Section 38 Campbell

Traffic Impact Assessment

January 2020

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Section 38 Campbell

Client: DOMA GROUP

ABN: 9360 2605 710

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7	14-June-2019	Revised Layout	Brendan Hogan Senior Transport Engineer	Original signed
8e	15-Jan-2020	Revised Layout and Access Arrangements review	Brendan Hogan Senior Transport Engineer	

Table of Contents

Executive Summary

DOMA Group (ABN 9360 2605 710) has briefed AECOM Australia Pty Ltd (ABN 20 093 846 925) to prepare a traffic impact assessment report for the proposed development of Block 4 Section 38, Campbell, ACT 2612.

The proposed development comprises of the 244 residential dwellings and some ancillary ground floor recreation area. This includes 117 apartments and 127 townhouses (95 in stage 1 and 32 in future stage).

The analysis and relevant discussion in this report led to the following conclusions:

- The parking requirement as per the code requirements for Stage 1 of the proposed development is 402 car spaces to accommodate the residential land use.
- The on-site supply exceeds the minimum requirements and is considered appropriate for the for the proposed development.
- The site has an expected traffic generation of up to 146 vehicles in the AM and PM peak hours.
- Based on a review of safety, capacity and constructability, the existing access arrangement for the site and recommended to be retained.
- There is adequate capacity in the surrounding existing local road network to accommodate the traffic generated by the proposed development. The additional traffic proposed on Limestone Avenue has a minimal effect on queuing and delays at the key intersections as demonstrated by the modelling developed.
- Provision is made for all access arrangements to operate safely and efficiently in compliance with AS2890.1.
- Although the right turn movement from the site has impeded sightlines, the crash data did not indicate that this movement is a high-risk movement.
- The provision for bicycle facilities will be met on site through secure parking areas consistent with the Bicycle Parking General Code.

1.0 Introduction

1.1 Background

DOMA Group (ABN 9360 2605 710) has briefed AECOM Australia Pty Ltd (ABN 20 093 846 925) to prepare a traffic impact assessment report for the proposed development of Block 4 and 5 Section 38, Campbell, ACT 2612.

It is proposed to build a residential development which will include 244 private residences.

1.2 Purpose of this Report

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

i. existing traffic and parking conditions surrounding the site;

ii. suitability of the proposed parking in terms of supply (quantum) and layout;

iii. service vehicle requirements;

iv. pedestrian and bicycle requirements;

v. the traffic generating characteristics of the proposed development;

vi. suitability of the proposed access arrangements for the site;

vii. the transport impact of the development proposal on the surrounding road network

1.3 References

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

- an inspection of the site and its surrounds
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- Environment and Planning Directorate (EPD) Parking and Vehicular Access Code (formerly ACTPLA)
- Environment and Planning Directorate (EPD) Bicycle Parking General Code (formerly ACTPLA)
- EPD (formerly ACTPLA) Residential Subdivision Development Code
- National Construction Code of Australia (NCC)
- RMS NSW Guide to Traffic Generating Developments (October 2002 Version 2.2)
- Traffic and car parking observations undertaken and as referenced in the context of this report
- Plans for the proposed development prepared by Stewart Architecture
- Other documents and data as referenced in this report
- Transport Canberra And City Services Standard Drawings.

2.0 Existing Conditions

2.1 The Site

The subject site is located on the existing Block 4 and 5 of Section 38 in Campbell. The site has an area of approximately 40,102 m^2 and is bounded by Block 4 Section 63 Campbell to the north and east, Limestone Avenue to the west and Campbell High School to the south. Location of the subject site is shown in Figure 1.

Figure 1: Site Location

2.1.1 Current Land Use

Currently the site contains the previously occupied CSIRO building headquarters. The site was abandoned in 2016 when the CSIRO were fully relocated to their Black Mountain facility. The existing buildings are located towards the northern boundary of the site. There is an at-grade car park located in the eastern corner of the site.

The site is currently used informally as a pick-up/drop-off location for the adjacent Campbell High School. School users access the site primarily from the access track located between Quick Street and the site, alternatively the site is accessed from the main access on Limestone Avenue.

2.2 Road Network

2.2.1 Adjoining Roads

2.2.1.1 Limestone Avenue

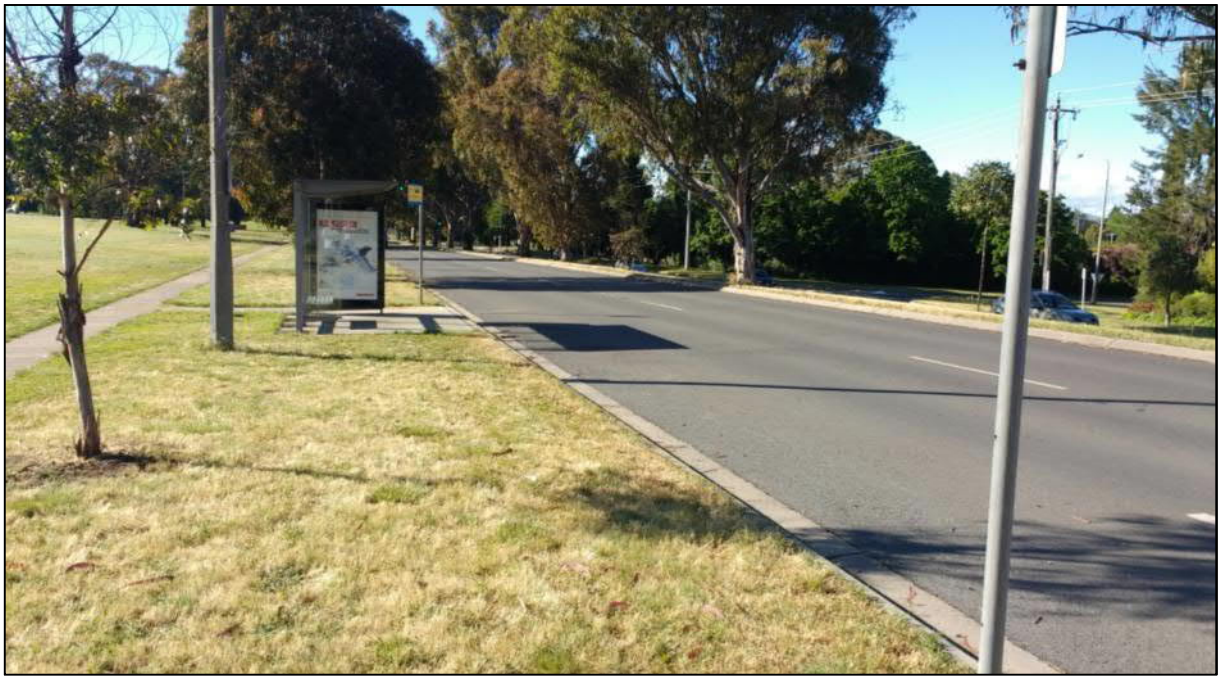


Figure 2: Limestone Avenue (adjacent site looking south)

Figure 3: Limestone Avenue (adjacent site looking north)

Figure 4: Limestone Avenue (right turn lane/ramp)

Limestone Avenue functions as an arterial road. It connects Ainslie, Braddon, Reid and Campbell in a north/south direction. It is primarily configured as two 2-lane carriageways approximately 7m in width. Within the vicinity of the site Limestone Avenue includes a left-turn deceleration lane and a right turn lane/ramp from the existing site access (Figure 4).

2.2.1.2 Existing Site Access

Figure 5: Existing Site Access (adjacent site looking west)

The existing site access is located off Limestone Avenue. The street is approximately 6.5m wide and consists of a single carriageway with a single lane in each direction. The street connects Limestone Avenue to the site car park and the existing laneway from Quick Street.

2.2.1.3 Quick Street

Figure 6: Quick Street (adjacent site looking east)

Quick Street is an access road which is located to the north of the site. The street is approximately 7.5m wide and consists of a single carriageway with a single lane in each direction. The road provides connectivity between Limestone Avenue and Hayley Street.

2.2.2 Surrounding Intersections

The following key intersections will be impacted by the proposed development and are located in the immediate vicinity of the site:

- Limestone Avenue / Ainslie Avenue (Signalised Intersection)
- Limestone Avenue / Euree Street / Treloar Crescent (Un-signalised Intersection)
- Limestone Avenue mid-block pedestrian crossing between – Euree Street and Coranderrk Street. (signalised)

2.3 Crash Analysis

A detailed analysis of the crashes that occurred near the site between January 2012 and December 2016 was undertaken to determine the risks associated with the existing access point and frequency of crashes in close proximity to the site. The key findings of the crash analysis are summarised as follows.

Within 100m of the existing site access:

- 12 crashes occurred in the 5 year period analysed.
- No crashes involved injury or fatality.
- All 12 crashes were rear end collisions.

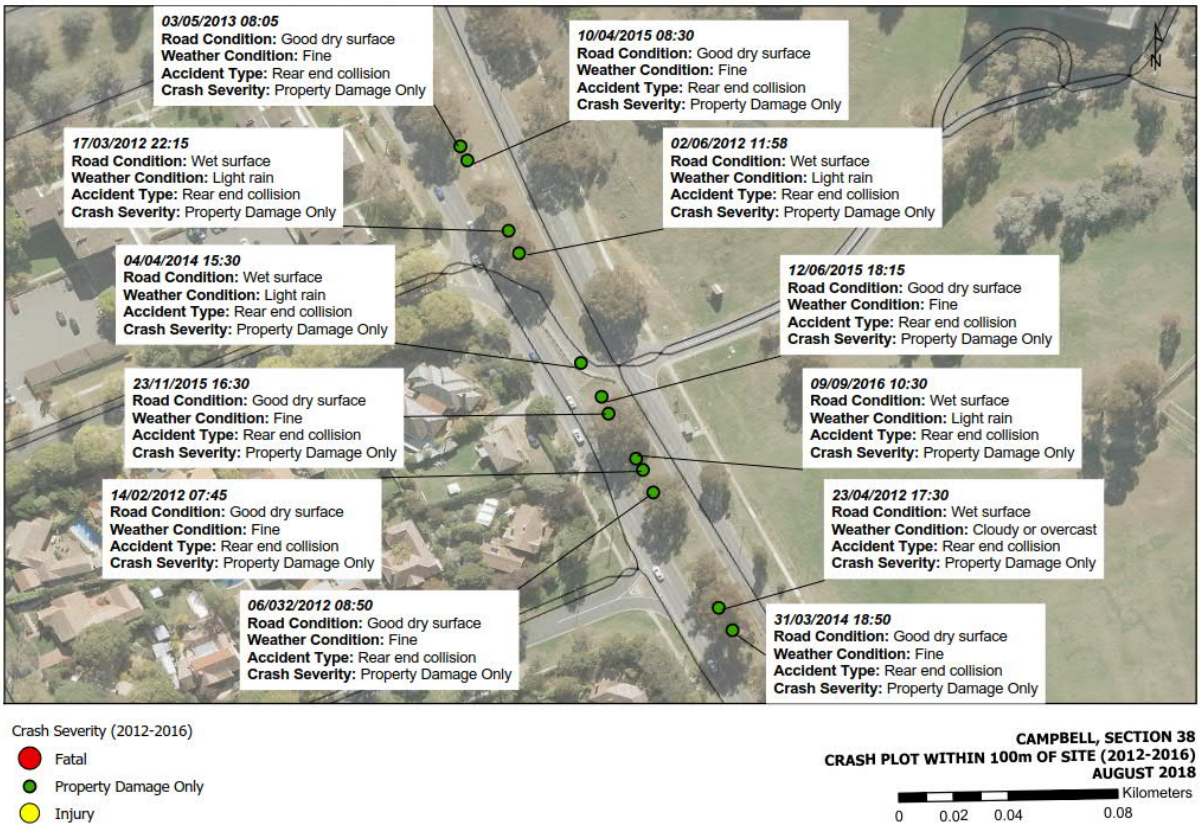


Figure 7: Crashes within 100m of the Existing Site Access (2012-2016)

None of the crashes appeared to be in relation to the right turn egress. These crashes would likely involve turning and through collisions, side swipe or weave crashes.

