Traffic Impact Assessment

BWC2/25 - Blacktown Workers Sports Club
Seniors Living Village – 170 Reservoir Road, Arndell Park

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Overview

TRAFFIX has been commissioned by Paynter Dixon Constructions Pty Ltd to undertake a Traffic Impact Assessment of a proposed development application for the Blacktown Workers Sports Club, situated in Arndell Park in New South Wales. This proposal envisages the development of a seniors living village on the existing sports field site.

The Blacktown Workers Sports Club is located approximately 3.0 kilometres south of Blacktown Railway Station and 30 kilometres west of the Sydney central business district. It covers approximately 21 hectares and is enclosed by Reservoir Road, Holbeche Road, Walters Road and Penny Lane.

All existing development within the Blacktown Workers Sports Club is limited to an area known as *'The Club'*, which currently accommodates a registered club, hotel and restaurant. The division of areas within the master plan is shown in **Figure 1**, whereby land adjacent to the *'The Club'* forms the subject of the following submission:

- Site B - Lot 201 DP8804404:
    - Development of a Seniors Living Village on Lot 201 DP880404.

This assessment assesses the Site B proposal at a pre-development application stage, however the assessment also accounts for the traffic impacts of other proposals including the approved 'Site A' (sports facilities) and works within 'The Club' section of the BSWC, as well as relying on a new proposed access at Holbeche Road.

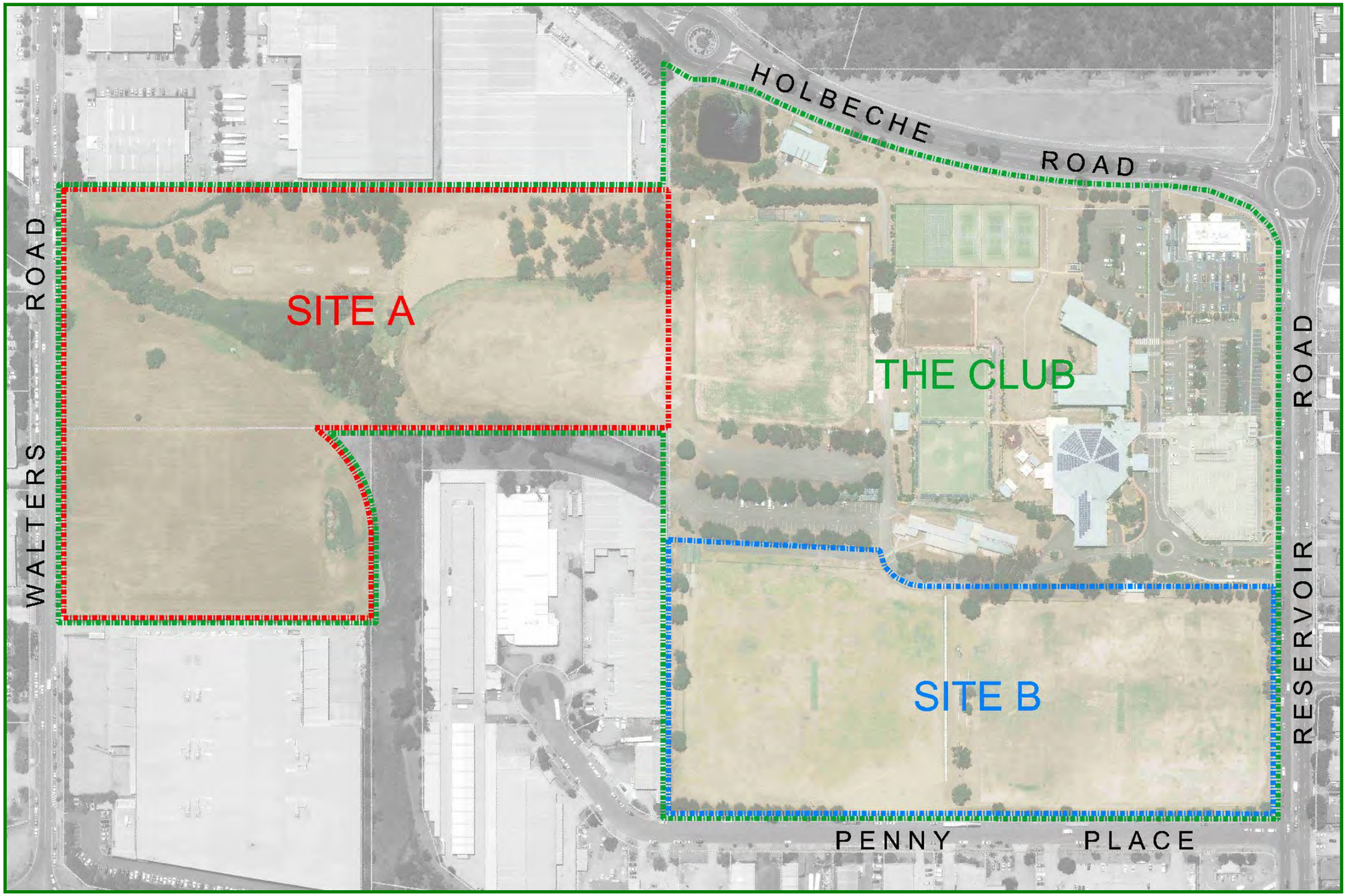

Figure 1: Blacktown Workers Sports Club

1. Introduction

The Development Application for the Blacktown Workers Sports Club shall propose a Seniors Living Village within Site B. Whilst the final layouts are still being resolved, it is understood that these applications will propose:

- Up to 800 Independent Living Units; and
- A Residential Aged Care Facility providing up to 160 beds.

This report documents the parking requirements and traffic impacts of the above development on the basis that 800 independent living units and 160 RACF beds are developed. As the site is located in the City of Blacktown local government area, it has been assessed under that Council's controls, in addition to the provisions of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

The development is expected to contain more than 200 car parking spaces and therefore requires referral to the Roads and Maritime Services (RMS) under the provisions of State Environmental Planning Policy (Infrastructure) 2007.

This report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed and permissible developments
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Describes the Access and Internal Design.
- Section 8: Presents the overall study conclusions.

2. Location and Site

The site for the Seniors Living estate, known as 'Site B' is located at 170 Reservoir Road in Arndell Park and is legally described as Lot 201 in DP880404. It occupies the south eastern portion of the Blacktown Workers Sports Club (BWSC)

Site B has a rectangular shaped configuration and with an area of approximately five hectares. It has an eastern frontage to Reservoir Road that measures approximately 140 metres and a southern frontage to Penny Lane that measures approximately 360 metres. The remainder of the site is bounded by the area within the BWSC known as 'The Club' to the north and by industrial developments to the west.

Site B currently comprises of two sports fields. Vehicular access is provided via an internal circulation road within 'The Club' area of BWSC that in turn, is most conveniently accessed from Reservoir Road.

A Location Plan is presented in **Figure 2**, with a Site Plan presented in **Figure 3**. Reference should also be made to the site photos included in **Appendix A**.

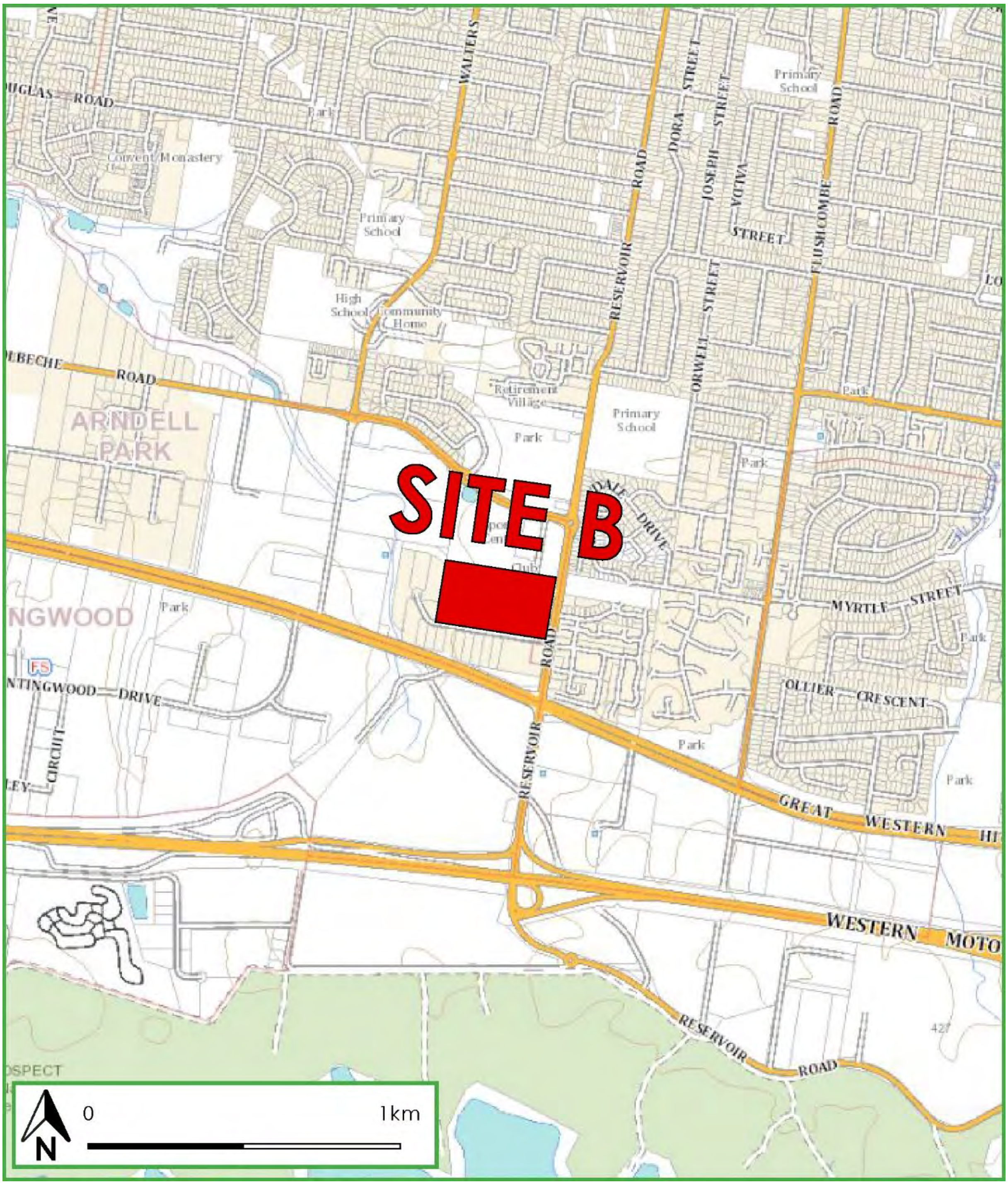

Figure 2: Location Plan

Figure 3: Site Plan

3. Existing Traffic Conditions

3.1 Road Hierarchy

The road hierarchy in the vicinity of the site is shown in **Figure 4** with the following roads of particular interest:

- Great Western Highway: a highway (HW5) that generally runs in an east-west direction between Broadway at Haymarket in the east and Brilliant Street at Bathurst to the west. In the vicinity of the site, it carries approximately 39,900 vehicles per day (2012 AADT) and has a posted speed limit of 80 km/h. The Great Western Highway accommodates three lanes of traffic in each direction within a divided carriageway on approach to Reservoir Road, whilst accommodating two lanes of traffic in each direction further west on approach to Walters Road.

- Reservoir Road: an RMS Main Road (MR683) that runs in a north-south direction between Bungarribee Road in the north and the M4 Western Motorway to the south (Reservoir Road continues as a local road south of the M4 Western Motorway). It carries approximately 21,900 vehicles per day (2005 AADT) and has a posted speed limit of 60 km/h. Between Holbeche Road and the Great Western Highway, Reservoir Road accommodates two lanes of traffic in each direction within a divided carriageway.

- Holbeche Road: a local road that runs in an east-west direction between Reservoir Road in the east and Doonside Road to the west. Between Reservoir Road and Walters Road, it has a posted speed limit of 50 km/h and accommodates two lanes of traffic in each direction within a divided carriageway.

- Penny Place: a local road that extends west of Reservoir Road and forms a cul-de-sac. It has a 50 km/h speed limit and accommodates a single lane of traffic within an undivided carriageway.

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.

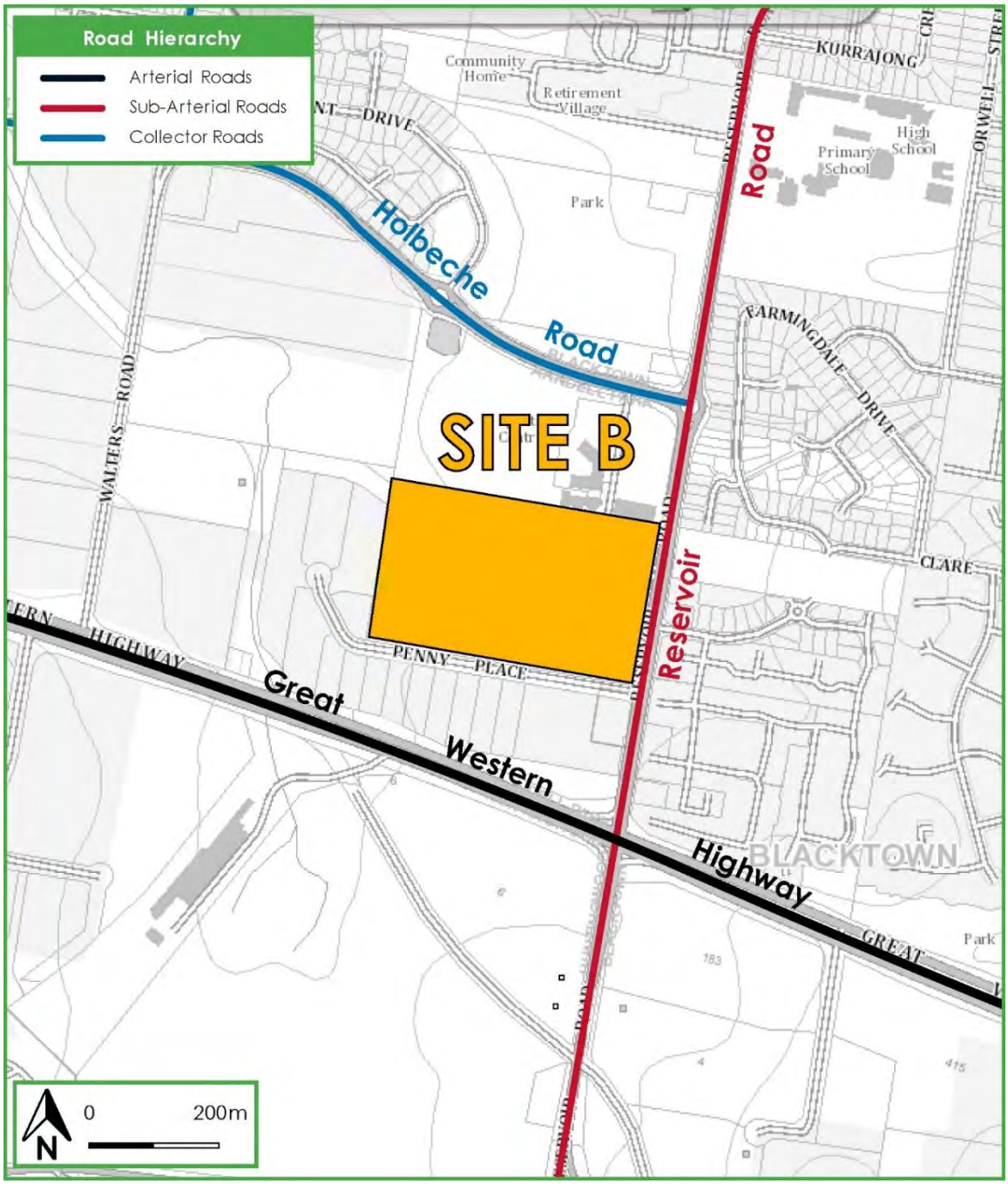

Figure 4: Road Hierarchy

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:

Source: Near Map

Figure 5: Intersection of Reservoir Road and Holbeche Road

It can be seen from **Figure 5** that Reservoir Road and Holbeche Road forms a two-lane roundabout, with two entry and exit lanes provided on each of the three legs of the intersection. Both lanes on the north and south approaches of Reservoir Road are permitted to proceed straight, whilst left turn only and right turn only lanes are provided on the Holbeche Road approach.

