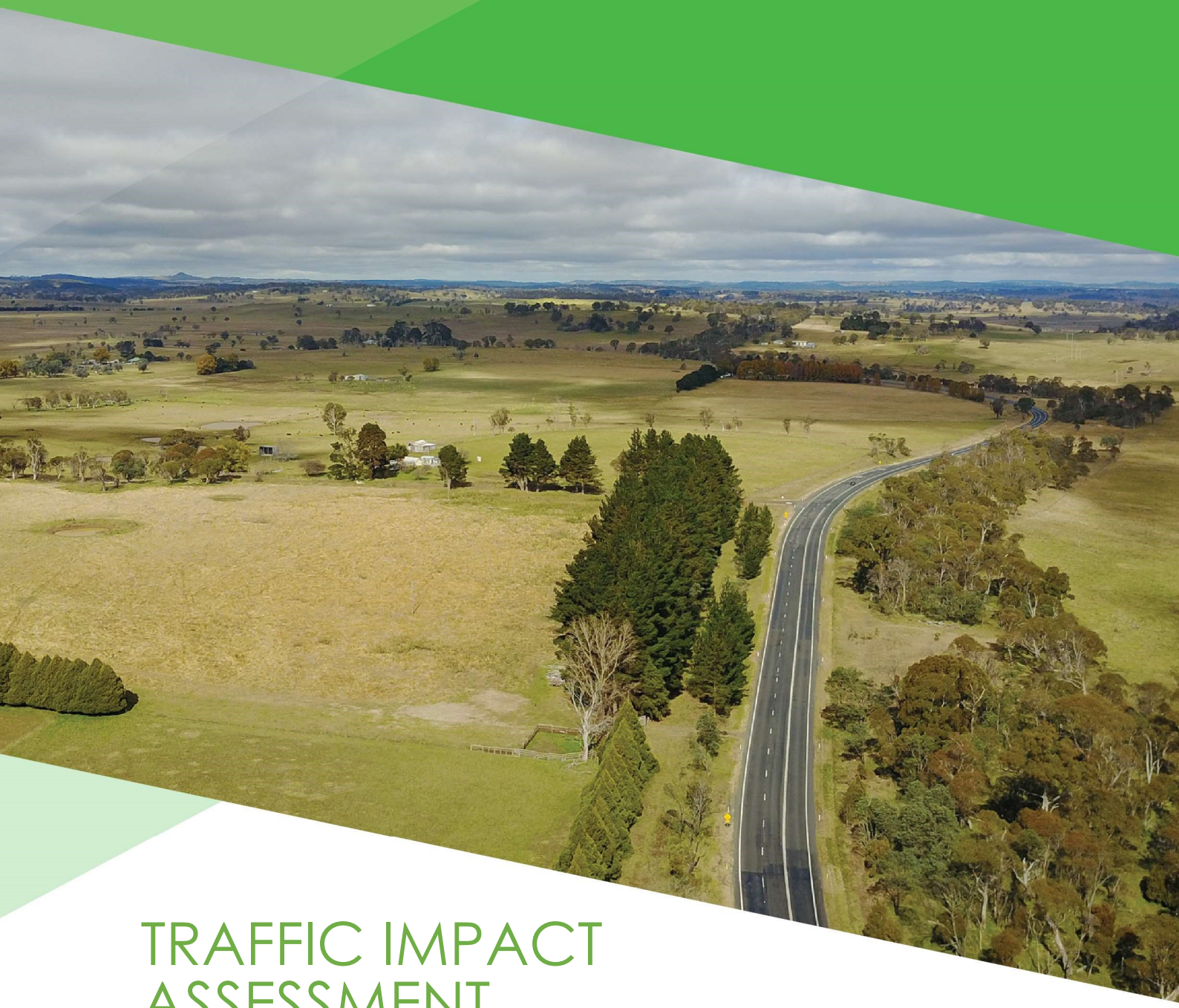

TRAFFIC IMPACT ASSESSMENT

Cricket NSW Centre of Excellence
Sydney Olympic Park

Reference: 19.063r02v04
Date: 1 November 2019

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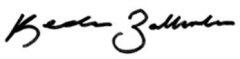
v04	01/11/2019	Kedar Ballurkar	Kedar Ballurkar	

CONTENTS

Appendices

1. INTRODUCTION

TRAFFIX has been commissioned by Cox Architecture to undertake a Traffic Impact Assessment to accompany a State Significant Development (SSD) Application for the proposed Cricket NSW Centre of Excellence at Wilson Park in Sydney Olympic Park. Approval is sought for the construction of several integrated facilities including:

- Two cricket ovals;
- 86 Outdoor and indoor practice nets;
- A training and administration building; and
- A community building with an ancillary café.

The subject site is located within the City of Parramatta local government area, however is administered by Sydney Olympic Park Authority (SOPA). The proposed development has been assessed under SOPA's planning policies and with reference to the Planning Secretary's Environmental Assessment Requirements (SEARS) issued for the SSD Application.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects, prepared separately by Ethos Urban. The proposal will generate more than 50 vehicle trips per hour and will thus require referral to the Roads and Maritime Services under the provisions of State Environmental Planning Policy (Infrastructure) 2007.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Outlines a preliminary construction plan
- Section 9: Outlines a transport management plan
- Presents the overall study conclusions

2. LOCATION AND SITE

The subject development site comprises of Wilson Park, located on Newington Road in Silverwater. It lies immediately east of Silverwater Road and in a regional context, is approximately 15 kilometres west of the Sydney Central Business District and situated on the northwest extent of Sydney Olympic Park.

The site has a generally square configuration with a total area of 121,082m^2 (with the subject development area comprising of a leased area with a site area of 65,767m^2). It is contained by:

- A 294 metre boundary to east, fronting Clyde Street, Silverwater Road as well as a shared roadway, which leads underneath towards Silverwater Park further west.
- A 354 metre boundary to the north fronting the Parramatta River
- A 413 metre boundary to the east fronting parkland and the Silverwater Correctional Complex.
- A 374 metre boundary to the south shared with an industrial complex and fronting Newington Road.

The site comprises of parklands, most notably, the Wilson Park Stadium, a football field with a grandstand capable of accommodating 450 spectators. A sports field directly to the south has historically been used with multiple configurations, with up to two football fields being formed.

The site is served by the following access points and parking areas:

- Clyde Street to the southwest of the site, via an internal roadway extending along the western boundary. This roadway leads to an at-grade parking area accommodating approximately 90 parking spaces within site and 89 unrestricted parking spaces external to the site (inclusive of a parking area accessed further west of a Silverwater Road underpass). The roadway also accommodates a boat ramp onto the Parramatta River, with 23 of the above spaces suited for trailer parking.
- Newington Road to the southeast of the site, where the road terminates. A private roadway extends into the site serving 55 at-grade parking spaces.

- An internal roadway connecting Clyde Street with Newington Road. It accommodates one lane of traffic in each direction, both of which have been designated as bus lanes. A cycle path is also provided adjacent to the roadway.

It is also noteworthy that the internal roadway is prohibited for private motor vehicle traffic as stipulated in SOPA's major event guidelines:

> *"The 'Holker Street Busway' should not be used for private motor vehicle traffic during Major Event Mode periods. There should be no Development or Master Plan direction relying on the opening of the 'Holker Street Busway' in support of a particular level or type of site Development or capacity."*

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

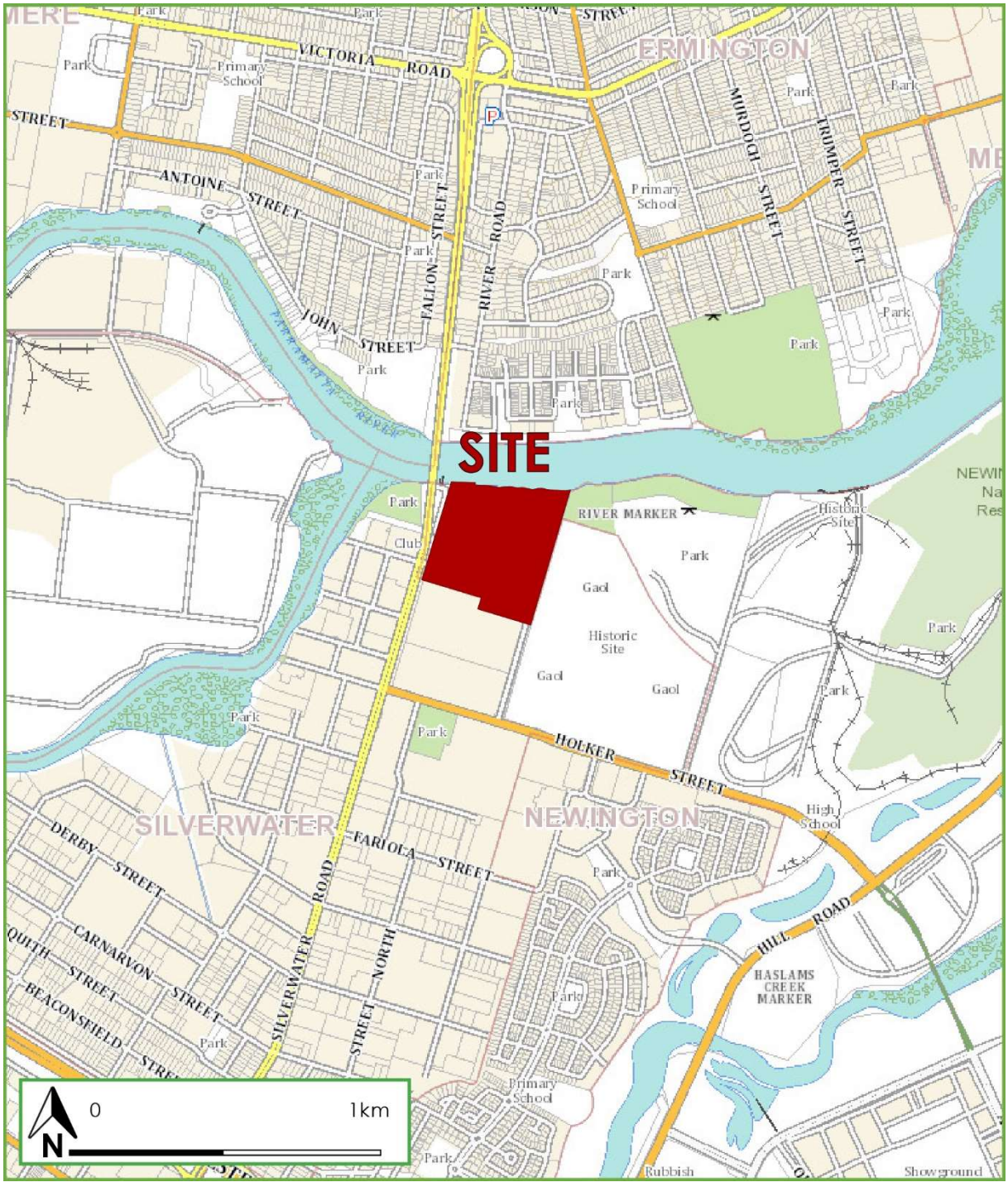


Figure 1: Location Plan

Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

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

- Silverwater Road: an RMS Main Road (MR190) that runs in a north-south direction between Kissing Point Road in the north and the M4 Motorway in the south. It has a posted speed limit of 80km/h north of its intersection with Clyde Street and a posted speed limit of 70km/h south of its intersection with Clyde Street. Silverwater Road accommodates two lanes of traffic in each direction north of its intersection with Clyde Street and three lanes of traffic in each direction south of its intersection with Clyde Street. Silverwater Road is constructed with a divided carriageway and parking is not permitted on either kerbside.
- Holker Street: a local collector road that runs in an east-west direction between Hill Road in the east and a cul-de-sac which is formed in the west. It has a posted speed limit of 50km/h west of its intersection with Silverwater Road and a posted speed limit of 60km/h east of its intersection with Silverwater Road. Holker Street provides a single lane of traffic in each direction west of its intersection with Silverwater Road and two lanes of traffic in each direction east of its intersection with Silverwater Road within an undivided carriageway. East of Silverwater Road, kerbside parking is not permitted on either kerbside of Holker Street.
- Newington Road: a local road that runs in a north-south direction between Holker Street in the south and the Holker Street Busway in the north . Newington Road is subject to a 50km/h speed limit and accommodates a single lane of traffic in each direction within an undivided carriageway. Kerbside parking is generally permitted along both kerbsides of Newington Road.
- Clyde Street: a local road that generally runs in an east-west direction between Picken Street in the west and the site access roadway to the east. The eastern terminal also intersects with the Holker Street Busway which permits access to buses,

bicycles and authorized vehicles. Clyde Street is subject to a 50 km/h speed limit and accommodates a single lane of traffic in each direction within an undivided carriageway. Unrestricted kerbside parking is generally permitted west of its intersection with Silverwater Road.

It is evident that the site benefits from direct access to the arterial road network via Clyde Street, with alternate access provided from Newington Road via Holker Street.

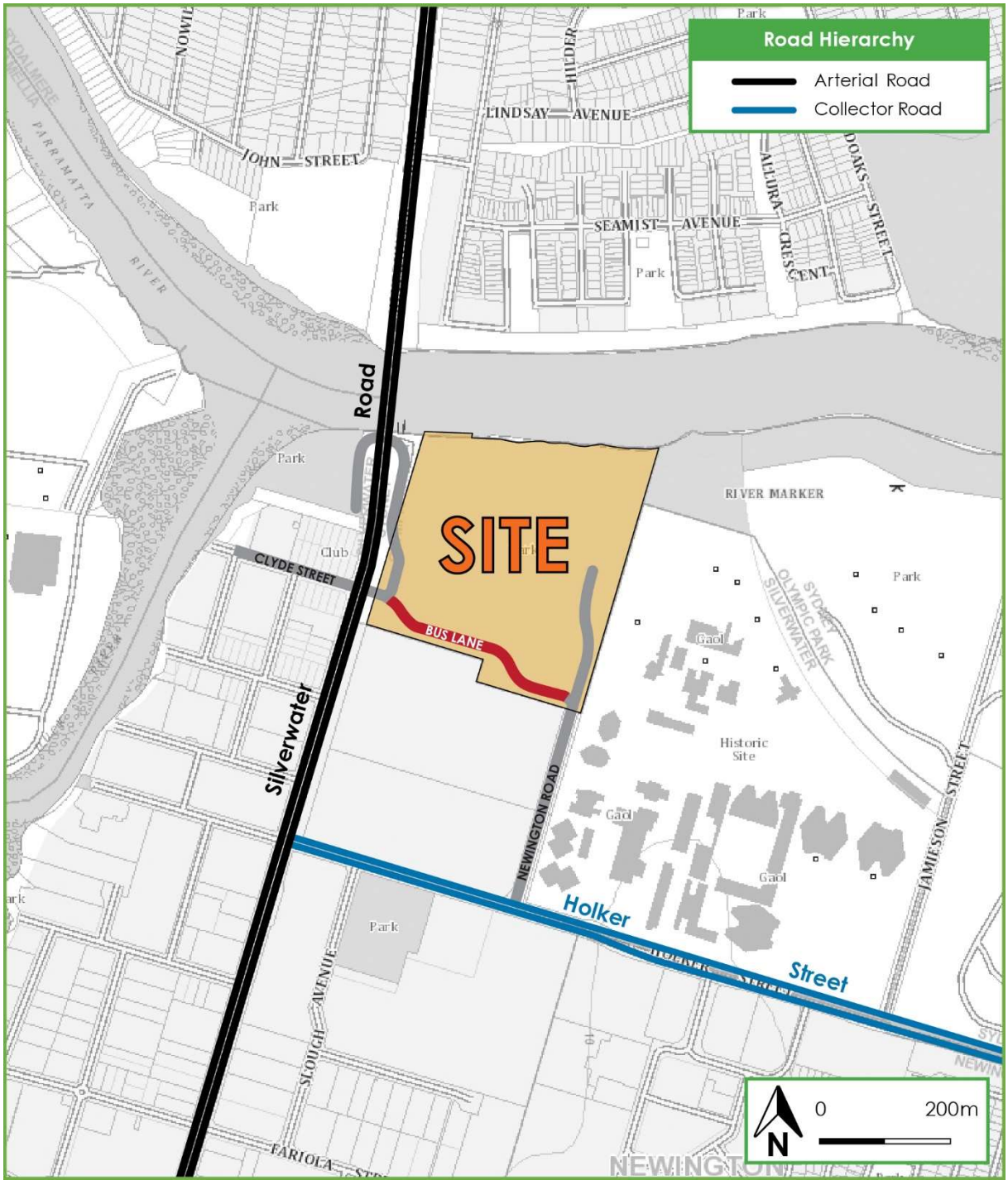


Figure 3: Road Hierarchy

3.2 Key Intersections

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

Silverwater Road and Clyde Street

Figure 4: Intersection of Silverwater Road and Clyde Street

It can be seen from **Figure 4** that Silverwater Road and Clyde Street forms a four-legged intersection with the north, south and eastern legs signalised. The north approach of Silverwater Road accommodates three approach lanes with an auxiliary right turn lane and 110 metre slip lane into Clyde Street while the south approach of Silverwater Road accommodates three approach lanes and a 70 metre right turn lane.

