MANLY WARRINGAH GYMNASTICS CENTRE

TRAFFIC REPORT FOR PROPOSED MANLY WARRINGAH GYMNASTICS CENTRE, NOLAN RESERVE, NORTH MANLY

DECEMBER 2023

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1. INTRODUCTION

1.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by Manly Warringah Gymnastics Centre to prepare the DA traffic report examining the traffic and parking implications of the proposed gymnastics centre at Nolan Reserve, Kentwell Road, North Manly. The site of the proposed development is shown in Figure 1.

1.2 Manly Warringah Gymnastics Centre (MWGC) currently operates a gymnastic training facility at Cromer. The centre is not a typical fitness centre/gymnasium. It provides training for athletes in gymnastics. The proposed gymnastics centre will replace the existing facility at Cromer and accommodate athletes who cannot be accommodated at the Cromer facility (that currently train at Narrabeen). MWGC has advised that the new centre at North Manly will have some 40% more capacity than the existing centre at Cromer.

1.3 This report assesses the traffic and parking implications of the proposed shopping entre through the following chapters:

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - assessing the traffic implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

2.1 The site is located within Nolan Reserve on the south western corner of the Kentwell Road/Pittwater Road intersection as shown in Figure 1. The site is currently occupied by a bowling club (with four greens) with access provided from the Access Road along the western frontage of the site. 11 parking spaces are located within the site, with direct access of the Access Road. Surrounding land use includes residential/commercial on the opposite side of Pittwater, and recreational facilities either side of Kentwell Road (golf course, netball and tennis courts) and playing fields to the east.

2.2 The road network in the vicinity of the site includes Kentwell Road, Pittwater Road, Condamine Street and the access road to the bowling club and playing fields. Kentwell Road runs along the northern boundary of the site. Along the frontage of the site, it provides one traffic lane in each direction with kerb side parking on the northern side and angled parking on the southern side. It connects with Condamine Street to the west and Pittwater Road to the east at traffic signal controlled intersections, with additional short turn lanes provided at these intersections. It has a posted speed limit of 60km/h.

2.3 Condamine Road is located west of the site and is an arterial road that connects Brookvale and Balgowlah. In the vicinity of the site, it provides two traffic lanes and one bus lane in both directions with additional turn lanes at major intersections. It has a posted speed limit of 60km/h.

2.4 Pittwater Road is located east of the site and is an arterial road that connects Manly with Mona Vale. It provides two northbound traffic lanes and three southbound traffic lanes in the vicinity of the site. It has a posted speed limit of 60km/h.

2.5 The access road along the western boundary of the site and provides access to the site and the playing fields to the east. It provides for two way traffic flow within a variable six to seven metre carriageway with angled parking on both sides of the road. Speed humps are provided along the access road. The access road connects to Kentwell Road at a priority controlled t-intersection.

Traffic Flows

2.6 Traffic generated by the proposed development will have its greatest effects during the weekday morning, afternoon and Saturday midday peak periods when it combines with other traffic on the surrounding road network. In order to gauge traffic conditions, counts were undertaken on Friday 1 September (weekday morning and afternoon peak periods) and Saturday 2 September (midday peak period) at the following intersections:

- Condamine Road / Kentwell Road (traffic signals);
- Kentwell Road / access road (priority controlled); and
- Pittwater Road / Kentwell road (traffic signals).

2.7 The results of the surveys are shown in Figures 2 to 4 and summarised in Table 2.1.

Table 2.1: Existing Weekday Morning, Afternoon and Saturday Midday Two Way (sum of both directions) Traffic Flows			
Location	**Weekday AM**	**Weekday PM**	**Saturday Midday**
Condamine Road			
- north of Kentwell Road	2622	3260	3124
- south of Kentwell Road	3106	3459	3354
Kentwell Road			
- west of Condamine Road	1134	1151	1164
- east of Condamine Road	1122	1186	1096
- west of Access Road	1131	1203	1094
- west of Pittwater Road	1146	1218	1107
Pittwater Road			
- north of Kentwell Road	1627	1605	1542
- south of Kentwell Road	1955	1805	1957
Access Road			
- south of Kentwell Road	30	23	24

2.8 Examination of Table 2.1 reveals that:

- Condamine Street carried some 2,620 to 3,460 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods;

- Kentwell Road carried some 1,120 to 1,220 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods;

- Pittwater Road carried some 1,605 to 1,955 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods; and

- The access road carried some to 25 to 30 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods.

Intersection Operation

2.9 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using the SIDRA 9 Network program for the traffic flows shown in Figures 2 to 4.

2.10 SIDRA simulates the operations of intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity.

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.11 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.12 The analysis found that:

- the signalised intersection of Condamine Street and Kentwell Road is operating with average delays of less than 45 seconds per vehicle during the weekday morning, afternoon and Saturday midday peak periods. This represents level of service C/D, a satisfactory level of service;

- the priority controlled intersection of Kentwell Road with the access road is operating with average delays for the highest delayed movement (right turn out of the access road) of less than 20 seconds per vehicle during the weekday morning, afternoon and Saturday midday peak periods. This represents level of service B, an acceptable level of service; and

- the signalised intersection of Pittwater Road and Kentwell Road is operating with average delays of less than 28 seconds per vehicle during the weekday morning, afternoon and Saturday midday peak periods. This represents level of service B, an acceptable level of service.

2.13 SIDRA movement summaries are provided in Attachment A.

Public Transport

2.14 The site is serviced by public transport with Transport NSW operating bus services on along Pittwater Road and Condamine Street. Bus stops on Pittwater Road are within some 100 metres of the site and on Condamine Street within 300 metres of the site. These services include:

- Route 142: Manly to Allambie Heights;
- Route 145: Warringah Mall to Seaforth;
- Route 172X: Warringah Mall to City Wynyard via North Balgowlah (Express);
- Route 173X: Warringah Mall to City Wynyard via Balgowlah Shops (Express);
- Route 174X: Narraweena to City Wynyard (Express);
- Route 176X: Dee Why to City Wynyard via North Curl Curl (Express);
- Route 177X: Dee Why to City Wynyard via Wingala (express);
- Route 199: Manly to Palm Beach via Dee Why and Mona Vale; and
- Route 280: Warringah Mall to Chatswood.

2.15 Pedestrian crossings are provided at the intersections of Kentwell Road with Condamine Street and Pittwater Road. The site therefore has good access to public transport.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 The proposed Manly Warringah Gymnastics Centre (MWGC) is a new facility to provide training for athletes in gymnastics. The centre is not a typical fitness centre/gymnasium. The proposed gymnastics centre will replace the existing facility at Cromer and accommodate athletes who cannot be accommodated at the Cromer facility (that currently train at Narrabeen). MWGC has advised that the new centre at North Manly will have some 40% more capacity than the existing centre. On-site parking will be provided in at an-grade car park comprising 105 car parking spaces (94 new and 11 existing) and 8 motorcycle spaces), with access from the Access Road along the southern frontage of the site.

3.2 This chapter assesses the implications of the proposed development through the following sections:

- public and active transport;
- parking provision;
- access, servicing and internal layout;
- traffic effects;
- response to pre-DA traffic matters; and
- summary.

<u>Public and Transport</u>

3.3 As previously discussed in Chapter 2, buses currently operate along Condamine Road and Pittwater Road close to the site.

3.4 The proposed development is therefore consistent with government objectives and the planning principles of:

(a) improving accessibility to employment and services by walking, cycling, and public transport;

(b) improving the choice of transport and reducing dependence solely on cars for travel purposes;

(c) moderating growth in the demand for travel and the distances travelled, especially by car; and

(d) supporting the efficient and viable operation of public transport services.

3.5 The site will also accommodate bus parking within the car park to accommodate class trips from nearby schools.

3.6 The site is located adjacent to a well established footpath network throughout the North Manly area including shared off road cycleway/footpath along both sides of Pittwater Road adjacent to the site and a footpath along the northern side of Kentwell Road. Pedestrian crossings are provided at the intersections of Kentwell Road with Condamine Street and Pittwater Road. Pedestrian access to the site will be provided to the from the corner of Pittwater Road and Kentwell Road.

3.7 To encourage and support travel to and from the site by public and active transport, a Framework Green Travel Plan has been prepared and is provided in Attachment C. The Framework Green Travel Plan includes the following:

- travel planning and demand management measures;
- measures to encourage travel by public transport;
- measures to encourage travel by active transport (walking and cycling);

- influencing travel behavior with the development of a travel access guide; and
- the need to monitor and review the green travel plan.

Parking Provision

3.8 Parking requirements for development on the subject site are set out in Warringah DCP 2011 (WDCP). However, WDCP does not provide a parking rate for the proposed gymnastics centre (which does not provide the facilities found in a typical fitness centre/gymnasium). To determine an appropriate parking provision for the site, surveys of parking demand at the existing MWGC at Cromer were undertaken.

3.9 Table 3.1 sets out the operation of the existing MWGC centre at Cromer.

Table 3.1: Summary of Existing MWGC Operation at Cromer		
Time	**Max Number of Students**	**Note**
Weekday		
6.00am – 8.30am	75 junior students	mix of drop off/park
9.30am – 11.30am	under 5 classes (up to 40 students)	parents park
12.00pm – 3.00pm	school visits	arrive by bus
	5-10 accessible students	arrive by mini bus
3.30pm – 6.00pm	up to 100 junior students	mix of drop off/park
4.00pm – 5.00pm	up to 50 junior students	mix of drop off/park
5.00pm – 6.00pm	up to 50 junior students	mix of drop off/park
6.30pm – 9.30pm	up to 80 senior students	some 75% drive and park
Saturday		
6.30am - 10.30am	55 competitive students	mix of drop off/park
8.00am – 12.00pm	35 competitive students	mix of drop off/park
8.00am - 9.00am	35 recreational students	mix of drop off/park
9.00am - 10.00am	35 recreational students	mix of drop off/park
10.00am - 11.00am	30 recreational students	mix of drop off/park
11.00am – 12.00pm	30 recreational students	mix of drop off/park
12.00pm - 1.00pm	15 recreational students	mix of drop off/park
1.00pm – 2.00pm	15 recreational students	mix of drop off/park

3.10 Based on the above, the peak parking demand during the week would occur between 4.30pm and 5.00pm when there could be up to 150 students in attendance at the centre, with a changeover in classes at 5.00pm. A secondary peak parking demand would occur with the nighttime class (6.30pm to 9.30pm). On Saturday the peak parking demand would occur between 9.45am and 10.15am when there could be up to 160 students in attendance at the centre, with the changeover in classes at 10.00am.

3.11 To determine parking demand at this time, observations of parking on site, and in the adjacent street were undertaken on Friday 28th April and Friday 5th May 2023 between 4.30pm and 5.30 pm. The observations found the following parking demand in this period:

- 4.30pm to 5.00pm - 52 to 57 spaces; and
- 5.00pm to 5.30pm - 41 to 46 spaces.

3.12 The above parking demand includes parking associated with students and staff. The classes at the time of the surveys were some 80% of capacity as set out below:

- some 80 students in the 3.30pm to 6.00pm class; and
- some 40 students of the each of the 4.00pm to 5.00pm and 5.00pm to 6.00pm classes.

3.13 To estimate peak parking demand for the proposed MWGC at North Manly:

- the surveyed parking demand has been increased by some 20% to take into account the practical capacity of the classes (95% of maximum class size as

some students will not be in attendance due to holidays, illness or other commitments) to determine peak parking demand at Cromer; and

- the peak parking demand at Cromer has been increased by 40% as the proposed MWGC at North Manly will have 40% additional capacity compared to the existing centre at Cromer.

3.14 Applying these factors, the peak demand at the existing Cromer centre would be some 68 spaces on a weekday and 73 spaces on Saturday and at the proposed North Manly centre peak parking demand would be some 96 spaces on a weekday and 102 spaces on a Saturday. The proposed parking provision of 113 spaces, comprising 105 car spaces and 8 motorcycle satisfies these requirements and is considered appropriate.

3.15 WDCP sets out the following rates for bicycle parking for recreational facilities:

- secure parking – 1 per 4 employees plus 1/1500 spectator seats; and
- casual parking – 1 per 200m^2 plus 1 per 250 spectator seats

3.16 Applying these rates, the proposed development with some 30 employees, some 150 spectator seats and some 4,800m^2, would require 9 secure spaces and 25 casual spaces. 22 bicycle spaces are provided in racks at various locations. As part of the proposed development, change rooms are provided and these will incorporate end of trip facilities (showers and lockers).