Source: Near Map

Figure 6: BWSC Access and Reservoir Road

It can be seen from **Figure 6** that Reservoir Road and the existing southern access for the BWSC forms a priority controlled 'T' seagull junction. An auxiliary lane is provided for vehicles to turn right from the north approach of Reservoir Road, whilst storage area for a single vehcile is provided for a vehicle when turning right from the BWSC access. A left turn only and right turn only lane is provided on the BWSC access approach.

Source: Near Map

Figure 7: BWSC Access and Holbeche Road

It can be seen from **Figure 7** that Holbeche Road and an existing access at 'The Club' section of BWSC forms a priority controlled 'T' junction. As Holbeche Road is divided, the intersection permits left-in / left-out movements only from the existing BWSC access. The intersection operates in a similar arrangement to a proposed BWSC access on Holbeche Road further west as shown in the master plan in **Appendix B**. That proposed intersection will be subject to a separate application.

3.3 Key Intersections

For the purposes of the assessment of traffic impacts of this development, surveys were undertaken of the following intersections related to the site:

- Reservoir Road / Site Access
- Reservoir Road / Penny Place
- Holbeche Road / (Existing) BWSC Access
- Reservoir Road / Holbeche Road

These surveys were undertaken on a typical weekday morning between 7:00am-9:00am and afternoon between 4:00pm-6:00pm which corresponds to the expected peak periods of the local road network. The results of the surveys were analysed using the SIDRA 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. In this regard, a practical limit at 1.1 can be assumed. 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 in **Table 1** below:

Table 1: Intersection Performance Characteristics

Level of Service	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 in **Table 2** for the morning (AM) and afternoon (PM) peak hours. Reference should also be made to the SIDRA outputs provided in **Appendix C**, which provide detailed results for individual lanes and approaches.

Table 2: Existing Intersection Performance –SIDRA Network

Intersection Description	Control Type	Period	Degree of Saturation	Average Delay (secs)	Level of Service
Reservoir Road / Site Access	Priority (Seagull)	AM	0.111	29.9	C
		PM	0.178	45.9	D
Reservoir Road / Penny Place	Priority (Seagull)	AM	0.151	29.9	C
		PM	0.206	30.6	C
Holbeche Road / BWSC Access	Priority (Left-in Left-out)	AM	0.179	5.4	A
		PM	0.163	5.4	A
Reservoir Road / Holbeche Road	Roundabout	AM	0.319	11.2	A
		PM	0.320	10.4	A

* Note: Results shown are for the movement with the highest delay, in accordance with RMS Guidelines.

It can be seen from **Table 2** that the key intersections around the site generally operate satisfactorily under the existing 'base case' scenario, with Level of Service of D or better and with moderate delays during both peak periods. The delays and queue lengths correlate with site observations, however it is noted that whilst the intersections at Reservoir Road / The Club and Reservoir Road / Penny Place are designed as seagull intersections a number of vehicles were observed to not make use of the right turn storage space when turning right onto Reservoir Road, that is these vehicles waited for a gap in both directions before pulling out increasing their delay rather than turning right in two stages.

However, the most relevant use of this analysis is to compare the relative change in the performance parameters as a result of the proposed development. This is discussed further in **Section 6**.

3.4 Public Transport

The existing public transport services that operate in the locality is shown in **Figure 7**. Bus stops within 400 metres of bus stops on Holbeche Road and Reservoir Road are serviced by the following routes:

- 722/4: Blacktown & Prospect / Arndell Park Loop
- 723: Blacktown & Prospect Loop
- 724: Blacktown to Mt Druitt

These bus services provide links to Blacktown Railway Station and other key regional bus services.

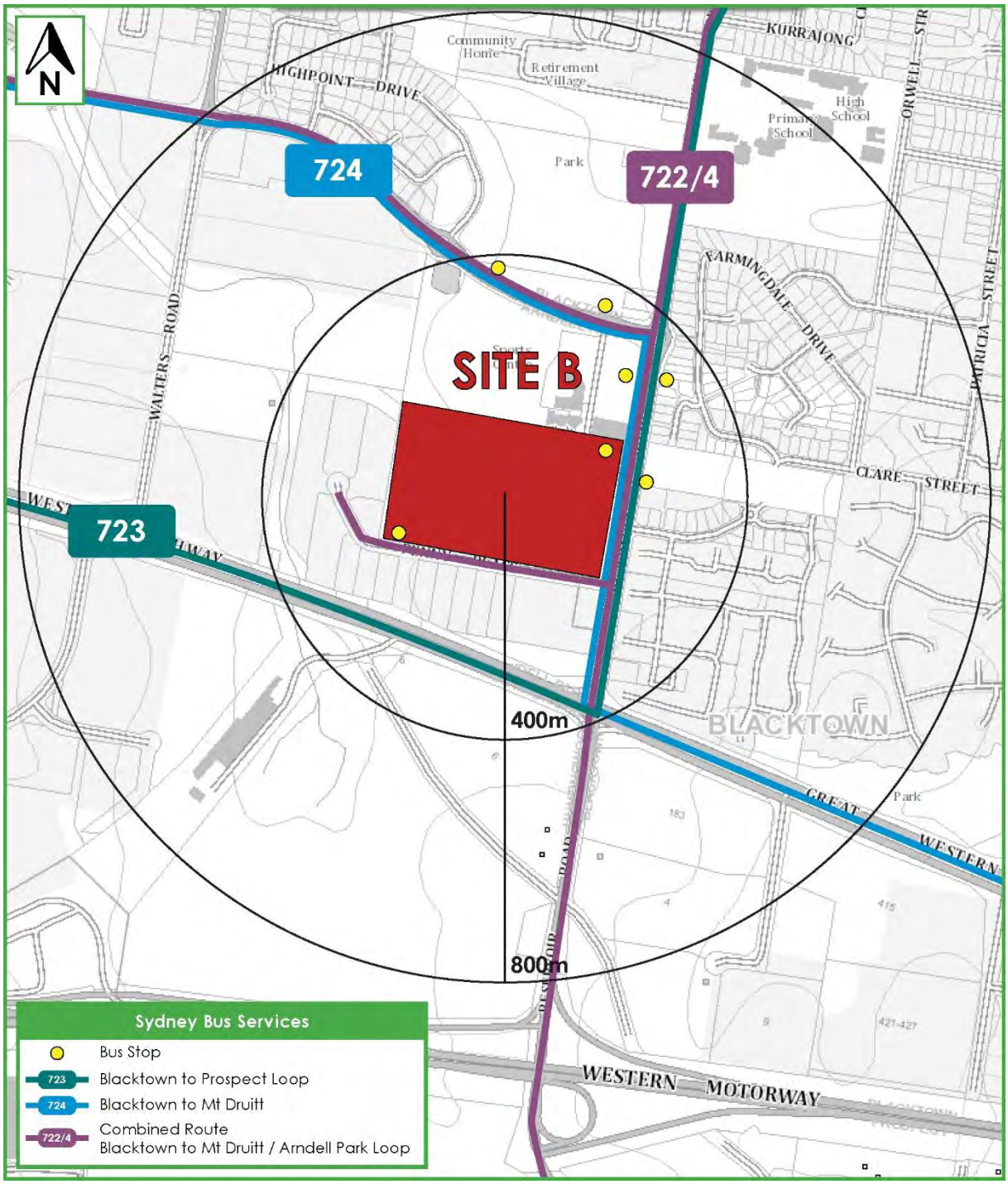

Figure 7: Public Transport

4. Description of Proposed Development

4.1 Proposal

A detailed description of the proposed development is provided in the statement of environmental effects to be prepared separately in support of the DA. In summary, the proposed development as assessed for the purpose of the Traffic Assessment comprises the following components:

- Construction of 12 buildings containing up to 800 Independent Living Units in the following manner:
  - 15% one bedroom units (up to 120);
  - 83% two bedroom units (up to 660); and
  - 2% three bedroom units (up to 20).
- Construction of a Residential Aged Care Facility (RACF) providing up to 160 beds serviced by 50 staff; and
- Provision of 900 parking spaces, accessed from a combination of Penny Place and 'The Club'

The parking requirements and traffic impacts arising from the proposed development are discussed in Sections 5 and 6 respectively.

5. Parking Requirements

5.1 Independent Living Units

The Blacktown Development Control Plan 2015 (DCP) refers car parking rates for Seniors Housing to State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Seniors Housing SEPP). Under this planning policy, a consent authority (Council) may not refuse consent to a development application for a self-contained dwelling on parking grounds if the development provides parking in accordance with the minimum provisions reproduced in **Table 3**.

Table 3: Seniors Housing SEPP Parking Rates and Provision

Type	Number	Minimum Parking Rate	Minimum Provision Required[1]
Independent Living Units			
One Bedroom	120	0.5 spaces per bedroom	60
Two Bedroom	660		660
Three Bedroom	20		30
Residential Aged Care Facility			
Beds	160	1 space per 10 beds	16
Staff	50	1 space per 2 staff	25
		Total	**791**

It can be seen from **Table 3**, that the Seniors Housing SEPP requires a minimum of 791 parking spaces to be provided for the above uses to guarantee consent by Council on parking related grounds. In response, the applicant advises that, when the site is developed for 800 independent living units and 160 residential aged care beds, approximately 900 parking spaces shall be provided on-site which will be confirmed as the detailed design is finalised for submission. In addition, the parking for Independent Living Units shall be designed as accessible spaces in accordance with the SEPP (further discussion on this is included in **Section 7**).

5.2 Disabled Parking

The DCP requires all parking areas to provide for disabled drivers in accordance with the provisions of the Building Code of Australia. In this respect, the proposed independent living units would fall under the definition for a Class 2 building, that is, a building *"containing two or more sole occupancy units, each being a separate dwelling*". Whilst no parking rates are provided within the code for this type of building, the DCP states that Council may require additional parking spaces for the disabled where it considers that the proposed land use warrants extra provision. As such, it is envisaged that the development will provide accessible parking in response to any condition of consent imposed by Council.

5.3 Bicycle Facilities

The DCP states the following with respect to bicycle parking:

"Applicants are encouraged to incorporate, in the design of their buildings, safe storage/parking areas for bicycles, with adequate shower and change facilities provided for staff (where appropriate)."

In this regard, bicycle parking rates from 'Planning guidelines for walking and cycling', published by the NSW Department of Planning, have been adopted for aged or disabled self-contained housing. The guide recommends that bicycle parking be provided at a rate between 3-5% of the overall number of units for residents, and an additional 3-5% of the overall number of units for visitors. This translates into a requirement to provide between 48-80 bicycle parking spaces.

In response the development shall provide storage cages capable of storing a bicycle if desired by the residents.

5.4 Servicing

The DCP does not provide service vehicle parking rates however states that these areas should be provided off-street with convenient access. Furthermore in larger developments, service areas should operate independently of other parking areas.

In response the development proposes to collect waste on site using the internal road network proposed. The design vehicle used shall be a Council garbage vehicle. A swept path assessment shall be undertaken testing the design using a 10.5m vehicle prior to the lodgement of a development application for the site.

6. Traffic Impacts

6.1 Trip Generation

Site B - Independent Living Units

The RMS *Technical Direction TDT 2013/4a* provides traffic generation rates for seniors housing, however it states that the 'site peak hour does not generally coincide with the network peak hour'. This is to be expected when considering an independent living unit whose residents have predominantly left full time employment and are no longer required to travel during the commuter peak hours. Appendix C2 of the Technical Direction provides a rate for PM trips per unit for five sites in the Sydney Metropolitan region. The average trip generation in the PM for these five sites was 0.18 trips per unit, whilst the AM peak is described as being outside of survey periods. However, in order to assess a rate for the AM peak a rate of 0.1 trips (approximately 50% of the PM peak) has been applied to ensure a conservative assessment.

The application of these rates to the proposed 800 Independent Living Units results in the following traffic generation:

- 80 vehicle trips per hour during the AM peak period (16 in, 64 out); and
- 144 vehicle trips per hour during the PM peak period (115 in, 29 out).

Site B - Residential Aged Care Facility

It is assumed that residents of the Residential Aged Care Facility will have a reduced need for mobility and therefore a trip generation of 0.2 trips per bed has been adopted during AM and PM peak hourly periods associated with staff and visitor parking. Application of this rate to the proposed 160 beds results in the following traffic generation:

- 32 vehicle trips per hour during the AM peak period (26 in, 6 out); and
- 32 vehicle trips per hour during the PM peak period (6 in, 26 out).

Combined

In summary, all future development within 'Site B' has been estimated to generate the following traffic:

- 112 vehicle trips per hour during the AM peak period (42 in, 70 out); and
- 176 vehicle trips per hour during the PM peak period (121 in, 55 out).

Total Traffic Generation for BWSC Master Plan

In addition to the volume of traffic accounted for on 'Site B', the trip generation for other approved (but yet to be constructed) developments within in the BWSC master plan has been included in the assessment. This shall ensure the traffic generation for all future development on the wider site is captured under a cumulative assessment.

Reference has been made to the traffic reports supporting the approved Development Applications for 'The Club' (Proposed Alterations and Additions Blacktown Workers Sports Club - Assessment of Traffic and Parking Implications – TTPA Jan 2014) and for 'Site A' (Traffic Impact Assessment BWSC - New Sports Facilities – March 2017).

With regards to the Club DA is it noted that 695m^2 of the 3,455m^2 of additional floor area has been built to date and would be captured in the latest traffic count surveys. As such the predicted additional peak hour generation of the club has been reduced by this pro rata amount over the rate shown in the TTPA report.

The summery of the expected additional generation in the peak hour taken from these reports is therefore as follows:

'The Club':

- 0 vehicle trips per hour during the AM peak period (0 in, 0 out); and
- 163 vehicle trips per hour during the PM peak period (91 in, 72 out).

'Site A':

- 18 vehicle trips per hour during the AM peak period (9 in, 9 out); and

- 169 vehicle trips per hour during the PM peak period (129 in, 40 out).

The above traffic generation forms the basis of the SIDRA modelling undertaken for key intersections impacted by these additional volumes. As the BWSC will have many existing and proposed site access, trip distributions for each development have been estimated as discussed below.

6.2 Trip Distribution

Having respect to the proximity of each development to site accesses and the general location of the site within the region, the following trip distributions have been adopted for the SIDRA intersection modelling undertaken in Section 6.3.

- Site B: 50% Reservoir Road / 30% Penny Lane / 20% Holbeche Road
- Site A: 30% Walters Road / 50% Holbeche Road (new) / 20% Reservoir Road
- The Club: 50% Reservoir Road / 50% Holbeche Road (existing)

It is noted the new proposed Holbeche Road access will be left-in and left-out only and shall predominantly service the sports fields located as 'Site A' whilst the existing Holbeche Road access is maintained and predominately facilitates vehicles arriving from the north.

6.3 Peak Period Intersection Performances

A summary of the modelling results provided in **Table 4** below. Reference should also be made to the detailed SIDRA outputs for the future scenario which are provided in **Appendix D**.

Table 4: Intersection Performance SIDRA Network: Future

Intersection Description	Control Type	Model	Period	Degree of Saturation	Intersection Delay	Level of Service
Reservoir Road / Site Access	Priority (Seagull)[1]	AM	Existing	0.111	29.9	C
			Future	0.214	32.7	C
		PM	Existing	0.178	45.9	D
			Future	0.835	130.3	F
Reservoir Road / Penny Place	Priority (Seagull)[1]	AM	Existing	0.151	29.9	C
			Future	0.202	29.6	C
		PM	Existing	0.206	30.6	C
			Future	0.287	36.5	C
Holbeche Road / BWSC Access	Priority (Left-in Left-out)[1]	AM	Existing	0.179	5.4	A
			Future	0.186	5.4	A
		PM	Existing	0.163	5.4	A
			Future	0.194	5.4	A
Reservoir Road / Holbeche Road	Roundabout[1]	AM	Existing	0.319	11.2	A
			Future	0.330	11.2	A
		PM	Existing	0.320	10.4	A
			Future	0.371	10.5	A
Reservoir Road / Great Western Highway	Signals	AM	Existing	0.917	61.5	E
			Future[2]	0.925	62.1	E
		PM	Existing	0.905	60.4	E
			Future[2]	0.912	58.8	E

Note 1: Results shown are for the movement with the highest delay, in accordance with RMS Guidelines.

Note 2: Intersection of Great Western Highway / Reservoir Road modelled with additional westbound right turn bay, in accordance with proposed future upgrade works.