More broadly within the wider area the crash history was also reviewed. South of Ainslie Avenue to Treloar Crescent:

- 46 crashes occurred in the 5 year period analysed.
- 8 crashes involved injury, 0 involved fatality.
- 23 crashes occurred at the intersection of Limestone Avenue, Euree Street and Treloar Crescent.
- 23 crashes were rear end collisions (50%)
- 16 crashes were right angle collisions (35%)
- 6 of the 8 injury crashes were right angle collisions and occurred at the intersection of Limestone Avenue, Euree Street and Treloar Crescent.

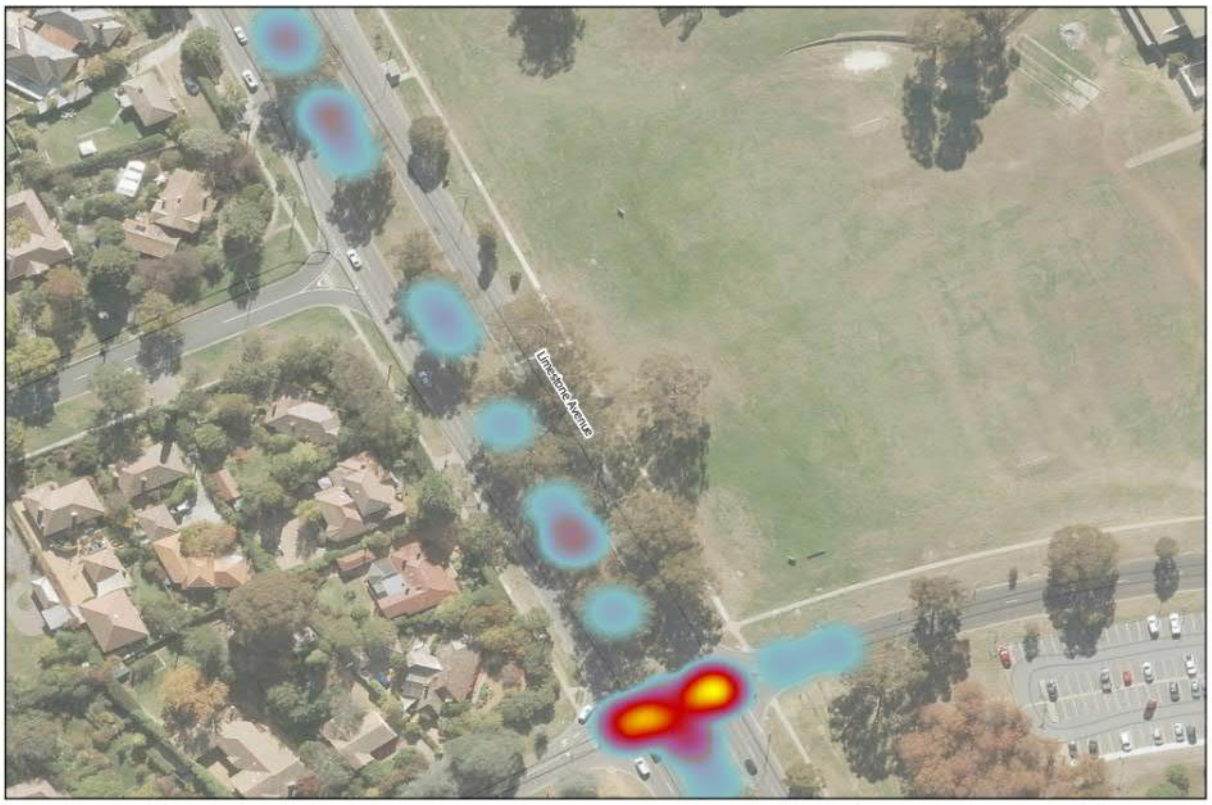


Figure 8: Crash Frequency/Density Distribution (2012-2016)

The crash data indicates that the majority of crashes analysed occurred at the intersection of Limestone Avenue, Euree Street and Treloar Crescent, which also included the majority of injury crashes.

The crash data also indicated that it is unlikely that the right turn movement from the existing site access caused any crashes. The data indicates that it is most likely that the crashes observed within 100m of the existing site access were rear-ending crashes as a result of the queuing caused by the adjacent signalised intersections. There is no clear correlation between the crash data and the right turn movement from the site entering Limestone Avenue northbound.

A full detailed crash breakdown can be found in Appendix A.

2.4 Traffic Volumes

Two data sources were used to determine the existing traffic volumes. These include:

- Traffic survey counts undertaken by Trans Traffic Survey Tuesday 15th November 2016 at the intersections of Ainslie Avenue / Limestone Avenue and Euree Street / Limestone Avenue / Treloar Crescent.
- SCATS data was also collected for the intersection of Ainslie Avenue / Limestone Avenue and the signalised pedestrian crossings between Coranderrk Street / Euree Street and between Euree Street and Anzac Parade.

These data sources were used to build a traffic model of the existing site adjacent traffic network (Figure 9).

Figure 9: Limestone Avenue Traffic Modelling Extents

The extents of the traffic model were determined based on the greatest potential impact of the proposed development on the site adjacent intersections. The existing volumes and observed operation of the Limestone Avenue / Ainslie Avenue intersection indicate that it will be a key concern with regards to future operation with the addition of the proposed development generated traffic. Similarly, the impacts of the development on the priority controlled intersection of Euree Street / Limestone Avenue / Treloar Crescent will be analysed to determine the extent of the impact of the proposed development.

2.5 Updated Traffic Counts

Updated SCATs data was collected on Tuesday 7th August 2018 for the intersection of Limestone Avenue / Ainslie Avenue and the Limestone Avenue midblock between Anzac Parade and Treloar Crescent. The data was compared with the previous traffic count data and showed negligible difference. Hence the previous background data was considered appropriate for use and the existing network was maintained.

2.6 Existing Intersection Operation

The operation of the existing intersections has been analysed using SIDRA INTERSECTION 6.1. This modelling package has been used to develop a linked intersection model to determine the performance of the existing intersection arrangements for both the AM and PM peaks. The weekend peak was not assessed as the network traffic is significantly lower during the weekend peak.

Average delay and Level of Service (LoS) are two of the key indicators of intersection performance. Table 1 below provides an explanation of the parameters of the LoS for SIDRA for signalised intersection and roundabout arrangements.

Table 1 SIDRA LOS Parameters

Level of Service	Average Delay / Vehicle (sec/veh)	Traffic Signals and Roundabouts
A	Less than 14	Good Operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; at signals incidents will cause excessive delays
F	>70	Roundabouts require other control mode

Table 2 below indicates the existing performance of the intersections analysed within the traffic network.

Table 2 Existing Intersection Performance

Intersection	Peak	Degree of Saturation	Average Delay (s)	95th Percentile Queue (m)	Level of Service
Limestone Avenue / Ainslie Avenue	AM	0.65	11	69	A
	PM	0.61	9	46	A
Limestone Avenue / Alambee Street / Site Access	AM	0.56	1	1	-
	PM	0.44	1	2	-
Limestone Avenue / Coranderrk Street	AM	0.56	1	1	-
	PM	0.44	1	2	-
Limestone Avenue Pedestrian Crossing	AM	0.80	6	100	A
	PM	0.71	4	48	A
Limestone Avenue / Euree Street / Treloar Crescent	AM	0.55	2	11	-
	PM	0.44	3	11	-

The results of the analysis above indicate that the existing operation of the intersection of Limestone Avenue / Ainslie Avenue is satisfactory. Similarly, the site access intersection currently operates with low volumes and low delays/queues. The model was calibrated using on-site peak hour queuing observations.

2.7 Car Parking

Currently the site possesses private at grade parking which was used to service the CSIRO. There are currently ~190 at grade parking spaces on the site. The existing parking area is currently used as an unofficial pick-up/drop-off facility for the adjacent school.

Other parking facilities in proximity to the site include the Campbell High School car park, on-street parking on Ainslie Avenue and on-street parking on Quick/Hayley Streets.

2.8 Public Transport

Campbell is an established area of Canberra with a frequent and reliable public transport network. The weekday public transport services for the site are shown in Figure 10.

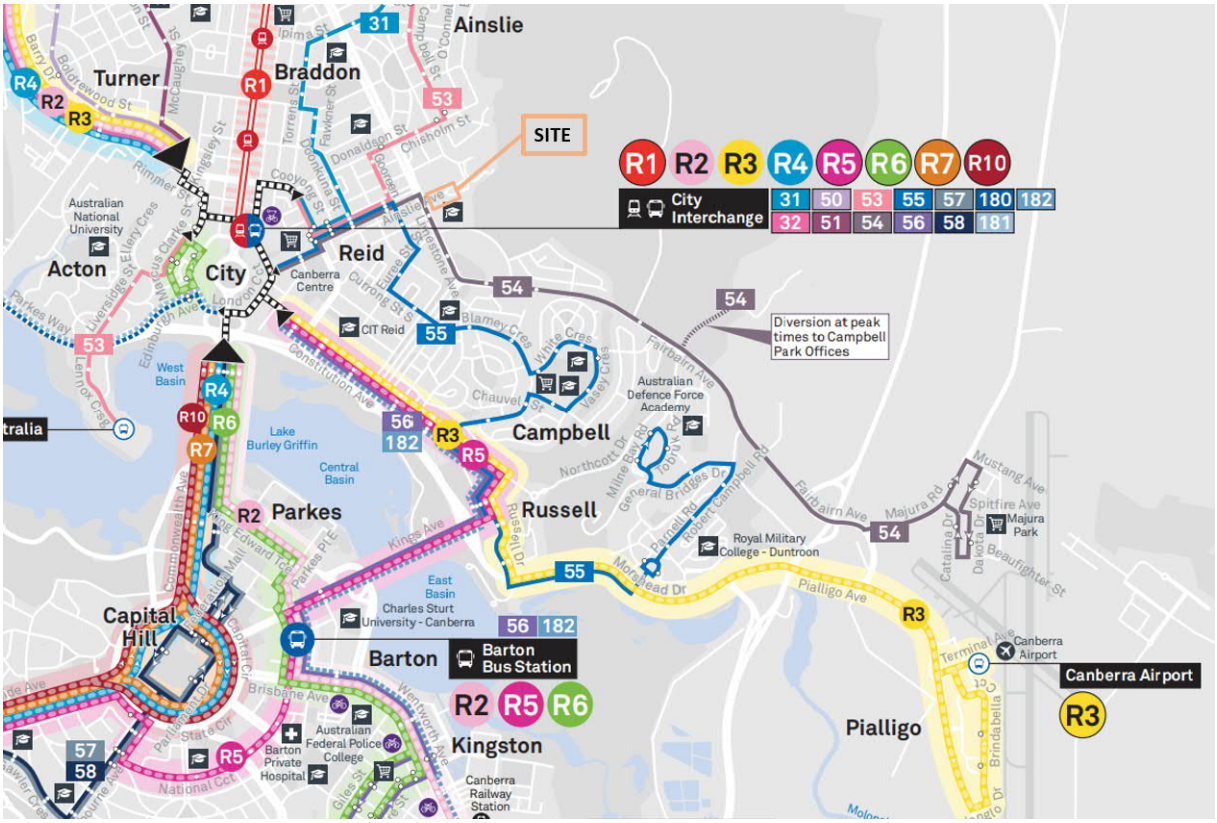


Figure 10: Transport Canberra Weekday Bus Network

There are two bus stops within in the immediate vicinity of the site located on Limestone Avenue northbound and southbound. The weekday routes that pass through these stops are the number 54 and 55 as indicated in Figure 10 above. The following tables outline the routes and frequency of the weekday bus services in this location.

Table 3: Transport Canberra Weekday Bus Network

Route #	Route Description	Frequency On peak		Frequency Off Peak
		AM 8am to 9am	PM 5:30pm to 6:30pm	12pm to 1pm
54	City Interchange, Campbell Park (Peak) Majura Park	30 minutes	30 minutes	60 minutes
55	City Interchange, Reid, Campbell, Russell, Duntroon	30 minutes	30 minutes	60 minutes

The total number of buses that access the site adjacent bus stops during the peak periods is relatively low compared to the frequency of buses in other locations in inner-Canberra suburbs.

Figure 11 indicates that the existing public transport accessibility for the site is moderate. An increase in frequency of the services along Limestone Avenue would improve this service level.

