the site. As such, this would allow for a maximum attendance of 6,000. The proposed routes to and from the transport interchanges are shown in Figure 6 and Figure 7.

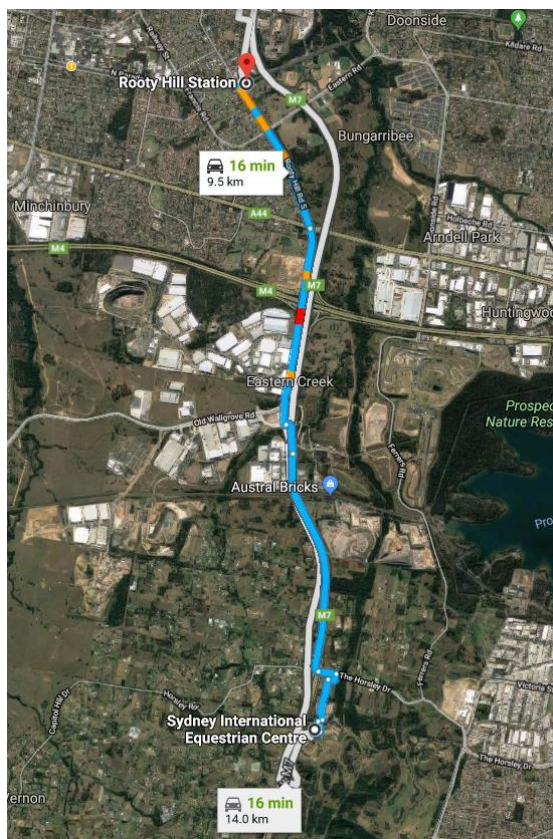


Figure 6: Proposed Shuttle Bus Route to and from Horsley T-Way, Wetherill Park



Source: Google Maps

Figure 7: Proposed Shuttle Bus Route to and from Rooty Hill Railway Station



Source: Google Maps



5.5 Parking Provision

The site can provide in excess of 3,400 parking spaces across the site, as such, it can adequately accommodate the parking requirement of 3,000 spaces. However, as particular events may use some of the parking areas for event purposes, not all parking areas will be available for parking. Therefore, a compliance form is included as part of this assessment to determine if the particular event complies with the expected parking requirement.

5.6 Compliance

The maximum parking provision for the events is to be determined by the particular event's usage of the areas on site that have been identified as parking areas shown in **Appendix D**. Therefore, some events may not have all parking areas available for parking and as such may significantly reduce the available parking and therefore the total attendance the event can accommodate. In addition, event with large attendance may require alternative transport options to reduce the parking requirement.

Therefore, each event should complete a Parking Compliance Form to be filled out by the event organiser in consultation with the Office of Sport and the Sydney International Equestrian Centre staff. A template, provided in **Appendix C**, of the form is to be filled out by the event organiser for assessment by the SIEC staff and the Office of Sport to determine if the event's proposed parking provision complies with the event's parking requirement. In the event the event does not comply, the event will have to submit a separate Development Application for the particular event.

5.7 Parking Management

The parking will be managed on site by Traffic Wardens and the SIEC site managers and will be progressively filled from P1 at the southern end of the site up to the North Truck Park at the northern end of the site. A mark-up of the formal and informal parking locations and the estimated number vehicles that can be accommodated at each location around the site is provided in **Appendix D**.

5.8 Accessible Parking

The site provides accessible parking on site near the site office in P5 as marked on the Centre Map in **Appendix B**.



5.9 Servicing

Specific servicing requirements for each event will be determined by the event coordinator, however the site is able to accommodate large trucks on site to allow for most servicing requirements.



6. Traffic Impacts

6.1 Existing Intersection Performance

For the purposes of assessment of the traffic impacts of the proposal, traffic surveys were undertaken on Saturday 19 June 2018. This included the critical intersections adjacent to the site during the network peak between 8:00am and 11:00am. The intersections surveyed were:

- ⑦ Wallgrove Road / Saxony Road,
- ⑦ The Horsley Drive / Wallgrove Road,

It is noted that the results of the surveys indicated that the network peak hour occurred at 9:45am – 10:45am for the Wallgrove Road and Saxony Road intersection and a peak between 10:00am – 11:00am for the Wallgrove Road and The Horsley Drive intersection. The results of these surveys were analysed using the SIDRA Intersection 8 computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS - the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DOS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown below:



Level of Service (Los)	Average Delay per Vehicle (secs/veh)	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. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

A summary of the modelled results are provided below in **Table 3**. Reference should also be made to the SIDRA outputs provided in **Appendix E** which provide detailed results for individual movements and approaches.