Access, Servicing and Internal Layout

3.17 Vehicular access will be provided at two locations on the access road that runs along the western boundary. The northern access will be car park entry and the southern access car park exit and service vehicle entry/exit. The southern access

would be signposted *"No Entry - Service Vehicles/Buses Excepted'*. The proposed driveways will be designed in accordance with the Australian Standard for Parking Facilities (Part 1: Off-street car parking and Part 2: Off-street commercial vehicle facilities), AS 2890.1:2004 and AS 2890.2:2018, with appropriate queuing provided prior to access controls. The following modifications are recommended to the access driveways:

- as the northern driveway is car entry only, it is recommended that it be a maximum of 4.5 metres wide as shown in Figure B1 in Attachment B; and
- as the southern driveway provides service vehicle access it should be widened to 9.3 metres as shown in Figure B1 in Attachment B.

3.18 Circulation within the central section of the car park will be one way clockwise (between the northern and southern driveways). The northern and southern sections will provide for two way traffic flow. Turn bays are provided at the end of the northern and southern sections of the car park. To assist drivers in finding a parking space, a simple parking management system is recommended that indicates the number of vacant spaces in the northern and central/southern sections of the car park. This would be displayed at the entry to the car park.

3.19 Within the site, parking spaces will be typically 2.6 metres wide by 5.4 metres long. The disabled space will be 2.4 metres wide, with a 2.4 metre wide adjacent area for wheelchairs. The circulation aisles will be a minimum of 6.6 metres wide. These dimensions satisfy the requirements of the Australian Standard for Parking Facilities (Part 1: Off-street car parking and Part 6: Off-street parking for people with disabilities), AS 2890.1:2004 and AS 2890.6:2022. A drop off zone (two to three car capacity) is provided in the central part of the car park with a median separating it from the adjacent circulation aisle.

3.20 Service vehicles will include garbage collection and deliveries. All service vehicles will enter and exit the site via the southern driveway. A loading dock is provided on the southern side of the building. The site will be serviced by vehicles ranging in size up to a 10.7 metre large rigid truck. The design provides for service vehicles to enter and exit in a forward direction. Waste collection will occur either before 6.00am or after 9.30pm. The number of deliveries is low at one or two per day. Servicing will occur in the morning, out outside of busy periods. Vehicle swept paths are provided in Attachment B.

3.21 During the weekday early afternoon period (12.00pm to 3.00pm), the facility will be used by schools and other groups. These groups will arrive and depart by bus with the bus parking in the entering and departing via the southern driveway and parking in the southern section of the car park as shown in Attachment B. As no other classes will be operating during this period, the car park will be largely vacant (only staff parking). Hence bus access and parking would be separate from the operation of the car park during classes at the centre.

3.22 Following DA approval, access arrangements, parking layouts, servicing and vehicle swept paths should be reviewed and confirmed for compliance certification.

Traffic Effects

3.23 Estimates of traffic generated by the proposed gymnastic centre have been based on observations of the operation of the existing centre at Cromer. During the weekday afternoon peak hour (between 4.30pm and 5.30pm), the existing centre at Cromer was estimated to generate some 100 vehicles per hour (two way)

based on 80% capacity. Using the same methodology as set out in Section 3.12, the peak weekday afternoon traffic generation at the existing (Cromer) and proposed (North Manly) gymnastic centres as set out below:

- the traffic generation at Cromer has been increased by some 20% to take into account the practical capacity of the classes (95% of maximum class size as some students will not be in attendance due to holidays, illness or other commitments) to determine peak parking demand at Cromer; and
- the peak traffic generation at Cromer has been increased by 40% as the proposed MWGC at North Manly will have 40% additional capacity compared to the existing centre at Cromer.

3.24 Applying these factors, the peak weekday afternoon traffic generation at the existing Cromer centre would be some 120 vehicles per hour (two way). At the proposed North Manly centre the peak weekday afternoon traffic generation would be some 170 vehicles per hour (two way). Based on class sizes, the peak weekday morning and Saturday midday traffic generation would be some 40% of the afternoon peak hour.

3.25 The additional traffic has been assigned to the road network. Existing peak hour flows plus the additional development traffic are shown in Figures 2 to 4 and summarised in Table 3.2.

Table 3.2: Existing Weekday Morning, Afternoon & Saturday Midday + Development Two Way (sum of both directions) Traffic Flows						
Location	**Weekday AM**		**Weekday PM**		**Saturday Midday**	
	Ex	**+Dev**	**Ex**	**+Dev**	**Ex**	**+Dev**
Condamine Road						
- north of Kentwell Road	2622	+0	3260	+0	3124	+0
- south of Kentwell Road	3106	+10	3459	+20	3354	+10
Kentwell Road						
- west of Condamine Road	1134	+20	1151	+40	1164	+20
- east of Condamine Road	1122	+30	1186	+70	1096	+30
- west of Access Road	1131	+30	1203	+70	1094	+30
- west of Pittwater Road	1146	+60	1218	+110	1107	+60
Pittwater Road						
- north of Kentwell Road	1627	+40	1605	+70	1542	+40
- south of Kentwell Road	1955	+20	1805	+40	1957	+20
Car Park Access						
- south of Kentwell Road	30	+90	23	+170	24	+90

3.26 The increases in traffic in Table 3.2 and SIDRA analysis in Sections 3.30 are conservative as no discount for traffic generated by the existing bowling club (with four bowling greens) has been applied. Surveys of a bowling club (with three bowling greens) in Cromer (Proposed Club and Seniors Living Development 221-223 Fisher Road North, Cromer – Traffix, September 2017) found a traffic generation of some 54 vehicles per hour (two way) in the weekday afternoon peak hour.

3.27 Examination of Table 3.2 reveals that:

- traffic flows on Condamine Street would increase by some 10 to 20 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods;

- traffic flows on Kentwell Road would increase by some 20 to 110 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods;

- traffic flows on Pittwater Road would increase by some 20 to 70 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods; and

- traffic flows in the access road would increase by some 90 to 170 vehicles per hour (two way) during the weekday morning, afternoon and Saturday midday peak periods.

3.28 The intersections assessed in Chapter 2 have been reanalysed with SIDRA for the additional development traffic flows shown in Figures 2 to 4. The analysis found that:

- the signalised intersection of Condamine Street and Kentwell Road will operate with average delays of less than 50 seconds per vehicle during the weekday morning, afternoon and Saturday midday peak periods. This represents level of service D, a satisfactory level of service, nearing capacity;

- the priority controlled intersection of Kentwell Road with Access Road will operate with average delays for the highest delayed movement (right turn out of Access Road) of less than 30 seconds per vehicle during the weekday morning, afternoon and Saturday midday peak periods. This represents level of service B/C, a satisfactory level of service; and

- the signalised intersection of Pittwater Road and Kentwell Road will continue to operate with average delays of less than 28 seconds per vehicle during the weekday morning, afternoon and Saturday midday peak periods. This represents level of service B, an acceptable level of service.

3.29 The SIDRA analysis found that with development traffic in place, queues on the Kentwell Road approach to the intersection with Pittwater Road can, on occasions, extend back past the access road, the queues are clearing each cycle which allows traffic to turn right out of the access road onto Kentwell Road.

Response to Pre-DA Traffic Matters

3.30 The traffic matters raised by Council at the pre-DA meeting and our responses are set out in Table 3.3.

Table 3.3	**Response to Pre-DA Traffic Matters**
Traffic Matter Raised	CBRK Responses
1. Applying the gym and café rates in the DCP results in a requirement for some 230 spaces. The provision of only 109 spaces will exacerbate existing on and off street parking pressures in the area.	Car parking is addressed Sections 3.8t o 3.14 and is based on the operation of the existing facility at Cromer. The proposed gymnastics centre is not a typical fitness centre/gym and hence application of the DCP rates for gyms is not appropriate. With regards to the café, its small size (less than 100m^2) and location (on the Pittwater Road frontage of the site not convenient to the on-site parking) will result in it being ancillary and hence not generate additional traffic or parking. While open to the general public, any external customers would be walk in trade from the adjacent residential area or playing fields.
2. Impact on existing parking on the Access Road.	There are currently 11 x 90 degree spaces located on the site with access to the road along the western boundary of the site. As part of the proposed development these spaces will be retained).

3. Insufficient number of accessible spaces.	Three accessible spaces are provided, which is consistent with BCA requirements (one accessible space per 50 spaces). It is noted that most students involved in specialised programs will arrive by mini-bus, which will park in the southern section of the car park.
4. The driveways appear to be unnecessarily wide, which is considered both a) unsafe as it encourages higher speeds in an area that will be well used by pedestrians and b) reduces the potential for off-street parking to be provided. The driveways should be narrowed to be no more than the width of required to facilitate ingress and egress of the largest vehicle.	The current plans show the northern driveway and southern driveway some 6.6 metres. As the northern driveway is for car entry only, we agree with Council's comment that the northern driveway should be narrowed. Figure B1 in Attachment B, shows the recommended narrowing of the driveway to 4.5 metres. With regards to the southern driveway, it provides for car park exit and service vehicle entry/exit. Hence a driveway of some 9.3 metres is appropriate.
5. The kiss and drop zone is currently not ideally located, while the presence of a kiss and drop zone is supported, it is sited within close proximity to where every vehicle will enter the site and with no separation from circulating/reversing traffic. A raised traffic island or alternate means of physically separating persons alighting from vehicles from circulating/reversing traffic would be better. Narrowing the entry driveway and shifting it south to locate the kiss and drop clear of the straight through travel path of circulating traffic is suggested	In response to the concerns raised by Council, the drop off zone has been separated from the car park by a raised median and as noted above, it is recommended that the northern driveway be narrowed to some 4.5 metres (as shown in Figure B1 Attachment B) with the driveway located to the south of the drop off zone.
6. It is also noted that the development will intensify traffic at the location, increasing the number of in and out movements to/from Kentwell Road. Given the proximity of the access road to the Kentwell Road/Pittwater Road signal controlled intersection there is potential for right turn movements to and from the site at Kentwell Road to congest traffic and create delays. SIDRA modelling of the Kentwell Road/ Pittwater Road intersection will be required taking account of traffic generated both from this site and the new golf club development on the opposite side of the	SIDRA modelling of the intersections of Kentwell Road with Pittwater Road and the Access Road have been undertaken with development traffic in place. The modelling found that while queues on Kentwell Road can, on occasions, extend back past the Access Road, the queues are clearing each cycle which allows traffic to turn right out of the Access Road onto Kentwell Road.

road. A median island extending along Kentwell Road west from Pittwater Road and across the site access road to prevent right turns may be required to minimise the potential for congestion.	
7. DCP compliant bicycle parking shall be provided. A separate pedestrian/cyclist connection should be provided to the existing bus stops and shared pedestrian/cycle way on Pittwater Road	As noted in Sections 3.15 and 3.16, bicycle parking will be provided. As noted in Section 3.6, a separate pedestrian/cyclist connection is provided to the Pittwater Road/Kentwell Road intersection. This provides access to the existing bus stops and shared pedestrian/cycle way on Pittwater Road.
8. The Trade Waste/ Loading Zone is located where trucks accessing it may interfere with parking manoeuvres and circulating traffic. The bay must be shown by swept path plots to be located where it can allow for forwards ingress and egress movements by the largest vehicle anticipated to access the bay. These plots should be provided with the DA plans. The times within which the bay is anticipated to be in use should also be outlined and, if feasible the use of the bay to occur outside of hours that the gym is in general use.	As noted in Sections 3.21 and 3.22, waste collection and deliveries are low at one or two per day and occur outside of busy periods. Vehicle swept paths are provided in Attachment B. These show that the largest vehicle that will access the site is a 10.7m long rigid truck (representative of a large waste truck), can satisfactorily access the site and the service bay.
9. Consideration shall also be given to alternative modes of transport and a Green Travel Plan is required.	Access to the site by public and active transport is assessed in Sections 2.14 to 2.15 and Sections 3.3 to 3.7. A Framework Green Travel Plan is provided in Attachment C.