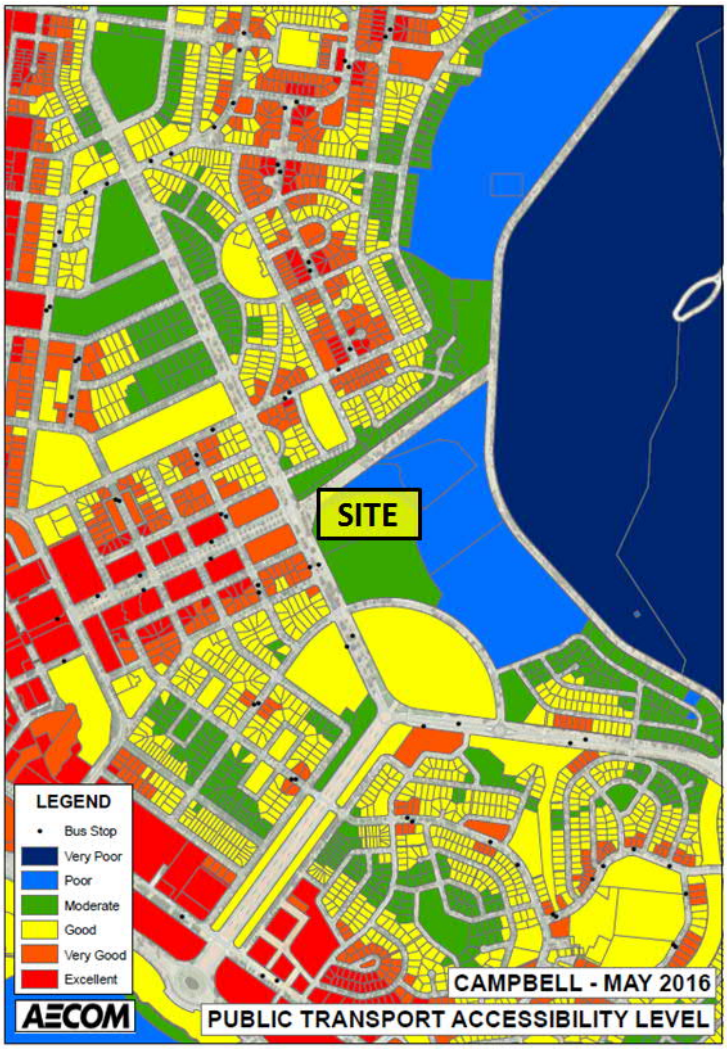


Figure 11: Campbell Public Transport Accessibility Level

2.9 Pedestrian and Cyclist Facilities

Public footpaths follow the verges of the streets surrounding the site allowing easy access for both pedestrians and cyclists. On-road cycle facilities are located on Fairbairn Avenue and at the Ainslie Avenue / Limestone Avenue intersection adjacent to the site. Pedestrian crossing facilities are located at the Ainslie Avenue / Limestone Avenue intersection and the dedicated signalised pedestrian crossing on Limestone Avenue adjacent to Campbell High School. Figure 12 indicates the existing pedestrian and cyclist facilities within proximity of the site.

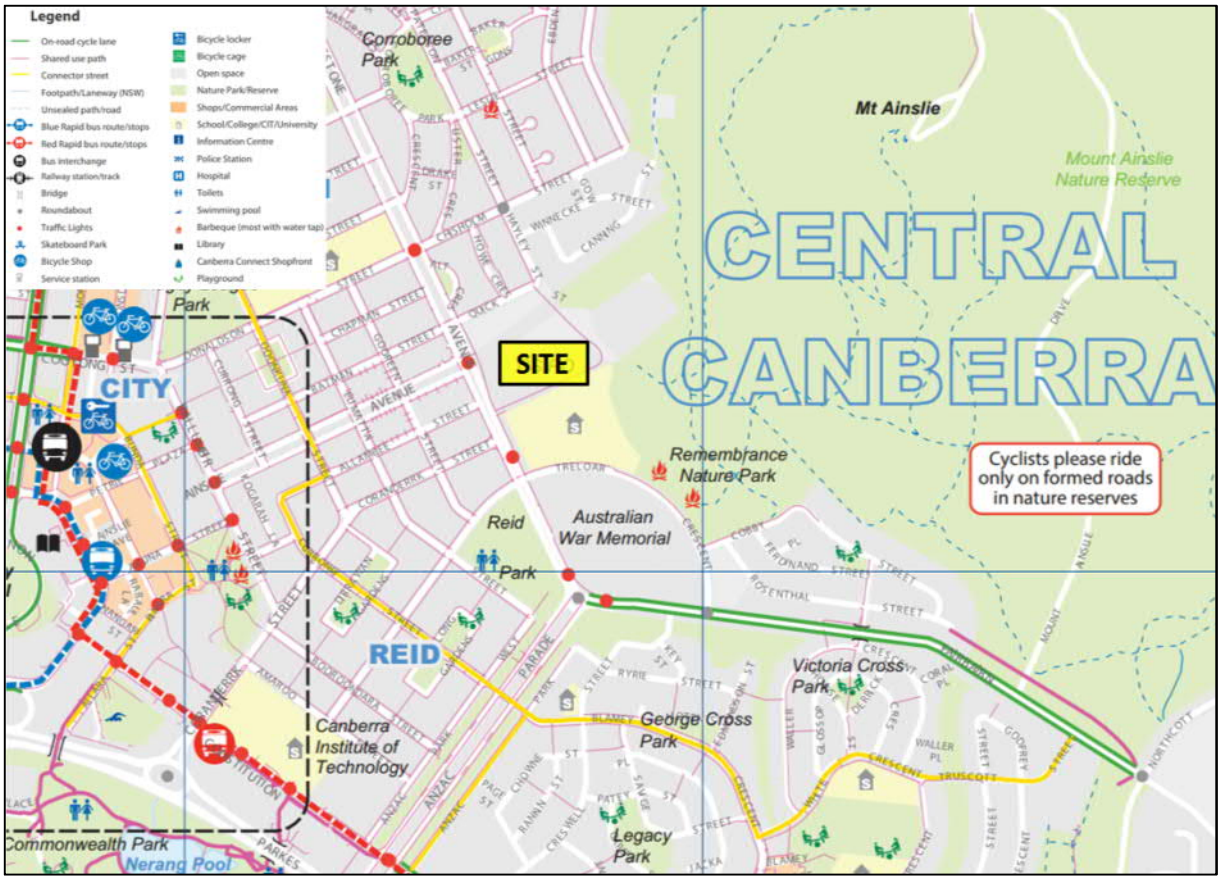


Figure 12: Pedestrian and Cyclist Facilities

3.0 Development Proposal

3.1 Proposed Development

It is proposed to remove the existing old CSIRO building and car park that currently occupies Block 4, of Section 38, Campbell. This will be replaced with the proposed development which consists of the following:

- 244 residential dwellings including apartments and townhouses
- Recreation Area for the use of residential guests (considered as ancillary residential use)

The development will consist of 117 apartments and 127 townhouses (95 in stage 1 and 32 in future stage). The ground floor of the west building is proposed to be made up of a recreation area.

The layout of the proposed development is shown in Figure 13.

Figure 13: Proposed Development

3.2 Vehicle Access

Primary vehicle access is proposed to be provided from Limestone Avenue. The existing Limestone Avenue access is a left-in only access from Limestone Avenue southbound. The existing egress from the site is also proposed to be retained which consists of a both left and right out movements. The right-out from the site involves a graded egress ramp to access Limestone Avenue northbound. The right-out movement from the site was reviewed in terms of safety and operation.

3.2.1 Options Assessment and Suitability Consideration

Several options were investigated in relation to the access considerations for the site. A number of factors were considered in determining the preferred access arrangement for the site, including distribution, network impacts, safety and active travel movements. Table 4 summarises the key options assessed and considerations behind retaining the existing site access arrangements noting the advantages and disadvantages of the various access configurations.

Table 4 Site Access Justification

Access Arrangement Layout	Advantages	Disadvantages
Retain Existing Layout (left-in, left-out, right-out)	Existing layout with adequate visibility and level of safety not expected to decrease with proposed use. The crash data analysed from the previous 5 years does not indicate any history of crashes as a result of this movement. The platooning of vehicles from the signalised pedestrian crossing upstream provides acceptable gaps in traffic for vehicles entering Limestone Avenue. The stop control and two staged movement of the right turn out separates and manages potential conflict risk.	No right-in movement available which limits some traffic distribution from the site. Right-out movement approach angle to Limestone Avenue northbound at a low angle.
Left-in Left-out Only	Minimisation of potential vehicle conflicts at access point.	Reduction of vehicle distribution options Likely result in an increase to U-turns at adjunct intersections resulting in greater safety and capacity impacts Possibly increase in rat-running in local streets.
Signalised – all movements	Allows priority movement of vehicles in all directions. Allows for priority pedestrian movements in close proximity to the site.	Close proximity to two existing sets of traffic signals on Limestone Avenue limiting network efficiency and increasing congestion and delays. Introduces another hold point in the network which may result in additional accidents, particularity rear end crashes Existing levels and grades in the Limestone Avenue median geometrically restrict the safe design and construction of this movement. Road surface and pedestrian movements would be very steep

Unsignalised – all movements	Improves vehicle distribution to/from the site.	Highest risk of conflict due to uncontrolled right-turn in/out movements. Not ideal to introduce new vehicle movements on a major distribution road such as Limestone Avenue. Existing levels and grades in the Limestone Avenue median geometrically restrict the safe design and construction of this movement. Impacts to and possibly removal of significant trees in the vicinity of the intersection.

It was determined that although the approach angle of the right turn movement is not ideal for sight distance for entering Limestone Avenue, the right turn movement outbound is considered appropriate and presents a good outcome from a safety and capacity perspective. Further considerations that inform our recommendation are discussed below.

Distribution of traffic and the traffic network would be impacted if the right-turn outbound movement were to be banned from the site. This would likely result in an increase in northbound vehicles undertaking a U-turn at the next intersection on Limestone Avenue / Treloar Crescent. U-turn movements have a greater safety risk than straight through traffic. An increase in U-turn movements for vehicles trying to head north would add additional conflict at an existing accident hot-spot location. This risk could be mitigated by retaining the existing two-staged right-turn out movement. Further, retention of the right-turn outbound movement maintains a good level of distribution from the site. In future there may be capacity issues at the Anzac Parade roundabout and greater distribution options would only be beneficial. The stop control and two staged movement of the right turn separates reduces potential conflict risk.

Being residential, the expected road users will be are aware of the operation of this access arrangement. Although the approach angle is not ideal for sight distance there is no anticipated increase in safety risk to road users as a result of retaining this access. Limestone Avenue is straight and fairly flat at that location and there is visibility back long Limestone Avenue to view oncoming traffic and judge appropriate gaps. Vehicles using the existing outbound movement have additional gaps in traffic due to the platooning of vehicles as a result of the upstream signalised crossing. This is especially prevalent in the AM peak where the pedestrian call frequency of these midblock signals is high. This aligns well with the expected peak use of the site egress movements in the AM peak. Further, vehicles using the existing outbound movement have sufficient distance to safely merge across Limestone Avenue and turn left of Ainslie Avenue.

Similarly, the location of the traffic signals at the intersection of Ainslie Avenue and Limestone Avenue creates vehicle platoons on Limestone Avenue southbound during the peak periods. This platooning is located only 150m north of the egress from the site and therefore creates regular, adequate platoons for vehicles exiting the site. Vehicles will be able to safely exit both left and right from the site due to the platooning created from the upstream traffic signals.

Heavy vehicle movements from the site are predominately expected to be waste vehicles. It is proposed that these vehicles access the site using a left-in left-out movement.

Pedestrian safety, connectivity and active travel were key concerns when determining the preferred access arrangement. The existing signalised pedestrian crossings on Limestone Avenue south of the site and at the intersection of Limestone Avenue / Ainslie Avenue provide sufficient connectivity to the Mercure hotel and towards the Canberra Centre.

3.2.2 Right-out Geometry Consideration

As part of the access analysis, AECOM investigated several alternate options for the right-out geometry. The geometry options considered, and relevant comments are summarised in Table 5 below.