The results indicate that full development of BWSC will result in minimal increases in delays for all site accesses, with a Level of Service no worse than C experienced for any intersection with the exception of the Reservior Road Site access intersection.

A detailed interrogation of the modelling assessment reveals vehicles undertaking a right turn manoeuvre from the club onto Reservoir Road are likely to experience delays of approximately 2 – 3 minutes and queues of 30m when waiting for a gap to turn resulting in a Level of Service 'F' being presented. This is due to the high volumes of continuous traffic on Reservoir Road past the site.

Intersection Upgrade

In order to improve the operation of the intersection between the Club access and Reservoir Road for both vehicles and pedestrians upgrade scenarios were considered. During a meeting with the Roads and Maritime Service (11th December 2017) four upgrade scenarios were proposed. These upgrade scenarios are as follows:

- Scenario 1: Roundabout control at Reservoir Road site access
- Scenario 2: Increased seagull storage at Reservoir Road site access
- Scenario 3: Signalisation of Reservoir Road site access
- Scenario 4: Signalisation of Reservoir Road / Holbeche Road intersection

The strengths and weaknesses of each option are detailed in the following sections.

Scenario 1 - Roundabout control at Reservoir Road site access

A roundabout upgrade for the site access would improve the right turning movements at this intersection, however this option has two significant drawbacks. The geometry of the intersection would not permit the implementation of a two lane roundabout within the existing road reserve, making this option very much an impractical solution. In addition, a roundabout solution would not improve the pedestrian facilities in this location. As such, Scenario 1 has been dismissed as not practically viable.

Scenario 2 - Increased seagull storage at Reservoir Road site access

An increased seagull storage for vehicles turning right out of the site would improve the operation of this movement, allowing the right turn to be undertaken in two stages, significantly reducing the queue to leave the site. However, this option has not been favoured for two reasons. The increase in seagull storage shall do nothing to improve pedestrian facilities at this intersection. In addition, it was noted during the meeting that this arrangement is not favoured by the RMS as drivers potentially find the use of the seagull arrangement confusing.

Scenario 3 - Signalisation of Reservoir Road site access

It is noted this upgrade would provide two key benefits, the first being to improve access for the club precinct for vehicles whist the second important benefit is to provide much needed pedestrian facilities in this location, allowing safe crossing points for pedestrians to access public transport connections on both sides of Reservoir Road. It is anticipated this provision would benefit both residents and visitors to the precinct as well as the wider community generally.

In order to test this scenario a modelling assessment has been undertaken of the signal intersection, operating with a basic three phase arrangement (main road, side road and right turn arrow) and a 120 second cycle time, with the results presented in **Table 5** (The full outputs have been presented in **Appendix E**).

Table 5: Intersection Performance SIDRA Network: Future – Site Access Signal Upgrade

Intersection Description	Control Type	Model	Period	Degree of Saturation	Intersection Delay	Level of Service
Reservoir Road / Site Access	Signal Upgrade	AM	Existing	0.111	29.9	C
			Future	0.476	11.9	A
		PM	Existing	0.178	45.9	D
			Future	0.582	11.2	A
		AM	Existing	0.151	29.9	C

Reservoir Road / Penny Place	Priority (Seagull)[1]		Future	0.311	28.9	C
		PM	Existing	0.206	30.6	C
			Future	0.275	35.1	C
Holbeche Road / BWSC Access	Priority (Left-in Left-out)[1]	AM	Existing	0.179	5.4	A
			Future	0.186	5.4	A
		PM	Existing	0.163	5.4	A
			Future	0.194	5.4	A
Reservoir Road / Holbeche Road	Roundabout[1]	AM	Existing	0.319	11.2	A
			Future	0.330	11.2	A
		PM	Existing	0.320	10.4	A
			Future	0.371	10.5	A
Reservoir Road / Great Western Highway	Signals	AM	Existing	0.917	61.5	E
			Future[2]	0.925	62.1	E
		PM	Existing	0.905	60.4	E
			Future[2]	0.912	58.8	E

Note 1: Results shown are for the movement with the highest delay, in accordance with RMS Guidelines.

Note 2: Intersection of Great Western Highway / Reservoir Road modelled with additional westbound right turn bay, in accordance with proposed future upgrade works.

It can be seen that the upgrade of the intersection produces good results with minimal delays and an excellent level of service.

On this basis, it is concluded that the traffic impacts of the proposed Seniors Living Village at Site B with the proposed upgrade are considered to be acceptable and the site shall operate satisfactorily whist providing an additional wider community benefit in the form of much needed pedestrian facilities at this location. This signal arrangement shall allow residents of the seniors living village, players accessing the sports fields and members and guests of the club to access the bus routes arriving from Blacktown

town centre which disembark on the eastern side of Reservoir Road. Currently, in order to make use of these routes to access the site, visitors are required to cross at the intersection of Reservoir Road and The Great Western Highway, a detour of approximately 600m.

Scenario 4 - Signalisation of Reservoir Road / Holbeche Road

A fourth scenario has been suggested by the RMS for modelling. It relates to the upgrade of the roundabout at Reservoir Road and Holbeche Road. This shall provide a benefit of creating gaps in the flow of traffic from the north, improving the likely hood of a vehicle finding a gap to exit site. This scenario has been modelled with the results presented in **Table 6** below (The full outputs have been presented in **Appendix F**):

Table 6: Intersection Performance SIDRA Network: Future – Signal Upgrade Holbeche

Intersection Description	Control Type	Model	Period	Degree of Saturation	Intersection Delay	Level of Service
Reservoir Road / Site Access	Signals	AM	Existing	0.111	29.9	C
			Future	0.214	32.7	C
		PM	Existing	0.178	45.9	D
			Future	0.562	56.0	D
Reservoir Road / Penny Place	Priority (Seagull)[1]	AM	Existing	0.151	29.9	C
			Future	0.202	29.6	C
		PM	Existing	0.206	30.6	C
			Future	0.356	45.8	D
Holbeche Road / BWSC Access	Priority (Left-in Left-out)[1]	AM	Existing	0.179	5.4	A
			Future	0.186	5.4	A
		PM	Existing	0.163	5.4	A
			Future	0.194	5.4	A

Reservoir Road / Holbeche Road	Signal Upgrade	AM	Existing	0.319	11.2	A
			Future	0.698	24.4	B
		PM	Existing	0.320	10.4	A
			Future	0.724	20.2	B
Reservoir Road / Great Western Highway	Signals	AM	Existing	0.917	61.5	E
			Future[2]	0.925	62.1	E
		PM	Existing	0.905	60.4	E
			Future[2]	0.912	58.8	E

Note 1: Results shown are for the movement with the highest delay, in accordance with RMS Guidelines.

Note 2: Intersection of Great Western Highway / Reservoir Road modelled with additional westbound right turn bay, in accordance with proposed future upgrade works.

It is noted that whilst a signalised intersection is capable of being delivered that presents acceptable results, whilst maintaining a level of service of 'D' on the site access, this arrangement has two drawbacks. The provision of signals at this location shall result in a significant detour for the elderly residents of the ILUs, located at the southern end of the site, to access the bus services on the eastern side of Reservoir Road. In addition, whilst the SIDRA results are potentially acceptable the SIDRA outputs for Scenario 3 can be seen to be superior both for the site access and the wider network.

In addition, this proposal relies on the elderly residents of the ILUs being forced to quickly look left and right to judge a safe gap in the high volume traffic flow on Reservoir Road. This is considered an undesirable outcome as detailed further below.

Hence it is considered that of the four options considered, Scenario 3 is the preferred option for the upgrade of the precinct.

Signal Warrants

It is noted that the *RMS Traffic Signal Guide - Section 2 Warrants* provides a set of guidelines for the local traffic conditions that should be considered when assessing if a signal upgrade is warranted. The guide states that the warrants "should only be used as a guide" but provides the following set of criteria for consideration:

(a) Traffic Demand:

For each of four one-hour periods of an average day:

(i) The major road flow exceeds 600 vehicles/hour in each direction; and

(ii) The minor road flow exceeds 200 vehicles/hour in one direction

OR

(b) Continuous Traffic

For each of four one-hour periods of an average day

(i) The major road flow exceeds 900 vehicles per/hour in each direction; and

(ii) The minor road flow exceed 100 vehicle/hour in one direction; and

(iii) The speed of traffic on the major road or limited sight distance from the minor road causes undue delay or hazard to the minor road vehicles; and

(iv) There is not any other nearby traffic control light site easily accessible to the minor road.

OR

(c) Pedestrian Safety:

For each of four one-hour periods of an average day

(i) The pedestrian flow crossing the major road exceeds 150 persons/hour; and

(ii) The major road flow exceeds 450 vehicles per/hour in each direction, or where there is a central median of at least 1.2m wide, 1000 vehicles per hour in each direction.

OR

(d) Pedestrian Safety – High Speed Road:

For each of four one-hour periods of an average day

(i) The pedestrian flow crossing the major road exceeds 150 persons per hour; and

(ii) The major road flow exceed 450 vehicles/ hour in each direction; and

(iii) The 85th percentile speed on the major road exceeds 75km/hr.

OR

(e) *Crashes:*

(i) *The intersection has been the site of an average of three or more reported two-away or casualty traffic accidents per year over a three year period, where the traffic accidents could have been prevented by a traffic control light; and*

(ii) *The traffic flows are at least 80% of the appropriate flow warrants*

In addition, the following RMS warrant for the installation of signalised pedestrian crossing facilities is considered relevant to this site:

If at least 50% of pedestrians using the crossing are elderly or people with disabilities and for each of two one-hour periods of an average day:

(i) *The pedestrian flow exceeds 50 persons/per hour; and*

(ii) *The vehicular flow exceeds 600 vehicles per hour in each direction.*

In order to assess the appropriateness of traffic signal at the intersection a survey of the access was undertaken under current conditions i.e. prior to the addition of the approved club expansion, the sports facilities at Site A and the Independent Living Units at Site B.

Under current conditions, on a typical Friday evening, over four separate hour periods, the traffic flows on Reservoir Road and the Site access were recorded as follows (the full survey results can be seen in **Appendix G**):

Table 7: Existing Site Access Conditions

Time Period	Major Road SB Veh/hr	Major Road NB Veh/hr	Minor Road (One Direction)
16:00-17:00	1055	1370	111
17:00-18:00	967	1296	101
18:00-19:00	797	1140	88
19:00-20:00	616	839	92

It can be seen that even under the existing conditions the site meets the guidelines for *Warrant (b) – Continuous Traffic* in two of the four hours and is short by only a small number of vehicles in the latter two hours.

When the addition of the 508 trips per hour is added to the precinct following full development, as identified in Section 6.1, it is considered the traffic signals shall clearly be warranted at the site access under this prevision.

In addition, it is considered noteworthy that the access shall be the main site access for up to 800 independent living units housing elderly residents.

Requiring these elderly residents to make use of an unsignalised access, forcing them to quickly judge gaps in oncoming traffic in both directions, is considered a highly unsafe outcome.

Furthermore as noted above, it is considered the ILU village, the expanded club and the sports facilities require pedestrian facilities to cross Reservoir Road in a convenient and practical location to make use of the public transport options on the eastern side of Reservoir Road connecting the site to Blacktown Town Centre.

Considering the high volume of elderly residents expected, the pedestrian crossing warrant listed above, requiring just 50 pedestrians crossing Reservoir Road in an hour is expected to easily be met in this location.

Hence the addition of traffic signals at this location is considered warranted due to the high volume of passing traffic at the site, the requirement for pedestrian facilities and the importance of a safe access arrangement for elderly drivers. It has been noted the existing site conditions meet the required warrants for signals in two of four hours whilst being marginally short in the following two hours. Hence the fully developed precinct shall meet the warrant guidelines for signals to be installed.

The installation of the signals shall be at the developer's expense and has been demonstrated to result in no adverse impacts on the network whilst providing a community benefit, as such the signalisation of the site access is recommended for adoption.

7. Access and Internal Design

7.1 Access

The civil engineering design of the proposed signalised access arrangements shall be detailed at subsequent DA stage in conjunction with the RMS and Council. However it is noteworthy that the geometry of the Reservoir Road intersection shall not require significant change to accommodate signal installation with large median islands in place.

7.2 Internal Design

The detailed design of the internal site layout shall be detailed at a subsequent DA stage. All internal roads and parking arrangements are to be designed in accordance with the requirements of AS2890 and SEPP Aged Care with the following characteristics are noteworthy:

7.3 Accessible Parking

It is noted Item 5 of Schedule 3 from *SEPP (Housing for Seniors or People with a Disability) (2004)* requires the following objects for car parking spaces for Seniors Living developments:

- *Car parking spaces must comply with the requirements for parking for persons with a disability set out in AS 2890, and*
- *5% of the total number of car parking spaces (or at least one space if there are fewer than 20 spaces) must be designed to enable the width of the spaces to be increased to 3.8 metres, and*
- *Any garage must have a power-operated roller door, or there must be a power point and an area for motor or control rods to enable a power-operated door to be installed at a later date*.

The following aspects (and historiacal anomalies) are considered noteworthy when assessing the parking design against this requirement:

- AS2890.1 is referenced, and at the time when the SEPP (2004) was developed, TRAFFIX understands this to refer to the disabled access arrangements found in Clause 2.4.5 (and Appendix C) of AS2890.1 (1993). Hence, spaces with dimensions of 3.2 metres by 5.4 metres meet the requirement of AS2890.1 (1993) for people with disabilities as set out when the SEPP was developed;

- A 'shared area' as required of the current AS2890.6 (2009) was not required under the SEPP when applying the disabled space design referenced in AS2890.1 (1993).

- The application of the current design standard, AS2890.6 (2009) requires a disabled access space to have a designated shared spaces of 2.4m wide, protected by a bollard, alongside every vehicle space in the car park. TRAFFIX considers the application of this newer standard AS2890.6 (2009) to be an over design and unsuitable to the parking requirements of the SEPP (2004) when providing parking for independent living units.

- A strict application of the SEPP rates of 0.5 spaces per bedroom, designed to AS2890.6 (2009) standard would lead to the impractical arrangement of a requirement of an additional 'shared' spaces of dimensions 2.4m x 5.4m between every vehicle space.

In this regard it is considered the application of the disabled parking provisions of AS2890.1 (1993), as set out above, is the optimal arrangement for a development of this nature.

7.4 Parking Modules

In addition, the following aspects regarding the design are also considered noteworthy:

- The proposed design shows 12 additional spaces have been designed in accordance with a Class 3 user, being provided with a minimum space length of 5.4m a minimum width of 2.6m and a minimum aisle width of 5.8m, capable of accommodating additional visitors to site if required.

- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.

- Blind aisles are to extend a minimum of 1.0m beyond the last parking space.

7.5 Other Considerations

- All columns are required to be located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).
- Appropriate visual splays are to be provided in accordance with the requirements of Figure 3.3 of AS2890.1 at all accesses.

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8. Conclusion

In summary:

- The development proposes up to 800 Independent Living Units in 12 buildings and a Residential Aged Care Facility for up to 160 beds, all to be constructed on land designated as 'Site B' within Blacktown Workers Sports Club.
- A parking assessment taking into account the Blacktown Development Control Plan 2015 and State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 results in a requirement for a minimum of 825 parking spaces. The preliminary plans for the site indicates that sufficient area is available for basement level car parking with access to Penny Lane and other areas of the Blacktown Workers Sports Club.
- Future development on Site B has been estimated to generate up to 352 vehicle trips per hour during AM and PM peak periods. Based on the distributions of these volumes across all site accesses, the traffic impacts of this assessment has been modelled using SIDRA for a worst case scenario involving other future developments on-site at the BWDC (the cumulative assessment), with the use of the proposed sports facilities at Site A and proposed developments at 'The Club' section taken into account.
- The results indicate that full development of Site B will result in minimal increases in delays for the wider network. An upgrade to the Reservoir Road access is proposed to provide traffic signals, including much needed pedestrian facilities. On this basis, the traffic impacts of the proposed Seniors Living Village at Site B are considered to be acceptable.

It is therefore concluded that the proposed development on Site B is supportable on traffic planning grounds and will operate satisfactorily.