Table 3: Existing Intersection Performance

Intersection	Control Type	Degree of Saturation	Intersection Delay	Level of Service (LoS)
Wallgrove Road / Saxony Road	Roundabout	0.200	10.5	A
The Horsley Drive / Wallgrove Road	Signals	0.374	34.8	C

It can be seen from **Table 5** that the intersections operate satisfactorily under the existing 'base case' scenario during the Saturday morning peak, with a Level of Service (LOS) C for the intersection of Wallgrove Road and The Horsley Drive and LOS A for the intersection of Wallgrove Road and Saxony Road. Nevertheless, it is stressed that the most relevant use of this analysis is to compare the relative change in the performance parameters as a result of the proposal. This is discussed further in **Section 6**.



6.2 Trip Generation

The events will involve 6,000 attendees arriving and departing within the two hours before and after the event. Assuming, a vehicle occupancy of three attendees per vehicle is considered acceptable for these events as the location of the venue will likely require more attendees to drive and will result in more attendees to carpool and this vehicle occupancy rate is reflected in surveys of other venues with large attendances. As a result, assuming 90% of attendees are driving or passengers the 5,400 patrons, a total arrival/departure of 1,800 vehicles spread over two hours. Therefore, a trip rate of 900 vehicles per hour during arrival/departure peak periods.

6.3 Trip Distribution

The assumed distribution of traffic is provided in **Table 4** below based on the origin LGA of the discretionary trips to the Fairfield LGA from the Household Travel Survey 2011 -2012.

Table 4: Traffic Distribution based on Household Travel Survey

Intersection	Direction	Vehicles Percentage
Wallgrove Road / Saxony Road	Wallgrove Road (South)	35%
	Wallgrove Road (North)	65%
The Horsley Drive / Wallgrove Road	Wallgrove Road (North)	20%
	The Horsley Drive (East)	80%

Based on the distribution on the above Table, **Figures 6 and 7** below show the distributions of the traffic generated by the proposal at the two key intersections in the vicinity of the sites for the different event scenarios.

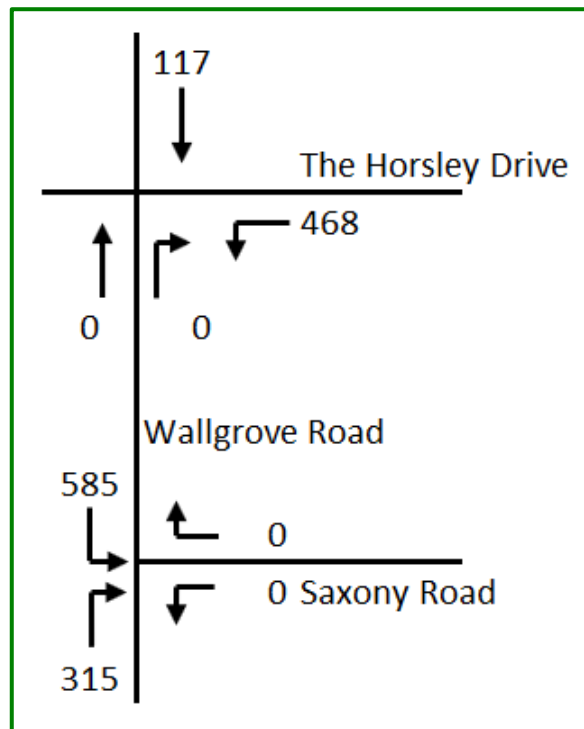


Figure 6: Intersection Traffic Distributions for Single Event - Arrival

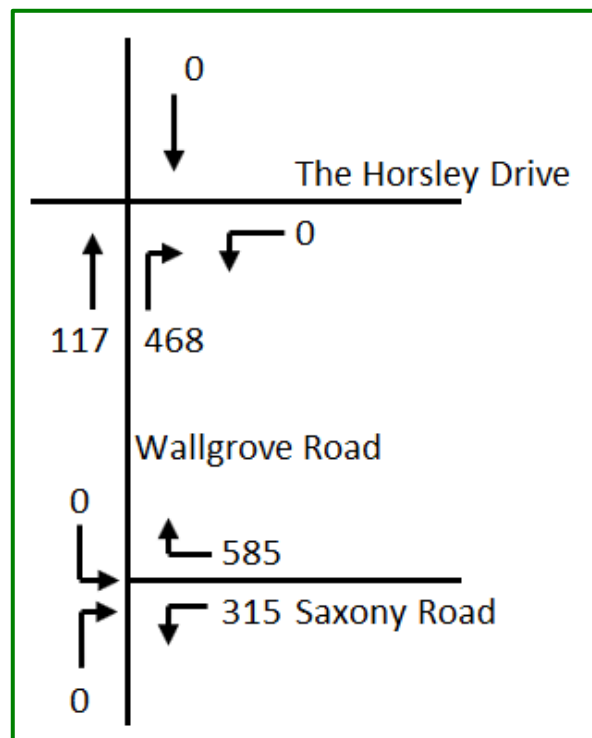


Figure 7: Intersection Traffic Distributions for Single Event - Departure



6.4 Peak Period Intersection Performances

The traffic distribution in **Figure 6** has been applied to the existing network models from Section 6.1 to determine the operation of the future network with the proposed developments. A summary of the modelled results are provided in **Table 3** below. Reference should also be made to the SIDRA outputs provided in **Appendix E** which provide detailed results for individual movements.