The east approach of Clyde Street accommodates two lanes, with the kerbside lane permitting all movements (left, straight and right) and the central lane permitting right turns only. Conversely the west approach of Clyde Street contains one lane only which is subject to a Stop control and is restricted to left turns only.

Signalised crossings are provided on Clyde Street and Silverwater Road, whilst a marked pedestrian crossing has been painted on the slip lane on the north approach of Silverwater Road.

Holker Street and Newington Road

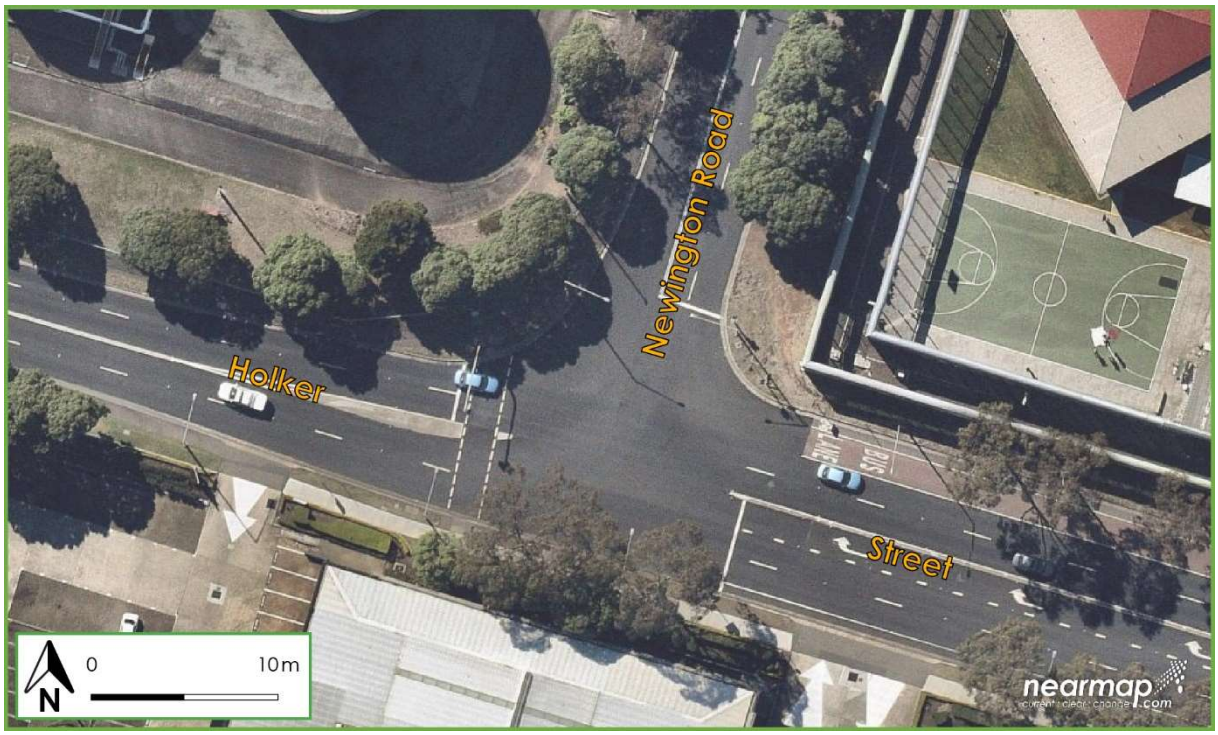


Figure 5: Intersection of Holker Street and Newington Road

It can be seen in **Figure 5** that Holker Street and Newington Road forms a signalised T-intersection with Holker Street. The west approach of Holker Street accommodates two lanes of traffic whilst the east approach provides two through lanes and an auxiliary 160m right turn lane. The north approach of Newington Street provides two lanes, with the kerbside lane extending 25 metres courtesy of a No Stopping restriction. A signalised crossing is provided on the west approach on Holker Street.

3.3 Public Transport

The public transport network presently operating in the locality is illustrated in **Figure 6**. It is evident that the site is located within 400 metres walking distance of bus stops on Silverwater Road and the Holker Street busways, which are serviced by Route 525 and Route 544. Notably, Route 525 provides a direct connection to Sydney Olympic Park Station with services also running on weekends.

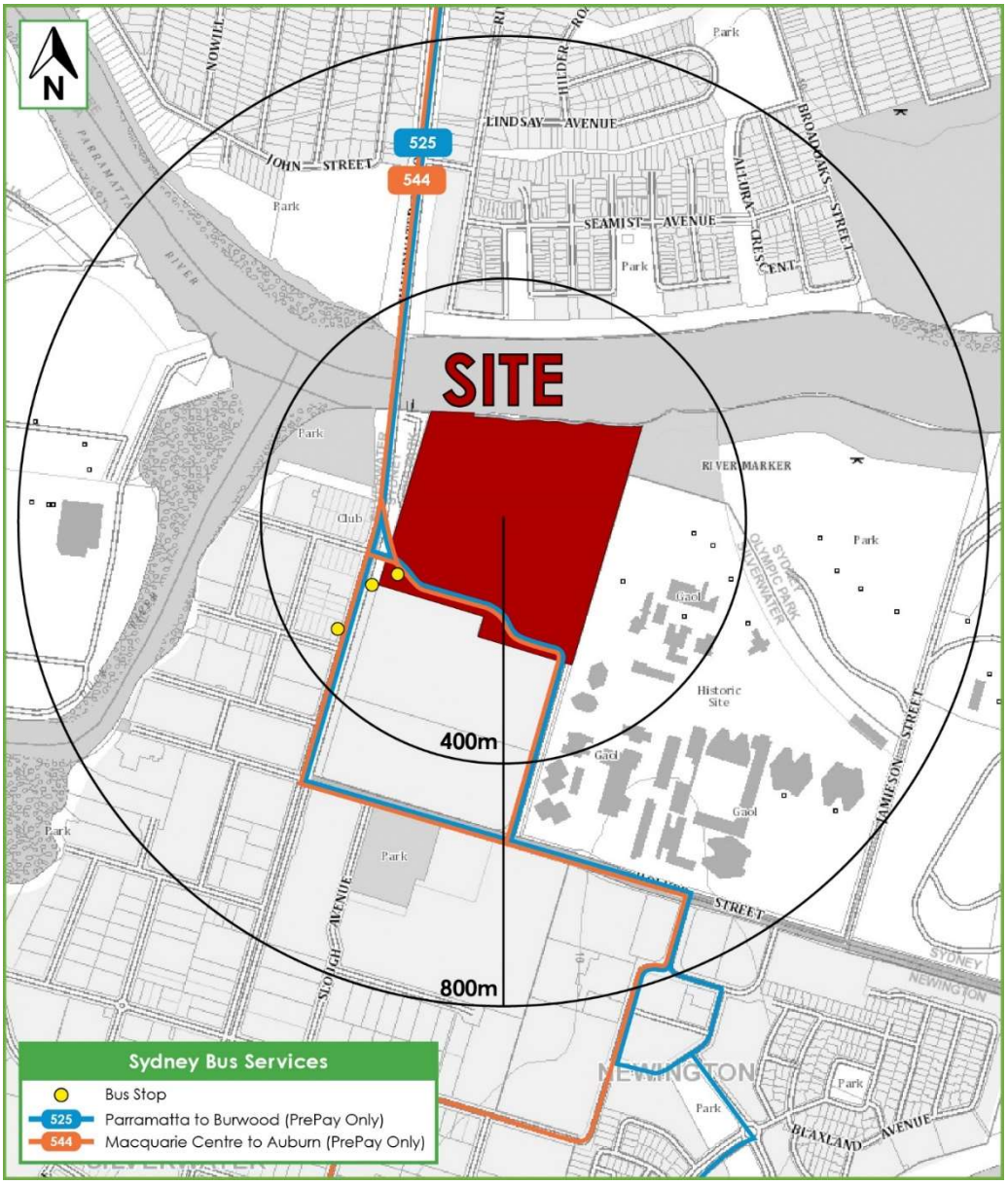


Figure 6: Public Transport

3.4 Existing Intersection Performance

In order to assess the road network performance in the locality, counts were undertaken in September 2019 for the intersection of Silverwater Road / Clyde Street and the intersection of Holker Street / Newington Road. Traffic volumes for three separate time periods were captured:

- Tuesday 7:00am to 9:00am, representative of the weekday AM peak period;
- Tuesday 4:00pm to 6:00pm, representative of the weekday PM peak period; and
- Saturday 11:00am to 11:00pm, representative of the weekend peak period.

The traffic volumes in these surveys formed the base case volumes for software modelling undertaken to assess intersection performance characteristics under existing traffic conditions. The SIDRA Intersection 8 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: RMS Intersection Performance Indicators

Level of Service (LoS)	Average Delay per Vehicle (sec/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 is provided below in **Table 2**. Reference should also be made to the SIDRA outputs provided in **Appendix B** which provide detailed results for individual lanes and approaches.

Table 2: Existing Intersection Performance

Intersection	Control	Scenario	Period	Degree of Saturation	Average Delay (s)	Level of Service
Silverwater Road and Clyde Street	Signalised	Existing	AM	0.841	18.8	B
			PM	1.069	67.2	E
			Sat	0.780	15.1	B
Holker Street and Newington Road	Signalised	Existing	AM	0.436	7.8	A
			PM	0.462	9.7	A
			Sat	0.413	6.7	A

It is evident that the intersection of Silverwater Road and Clyde Street performs well during the weekday AM peak period, as well as the weekend peak period, achieving a Level of Service of B. This indicates that the intersection has only moderate delays and has spare capacity. During the weekday PM peak period, the intersection of Silverwater Road and Clyde Street performs at a Level of Service of E, and is therefore operating at capacity under the RMS guideline definitions. The result is attributed to the intersection reaching a high degree of saturation due to through movements on Silverwater Road, though an examination of the outputs reveals minimal traffic volumes on Clyde Street.

This assessment will be used as a base case for comparing the traffic impacts of the proposed development under future conditions, for various scenarios. It is also relevant to note that Wilson Park is not expected to be used during weekdays and therefore there would be no site traffic generation that could be discounted under existing conditions. While sports activities occur on Wilson Park on weekends, these are seasonal and therefore the existing traffic generation during this period is also assumed to be zero.

4. DESCRIPTION OF PROPOSED DEVELOPMENT

4.1 Facilities

A detailed description of the proposed development is provided in the Statement of Environmental Effects prepared separately. In summary, the State Significant Development Application seeks approval for the construction of several facilities which will comprise the Cricket NSW Centre of Excellence, including:

- A two storey cricket centre, including an internal atrium, gymnasium, community facilities, sports science and sports medicine facilities and business offices. This assessment relies on the following breakdown of floor space:
  - 2,240m^2 gross floor area of administration space;
  - 388m^2 gross floor area of function space; and
  - 20m^2 gross floor area ancillary café.
- An International Cricket Council compliant oval 136m long x 144m wide (16,040m2)(Oval 1) and associated seating;
- A second oval (Oval 2 or "Junior Oval") that complies with the Cricket Australia community guidelines for community club cricket (with a minimum diameter of 100m (6365m^2);
- Outdoor practice nets, 71 wickets with a minimum of 30m run ups;
- A double height (10.7m) indoor training facility with 15 wickets;
- A single storey shed for machinery and storage;
- Associated car parking, landscaping and public domain works; and
- Extension and augmentation of services and infrastructure as required.

4.2 Parking

The development will provide the following formal parking facilities on-site:

- A total of 221 car parking spaces on-site, comprising of:
  - 111 parking spaces on the western side of the site, accessed from Clyde Street; and
  - 110 parking spaces on the eastern side of the site, accessed from Newington Road.
- A 32m shared bus parking and loading zone on the western side of the site, capable of accommodating two (2) 14.5m coaches.
- Nine (9) service parking spaces for maintenance vehicles on the eastern side of the site.

During extraordinary events, the Junior Oval will be used to provide for informal parking to provide additional capacity for approximately 250 vehicles.

4.3 Operational Information

The applicant has confirmed that the Cricket NSW Centre of Excellence will be regularly used by the following groups:

- A total of 170 administration and support staff employed on-site by Cricket NSW.
- A maximum of two professional cricket teams to train at the facility during any season, as detailed in the season diary in **Table 3**. Professional teams will generally train during the day (i.e. 9am to 5pm), although players may undergo individual activities before or after these hours.

Table 3: Professional Players – Season Diary

Team	Season	Number of Players
Blues	June to October 1	32
Breakers	June to October 1	17
WBB x 2	Oct to Dec 10	2 x 20
BBL x 2	Dec 10 to Feb 10	2 x 20

- Based on information from Cricket NSW's existing training facility at the Sydney Cricket Ground in Moore Park, non-professional cricket teams will continue use outdoor and indoor cricket nets with the following frequencies:

- Grade and school cricket teams: 28 sessions per week; and
- Pathway (junior representatives) teams: 10 sessions per week.

For the purposes of assessment, each non-professional team has been assumed to comprise of 20 players (including coach). This is based on existing data provided for 11 Pathway (junior representative teams) which indicated an average squad of 19 players.

- Fan days associated with professional cricket teams, accommodating up to 1,500 people, which are expected to occur once or twice per year.
- Cricket matches on the ICC Oval, expected to draw a maximum of 1,000 patrons. It is understood these matches are for 'non fan-facing' content with Cricket NSW having a tiered system of venues that have priority to host larger games.
- Community matches, either on the ICC Oval or Junior Oval, expected to accommodate approximately 50 patrons.
- Stakeholder meetings, expected to draw up to 150 people.
- School Gala Days, where up to 600 children will arrive from up to 20 buses.
- Various other Community Cricket activities, including:
  - Coaches workshop and courses;
  - Umpiring workshops and courses;
  - Volunteer workshops and courses;
  - Community engagement forums;
  - School ambassador days;
  - T20 Blast centre;
  - Social Modified Cricket (lunch time, afternoon, evening); and
  - Holiday clinics and programs; and
  - Dinners and events.

  These Community Cricket activities are not associated with core business activities and would be hosted primarily during evenings.

5. PARKING REQUIREMENTS

5.1 General Controls

The site is situated within Sydney Olympic Park and is subject to *State Environmental Planning Policy (State Significant Precincts) 2005*. In turn, this policy authorises the Sydney Olympic Park Authority (SOPA) to administer a master plan to determine planning controls, including parking requirements for new development.

The latest revision of SOPA's *Master Plan 2030* was released in 2018 and parking controls are stipulated in Section 4.7. The most applicable land-use category is considered to be a 'recreational facility' which has the following maximum parking requirement:

- 3 spaces per 100m^2 gross floor area; and
- 1 space per 2 staff.