Appendix A

Site Photos

Intersection of Reservoir Road and Holbeche Road

Reservoir Road looking south to site access

Intersection of Reservoir Road and Penny Place

Intersection of Site Access and Holbeche Road

Appendix B

Masterplan

Revisions				
No	Date	Description	Ver	App'd
01	04/12/15	CONCEPT DESIGN ISSUE FOR DISCUSSION	01	JW
02	15/12/15	CONCEPT DESIGN ISSUE FOR DISCUSSION	02	JW
03	11/01/16	CONCEPT DESIGN ISSUE FOR PRE-DA	03	JW

Nominated Architects: Michael Heenan 5264, Peter Ireland 6661

Site Location Plan

Client

PAYNTER DIXON

Paynter Dixon Constructions Pty Limited
Level 2, 2 Richardson Place
Riverside Corporate Park
North Ryde SYDNEY NSW 2113

Architect

AJ+C
Allen Jack+Cottier

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Project

BLACKTOWN WORKERS SPORTS CLUB - PROPOSED SPORTING FACILITIES, SENIOR LIVING APARTMENTS AND CHILDCARE CENTRE

Site A: Outdoor Sports Facilities - 221 Walters Road, Arndell Park.
Site B: Seniors Living Village - 170 Reservoir Road, Arndell Park.

Proj No. 15029

Drawing Title: SITE PLAN

Drawing Status: NOT FOR CONSTRUCTION

Scale: 1:1000

Drawing No: SK1000

Issue: 03

PLOT DATE & TIME: 11/01/2016 4:42:47 PM PLOTTED & CHECKED BY: wothall

REF: P:\2015\15029_Blacktown\Sports\Architekten\03_CAD\microstation\sheet_files\15029_SK1000.dgn

A1

Appendix C

SIDRA Intersection Modelling (Existing)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	237	16.0	237	16.0	0.142	5.8	LOS A	0.0	0.0	0.00	0.52	56.1
2	T1	555	10.5	555	10.5	0.912	75.5	LOS F	27.3	208.3	0.97	1.08	24.0
3	R2	221	11.3	221	11.3	0.900	85.2	LOS F	17.4	133.7	1.00	1.01	26.5
Approach		1013	11.9	1013	11.9	0.912	61.3	LOS E	27.3	208.3	0.75	0.94	30.6
East: Great Western Hw													
4	L2	584	5.7	584	5.7	0.617	31.2	LOS C	22.0	161.7	0.75	0.91	42.7
5	T1	764	6.4	764	6.4	0.545	49.1	LOS D	15.2	112.4	0.92	0.78	38.7
6	R2	250	6.4	250	6.4	0.673	62.9	LOS E	15.9	117.2	0.98	0.84	15.0
Approach		1598	6.1	1598	6.1	0.673	44.7	LOS D	22.0	161.7	0.87	0.84	37.1
North: Reservior Road													
7	L2	155	6.5	155	6.5	0.898	77.2	LOS F	28.3	214.3	1.00	1.04	17.3
8	T1	577	11.8	577	11.8	0.898	71.5	LOS F	28.6	220.1	1.00	1.06	27.3
9	R2	176	8.0	176	8.0	0.705	69.8	LOS E	11.9	89.0	1.00	0.85	27.4
Approach		908	10.1	908	10.1	0.898	72.1	LOS F	28.6	220.1	1.00	1.01	25.9
West: Great Western Hw													
10	L2	261	7.3	261	7.3	0.254	19.0	LOS B	7.7	57.6	0.50	0.73	50.5
11	T1	1296	7.0	1296	7.0	0.917	73.7	LOS F	34.6	257.0	1.00	1.06	30.8
12	R2	632	11.7	632	11.7	0.897	81.4	LOS F	24.9	191.6	1.00	0.97	33.7
Approach		2189	8.4	2189	8.4	0.917	69.4	LOS E	34.6	257.0	0.94	1.00	32.9
All Vehicles		5708	8.7	5708	8.7	0.917	61.5	LOS E	34.6	257.0	0.90	0.94	32.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	51.5	LOS E	0.2	0.2	0.86	0.86
P2	East Full Crossing	50	59.6	LOS E	0.2	0.2	0.92	0.92
P3	North Full Crossing	50	50.7	LOS E	0.2	0.2	0.85	0.85
P4	West Full Crossing	50	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		200	56.5	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1006	9.9	1006	9.9	0.303	4.5	LOS A	0.0	0.0	0.00	0.58	31.0
9a	R1	80	6.6	80	6.6	0.303	3.9	LOS A	0.0	0.0	0.00	0.57	31.2
Approach		1086	9.7	1086	9.7	0.303	4.5	NA	0.0	0.0	0.00	0.58	31.0
SouthWest: Reservoir Road													
30a	L1	1204	10.5	1204	10.5	0.338	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1204	10.5	1204	10.5	0.338	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2291	10.1	2291	10.1	0.338	4.1	NA	0.0	0.0	0.00	0.56	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road RT Storage													
8	T1	956	9.9	956	9.9	0.351	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		956	9.9	956	9.9	0.351	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Reservoir Road RT Storage													
12	R2	27	22.2	27	22.2	0.082	8.0	LOS A	0.2	1.5	0.67	0.84	6.4
Approach		27	22.2	27	22.2	0.082	8.0	LOS A	0.2	1.5	0.67	0.84	6.4
All Vehicles		983	10.3	983	10.3	0.351	0.2	NA	0.2	1.5	0.02	0.02	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	57	14.0	57	14.0	0.309	5.7	LOS A	0.0	0.0	0.00	0.06	55.6
2	T1	1066	10.3	1066	10.3	0.309	0.0	LOS A	0.0	0.0	0.00	0.03	58.6
Approach		1123	10.5	1123	10.5	0.309	0.3	NA	0.0	0.0	0.00	0.03	58.1
North: Reservoir Road													
9	R2	71	7.0	71	7.0	0.169	13.0	LOS A	0.6	4.7	0.73	0.88	40.8
Approach		71	7.0	71	7.0	0.169	13.0	NA	0.6	4.7	0.73	0.88	40.8
West: Penny Lane													
10	L2	78	12.8	78	12.8	0.099	11.6	LOS A	0.4	3.4	0.53	0.91	44.2
11	T1	27	22.2	27	22.2	0.151	29.9	LOS C	0.5	4.4	0.85	1.01	30.4
Approach		105	15.2	105	15.2	0.151	16.3	LOS B	0.5	4.4	0.61	0.93	39.6
All Vehicles		1299	10.7	1299	10.7	0.309	2.3	NA	0.6	4.7	0.09	0.15	51.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [06c Seagull Reservoir Road - Site Access EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1054	9.5	1054	9.5	0.296	5.4	LOS A	0.0	0.0	0.00	0.59	33.2
9a	R1	8	0.0	8	0.0	0.296	4.7	LOS A	0.0	0.0	0.00	0.59	33.2
Approach		1062	9.4	1062	9.4	0.296	5.3	NA	0.0	0.0	0.00	0.59	33.2
SouthWest: Reservoir Road													
30a	L1	1206	9.8	1206	9.8	0.337	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
Approach		1206	9.8	1206	9.8	0.337	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
All Vehicles		2268	9.6	2268	9.6	0.337	5.0	NA	0.0	0.0	0.00	0.57	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206b [06b. Reservoir Road Site Access Median Storage EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: RoadName													
8	T1	1001	9.5	1001	9.5	0.273	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1001	9.5	1001	9.5	0.273	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
12	R2	17	0.0	17	0.0	0.032	6.8	LOS A	0.1	0.7	0.64	0.81	7.4
Approach		17	0.0	17	0.0	0.032	6.8	LOS A	0.1	0.7	0.64	0.81	7.4
All Vehicles		1018	9.3	1018	9.3	0.273	0.1	NA	0.1	0.7	0.01	0.01	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206a [06a. Reservoir Road - Site Access EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	25	12.0	25	12.0	0.315	4.8	LOS A	0.0	0.0	0.00	0.03	29.5
2	T1	1127	9.8	1127	9.8	0.315	0.0	LOS A	0.0	0.0	0.00	0.01	58.8
Approach		1152	9.8	1152	9.8	0.315	0.1	NA	0.0	0.0	0.00	0.01	56.9
North: Reservoir Road													
9	R2	8	0.0	8	0.0	0.025	15.9	LOS B	0.1	0.6	0.78	0.91	18.4
Approach		8	0.0	8	0.0	0.025	15.9	NA	0.1	0.6	0.78	0.91	18.4
West: Site Access													
10	L2	19	10.5	19	10.5	0.028	7.8	LOS A	0.1	0.8	0.54	0.91	13.0
11	T1	17	0.0	17	0.0	0.111	29.9	LOS C	0.4	2.5	0.88	1.00	7.1
Approach		36	5.6	36	5.6	0.111	18.2	LOS B	0.4	2.5	0.70	0.95	9.4
All Vehicles		1196	9.6	1196	9.6	0.315	0.8	NA	0.4	2.5	0.03	0.05	50.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 205 [05. Reservoir Road - Holbeche Road EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Reservoir Road													
1	L2	414	10.4	414	10.4	0.371	4.2	LOS A	2.8	20.8	0.32	0.43	35.5
2	T1	673	7.1	673	7.1	0.371	4.2	LOS A	2.8	20.8	0.34	0.41	54.3
Approach		1087	8.4	1087	8.4	0.371	4.2	LOS A	2.8	20.8	0.33	0.42	51.2
North: Reservoir Road													
8	T1	646	6.3	646	6.3	0.319	5.2	LOS A	2.0	14.7	0.47	0.54	48.7
9	R2	117	3.4	117	3.4	0.319	11.2	LOS A	1.8	13.5	0.48	0.61	47.5
Approach		763	5.9	763	5.9	0.319	6.1	LOS A	2.0	14.7	0.47	0.55	48.5
West: Holbeche Road													
10	L2	101	9.9	101	9.9	0.148	5.8	LOS A	0.6	4.9	0.58	0.67	49.2
12	R2	335	14.0	335	14.0	0.337	10.0	LOS A	1.8	14.3	0.62	0.78	26.1
Approach		436	13.1	436	13.1	0.337	9.0	LOS A	1.8	14.3	0.61	0.75	34.5
All Vehicles		2286	8.4	2286	8.4	0.371	5.8	LOS A	2.8	20.8	0.43	0.53	47.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access EX AM]

Network: N102 [EX AM - Holbeche + Reservoir]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	135	0.7	135	0.7	0.126	1.0	LOS A	0.5	3.4	0.32	0.21	29.9
Approach		135	0.7	135	0.7	0.126	1.0	LOS A	0.5	3.4	0.32	0.21	29.9
East: Holbeche Road													
4	L2	116	0.0	116	0.0	0.179	5.4	LOS A	0.0	0.0	0.00	0.21	49.4
5	T1	534	12.2	534	12.2	0.179	0.0	LOS A	0.0	0.0	0.00	0.08	57.8
Approach		650	10.0	650	10.0	0.179	1.0	NA	0.0	0.0	0.00	0.11	56.3
West: Holbeche Road													
11	T1	456	11.6	456	11.6	0.126	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		456	11.6	456	11.6	0.126	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1241	9.6	1241	9.6	0.179	0.6	NA	0.5	3.4	0.04	0.08	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.6 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	180	21.1	180	21.1	0.112	5.8	LOS A	0.0	0.0	0.00	0.52	55.9
2	T1	659	5.9	659	5.9	0.895	67.8	LOS E	28.6	210.6	0.97	1.04	25.5
3	R2	186	4.8	186	4.8	0.806	75.6	LOS F	13.3	97.2	1.00	0.90	28.5
Approach		1025	8.4	1025	8.4	0.895	58.3	LOS E	28.6	210.6	0.80	0.92	30.6
East: Great Western Hw													
4	L2	594	2.5	594	2.5	0.602	28.7	LOS C	22.9	164.1	0.73	0.87	43.9
5	T1	1169	4.0	1169	4.0	0.846	61.1	LOS E	27.7	200.6	1.00	0.95	34.4
6	R2	438	3.4	438	3.4	0.905	76.8	LOS F	34.2	246.3	1.00	0.97	12.7
Approach		2201	3.5	2201	3.5	0.905	55.5	LOS D	34.2	246.3	0.93	0.93	32.8
North: Reservior Road													
7	L2	141	2.1	141	2.1	0.817	62.2	LOS E	26.2	190.9	1.00	0.93	20.5
8	T1	634	6.2	634	6.2	0.817	56.8	LOS E	26.5	195.4	1.00	0.94	30.7
9	R2	197	7.6	197	7.6	0.874	81.9	LOS F	15.0	111.7	1.00	0.98	24.8
Approach		972	5.9	972	5.9	0.874	62.7	LOS E	26.5	195.4	1.00	0.94	28.3
West: Great Western Hw													
10	L2	247	5.3	247	5.3	0.291	27.1	LOS B	9.6	70.1	0.64	0.76	43.7
11	T1	924	2.6	924	2.6	0.890	73.2	LOS F	23.5	168.3	1.00	1.00	30.9
12	R2	578	9.2	578	9.2	0.835	72.7	LOS F	20.9	157.5	1.00	0.91	35.6
Approach		1749	5.1	1749	5.1	0.890	66.5	LOS E	23.5	168.3	0.95	0.94	33.7
All Vehicles		5947	5.2	5947	5.2	0.905	60.4	LOS E	34.2	246.3	0.92	0.93	31.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	52.4	LOS E	0.2	0.2	0.87	0.87
P2	East Full Crossing	50	55.9	LOS E	0.2	0.2	0.89	0.89
P3	North Full Crossing	50	59.6	LOS E	0.2	0.2	0.92	0.92
P4	West Full Crossing	50	60.5	LOS F	0.2	0.2	0.93	0.93
All Pedestrians		200	57.1	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1035	5.5	1035	5.5	0.291	4.5	LOS A	0.0	0.0	0.00	0.58	30.9
9a	R1	38	8.3	38	8.3	0.291	3.9	LOS A	0.0	0.0	0.00	0.58	31.0
Approach		1073	5.6	1073	5.6	0.291	4.5	NA	0.0	0.0	0.00	0.58	30.9
SouthWest: Reservoir Road													
30a	L1	1437	6.3	1437	6.3	0.392	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1437	6.3	1437	6.3	0.392	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2509	6.0	2509	6.0	0.392	4.1	NA	0.0	0.0	0.00	0.56	32.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road RT Storage													
8	T1	983	5.5	983	5.5	0.307	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		983	5.5	983	5.5	0.307	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Reservoir Road RT Storage													
12	R2	37	5.4	37	5.4	0.083	7.0	LOS A	0.2	1.6	0.64	0.83	7.2
Approach		37	5.4	37	5.4	0.083	7.0	LOS A	0.2	1.6	0.64	0.83	7.2
All Vehicles		1020	5.5	1020	5.5	0.307	0.3	NA	0.2	1.6	0.02	0.03	56.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	26	11.5	26	11.5	0.356	5.7	LOS A	0.0	0.0	0.00	0.02	56.2
2	T1	1306	6.4	1306	6.4	0.356	0.0	LOS A	0.0	0.0	0.00	0.01	59.4
Approach		1332	6.5	1332	6.5	0.356	0.1	NA	0.0	0.0	0.00	0.01	59.2
North: Reservoir Road													
9	R2	36	8.3	36	8.3	0.107	15.3	LOS B	0.4	2.9	0.78	0.90	38.9
Approach		36	8.3	36	8.3	0.107	15.3	NA	0.4	2.9	0.78	0.90	38.9
West: Penny Lane													
10	L2	56	3.6	56	3.6	0.077	12.0	LOS A	0.3	2.4	0.58	0.90	43.5
11	T1	37	5.4	37	5.4	0.206	30.6	LOS C	0.7	5.5	0.87	1.01	29.6
Approach		93	4.3	93	4.3	0.206	19.4	LOS B	0.7	5.5	0.69	0.95	36.7
All Vehicles		1461	6.4	1461	6.4	0.356	1.7	NA	0.7	5.5	0.06	0.09	53.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [06c Seagull Reservoir Road - Site Access EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1098	4.3	1098	4.3	0.300	5.3	LOS A	0.0	0.0	0.00	0.59	33.2
9a	R1	18	0.0	18	0.0	0.300	4.7	LOS A	0.0	0.0	0.00	0.59	33.3
Approach		1116	4.2	1116	4.2	0.300	5.3	NA	0.0	0.0	0.00	0.59	33.2
SouthWest: Reservoir Road													
30a	L1	1414	6.5	1414	6.5	0.386	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
Approach		1414	6.5	1414	6.5	0.386	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
All Vehicles		2529	5.5	2529	5.5	0.386	4.9	NA	0.0	0.0	0.00	0.57	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206b [06b. Reservoir Road Site Access Median Storage EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: RoadName													
8	T1	1043	4.3	1043	4.3	0.275	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1043	4.3	1043	4.3	0.275	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
12	R2	17	0.0	17	0.0	0.033	7.0	LOS A	0.1	0.7	0.65	0.82	7.2
Approach		17	0.0	17	0.0	0.033	7.0	LOS A	0.1	0.7	0.65	0.82	7.2
All Vehicles		1060	4.2	1060	4.2	0.275	0.1	NA	0.1	0.7	0.01	0.01	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206a [06a. Reservoir Road - Site Access EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	48	0.0	48	0.0	0.366	4.8	LOS A	0.0	0.0	0.00	0.04	29.5
2	T1	1322	6.6	1322	6.6	0.366	0.0	LOS A	0.0	0.0	0.00	0.02	58.0
Approach		1370	6.4	1370	6.4	0.366	0.2	NA	0.0	0.0	0.00	0.02	55.1
North: Reservoir Road													
9	R2	17	0.0	17	0.0	0.078	21.5	LOS B	0.2	1.7	0.86	0.94	15.6
Approach		17	0.0	17	0.0	0.078	21.5	NA	0.2	1.7	0.86	0.94	15.6
West: Site Access													
10	L2	21	0.0	21	0.0	0.032	7.9	LOS A	0.1	0.8	0.56	0.92	12.8
11	T1	17	0.0	17	0.0	0.178	45.9	LOS D	0.6	3.9	0.93	1.01	4.8
Approach		38	0.0	38	0.0	0.178	24.9	LOS B	0.6	3.9	0.73	0.96	7.4
All Vehicles		1425	6.1	1425	6.1	0.366	1.1	NA	0.6	3.9	0.03	0.06	46.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 205 [05. Reservoir Road - Holbeche Road EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Reservoir Road													
1	L2	469	9.6	469	9.6	0.421	4.2	LOS A	3.3	24.5	0.31	0.43	35.7
2	T1	800	3.6	800	3.6	0.421	4.2	LOS A	3.3	24.5	0.33	0.40	54.5
Approach		1269	5.8	1269	5.8	0.421	4.2	LOS A	3.3	24.5	0.32	0.41	51.5
North: Reservoir Road													
8	T1	767	3.1	767	3.1	0.320	4.5	LOS A	2.0	14.5	0.37	0.47	49.7
9	R2	107	1.9	107	1.9	0.320	10.4	LOS A	1.9	13.6	0.39	0.53	48.7
Approach		874	3.0	874	3.0	0.320	5.2	LOS A	2.0	14.5	0.37	0.48	49.5
West: Holbeche Road													
10	L2	154	1.9	154	1.9	0.185	5.4	LOS A	0.9	6.3	0.61	0.68	50.0
12	R2	212	7.5	212	7.5	0.215	9.9	LOS A	1.1	8.3	0.61	0.76	26.2
Approach		366	5.2	366	5.2	0.215	8.0	LOS A	1.1	8.3	0.61	0.73	39.9
All Vehicles		2509	4.7	2509	4.7	0.421	5.1	LOS A	3.3	24.5	0.38	0.48	49.2