Table 3: Intersection Performance - Existing + Development

Intersection Description	Control Type	Model	Degree of Saturation	Intersection Delay	Level of Service
Wallgrove Road / Saxony Road	Signal	Existing	0.200	10.5	A
		With Single Event - Arrival	0.872	17.6	B
		With Single Event - Departure	0.863	17.3	B
The Horsley Drive / Wallgrove Road	Signal	Existing	0.374	34.8	C
		With Single Event - Arrival	0.759	37.0	C
		With Single Event - Departure	0.704	37.6	C

It can be seen from **Table 3** that the intersections operate satisfactorily under the future scenario, with a Level of Service C during the peak period for the intersection of The Horsley Drive and Wallgrove Road and a Level of Service B for Wallgrove Road and Saxony Road in the peak period. These results demonstrate the intersections will perform satisfactorily with the additional traffic generation of the events. Accordingly, the traffic impacts associated with the large events can be accommodated by the existing road network with only minor traffic impacts.



7. Access and Internal Design

7.1 Access Requirements

The events would require a minimum of a Category 4 access facility for the provision of 2,500 car parking spaces with access on a local road under AS2890.1. A Category 4 access facility requires separate entry and exit driveways of width 6.0 – 8.0 metres each. The development currently provides roundabout intersection at the existing site access, which is classified as a Category 5 access facility and exceeds the minimum requirement under A2890.1. Therefore, the access is considered sufficient to accommodate the large traffic generation of the proposed large events to be held at the site, which have occurred previously on the site.

7.2 Internal Design

There are no changes proposed to the formal car parking areas as a result of this application. As no amendments are proposed to the existing car parking arrangement, no design assessment of the parking provision is required. The Venue Map in **Appendix B** provides an overview of the formal parking locations. In addition, **Appendix D** provides an overview of the formal and informal parking areas and the estimated number of vehicles accommodated at each location.

The site will use a mixture of formal car parking spaces and informal parking on hard and soft stand areas including arenas, private roads, verges, and tracks for the cross country and steeple chase. This is considered acceptable for the events as they only occur on weekends and the need for formal car parking for 2,500 spaces for only a few times per year would be impractical.

The informal parking is managed on site to ensure vehicles are parked in order with an allowance of 3 metres by 8 metres for a parking space which significantly exceeds the minimum requirements under AS2890.1 and is considered appropriate for the informal parking areas. This arrangement has been previously approved and used successfully at previous events similar in scale to the type of events proposed in this application. Therefore, it is considered acceptable for the informal parking to be used at the proposed events.



8. Conclusions

In summary:

- ② TRAFFIX has been commissioned to undertake a Traffic Impact Assessment (TIA) in support of a development application relating to large events held at the Sydney International Equestrian Centre.
- ② A detailed description of the proposed development is provided in the Statement of Environmental Effects prepared separately. In summary, the developments for which approval is sought for large events would be able to have a maximum capacity of up to 5,400 attendees that will occur on weekends. An additional 600 attendees would be able to be accommodated with the provision of alternative travel modes, totalling 6,000 attendees.
- ② Based on the vehicular occupancy rate determined by the Household Travel Survey the site requires 3,000 parking spaces for a maximum attendance of 5,400 with no alternative transport options. The maximum attendance can be increased by another 600 attendees if alternative transport such as shuttle buses to Rooty Hill Station and Horsley T-Way are provided.
- ② The site can provide in excess of 3,400 parking spaces across the site as which can accommodate the requirement of 3,000 parking spaces. However, as events may use some parking areas for event purposes a Parking Compliance Form is included to determine if the particular event meets their particular parking requirement.
- ② It is noted that the results of the surveys indicated that the Saturday network peak hour occurred at 9:45am – 10:45am for Wallgrove and Saxony Road intersection and a peak between 10:00am – 11:00am for the Wallgrove Road and The Horsley Drive intersection.
- ② The traffic generation of the event at the network peak was found to 900 vehicle trips per hour for the single event scenario with the arrivals and departures occurring before and after the event respectively.
- ② The existing and existing + development scenarios were modelled using SIDRA Intersection to determine the impact of the additional traffic generation on the local road network. It was found that the traffic impacts associated with the developments can be accommodated on the road network with no changes required to the existing road network and only minor traffic impacts.
- ② The existing site already provides an access that complies with AS2890.1 and the informal parking spaces exceed the minimum dimensions required under AS2890.1.