Summary

3.31 In summary, the main points relating to the traffic implications of the proposed development are as follows:

i) the site is accessible by active and public transport with a Framework Green Travel Plan developed for the site;

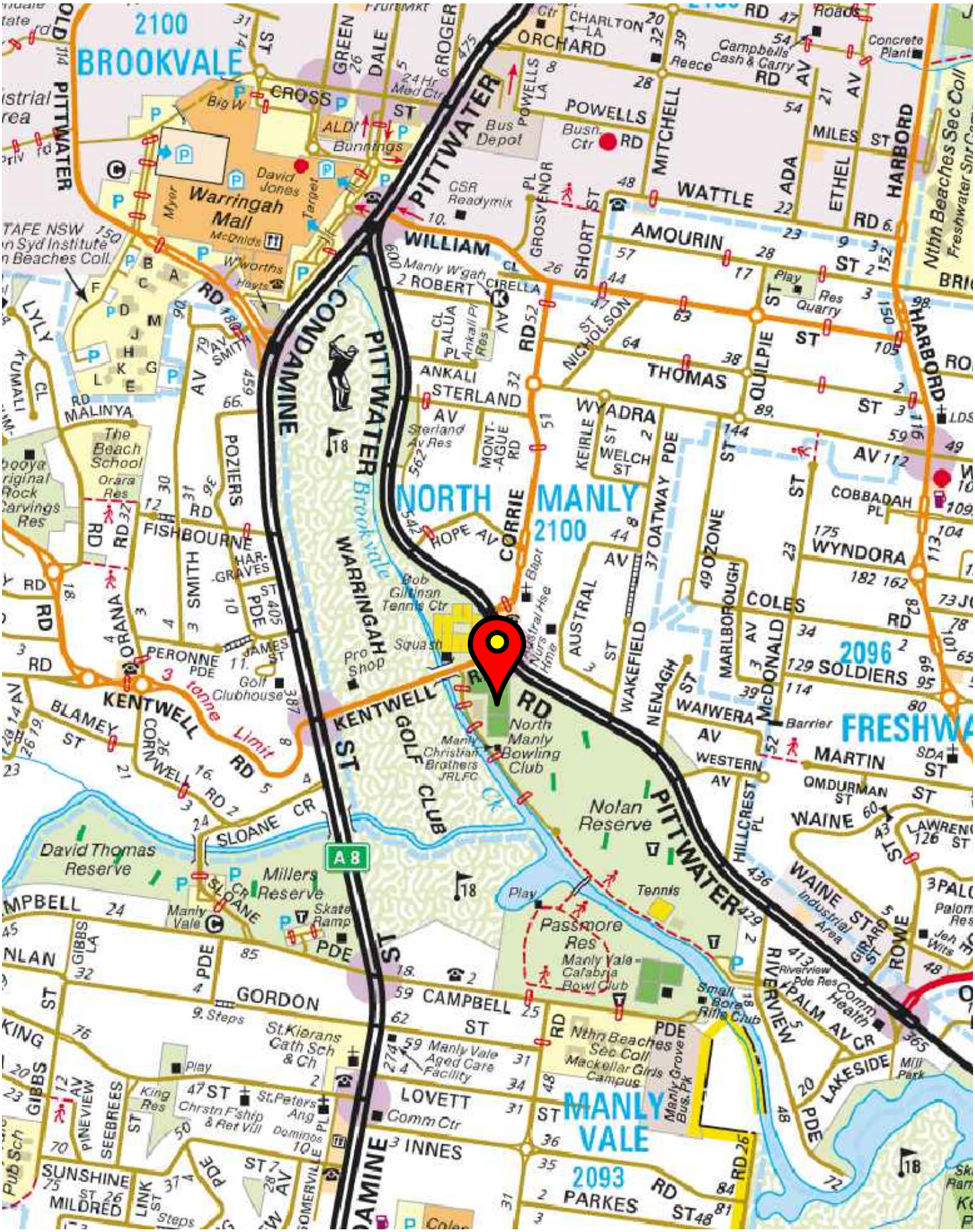
ii) the proposed parking provision is appropriate;

iii) vehicular access, internal circulation and servicing arrangements will be provided in accordance with AS 2890.1:2004 and AS 2890.2:2018;

iv) following DA approval, access arrangements, parking layouts, servicing and vehicle swept paths should be reviewed and confirmed for compliance certification;

v) the road network will be able to cater for the traffic generation of the proposed development;

vi) the pre- DA traffic matters raised by Council have been addressed.



Location Plan

Colston Budd Rogers & Kafes Pty Ltd

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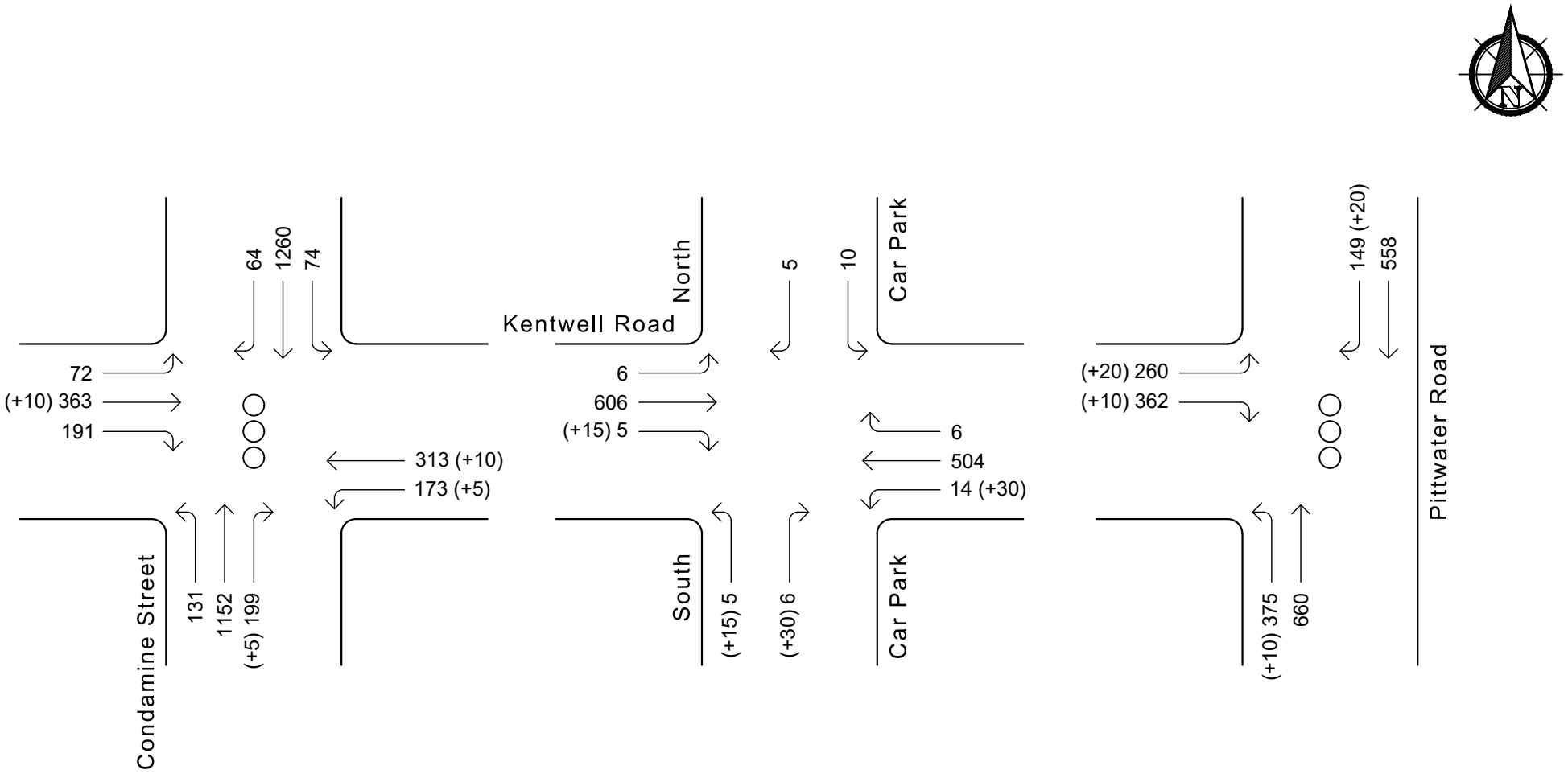
Figure 1



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals

Existing weekday morning peak hour traffic flows plus development traffic

Figure 2

Colston Budd Rogers & Kafes Pty Ltd

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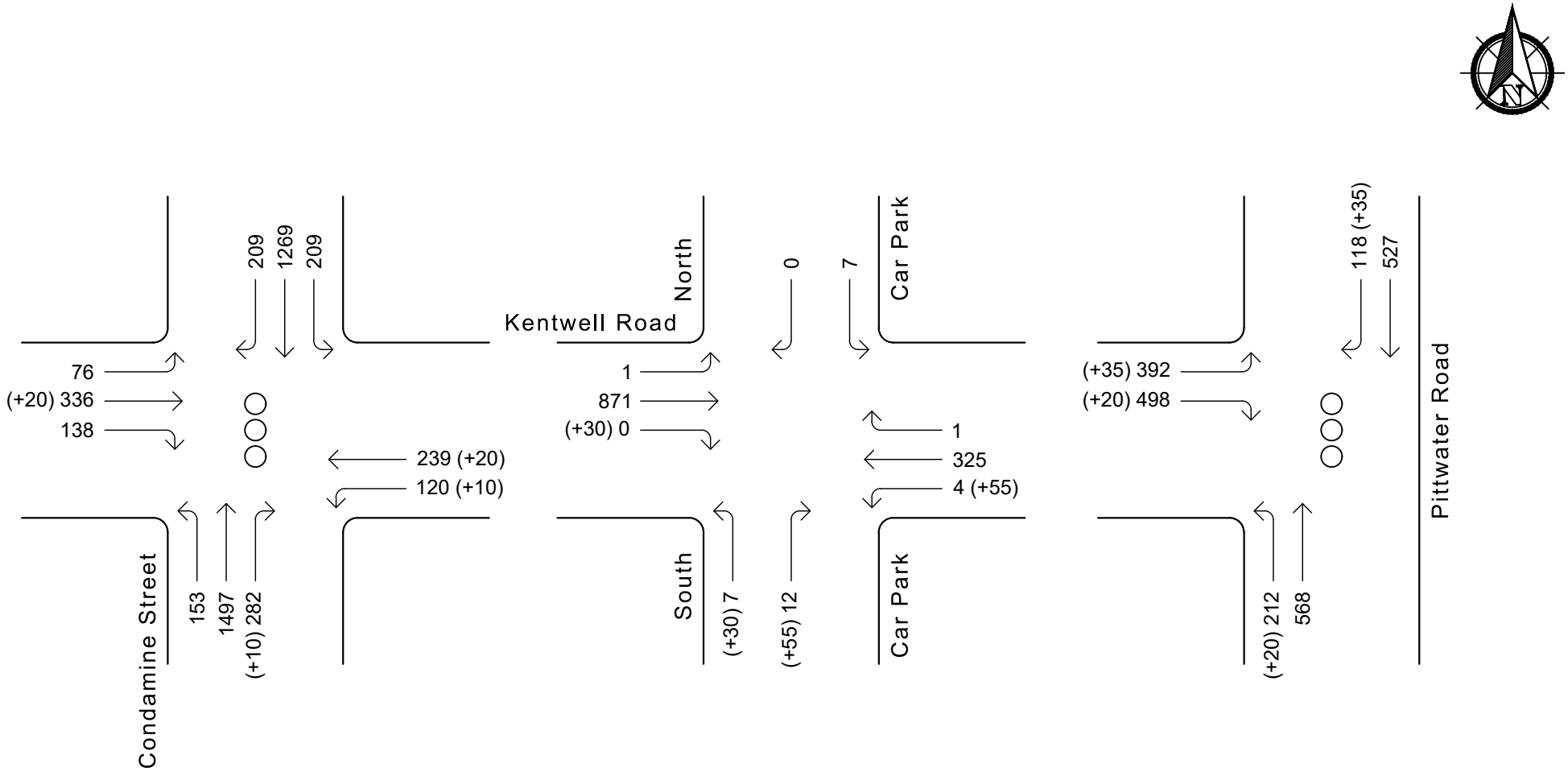

LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals

Existing weekday afternoon peak hour traffic flows plus development traffic

Figure 3

Colston Budd Rogers & Kafes Pty Ltd

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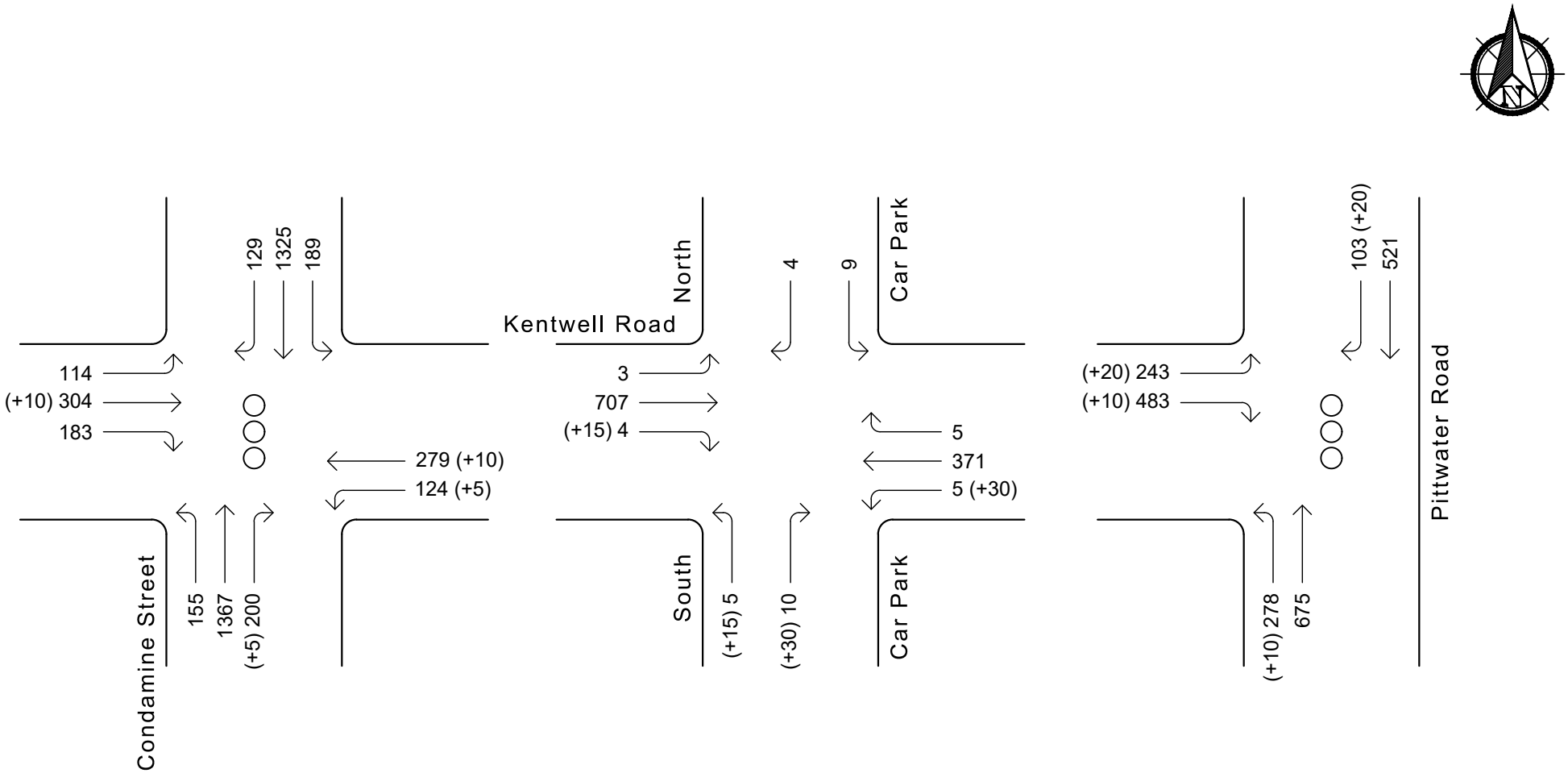

LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals

Existing Sturday Midday peak hour traffic flows plus development traffic

Figure 4

Colston Budd Rogers & Kafes Pty Ltd

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ATTACHMENT A

SIDRA MOVEMENT SUMMARIES

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: Kentwell Road Networks 231017 (w Sat)

Template: Movement Summaries

Site: 101 [AM EX - Pittwater Road - Kentwell Road (Site Folder: Weekday Morning Existing)]

Network: 1 [Weekday Morning Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 101 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pittwater Road														
1	L2	395	2.4	395	2.4	0.265	6.8	LOS A	1.8	12.9	0.24	0.65	0.24	49.1
2	T1	695	4.8	695	4.8	0.343	13.7	LOS A	5.8	42.3	0.60	0.52	0.60	49.0
Approach		1089	4.0	1089	4.0	0.343	11.2	LOS A	5.8	42.3	0.47	0.57	0.47	49.0
North: Pittwater Road														
8	T1	587	3.6	587	3.6	* 0.286	13.2	LOS A	4.7	34.1	0.58	0.50	0.58	49.3
9	R2	157	0.0	157	0.0	0.636	31.3	LOS C	4.0	27.8	0.82	0.83	0.87	29.8
Approach		744	2.8	744	2.8	0.636	17.0	LOS B	4.7	34.1	0.63	0.57	0.64	45.7
West: Kentwell Road														
10	L2	274	0.8	274	0.8	* 0.610	38.0	LOS C	7.8	55.0	0.92	0.83	0.92	27.8
12	R2	381	2.2	381	2.2	0.610	34.2	LOS C	7.8	55.0	0.88	0.82	0.88	29.3
Approach		655	1.6	655	1.6	0.610	35.8	LOS C	7.8	55.0	0.89	0.83	0.89	28.6
All Vehicles		2488	3.0	2488	3.0	0.636	19.4	LOS B	7.8	55.0	0.63	0.64	0.63	42.2

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
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: 101 [AM EX - Kentwell Road - Car Park Access (Site Folder: Weekday Morning Existing)]

Network: 1 [Weekday Morning Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: South Car Park														
1	L2	5	20.0	5	20.0	0.042	8.2	LOS A	0.0	0.3	0.62	0.79	0.62	43.0
3	R2	6	0.0	6	0.0	0.042	15.7	LOS B	0.0	0.3	0.62	0.79	0.62	43.0
Approach		12	9.1	12	9.1	0.042	12.3	LOS A	0.0	0.3	0.62	0.79	0.62	43.0
East: Kentwell Road														
4	L2	15	7.1	15	7.1	0.292	5.8	LOS A	0.1	0.4	0.03	0.02	0.03	56.0
5	T1	531	1.6	531	1.6	0.292	0.1	LOS A	0.1	0.4	0.03	0.02	0.03	55.2
6	R2	6	0.0	6	0.0	0.292	8.1	LOS A	0.1	0.4	0.03	0.02	0.03	55.5
Approach		552	1.7	552	1.7	0.292	0.3	NA	0.1	0.4	0.03	0.02	0.03	55.4
North: North Car Park														
7	L2	11	0.0	11	0.0	0.049	8.2	LOS A	0.0	0.3	0.59	0.75	0.59	44.6
9	R2	5	0.0	5	0.0	0.049	15.6	LOS B	0.0	0.3	0.59	0.75	0.59	44.6
Approach		16	0.0	16	0.0	0.049	10.7	LOS A	0.0	0.3	0.59	0.75	0.59	44.6
West: Kentwell Road														
10	L2	6	0.0	6	0.0	0.344	9.0	LOS A	0.7	5.2	0.02	0.01	0.03	57.6
11	T1	638	1.7	638	1.7	0.344	0.1	LOS A	0.7	5.2	0.02	0.01	0.03	59.1
12	R2	5	40.0	5	40.0	0.344	11.1	LOS A	0.7	5.2	0.02	0.01	0.03	54.2
Approach		649	1.9	649	1.9	0.344	0.3	NA	0.7	5.2	0.02	0.01	0.03	58.9
All Vehicles		1228	1.9	1228	1.9	0.344	0.6	NA	0.7	5.2	0.04	0.03	0.04	57.1

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.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 101 [AM EX - Condamine Street - Kentwell Road (Site Folder: Weekday Morning Existing)]

Network: 1 [Weekday Morning Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 101 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E*, F, F1*, F2*
Output Phase Sequence: A, D, F
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Condamine Street														
1	L2	138	3.1	138	3.1	0.233	28.0	LOS B	3.1	24.3	0.71	0.74	0.71	40.6
2	T1	1213	9.6	1213	9.6	* 0.896	44.2	LOS D	21.4	161.0	0.98	1.06	1.21	34.7
3	R2	209	3.0	209	3.0	* 0.727	26.8	LOS B	4.0	28.6	0.88	0.86	1.00	32.3
Approach		1560	8.2	1560	8.2	0.896	40.4	LOS C	21.4	161.0	0.95	1.00	1.14	35.0
East: Kentwell Road														
4	L2	182	1.7	182	1.7	0.202	20.8	LOS B	3.0	21.6	0.60	0.73	0.60	40.6
5	T1	329	2.2	329	2.2	0.633	28.1	LOS B	7.9	56.2	0.84	0.72	0.84	37.8
Approach		512	2.1	512	2.1	0.633	25.5	LOS B	7.9	56.2	0.75	0.72	0.75	38.7
North: Condamine Street														
7	L2	78	1.4	78	1.4	0.071	8.0	LOS A	0.6	4.9	0.23	0.56	0.23	48.9
8	T1	1326	8.7	1326	8.7	0.457	3.6	LOS A	6.3	47.2	0.35	0.32	0.35	56.6
9	R2	67	6.3	67	6.3	0.283	27.7	LOS B	1.0	7.7	0.92	0.75	0.92	40.5
Approach		1472	8.2	1472	8.2	0.457	4.9	LOS A	6.3	47.2	0.37	0.36	0.37	55.3
West: Kentwell Road														
10	L2	76	9.7	76	9.7	0.904	53.5	LOS D	15.4	110.2	0.92	1.03	1.24	32.8
11	T1	382	1.4	382	1.4	0.904	47.9	LOS D	15.4	110.2	0.92	1.03	1.24	23.6
12	R2	201	7.3	201	7.3	* 0.942	79.5	LOS F	8.5	62.9	1.00	1.14	1.66	25.8
Approach		659	4.2	659	4.2	0.942	58.2	LOS E	15.4	110.2	0.94	1.07	1.36	25.7
All Vehicles		4202	6.8	4202	6.8	0.942	29.0	LOS C	21.4	161.0	0.72	0.75	0.86	39.1

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

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: Kentwell Road Networks 231017 (w Sat)

Template: Movement Summaries

Site: 101 [PM EX - Pittwater Road - Kentwell Road (Site Folder: Weekday Afternoon Existing)]

Network: 2 [Weekday Afternoon Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 114 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pittwater Road														
1	L2	223	1.9	223	1.9	0.146	6.5	LOS A	0.9	6.5	0.19	0.63	0.19	49.5
2	T1	598	3.2	598	3.2	0.473	29.8	LOS C	8.4	60.5	0.81	0.69	0.81	40.3
Approach		821	2.8	821	2.8	0.473	23.5	LOS B	8.4	60.5	0.64	0.68	0.64	41.5
North: Pittwater Road														
8	T1	555	3.4	555	3.4	* 0.409	29.4	LOS C	7.1	50.9	0.80	0.68	0.80	40.5
9	R2	124	0.0	124	0.0	0.666	52.2	LOS D	4.2	29.2	0.96	0.86	1.04	22.3
Approach		679	2.8	679	2.8	0.666	33.5	LOS C	7.1	50.9	0.83	0.71	0.84	37.4
West: Kentwell Road														
10	L2	413	0.8	413	0.8	* 0.656	24.9	LOS B	7.8	55.0	0.72	0.79	0.72	33.8
12	R2	524	0.2	524	0.2	0.656	22.2	LOS B	7.8	55.0	0.69	0.78	0.69	35.4
Approach		937	0.4	937	0.4	0.656	23.4	LOS B	7.8	55.0	0.70	0.78	0.70	34.7
All Vehicles		2437	1.9	2437	1.9	0.666	26.2	LOS B	8.4	60.5	0.72	0.73	0.72	38.0

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
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: 101 [PM EX - Kentwell Road - Car Park Access (Site Folder: Weekday Afternoon Existing)]