Table 5 Right-out Geometry Considerations

Right-out Arrangement	Related Issues
Median Break at 90 Degrees to Limestone Avenue	• A straight across options had grade issues due to the steep slope creating an unsafe downward sloping approach grade • The design may encourage vehicles to utilise the median break in the opposite direction • There is an existing private driveway located directly adjacent to where this median break would be located • Small storage capacity (1 to 2 vehicles) • Small offset to the existing northbound bus stop on Limestone Avenue
Extended Lane to Create a Parallel Merge on Limestone Avenue Northbound	• Very low approach angle, drivers forced to look over their shoulder in short merge lane • Queuing from Ainslie Avenue intersection is likely to impact the merge lane, likely to result in rear-end or side swipe crashes • There are potential weaving issues from vehicles merging and crossing exiting Allambee Street • Tree removal required to accommodate this option • Inadequate merge taper length
High Angle Right-out Turn	• A high angle approach has grade and alignment issues due to the median width • Would require an alignment in a reverse S shape which is not a conventional or safe vehicle movement • Tree removal required to accommodate this option • Potential conflict with Allambie Street ingress

From the considerations of the alternate right-out options above it is clear that the issues that would be created as a result of an alternative option would create a significant and unnecessary reduction in safety for road users. The current right-out arrangement, although not ideal for sight distance, is a frequently used access arrangement with a low crash history, therefore it is recommended to retain this arrangement, opposed to introducing a new right-out arrangement with inherent associated risks.

3.2.3 Alternate Access Points

Access off Quick Street /Hayley Street was considered as an alternate access point to site servicing however it has multiple constraints that impact on it being achieved resulting in it being non viable. Primarily this is the fact that it is a non gazetted road. Issues with connections, habitat, land ownership and legibility were also problematic.

A road link at that part would also induce more traffic on the local Ainslie road network. Conflict with the school children and passive surveillance could also become and issue.

3.2.4 Heavy vehicle access

Heavy vehicle access is proposed to be provided from Limestone Avenue. The proposed roundabout arrangement at the end of the access from Limestone Avenue will be developed to ensure that the road width is appropriate for the manoeuvring of a waste vehicle. The waste carting diagram and truck service manoeuvring is shown in Figure 14. Waste services will be collected from Building A. Other heavy vehicles servicing the recreational facilities will also access the site as described above.

Figure 14: Proposed Development Waste Services Movements

3.3 Vehicle Access Distribution

As outlined above, maintaining in the current access arrangements and not introducing additional conflict points or restrictions to the network is considered the most appropriate access treatments for the site. The absence of a right turn ingress movement into the site will result in some minor redistribution of inbound vehicles to accommodate the left-in only ingress movement from Limestone Avenue. The two primary locations where eastern traffic (traffic that would have typically utilised the right turn in movement) would approach the site are from Fairbairn Avenue and from Parkes Way. The likely rerouting options from these origins are shown in Figure 15.

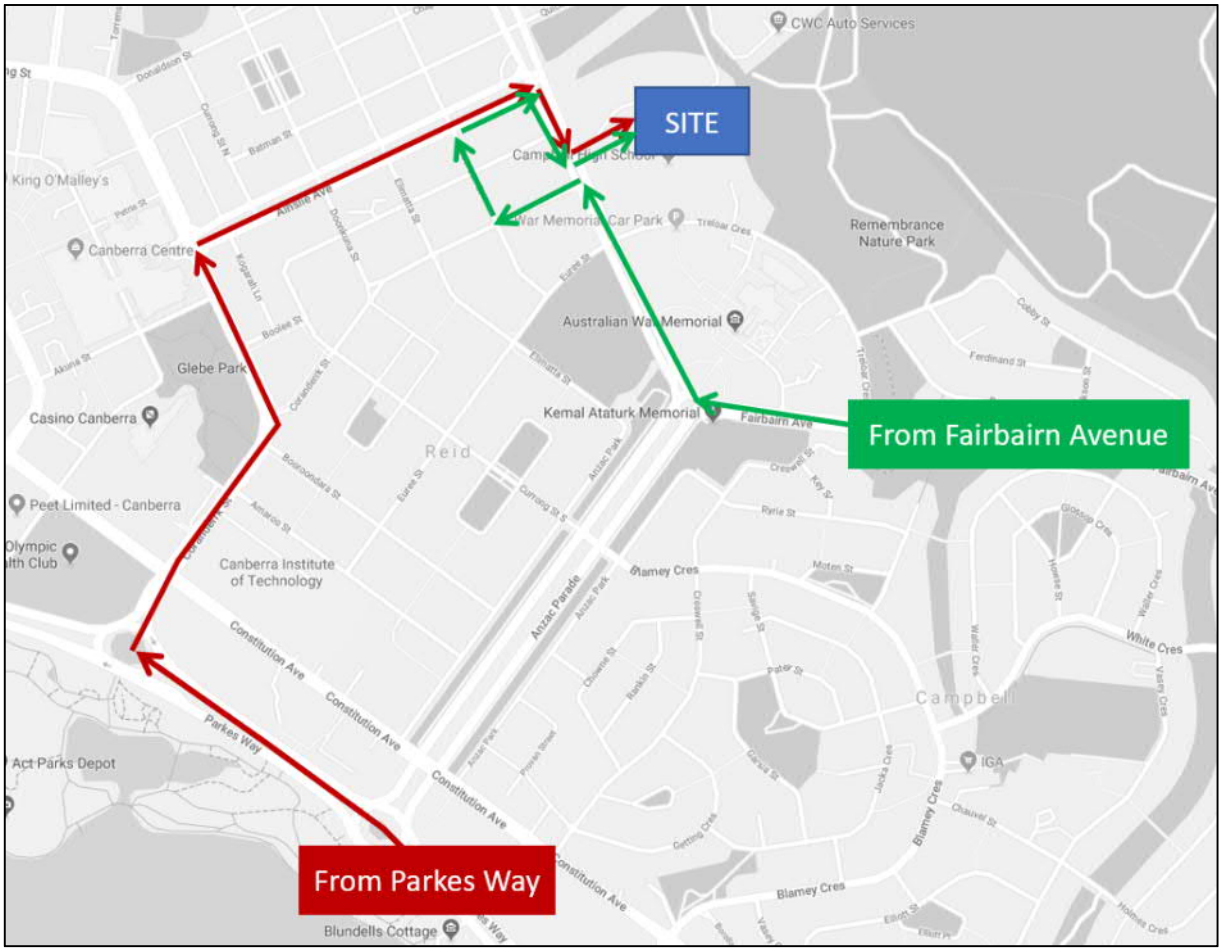


Figure 15: Ingress Right-in Redistribution Routes

Drivers accessing the site from the east will typically choose to route via Parkes Way if they have the option of this route. The only origin area in the ACT that would be likely to access the site from Fairbairn Avenue is Campbell based traffic. According to ABS journey to work data, this would account for only 6% of all traffic that would access the site. The traffic generation analysis indicates that the total inbound traffic for the development is 30vph in the AM peak and 115vph in the PM peak. Therefore, the potential number of vehicles that would be required to reroute from Fairbairn Avenue is 2vph in the AM peak and 7vph in the PM peak.

3.4 Car Parking

The proposed overall carpark provision for Stage 1 of this development is 575 car parking spaces. A breakdown of spaces includes:

- 168 parking spaces for apartments
- 337 parking spaces for townhouse
- 69 parking spaces for visitors

3.5 Pedestrian and Bicycle Facilities

Path and pedestrian linkages are proposed to be provided throughout the development. The key linkages will be located on the north and south boundaries of the site providing east-west pedestrian connections through the site. Hard stand and paved driveway areas will also be used for pedestrian connectivity.

The proposed pedestrian paths and linkages are shown in Figure 16 below.

The suitability of the proposed pedestrian and bicycle facilities is discussed in Section 6.0.

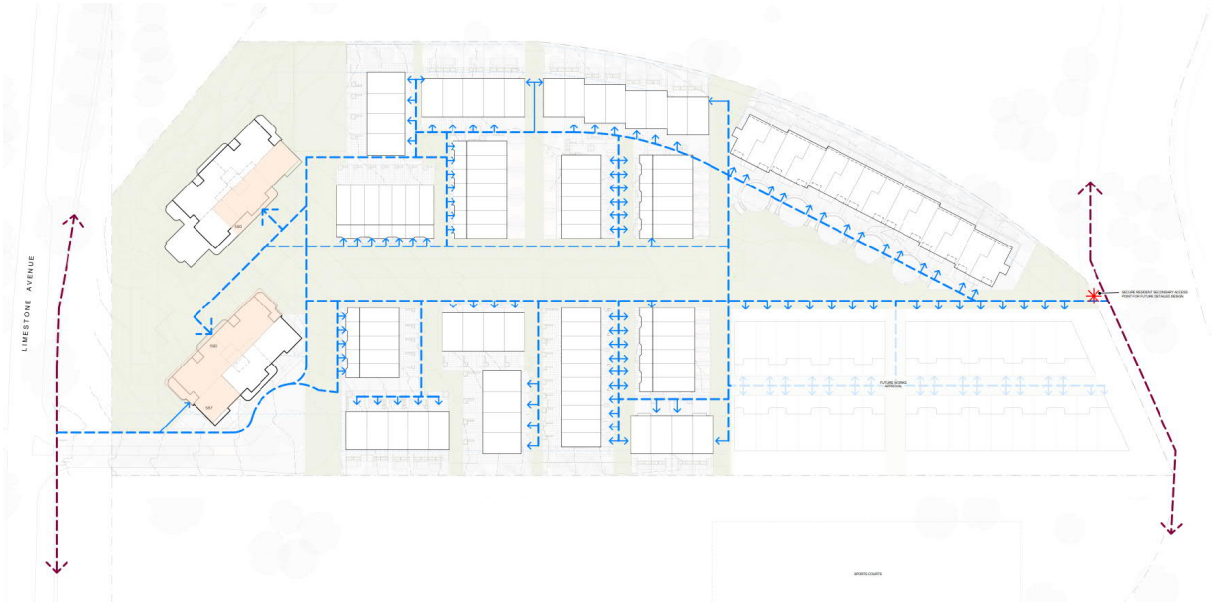


Figure 16: Proposed Pedestrian Paths and Linkages

3.6 Active Travel Paths

The active travel paths for pedestrians from the site to the nearest bus facilities are shown in Figure 17. The southbound bus stop on Limestone Avenue is located directly out the front of the proposed development (<50m from the site). Pedestrian access to the bus stop from the site is via the existing pedestrian footpath. The northbound bus stop on Limestone Avenue is located opposite. Pedestrian access to this bus stop is via either the signalised intersection of Limestone Avenue / Ainslie Avenue to the north of the site or via the signalised pedestrian crossing on Limestone Avenue to the south of the site. The shortest option to access this bus stop is via the signalised pedestrian crossing on Limestone Avenue. For dwellings located in the proposed development, the walking distance will vary between 275m to 605m, depending on the starting/finishing location within the site. Generally, the preferred maximum walking distance from a dwelling to a bus stop is 400m in the ACT, with distances greater than 800m considered to be outside of an acceptable walking distance. The required walking distance to the furthest bus stop for this development is under 400m for approximately 50% of the development dwellings, and under 800m for the remaining 50% of the development dwellings. The proximity of the existing bus stops to the site are considered to be an acceptable walking distance and the existing infrastructure for the active travel paths to/from these facilities are considered acceptable.