It is noteworthy that the above rates are maximum, which is consistent with the general planning principles outlined in the master plan, most notably the need to manage parking provision to promote alternative forms of transport. It is considered that in view of the moderate number of existing public transport serving the site (refer to Section 3.3), provision of the maximum staff parking rate of 1 space per 2 staff is appropriate, which is consistent with the assumptions for unrestrained parking situations in the RMS *Guide to Traffic Generating Developments* (52% car drivers arising from a 0.62 mode split and car occupancy of 1.19).

Notwithstanding, it is interpreted that the floor space based parking rate (3 spaces per 100m^2 gross floor area) is intended for a recreational facility that is open to public use. In this regard, a first principles approach derived from the operational details for the centre is considered more appropriate for establishing parking demands, given that training and match day facilities will be used by and scheduled for approved cricket teams only.

Noting the various functions of the Cricket NSW Centre for Excellence, the proposal has been assessed for three scenarios representative of typical and extraordinary peak conditions:

- Normal Weekday Demands;
- Normal Weekend Peak Demands; and
- Occasional Special Event Peak Demands.

5.2 Weekday Parking Demands

The weekday scenario relates to the 'typical' demands on a normal 'business' day and is focussed on the staff/administrative functions with normal training, which to a degree is ancillary, with sharing of some facilities.

On a typical day, the site is estimated to accommodate the following number of people:

- Up to 47 professional players where two teams will be training concurrently in a season. A car occupancy ratio of 1.3 players per car has been adopted.
- 170 administrative and support staff, subject to a maximum parking rate of 1 space per 2 staff.
- Training sessions for non-professional teams (20 players), which during peak times is assumed to comprise no more than six (6) concurrent sessions, comprising of:
  - 2 x grade cricket teams – a car occupancy of 1.5 players has been adopted.
  - 2 x pathway (junior representatives) teams – a car occupancy of 1.5 players has been adopted.
  - 2 x school teams – school teams are expected to arrive by bus.

The above numbers give rise to a cumulative demand for 175 parking spaces however it is emphasised that these activities would be unlikely to coincide, with most non-professional training sessions occurring during the evening after most employees (and professional players) leaving the site.

The on-site capacity for 221 parking spaces will comfortably accommodate this core weekday capacity, with a spare capacity of 46 spaces available at anytime. Accordingly, a Community Cricket event with 70 external patrons could be accommodated with no reliance on parking, when assuming a car occupancy ratio of 1.5 persons per car.

Notwithstanding, it is emphasised that Community Cricket events are extra-curricular and not associated with core business activities. In this regard, the majority of Community Cricket events would occur during evenings, when again most employees would have left the site. As such, this would allow additional capacity for parking where events exceed 70 external patrons.

5.3 Normal Weekend Peak Parking Demands

It is expected that normal weekend conditions will relate mostly to junior representative cricket matches. Training by professional and other junior representative teams may also take place concurrently, although there would be a significantly reduced amount of administrative and support staff on-site.

It is understood that only one junior representative game would take place at the site over the course of the day (as opposed to a rotating, limited overs competition), and accordingly, it is estimated that a typical weekend match scenario would comprise of:

- 90 people associated with grade or pathway cricket matches, consisting of 40 players/coaching staff and 50-60 spectators. A car occupancy ratio of 2.0 people (players and spectators) per car has been adopted.
- 47 professional players training (two teams). A car occupancy ratio of 1.3 players per car has been adopted.
- 40 Grade or Pathway players training (two teams) A car occupancy ratio of 1.5 people (players) per car has been adopted.; and
- 20 administrative and support staff, subject to a maximum parking rate of 1 space per 2 staff.

It is estimated that a maximum demand for some 118 parking spaces would arise from the above activities. This would be significantly lower if training sessions were to be staggered for all teams, with no temporal overlaps.

It is thus anticipated that all parking demands from normal peak weekend conditions can be accommodated within the overall on-site parking provision of 221 parking spaces. It is emphasised that this assessment assumes no uptake of public transport, and that any initiatives to improve uptake of existing services or provide shuttle bus services to regional transport destinations will result in a reduction in overall demand for parking.

5.4 Special Events

Special events will relate to either fan event days or matches hosted at the ICC compliant cricket field, which may draw a peak attendance of 1,500 people on-site. In this regard, it would be expected that all activity on-site during these days would be related to the event (e.g. staff to manage patrons and players to interact with fans).

Prior to occupation of the centre, a Transport Management Plan will be drafted to manage peak parking demands on-site, which would include facilitating overflow parking on-site. Notwithstanding, the following assumptions have been made for estimating parking demands:

- An 80% mode share of people arriving by car, either as driver or passenger.
- A car occupancy ratio of 2.5 patrons per car, noting these are family orientated and social events.

On this basis, it is expected that a parking demand in the order of 500 vehicles would arise. Additional capacity can be provided by the following means:

- 221 parking spaces which are formally provided on-site;
- 90 parking spaces on Council land immediately to the west of the site; and
- 250 parking spaces which can be informally accommodated on the Junior Oval.

In this regard, there would be no reliance on any on-street parking or any parking facilities provided by SOPA (for other events or parklands). Indeed, the existing 89 parking spaces constructed by Council was built primarily to serve existing sports activities at Wilson Park and in this regard by allowing for overflow parking, the proposal can be managed to ensure no additional parking impacts will occur over approved conditions.

Suitable public transport strategies should in any case be pursued to deliver a more sustainable planning outcome, in line with best practice. This would be addressed in a Green Travel Plan prepared prior to occupation of the centre, which is to promote event specific measures to increase uptake of public transport services. This may include bus services to/from Olympic Park Station as well ensuring that sufficient pick-up and set-down areas are provided (e.g. for taxi and ride share services).

5.5 Summary of Parking Demands

A summary of parking demands and capacities for all assessed scenarios is provided in **Table 4**.

Table 4: Parking Summary

Scenario	Parking Demand	Parking Capacity	Spare Capacity
Weekday	175 spaces	221 spaces	46*
Weekend	118 spaces	221 spaces	96
Special Event	500 spaces	550 spaces**	50

* Spare capacity intended to accommodate demands for occasional Community Cricket Events.

** Parking capacity increased to include adjacent Council car park (89) spaces and junior oval (~250 spaces).

It is concluded that the site will be capable of accommodating all parking demands under normal weekday and weekend conditions, where additional capacity can be drawn upon for special event conditions without reliance on on-street parking or other parking facilities provided within Sydney Olympic Park.

5.6 Other Parking Needs

5.6.1 Accessible Parking

The SOPA Access Guidelines stipulate that accessible parking should be provided in accordance with Table D3.5 of the Building Code of Australia (BCA) or not less than 2%, whichever is greater. In turn, for a Class 9b building (assembly building), the BCA requires 1 space for every 50 car parking spaces or part thereof to be provided as an accessible parking space. The proposed development has been assessed to generate a maximum demand for 148 parking spaces under normal weekday and weekend conditions and thus would nominally require three (3) spaces to be designed for accessible use. In response provision for six (6) accessible parking spaces has been made, which are designed in accordance with AS2890.6 (2009).

5.6.2 Bus Parking

A 32 metre bus zone is provided at the western car park which will facilitate all bus needs for the development. At anytime, this can accommodate two (2) 14.5m coaches which would be the largest bus type expected (larger than a standard 12.5m length bus). This provision will enable bus services to be chartered by Cricket NSW for both junior representative players and during event days which will reduce private car dependency.

5.6.3 Bicycle Parking

Section 4.7 of the SOPA Master Plan 2030 does not stipulate bicycle parking rates for recreational facilities. Notwithstanding, the proposed development will provide 20 bicycle parking spaces with end of trip facilities.

5.6.4 Service Vehicle Parking

The 32 metre bus zone is also expected to accommodate all heavy vehicle servicing demands including deliveries and waste collection, which are not expected to occur during event periods when buses will be relied upon. It is also noteworthy that provision for nine (9) service spaces have been made for vehicles up to the size of a B99 vehicle, which will account for the maintenance fleet operated by Cricket NSW.

6. TRAFFIC IMPACTS

6.1 Weekday

During typical weekdays, the Cricket NSW Centre of Excellence will accommodate several different activities simultaneously and thus will draw a variety of users at any time, including employees, professional teams and non-professional teams. Accordingly, the trip rates and assumptions for each user is provided below.

- Employees:

  a total of 170 staff will be employed by Cricket NSW including for both administration and player support roles. Whilst RMS guidelines publish trip rates for office uses, this is based on a floor space rate and is not considered applicable to the proposed development, due to the lower employee density that arises from the centre having a significant amount of floor space reserved for activities.

  Accordingly, on a first principles basis it is assumed that the trip generation during a typical morning and evening peak hour is equivalent to 50% of the 85 allocated parking spaces per hour.

  During the AM peak period, an 80:20 split of arrivals/departures has been adopted, which has been reversed to 20:80 during the PM peak period.

  It has also been assumed that 80% of staff will park at the western car park accessed from Clyde Street and the remaining 20% parking at the eastern car park accessed from Newington Road.

- Professional Players:

  Similar to Cricket NSW employees, it is assumed that professional players will arrive during the morning and depart in the evening, and thus trip generation will be similar to journey to work trips. As some professional players will have their own individual training program it is assumed for assessment that the AM and PM peak trip generation rates are equivalent to 80% of the number of players per hour, after accounting for a 1.3 car occupancy ratio (as adopted for the parking assessment).

It is assumed that 100% of the trip generation during the AM peak period will be arrivals, whilst 100% of the trip generation during the PM peak period will be departures.

It has also been assumed that 85% of professional players will park at the western car park accessed from Clyde Street and the remaining 15% parking at the eastern car park accessed from Newington Road.

- School Teams:

It is assumed that two (2) school teams, each comprising of 20 players, will train during weekday afternoons. It would be expected that players will be transported by buses to and from the site (where parents would then pick up players from the school).

School teams are also anticipated to train earlier in the afternoon, arriving between 3:00pm – 4:00pm. Accordingly, after a two hour session, traffic movements during the critical peak hour from 5:00pm to 6:00pm will comprise of two (2) bus movements exiting the site from Clyde Street.

- Grade teams:

It is assumed that two (2) grade teams, each comprising of 20 players will train during the afternoon, arriving between 4:00pm and 5:00pm. These sessions are understood to be longer in duration, between 3-4 hours and thus would finish after the network peak period between 4:00pm to 6:00pm.

It is assumed that 50% of grade players will park in the western car park, accessed from Clyde Street and the remaining 50% park in the eastern car park, accessed from Newington Road.

- Pathway teams:

It is assumed that two (2) pathways (junior representative) teams will train in the afternoon, arriving between 5:00pm and 6:00pm. These sessions are understood to be two hours in duration, with many parents tending to stay on-site based on experience from the existing training facility at the Sydney Cricket Ground. Accordingly, it is assumed that 50% of parents would leave the site after dropping off players and 50% would remain on-site.

It is assumed that 20% of Pathway players will arrive by public transport and 80% players arrive by car with a car occupancy ratio of 1.5 players per car.

It is assumed that 50% of Pathway players will be dropped off in the western car park, accessed from Clyde Street and the remaining 50% dropped off in the eastern car park accessed from Newington Road.

These trip rates and assumptions have been applied for each user in **Table 5**, in order to estimate the maximum trip generation of the proposed development during weekdays.

Table 5: Trip Generation – Typical Weekday

Driver	No.	Car Occupancy	Arrival Time	Departure Time	AM Peak Trips	PM Peak Trips	Car Park
Administration and Support Employees							
Employees	170	-	8:00am - 9:00am	5:00pm - 6:00pm	43 (34 in, 9 out)	43 (9 in, 34 out)	85% Clyde Street 15% Newington Road
Professional Teams							
Professional Players	(80%) 47	1.3 players per car	8:00am - 9:00am	5:00pm - 6:00pm	29 (29 in, 0 out)	29 (0 in, 29 out)	85% Clyde Street 15% Newington Road
School Teams							
Players	40	(arrive by bus)	3:00pm - 4:00pm	5:00pm - 6:00pm	0 (0 in, 0 out)	2 (0 in, 2 out) (buses)	100% Clyde Street
Grade Teams							
Players	40	1.5 players per car (100% by car)	4:00pm - 5:00pm	8:00pm - 9:00pm	0 (0 in, 0 out)	14 (14 in, 0 out)	50% Clyde Street 50% Newington Road
Pathways (Junior Representative) Teams							
Players	(80%) 40	1.5 players per car (80% by car, 50% parking)	5:00pm - 6:00pm	7:00pm - 8:00pm	0 (0 in, 0 out)	32 (21 in, 11 out)	50% Clyde Street 50% Newington Road

Based on the above, the non-cumulative peak hours occurs between 8:00am–9:00am and 5:00pm–6:00pm. Accordingly, the peak period traffic generation during typical weekdays is estimated to be:

- 72 vehicle trips per hour during the AM peak period: (63 in and 9 out); and
- 106 vehicle trips per hour during the PM peak period: (30 in and 76 out).

Notwithstanding, the proposed development will occasionally host a Community Cricket event that may draw external patrons. It is understood this will typically occur during evenings as they are non-core business related. Accordingly, for the purposes of assessment, a Community Cricket event with 100 external patrons has been assumed to start during the 5:00pm – 6:00pm evening peak hour. The traffic volumes for a worst case weekday scenario are therefore summarised in **Table 6**.

Table 6: Trip Generation – Worst Case Weekday

Driver	No.	Car Occupancy	Arrival Time	Departure Time	AM Peak Trips	PM Peak Trips	Car Park
Administration and Support Employees							
Employees	170	-	8:00am - 9:00am	5:00pm - 6:00pm	43 (34 in, 9 out)	43 (9 in, 34 out)	85% Clyde Street 15% Newington Road
Professional Teams							
Professional Players	(80%) 47	1.3 players per car	8:00am - 9:00am	5:00pm - 6:00pm	29 (29 in, 0 out)	29 (0 in, 29 out)	85% Clyde Street 15% Newington Road
School Teams							
Players	40	(arrive by bus)	3:00pm - 4:00pm	5:00pm - 6:00pm	0 (0 in, 0 out)	2 (0 in, 2 out) (buses)	100% Clyde Street
Grade Teams							
Players	40	1.5 players per car (100% by car)	4:00pm - 5:00pm	8:00pm - 9:00pm	0 (0 in, 0 out)	14 (14 in, 0 out)	50% Clyde Street 50% Newington Road
Pathways (Junior Representative) Teams							
Players	(80%) 40	1.5 players per car (80% by car, 50% parking)	5:00pm - 6:00pm	7:00pm - 8:00pm	0 (0 in, 0 out)	32 (21 in, 11 out)	50% Clyde Street 50% Newington Road
Community Cricket Event							
Visitors	100	2.0 people per car	5:00pm - 6:00pm	8:00pm - 9:00pm	0 (0 in, 0 out)	50 (50 in, 0 out)	50% Clyde Street 50% Newington Road

In this regard, the worst case weekday scenario, which incorporates a Community Cricket event during the evening would generate the following peak traffic generation:

- 72 vehicle trips per hour during the AM peak period: (63 in and 9 out); and
- 156 vehicle trips per hour during the PM peak period: (80 in and 76 out).

The above trip volumes have been adopted and distributed based on the anticipated car park that will be used (accessed from either Clyde Street or Newington Road). The origin and destination of development traffic has also been split according to the relative percentage of opposing through movements on the major road for each intersection:

- Silverwater Road:
  - 43% northbound and 57% southbound during the weekday AM peak period.
  - 59% northbound and 41% southbound during the weekday PM peak period.
- Holker Street:
  - 38% westbound and 62% eastbound during the weekday AM peak period.
  - 37% westbound and 63% eastbound during the weekday PM peak period.

It has also been assumed that 30% of traffic exiting or exiting Clyde Street would originate or depart from Holker Street, with the remaining 70% originating or departing further south on Silverwater Road.