Network: 2 [Weekday Afternoon Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: South Car Park														
1	L2	7	0.0	7	0.0	0.090	6.7	LOS A	0.1	0.5	0.61	0.77	0.61	41.3
3	R2	13	0.0	13	0.0	0.090	18.1	LOS B	0.1	0.5	0.61	0.77	0.61	41.3
Approach		20	0.0	20	0.0	0.090	13.9	LOS A	0.1	0.5	0.61	0.77	0.61	41.3
East: Kentwell Road														
4	L2	4	0.0	4	0.0	0.181	6.5	LOS A	0.0	0.1	0.01	0.01	0.01	56.9
5	T1	342	1.2	342	1.2	0.181	0.1	LOS A	0.0	0.1	0.01	0.01	0.01	57.6
6	R2	1	0.0	1	0.0	0.181	10.6	LOS A	0.0	0.1	0.01	0.01	0.01	55.8
Approach		347	1.2	347	1.2	0.181	0.2	NA	0.0	0.1	0.01	0.01	0.01	57.5
North: North Car Park														
7	L2	7	0.0	7	0.0	0.030	10.5	LOS A	0.0	0.2	0.65	0.78	0.65	43.9
9	R2	1	0.0	1	0.0	0.030	17.7	LOS B	0.0	0.2	0.65	0.78	0.65	43.9
Approach		8	0.0	8	0.0	0.030	11.4	LOS A	0.0	0.2	0.65	0.78	0.65	43.9
West: Kentwell Road														
10	L2	1	0.0	1	0.0	0.474	6.9	LOS A	2.7	18.9	0.00	0.00	0.00	57.9
11	T1	917	0.5	917	0.5	0.474	0.0	LOS A	2.7	18.9	0.00	0.00	0.00	59.9
12	R2	1	0.0	1	0.0	0.474	7.8	LOS A	2.7	18.9	0.00	0.00	0.00	57.1
Approach		919	0.5	919	0.5	0.474	0.0	NA	2.7	18.9	0.00	0.00	0.00	59.9
All Vehicles		1295	0.7	1295	0.7	0.474	0.3	NA	2.7	18.9	0.02	0.02	0.02	58.5

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 101 [PM EX - Condamine Street - Kentwell Road (Site Folder: Weekday Afternoon Existing)]

Network: 2 [Weekday Afternoon Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 114 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E*, F, F1*, F2*
Output Phase Sequence: A, D, E*, F, F1*
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Condamine Street														
1	L2	161	4.6	161	4.6	0.198	13.5	LOS A	2.0	15.2	0.52	0.68	0.52	48.3
2	T1	1576	4.8	1576	4.8	* 0.931	23.2	LOS B	26.4	190.9	0.76	0.80	0.89	43.4
3	R2	297	1.1	297	1.1	0.780	44.9	LOS D	7.7	54.6	1.00	0.95	1.11	24.6
Approach		2034	4.2	2034	4.2	0.931	25.6	LOS B	26.4	190.9	0.77	0.81	0.90	41.2
East: Kentwell Road														
4	L2	126	0.8	126	0.8	0.201	24.0	LOS B	2.4	16.6	0.74	0.74	0.74	38.8
5	T1	252	0.8	252	0.8	* 0.920	67.0	LOS E	10.1	71.1	1.00	1.09	1.44	25.0
Approach		378	0.8	378	0.8	0.920	52.6	LOS D	10.1	71.1	0.91	0.97	1.21	28.3
North: Condamine Street														
7	L2	220	0.0	220	0.0	0.334	31.1	LOS C	5.5	40.7	0.73	0.77	0.73	30.1
8	T1	1336	5.6	1336	5.6	0.928	47.0	LOS D	26.2	190.4	0.97	1.04	1.18	33.8
9	R2	220	2.4	220	2.4	* 0.909	62.5	LOS E	6.7	48.0	1.00	1.07	1.46	29.3
Approach		1776	4.5	1776	4.5	0.928	46.9	LOS D	26.2	190.4	0.94	1.01	1.16	32.9
West: Kentwell Road														
10	L2	83	5.1	83	5.1	0.916	64.6	LOS E	17.3	122.5	0.99	1.09	1.31	29.9
11	T1	354	0.6	354	0.6	0.916	59.0	LOS E	17.3	122.5	0.99	1.09	1.31	20.6
12	R2	145	2.2	145	2.2	* 0.771	62.6	LOS E	5.1	36.0	1.00	0.95	1.19	29.3
Approach		582	1.6	582	1.6	0.916	60.7	LOS E	17.3	122.5	0.99	1.06	1.28	24.8
All Vehicles		4769	3.8	4769	3.8	0.931	40.0	LOS C	26.4	190.9	0.87	0.93	1.06	34.5

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

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: Kentwell Road Networks 231017 (w Sat)

Template: Movement Summaries

Site: 101 [Sat MD EX - Pittwater Road - Kentwell Road (Site Folder: Saturday Midday Existing)]

Network: 5 [Saturday Midday Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 101 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pittwater Road														
1	L2	293	0.4	293	0.4	0.192	6.7	LOS A	1.2	8.7	0.23	0.64	0.23	49.2
2	T1	711	2.5	711	2.5	0.444	20.4	LOS B	7.8	55.8	0.73	0.63	0.73	44.9
Approach		1003	1.9	1003	1.9	0.444	16.4	LOS B	7.8	55.8	0.58	0.63	0.58	45.6
North: Pittwater Road														
8	T1	548	2.9	548	2.9	* 0.325	19.4	LOS B	5.3	38.2	0.69	0.59	0.69	45.5
9	R2	108	1.0	108	1.0	0.527	37.8	LOS C	2.8	20.1	0.87	0.80	0.87	27.0
Approach		657	2.6	657	2.6	0.527	22.4	LOS B	5.3	38.2	0.72	0.62	0.72	42.8
West: Kentwell Road														
10	L2	256	0.4	256	0.4	* 0.538	29.5	LOS C	7.8	55.0	0.81	0.81	0.81	31.4
12	R2	508	0.0	508	0.0	0.538	26.9	LOS B	7.9	55.0	0.78	0.80	0.78	32.8
Approach		764	0.1	764	0.1	0.538	27.8	LOS B	7.9	55.0	0.79	0.80	0.79	32.3
All Vehicles		2424	1.5	2424	1.5	0.538	21.6	LOS B	7.9	55.8	0.69	0.68	0.69	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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
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: 101 [Sat MD EX - Kentwell Road - Car Park Access (Site Folder: Saturday Midday Existing)]

Network: 5 [Saturday Midday Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: South Car Park														
1	L2	5	0.0	5	0.0	0.068	6.9	LOS A	0.1	0.4	0.62	0.78	0.62	42.2
3	R2	11	0.0	11	0.0	0.068	16.0	LOS B	0.1	0.4	0.62	0.78	0.62	42.2
Approach		16	0.0	16	0.0	0.068	12.9	LOS A	0.1	0.4	0.62	0.78	0.62	42.2
East: Kentwell Road														
4	L2	5	0.0	5	0.0	0.211	7.4	LOS A	0.0	0.3	0.03	0.02	0.03	56.6
5	T1	391	0.5	391	0.5	0.211	0.1	LOS A	0.0	0.3	0.03	0.02	0.03	55.2
6	R2	5	0.0	5	0.0	0.211	8.6	LOS A	0.0	0.3	0.03	0.02	0.03	55.5
Approach		401	0.5	401	0.5	0.211	0.3	NA	0.0	0.3	0.03	0.02	0.03	55.4
North: North Car Park														
7	L2	9	0.0	9	0.0	0.045	8.9	LOS A	0.0	0.3	0.62	0.78	0.62	44.2
9	R2	4	0.0	4	0.0	0.045	15.8	LOS B	0.0	0.3	0.62	0.78	0.62	44.2
Approach		14	0.0	14	0.0	0.045	11.0	LOS A	0.0	0.3	0.62	0.78	0.62	44.2
West: Kentwell Road														
10	L2	3	0.0	3	0.0	0.387	7.2	LOS A	1.0	7.1	0.01	0.01	0.01	57.8
11	T1	744	0.1	744	0.1	0.387	0.0	LOS A	1.0	7.1	0.01	0.01	0.01	59.6
12	R2	4	0.0	4	0.0	0.387	7.8	LOS A	1.0	7.1	0.01	0.01	0.01	57.0
Approach		752	0.1	752	0.1	0.387	0.1	NA	1.0	7.1	0.01	0.01	0.01	59.6
All Vehicles		1182	0.3	1182	0.3	0.387	0.5	NA	1.0	7.1	0.03	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 101 [Sat MD EX - Condamine Street - Kentwell Road (Site Folder: Saturday Midday Existing)]

Network: 5 [Saturday Midday Existing (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 101 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E*, F, F1*, F2*
Output Phase Sequence: A, D, F
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Condamine Street														
1	L2	163	0.6	163	0.6	0.234	25.4	LOS B	3.3	24.3	0.67	0.74	0.67	41.7
2	T1	1439	2.5	1439	2.5	* 0.928	26.6	LOS B	22.7	161.7	0.88	0.92	1.04	41.7
3	R2	211	1.5	211	1.5	* 0.621	17.7	LOS B	3.2	22.4	0.71	0.76	0.71	38.2
Approach		1813	2.2	1813	2.2	0.928	25.4	LOS B	22.7	161.7	0.84	0.89	0.97	41.5
East: Kentwell Road														
4	L2	131	0.8	131	0.8	0.152	22.1	LOS B	2.2	15.8	0.61	0.72	0.61	39.9
5	T1	294	0.4	294	0.4	0.606	31.8	LOS C	7.4	51.9	0.88	0.75	0.88	36.0
Approach		424	0.5	424	0.5	0.606	28.8	LOS C	7.4	51.9	0.80	0.74	0.80	37.1
North: Condamine Street														
7	L2	199	0.5	199	0.5	0.151	8.5	LOS A	1.5	11.1	0.26	0.63	0.26	47.4
8	T1	1395	2.4	1395	2.4	0.467	0.5	LOS A	1.5	11.1	0.04	0.04	0.04	59.5
9	R2	136	1.6	136	1.6	0.473	26.5	LOS B	2.0	14.5	0.94	0.79	0.94	41.2
Approach		1729	2.1	1729	2.1	0.473	3.4	LOS A	2.0	14.5	0.14	0.17	0.14	56.5
West: Kentwell Road														
10	L2	120	4.4	120	4.4	0.934	63.7	LOS E	16.3	115.8	0.97	1.14	1.39	30.0
11	T1	320	0.7	320	0.7	* 0.934	58.2	LOS E	16.3	115.8	0.97	1.14	1.39	20.7
12	R2	193	1.1	193	1.1	0.940	77.8	LOS F	7.8	55.4	1.00	1.12	1.65	26.2
Approach		633	1.5	633	1.5	0.940	65.2	LOS E	16.3	115.8	0.98	1.13	1.47	24.7
All Vehicles		4599	1.9	4599	1.9	0.940	22.9	LOS B	22.7	161.7	0.59	0.64	0.71	42.2

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
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)

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: Kentwell Road Networks 231017 (w Sat)

Template: Movement Summaries

Site: 101 [AM EX + Dev - Pittwater Road - Kentwell Road (Site Folder: Weekday Morning Existing + Development)]

Network: 3 [Weekday Morning Existing + Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 107 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pittwater Road														
1	L2	405	2.3	405	2.3	0.269	6.7	LOS A	1.9	13.3	0.23	0.65	0.23	49.2
2	T1	695	4.8	695	4.8	0.344	14.1	LOS A	6.2	44.9	0.59	0.51	0.59	48.7
Approach		1100	3.9	1100	3.9	0.344	11.4	LOS A	6.2	44.9	0.46	0.56	0.46	48.8
North: Pittwater Road														
8	T1	587	3.6	587	3.6	* 0.283	13.5	LOS A	4.9	35.5	0.57	0.49	0.57	49.1
9	R2	178	0.0	178	0.0	0.733	39.0	LOS C	5.5	38.2	0.88	0.90	1.02	26.5
Approach		765	2.8	765	2.8	0.733	19.4	LOS B	5.5	38.2	0.64	0.58	0.67	44.1
West: Kentwell Road														
10	L2	295	0.7	295	0.7	* 0.719	40.9	LOS C	7.8	55.0	0.92	0.85	0.96	26.7
12	R2	392	2.2	392	2.2	0.719	37.0	LOS C	7.8	55.0	0.89	0.84	0.91	28.2
Approach		686	1.5	686	1.5	0.719	38.7	LOS C	7.8	55.0	0.90	0.84	0.93	27.5
All Vehicles		2552	2.9	2552	2.9	0.733	21.1	LOS B	7.8	55.0	0.63	0.64	0.65	41.1

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
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: 101 [AM EX + Dev - Kentwell Road - Car Park Access (Site Folder: Weekday Morning Existing + Development)]