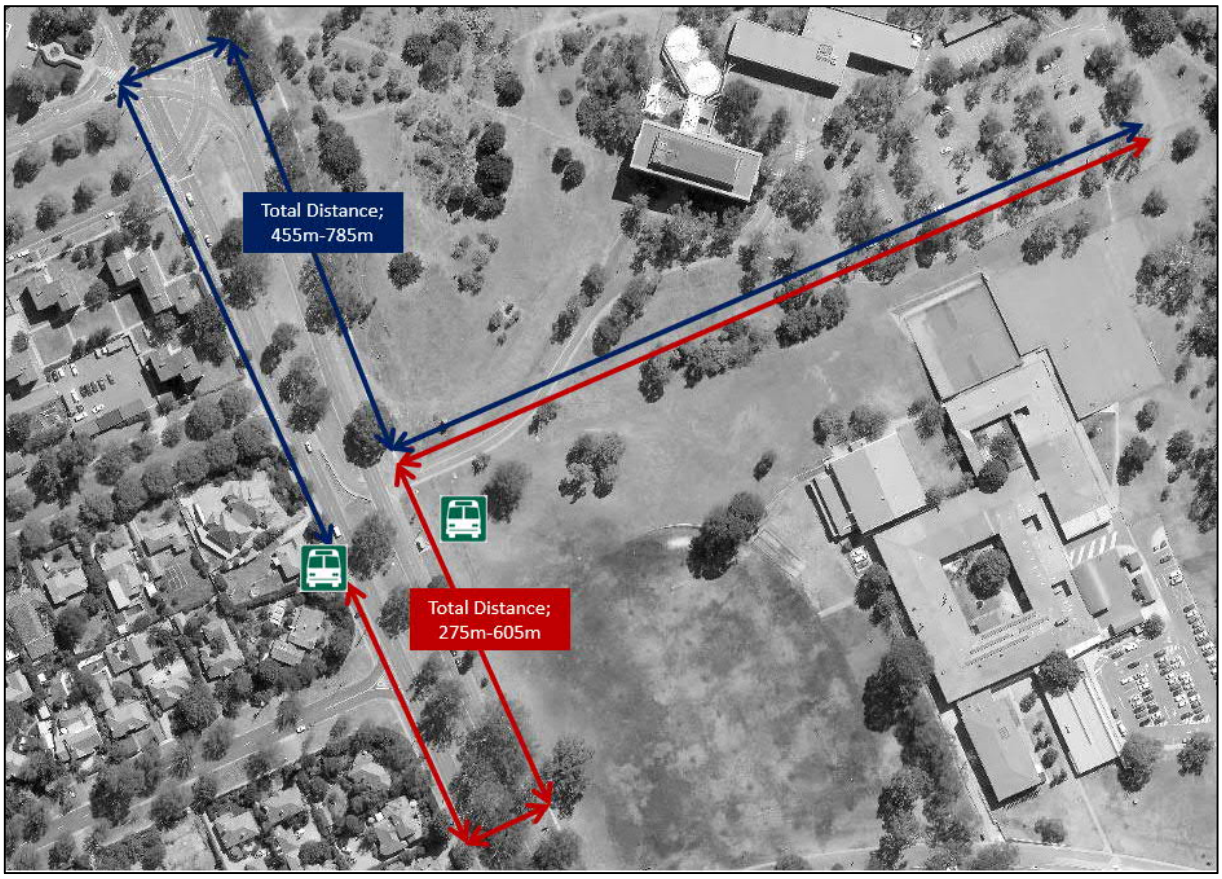


Figure 17: Existing Pedestrian Access to Public Transport Stops

4.0 Impact of the Development

4.1 Traffic Generation

The traffic generation for the development was determined based upon rates from the Environment and Sustainable Development Estate Development Code.

A trip rate of 0.6 vehicle trips per dwelling in a peak hour was applied to the proposed residential development as per the Estate Development Code.

A summary of the trip generation for both Stage 1 and Stage 2 of the development is as follows:

Table 6 Trip Generation

Land Use	Rate	Yield	Peak Hour Traffic Generated
Residential	0.6	244	**146 vph**

As the site is not currently occupied, the traffic generated by the site is considered to be negligible and was not considered in the traffic distribution modelling calculations undertaken.

Previous analysis of the site undertaken in 2016 resulted in higher yields and traffic generation. The site was therefore tested and modelled at a higher traffic generation rate than the current proposed use as listed above by approximately 100 vph. This provides further confidence in the future operation of the traffic network as a result of the proposed development.

4.2 Trip Distribution

The trip distribution assigned to the site generated traffic was determined primarily using the 2016 Australian Bureau of Statistics (ABS) journey to work data and TCCS household travel survey. The modified Journey to Work (JTW) data, treating Campbell as the destination, for the key areas within the ACT as follows:

- Belconnen 33%
- Civic 13%
- Gungahlin 20%
- Woden/Tuggeranong 34%

The right turn movement from the proposed development as per the JTW data was considered to be higher than the most likely scenario considering the existing volume of vehicles on Limestone Avenue and the subsequent queues. For this reason, 50% of the likely right turning vehicles were redistributed to turn left onto Limestone Avenue and utilise ANZAC Parade or go through Reid to access the City. This redistribution is a reasonable representation of driver behaviour in this situation where they alter their routes to achieve the lowest perceived delays.

The egress from the site should be retained as a single exit lane to avoid the potential conflict associated with the sight lines of the left turn vehicles being impeded by the right turning vehicles exiting the site.

The inbound/outbound splits for the trip distribution for the site land uses are summarised Table 7.

Table 7 Inbound and Outbound Splits

Land Use	Peak	INBOUND	OUTBOUND
Residential	AM	20%	80%
	PM	80%	20%

The above inbound/outbound percentage splits were applied to the site generated traffic within the network shown in Figure 1.

In addition to the traffic volumes generated from the site background traffic growth was reviewed for the broader network. This was undertaken by reviewing the Canberra Strategic Transport Model (CSTM) forecasts for 2016 and 2031. The review showed a 2.3% and 4.3% increase in traffic along Limestone Avenue for the AM and PM peaks respectively. This growth was then applied across the network. A summary of the resultant future traffic volumes in the road network surrounding the development in the AM and PM peak periods is shown in Figure 18 and Figure 19.

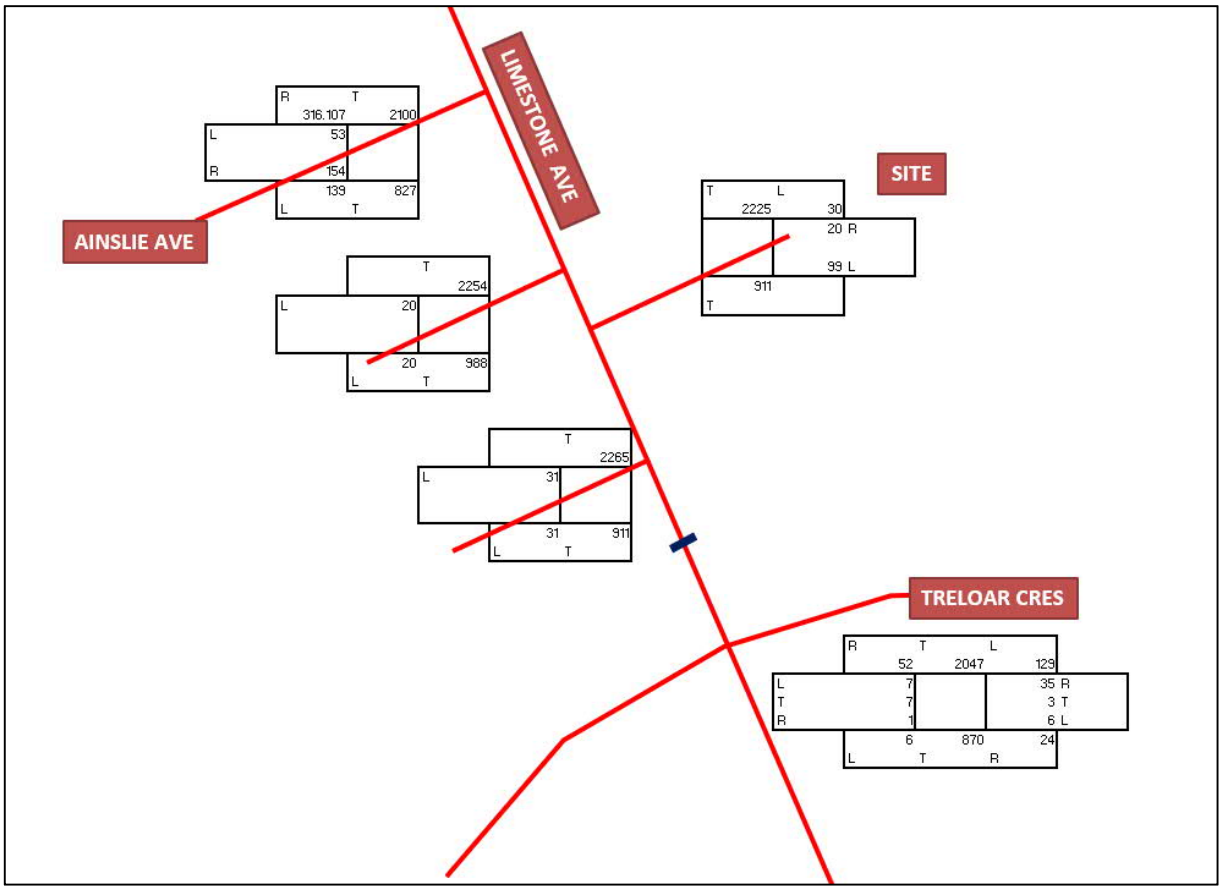


Figure 18: Future AM Peak Hour Turn Volumes (2031 with development)

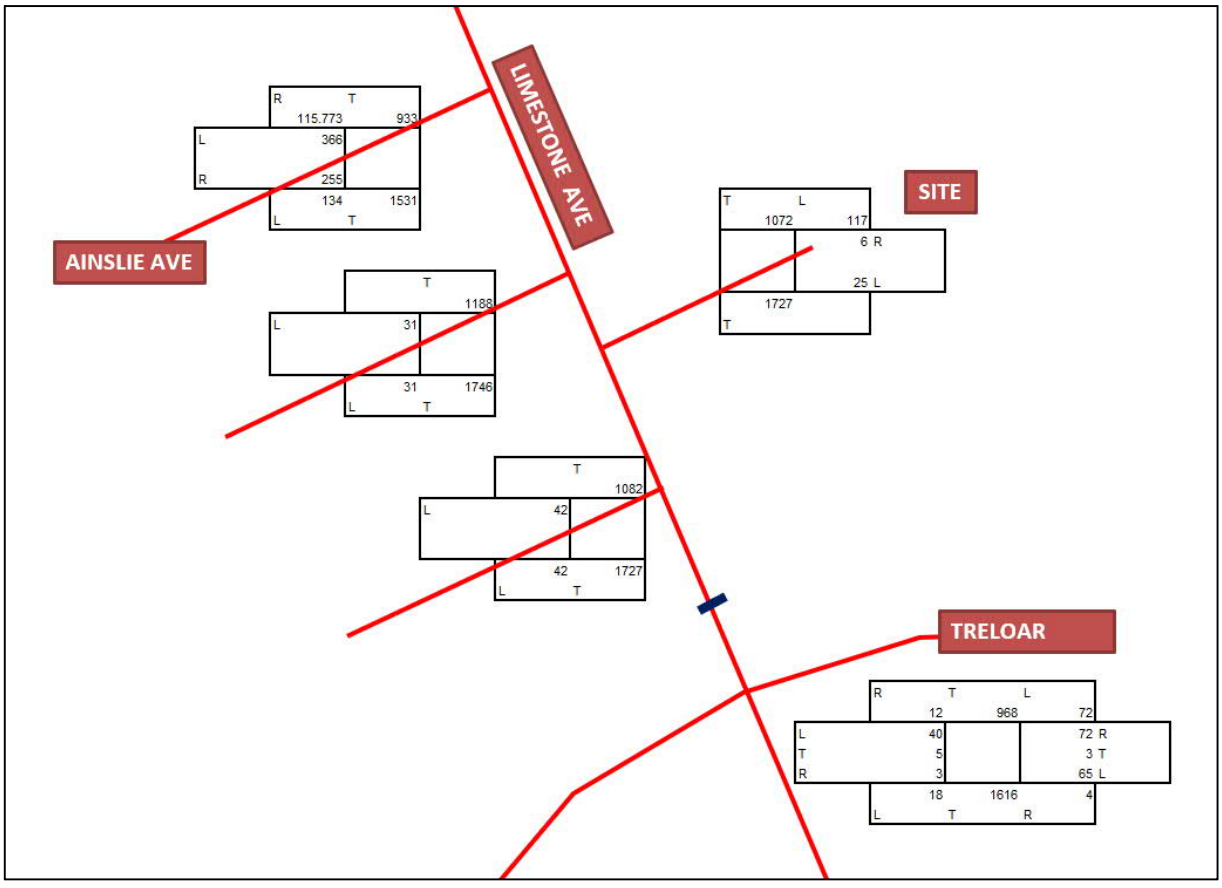


Figure 19: Future PM Peak Hour Turn Volumes (2031 with development)

4.3 Intersection Impacts

The traffic generation from the proposed development and traffic distribution determined as part of these modelling works were used to determine the additional traffic volumes to be placed on the local traffic network adjacent to the site.

4.3.1 Future Intersection Performance

The expected traffic generation of the proposed development was analysed in SIDRA Intersection 8.0. A summary of the results can be seen in the table below. The signalised mid-block crossing has been assessed in relation to the traffic movement and operation of adjacent intersections. This includes the expected crossing demand and call frequency. When called, the green pedestrian movement holds through traffic which creates additional gaps in the through traffic movements to assist with turning movements for downstream side roads.