An illustration of the distributed road volumes for the development traffic is shown in **Figure 7** and **Figure 8**, for the AM peak period and PM peak period respectively.

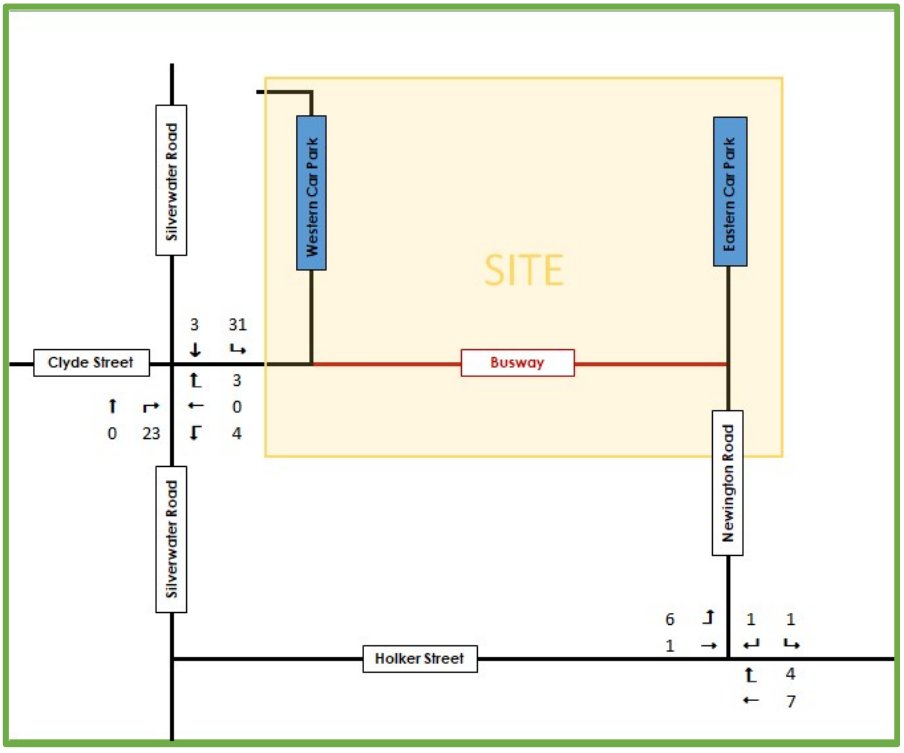


Figure 7: AM Peak Period Development Volumes

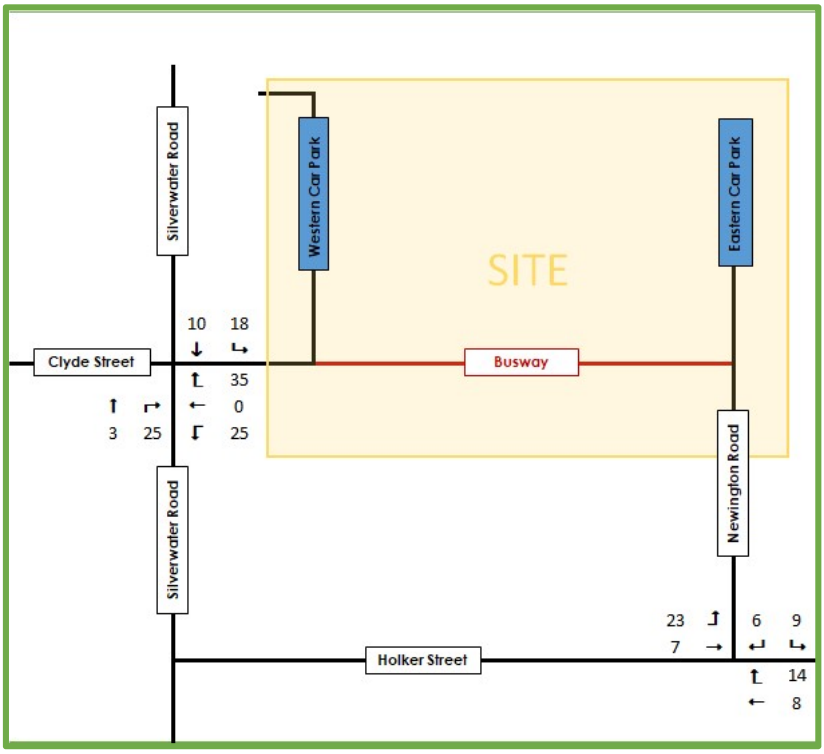


Figure 8: PM Peak Period Development Volumes

These volumes have been added to the SIDRA software model to assess intersection performance under future conditions. A summary of the key parameters is provided in **Table 7** and reference should be made to the detailed SIDRA outputs in **Appendix B**.

Table 7: Weekday Intersection Performance

Intersection	Control	Scenario	Period	Degree of Saturation	Average Delay (s)	Level of Service
Silverwater Road and Clyde Street	Signalised	Existing	AM	0.841	18.8	B
			PM	1.069	67.2	E
		Development	AM	0.843	19.1	B
			PM	1.078	70.4	E
Holker Street and Newington Road	Signalised	Existing	AM	0.436	7.8	A
			PM	0.462	9.7	A
		Development	AM	0.439	8.0	A
			PM	0.476	10.3	A

It is evident that the intersection of Silverwater Road and Clyde Street will continue to perform with the same Level of Service of B during the AM peak period and Level of Service of E during the PM peak period. The maximum increase in overall delay is 3.2 seconds, which is considered minimal.

This result is attributed to the low number of traffic movements on the Clyde Street approaches, thereby allowing development traffic to access the site without significantly increasing phase times (or the number of phases) where through traffic on Silverwater Road is stopped.

It is emphasised that the PM peak period scenario has been modelled with an additional 50 vehicle trips per hour, representing an occasional scenario with a Community Event occurring, and with no scaling down of other activities. This includes up to six (6) non-professional teams training on-site, majority of administration employees (and professional teams) departing the site.

The intersection of Holker Street and Newington Road performs very well during both the AM peak period and PM peak period, achieving a Level of Service of A under both existing and

future conditions. In this regard, capacity is available at this intersection for additional development traffic.

In summary, the intersections of Silverwater Road / Clyde Road and Holker Street / Newington Road have been assessed to perform satisfactorily and with minimal increases in delays. This assumes that regular weekday training at the centre will comprise of six non-professional teams training concurrently with appropriate scheduling and management.

6.2 Weekend

As outlined in Section 5.3, regular weekend activity on-site is predicted to comprise of the following activities:

- 90 people associated with grade or pathway cricket matches, consisting of 40 players/coaching staff and 50-60 spectators. A car occupancy ratio of 2.0 people (players and spectators) per car has been adopted.
- 47 professional players training (two teams). A car occupancy ratio of 1.3 players per car has been adopted.
- 40 Grade or Pathway players training (two teams) A car occupancy ratio of 1.5 people (players) per car has been adopted.; and
- 20 administrative and support staff, subject to a maximum parking rate of 1 space per 2 staff.

It is estimated in the order of 75 vehicle trips per hour would be generated during peak activity, prior to or following the conclusion of a cricket match. Notwithstanding, these volumes would be substantially less than special events hosted at the site, and would be expected to occur outside of the typical weekend peak period of 11:00am to 1:00pm.

6.3 Special Events (Weekends)

Extraordinary events will relate to either fan event days or matches hosted at the ICC compliant cricket field, which may draw a peak attendance of 1,500 people on-site. In this regard, it would be expected that all activity on-site during these days would be related to the event (e.g. staff to manage patrons and players to interact with fans).

It was assessed in Section 5.4 that extraordinary events would generate parking demand for approximately 500 vehicles, taking into account an 80% car mode share and 2.5 patrons per car. In this regard, the trip generation of the development can be estimated on a first principles basis where:

- 100% of the event parking demand would arrive on-site in an hour (given events are unlikely to end between the weekend peak period of 11:00am – 1:00pm).
- 33% of the event parking demand would depart the site in an hour, associated with parents or taxis dropping off patrons.

Accordingly, the trip generation for extraordinary events during the weekend peak period has been outlined in **Table 8**. A percentage split has also been applied where 40% of traffic would be assumed to enter Clyde Street (total capacity for 200 spaces) and 60% of traffic assumed to enter Newington Road (capacity for 300+ spaces).

Table 8: Trip Generation – Extraordinary Events

Parking Demand	Arrivals	Departures	Trips per Hour	Car Park
500	100%	30%	650 (500 in, 150 out)	40% Clyde Street 60% Holker Street

The origin and destination of development traffic has also been split according to the relative percentage of opposing through movements on the major road for each intersection during the weekend peak period:

- Silverwater Road: 48% northbound and 52% southbound
- Holker Street: 55% eastbound and 45% westbound

It has also been assumed that 30% of traffic exiting or exiting Clyde Street would originate or depart from Holker Street, with the remaining 70% originating or departing further south on Silverwater Road.

An illustration of the distributed road volumes for the development traffic is shown in **Figure 9**.

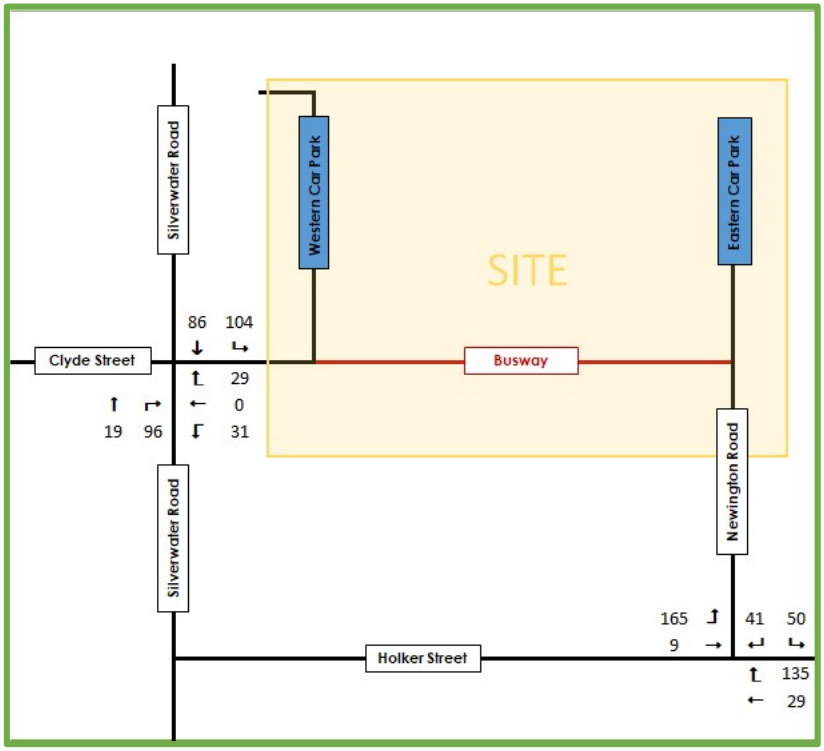


Figure 9: Weekend Event Volumes

These volumes have been added to the SIDRA software model to assess intersection performance under future conditions. A summary of the key parameters is provided in **Table 9** and reference should be made to the detailed SIDRA outputs in **Appendix B**.

Table 9: Weekend Intersection Performance

Intersection	Control	Scenario	Period	Degree of Saturation	Average Delay (s)	Level of Service
Silverwater Road and Clyde Street	Signalised	Existing	Weekend	0.780	15.1	B
		Event	Weekend	0.832	18.7	B
Holker Street and Newington Road	Signalised	Existing	Weekend	0.413	6.7	A
		Event	Weekend	0.656	11.5	A

It is evident that the intersection of Silverwater Road and Clyde Street will continue to perform with the same Level of Service of B during weekend conditions, even with the addition of event traffic. A similar result is achieved with Holker Street and Newington Road, where a Level of Service of A is achieved and maintained.

The minimal increases in delays are attributed to the intersections performing well within capacity and in particular, the results at the Clyde Street intersection are attributed to existing upgrades facilitating activities for Wilson Park, including an auxiliary slip lane and right turn lane from Silverwater Road.

It is therefore concluded that the proposed development will operate with minimal impacts under weekends when the road network is subject to normal road volumes. It would be anticipated however that special events could be scheduled to not co-incide with major events at Sydney Olympic Park.

7. INTERNAL DESIGN

7.1 Access

The western car park accessed from Clyde Street (arterial road) will contain 111 (Class 2) parking spaces and is also supplemented by 89 public car parking spaces. It thus nominally requires a Category 3 access facility, defined as two (2) access driveways, comprising of an entry access of width 6.0m and an exit access of a width between 4.0m to 6.0m, with separation of 1.0m to 3.0m.

The existing Clyde Street access however is designed as a public road intersection and is therefore representative of a Category 5 access facility. It has been signalised with separate entry and exit turning lanes, and with extensive upgrades as outlined in Section 3.2. Intersection modelling has indicted this intersection will not exceed capacity under peak conditions.

The eastern car park accessed from Newington Road (local) road will contain 110 (Class 2) spaces, which would nominally require a Category 2 access facility, defined as a single access driveway with a width between 6.0m to 9.0m.

The existing Newington Road access measures 6.0m wide and thus nominally requires with the Category 2 requirement. Notwithstanding under special event conditions, the car park would have additional capacity for 250 parking spaces (via the junior oval) and thus the requirement would increase to a Category 4 access facility which is defined as two (2) access driveways, comprising of an entry access of width between 6.0m to 8.0m and an exit access of a width between 6.0m to 8.0m, with separation of 1.0m to 3.0m.

The existing Newington Road access however is designed as a public road intersection and therefore representative of a Category 5 access facility. It has been designed as a Give Way priority controlled intersection, with road volumes expected to be negligible noting that Newington Road terminates at the Holker Street Bus Way.

It is thus evident that the existing Clyde Street and Newington Road accesses have been designed to accommodate high volume traffic, and will provide ample capacity during regular weekday and weekend operation.

7.2 Internal Design

The design of all car parking areas comply with the requirements of AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009), with the following noteworthy:

- All car parking spaces have been designed in accordance with a Class 2 user, and are provided with a minimum space width of 2.4m, space length of 5.4m and aisle width of 5.8m.
- All accessible parking spaces have been designed in accordance with AS2890.6 (2009) and are provided with a minimum space width of 2.4m and adjacent to a shared area with a minimum space width of 2.4m.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Turning bays have been provided at blind aisles exceeding six (6) parking spaces
- The 32m bus bay at the western car park will also enable loading and waste collection to occur without the need for reverse movements.

It is envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

8. PRELIMINARY CONSTRUCTION PLAN

8.1 Overview

This Preliminary Construction, Pedestrian and Traffic Management Plan (CPTMP) assesses the feasibility of vehicles accessing the site during construction. Specifically, it addresses truck routes from the arterial network and access movements for each stage (demolition, excavation, construction and fit out).

An assessment of cumulative impacts associated with other construction activities in the vicinity of the site is to be undertaken once a commencement date and construction program is finalized. Upon a builder being contracted following development approval, a final CPTMP will provide final details on the construction methodology and traffic control measures.

8.2 Truck Size and Route

All truck routes will access the local road network from Silverwater Road, which is an RMS approved heavy vehicle route for B-Doubles (up to 26m). When accounting for turning restrictions as well as intersection geometry, the following truck routes are proposed when entering and exiting the site as illustrated in **Figure 10** and **Figure 11**, respectively.

Routes from North

- Routes to subject site:
  1. Turn left from Silverwater Road into Clyde Street.
  2. Turn left into Sydney Olympic Park.
  3. Turn right into site.
- Routes from subject site:
  1. Turn left from the site into Sydney Olympic Park.
  2. Turn right into Clyde Street.
  3. Turn right into Silverwater Road.