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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access EX PM]

Network: N102 [EX PM - Holbeche + Reservoir]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	111	0.9	111	0.9	0.101	0.9	LOS A	0.4	2.7	0.30	0.18	29.9
Approach		111	0.9	111	0.9	0.101	0.9	LOS A	0.4	2.7	0.30	0.18	29.9
East: Holbeche Road													
4	L2	108	1.9	108	1.9	0.163	5.4	LOS A	0.0	0.0	0.00	0.21	49.0
5	T1	493	9.1	493	9.1	0.163	0.0	LOS A	0.0	0.0	0.00	0.08	57.8
Approach		601	7.8	601	7.8	0.163	1.0	NA	0.0	0.0	0.00	0.11	56.3
West: Holbeche Road													
11	T1	392	4.8	392	4.8	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		392	4.8	392	4.8	0.104	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1104	6.1	1104	6.1	0.163	0.6	NA	0.4	2.7	0.03	0.08	50.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 10 (maximum specified: 10)

Appendix D

SIDRA Intersection Modelling (Future – No Upgrades)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy FU AM (Improved)]

Network: N102 [FU AM - Holbeche + Reservoir]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	237	16.0	237	16.0	0.142	5.8	LOS A	0.0	0.0	0.00	0.52	56.1
2	T1	563	10.3	563	10.3	0.925	80.0	LOS F	28.4	216.7	0.97	1.12	23.1
3	R2	221	11.3	221	11.3	0.900	85.2	LOS F	17.4	133.7	1.00	1.02	26.6
Approach		1021	11.9	1021	11.9	0.925	63.9	LOS E	28.4	216.7	0.75	0.96	29.9
East: Great Western Hw													
4	L2	584	5.7	584	5.7	0.621	31.6	LOS C	22.1	162.2	0.76	0.91	42.5
5	T1	764	6.4	764	6.4	0.545	49.1	LOS D	15.2	112.4	0.92	0.78	38.7
6	R2	254	6.3	254	6.3	0.341	58.5	LOS E	7.4	54.8	0.90	0.79	15.9
Approach		1602	6.1	1602	6.1	0.621	44.2	LOS D	22.1	162.2	0.86	0.83	37.3
North: Reservior Road													
7	L2	159	6.3	159	6.3	0.913	80.5	LOS F	30.4	230.0	1.00	1.07	16.8
8	T1	595	11.4	595	11.4	0.913	75.0	LOS F	30.4	230.0	1.00	1.09	26.6
9	R2	180	7.8	180	7.8	0.720	70.3	LOS E	12.3	91.5	1.00	0.85	27.2
Approach		934	9.9	934	9.9	0.913	75.1	LOS F	30.4	230.8	1.00	1.04	25.3
West: Great Western Hw													
10	L2	265	7.2	265	7.2	0.236	14.8	LOS B	6.3	46.5	0.42	0.71	54.9
11	T1	1296	7.0	1296	7.0	0.917	73.7	LOS F	34.6	257.0	1.00	1.06	30.8
12	R2	632	11.7	632	11.7	0.897	81.4	LOS F	24.9	191.6	1.00	0.97	33.7
Approach		2193	8.4	2193	8.4	0.917	68.8	LOS E	34.6	257.0	0.93	0.99	33.0
All Vehicles		5750	8.6	5750	8.6	0.925	62.1	LOS E	34.6	257.0	0.89	0.95	32.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	51.5	LOS E	0.2	0.2	0.86	0.86
P2	East Full Crossing	50	60.5	LOS F	0.2	0.2	0.93	0.93
P3	North Full Crossing	50	50.7	LOS E	0.2	0.2	0.85	0.85
P4	West Full Crossing	50	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		200	56.7	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1022	9.8	1022	9.8	0.307	4.5	LOS A	0.0	0.0	0.00	0.58	31.0
9a	R1	80	6.6	80	6.6	0.307	3.9	LOS A	0.0	0.0	0.00	0.57	31.2
Approach		1102	9.6	1102	9.6	0.307	4.5	NA	0.0	0.0	0.00	0.58	31.0
SouthWest: Reservoir Road													
30a	L1	1209	10.4	1209	10.4	0.339	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1209	10.4	1209	10.4	0.339	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2312	10.0	2312	10.0	0.339	4.1	NA	0.0	0.0	0.00	0.56	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road RT Storage													
8	T1	971	9.8	971	9.8	0.384	0.0	LOS A	0.0	0.0	0.00	0.00	59.8
Approach		971	9.8	971	9.8	0.384	0.0	NA	0.0	0.0	0.00	0.00	59.8
West: Reservoir Road RT Storage													
12	R2	38	15.8	38	15.8	0.117	7.8	LOS A	0.2	2.0	0.67	0.84	6.6
Approach		38	15.8	38	15.8	0.117	7.8	LOS A	0.2	2.0	0.67	0.84	6.6
All Vehicles		1009	10.0	1009	10.0	0.384	0.3	NA	0.2	2.0	0.03	0.03	56.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	65	12.3	65	12.3	0.311	5.7	LOS A	0.0	0.0	0.00	0.07	55.6
2	T1	1067	10.3	1067	10.3	0.311	0.0	LOS A	0.0	0.0	0.00	0.03	58.4
Approach		1132	10.4	1132	10.4	0.311	0.3	NA	0.0	0.0	0.00	0.03	57.9
North: Reservoir Road													
9	R2	71	7.0	71	7.0	0.173	13.3	LOS A	0.6	4.8	0.74	0.89	40.6
Approach		71	7.0	71	7.0	0.173	13.3	NA	0.6	4.8	0.74	0.89	40.6
West: Penny Lane													
10	L2	82	12.2	82	12.2	0.103	11.6	LOS A	0.5	3.5	0.53	0.91	44.3
11	T1	38	15.8	38	15.8	0.202	29.6	LOS C	0.7	5.8	0.85	1.02	30.3
Approach		120	13.3	120	13.3	0.202	17.3	LOS B	0.7	5.8	0.63	0.94	38.7
All Vehicles		1323	10.5	1323	10.5	0.311	2.6	NA	0.7	5.8	0.10	0.16	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [06c Seagull Reservoir Road - Site Access FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1054	9.5	1054	9.5	0.297	5.4	LOS A	0.0	0.0	0.00	0.59	33.2
9a	R1	13	0.0	13	0.0	0.297	4.7	LOS A	0.0	0.0	0.00	0.59	33.3
Approach		1066	9.4	1066	9.4	0.297	5.3	NA	0.0	0.0	0.00	0.59	33.2
SouthWest: Reservoir Road													
30a	L1	1234	9.6	1234	9.6	0.344	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
Approach		1234	9.6	1234	9.6	0.344	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
All Vehicles		2300	9.5	2300	9.5	0.344	5.0	NA	0.0	0.0	0.00	0.57	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206b [06b. Reservoir Road Site Access Median Storage FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: RoadName													
8	T1	1016	9.4	1016	9.4	0.276	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1016	9.4	1016	9.4	0.276	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
12	R2	28	0.0	28	0.0	0.054	7.1	LOS A	0.2	1.1	0.65	0.83	7.2
Approach		28	0.0	28	0.0	0.054	7.1	LOS A	0.2	1.1	0.65	0.83	7.2
All Vehicles		1044	9.1	1044	9.1	0.276	0.2	NA	0.2	1.1	0.02	0.02	58.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206a [06a. Reservoir Road - Site Access FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	32	9.4	32	9.4	0.318	4.8	LOS A	0.0	0.0	0.00	0.03	29.4
2	T1	1131	9.7	1131	9.7	0.318	0.0	LOS A	0.0	0.0	0.00	0.02	58.5
Approach		1163	9.7	1163	9.7	0.318	0.1	NA	0.0	0.0	0.00	0.02	56.1
North: Reservoir Road													
9	R2	12	0.0	12	0.0	0.039	16.2	LOS B	0.1	0.9	0.79	0.91	21.3
Approach		12	0.0	12	0.0	0.039	16.2	NA	0.1	0.9	0.79	0.91	21.3
West: Site Access													
10	L2	41	4.9	41	4.9	0.057	10.3	LOS A	0.2	1.5	0.54	0.93	16.1
11	T1	32	0.0	32	0.0	0.214	32.7	LOS C	0.7	5.1	0.89	1.01	6.6
Approach		73	2.7	73	2.7	0.214	20.1	LOS B	0.7	5.1	0.69	0.97	9.9
All Vehicles		1248	9.2	1248	9.2	0.318	1.5	NA	0.7	5.1	0.05	0.08	45.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 205 [05. Reservoir Road - Holbeche Road FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Reservoir Road													
1	L2	418	10.3	418	10.3	0.387	4.3	LOS A	2.9	22.0	0.36	0.45	35.0
2	T1	695	6.9	695	6.9	0.387	4.3	LOS A	2.9	22.0	0.37	0.43	54.0
Approach		1113	8.2	1113	8.2	0.387	4.3	LOS A	2.9	22.0	0.37	0.44	50.9
North: Reservoir Road													
8	T1	649	6.3	649	6.3	0.330	5.2	LOS A	2.1	15.5	0.47	0.54	48.6
9	R2	141	2.8	141	2.8	0.330	11.2	LOS A	1.9	14.2	0.49	0.63	47.1
Approach		790	5.7	790	5.7	0.330	6.3	LOS A	2.1	15.5	0.48	0.55	48.3
West: Holbeche Road													
10	L2	101	9.9	101	9.9	0.151	5.9	LOS A	0.7	5.0	0.59	0.68	49.1
12	R2	336	14.0	336	14.0	0.344	10.0	LOS A	1.9	14.7	0.63	0.79	26.1
Approach		437	13.0	437	13.0	0.344	9.1	LOS A	1.9	14.7	0.62	0.76	34.4
All Vehicles		2340	8.2	2340	8.2	0.387	5.9	LOS A	2.9	22.0	0.45	0.54	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access FU AM]

Network: N102 [FU AM - Holbeche + Reservoir]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	149	0.7	149	0.7	0.137	1.8	LOS A	0.5	3.7	0.32	0.32	32.9
Approach		149	0.7	149	0.7	0.137	1.8	LOS A	0.5	3.7	0.32	0.32	32.9
East: Holbeche Road													
4	L2	140	0.0	140	0.0	0.186	5.4	LOS A	0.0	0.0	0.00	0.24	48.8
5	T1	538	12.1	538	12.1	0.186	0.0	LOS A	0.0	0.0	0.00	0.09	57.6
Approach		678	9.6	678	9.6	0.186	1.1	NA	0.0	0.0	0.00	0.12	55.8
West: Holbeche Road													
11	T1	456	11.6	456	11.6	0.126	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		456	11.6	456	11.6	0.126	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1283	9.3	1283	9.3	0.186	0.8	NA	0.5	3.7	0.04	0.10	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 205 [05. Reservoir Road - Holbeche Road FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Reservoir Road													
1	L2	476	9.5	476	9.5	0.482	4.9	LOS A	4.0	29.8	0.48	0.50	33.5
2	T1	850	3.4	850	3.4	0.482	4.9	LOS A	4.0	29.8	0.49	0.49	53.1
Approach		1326	5.6	1326	5.6	0.482	4.9	LOS A	4.0	29.8	0.49	0.49	50.0
North: Reservoir Road													
8	T1	785	3.1	785	3.1	0.371	4.6	LOS A	2.5	17.8	0.40	0.48	49.2
9	R2	219	0.9	219	0.9	0.371	10.5	LOS A	2.3	16.6	0.41	0.59	47.4
Approach		1004	2.6	1004	2.6	0.371	5.9	LOS A	2.5	17.8	0.40	0.51	48.8
West: Holbeche Road													
10	L2	154	1.9	154	1.9	0.199	5.5	LOS A	1.0	7.0	0.65	0.72	49.8
12	R2	221	7.2	221	7.2	0.238	10.1	LOS A	1.3	9.4	0.65	0.80	25.9
Approach		375	5.1	375	5.1	0.238	8.2	LOS A	1.3	9.4	0.65	0.77	39.4
All Vehicles		2705	4.4	2705	4.4	0.482	5.7	LOS A	4.0	29.8	0.48	0.54	48.2

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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy FU PM (Improved)]