Network: 3 [Weekday Morning Existing + Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: South Car Park														
1	L2	21	5.0	21	5.0	0.255	8.6	LOS A	0.2	1.6	0.68	0.87	0.75	40.7
3	R2	38	0.0	38	0.0	0.255	17.8	LOS B	0.2	1.6	0.68	0.87	0.75	40.7
Approach		59	1.8	59	1.8	0.255	14.5	LOS B	0.2	1.6	0.68	0.87	0.75	40.7
East: Kentwell Road														
4	L2	46	2.3	46	2.3	0.309	4.9	LOS A	0.1	0.5	0.03	0.05	0.03	56.0
5	T1	531	1.6	531	1.6	0.309	0.1	LOS A	0.1	0.5	0.03	0.05	0.03	52.4
6	R2	6	0.0	6	0.0	0.309	8.2	LOS A	0.1	0.5	0.03	0.05	0.03	55.2
Approach		583	1.6	583	1.6	0.309	0.6	NA	0.1	0.5	0.03	0.05	0.03	54.0
North: North Car Park														
7	L2	11	0.0	11	0.0	0.050	8.2	LOS A	0.0	0.3	0.59	0.75	0.59	44.4
9	R2	5	0.0	5	0.0	0.050	16.1	LOS B	0.0	0.3	0.59	0.75	0.59	44.4
Approach		16	0.0	16	0.0	0.050	10.8	LOS A	0.0	0.3	0.59	0.75	0.59	44.4
West: Kentwell Road														
10	L2	6	0.0	6	0.0	0.360	9.4	LOS A	2.0	14.0	0.07	0.03	0.08	57.1
11	T1	638	1.7	638	1.7	0.360	0.3	LOS A	2.0	14.0	0.07	0.03	0.08	57.7
12	R2	21	10.0	21	10.0	0.360	9.9	LOS A	2.0	14.0	0.07	0.03	0.08	55.7
Approach		665	1.9	665	1.9	0.360	0.7	NA	2.0	14.0	0.07	0.03	0.08	57.5
All Vehicles		1323	1.8	1323	1.8	0.360	1.4	NA	2.0	14.0	0.09	0.08	0.10	54.1

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.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 101 [AM EX + Dev - Condamine Street - Kentwell Road (Site Folder: Weekday Morning Existing + Development)]

Network: 3 [Weekday Morning Existing + Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 107 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E*, F, F1*, F2*
Output Phase Sequence: A, D, F
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Condamine Street														
1	L2	138	3.1	138	3.1	0.235	29.5	LOS C	3.3	25.8	0.72	0.74	0.72	39.9
2	T1	1213	9.6	1213	9.6	* 0.908	48.8	LOS D	23.3	175.1	0.98	1.08	1.23	33.3
3	R2	215	2.9	215	2.9	* 0.736	28.3	LOS B	4.3	31.1	0.90	0.86	1.01	31.4
Approach		1565	8.1	1565	8.1	0.908	44.3	LOS D	23.3	175.1	0.95	1.02	1.15	33.7
East: Kentwell Road														
4	L2	187	1.7	187	1.7	0.204	21.1	LOS B	3.3	23.2	0.59	0.73	0.59	40.4
5	T1	340	2.2	340	2.2	0.649	29.1	LOS C	8.5	60.8	0.84	0.72	0.84	37.3
Approach		527	2.0	527	2.0	0.649	26.3	LOS B	8.5	60.8	0.75	0.72	0.75	38.3
North: Condamine Street														
7	L2	78	1.4	78	1.4	0.070	8.1	LOS A	0.6	5.1	0.23	0.56	0.23	48.8
8	T1	1326	8.7	1326	8.7	0.455	3.7	LOS A	6.6	49.4	0.35	0.32	0.35	56.5
9	R2	67	6.3	67	6.3	0.281	29.3	LOS C	1.1	8.1	0.93	0.75	0.93	39.8
Approach		1472	8.2	1472	8.2	0.455	5.1	LOS A	6.6	49.4	0.37	0.35	0.37	55.2
West: Kentwell Road														
10	L2	76	9.7	76	9.7	0.926	60.8	LOS E	17.4	124.4	0.91	1.07	1.28	30.8
11	T1	393	1.3	393	1.3	0.926	55.1	LOS D	17.4	124.4	0.91	1.07	1.28	21.6
12	R2	201	7.3	201	7.3	* 0.949	85.6	LOS F	9.1	67.5	1.00	1.14	1.66	24.7
Approach		669	4.1	669	4.1	0.949	64.9	LOS E	17.4	124.4	0.94	1.09	1.39	24.0
All Vehicles		4234	6.8	4234	6.8	0.949	31.7	LOS C	23.3	175.1	0.72	0.76	0.87	37.8

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
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)

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: Kentwell Road Networks 231017 (w Sat)

Template: Movement Summaries

Site: 101 [PM EX + Dev - Pittwater Road - Kentwell Road (Site Folder: Weekday Afternoon Existing + Development)]

Network: 4 [Weekday Afternoon Existing + Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pittwater Road														
1	L2	244	1.7	244	1.7	0.163	6.7	LOS A	1.0	7.2	0.22	0.64	0.22	49.3
2	T1	598	3.2	598	3.2	0.429	24.5	LOS B	6.8	49.0	0.78	0.67	0.78	42.7
Approach		842	2.8	842	2.8	0.429	19.4	LOS B	6.8	49.0	0.62	0.66	0.62	43.7
North: Pittwater Road														
8	T1	555	3.4	555	3.4	* 0.387	24.2	LOS B	6.0	43.3	0.77	0.66	0.77	42.9
9	R2	161	0.0	161	0.0	0.771	50.7	LOS D	5.2	36.3	0.98	0.93	1.21	22.7
Approach		716	2.6	716	2.6	0.771	30.2	LOS C	6.0	43.3	0.82	0.72	0.87	38.5
West: Kentwell Road														
10	L2	449	0.7	449	0.7	* 0.779	29.3	LOS C	7.8	55.0	0.79	0.84	0.86	31.5
12	R2	545	0.2	545	0.2	0.779	25.6	LOS B	7.8	55.0	0.76	0.82	0.81	33.4
Approach		995	0.4	995	0.4	0.779	27.3	LOS B	7.8	55.0	0.77	0.83	0.83	32.5
All Vehicles		2553	1.8	2553	1.8	0.779	25.5	LOS B	7.8	55.0	0.74	0.74	0.77	38.2

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
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: 101 [PM EX + Dev - Kentwell Road - Car Park Access (Site Folder: Weekday Afternoon Existing + Development)]

Network: 4 [Weekday Afternoon Existing + Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: South Car Park														
1	L2	39	0.0	39	0.0	0.541	13.0	LOS A	0.6	4.3	0.68	0.93	1.06	34.8
3	R2	71	0.0	71	0.0	0.541	27.5	LOS B	0.6	4.3	0.68	0.93	1.06	34.8
Approach		109	0.0	109	0.0	0.541	22.3	LOS B	0.6	4.3	0.68	0.93	1.06	34.8
East: Kentwell Road														
4	L2	62	0.0	62	0.0	0.195	4.4	LOS A	0.0	0.1	0.01	0.09	0.01	56.0
5	T1	342	1.2	342	1.2	0.195	0.1	LOS A	0.0	0.1	0.01	0.09	0.01	50.4
6	R2	1	0.0	1	0.0	0.195	10.8	LOS A	0.0	0.1	0.01	0.09	0.01	55.5
Approach		405	1.0	405	1.0	0.195	0.7	NA	0.0	0.1	0.01	0.09	0.01	53.7
North: North Car Park														
7	L2	7	0.0	7	0.0	0.031	10.5	LOS A	0.0	0.2	0.66	0.78	0.66	43.7
9	R2	1	0.0	1	0.0	0.031	18.9	LOS B	0.0	0.2	0.66	0.78	0.66	43.7
Approach		8	0.0	8	0.0	0.031	11.5	LOS A	0.0	0.2	0.66	0.78	0.66	43.7
West: Kentwell Road														
10	L2	1	0.0	1	0.0	0.460	8.3	LOS A	3.7	26.1	0.05	0.02	0.06	57.3
11	T1	917	0.5	917	0.5	0.460	0.2	LOS A	3.7	26.1	0.05	0.02	0.06	58.3
12	R2	32	0.0	32	0.0	0.460	8.3	LOS A	3.7	26.1	0.05	0.02	0.06	57.0
Approach		949	0.4	949	0.4	0.460	0.5	NA	3.7	26.1	0.05	0.02	0.06	58.2
All Vehicles		1473	0.6	1473	0.6	0.541	2.2	NA	3.7	26.1	0.09	0.11	0.13	52.4

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 101 [PM EX + Dev - Condamine Street - Kentwell Road (Site Folder: Weekday Afternoon Existing + Development)]

Network: 4 [Weekday Afternoon Existing + Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E*, F, F1*, F2*
Output Phase Sequence: A, D, E*, F, F1*
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Condamine Street														
1	L2	161	4.6	161	4.6	0.205	13.2	LOS A	1.8	14.4	0.54	0.68	0.54	48.5
2	T1	1576	4.8	1576	4.8	* 0.965	33.3	LOS C	28.7	207.7	0.89	1.02	1.15	38.8
3	R2	307	1.0	307	1.0	0.870	47.1	LOS D	8.0	56.5	1.00	1.01	1.29	23.9
Approach		2044	4.2	2044	4.2	0.965	33.8	LOS C	28.7	207.7	0.88	0.99	1.12	37.4
East: Kentwell Road														
4	L2	137	0.8	137	0.8	0.225	21.8	LOS B	2.2	15.6	0.76	0.75	0.76	40.0
5	T1	273	0.8	273	0.8	* 0.961	72.0	LOS F	10.8	76.0	1.00	1.19	1.64	23.9
Approach		409	0.8	409	0.8	0.961	55.2	LOS D	10.8	76.0	0.92	1.04	1.35	27.6
North: Condamine Street														
7	L2	220	0.0	220	0.0	0.356	30.0	LOS C	5.1	37.5	0.76	0.77	0.76	30.6
8	T1	1336	5.6	1336	5.6	0.962	55.9	LOS D	25.9	188.0	1.00	1.18	1.36	31.3
9	R2	220	2.4	220	2.4	* 1.056	107.7	LOS F	8.6	61.4	1.00	1.23	2.16	18.5
Approach		1776	4.5	1776	4.5	1.056	59.1	LOS E	25.9	188.0	0.97	1.14	1.38	28.6
West: Kentwell Road														
10	L2	83	5.1	83	5.1	0.883	51.7	LOS D	15.1	106.8	0.98	1.04	1.23	33.4
11	T1	375	0.6	375	0.6	0.883	46.1	LOS D	15.1	106.8	0.98	1.04	1.23	24.0
12	R2	145	2.2	145	2.2	* 0.722	54.0	LOS D	4.4	31.1	1.00	0.92	1.14	31.5
Approach		603	1.6	603	1.6	0.883	48.8	LOS D	15.1	106.8	0.98	1.01	1.21	27.9
All Vehicles		4833	3.7	4833	3.7	1.056	46.8	LOS D	28.7	207.7	0.93	1.05	1.25	31.7

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

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: Kentwell Road Networks 231017 (w Sat)

Template: Movement Summaries

Site: 101 [Sat MD EX + Dev - Pittwater Road - Kentwell Road (Site Folder: Saturday Midday Existing+ Development)]

Network: 6 [Saturday Midday Existing+ Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pittwater Road														
1	L2	303	0.3	303	0.3	0.200	6.7	LOS A	1.3	9.1	0.23	0.64	0.23	49.2
2	T1	711	2.5	711	2.5	0.438	19.9	LOS B	7.6	54.6	0.72	0.63	0.72	45.2
Approach		1014	1.9	1014	1.9	0.438	16.0	LOS B	7.6	54.6	0.58	0.63	0.58	45.9
North: Pittwater Road														
8	T1	548	2.9	548	2.9	* 0.321	18.9	LOS B	5.2	37.5	0.68	0.58	0.68	45.8
9	R2	129	0.8	129	0.8	0.622	39.5	LOS C	3.6	25.1	0.90	0.84	0.95	26.4
Approach		678	2.5	678	2.5	0.622	22.8	LOS B	5.2	37.5	0.73	0.63	0.74	42.4
West: Kentwell Road														
10	L2	277	0.4	277	0.4	* 0.607	30.0	LOS C	7.8	55.0	0.83	0.81	0.83	31.1
12	R2	519	0.0	519	0.0	0.607	27.4	LOS B	7.9	55.0	0.80	0.81	0.80	32.5
Approach		796	0.1	796	0.1	0.607	28.3	LOS B	7.9	55.0	0.81	0.81	0.81	32.0
All Vehicles		2487	1.5	2487	1.5	0.622	21.8	LOS B	7.9	55.0	0.69	0.69	0.69	40.7

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
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: 101 [Sat MD EX + Dev - Kentwell Road - Car Park Access (Site Folder: Saturday Midday Existing+ Development)]