The intersection of Limestone Avenue / Euree Street / Treloar Crescent was modelled as a 4-way priority controlled un-signalised intersection. The median was given allocation for 4 vehicles to queue; two through and two right.

The operation of signalised intersection of Ainslie Avenue and Limestone Avenue accounted for pedestrian movements crossing in the phase timings.

The SIDRA analysis undertaken indicates that the proposed development will have a marginal negative impact on the operation of the site adjacent intersections. This was represented by a maximum increase in queuing of 18 m and a maximum increase in delays of 1 s. The increase in queuing is directly related to the outbound movement from the site where the delay is only increased by 1 s.

The intersection with the worst delays, queues and level of service was the intersection of Limestone Avenue and Ainslie Avenue. This intersection will operate at an average LOS A in the AM and PM peak periods. The side roads of this intersection operate at lower level of service (D/E/F) however this is representative of the existing intersection operation and the proposed development has only a minor negative impact on the operation of the side roads. The increases in delays and queuing as a result of the development on this intersection were minimal, as indicated above, signifying that the development has only a minor negative impact on the operation of this intersection. The reduction in the performance of this intersection is considered to be a minor overall performance reduction.

For more detailed results see Appendix B.

Table 8 Future Intersection Performance

Intersection	Peak	Degree of Saturation	Average Delay (s)	95th Percentile Queue (m)	Level of Service
Limestone Avenue / Ainslie Avenue	AM	0.67	11	76	A
	PM	0.64	10	60	A
Limestone Avenue / Alambee Street / Site Access	AM	0.57	1	40	-
	PM	0.46	1	1	-
Limestone Avenue / Coranderrk Street	AM	0.58	1	1	-
	PM	0.46	1	2	-
Limestone Avenue Pedestrian Crossing	AM	0.83	7	118	A
	PM	0.76	5	58	A
Limestone Avenue / Euree Street / Treloar Crescent	AM	0.58	2	13	-
	PM	0.50	3	13	-

4.4 Access Arrangements

An analysis of the internal access arrangements has been undertaken. The internal queuing for the site will be dependent on the internal site gate located adjacent to the first internal roundabout as shown in Figure 20. The access point is over 50m inside the site and allows for vehicle that turn into the site accidently or vehicles that are not permitted access to easily turn around utilising the roundabout. The offset and the ease of turn around by the roundabout is considered adequate and lot likely to produce any queuing back to the broader road network. Further discussion is provided below.

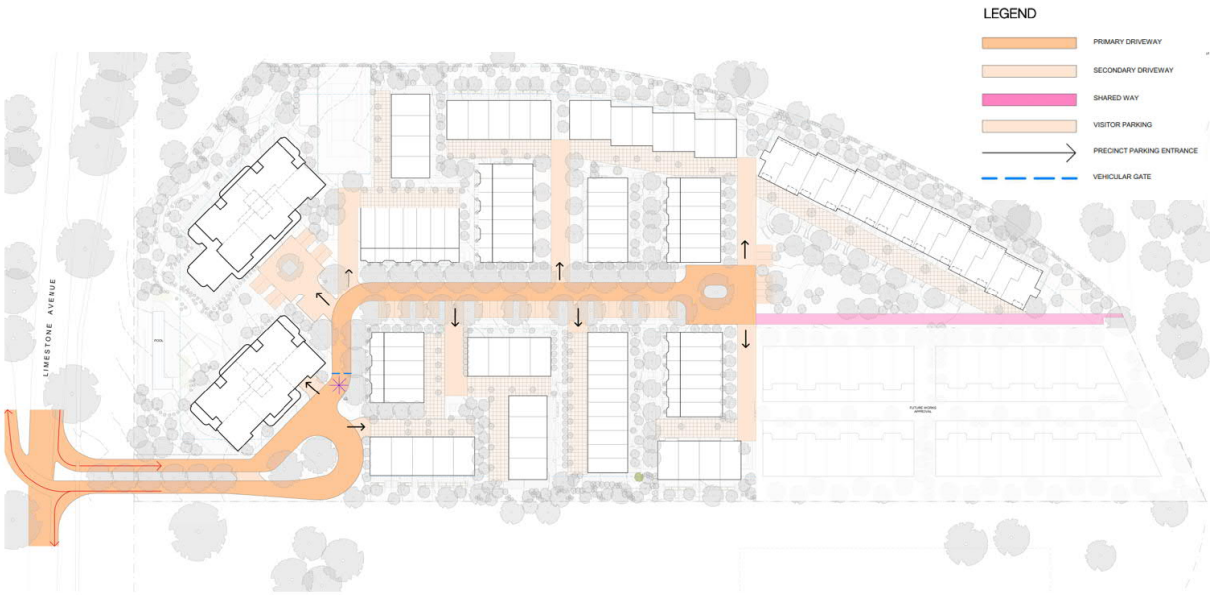


Figure 20: Vehicle Access Paths

Table 9 outlines the queuing determined at the control point of the main access shown above. It has been assumed that the service rate of the gate is 10 seconds per vehicle. The queuing analysis shown has been determined using a probability of less than 2% chance of occurrence, i.e. there is a less than 2% chance of more than the number of vehicles queued arriving at the control point at any one time.

Table 9 Control Point Queuing

Location		AM		PM	
		Ingress	**Egress**	**Ingress**	**Egress**
Vehicle Access	Peak Arrival Rate (vph)	29	117	117	29
	Peak Queue (vehicles)	1	3	3	1

As the gate will likely operate as a shared control for both the inbound and outbound movements from the site, the peak internal queuing of the proposed development has been determined to be 3 vehicles during both the AM peak egress and PM peak ingress. The internal road network has capacity to accommodate this queuing within the site. Even using the conservative approach for ingress timing, this control point will have no impact on the local road network.

Any vehicle that accesses the site by mistake including heavy vehicles will be able to use the roundabout to turn around safely and efficiently.

5.0 Car Parking

5.1 Car Parking Requirements

The car parking provision requirements for various types of developments are detailed in the Environment, Planning and Sustainable Development Directorate (EPSDD) (formerly ACTPLA), Parking and Vehicular Access General Code. The code indicates the following parking rates for residential developments in the Campbell area:

- 1 space per 1 bedroom dwelling;
- 1.5 spaces per 2 bedroom dwelling;
- 2 spaces per 3+ bedroom dwelling;
- 0.25 spaces per apartment for visitors (townhouse visitor parking inclusive in existing parking area).

The proposed development site is currently zoned as Community Facilitates and is in the process of rezoning application to allow residential development. Residential parking for this development has been determined using residential zone rates from the Parking and Vehicular Access General Code.

Table 10 outlines the expected peak demand from the development as per the rates above for Stage 1 of the development.

Table 10 Parking Breakdown Stage 1, S38 Campbell

Apartment Type	Number	Rate	Parking Requirement
1 BR	29	1	29
2 BR	92	1.5	138
3+ BR	91	2	182
SUB-TOTAL			***349***
Visitor*	212	0.25	53
TOTAL			**402**

The parking supply for stage 1 of the development is 558 resident spaces. This includes 337 spaces for townhouses where 3 and 4 bedroom units have 2-4 spaces in under croft and garage parking and 168 spaces for apartments in the building basements.

There are 69 dedicated visitor parking spaces throughout the site, which is 16 spaces above the required 53 spaces. There are also additional provisional parking areas where town house visitors can park in the driveway out the front of the town houses they are visiting or utilise additional on-site supply. Some of these provisional parking areas are shown in Figure 21. These locations are considered suitable and do not impact the safety or amenity of the internal road network. These ancillary parking areas combined with the dedicated visitor parking provide suitable supply for the expected demand and are considered appropriate.

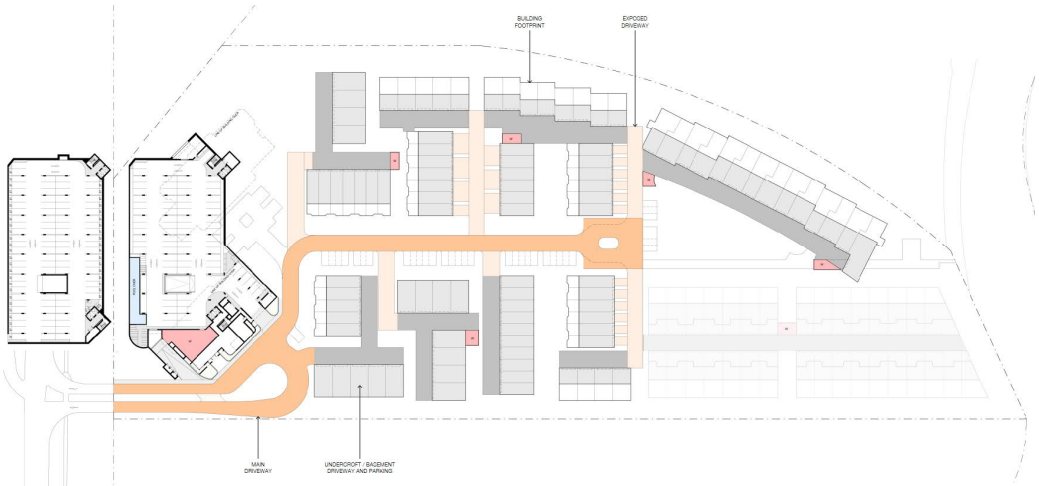


Figure 21 Site Parking Areas

5.2 Other Factors

5.2.1 Accessible Parking Provision

Accessible parking will be provided within the parking areas of the development in accordance with the ACT Parking and Vehicular Access General Code that requires 3% of spaces to be provided to be compliant for accessible parking for the public parking spaces. In this proposal, that amounts to 2 spaces (excluding any proposed adaptable housing requirements), to accommodate the accessible requirements for the residential development. The exact location and implementation of these spaces will be refined through the continuing design resolution process.

5.2.2 Motorcycle / Small Vehicle Parking Provision

The parking provision for motorcycles within the site must meet the requirements of the Code. The Code indicates that the site must supply three dedicated spaces per 100 public car spaces. This equates to 2 motorcycle parking spaces. This can be achieved in the proposed design with several areas which could be suitable.

5.3 Car Parking Layout Review

The proposed layout and operation of the basement parking arrangements have been reviewed at a high level in terms of safety and feasibility. The car park review was undertaken on the PDF in reference to AS2980.1 Off-street Car Parking.

The assessment of the car park included a review of the following aspects of the design:

- Bay and aisle width
- Internal queuing
- Car park bay dimensions
- Ramp gradients

The review indicated that the proposed design meets the required standards and will operate in a satisfactory manner. For the town houses, the allocation of visitor spaces as tandem to the resident spaces is considered acceptable and similar to what happens at many sites currently where visitors may park in front of the resident garage or carport.

6.0 Sustainable Transport Infrastructure

6.1 Bicycle End of Trip Facilities

The Bicycle Parking General Code for the ACT was used to determine the required supply of bicycle parking spaces.

According to the code the following supply of bicycle parking spaces must be provided:

For Residential units:

- 1 space per apartment and;
- 1 space per 12 apartments after the first 12 apartments for visitors

A summary of how these supply requirements are applied to both Stage 1 and Stage 2 of this development can be seen in the table below.

Table 11 Bicycle Parking Space Supply Requirements Summary

Land Use	Yield	Employees and Residents			Visitors and Guests			Total
		Spaces per unit	Class	Subtotal	Spaces per unit	Class	Subtotal	
Residential Units	244	1 per apartment	1, 2	*244*	1/12 after 1st 12	3	*20*	**264**

The bicycle parking spaces for the townhouses proposed for the development will be contained within the townhouses individual parking area.

Bicycle lockers are proposed to be located at the head of residential parking spaces where appropriate. The exact supply of lockers will need to be confirmed during subsequent design stages; however the intent of suppling bicycle parking as shown is supported. The type of bicycle parking to be supplied is Class 1 (lockable) bicycle storage.

The proposed supply option will meet the requirements of the Bicycle Parking General Code.

6.2 Walking and Cycling Network

The adjacent walking and cycling network is well established and good site connections from the proposed development to the existing adjacent infrastructure will be provided. A summary of the existing infrastructure that the site will be connecting into is shown in Figure 22.