Network: N102 [FU PM - Holbeche + Reservoir]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	180	21.1	180	21.1	0.112	5.8	LOS A	0.0	0.0	0.00	0.52	55.9
2	T1	736	5.3	736	5.3	0.912	70.2	LOS E	32.4	236.8	0.96	1.07	25.0
3	R2	186	4.8	186	4.8	0.763	72.6	LOS F	13.0	94.5	1.00	0.88	29.2
Approach		1102	7.8	1102	7.8	0.912	60.1	LOS E	32.4	236.8	0.81	0.95	30.0
East: Great Western Hw													
4	L2	594	2.5	594	2.5	0.609	29.3	LOS C	23.2	166.1	0.74	0.88	43.6
5	T1	1169	4.0	1169	4.0	0.899	70.7	LOS F	30.2	218.9	1.00	1.02	31.5
6	R2	475	3.2	475	3.2	0.697	65.7	LOS E	15.5	111.2	0.99	0.84	14.4
Approach		2238	3.4	2238	3.4	0.899	58.7	LOS E	30.2	218.9	0.93	0.95	31.6
North: Reservior Road													
7	L2	151	2.0	151	2.0	0.799	58.3	LOS E	26.9	195.8	0.99	0.91	21.4
8	T1	672	5.8	672	5.8	0.799	53.0	LOS D	27.2	200.2	0.99	0.91	31.7
9	R2	207	7.2	207	7.2	0.868	80.5	LOS F	15.6	116.1	1.00	0.97	25.1
Approach		1030	5.5	1030	5.5	0.868	59.3	LOS E	27.2	200.2	0.99	0.92	29.1
West: Great Western Hw													
10	L2	286	4.5	286	4.5	0.282	20.0	LOS B	9.0	65.2	0.53	0.74	48.5
11	T1	924	2.6	924	2.6	0.695	53.5	LOS D	19.4	138.6	0.98	0.83	37.0
12	R2	578	9.2	578	9.2	0.900	83.5	LOS F	22.9	172.6	1.00	0.98	33.3
Approach		1788	5.0	1788	5.0	0.900	57.8	LOS E	22.9	172.6	0.91	0.86	36.1
All Vehicles		6158	5.0	6158	5.0	0.912	58.8	LOS E	32.4	236.8	0.91	0.92	32.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	54.1	LOS E	0.2	0.2	0.88	0.88
P2	East Full Crossing	50	54.1	LOS E	0.2	0.2	0.88	0.88
P3	North Full Crossing	50	53.3	LOS E	0.2	0.2	0.87	0.87
P4	West Full Crossing	50	57.7	LOS E	0.2	0.2	0.91	0.91
All Pedestrians		200	54.8	LOS E			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Reservoir Road													
1	L2	50	6.0	50	6.0	0.378	5.6	LOS A	0.0	0.0	0.00	0.04	56.4
2	T1	1365	6.1	1365	6.1	0.378	0.0	LOS A	0.0	0.0	0.00	0.02	58.9
Approach		1415	6.1	1415	6.1	0.378	0.2	NA	0.0	0.0	0.00	0.02	58.6
North: Reservoir Road													
9	R2	37	8.1	37	8.1	0.126	17.1	LOS B	0.4	3.3	0.81	0.92	37.5
Approach		37	8.1	37	8.1	0.126	17.1	NA	0.4	3.3	0.81	0.92	37.5
West: Penny Lane													
10	L2	59	3.4	59	3.4	0.083	12.1	LOS A	0.4	2.6	0.59	0.91	43.3
11	T1	45	4.4	45	4.4	0.287	36.5	LOS C	1.1	7.8	0.89	1.03	26.8
Approach		104	3.8	104	3.8	0.287	22.7	LOS B	1.1	7.8	0.72	0.97	34.2
All Vehicles		1556	6.0	1556	6.0	0.378	2.1	NA	1.1	7.8	0.07	0.11	52.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road RT Storage													
8	T1	1034	5.2	1034	5.2	0.331	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1034	5.2	1034	5.2	0.331	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Reservoir Road RT Storage													
12	R2	45	4.4	45	4.4	0.110	10.0	LOS A	0.3	2.0	0.67	0.87	17.8
Approach		45	4.4	45	4.4	0.110	10.0	LOS A	0.3	2.0	0.67	0.87	17.8
All Vehicles		1079	5.2	1079	5.2	0.331	0.4	NA	0.3	2.0	0.03	0.04	55.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1088	5.2	1088	5.2	0.306	4.5	LOS A	0.0	0.0	0.00	0.58	30.9
9a	R1	39	8.1	39	8.1	0.306	3.9	LOS A	0.0	0.0	0.00	0.58	31.0
Approach		1127	5.3	1127	5.3	0.306	4.5	NA	0.0	0.0	0.00	0.58	30.9
SouthWest: Reservoir Road													
30a	L1	1502	6.0	1502	6.0	0.409	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1502	6.0	1502	6.0	0.409	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2629	5.7	2629	5.7	0.409	4.1	NA	0.0	0.0	0.00	0.56	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206a [06a. Reservoir Road - Site Access FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	125	0.0	125	0.0	0.388	4.8	LOS A	0.0	0.0	0.00	0.10	28.6
2	T1	1325	6.6	1325	6.6	0.388	0.0	LOS A	0.0	0.0	0.00	0.05	55.7
Approach		1450	6.0	1450	6.0	0.388	0.4	NA	0.0	0.0	0.00	0.05	49.6
North: Reservoir Road													
9	R2	41	0.0	41	0.0	0.220	26.5	LOS B	0.7	5.0	0.90	0.97	15.0
Approach		41	0.0	41	0.0	0.220	26.5	NA	0.7	5.0	0.90	0.97	15.0
West: Site Access													
10	L2	74	0.0	74	0.0	0.106	10.5	LOS A	0.4	2.8	0.56	0.97	16.7
11	T1	68	0.0	68	0.0	0.835	130.3	LOS F	4.0	28.1	0.99	1.25	1.7
Approach		142	0.0	142	0.0	0.835	67.9	LOS E	4.0	28.1	0.77	1.10	3.3
All Vehicles		1633	5.3	1633	5.3	0.835	6.9	NA	4.0	28.1	0.09	0.17	25.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206b [06b. Reservoir Road Site Access Median Storage FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: RoadName													
8	T1	1043	4.3	1043	4.3	0.275	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1043	4.3	1043	4.3	0.275	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
12	R2	68	0.0	68	0.0	0.130	7.3	LOS A	0.4	2.8	0.67	0.84	6.2
Approach		68	0.0	68	0.0	0.130	7.3	LOS A	0.4	2.8	0.67	0.84	6.2
All Vehicles		1111	4.1	1111	4.1	0.275	0.5	NA	0.4	2.8	0.04	0.05	55.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [06c Seagull Reservoir Road - Site Access FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1098	4.3	1098	4.3	0.307	5.3	LOS A	0.0	0.0	0.00	0.59	33.3
9a	R1	43	0.0	43	0.0	0.307	4.7	LOS A	0.0	0.0	0.00	0.59	33.3
Approach		1141	4.2	1141	4.2	0.307	5.3	NA	0.0	0.0	0.00	0.59	33.3
SouthWest: Reservoir Road													
30a	L1	1473	6.2	1473	6.2	0.402	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
Approach		1473	6.2	1473	6.2	0.402	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
All Vehicles		2614	5.3	2614	5.3	0.402	4.9	NA	0.0	0.0	0.00	0.57	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access FU PM]

Network: N102 [FU PM - Holbeche + Reservoir]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	126	0.8	126	0.8	0.108	1.6	LOS A	0.4	2.9	0.25	0.29	33.8
Approach		126	0.8	126	0.8	0.108	1.6	LOS A	0.4	2.9	0.25	0.29	33.8
East: Holbeche Road													
4	L2	220	0.9	220	0.9	0.194	5.4	LOS A	0.0	0.0	0.00	0.36	46.4
5	T1	496	9.1	496	9.1	0.194	0.0	LOS A	0.0	0.0	0.00	0.10	57.4
Approach		716	6.6	716	6.6	0.194	1.7	NA	0.0	0.0	0.00	0.18	54.0
West: Holbeche Road													
11	T1	392	4.8	392	4.8	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		392	4.8	392	4.8	0.104	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1234	5.4	1234	5.4	0.194	1.1	NA	0.4	2.9	0.03	0.13	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

Appendix E

SIDRA Intersection Modelling (Future Scenario 3 – Site Access Signals)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy FU AM (Improved)]

Network: N102 [FU AM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	237	16.0	237	16.0	0.142	5.8	LOS A	0.0	0.0	0.00	0.52	56.1
2	T1	563	10.3	563	10.3	0.925	80.0	LOS F	28.4	216.7	0.97	1.12	23.1
3	R2	221	11.3	221	11.3	0.900	85.2	LOS F	17.4	133.7	1.00	1.02	26.6
Approach		1021	11.9	1021	11.9	0.925	63.9	LOS E	28.4	216.7	0.75	0.96	29.9
East: Great Western Hw													
4	L2	584	5.7	584	5.7	0.621	31.6	LOS C	22.1	162.2	0.76	0.91	42.5
5	T1	764	6.4	764	6.4	0.545	49.1	LOS D	15.2	112.4	0.92	0.78	38.7
6	R2	254	6.3	254	6.3	0.341	58.5	LOS E	7.4	54.8	0.90	0.79	15.9
Approach		1602	6.1	1602	6.1	0.621	44.2	LOS D	22.1	162.2	0.86	0.83	37.3
North: Reservior Road													
7	L2	159	6.3	159	6.3	0.913	80.5	LOS F	30.4	230.0	1.00	1.07	16.8
8	T1	595	11.4	595	11.4	0.913	75.0	LOS F	30.4	230.0	1.00	1.09	26.6
9	R2	180	7.8	180	7.8	0.720	70.3	LOS E	12.3	91.5	1.00	0.85	27.2
Approach		934	9.9	934	9.9	0.913	75.1	LOS F	30.4	230.8	1.00	1.04	25.3
West: Great Western Hw													
10	L2	265	7.2	265	7.2	0.236	14.8	LOS B	6.3	46.5	0.42	0.71	54.9
11	T1	1296	7.0	1296	7.0	0.917	73.7	LOS F	34.6	257.0	1.00	1.06	30.8
12	R2	632	11.7	632	11.7	0.897	81.4	LOS F	24.9	191.6	1.00	0.97	33.7
Approach		2193	8.4	2193	8.4	0.917	68.8	LOS E	34.6	257.0	0.93	0.99	33.0
All Vehicles		5750	8.6	5750	8.6	0.925	62.1	LOS E	34.6	257.0	0.89	0.95	32.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	51.5	LOS E	0.2	0.2	0.86	0.86
P2	East Full Crossing	50	60.5	LOS F	0.2	0.2	0.93	0.93
P3	North Full Crossing	50	50.7	LOS E	0.2	0.2	0.85	0.85
P4	West Full Crossing	50	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		200	56.7	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1022	9.8	1022	9.8	0.307	4.5	LOS A	0.0	0.0	0.00	0.58	31.0
9a	R1	80	6.6	80	6.6	0.307	3.9	LOS A	0.0	0.0	0.00	0.57	31.2
Approach		1102	9.6	1102	9.6	0.307	4.5	NA	0.0	0.0	0.00	0.58	31.0
SouthWest: Reservoir Road													
30a	L1	1209	10.4	1209	10.4	0.679	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1209	10.4	1209	10.4	0.679	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2312	10.0	2312	10.0	0.679	4.1	NA	0.0	0.0	0.00	0.56	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Reservoir Road RT Storage													
8	T1	971	9.8	971	9.8	0.384	0.0	LOS A	0.0	0.0	0.00	0.00	59.8
Approach		971	9.8	971	9.8	0.384	0.0	NA	0.0	0.0	0.00	0.00	59.8
West: Reservoir Road RT Storage													
12	R2	38	15.8	38	15.8	0.117	7.8	LOS A	0.2	2.0	0.67	0.84	6.6
Approach		38	15.8	38	15.8	0.117	7.8	LOS A	0.2	2.0	0.67	0.84	6.6
All Vehicles		1009	10.0	1009	10.0	0.384	0.3	NA	0.2	2.0	0.03	0.03	56.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	65	12.3	65	12.3	0.311	5.7	LOS A	0.0	0.0	0.00	0.07	55.6
2	T1	1067	10.3	1067	10.3	0.311	0.0	LOS A	0.0	0.0	0.00	0.03	58.4
Approach		1132	10.4	1132	10.4	0.311	0.3	NA	0.0	0.0	0.00	0.03	57.9
North: Reservoir Road													
9	R2	71	7.0	71	7.0	0.173	13.3	LOS A	0.6	4.8	0.74	0.89	40.6
Approach		71	7.0	71	7.0	0.173	13.3	NA	0.6	4.8	0.74	0.89	40.6
West: Penny Lane													
10	L2	82	12.2	82	12.2	0.103	11.6	LOS A	0.5	3.5	0.53	0.91	44.3
11	T1	38	15.8	38	15.8	0.202	29.6	LOS C	0.7	5.8	0.85	1.02	30.3
Approach		120	13.3	120	13.3	0.202	17.3	LOS B	0.7	5.8	0.63	0.94	38.7
All Vehicles		1323	10.5	1323	10.5	0.311	2.6	NA	0.7	5.8	0.10	0.16	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206av [06a. Reservoir Road - Site Access FU AM (Signals)]

Network: N102 [FU AM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	33	9.1	33	9.1	0.476	15.1	LOS B	15.1	114.2	0.53	0.49	23.8
2	T1	1128	9.8	1128	9.8	0.476	10.3	LOS A	15.1	114.2	0.53	0.48	19.9
Approach		1161	9.7	1161	9.7	0.476	10.4	LOS A	15.1	114.2	0.53	0.49	20.1
North: Reservoir Road													
8	T1	105	90.8	105	90.8	0.056	3.6	LOS A	0.7	9.1	0.26	0.20	46.8
9	R2	23	0.0	23	0.0	0.075	12.2	LOS A	0.3	2.4	0.47	0.66	31.0
Approach		128	74.5	128	74.5	0.075	5.1	LOS A	0.7	9.1	0.29	0.29	42.2
West: Site Access													
10	L2	41	4.9	41	4.9	0.098	42.4	LOS C	1.9	13.7	0.82	0.70	4.9
12	R2	32	0.0	32	0.0	0.129	53.4	LOS D	1.7	11.7	0.92	0.71	4.0
Approach		73	2.7	73	2.7	0.129	47.2	LOS D	1.9	13.7	0.86	0.71	4.5
All Vehicles		1362	15.4	1362	15.4	0.476	11.9	LOS A	15.1	114.2	0.52	0.48	19.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	54.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	50	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	50	12.2	LOS B	0.1	0.1	0.45	0.45
All Pedestrians		150	40.2	LOS E			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 205 [05. Reservoir Road - Holbeche Road FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	418	10.3	418	10.3	0.387	4.3	LOS A	2.9	22.0	0.36	0.45	35.0
2	T1	695	6.9	695	6.9	0.387	4.3	LOS A	2.9	22.0	0.37	0.43	54.0
Approach		1113	8.2	1113	8.2	0.387	4.3	LOS A	2.9	22.0	0.37	0.44	50.9
North: Reservoir Road													
8	T1	649	6.3	649	6.3	0.330	5.2	LOS A	2.1	15.5	0.47	0.54	48.6
9	R2	141	2.8	141	2.8	0.330	11.2	LOS A	1.9	14.2	0.49	0.63	47.1
Approach		790	5.7	790	5.7	0.330	6.3	LOS A	2.1	15.5	0.48	0.55	48.3
West: Holbeche Road													
10	L2	101	9.9	101	9.9	0.151	5.9	LOS A	0.7	5.0	0.59	0.68	49.1
12	R2	336	14.0	336	14.0	0.344	10.0	LOS A	1.9	14.7	0.63	0.79	26.1
Approach		437	13.0	437	13.0	0.344	9.1	LOS A	1.9	14.7	0.62	0.76	34.4
All Vehicles		2340	8.2	2340	8.2	0.387	5.9	LOS A	2.9	22.0	0.45	0.54	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	149	0.7	149	0.7	0.137	1.8	LOS A	0.5	3.7	0.32	0.32	32.9
Approach		149	0.7	149	0.7	0.137	1.8	LOS A	0.5	3.7	0.32	0.32	32.9
East: Holbeche Road													
4	L2	140	0.0	140	0.0	0.186	5.4	LOS A	0.0	0.0	0.00	0.24	48.8
5	T1	538	12.1	538	12.1	0.186	0.0	LOS A	0.0	0.0	0.00	0.09	57.6
Approach		678	9.6	678	9.6	0.186	1.1	NA	0.0	0.0	0.00	0.12	55.8
West: Holbeche Road													
11	T1	456	11.6	456	11.6	0.126	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		456	11.6	456	11.6	0.126	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1283	9.3	1283	9.3	0.186	0.8	NA	0.5	3.7	0.04	0.10	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy FU PM (Improved)]