Network: 6 [Saturday Midday Existing+ Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: South Car Park														
1	L2	21	0.0	21	0.0	0.280	8.0	LOS A	0.2	1.7	0.65	0.84	0.73	40.4
3	R2	42	0.0	42	0.0	0.280	18.4	LOS B	0.2	1.7	0.65	0.84	0.73	40.4
Approach		63	0.0	63	0.0	0.280	14.9	LOS B	0.2	1.7	0.65	0.84	0.73	40.4
East: Kentwell Road														
4	L2	37	0.0	37	0.0	0.228	5.1	LOS A	0.1	0.4	0.04	0.06	0.04	56.1
5	T1	391	0.5	391	0.5	0.228	0.1	LOS A	0.1	0.4	0.04	0.06	0.04	51.4
6	R2	5	0.0	5	0.0	0.228	8.7	LOS A	0.1	0.4	0.04	0.06	0.04	55.1
Approach		433	0.5	433	0.5	0.228	0.7	NA	0.1	0.4	0.04	0.06	0.04	53.5
North: North Car Park														
7	L2	9	0.0	9	0.0	0.046	8.9	LOS A	0.0	0.3	0.62	0.78	0.62	44.0
9	R2	4	0.0	4	0.0	0.046	16.3	LOS B	0.0	0.3	0.62	0.78	0.62	44.0
Approach		14	0.0	14	0.0	0.046	11.2	LOS A	0.0	0.3	0.62	0.78	0.62	44.0
West: Kentwell Road														
10	L2	3	0.0	3	0.0	0.401	8.1	LOS A	1.5	10.3	0.04	0.02	0.05	57.4
11	T1	744	0.1	744	0.1	0.401	0.1	LOS A	1.5	10.3	0.04	0.02	0.05	58.7
12	R2	20	0.0	20	0.0	0.401	8.1	LOS A	1.5	10.3	0.04	0.02	0.05	56.7
Approach		767	0.1	767	0.1	0.401	0.4	NA	1.5	10.3	0.04	0.02	0.05	58.5
All Vehicles		1277	0.2	1277	0.2	0.401	1.3	NA	1.5	10.3	0.08	0.08	0.08	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 101 [Sat MD EX + Dev - Condamine Street - Kentwell Road (Site Folder: Saturday Midday Existing+ Development)]

Network: 6 [Saturday Midday Existing+ Development (Network Folder: Existing + Development)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Network Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B*, C*, D, E*, F, F1*, F2*
Output Phase Sequence: A, D, F
(* Variable Phase)

Vehicle Movement Performance

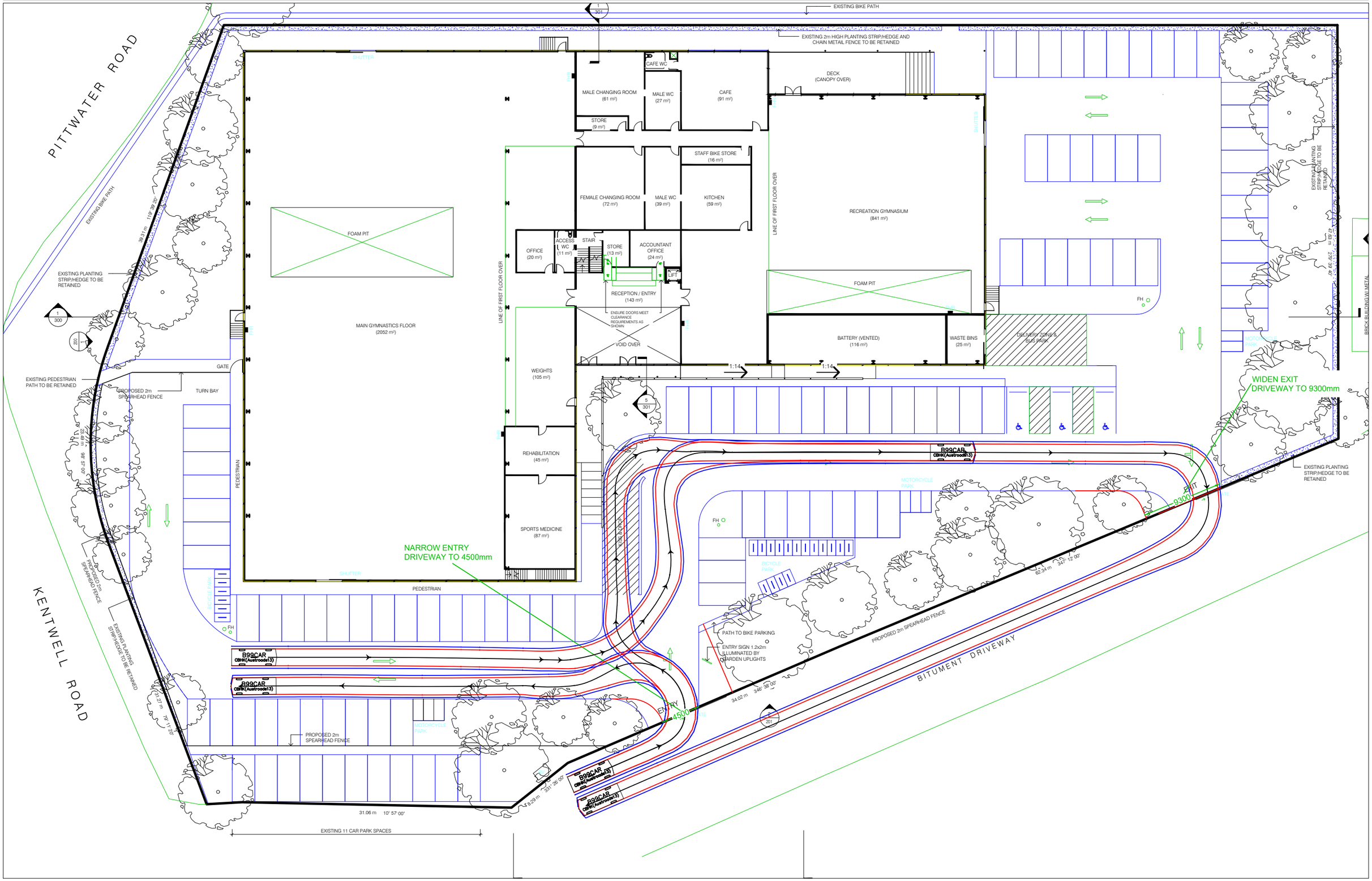
Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Condamine Street														
1	L2	163	0.6	163	0.6	0.237	25.6	LOS B	3.3	24.3	0.67	0.74	0.67	41.6
2	T1	1439	2.5	1439	2.5	* 0.940	29.5	LOS C	23.8	168.8	0.90	0.97	1.10	40.4
3	R2	216	1.5	216	1.5	* 0.669	20.1	LOS B	3.5	25.0	0.73	0.79	0.77	36.5
Approach		1818	2.2	1818	2.2	0.940	28.0	LOS B	23.8	168.8	0.86	0.93	1.02	40.2
East: Kentwell Road														
4	L2	136	0.8	136	0.8	0.157	21.7	LOS B	2.3	16.2	0.60	0.72	0.60	40.1
5	T1	304	0.3	304	0.3	0.604	30.5	LOS C	7.5	52.5	0.87	0.74	0.87	36.6
Approach		440	0.5	440	0.5	0.604	27.8	LOS B	7.5	52.5	0.79	0.73	0.79	37.6
North: Condamine Street														
7	L2	199	0.5	199	0.5	0.150	8.3	LOS A	1.5	10.7	0.25	0.63	0.25	47.7
8	T1	1395	2.4	1395	2.4	0.463	0.4	LOS A	1.5	10.7	0.04	0.04	0.04	59.5
9	R2	136	1.6	136	1.6	0.507	27.5	LOS B	2.0	14.5	0.96	0.79	0.96	40.7
Approach		1729	2.1	1729	2.1	0.507	3.5	LOS A	2.0	14.5	0.14	0.17	0.14	56.5
West: Kentwell Road														
10	L2	120	4.4	120	4.4	0.926	60.4	LOS E	16.2	114.7	0.96	1.11	1.35	30.8
11	T1	331	0.6	331	0.6	* 0.926	54.8	LOS D	16.2	114.7	0.96	1.11	1.35	21.5
12	R2	193	1.1	193	1.1	0.909	69.3	LOS E	7.3	51.8	1.00	1.07	1.53	27.9
Approach		643	1.5	643	1.5	0.926	60.2	LOS E	16.2	114.7	0.97	1.10	1.41	25.8
All Vehicles		4631	1.9	4631	1.9	0.940	23.3	LOS B	23.8	168.8	0.60	0.65	0.72	42.0

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
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)

ATTACHMENT B

VEHICLE SWEPT PATHS



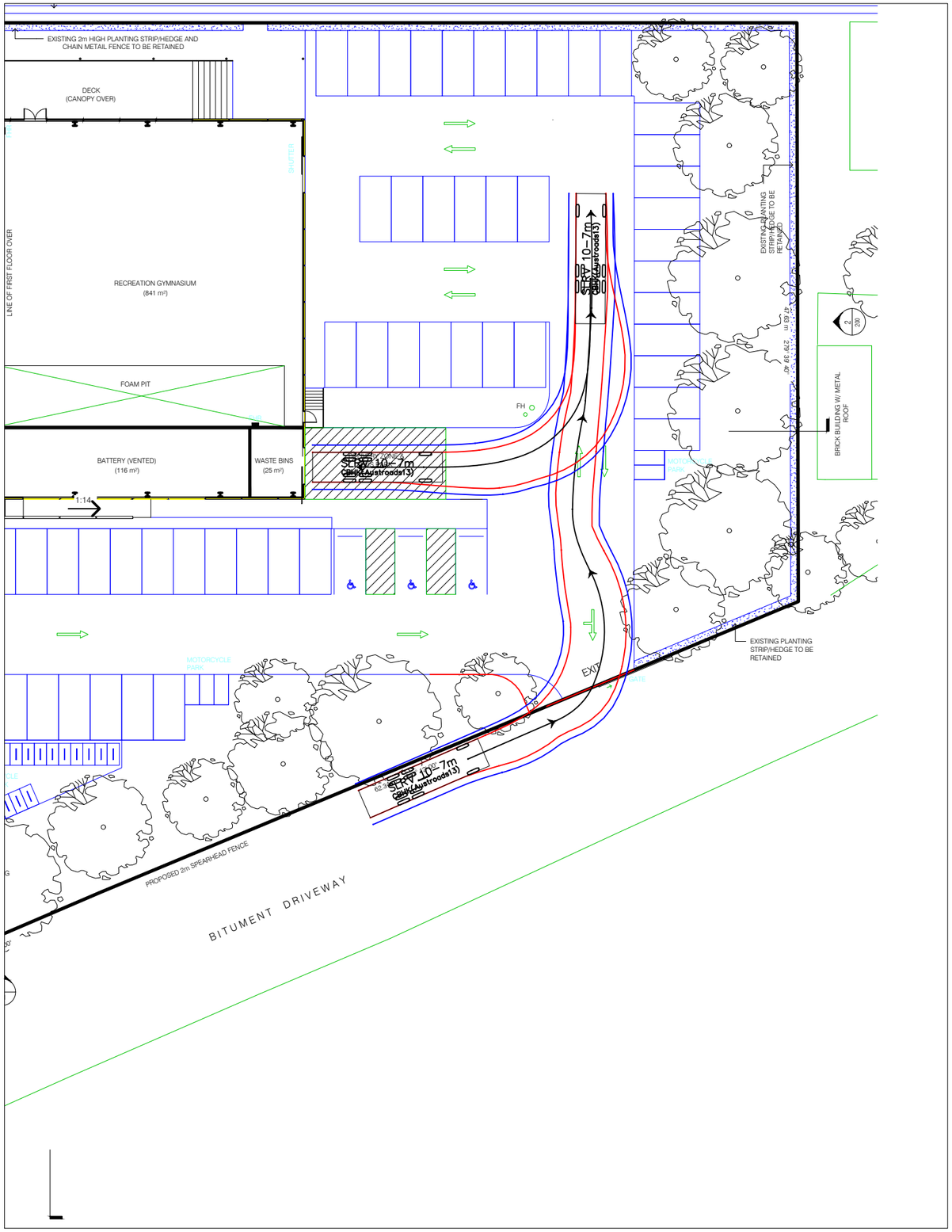
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