It is therefore concluded that the proposed application is supportable on traffic planning grounds and would operate satisfactorily.



Appendix A

Photographic Record



View looking east along Saxony Road towards site access.



View looking west towards site access.





View looking west along Saxony Road towards intersection with Wallgrove Road.



View looking south along Wallgrove Road towards at intersection with Wallgrove Road.





View looking south along Wallgrove Road at its intersection with The Horsley Drive.



View looking east along The Horsley Drive at its intersection with Wallgrove Road.





Appendix B

Centre Map

SYDNEY INTERNATIONAL EQUESTRIAN CENTRE

Centre Map



Main Arena (1) 120m x 80m
 Area (2) 90m x 70m
 Arena (3) 100m x 50m
 Arena (4) 100m x 50m
 Indoor Arena (5) 70m x 35m
 Arena (6) 70m x 28m
 Arena (7, 8, 9, 10 and 11) 60m x 20m
 Arena (12) 90m x 45m
 Arena (13) 90m x 35m
 Arena (14) 90m x 45m
 Hacking Arena (15) 180m x 90m



Sydney
International
Equestrian
Centre





Appendix C

Parking Compliance Form

PARKING COMPLIANCE FORM

Requirement	Description	Number	
Total Parking Provision	-	3400	X
Parking areas required for event purposes	Area:	Provision:	
	Total		Y
Additional Parking Areas (as advised by SIEC)	Area:	Provision:	
	Total		Z
Event Parking Provision	$X - Y + Z$		
Expected Attendance	(max. 4,500 with no alternative transport or parking charge)		A
Parking Charge	Yes or No and Specify Charge		
Vehicular Occupancy (enter value)	1.8 attendees per vehicle	1.8	B
Alternative Transport	Additional 10% of expected attendance if provided Provide details below:	0 Or 0.1	C
Event Parking Requirement	$(A / B) + C \times A$		D
Compliance with provision	$(A \leq D)$ Yes or No		