Routes from South

- Routes to subject site:
  1. Turn right from Silverwater Road into Clyde Street
  2. Turn left into Sydney Olympic Park
  3. Turn right into site

- Routes from subject site:
  1. Turn left into Sydney Olympic Park
  2. Turn right into Clyde Street
  3. Turn left into Silverwater Road

The above routes have been tested with various sized vehicles. It was found that the largest vehicle able to complete these turns would be a 19.0m Articulated Vehicle (AV) which is expected to account for the majority of vehicle types including all truck and dog combinations. The swept path analysis for this vehicle is presented in **Appendix C** and demonstrates that critical turns can be accomplished without the need for traffic control to manage truck movements at key intersections. Therefore, construction impacts on road safety at key intersections are expected to be minimal.

Truck arrival and departure times are to be coordinated by the Site Manager to ensure truck movements to and from the site do not coincide with network peaks as far as practicable. This will have the effect of minimizing any potential traffic impacts at the key intersection of Silverwater Road and Clyde Street.

Figure 10: Truck Routes to the site from the north and south

Figure 11: Truck Routes originating from the site to the north and south

8.3 Truck Access and Activity

The anticipated truck access arrangements and activities are identical for all three (3) stages of construction, as described below:

- All loading and unloading of materials will be contained onsite within the site's existing western carpark as shown in **Figure 12** below. Therefore, Traffic Control Plan(s) and traffic controllers are not required in this regard.
- Construction vehicles will enter the site in a forward direction using the site's northern gate, circulate through the site in a forward direction and exit the site in a forward direction using the carparks southern gate as shown in **Figure 12.**
- No pedestrian footpaths are provided across the sites vehicular access points. In addition, trucks can access and circulate through the site without being required to perform any reverse manoeuvres. Therefore, risks to pedestrians, cyclists and public transport users during construction are considered minimal.
- Emergency service vehicles can access the site in the same manner as trucks, described above.
- Indicative truck volumes for each stage of construction are given below:
    - Stage 1 demolition: 10-15 truck arrivals per day
    - Stage 2 Excavation & material stockpiling: 30 truck arrivals per day
    - Stage 3: Structure and fit out: Up to 25 truck arrivals per day

  It is emphasised the above volumes are estimates only and the final volumes are to be confirmed pending the appointment of a builder and the provision of a final CPTMP.

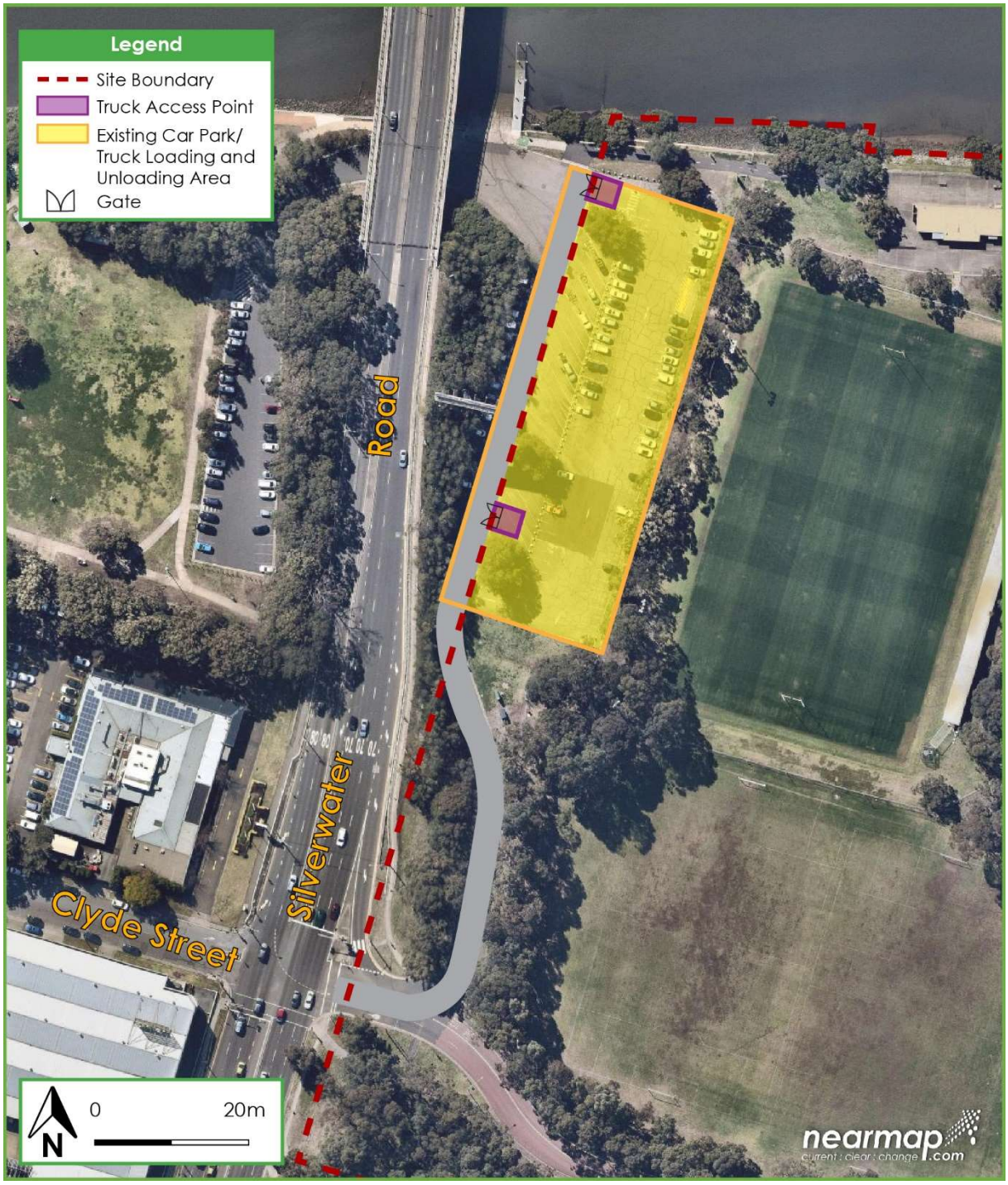


Figure 12: Site Access – All Stages

8.4 Employee Parking

Employees are permitted to utilize the site's eastern carpark which is accessed via Newington Road as shown in **Figure 13** below. The carpark has capacity to cater for at least 40 vehicles and it is expected that all employee carparking requirements will be accommodated onsite, thereby minimizing any traffic impacts to the surrounding road network.

Figure 13: Parking Location for Workers

9. TRANSPORT MANAGEMENT PLAN

Prior to issue of an Occupation Certificate, a comprehensive Transport Management Plan may address all relevant details for the ongoing operation of the development including:

- A Green Travel Plan, which will include strategies to promote active and public transport for all users of the site.
- Details on scheduling of training sessions and Community Events, in order to minimise impacts during network peak periods.
- Details on loading and waste collection arrangements, as well as management of maintenance fleet.
- Management during special events, including use of the junior oval to accommodate additional parking, as well as use of traffic control to manage flows.

The Transport Management Plan would be prepared in conjunction with Cricket NSW once final operational details can be confirmed.

10. CONCULSIONS

In summary:

- The State Significant Development Application seeks approval for the construction of several facilities which will comprise the Cricket NSW Centre of Excellence. This includes administration space for 170 staff, two (2) cricket ovals, outdoor and indoor practice nets and a community building. The training facilities will be shared and scheduled for use by professional and non-professional cricket teams comprising of grade, pathway (junior representative) and school players.
- The proposed development will provide a total of 221 car parking spaces on-site. Based on the operational information provided, this provision is expected to amply accommodate core weekday and weekend demands of 175 parking spaces and 118 parking spaces respectively. The development may occasionally accommodate special events hosting up to 1,500 patrons, where parking capacity can be expanded to 550 spaces (Clyde Street public car park and on a cricket oval) to accommodate the projected demand for 500 spaces. Accordingly, the proposed development is expected to have no reliance on on-street parking or other parking facilities within Sydney Olympic Park.
- When accounting for all users and with scheduling of training sessions, the proposed development has been assessed to generate the following traffic volumes:
  - Regular Weekdays: 72 vehicle trips per hour during the AM peak period
106 vehicle trips per hour during the PM peak period
  - Weekdays with Community Events: 72 vehicle trips per hour during the AM peak period
  - Regular Weekends: 75 vehicle trips per hour
  - Special Events: 650 vehicle trips per hour

  Intersection modelling has been undertaken using SIDRA software for the intersection of Clyde Street/Silverwater Road and Newington Road/Silverwater road, with the results demonstrating that Level of Service parameters will be maintained. In particular, weekday movements will have minimal disruption on phasing for Silverwater Road during peak

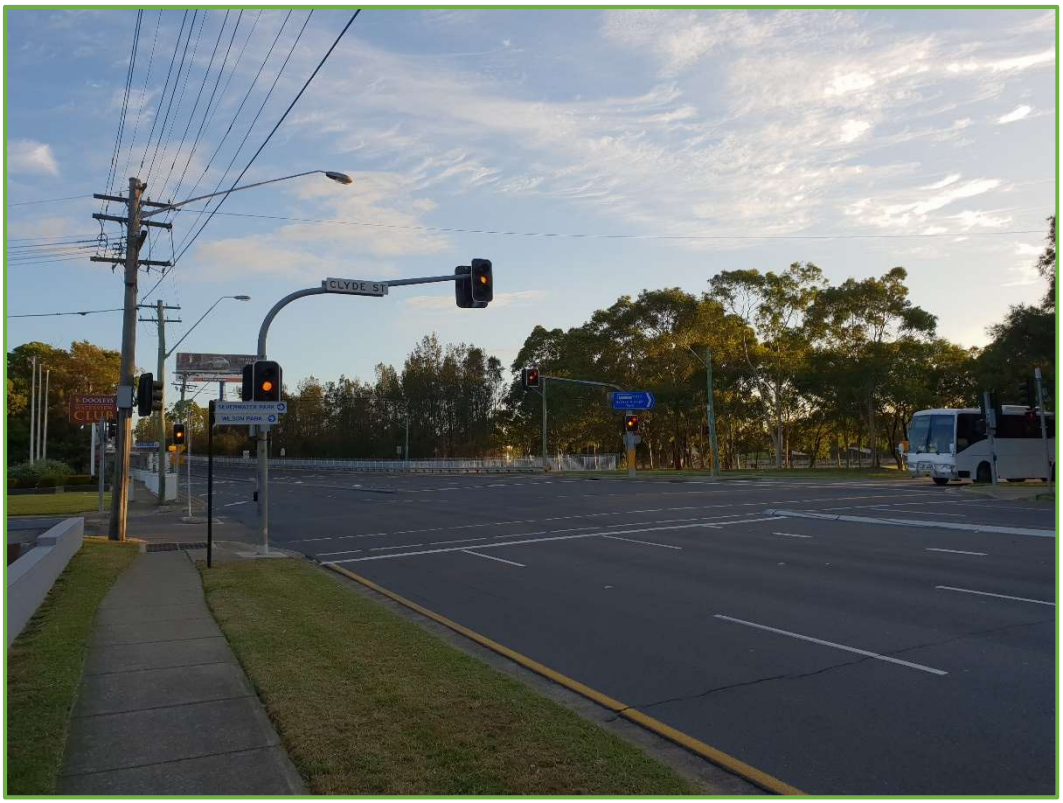
periods, whilst ample capacity for events is available during normal weekend conditions with upgrades on Silverwater Road facilitating site access movements at Clyde Street.

- The site accesses at Clyde Street and Newington Road have also been designed as public road intersections and thus can accommodate high volumes of traffic during special events. The design of car parking areas has been assessed to comply with AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009). This includes the provision of a 32m bay for buses and loading vehicles.
- Prior to issue of an Occupation Certificate, a Transport Management Plan can be drafted to ensure that activities can be scheduled to manage impacts during peak periods and events, which may also incorporate public transport strategies during special events.
- Construction impacts are expected to be minimal, noting all truck parking and loading may occur wholly within site, and with direct access to the arterial road network provided from Clyde Street.

This Traffic Impact Assessment therefore demonstrates that the subject application is supportable on transport planning grounds.

APPENDIX A

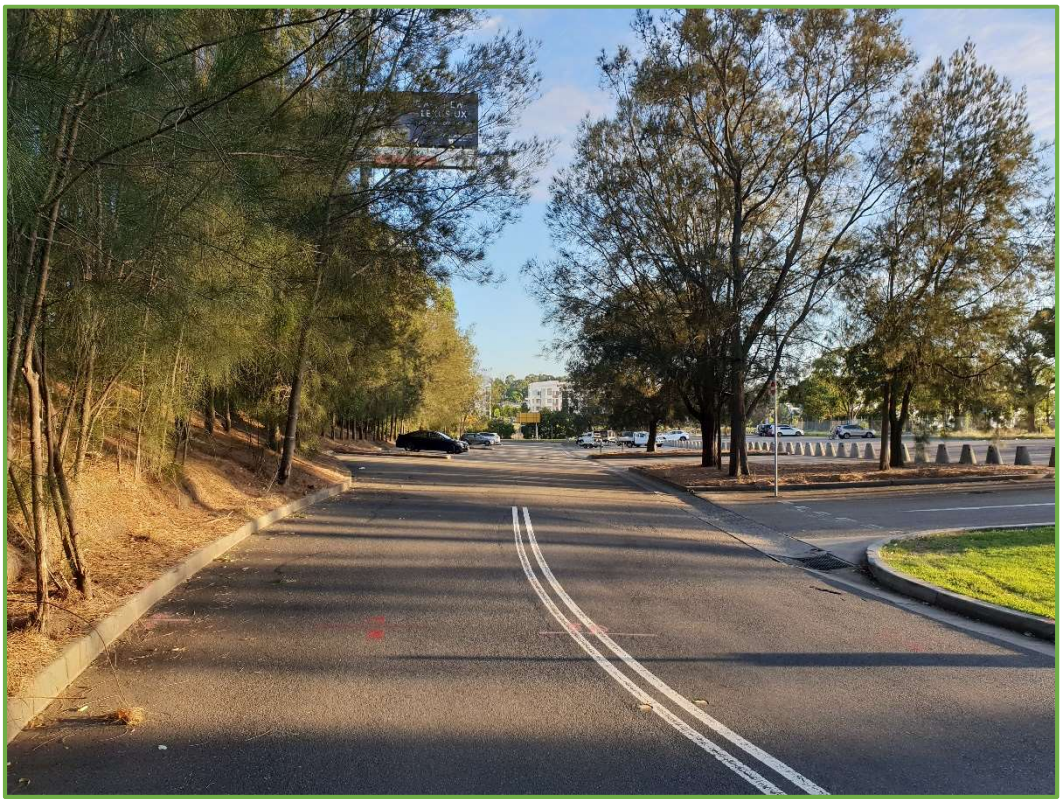
Photographic Record



View on Silverwater Road looking north towards intersection of Clyde Street

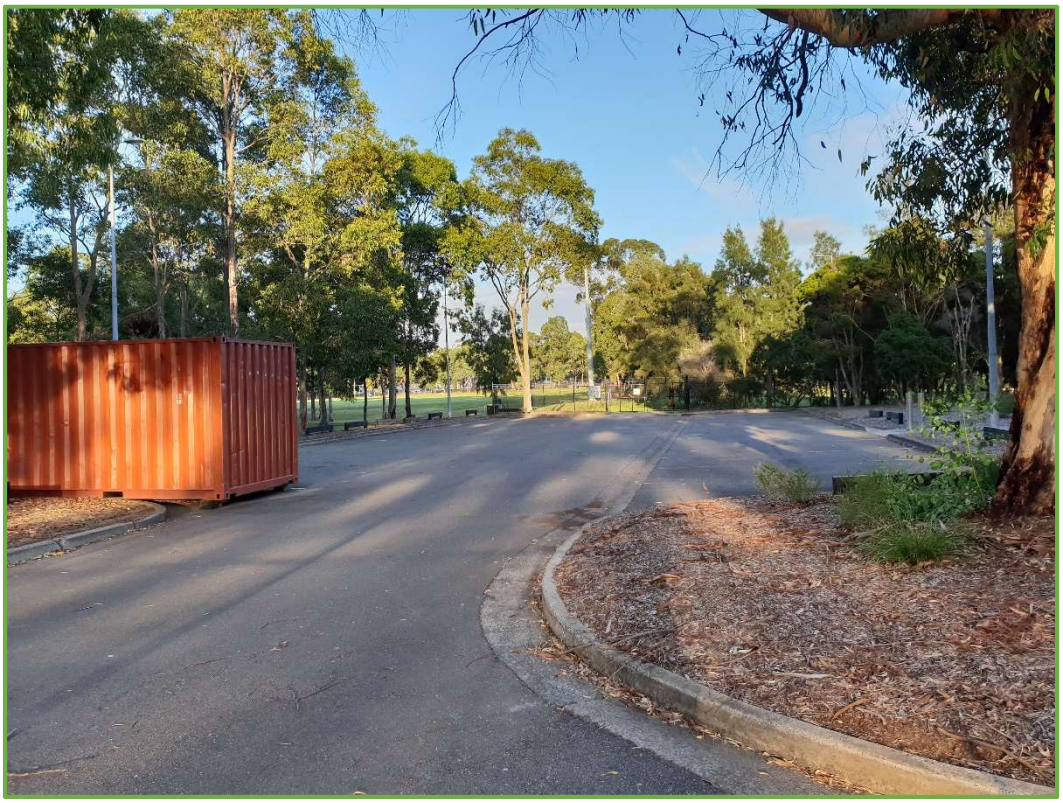
View on Clyde Street looking north towards internal roadway to western parking area