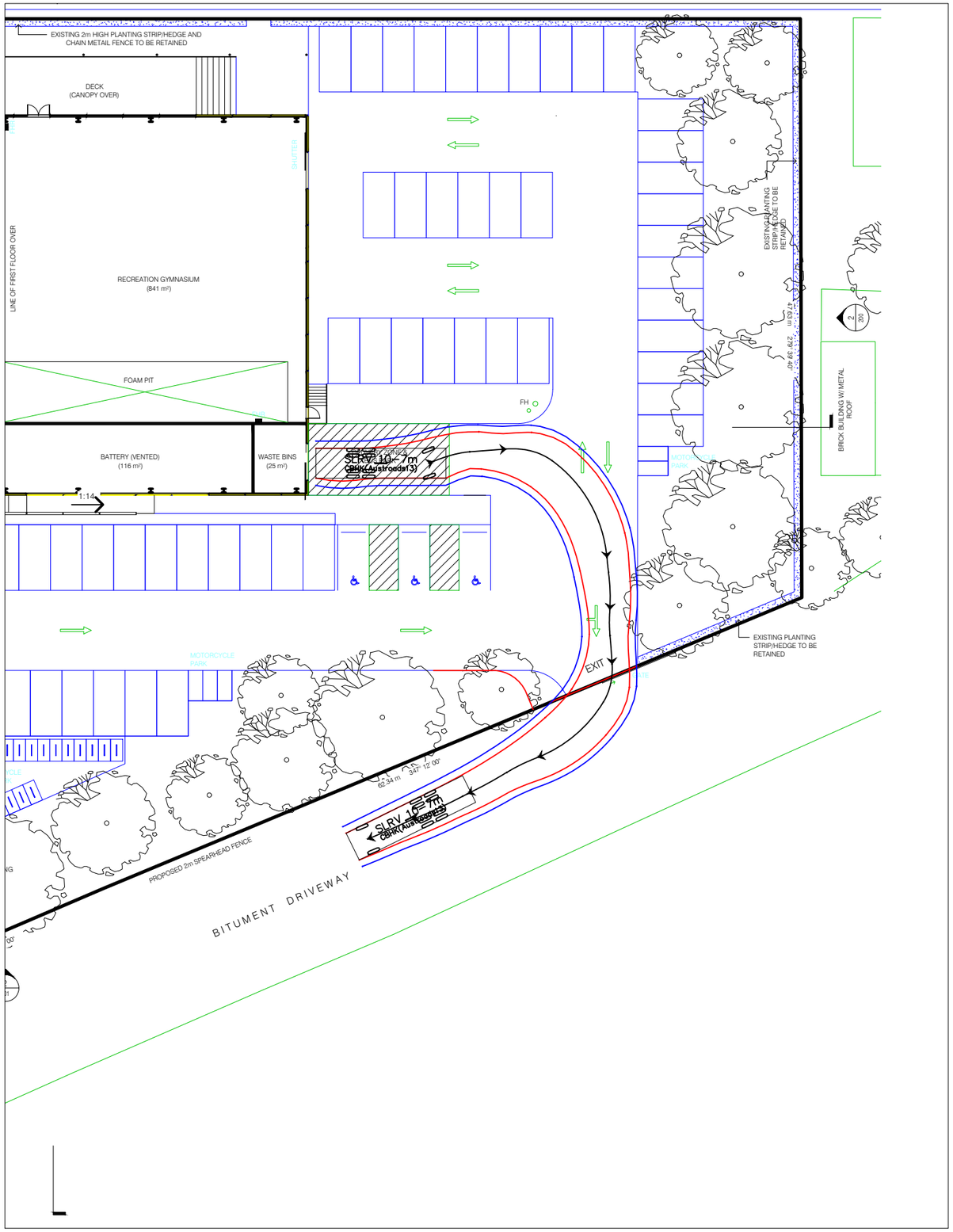
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

B99 VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 12217 31.10.2023

B1





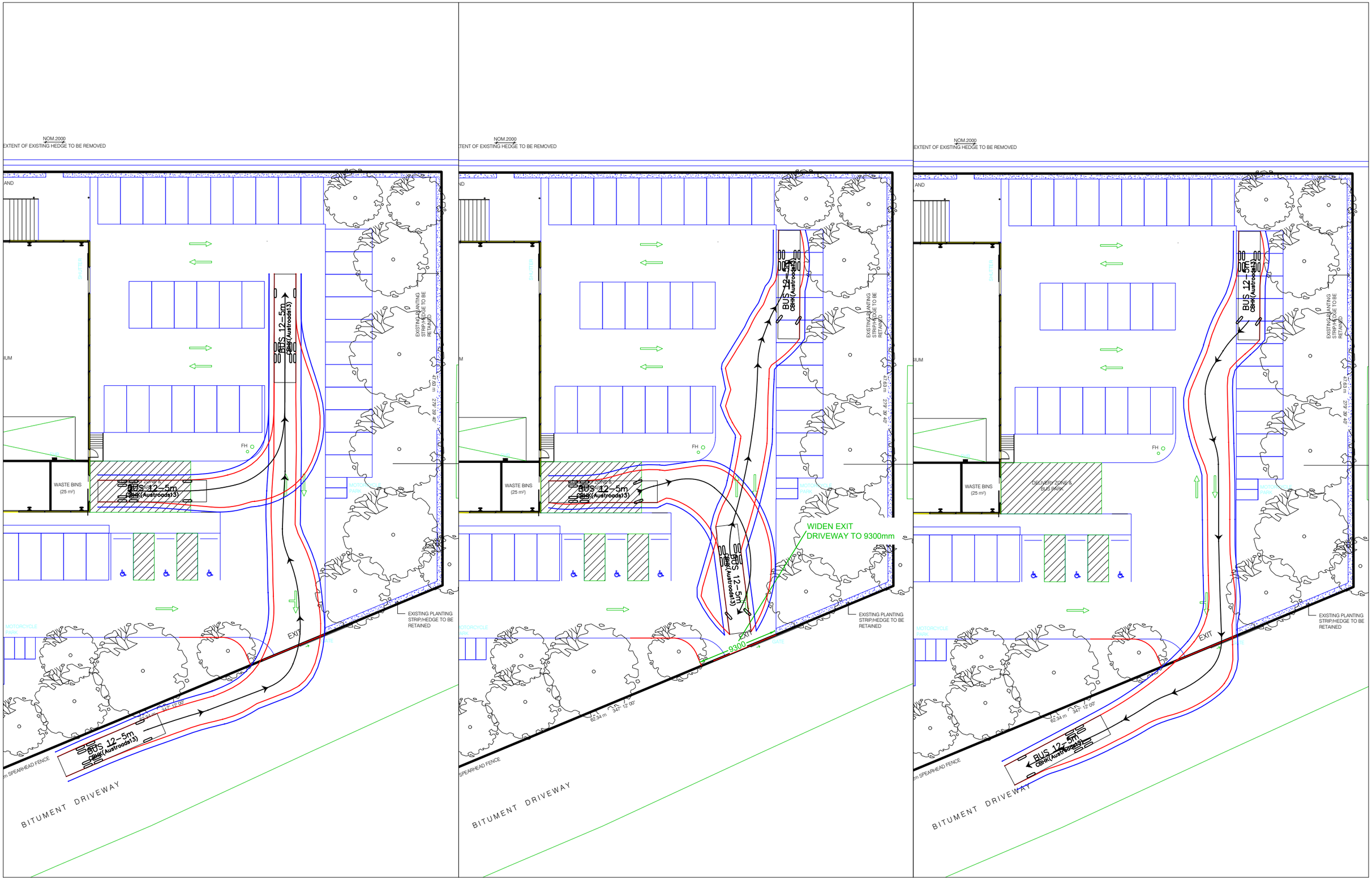
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

10.7m LARGE RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 12217 31.10.2023

B2



NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

12.5m BUS SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 12217 31.10.2023

B3

ATTACHMENT C

FRAMEWORK GREEN TRAVEL PLAN

FRAMEWORK GREEN TRAVEL PLAN

Introduction

1. A framework Green Travel Plan (GTP) has been developed to identify measures to promote sustainable transport options and to encourage travel modes away from single occupant private vehicles. It adopts a transport management approach and provides a site-specific management strategy for delivering long term behavioural change and sustainable travel patterns. It outlines a range of actions and initiatives to increase travel modes such as walking, cycling, public transport and car pooling, as well as influencing behaviours that lead to better organisational outcomes, improving environmental impacts, improving viability of public transport services and creating healthier lifestyles, while reducing traffic on the surrounding road network. The framework GTP ensures that visitors to the facility feel safe, secure and well informed about travel to and from the site.

Public Transport

2. As set out in Sections 2.14 to 2.15 and 3.3 to 3.6 of the traffic report, the site is services by public transport with Transport NSW operating bus services along Pittwater Road and Condamine Street.

3. Pedestrian crossings are provided at the intersections of Kentwell Road with Condamine Street and Pittwater Road, providing convenient access to bus stops. The site therefore has good access to public transport.

Active Transport

4. The site is located adjacent to a well established footpath network throughout the North Manly area including shared off road cycleway/footpath along both sides of Pittwater Road adjacent to the site and a footpath along the northern side of Kentwell Road. Pedestrian crossings are provided at the intersections of Kentwell Road with Condamine Street and Pittwater Road. Pedestrian access to the site will be provided to the from the corner of Pittwater Road and Kentwell Road.

5. In addition to the above, there are off-road cycle paths through Nolan Reserve, providing access to open space areas in the vicinity of the site. These off-road cycle paths connect to the shared cycleway/footpath along Pittwater Road.

6. Pedestrian footpaths, shared paths, marked pedestrian crossings and pedestrian facility within the existing traffic signals on the surrounding road network, combine to provide convenient pedestrian and cycle access to and from the site.

7. As set out in the traffic report, bicycle parking and end of trip facilities, including change rooms, lockers and showers, will be provided for athletes/gymnasts, staff/trainers and visitors. Bicycle racks will be provided at various locations around the site. As part of the proposed development, change rooms will be provided and these facilities will incorporate end of trip facilities (showers and lockers).

Objective of the Framework Green Travel Plan

8. The framework GTP will comprise a package of measures designed to address the specific travel needs of the site. The main objectives of the framework GTP include:

- reducing dependence on private vehicles and encourage the use of more sustainable travel modes;
- reduce the number of car trips to and from the site, by encouraging the use of public transport;
- provide facilities for athletes/gymnasts, staff/trainers and visitors to commute by sustainable transport modes, including walking and cycling;
- promoting public transport and car pooling;
- advise all new athletes/gymnasts, staff/trainers and visitors of the available public transport options to and from the site;
- reduce the environmental footprint of the development;
- reducing congestion in the local area; and
- promote the health benefits of active transport and create a more active social culture.

Framework Green Travel Plan

9. The framework GTP will be refined in consultation with council, public transport operators and other stakeholders. It will include the following measures:

- Travel Planning and Demand Management

  - develop a Travel Access Guide. The travel guide will provide public transport information, maps, car share vehicle locations and public transport timetable;

  - management and promotion of the travel guide by encouraging athletes/gymnasts, staff/trainers and visitors to travel actively and to help develop a healthy, active culture and meet travel mode targets;

  - promote car pooling scheme. Athletes/gymnasts and staff/trainers that live in the same area and train at a similar time would be encouraged to car pool when travelling to and from the facility;

- Encourage the Use of Public Transport

  - encourage the use of public transport by providing information and resources, through the development of a Travel Access Guide;

  - work with public transport providers to improve services;

  - meet or exceed TfNSW bus planning guidelines;

  - promote the provision of travel passes to staff/trainers to encourage use of public transport;

  - develop a car pool scheme to help athletes/gymnast and staff/trainers find someone to share their travel to and from the site;

- Encouraging Active Transport (Cycling and Walking)
    - provide appropriate bicycle parking facilities;
    - provide convenient end of trip facilities, including showers, change rooms, lockers, etc, to encourage people to walk and cycle;
    - create a Bicycle User Group (BUG) to educate and encourage others to ride. BUG members can provide helpful tips on cycling, share route plans or form 'bike bus' to travel to and from the site;
- Influencing Travel Behavior
    - provision of a Travel Access Guide. This provides information on walking and cycling routes, and travel by bus to and from the site. Contacts of the travel plan coordinator for the GTP will also be provided.

Monitoring and Reviewing the Framework Green Travel Plan

10. The framework GTP will be monitored to ensure that it is meeting its objectives and having the intended impact on car use and transport choices for athletes/gymnasts, staff/trainers and visitors. The framework GTP will be reviewed annually and if required updated to reflect changing circumstances and to identify which initiatives are having an impact or need to be modified to ensure appropriate travel behaviour.

11. The operator of the facility will provide a travel plan coordinator (TPC) that will oversee the measures and resultant impacts of the framework GTP. This person

will review and assess the travel mode data against the existing travel data available for the area and make appropriate recommendations.

12. In association with the framework GTP, a Travel Access Guide will be prepared for the facility. The plan will provide public transport information, maps, car share vehicle locations and public transport timetable.