Network: N102 [FU PM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	180	21.1	180	21.1	0.112	5.8	LOS A	0.0	0.0	0.00	0.52	55.9
2	T1	736	5.3	736	5.3	0.912	70.2	LOS E	32.4	236.8	0.96	1.07	25.0
3	R2	186	4.8	186	4.8	0.763	72.6	LOS F	13.0	94.5	1.00	0.88	29.2
Approach		1102	7.8	1102	7.8	0.912	60.1	LOS E	32.4	236.8	0.81	0.95	30.0
East: Great Western Hw													
4	L2	594	2.5	594	2.5	0.609	29.3	LOS C	23.2	166.1	0.74	0.88	43.6
5	T1	1169	4.0	1169	4.0	0.899	70.7	LOS F	30.2	218.9	1.00	1.02	31.5
6	R2	475	3.2	475	3.2	0.697	65.7	LOS E	15.5	111.2	0.99	0.84	14.4
Approach		2238	3.4	2238	3.4	0.899	58.7	LOS E	30.2	218.9	0.93	0.95	31.6
North: Reservior Road													
7	L2	151	2.0	151	2.0	0.799	58.3	LOS E	26.9	195.8	0.99	0.91	21.4
8	T1	672	5.8	672	5.8	0.799	53.0	LOS D	27.2	200.2	0.99	0.91	31.7
9	R2	207	7.2	207	7.2	0.868	80.5	LOS F	15.6	116.1	1.00	0.97	25.1
Approach		1030	5.5	1030	5.5	0.868	59.3	LOS E	27.2	200.2	0.99	0.92	29.1
West: Great Western Hw													
10	L2	286	4.5	286	4.5	0.282	20.0	LOS B	9.0	65.2	0.53	0.74	48.5
11	T1	924	2.6	924	2.6	0.695	53.5	LOS D	19.4	138.6	0.98	0.83	37.0
12	R2	578	9.2	578	9.2	0.900	83.5	LOS F	22.9	172.6	1.00	0.98	33.3
Approach		1788	5.0	1788	5.0	0.900	57.8	LOS E	22.9	172.6	0.91	0.86	36.1
All Vehicles		6158	5.0	6158	5.0	0.912	58.8	LOS E	32.4	236.8	0.91	0.92	32.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	54.1	LOS E	0.2	0.2	0.88	0.88
P2	East Full Crossing	50	54.1	LOS E	0.2	0.2	0.88	0.88
P3	North Full Crossing	50	53.3	LOS E	0.2	0.2	0.87	0.87
P4	West Full Crossing	50	57.7	LOS E	0.2	0.2	0.91	0.91
All Pedestrians		200	54.8	LOS E			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Reservoir Road													
7a	L1	1088	5.2	1088	5.2	0.306	4.5	LOS A	0.0	0.0	0.00	0.58	30.9
9a	R1	39	8.1	39	8.1	0.306	3.9	LOS A	0.0	0.0	0.00	0.58	31.0
Approach		1127	5.3	1127	5.3	0.306	4.5	NA	0.0	0.0	0.00	0.58	30.9
SouthWest: Reservoir Road													
30a	L1	1502	6.0	1502	6.0	0.819	3.9	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1502	6.0	1502	6.0	0.819	3.9	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2629	5.7	2629	5.7	0.819	4.2	NA	0.0	0.0	0.00	0.56	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Reservoir Road RT Storage													
8	T1	1034	5.2	1034	5.2	0.331	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1034	5.2	1034	5.2	0.331	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Reservoir Road RT Storage													
12	R2	45	4.4	45	4.4	0.110	10.0	LOS A	0.3	2.0	0.67	0.87	17.8
Approach		45	4.4	45	4.4	0.110	10.0	LOS A	0.3	2.0	0.67	0.87	17.8
All Vehicles		1079	5.2	1079	5.2	0.331	0.4	NA	0.3	2.0	0.03	0.04	55.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	50	6.0	50	6.0	0.378	5.6	LOS A	0.0	0.0	0.00	0.04	56.4
2	T1	1365	6.1	1365	6.1	0.378	0.0	LOS A	0.0	0.0	0.00	0.02	58.9
Approach		1415	6.1	1415	6.1	0.378	0.2	NA	0.0	0.0	0.00	0.02	58.6
North: Reservoir Road													
9	R2	37	8.1	37	8.1	0.126	17.1	LOS B	0.4	3.3	0.81	0.92	37.5
Approach		37	8.1	37	8.1	0.126	17.1	NA	0.4	3.3	0.81	0.92	37.5
West: Penny Lane													
10	L2	59	3.4	59	3.4	0.083	12.1	LOS A	0.4	2.6	0.59	0.91	43.3
11	T1	45	4.4	45	4.4	0.287	36.5	LOS C	1.1	7.8	0.89	1.03	26.8
Approach		104	3.8	104	3.8	0.287	22.7	LOS B	1.1	7.8	0.72	0.97	34.2
All Vehicles		1556	6.0	1556	6.0	0.378	2.1	NA	1.1	7.8	0.07	0.11	52.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206av [06a. Reservoir Road - Site Access FU PM (Signals)]

Network: N102 [FU PM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	125	0.0	125	0.0	0.582	16.3	LOS B	15.6	114.2	0.59	0.58	14.1
2	T1	1325	6.6	1325	6.6	0.582	11.5	LOS A	15.6	114.2	0.59	0.56	18.2
Approach		1450	6.0	1450	6.0	0.582	11.9	LOS A	15.6	114.2	0.59	0.56	17.6
North: Reservoir Road													
8	T1	998	4.5	998	4.5	0.344	4.7	LOS A	9.0	65.7	0.34	0.31	43.9
9	R2	41	0.0	41	0.0	0.173	14.7	LOS B	0.8	5.3	0.56	0.69	28.6
Approach		1039	4.3	1039	4.3	0.344	5.1	LOS A	9.0	65.7	0.35	0.32	42.8
West: Site Access													
10	L2	74	0.0	74	0.0	0.171	43.4	LOS D	3.5	24.2	0.84	0.74	4.9
12	R2	68	0.0	68	0.0	0.275	55.3	LOS D	3.7	25.6	0.94	0.75	3.9
Approach		142	0.0	142	0.0	0.275	49.1	LOS D	3.7	25.6	0.89	0.75	4.4
All Vehicles		2631	5.0	2631	5.0	0.582	11.2	LOS A	15.6	114.2	0.51	0.48	24.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	54.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	50	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	50	12.2	LOS B	0.1	0.1	0.45	0.45
All Pedestrians		150	40.2	LOS E			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 205 [05. Reservoir Road - Holbeche Road FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	476	9.5	476	9.5	0.482	4.9	LOS A	4.0	29.8	0.48	0.50	33.5
2	T1	850	3.4	850	3.4	0.482	4.9	LOS A	4.0	29.8	0.49	0.49	53.1
Approach		1326	5.6	1326	5.6	0.482	4.9	LOS A	4.0	29.8	0.49	0.49	50.0
North: Reservoir Road													
8	T1	785	3.1	785	3.1	0.371	4.6	LOS A	2.5	17.8	0.40	0.48	49.2
9	R2	219	0.9	219	0.9	0.371	10.5	LOS A	2.3	16.6	0.41	0.59	47.4
Approach		1004	2.6	1004	2.6	0.371	5.9	LOS A	2.5	17.8	0.40	0.51	48.8
West: Holbeche Road													
10	L2	154	1.9	154	1.9	0.199	5.5	LOS A	1.0	7.0	0.65	0.72	49.8
12	R2	221	7.2	221	7.2	0.238	10.1	LOS A	1.3	9.4	0.65	0.80	25.9
Approach		375	5.1	375	5.1	0.238	8.2	LOS A	1.3	9.4	0.65	0.77	39.4
All Vehicles		2705	4.4	2705	4.4	0.482	5.7	LOS A	4.0	29.8	0.48	0.54	48.2

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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signal Access + GWH Improved)]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	126	0.8	126	0.8	0.108	1.6	LOS A	0.4	2.9	0.25	0.29	33.8
Approach		126	0.8	126	0.8	0.108	1.6	LOS A	0.4	2.9	0.25	0.29	33.8
East: Holbeche Road													
4	L2	220	0.9	220	0.9	0.194	5.4	LOS A	0.0	0.0	0.00	0.36	46.4
5	T1	496	9.1	496	9.1	0.194	0.0	LOS A	0.0	0.0	0.00	0.10	57.4
Approach		716	6.6	716	6.6	0.194	1.7	NA	0.0	0.0	0.00	0.18	54.0
West: Holbeche Road													
11	T1	392	4.8	392	4.8	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		392	4.8	392	4.8	0.104	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1234	5.4	1234	5.4	0.194	1.1	NA	0.4	2.9	0.03	0.13	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 3.8 %
Number of Iterations: 10 (maximum specified: 10)

Appendix F

SIDRA Intersection Modelling (Future Scenario 4 – Holbeche Signals)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy FU AM (Improved)]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	237	16.0	237	16.0	0.142	5.8	LOS A	0.0	0.0	0.00	0.52	56.1
2	T1	563	10.3	563	10.3	0.925	80.0	LOS F	28.4	216.7	0.97	1.12	23.1
3	R2	221	11.3	221	11.3	0.900	85.2	LOS F	17.4	133.7	1.00	1.02	26.6
Approach		1021	11.9	1021	11.9	0.925	63.9	LOS E	28.4	216.7	0.75	0.96	29.9
East: Great Western Hw													
4	L2	584	5.7	584	5.7	0.621	31.6	LOS C	22.1	162.2	0.76	0.91	42.5
5	T1	764	6.4	764	6.4	0.545	49.1	LOS D	15.2	112.4	0.92	0.78	38.7
6	R2	254	6.3	254	6.3	0.341	58.5	LOS E	7.4	54.8	0.90	0.79	15.9
Approach		1602	6.1	1602	6.1	0.621	44.2	LOS D	22.1	162.2	0.86	0.83	37.3
North: Reservior Road													
7	L2	159	6.3	159	6.3	0.913	80.5	LOS F	30.4	230.0	1.00	1.07	16.8
8	T1	595	11.4	595	11.4	0.913	75.0	LOS F	30.4	230.0	1.00	1.09	26.6
9	R2	180	7.8	180	7.8	0.720	70.3	LOS E	12.3	91.5	1.00	0.85	27.2
Approach		934	9.9	934	9.9	0.913	75.1	LOS F	30.4	230.8	1.00	1.04	25.3
West: Great Western Hw													
10	L2	265	7.2	265	7.2	0.236	14.8	LOS B	6.3	46.5	0.42	0.71	54.9
11	T1	1296	7.0	1296	7.0	0.917	73.7	LOS F	34.6	257.0	1.00	1.06	30.8
12	R2	632	11.7	632	11.7	0.897	81.4	LOS F	24.9	191.6	1.00	0.97	33.7
Approach		2193	8.4	2193	8.4	0.917	68.8	LOS E	34.6	257.0	0.93	0.99	33.0
All Vehicles		5750	8.6	5750	8.6	0.925	62.1	LOS E	34.6	257.0	0.89	0.95	32.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	51.5	LOS E	0.2	0.2	0.86	0.86
P2	East Full Crossing	50	60.5	LOS F	0.2	0.2	0.93	0.93
P3	North Full Crossing	50	50.7	LOS E	0.2	0.2	0.85	0.85
P4	West Full Crossing	50	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		200	56.7	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Reservoir Road													
7a	L1	1022	9.8	1022	9.8	0.307	4.5	LOS A	0.0	0.0	0.00	0.58	31.0
9a	R1	80	6.6	80	6.6	0.307	3.9	LOS A	0.0	0.0	0.00	0.57	31.2
Approach		1102	9.6	1102	9.6	0.307	4.5	NA	0.0	0.0	0.00	0.58	31.0
SouthWest: Reservoir Road													
30a	L1	1209	10.4	1209	10.4	0.339	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1209	10.4	1209	10.4	0.339	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2312	10.0	2312	10.0	0.339	4.1	NA	0.0	0.0	0.00	0.56	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road RT Storage													
8	T1	971	9.8	971	9.8	0.384	0.0	LOS A	0.0	0.0	0.00	0.00	59.8
Approach		971	9.8	971	9.8	0.384	0.0	NA	0.0	0.0	0.00	0.00	59.8
West: Reservoir Road RT Storage													
12	R2	38	15.8	38	15.8	0.117	7.8	LOS A	0.2	2.0	0.67	0.84	6.6
Approach		38	15.8	38	15.8	0.117	7.8	LOS A	0.2	2.0	0.67	0.84	6.6
All Vehicles		1009	10.0	1009	10.0	0.384	0.3	NA	0.2	2.0	0.03	0.03	56.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	65	12.3	65	12.3	0.311	5.7	LOS A	0.0	0.0	0.00	0.07	55.6
2	T1	1067	10.3	1067	10.3	0.311	0.0	LOS A	0.0	0.0	0.00	0.03	58.4
Approach		1132	10.4	1132	10.4	0.311	0.3	NA	0.0	0.0	0.00	0.03	57.9
North: Reservoir Road													
9	R2	71	7.0	71	7.0	0.173	13.3	LOS A	0.6	4.8	0.74	0.89	40.6
Approach		71	7.0	71	7.0	0.173	13.3	NA	0.6	4.8	0.74	0.89	40.6
West: Penny Lane													
10	L2	82	12.2	82	12.2	0.103	11.6	LOS A	0.5	3.5	0.53	0.91	44.3
11	T1	38	15.8	38	15.8	0.202	29.6	LOS C	0.7	5.8	0.85	1.02	30.3
Approach		120	13.3	120	13.3	0.202	17.3	LOS B	0.7	5.8	0.63	0.94	38.7
All Vehicles		1323	10.5	1323	10.5	0.311	2.6	NA	0.7	5.8	0.10	0.16	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [06c Seagull Reservoir Road - Site Access FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road													
7a	L1	1054	9.5	1054	9.5	0.297	5.4	LOS A	0.0	0.0	0.00	0.59	33.2
9a	R1	13	0.0	13	0.0	0.297	4.7	LOS A	0.0	0.0	0.00	0.59	33.3
Approach		1066	9.4	1066	9.4	0.297	5.3	NA	0.0	0.0	0.00	0.59	33.2
SouthWest: Reservoir Road													
30a	L1	1234	9.6	1234	9.6	0.467	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
Approach		1234	9.6	1234	9.6	0.467	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
All Vehicles		2300	9.5	2300	9.5	0.467	5.0	NA	0.0	0.0	0.00	0.57	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206b [06b. Reservoir Road Site Access Median Storage FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: RoadName													
8	T1	1016	9.4	1016	9.4	0.276	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1016	9.4	1016	9.4	0.276	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
12	R2	28	0.0	28	0.0	0.054	7.1	LOS A	0.2	1.1	0.65	0.83	7.2
Approach		28	0.0	28	0.0	0.054	7.1	LOS A	0.2	1.1	0.65	0.83	7.2
All Vehicles		1044	9.1	1044	9.1	0.276	0.2	NA	0.2	1.1	0.02	0.02	58.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206a [06a. Reservoir Road - Site Access FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	32	9.4	32	9.4	0.318	4.8	LOS A	0.0	0.0	0.00	0.03	29.4
2	T1	1131	9.7	1131	9.7	0.318	0.0	LOS A	0.0	0.0	0.00	0.02	58.5
Approach		1163	9.7	1163	9.7	0.318	0.1	NA	0.0	0.0	0.00	0.02	56.1
North: Reservoir Road													
9	R2	12	0.0	12	0.0	0.039	16.2	LOS B	0.1	0.9	0.79	0.91	21.3
Approach		12	0.0	12	0.0	0.039	16.2	NA	0.1	0.9	0.79	0.91	21.3
West: Site Access													
10	L2	41	4.9	41	4.9	0.057	10.3	LOS A	0.2	1.5	0.54	0.93	16.1
11	T1	32	0.0	32	0.0	0.214	32.7	LOS C	0.7	5.1	0.89	1.01	6.6
Approach		73	2.7	73	2.7	0.214	20.1	LOS B	0.7	5.1	0.69	0.97	9.9
All Vehicles		1248	9.2	1248	9.2	0.318	1.5	NA	0.7	5.1	0.05	0.08	45.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 205v [05. Reservoir Road - Holbeche Road FU AM - Signal Conversion]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	418	10.3	418	10.3	0.691	29.3	LOS C	16.8	128.3	0.75	0.80	11.5
2	T1	695	6.9	695	6.9	0.470	22.4	LOS B	16.8	124.3	0.71	0.61	36.6
Approach		1113	8.2	1113	8.2	0.691	25.0	LOS B	16.8	128.3	0.72	0.68	29.7
North: Reservoir Road													
8	T1	649	6.3	649	6.3	0.303	12.5	LOS A	9.6	71.0	0.57	0.47	41.9
9	R2	141	2.8	141	2.8	0.366	19.7	LOS B	3.5	24.9	0.72	0.75	35.8
Approach		790	5.7	790	5.7	0.366	13.8	LOS A	9.6	71.0	0.60	0.52	40.6
West: Holbeche Road													
10	L2	101	9.9	101	9.9	0.130	26.3	LOS B	3.5	26.5	0.63	0.70	32.0
12	R2	336	14.0	336	14.0	0.698	47.0	LOS D	17.7	138.7	0.96	0.85	7.1
Approach		437	13.0	437	13.0	0.698	42.2	LOS C	17.7	138.7	0.88	0.81	13.5
All Vehicles		2340	8.2	2340	8.2	0.698	24.4	LOS B	17.7	138.7	0.71	0.65	29.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	45.2	LOS E	0.1	0.1	0.87	0.87
P3	North Full Crossing	50	45.2	LOS E	0.1	0.1	0.87	0.87
P4	West Full Crossing	50	25.4	LOS C	0.1	0.1	0.65	0.65
All Pedestrians		150	38.6	LOS D			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access FU AM]