View from site access for eastern parking area looking south towards Newington Road



View on internal roadway looking north towards western parking area

View on internal roadway looking south towards western parking area



View in eastern parking area looking west

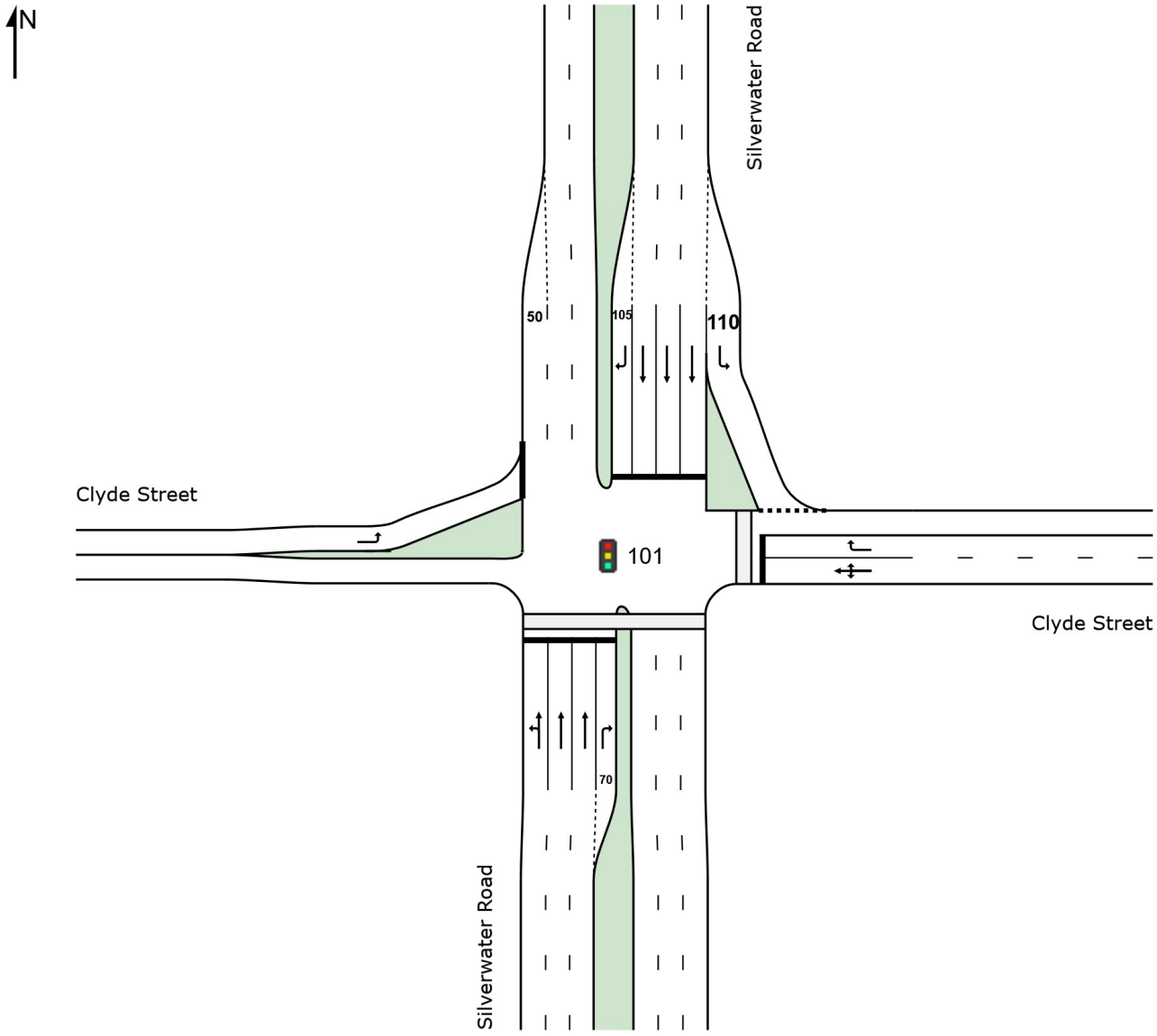
APPENDIX B

SIDRA Outputs

SITE LAYOUT

Site: 101 [101. Silverwater Road / Clyde Street AM Peak Existing Tuesday]

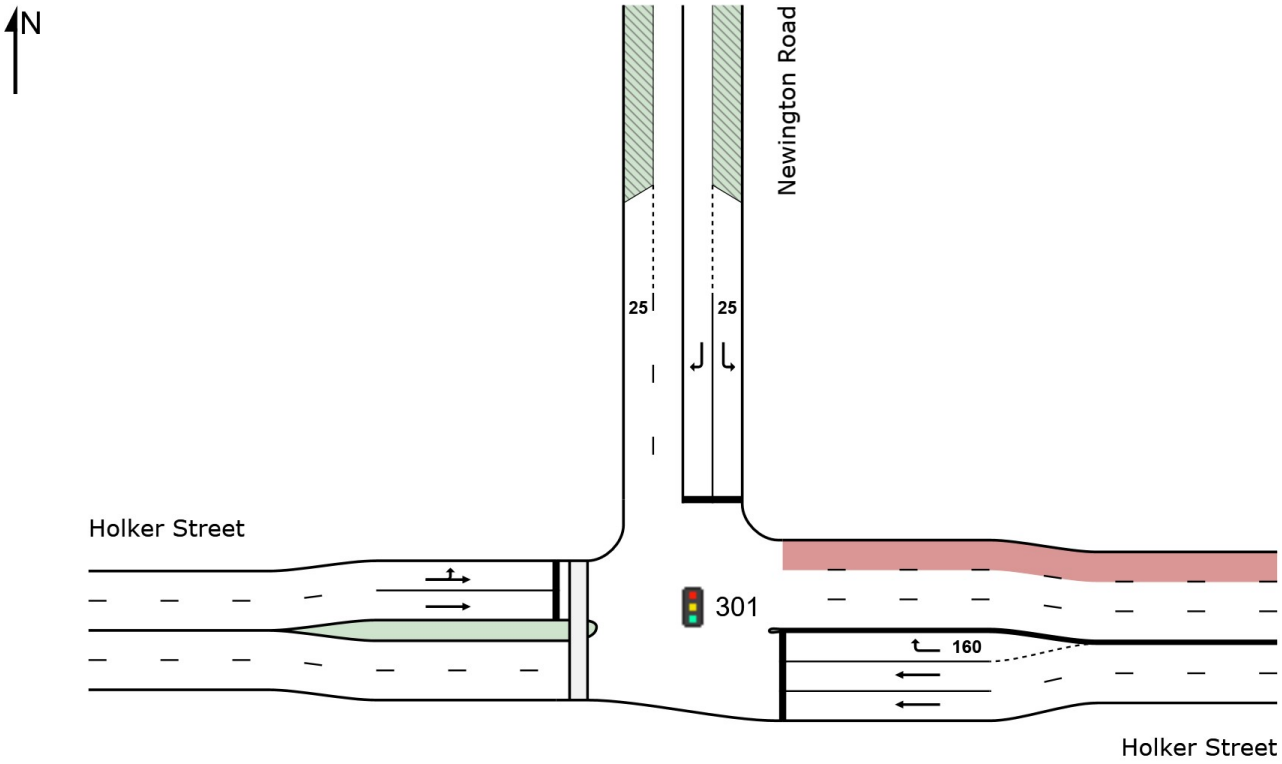
Silverwater Road/ Clyde Street
AM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated



SITE LAYOUT

Site: 301 [301. Holker Street/ Newington Road AM Peak Existing Tuesday]

Holker Street/ Newington Road
AM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated



Organisation: TRAFFIX PTY LTD | Created: Friday, 1 November 2019 5:11:04 PM
Project: T:\Synergy\Projects\19\19.063\Modelling\19.063m01v05 Traffix Western Sydney Cricket and Community Centre, Silverwater.sip8

MOVEMENT SUMMARY

Site: 301 [301. Holker Street/ Newington Road AM Peak Existing Tuesday + Development]

Holker Street/ Newington Road
AM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
East: Holker Street												
11	T1	717	3.8	0.233	3.3	LOS A	5.6	40.8	0.26	0.23	0.26	53.9
12	R2	49	12.8	0.182	15.4	LOS B	1.3	10.3	0.44	0.68	0.44	44.1
Approach		766	4.4	0.233	4.1	LOS A	5.6	40.8	0.27	0.26	0.27	52.8
North: Newington Road												
1	L2	17	37.5	0.060	55.7	LOS D	0.9	8.7	0.85	0.70	0.85	26.5
3	R2	22	66.7	0.164	69.7	LOS E	1.4	15.7	0.94	0.72	0.94	26.0
Approach		39	54.1	0.164	63.7	LOS E	1.4	15.7	0.90	0.71	0.90	26.2
West: Holker Street												
4	L2	65	11.3	0.439	13.9	LOS A	16.0	115.8	0.44	0.43	0.44	50.2
5	T1	1140	2.9	0.439	8.3	LOS A	16.5	118.0	0.44	0.42	0.44	46.6
Approach		1205	3.3	0.439	8.6	LOS A	16.5	118.0	0.44	0.42	0.44	47.0
All Vehicles		2011	4.7	0.439	8.0	LOS A	16.5	118.0	0.38	0.36	0.38	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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
P2	West Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	64.3	LOS F			0.96	0.96

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 [101. Silverwater Road / Clyde Street AM Tuesday Peak Existing + Development]

Silverwater Road/ Clyde Street
AM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
South: Silverwater Road												
1	L2	13	16.7	0.263	17.2	LOS B	9.4	69.6	0.43	0.39	0.43	47.7
2	T1	2388	6.1	0.843	18.5	LOS B	57.1	420.6	0.77	0.72	0.77	54.8
3	R2	27	0.0	0.380	86.5	LOS F	2.1	14.6	1.00	0.72	1.00	12.9
Approach		2428	6.1	0.843	19.3	LOS B	57.1	420.6	0.77	0.72	0.77	54.2
East: Clyde Street												
4	L2	11	0.0	0.049	57.9	LOS E	0.9	6.9	0.86	0.68	0.86	17.2
5	T1	1	0.0	0.049	55.3	LOS D	0.9	6.9	0.86	0.68	0.86	16.6
6	R2	14	38.5	0.049	61.4	LOS E	0.9	6.9	0.88	0.67	0.88	28.6
Approach		25	20.8	0.049	59.7	LOS E	0.9	6.9	0.87	0.68	0.87	24.4
North: Silverwater Road												
7	L2	42	5.0	0.024	6.3	LOS A	0.2	1.3	0.10	0.58	0.10	54.9
8	T1	3153	3.0	0.818	16.5	LOS B	54.6	392.0	0.75	0.70	0.75	58.1
9	R2	98	4.3	0.841	90.6	LOS F	7.8	56.9	1.00	0.89	1.31	29.1
Approach		3293	3.1	0.841	18.6	LOS B	54.6	392.0	0.75	0.71	0.75	56.4
West: Clyde Street												
10	L2	13	50.0	0.032	30.4	LOS C	0.5	5.0	0.55	0.89	0.55	38.4
Approach		13	50.0	0.032	30.4	LOS C	0.5	5.0	0.55	0.89	0.55	38.4
All Vehicles		5759	4.6	0.843	19.1	LOS B	57.1	420.6	0.76	0.71	0.76	55.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		105	69.3	LOS F			0.96	0.96

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 [101. Silverwater Road / Clyde Street AM Peak Existing Tuesday]

Silverwater Road/ Clyde Street
AM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
South: Silverwater Road												
1	L2	13	16.7	0.261	17.2	LOS B	9.3	68.9	0.43	0.39	0.43	47.7
2	T1	2388	6.1	0.836	18.6	LOS B	56.0	412.6	0.77	0.72	0.77	54.8
3	R2	3	0.0	0.044	84.2	LOS F	0.2	1.6	0.98	0.63	0.98	13.5
Approach		2404	6.2	0.836	18.6	LOS B	56.0	412.6	0.77	0.72	0.77	54.7
East: Clyde Street												
4	L2	6	0.0	0.037	58.8	LOS E	0.6	5.1	0.87	0.66	0.87	17.1
5	T1	1	0.0	0.037	56.1	LOS D	0.6	5.1	0.87	0.66	0.87	16.5
6	R2	11	50.0	0.037	61.4	LOS E	0.6	5.1	0.88	0.66	0.88	28.5
Approach		18	29.4	0.037	60.1	LOS E	0.6	5.1	0.87	0.66	0.87	24.8
North: Silverwater Road												
7	L2	9	22.2	0.006	7.1	LOS A	0.0	0.2	0.08	0.59	0.08	59.9
8	T1	3149	3.0	0.813	16.5	LOS B	53.9	386.9	0.75	0.70	0.75	58.1
9	R2	98	4.3	0.841	90.6	LOS F	7.8	56.9	1.00	0.89	1.31	29.1
Approach		3257	3.1	0.841	18.7	LOS B	53.9	386.9	0.75	0.71	0.76	56.4
West: Clyde Street												
10	L2	13	50.0	0.032	29.3	LOS C	0.5	4.9	0.54	0.90	0.54	38.7
Approach		13	50.0	0.032	29.3	LOS C	0.5	4.9	0.54	0.90	0.54	38.7
All Vehicles		5692	4.6	0.841	18.8	LOS B	56.0	412.6	0.76	0.71	0.76	55.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

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
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		105	69.3	LOS F			0.96	0.96

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: 102 [102. Silverwater Road / Clyde Street PM Peak Existing Tuesday]