Appendix D

Venue Map

Sydney International Equestrian Centre – Venue Map

Number of Parking Spaces per Parking Area
Total Parking Spaces +3400





Appendix E

SIDRA Intersection Modelling Outputs

USER REPORT FOR SITE



Project: 18.258m01v01 TRAFFIX Wallgrove Road Model

Template: Layout

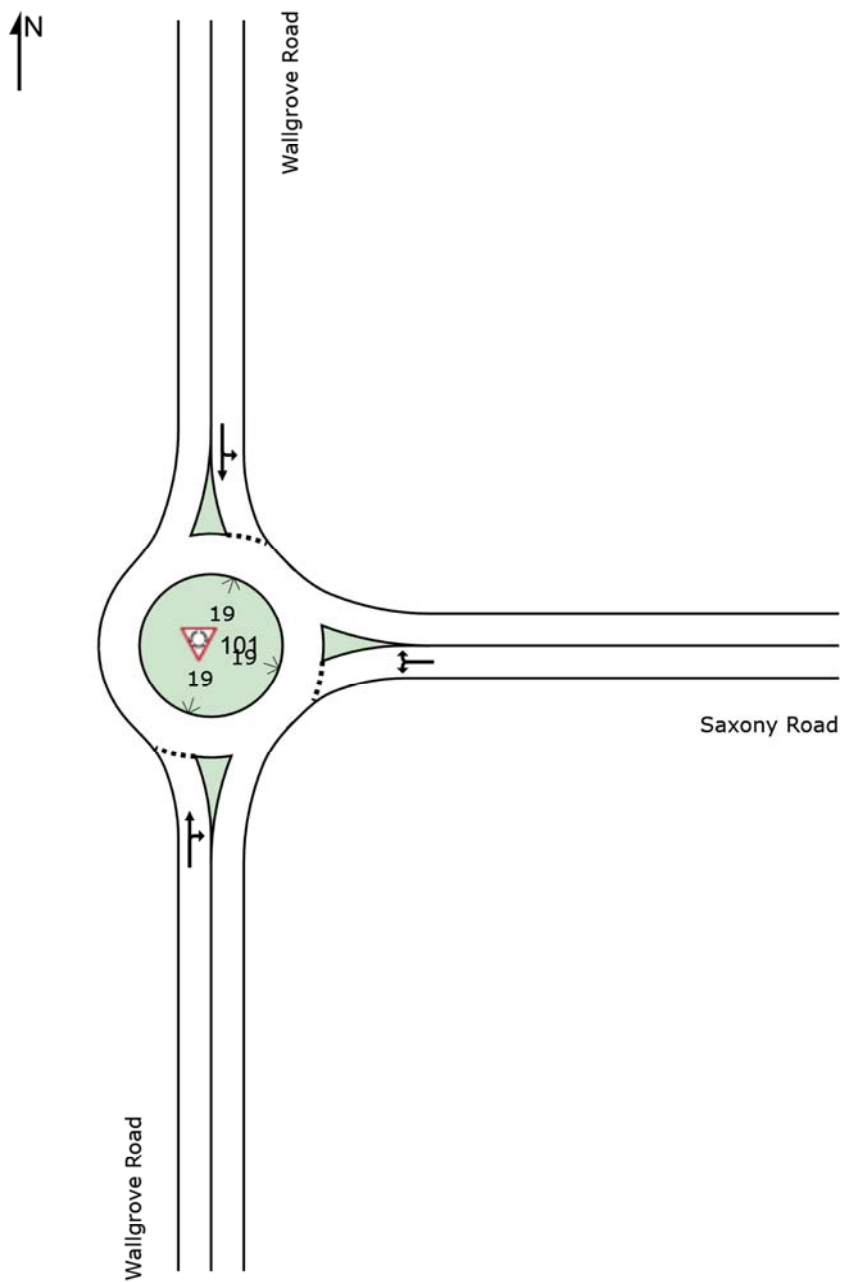


Site: 101 [Wallgrove Rd and Saxony Rd EX Sat]

Wallgrove Road and Saxony Road

Site Category: Existing Saturday
Roundabout

Site Layout



Site: 102 [Wallgrove Rd Horsley Dr EX Sat]