Network: N102 [FU AM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	149	0.7	149	0.7	0.135	1.8	LOS A	0.6	4.1	0.32	0.31	32.9
Approach		149	0.7	149	0.7	0.135	1.8	LOS A	0.6	4.1	0.32	0.31	32.9
East: Holbeche Road													
4	L2	140	0.0	140	0.0	0.186	5.4	LOS A	0.0	0.0	0.00	0.24	48.8
5	T1	538	12.1	538	12.1	0.186	0.0	LOS A	0.0	0.0	0.00	0.09	57.6
Approach		678	9.6	678	9.6	0.186	1.1	NA	0.0	0.0	0.00	0.12	55.8
West: Holbeche Road													
11	T1	456	11.6	456	11.6	0.126	0.0	LOS A	0.1	0.8	0.00	0.00	60.0
Approach		456	11.6	456	11.6	0.126	0.0	NA	0.1	0.8	0.00	0.00	60.0
All Vehicles		1283	9.3	1283	9.3	0.186	0.8	NA	0.6	4.1	0.04	0.10	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.9 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 208 [08. Reservior Road - Great Western Hwy FU PM (Improved)]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Signalized inersection: Reservior Road - Great Western Hwy
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservior Road													
1	L2	180	21.1	180	21.1	0.112	5.8	LOS A	0.0	0.0	0.00	0.52	55.9
2	T1	736	5.3	736	5.3	0.912	70.2	LOS E	32.4	236.8	0.96	1.07	25.0
3	R2	186	4.8	186	4.8	0.763	72.6	LOS F	13.0	94.5	1.00	0.88	29.2
Approach		1102	7.8	1102	7.8	0.912	60.1	LOS E	32.4	236.8	0.81	0.95	30.0
East: Great Western Hw													
4	L2	594	2.5	594	2.5	0.609	29.3	LOS C	23.2	166.1	0.74	0.88	43.6
5	T1	1169	4.0	1169	4.0	0.899	70.7	LOS F	30.2	218.9	1.00	1.02	31.5
6	R2	475	3.2	475	3.2	0.697	65.7	LOS E	15.5	111.2	0.99	0.84	14.4
Approach		2238	3.4	2238	3.4	0.899	58.7	LOS E	30.2	218.9	0.93	0.95	31.6
North: Reservior Road													
7	L2	151	2.0	151	2.0	0.799	58.3	LOS E	26.9	195.8	0.99	0.91	21.4
8	T1	672	5.8	672	5.8	0.799	53.0	LOS D	27.2	200.2	0.99	0.91	31.7
9	R2	207	7.2	207	7.2	0.868	80.5	LOS F	15.6	116.1	1.00	0.97	25.1
Approach		1030	5.5	1030	5.5	0.868	59.3	LOS E	27.2	200.2	0.99	0.92	29.1
West: Great Western Hw													
10	L2	286	4.5	286	4.5	0.282	20.0	LOS B	9.0	65.2	0.53	0.74	48.5
11	T1	924	2.6	924	2.6	0.695	53.5	LOS D	19.4	138.6	0.98	0.83	37.0
12	R2	578	9.2	578	9.2	0.900	83.5	LOS F	22.9	172.6	1.00	0.98	33.3
Approach		1788	5.0	1788	5.0	0.900	57.8	LOS E	22.9	172.6	0.91	0.86	36.1
All Vehicles		6158	5.0	6158	5.0	0.912	58.8	LOS E	32.4	236.8	0.91	0.92	32.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	54.1	LOS E	0.2	0.2	0.88	0.88
P2	East Full Crossing	50	54.1	LOS E	0.2	0.2	0.88	0.88
P3	North Full Crossing	50	53.3	LOS E	0.2	0.2	0.87	0.87
P4	West Full Crossing	50	57.7	LOS E	0.2	0.2	0.91	0.91
All Pedestrians		200	54.8	LOS E			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [07c Seagull Reservoir Road - Penny Lane FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Reservoir Road													
7a	L1	1088	5.2	1088	5.2	0.306	4.5	LOS A	0.0	0.0	0.00	0.58	30.9
9a	R1	39	8.1	39	8.1	0.306	3.9	LOS A	0.0	0.0	0.00	0.58	31.0
Approach		1127	5.3	1127	5.3	0.306	4.5	NA	0.0	0.0	0.00	0.58	30.9
SouthWest: Reservoir Road													
30a	L1	1502	6.0	1502	6.0	0.409	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
Approach		1502	6.0	1502	6.0	0.409	3.8	LOS A	0.0	0.0	0.00	0.54	33.5
All Vehicles		2629	5.7	2629	5.7	0.409	4.1	NA	0.0	0.0	0.00	0.56	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207b [07b. Reservoir Road Penny Place Median Storage FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Reservoir Road and Penny Lane with Median Storage
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
North: Reservoir Road RT Storage													
8	T1	1034	5.2	1034	5.2	0.331	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1034	5.2	1034	5.2	0.331	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Reservoir Road RT Storage													
12	R2	45	4.4	45	4.4	0.110	10.0	LOS A	0.3	2.0	0.67	0.87	17.8
Approach		45	4.4	45	4.4	0.110	10.0	LOS A	0.3	2.0	0.67	0.87	17.8
All Vehicles		1079	5.2	1079	5.2	0.331	0.4	NA	0.3	2.0	0.03	0.04	55.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 207a [07a. Reservoir Road - Penny Lane FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Reservoir Road and Penny Lane
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	50	6.0	50	6.0	0.378	5.6	LOS A	0.0	0.0	0.00	0.04	56.4
2	T1	1365	6.1	1365	6.1	0.378	0.0	LOS A	0.0	0.0	0.00	0.02	58.9
Approach		1415	6.1	1415	6.1	0.378	0.2	NA	0.0	0.0	0.00	0.02	58.6
North: Reservoir Road													
9	R2	37	8.1	37	8.1	0.126	17.1	LOS B	0.4	3.3	0.81	0.92	37.5
Approach		37	8.1	37	8.1	0.126	17.1	NA	0.4	3.3	0.81	0.92	37.5
West: Penny Lane													
10	L2	59	3.4	59	3.4	0.083	12.1	LOS A	0.4	2.6	0.59	0.91	43.3
11	T1	45	4.4	45	4.4	0.287	36.5	LOS C	1.1	7.8	0.89	1.03	26.8
Approach		104	3.8	104	3.8	0.287	22.7	LOS B	1.1	7.8	0.72	0.97	34.2
All Vehicles		1556	6.0	1556	6.0	0.378	2.1	NA	1.1	7.8	0.07	0.11	52.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [06c Seagull Reservoir Road - Site Access FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Seagull
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Reservoir Road													
7a	L1	1098	4.3	1098	4.3	0.307	5.3	LOS A	0.0	0.0	0.00	0.59	33.3
9a	R1	43	0.0	43	0.0	0.307	4.7	LOS A	0.0	0.0	0.00	0.59	33.3
Approach		1141	4.2	1141	4.2	0.307	5.3	NA	0.0	0.0	0.00	0.59	33.3
SouthWest: Reservoir Road													
30a	L1	1473	6.2	1473	6.2	0.615	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
Approach		1473	6.2	1473	6.2	0.615	4.6	LOS A	0.0	0.0	0.00	0.55	34.7
All Vehicles		2614	5.3	2614	5.3	0.615	4.9	NA	0.0	0.0	0.00	0.57	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206b [06b. Reservoir Road Site Access Median Storage FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: RoadName													
8	T1	1043	4.3	1043	4.3	0.275	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		1043	4.3	1043	4.3	0.275	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: RoadName													
12	R2	68	0.0	68	0.0	0.130	7.3	LOS A	0.4	2.8	0.67	0.84	6.2
Approach		68	0.0	68	0.0	0.130	7.3	LOS A	0.4	2.8	0.67	0.84	6.2
All Vehicles		1111	4.1	1111	4.1	0.275	0.5	NA	0.4	2.8	0.04	0.05	55.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 206a [06a. Reservoir Road - Site Access FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Intersectoion: Reservoir Road and Site Access
Scenario: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	125	0.0	125	0.0	0.388	4.8	LOS A	0.0	0.0	0.00	0.10	28.6
2	T1	1325	6.6	1325	6.6	0.388	0.0	LOS A	0.0	0.0	0.00	0.05	55.7
Approach		1450	6.0	1450	6.0	0.388	0.4	NA	0.0	0.0	0.00	0.05	49.6
North: Reservoir Road													
9	R2	41	0.0	41	0.0	0.220	26.5	LOS B	0.7	5.0	0.90	0.97	15.0
Approach		41	0.0	41	0.0	0.220	26.5	NA	0.7	5.0	0.90	0.97	15.0
West: Site Access													
10	L2	74	0.0	74	0.0	0.106	10.5	LOS A	0.4	2.8	0.56	0.97	16.7
11	T1	68	0.0	68	0.0	0.835	130.3	LOS F	4.0	28.1	0.99	1.25	1.7
Approach		142	0.0	142	0.0	0.835	67.9	LOS E	4.0	28.1	0.77	1.10	3.3
All Vehicles		1633	5.3	1633	5.3	0.835	6.9	NA	4.0	28.1	0.09	0.17	25.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 205v [05. Reservoir Road - Holbeche Road FU PM - Signal Conversion]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Holbeche Road and Reservoir Road
Scenario: Existing PM Peak
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Reservoir Road													
1	L2	476	9.5	476	9.5	0.710	25.1	LOS B	17.8	134.3	0.69	0.79	13.0
2	T1	850	3.4	850	3.4	0.510	18.6	LOS B	19.8	142.6	0.66	0.58	39.2
Approach		1326	5.6	1326	5.6	0.710	21.0	LOS B	19.8	142.6	0.67	0.66	32.6
North: Reservoir Road													
8	T1	785	3.1	785	3.1	0.311	6.9	LOS A	8.9	64.2	0.46	0.38	48.3
9	R2	219	0.9	219	0.9	0.461	16.9	LOS B	5.5	38.7	0.75	0.79	38.0
Approach		1004	2.6	1004	2.6	0.461	9.1	LOS A	8.9	64.2	0.52	0.47	45.6
West: Holbeche Road													
10	L2	154	1.9	154	1.9	0.216	31.7	LOS C	6.1	43.1	0.72	0.74	29.7
12	R2	221	7.2	221	7.2	0.724	58.2	LOS E	12.8	95.4	1.00	0.87	5.9
Approach		375	5.1	375	5.1	0.724	47.3	LOS D	12.8	95.4	0.88	0.81	15.9
All Vehicles		2705	4.4	2705	4.4	0.724	20.2	LOS B	19.8	142.6	0.65	0.61	33.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	54.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	50	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	50	21.0	LOS C	0.1	0.1	0.59	0.59
All Pedestrians		150	43.2	LOS E			0.83	0.83

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 204 [04. Holbeche Road - Site Access FU PM]

Network: N102 [FU PM - Holbeche + Reservoir (Signals at Holbeche)]

Intersection: Holbeche Road and Site Access
Scenario: Existing Peak PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access													
1	L2	126	0.8	126	0.8	0.107	1.6	LOS A	0.5	3.3	0.25	0.28	33.8
Approach		126	0.8	126	0.8	0.107	1.6	LOS A	0.5	3.3	0.25	0.28	33.8
East: Holbeche Road													
4	L2	220	0.9	220	0.9	0.194	5.4	LOS A	0.0	0.0	0.00	0.36	46.4
5	T1	496	9.1	496	9.1	0.194	0.0	LOS A	0.0	0.0	0.00	0.10	57.4
Approach		716	6.6	716	6.6	0.194	1.7	NA	0.0	0.0	0.00	0.18	54.0
West: Holbeche Road													
11	T1	392	4.8	392	4.8	0.112	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		392	4.8	392	4.8	0.112	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1234	5.4	1234	5.4	0.194	1.1	NA	0.5	3.3	0.03	0.13	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 2.2 %
Number of Iterations: 10 (maximum specified: 10)

Appendix G

Traffic Count Survey to Check Warrants

R.O.A.R. DATA

Reliable, Original & Authentic Results

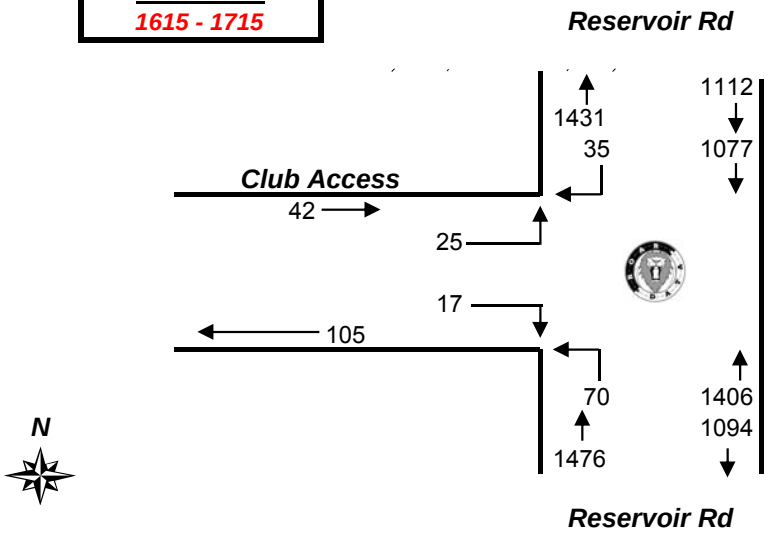
Ph.88196847, Mob.0418-239019

Client : Traffix
Job No/Name : 6680 BLACKTOWN Workers Club Access
Day/Date : Friday 19th January 2018

All Vehicles

	WEST		NORTH		SOUTH		
	Club Access		*Reservoir Rd*		*Reservoir Rd*		
Time Per	**L**	**R**	**R**	**T**	**L**	**T**	**TOTAL**
1600 - 1615	11	7	5	223	17	287	**550**
1615 - 1630	7	7	5	315	14	362	**710**
1630 - 1645	8	3	14	294	27	394	**740**
1645 - 1700	5	5	14	223	15	327	**589**
1700 - 1715	5	2	2	245	14	323	**591**
1715 - 1730	8	3	9	275	14	374	**683**
1730 - 1745	9	2	14	215	12	287	**539**
1745 - 1800	8	3	16	232	21	312	**592**
1800 - 1815	8	5	7	241	18	349	**628**
1815 - 1830	19	5	14	221	10	296	**565**
1830 - 1845	3	8	14	168	9	250	**452**
1845 - 1900	7	8	8	167	8	245	**443**
1900 - 1915	2	2	5	169	14	230	**422**
1915 - 1930	6	5	7	158	10	221	**407**
1930 - 1945	25	12	5	140	12	194	**388**
1945 - 2000	25	15	9	149	7	194	**399**
Period End	**156**	**92**	**148**	**3435**	**222**	**4645**	**8698**

PEAK HOUR
1615 - 1715



	WEST		NORTH		SOUTH		
	Club Access		*Reservoir Rd*		*Reservoir Rd*		
Peak Per	**L**	**R**	**R**	**T**	**L**	**T**	**TOTAL**
1600 - 1700	31	22	38	1055	73	1370	**2589**
1615 - 1715	25	17	35	1077	70	1406	**2630**
1630 - 1730	26	13	39	1037	70	1418	**2603**
1645 - 1745	27	12	39	958	55	1311	**2402**
1700 - 1800	30	10	41	967	61	1296	**2405**
1715 - 1815	33	13	46	963	65	1322	**2442**
1730 - 1830	44	15	51	909	61	1244	**2324**
1745 - 1845	38	21	51	862	58	1207	**2237**
1800 - 1900	37	26	43	797	45	1140	**2088**
1815 - 1915	31	23	41	725	41	1021	**1882**
1830 - 1930	18	23	34	662	41	946	**1724**
1845 - 1945	40	27	25	634	44	890	**1660**
1900 - 2000	58	34	26	616	43	839	**1616**

PEAK HR	**25**	**17**	**35**	**1077**	**70**	**1406**	**2630**

TOTAL VOLUMES FOR COUNT PERIODS