Silverwater Road/ Clyde Street
PM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
South: Silverwater Road												
1	L2	8	0.0	0.334	16.0	LOS B	12.7	89.8	0.43	0.39	0.43	52.2
2	T1	3301	0.7	1.069	106.1	LOS F	173.6	1222.4	0.92	1.28	1.42	26.9
3	R2	3	0.0	0.044	84.2	LOS F	0.2	1.6	0.98	0.63	0.98	13.5
Approach		3313	0.7	1.069	105.8	LOS F	173.6	1222.4	0.92	1.27	1.42	26.9
East: Clyde Street												
4	L2	11	10.0	0.049	57.1	LOS E	0.9	7.1	0.86	0.68	0.86	17.2
5	T1	1	0.0	0.049	54.5	LOS D	0.9	7.1	0.86	0.68	0.86	16.8
6	R2	13	50.0	0.049	61.4	LOS E	0.9	7.1	0.88	0.67	0.88	28.5
Approach		24	30.4	0.049	59.2	LOS E	0.9	7.1	0.87	0.68	0.87	24.2
North: Silverwater Road												
7	L2	11	30.0	0.007	7.2	LOS A	0.0	0.3	0.08	0.59	0.08	59.9
8	T1	2308	2.1	0.581	12.3	LOS A	28.6	203.8	0.56	0.51	0.56	61.2
9	R2	18	0.0	0.249	86.4	LOS F	1.4	9.5	1.00	0.70	1.00	30.0
Approach		2337	2.3	0.581	12.9	LOS A	28.6	203.8	0.56	0.51	0.56	60.7
West: Clyde Street												
10	L2	62	0.0	0.145	53.7	LOS D	3.6	25.2	0.80	0.78	0.80	32.1
Approach		62	0.0	0.145	53.7	LOS D	3.6	25.2	0.80	0.78	0.80	32.1
All Vehicles		5736	1.4	1.069	67.2	LOS E	173.6	1222.4	0.77	0.96	1.06	34.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

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
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	9.4	LOS A	0.1	0.1	0.35	0.35
All Pedestrians		105	39.3	LOS D			0.66	0.66

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: 301 [301. Holker Street/ Newington Road AM Peak Existing Tuesday]

Holker Street/ Newington Road
AM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
East: Holker Street												
11	T1	709	3.9	0.231	3.3	LOS A	5.6	40.3	0.25	0.23	0.25	54.0
12	R2	45	14.0	0.166	14.8	LOS B	1.2	9.1	0.43	0.67	0.43	44.4
Approach		755	4.5	0.231	4.0	LOS A	5.6	40.3	0.27	0.25	0.27	52.9
North: Newington Road												
1	L2	16	40.0	0.057	55.7	LOS D	0.9	8.3	0.85	0.70	0.85	26.4
3	R2	21	70.0	0.159	69.8	LOS E	1.4	15.2	0.94	0.72	0.94	25.9
Approach		37	57.1	0.159	63.7	LOS E	1.4	15.2	0.90	0.71	0.90	26.1
West: Holker Street												
4	L2	59	12.5	0.436	13.9	LOS A	15.9	114.8	0.43	0.43	0.43	50.2
5	T1	1139	2.9	0.436	8.3	LOS A	16.3	116.9	0.44	0.41	0.44	46.7
Approach		1198	3.3	0.436	8.5	LOS A	16.3	116.9	0.44	0.41	0.44	47.0
All Vehicles		1989	4.8	0.436	7.8	LOS A	16.3	116.9	0.38	0.36	0.38	47.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

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
P2	West Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	64.3	LOS F			0.96	0.96

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: 102 [102. Silverwater Road / Clyde Street PM Tuesday Peak Existing + Development]

Silverwater Road/ Clyde Street
PM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
South: Silverwater Road												
1	L2	8	0.0	0.337	16.0	LOS B	12.9	90.7	0.43	0.39	0.43	52.2
2	T1	3304	0.7	1.078	112.2	LOS F	178.8	1259.4	0.92	1.30	1.45	26.0
3	R2	29	0.0	0.410	86.7	LOS F	2.3	15.8	1.00	0.72	1.00	12.8
Approach		3342	0.7	1.078	111.7	LOS F	178.8	1259.4	0.92	1.30	1.45	25.9
East: Clyde Street												
4	L2	37	2.9	0.153	58.5	LOS E	3.1	22.4	0.88	0.73	0.88	17.0
5	T1	1	0.0	0.153	55.8	LOS D	3.1	22.4	0.88	0.73	0.88	16.4
6	R2	49	12.8	0.153	62.4	LOS E	3.1	22.4	0.90	0.73	0.90	28.7
Approach		87	8.4	0.153	60.7	LOS E	3.1	22.4	0.89	0.73	0.89	24.6
North: Silverwater Road												
7	L2	29	10.7	0.018	6.5	LOS A	0.1	1.0	0.10	0.58	0.10	55.7
8	T1	2319	2.1	0.584	12.4	LOS A	28.7	204.8	0.56	0.51	0.56	61.2
9	R2	18	0.0	0.249	86.4	LOS F	1.4	9.5	1.00	0.70	1.00	30.0
Approach		2366	2.2	0.584	12.9	LOS A	28.7	204.8	0.56	0.52	0.56	60.6
West: Clyde Street												
10	L2	62	0.0	0.158	53.8	LOS D	3.6	25.2	0.81	0.78	0.81	32.1
Approach		62	0.0	0.158	53.8	LOS D	3.6	25.2	0.81	0.78	0.81	32.1
All Vehicles		5858	1.4	1.078	70.4	LOS E	178.8	1259.4	0.77	0.97	1.07	33.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

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
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	9.4	LOS A	0.1	0.1	0.35	0.35
All Pedestrians		105	39.3	LOS D			0.66	0.66

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: 302 [302. Holker Street/ Newington Road PM Peak Existing Tuesday + Development]

Holker Street/ Newington Road
PM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
East: Holker Street												
11	T1	591	1.2	0.211	3.8	LOS A	3.7	26.0	0.35	0.30	0.35	53.2
12	R2	32	20.0	0.095	14.9	LOS B	0.6	4.9	0.55	0.68	0.55	44.2
Approach		622	2.2	0.211	4.3	LOS A	3.7	26.0	0.36	0.32	0.36	52.4
North: Newington Road												
1	L2	81	13.0	0.212	32.7	LOS C	2.6	20.2	0.84	0.75	0.84	34.4
3	R2	42	17.5	0.204	41.2	LOS C	1.5	12.5	0.93	0.73	0.93	33.9
Approach		123	14.5	0.212	35.6	LOS C	2.6	20.2	0.87	0.75	0.87	34.2
West: Holker Street												
4	L2	36	20.6	0.476	16.3	LOS B	11.8	84.3	0.62	0.57	0.62	48.3
5	T1	1015	1.6	0.476	10.6	LOS A	12.0	85.2	0.63	0.56	0.63	44.1
Approach		1051	2.2	0.476	10.8	LOS A	12.0	85.2	0.63	0.56	0.63	44.3
All Vehicles		1796	3.0	0.476	10.3	LOS A	12.0	85.2	0.55	0.49	0.55	45.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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
P2	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		53	34.3	LOS D			0.93	0.93

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: 302 [302. Holker Street/ Newington Road PM Peak Existing Tuesday]

Holker Street/ Newington Road
PM Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
East: Holker Street												
11	T1	582	1.3	0.208	3.8	LOS A	3.6	25.6	0.35	0.30	0.35	53.3
12	R2	17	37.5	0.056	14.8	LOS B	0.3	2.8	0.54	0.66	0.54	43.7
Approach		599	2.3	0.208	4.1	LOS A	3.6	25.6	0.35	0.31	0.35	52.7
North: Newington Road												
1	L2	72	14.7	0.155	29.7	LOS C	2.1	16.9	0.79	0.74	0.79	35.7
3	R2	36	20.6	0.177	41.1	LOS C	1.3	10.8	0.93	0.73	0.93	33.9
Approach		107	16.7	0.177	33.5	LOS C	2.1	16.9	0.84	0.73	0.84	35.0
West: Holker Street												
4	L2	12	63.6	0.462	16.7	LOS B	11.3	81.0	0.62	0.55	0.62	47.0
5	T1	1007	1.6	0.462	10.5	LOS A	11.5	81.7	0.62	0.55	0.62	44.4
Approach		1019	2.3	0.462	10.6	LOS A	11.5	81.7	0.62	0.55	0.62	44.4
All Vehicles		1725	3.2	0.462	9.7	LOS A	11.5	81.7	0.54	0.48	0.54	45.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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
P2	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		53	34.3	LOS D			0.93	0.93

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: 103 [103. Silverwater Road / Clyde Street Sat Existing]

Silverwater Road/ Clyde Street
Sat Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
South: Silverwater Road												
1	L2	29	17.9	0.244	15.5	LOS B	8.4	60.5	0.40	0.38	0.40	48.8
2	T1	2362	1.8	0.780	15.2	LOS B	49.5	351.5	0.69	0.65	0.69	57.0
3	R2	3	0.0	0.044	84.2	LOS F	0.2	1.6	0.98	0.63	0.98	13.5
Approach		2395	2.0	0.780	15.3	LOS B	49.5	351.5	0.68	0.64	0.68	56.9
East: Clyde Street												
4	L2	19	0.0	0.067	55.5	LOS D	1.4	10.0	0.85	0.70	0.85	17.7
5	T1	1	0.0	0.067	52.8	LOS D	1.4	10.0	0.85	0.70	0.85	17.1
6	R2	19	22.2	0.067	61.4	LOS E	1.4	10.0	0.88	0.69	0.88	28.8
Approach		39	10.8	0.067	58.3	LOS E	1.4	10.0	0.87	0.69	0.87	24.2
North: Silverwater Road												
7	L2	25	8.3	0.015	6.9	LOS A	0.1	0.6	0.08	0.60	0.08	60.0
8	T1	2546	1.9	0.645	13.2	LOS A	34.0	242.0	0.60	0.55	0.60	60.5
9	R2	39	5.4	0.562	88.8	LOS F	3.0	22.2	1.00	0.75	1.05	29.4
Approach		2611	2.1	0.645	14.3	LOS A	34.0	242.0	0.60	0.56	0.60	59.6
West: Clyde Street												
10	L2	16	6.7	0.036	23.1	LOS B	0.5	3.9	0.49	0.89	0.49	40.5
Approach		16	6.7	0.036	23.1	LOS B	0.5	3.9	0.49	0.89	0.49	40.5
All Vehicles		5060	2.1	0.780	15.1	LOS B	49.5	351.5	0.64	0.60	0.64	57.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

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
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		105	69.3	LOS F			0.96	0.96

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: 303 [303. Holker Street/ Newington Road Sat Existing]

Holker Street/ Newington Road
Sat Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
East: Holker Street												
11	T1	937	1.1	0.300	3.6	LOS A	7.9	55.8	0.27	0.25	0.27	53.6
12	R2	13	41.7	0.055	13.9	LOS A	0.3	2.7	0.38	0.64	0.38	44.2
Approach		949	1.7	0.300	3.7	LOS A	7.9	55.8	0.28	0.25	0.28	53.3
North: Newington Road												
1	L2	13	25.0	0.042	55.1	LOS D	0.7	5.9	0.84	0.69	0.84	26.9
3	R2	11	60.0	0.076	68.5	LOS E	0.7	7.1	0.93	0.69	0.93	26.3
Approach		23	40.9	0.076	61.2	LOS E	0.7	7.1	0.88	0.69	0.88	26.6
West: Holker Street												
4	L2	7	57.1	0.413	14.3	LOS A	15.0	106.9	0.43	0.39	0.43	48.9
5	T1	1139	1.6	0.413	8.1	LOS A	15.2	107.6	0.43	0.39	0.43	47.2
Approach		1146	1.9	0.413	8.1	LOS A	15.2	107.6	0.43	0.39	0.43	47.2
All Vehicles		2119	2.2	0.413	6.7	LOS A	15.2	107.6	0.36	0.33	0.36	49.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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
P2	West Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	64.3	LOS F			0.96	0.96

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: 103 [103. Silverwater Road / Clyde Street Sat Existing + Event]

Silverwater Road/ Clyde Street
Sat Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
South: Silverwater Road												
1	L2	29	17.9	0.260	15.8	LOS B	8.7	62.4	0.42	0.40	0.42	48.4
2	T1	2382	1.8	0.832	15.7	LOS B	53.4	379.2	0.72	0.68	0.72	56.6
3	R2	104	0.0	0.737	78.7	LOS F	7.5	52.2	1.00	0.85	1.15	13.8
Approach		2516	1.9	0.832	18.3	LOS B	53.4	379.2	0.73	0.68	0.74	54.3
East: Clyde Street												
4	L2	52	0.0	0.158	50.7	LOS D	3.4	24.0	0.85	0.74	0.85	18.8
5	T1	1	0.0	0.158	48.0	LOS D	3.4	24.0	0.85	0.74	0.85	18.2
6	R2	49	8.5	0.158	57.8	LOS E	3.4	24.0	0.90	0.73	0.90	29.8
Approach		102	4.1	0.158	54.1	LOS D	3.4	24.0	0.87	0.73	0.87	25.3
North: Silverwater Road												
7	L2	135	1.6	0.079	6.7	LOS A	1.0	7.1	0.15	0.59	0.15	54.2
8	T1	2637	1.9	0.730	17.3	LOS B	40.4	287.7	0.72	0.66	0.72	57.2
9	R2	39	5.4	0.525	82.7	LOS F	2.8	20.6	1.00	0.74	1.02	30.5
Approach		2811	1.9	0.730	17.7	LOS B	40.4	287.7	0.69	0.66	0.69	56.4
West: Clyde Street												
10	L2	16	6.7	0.033	23.6	LOS B	0.5	3.8	0.52	0.88	0.52	40.4
Approach		16	6.7	0.033	23.6	LOS B	0.5	3.8	0.52	0.88	0.52	40.4
All Vehicles		5444	2.0	0.832	18.7	LOS B	53.4	379.2	0.71	0.67	0.72	54.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		105	64.3	LOS F			0.96	0.96

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: 303 [303. Holker Street/ Newington Road Sat Existing + Event]

Holker Street/ Newington Road
Sat Peak
Existing
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand 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	Aver. No. Cycles	Average Speed km/h
East: Holker Street												
11	T1	967	1.1	0.357	4.5	LOS A	6.6	46.3	0.43	0.38	0.43	52.2
12	R2	155	3.4	0.481	22.7	LOS B	4.3	31.2	0.88	0.81	0.88	39.8
Approach		1122	1.4	0.481	7.0	LOS A	6.6	46.3	0.49	0.44	0.49	49.0
North: Newington Road												
1	L2	65	4.8	0.121	25.0	LOS B	1.6	11.9	0.76	0.73	0.76	38.3
3	R2	54	11.8	0.244	36.9	LOS C	1.7	13.4	0.94	0.74	0.94	35.5
Approach		119	8.0	0.244	30.3	LOS C	1.7	13.4	0.84	0.73	0.84	36.9
West: Holker Street												
4	L2	181	2.3	0.656	18.3	LOS B	16.1	114.5	0.77	0.73	0.77	46.8
5	T1	1148	1.6	0.656	12.8	LOS A	16.6	117.7	0.77	0.71	0.77	41.4
Approach		1329	1.7	0.656	13.5	LOS A	16.6	117.7	0.77	0.71	0.77	42.5
All Vehicles		2571	1.8	0.656	11.5	LOS A	16.6	117.7	0.65	0.59	0.65	44.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