Wallgrove Road and The Horsley Drive

Site Category: Existing Saturday

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS Signal Layout

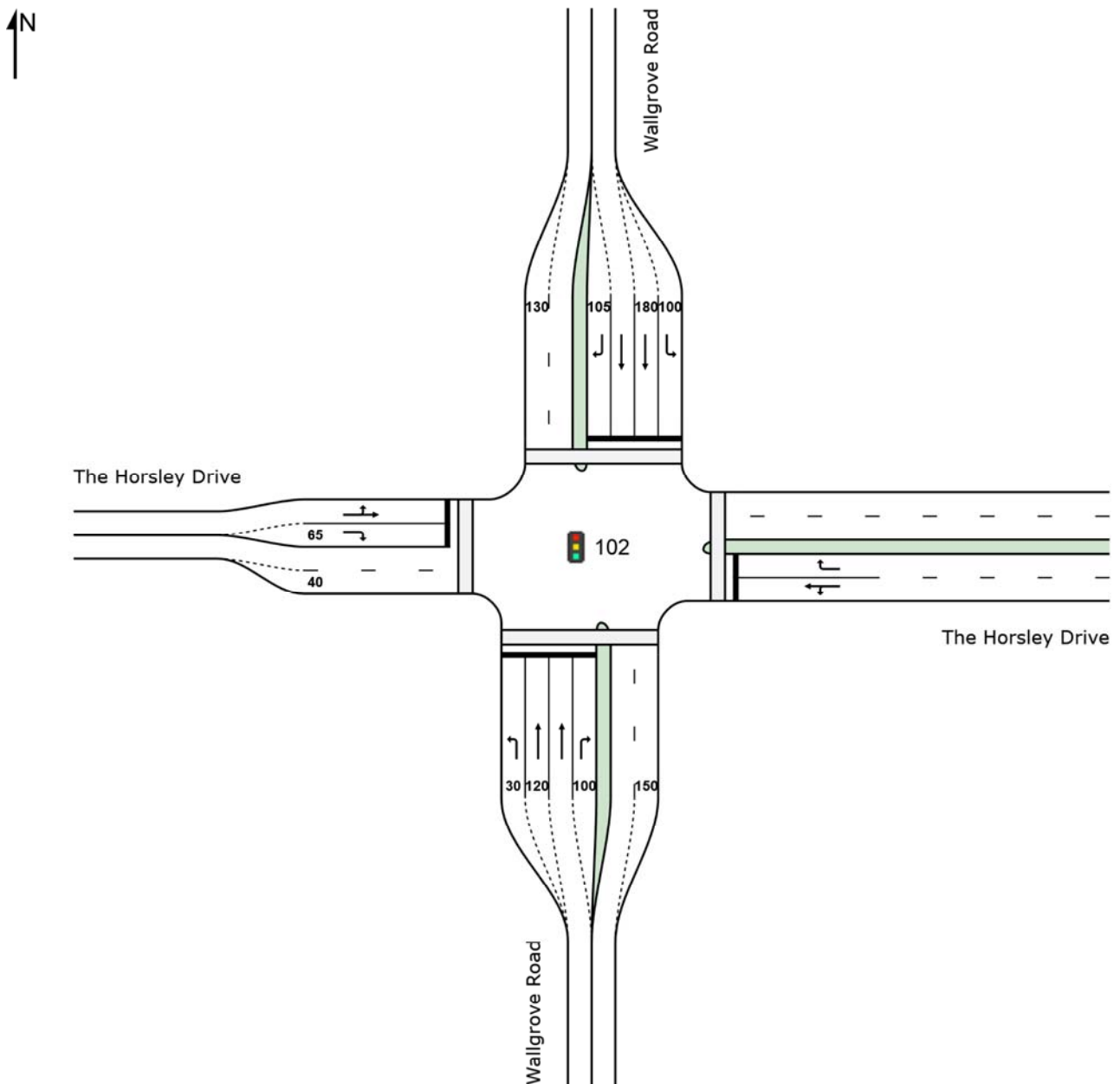
Reference Phase: Phase A

Input Phase Sequence: A, B*, C*, D, D1*, D2*, E, F1*, F2*, G, G1*, G2*

Output Phase Sequence: A, D, D1*, E, G

(* Variable Phase)

Site Layout



USER REPORT FOR SITE



Project: 18.258m01v01 TRAFFIX Wallgrove Road Model

Template: Default Site User Report

Site: 101 [Wallgrove Rd and Saxony Rd EX Sat]

Wallgrove Road and Saxony Road

Site Category: Existing Saturday Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallgrove Road												
2	T1	322	5.2	0.194	6.2	LOS A	1.2	8.8	0.02	0.51	0.02	75.1
3	R2	4	0.0	0.194	10.5	LOS A	1.2	8.8	0.02	0.51	0.02	69.6
Approach		326	5.2	0.194	6.2	LOS A	1.2	8.8	0.02	0.51	0.02	75.0
East: Saxony Road												
4	L2	3	0.0	0.004	4.3	LOS A	0.0	0.1	0.42	0.49	0.42	65.8
6	R2	1	0.0	0.004	8.6	LOS A	0.0	0.1	0.42	0.49	0.42	68.3
Approach		4	0.0	0.004	5.4	LOS A	0.0	0.1	0.42	0.49	0.42	66.4
North: Wallgrove Road												
7	L2	8	25.0	0.200	6.0	LOS A	1.1	8.0	0.04	0.51	0.04	69.1
8	T1	315	7.7	0.200	6.2	LOS A	1.1	8.0	0.04	0.51	0.04	74.9
Approach		323	8.1	0.200	6.2	LOS A	1.1	8.0	0.04	0.51	0.04	74.8
All Vehicles		654	6.6	0.200	6.2	LOS A	1.2	8.8	0.03	0.51	0.03	74.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Site: 102 [Wallgrove Rd Horsley Dr EX Sat]

Wallgrove Road and The Horsley Drive

Site Category: Existing Saturday

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS Signal Layout

Reference Phase: Phase A

Input Phase Sequence: A, B*, C*, D, D1*, D2*, E, F1*, F2*, G, G1*, G2*

Output Phase Sequence: A, D, D1*, E, G

(* Variable Phase)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wallgrove Road												
1	L2	29	10.7	0.062	39.9	LOS C	1.3	9.6	0.77	0.71	0.77	45.5
2	T1	241	5.2	0.374	44.6	LOS D	7.2	52.8	0.90	0.72	0.90	51.2
3	R2	63	6.7	0.226	38.3	LOS C	2.7	19.8	0.88	0.74	0.88	42.0
Approach		334	6.0	0.374	43.0	LOS D	7.2	52.8	0.88	0.73	0.88	49.9
East: The Horsley Drive												
4	L2	57	9.3	0.314	34.0	LOS C	8.6	65.1	0.76	0.68	0.76	44.8
5	T1	151	9.1	0.314	29.1	LOS C	8.6	65.1	0.76	0.68	0.76	36.3
6	R2	176	6.6	0.270	19.8	LOS B	5.0	37.2	0.66	0.73	0.66	53.5
Approach		383	8.0	0.314	25.6	LOS B	8.6	65.1	0.72	0.70	0.72	48.5
North: Wallgrove Road												
7	L2	211	8.5	0.277	28.9	LOS C	7.9	59.0	0.68	0.76	0.68	50.7
8	T1	239	7.5	0.354	44.6	LOS D	6.7	49.9	0.90	0.72	0.90	51.2
9	R2	48	23.9	0.164	37.8	LOS C	2.1	17.3	0.83	0.72	0.83	50.3
Approach		498	9.5	0.354	37.3	LOS C	7.9	59.0	0.80	0.74	0.80	50.9
West: The Horsley Drive												
10	L2	45	11.6	0.332	38.6	LOS C	8.4	63.1	0.80	0.70	0.80	51.1
11	T1	145	7.2	0.332	32.9	LOS C	8.4	63.1	0.80	0.70	0.80	34.6
12	R2	27	3.8	0.050	21.4	LOS B	0.8	5.5	0.67	0.67	0.67	51.2
Approach		218	7.7	0.332	32.6	LOS C	8.4	63.1	0.79	0.69	0.79	44.0
All Vehicles		1433	8.0	0.374	34.8	LOS C	8.6	65.1	0.80	0.72	0.80	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

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.