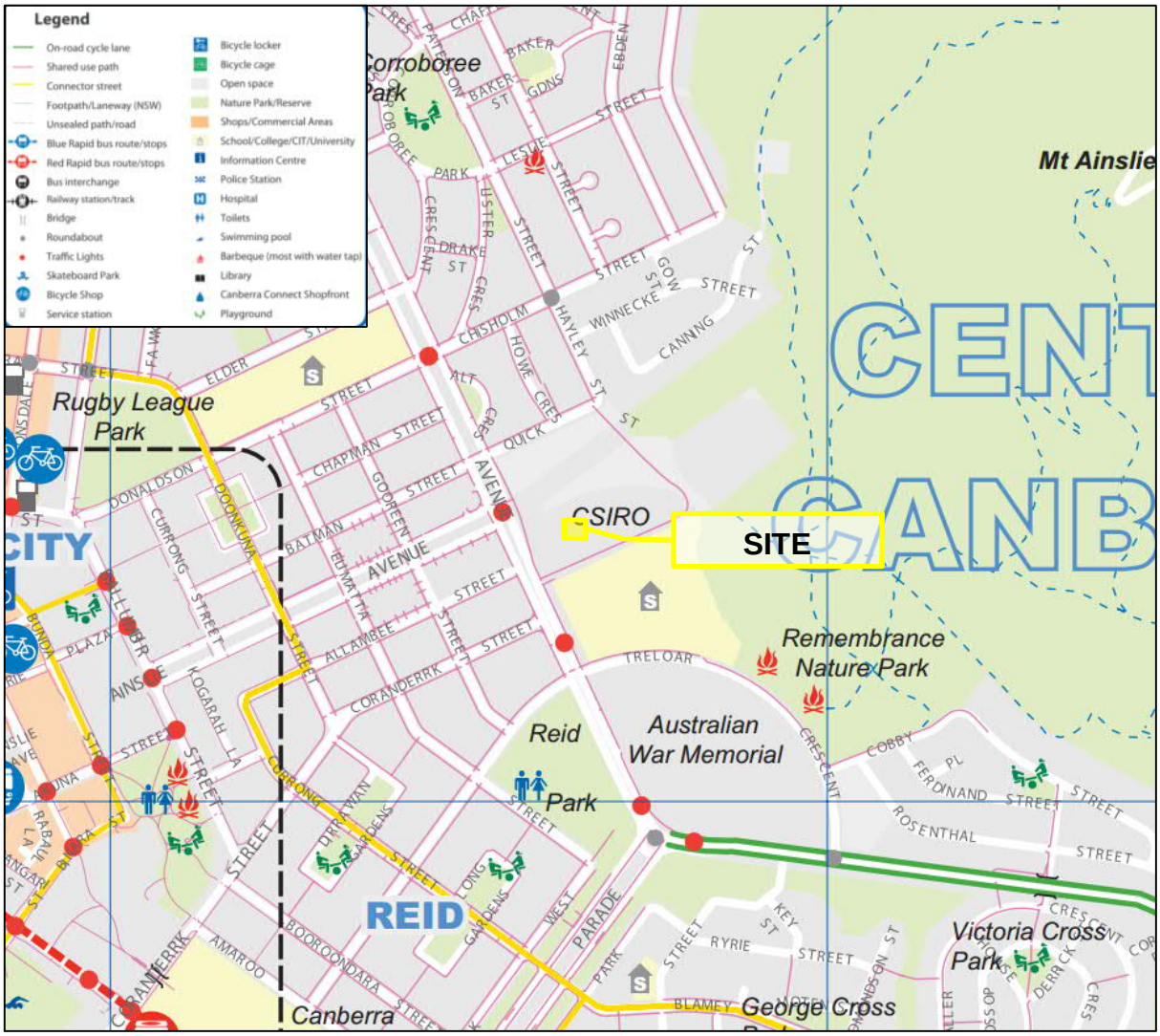


Figure 22: Walking and Cyclist Facilities

6.3 Walkability Score

Depending on the intersection phasing and pedestrian delays crossing Limestone Avenue and Cooyong Street the subject site is about 15-20minutes walk from the Canberra Centre. The subject site has a walk score of 51[1] out of 100. This score indicates that the site is somewhat walkable and that some errands can be accomplished on foot. Points are awarded based on the distance to amenities in each category. Amenities within a 5 minute walk are given maximum points. A decay function is used to give points to more distant amenities, with no points given after a 30 minute walk. Walk Score also measures pedestrian friendliness by analysing population density and road metrics such as block length and intersection density.

The low number of immediately accessible amenities has resulted in a relatively low walkability score for the site.

The walking distance from the site in a 20 minute time frame can be seen in Figure 23.

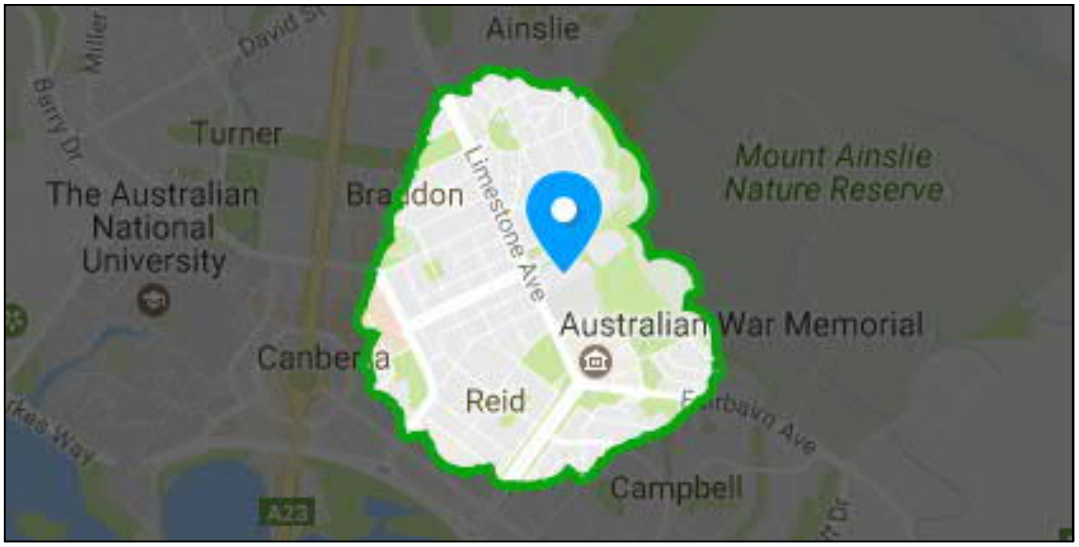


Figure 23: Site 20min Walk Distance

[1] Based on data from walkscore.com

6.4 Consideration of Alternate Site Access Options

Prior to the decision to retain the existing site access, other various access options were considered for this development. The following outlines the options considered and the justification behind the preferred option of retaining the existing site access.

Table 12 Site Access Options Summary

Site Access Option	Commentary
Signalisation (all movements)	• The site access point is located approximately 150m from the signalised intersection of Limestone Avenue and Ainslie Avenue, and approximately 125m from the signalised pedestrian crossing on Limestone Avenue to the south of the site. Due to the proximity to these existing signals, and with the road environment being an urban distributor road, signalisation at this location would not be preferred. • There is a considerable level difference between the southbound carriageway and northbound carriageway in the location of this access point. Construction of an at-grade signalised intersection in this location would be difficult from a safe design perspective. The level difference is shown in the image below. • The existing access to Allambee Street from Limestone Avenue may need to be removed due to weaving conflict. 
Seagull Intersection (all movements)	• A seagull intersection arrangement in this location has been considered. The level difference in the location of the intersection would make it difficult to design/construct an operationally safe intersection. • The right-in movement from Limestone Avenue is likely to have visibility issues between right-in turning vehicles and vehicles exiting the site due to the grade difference. • The current operation of the right-out movement has no crash history and is considered safe. Introduction of a right-in movement will introduce additional conflicts which would increase the likelihood of a crash in this location.
Left-in Left-out only	• The option of removing the right-out movement and converting the intersection into a left-in left-out intersection only was also considered. • The existing right-out movement is not considered to be an unsafe movement, based on the crash history in this location, with no crashes recorded being attributed to this movement. From this, we see no reason to remove this movement. • A left-in left-out arrangement would be a safer alternative to the current arrangement, however would result in redistribution of traffic through the immediate road network.

Site Access Option	Commentary
Retain Existing Arrangement	• Retaining the existing arrangement allows for most vehicle movements (no right-in), as a result of this there is minimal redistribution of traffic within proximity to the site. • The right-out movement does not have any recorded crashes in this location attributable to this movement and is therefore considered to be safe movement. • The intersection layout has capacity operate an acceptable level of service given the traffic volumes generated by the proposed development.

As is shown from the discussion above, the preferred option of retaining the existing intersection arrangement is justified due to the geometric constraints of the site, the limitations of the control mechanisms of the other intersection options and the current safe operation of the existing intersection.

7.0 Conclusion

The analysis and relevant discussion in this report led to the following conclusions:

- The parking requirement as per the code requirements for Stage 1 of the proposed development is 402 car spaces to accommodate the residential land use.
- The on-site parking supply is sufficient for the proposed development.
- The site has an expected traffic generation of up to 146 vehicles in the AM and PM peak hours.
- Based on a review of safety, capacity and constructability, the existing access arrangement for the site and recommended to be retained.
- There is adequate capacity in the surrounding existing local road network to accommodate the traffic generated by the proposed development. The additional traffic proposed on Limestone Avenue has a minimal effect on queuing and delays at the key intersections as demonstrated by the modelling developed.
- Provision is made for all access arrangements to operate safely and efficiently in compliance with AS2890.1.
- Although the right turn movement from the site has impeded sightlines, the crash data did not identify any crashes associated with this movement or indicate that this movement is a high-risk movement.
- The provision for bicycle facilities will be met on site through secure parking areas consistent with the Bicycle Parking General Code.

Appendix A

Detailed Crash Diagram

AECOM

1

15/11/2016 17:30
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Same direction side swipe
Crash Severity: Property Damage Only

24/12/2016 09:30
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Collision while one vehicle reversing
Crash Severity: Property Damage Only

06/05/2014 08:55
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

21/11/2013 08:55
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Injury

24/06/2015 17:55
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collison
Crash Severity: Property Damage Only

06/08/2014 16:57
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

10/04/2015 08:30
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

03/05/2013 08:05
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

02/06/2012 11:58
Road Condition: Wet surface
Weather Condition: Light rain
Accident Type: Rear end collision
Crash Severity: Property Damage Only

17/03/2012 22:15
Road Condition: Wet surface
Weather Condition: Light rain
Accident Type: Rear end collision
Crash Severity: Property Damage Only

12/06/2015 18:15
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

04/04/2014 15:30
Road Condition: Wet surface
Weather Condition: Light rain
Accident Type: Rear end collision
Crash Severity: Property Damage Only

09/09/2016 10:30
Road Condition: Wet surface
Weather Condition: Light rain
Accident Type: Rear end collision
Crash Severity: Property Damage Only

23/11/2015 16:30
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

06/03/2012 08:50
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

14/02/2012 07:45
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

31/03/2014 18:50
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

23/04/2012 17:30
Road Condition: Wet surface
Weather Condition: Cloudy or overcast
Accident Type: Rear end collision
Crash Severity: Property Damage Only

02/06/2016 20:00
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Struck animal (not ridden on road)
Crash Severity: Property Damage Only

19/04/2014 18:00
Road Condition: Wet surface
Weather Condition: Heavy rain
Accident Type: Rear end collision
Crash Severity: Property Damage Only

01/10/2012 14:46
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property Damage Only

27/11/2012 17:00
Road Condition: Wet surface
Weather Condition: Heavy rain
Accident Type: Rear end collision
Crash Severity: Injury

07/08/2015 19:38
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property Damage Only

07/08/2014 09:10
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Injury

24/07/2013 17:30
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision
Crash Severity: Property Damage Only

07/08/2015 19:38
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property Damage Only

18/08/2015 15:15
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property damage only

14/03/2013 08:20
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Injury

28/06/2015 18:05
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rightangle collision
Crash Severity: Property Damage Only

21/06/2016 17:07
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right turn into oncoming vehicle
Crash Severity: Property Damage Only

18/09/2016 16:10
Road Condition: Wet surface
Weather Condition: Light rain
Accident Type: Right angle collision
Crash Severity: Property damage only

16/09/2014 17:25
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property Damage Only

08/12/2013 13:15
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Injury

03/11/2013 07:50
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property Damage Only