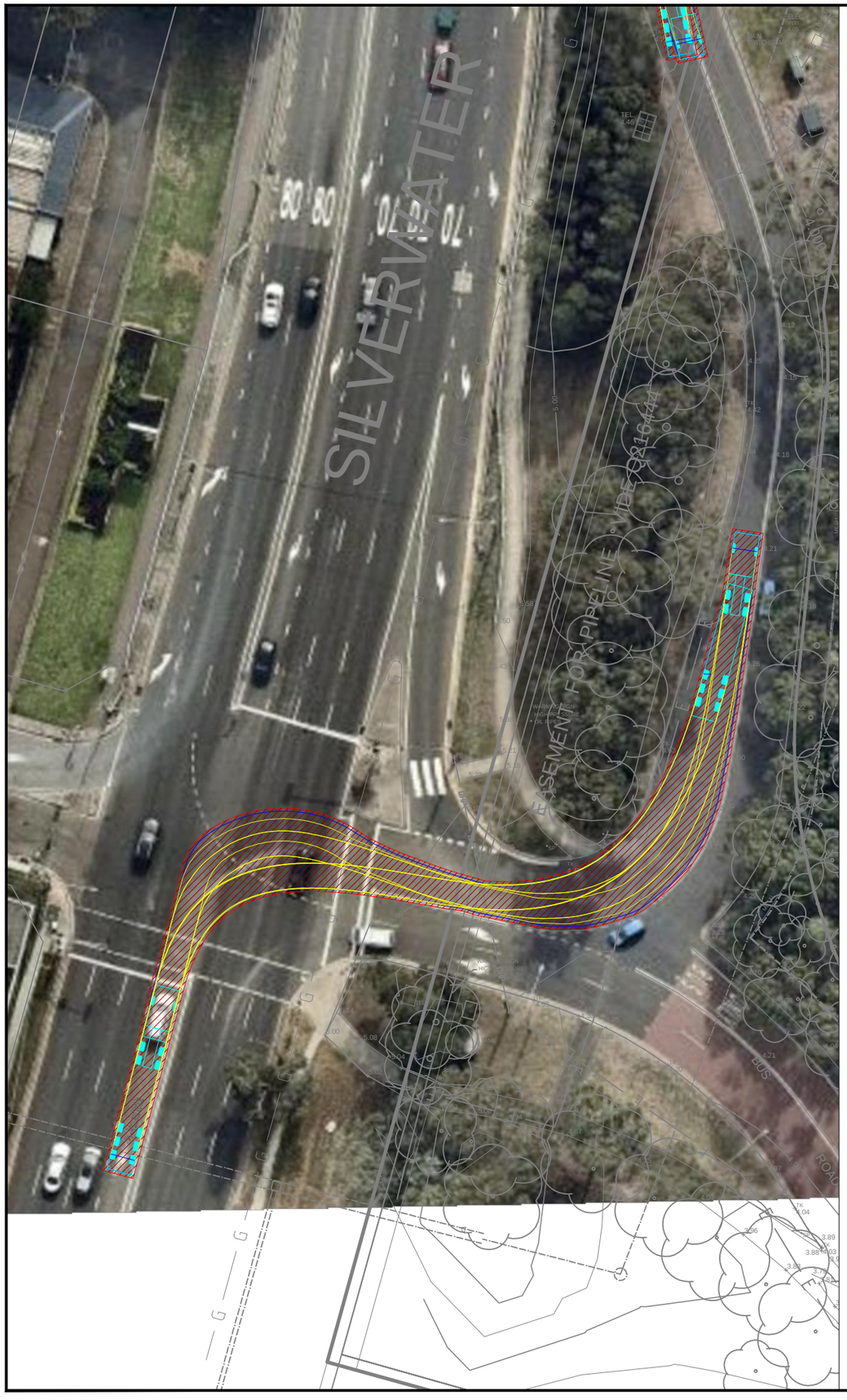
Movement Performance - Pedestrians

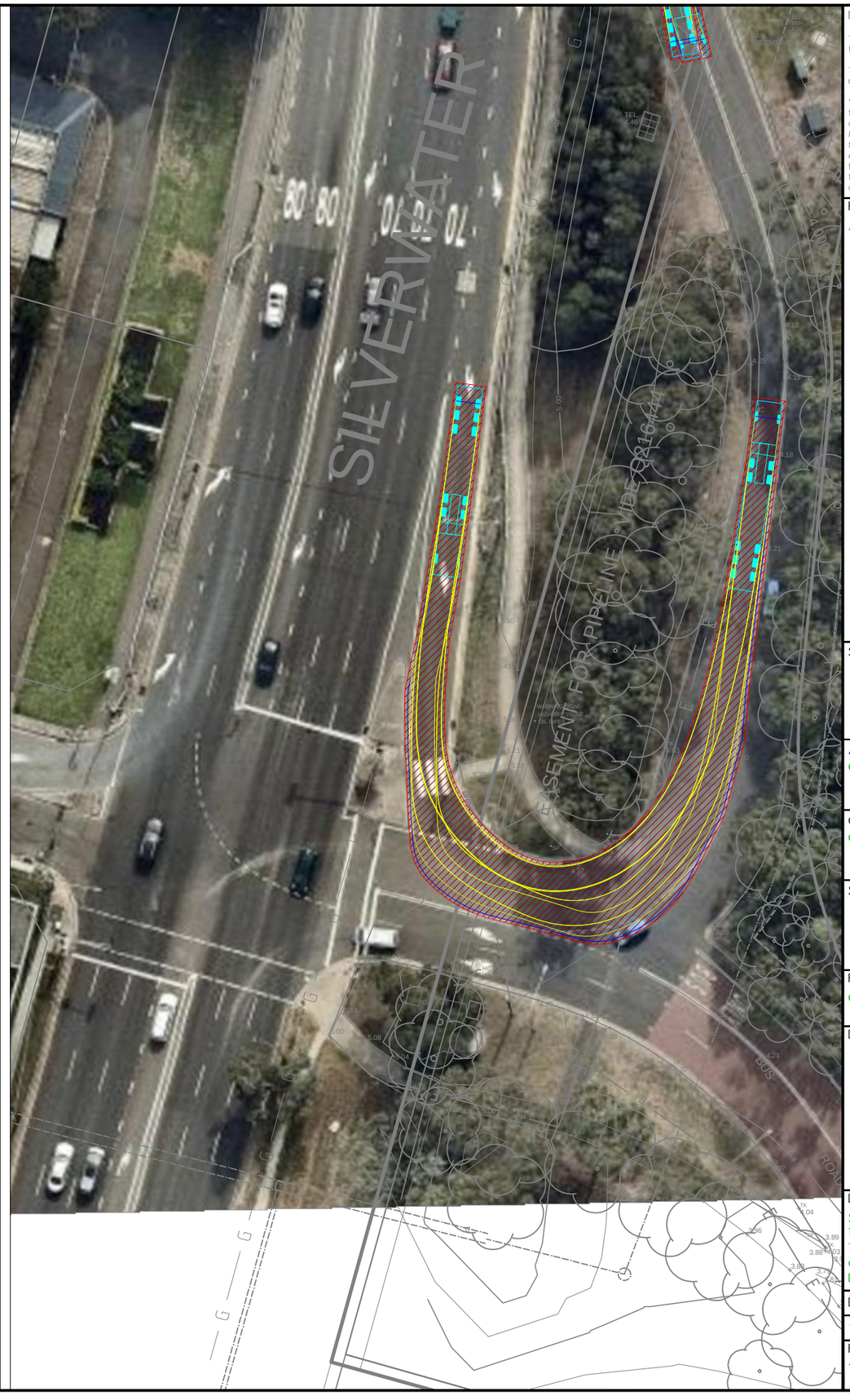
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	West Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92
All Pedestrians		53	29.3	LOS C			0.92	0.92

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.

APPENDIX C

Swept Path Analysis





Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (*AS/NZS 2890.1:2004 Parking facilities - Off-street car parking*, and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Truck Toutes	JP	25-09-19

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Cox Architecture

Client
Cox Architecture

Scale / Plan Orientation

0 5 10 15 20m

1:500 @ A3

Project Description
Cricket New South Wales Centre of Excellence

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

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Drawing Title
Swept Path Analsysis
19.0m Articulated Vehicle
Truck Route to Site - Intersection of Silverwater Road and Clyde Street
Left: Southern Approach Right: Northern Approach

Drawn:	Checked:	Date:
JP	KB	25 Sep 19

19.063d02v01 TRAFFIX Truck Routes.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
19.063	DA	TX.01	A

Notes:

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Rev.	Revision Note	By.	Date
A	Truck Routes	JP	25-09-19

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Cox Architecture

Client
Cox Architecture

Scale / Plan Orientation

0 5 10 15 20m
1:500 @ A3

Project Description
Cricket New South Wales Centre of Excellence

Drawing Prepared By

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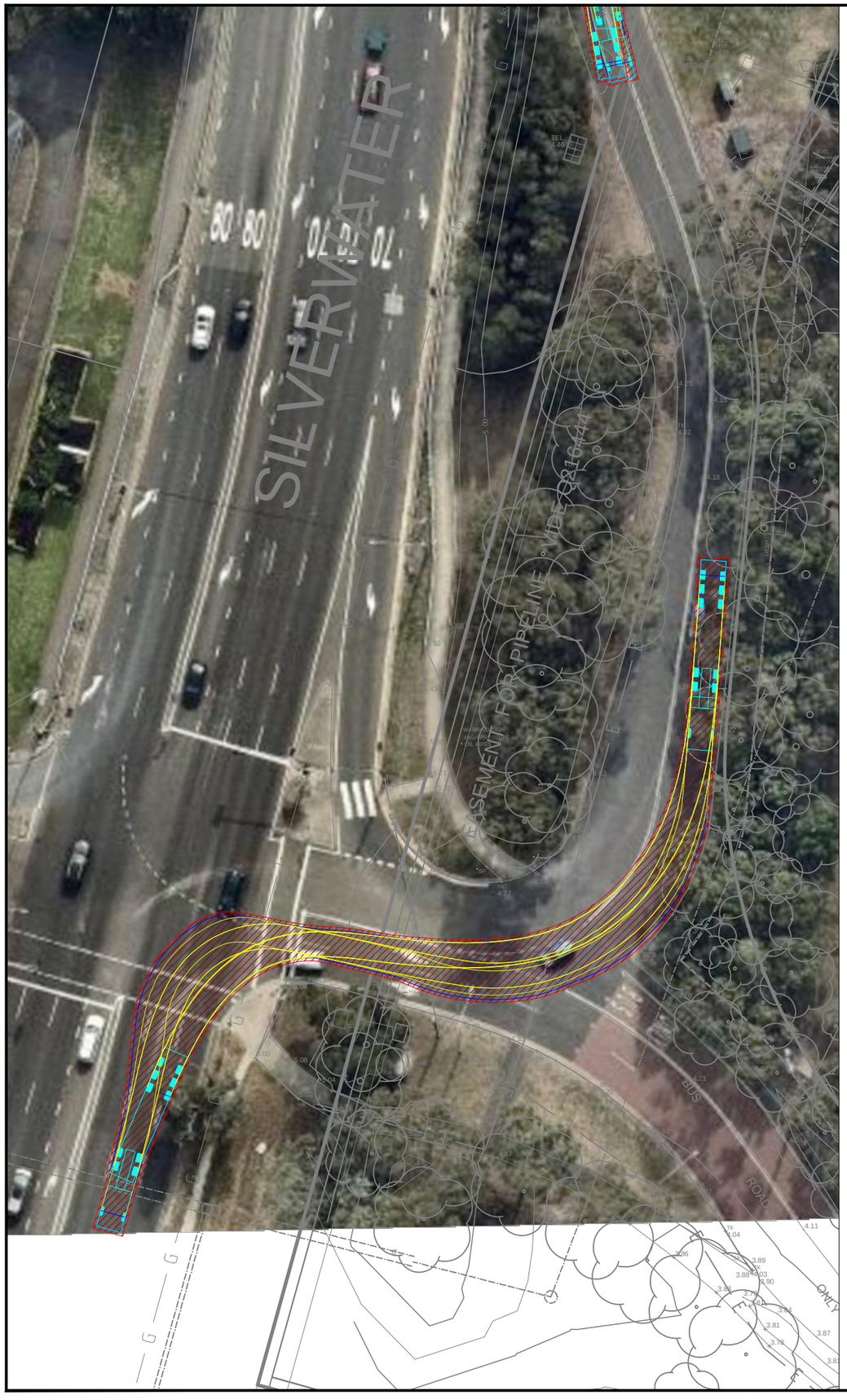
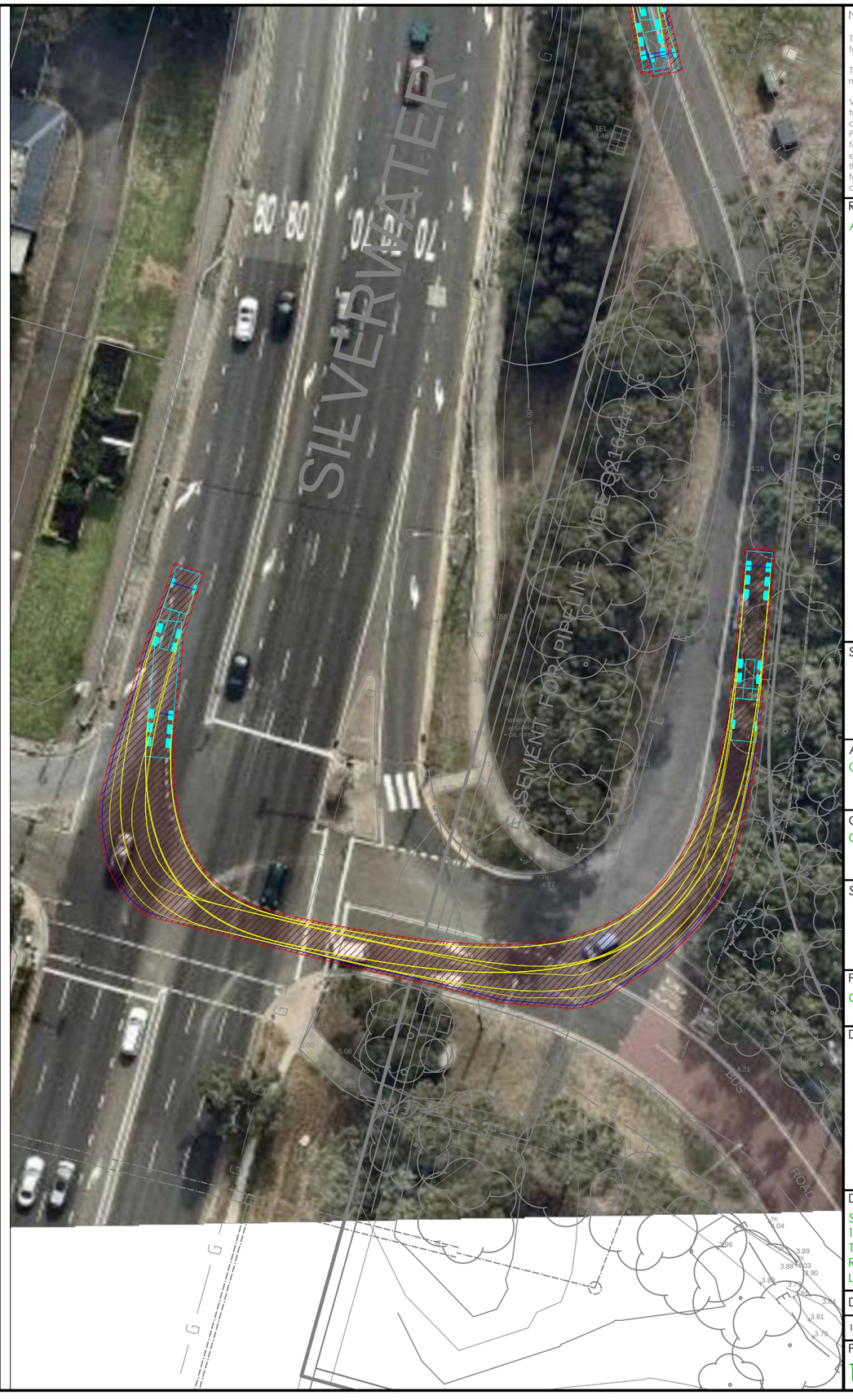
Drawing Title
Swept Path Analsysis
19.0m Articulated Vehicle
Forward Entry, Circulation and Exit to / from the Site

Drawn:	Checked:	Date:
JP	KB	25 Sep 19

19.063d02v01 TRAFFIX Truck Routes.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
19.063	DA	TX.02	A





Notes:

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Rev.	Revision Note	By.	Date
A	Truck Routes	JP	25-09-19

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Cox Architecture

Client
Cox Architecture

Scale / Plan Orientation

0 5 10 15 20m
1:500 @ A3

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Drawing Title
Swept Path Analysis
19.0m Articulated Vehicle
Truck Route from Site - Intersection of Silverwater Road and Clyde Street
Left: Egress to south Right: Egress to north

Drawn:	Checked:	Date:
JP	KB	25 Sep 19

19.063d02v01 TRAFFIX Truck Routes.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
19.063	DA	TX.03	A