USER REPORT FOR SITE

All Movement Classes

 **Project: 18.258m01v02 TRAFFIX Wallgrove Road Model**

Template: Movement Summaries

 **Site: 401 [Wallgrove Rd and Saxony Rd EX + FU Sat 6000 cap - Arrival (Site Folder: General)]**

Wallgrove Road and Saxony Road

Site Category: Future Saturday Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Wallgrove Road														
2	T1	306	16	322	5.2	0.386	6.2	LOS A	3.1	22.3	0.02	0.61	0.02	69.2
3	R2	319	0	336	0.0	0.386	8.6	LOS A	3.1	22.3	0.02	0.61	0.02	61.4
Approach		625	16	658	2.6	0.386	7.4	LOS A	3.1	22.3	0.02	0.61	0.02	66.2
East: Saxony Road														
4	L2	3	0	3	0.0	0.004	4.3	LOS A	0.0	0.2	0.51	0.49	0.51	65.5
6	R2	1	0	1	0.0	0.004	8.6	LOS A	0.0	0.2	0.51	0.49	0.51	68.0
Approach		4	0	4	0.0	0.004	5.4	LOS A	0.0	0.2	0.51	0.49	0.51	66.2
North: Wallgrove Road														
7	L2	593	2	624	0.3	0.872	16.7	LOS B	17.9	128.6	1.00	1.03	1.49	61.9
8	T1	299	23	315	7.7	0.872	17.6	LOS B	17.9	128.6	1.00	1.03	1.49	69.3
Approach		892	25	939	2.8	0.872	17.0	LOS B	17.9	128.6	1.00	1.03	1.49	65.0
All Vehicles		1521	41	1601	2.7	0.872	13.0	LOS A	17.9	128.6	0.60	0.86	0.89	65.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 402 [Wallgrove Rd Horsley Dr EX + FU Sat 6000 cap - Arrival (Site Folder: General)]

Wallgrove Road and The Horsley Drive

Site Category: Future Saturday

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS Signal Layout

Reference Phase: Phase A

Input Phase Sequence: A, B*, C*, D, D1*, D2*, E, F1*, F2*, G, G1*, G2*

Output Phase Sequence: A, D, E, G

(* Variable Phase)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h veh/h		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Wallgrove Road														
1	L2	28	3	29	10.7	0.057	37.6	LOS C	1.2	9.3	0.74	0.70	0.74	46.1
2	T1	229	12	241	5.2	0.528	52.4	LOS D	7.9	57.5	0.97	0.77	0.97	49.9
3	R2	60	4	63	6.7	* 0.402	49.2	LOS D	3.2	23.3	0.99	0.75	0.99	38.9
Approach		317	19	334	6.0	0.528	50.5	LOS D	7.9	57.5	0.95	0.76	0.95	48.6
East: The Horsley Drive														
4	L2	522	5	549	1.0	0.759	30.9	LOS C	32.5	232.7	0.87	0.85	0.87	45.3
5	T1	143	13	151	9.1	* 0.759	25.3	LOS B	32.5	232.7	0.87	0.85	0.87	36.8
6	R2	167	11	176	6.6	* 0.241	14.5	LOS B	4.0	29.9	0.54	0.70	0.54	55.0
Approach		832	29	876	3.5	0.759	26.6	LOS B	32.5	232.7	0.80	0.82	0.80	47.3
North: Wallgrove Road														
7	L2	200	17	211	8.5	0.390	40.8	LOS C	9.7	72.8	0.83	0.80	0.83	48.0
8	T1	344	17	362	4.9	* 0.745	55.6	LOS D	11.9	86.6	1.00	0.85	1.05	49.5
9	R2	46	11	48	23.9	0.263	48.6	LOS D	2.4	20.4	0.94	0.73	0.94	48.2
Approach		590	45	621	7.6	0.745	50.0	LOS D	11.9	86.6	0.94	0.82	0.97	49.0
West: The Horsley Drive														
10	L2	43	5	45	11.6	0.221	25.3	LOS B	6.4	47.6	0.61	0.57	0.61	54.2
11	T1	138	10	145	7.2	0.221	19.0	LOS B	6.4	47.6	0.61	0.57	0.61	41.8
12	R2	26	1	27	3.8	0.066	22.2	LOS B	0.6	4.4	0.74	0.69	0.74	50.9
Approach		207	16	218	7.7	0.221	20.7	LOS B	6.4	47.6	0.63	0.59	0.63	48.7
All Vehicles		1946	109	2048	5.6	0.759	37.0	LOS C	32.5	232.7	0.85	0.78	0.86	48.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Site: 501 [Wallgrove Rd and Saxony Rd EX + FU Sat 6000 cap - Departure (Site Folder: General)]

Wallgrove Road and Saxony Road

Site Category: Future Saturday
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Wallgrove Road														
2	T1	306	16	322	5.2	0.481	11.7	LOS A	4.0	29.0	0.89	0.91	0.97	72.1
3	R2	4	0	4	0.0	0.481	15.8	LOS B	4.0	29.0	0.89	0.91	0.97	65.0
Approach		310	16	326	5.2	0.481	11.7	LOS A	4.0	29.0	0.89	0.91	0.97	72.1
East: Saxony Road														
4	L2	318	0	335	0.0	0.863	14.0	LOS A	17.1	119.7	0.98	1.04	1.41	49.5
6	R2	586	0	617	0.0	0.863	17.3	LOS B	17.1	119.7	0.98	1.04	1.41	61.6
Approach		904	0	952	0.0	0.863	16.1	LOS B	17.1	119.7	0.98	1.04	1.41	57.1
North: Wallgrove Road														
7	L2	8	2	8	25.0	0.200	6.0	LOS A	1.4	10.8	0.05	0.50	0.05	69.0
8	T1	299	23	315	7.7	0.200	6.2	LOS A	1.4	10.8	0.05	0.50	0.05	74.9
Approach		307	25	323	8.1	0.200	6.2	LOS A	1.4	10.8	0.05	0.50	0.05	74.8
All Vehicles		1521	41	1601	2.7	0.863	13.2	LOS A	17.1	119.7	0.77	0.91	1.05	64.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 502 [Wallgrove Rd Horsley Dr EX + FU Sat 6000 cap - Departure (Site Folder: General)]

Wallgrove Road and The Horsley Drive

Site Category: Future Saturday

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: TCS Signal Layout

Reference Phase: Phase A

Input Phase Sequence: A, B*, C*, D, D1*, D2*, E, F1*, F2*, G, G1*, G2*

Output Phase Sequence: A, D, D1*, E, G, G2*

(* Variable Phase)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Wallgrove Road														
1	L2	28	3	29	10.7	0.035	22.3	LOS B	0.9	6.7	0.54	0.67	0.54	50.6
2	T1	346	12	364	3.5	0.268	24.4	LOS B	8.1	58.3	0.69	0.57	0.69	54.9
3	R2	528	4	556	0.8	* 0.704	29.3	LOS C	22.7	160.1	0.88	0.86	0.88	45.0
Approach		902	19	949	2.1	0.704	27.2	LOS B	22.7	160.1	0.79	0.75	0.79	50.8
East: The Horsley Drive														
4	L2	54	5	57	9.3	0.496	48.5	LOS D	10.6	80.2	0.92	0.78	0.92	40.3
5	T1	143	13	151	9.1	0.496	43.4	LOS D	10.6	80.2	0.92	0.78	0.92	30.6
6	R2	167	11	176	6.6	* 0.563	39.4	LOS C	7.9	58.7	0.94	0.80	0.94	48.6
Approach		364	29	383	8.0	0.563	42.3	LOS C	10.6	80.2	0.93	0.79	0.93	43.3
North: Wallgrove Road														
7	L2	200	17	211	8.5	0.497	48.2	LOS D	10.7	80.5	0.91	0.81	0.91	46.4
8	T1	227	17	239	7.5	* 0.607	55.9	LOS D	7.6	56.6	0.99	0.79	1.00	49.4
9	R2	46	11	48	23.9	0.172	28.1	LOS B	1.4	11.4	0.86	0.73	0.86	52.3
Approach		473	45	498	9.5	0.607	50.0	LOS D	10.7	80.5	0.95	0.79	0.95	48.6
West: The Horsley Drive														
10	L2	43	5	45	11.6	0.527	52.6	LOS D	10.1	75.5	0.94	0.79	0.94	48.5
11	T1	138	10	145	7.2	* 0.527	46.1	LOS D	10.1	75.5	0.94	0.79	0.94	29.7
12	R2	26	1	27	3.8	0.094	37.9	LOS C	1.1	8.3	0.87	0.70	0.87	46.3
Approach		207	16	218	7.7	0.527	46.5	LOS D	10.1	75.5	0.93	0.78	0.93	39.6
All Vehicles		1946	109	2048	5.6	0.704	37.6	LOS C	22.7	160.1	0.87	0.77	0.87	48.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: T:\Synergy\Projects\18\18.258\Modelling\18.258m01v02 TRAFFIX Wallgrove Road Model.sip9