11/04/2013 07:50
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Other vehicle-to-vehicle collision
Crash Severity: Property Damage Only

07/08/2015 19:38
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property Damage Only

13/03/2015 10:20
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property Damage Only

16/12/2013 17:59
Road Condition: Wet surface
Weather Condition: Light rain
Accident Type: Rear end collision
Crash Severity: Property Damage Only

22/04/2016 14:00
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Property damage only

15/11/2016 10:45
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Injury

01/09/2013 11:35
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Injury

17/05/2014 15:47
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Same direction side swipe collision
Crash Severity: Property Damage Only

08/06/2012 19:15
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision collision
Crash Severity: Property Damage Only

12/02/2014 08:40
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Rear end collision collision
Crash Severity: Property Damage Only

27/07/2015 14:10
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collison collision
Crash Severity: Property Damage Only

23/04/2015 12:23
Road Condition: Good dry surface
Weather Condition: Fine
Accident Type: Right angle collision
Crash Severity: Injury

Crash Severity (2012-2016)

- Fatal
- Property Damage Only
- Injury

CAMPBELL, SECTION 38
CRASH PLOT (2012-2016)
AUGUST 2018

Kilometers
0 0.04 0.08 0.15

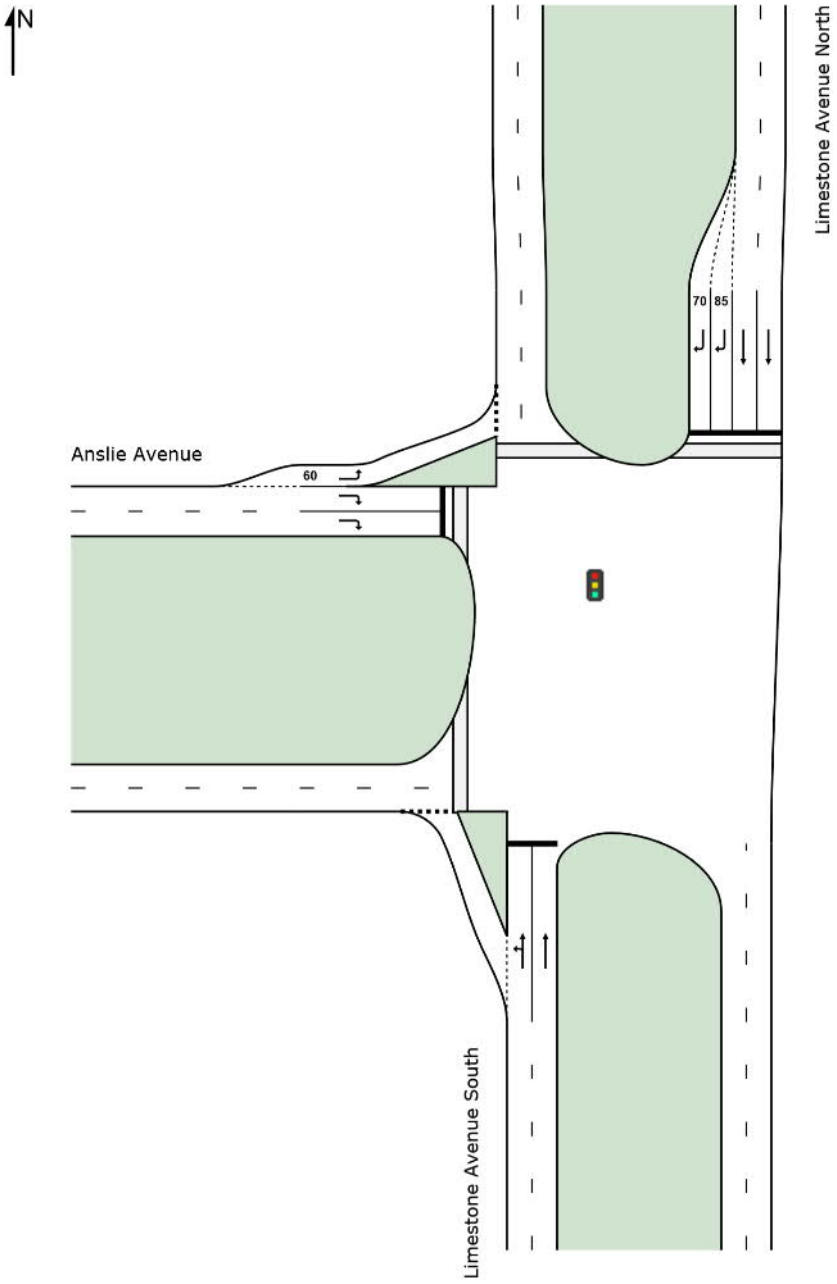
Appendix B

SIDRA Outputs

SITE LAYOUT

Site: [Limestone Avenue_Ainslie Avenue]

AM Existing
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: [Limestone Avenue_Ainslie Avenue]

Network: 1 [Existing AM]

AM Existing
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	102	0.0	102	0.0	0.408	16.8	LOS B	9.2	64.5	0.41	0.46	0.51	49.2
2	T1	767	0.0	767	0.0	0.408	11.6	LOS A	9.9	69.0	0.42	0.41	0.46	50.0
Approach		869	0.0	869	0.0	0.408	12.2	LOS A	9.9	69.0	0.42	0.41	0.47	49.9
North: Limestone Avenue North														
8	T1	2042	0.0	2042	0.0	0.648	0.5	LOS A	3.2	22.4	0.06	0.06	0.06	59.0
9	R2	309	0.0	309	0.0	0.406	50.3	LOS D	7.4	52.1	0.86	0.78	0.86	32.5
Approach		2351	0.0	2351	0.0	0.648	7.1	LOS A	7.4	52.1	0.16	0.15	0.16	49.8
West: Anslie Avenue														
10	L2	52	0.0	52	0.0	0.050	5.8	LOS A	0.0	0.3	0.02	0.55	0.02	54.2
12	R2	133	0.0	133	0.0	0.354	61.7	LOS E	3.7	25.7	0.95	0.75	0.95	20.0
Approach		185	0.0	185	0.0	0.354	46.0	LOS D	3.7	25.7	0.69	0.70	0.69	27.7
All Vehicles		3405	0.0	3405	0.0	0.648	10.5	LOS A	9.9	69.0	0.26	0.25	0.27	47.9

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

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
P31	North Stage 1	53	54.3	LOS E	0.2	0.2	0.95	0.95
P32	North Stage 2	53	27.4	LOS C	0.1	0.1	0.68	0.68
P41	West Stage 1	53	3.3	LOS A	0.0	0.0	0.23	0.23
P42	West Stage 2	53	14.5	LOS B	0.1	0.1	0.49	0.49
All Pedestrians		211	24.9	LOS C			0.59	0.59

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: [Limestone Avenue_Ainslie Avenue (2)]

Network: 1 [Existing PM]

PM Existing
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	120	0.0	120	0.0	0.573	7.7	LOS A	5.5	38.4	0.13	0.21	0.21	56.5
2	T1	1458	0.0	1458	0.0	0.573	2.3	LOS A	6.5	45.6	0.15	0.17	0.18	57.5
Approach		1578	0.0	1578	0.0	0.573	2.7	LOS A	6.5	45.6	0.14	0.18	0.18	57.4
North: Limestone Avenue North														
8	T1	854	0.0	854	0.0	0.271	0.3	LOS A	0.7	4.6	0.03	0.03	0.03	59.4
9	R2	111	0.0	111	0.0	0.607	70.8	LOS F	3.4	24.0	1.00	0.77	1.06	27.5
Approach		965	0.0	965	0.0	0.607	8.4	LOS A	3.4	24.0	0.14	0.11	0.15	48.1
West: Anslie Avenue														
10	L2	351	0.0	351	0.0	0.518	5.9	LOS A	0.7	4.7	0.05	0.57	0.05	54.1
12	R2	174	0.0	174	0.0	0.464	62.5	LOS E	4.9	34.2	0.97	0.77	0.97	19.9
Approach		525	0.0	525	0.0	0.518	24.6	LOS B	4.9	34.2	0.35	0.63	0.35	40.2
All Vehicles		3068	0.0	3068	0.0	0.607	8.2	LOS A	6.5	45.6	0.18	0.23	0.20	51.5

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

Movement Performance - Pedestrians

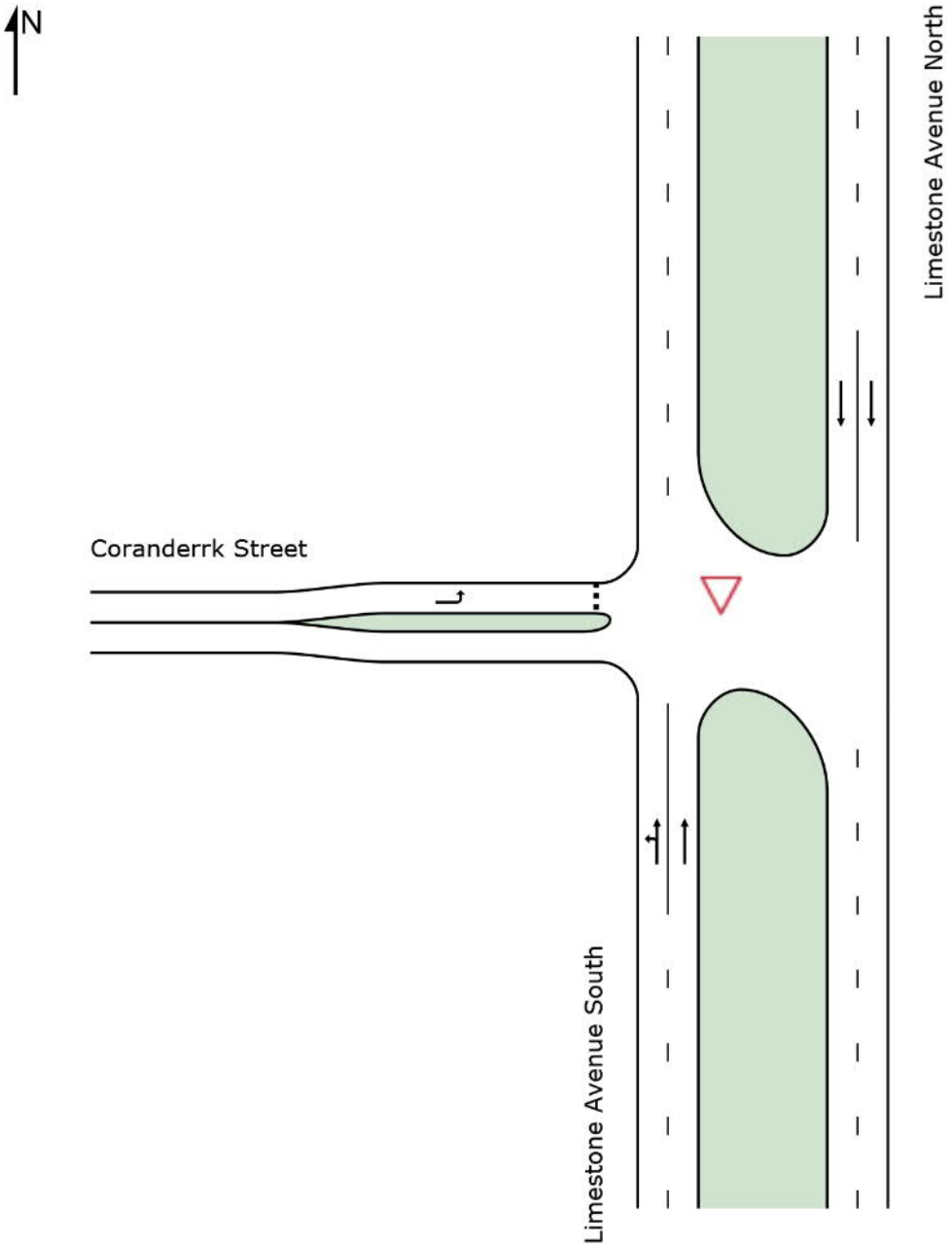
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P31	North Stage 1	53	54.3	LOS E	0.2	0.2	0.95	0.95
P32	North Stage 2	53	41.8	LOS E	0.1	0.1	0.84	0.84
P41	West Stage 1	53	3.3	LOS A	0.0	0.0	0.23	0.23
P42	West Stage 2	53	6.7	LOS A	0.1	0.1	0.33	0.33
All Pedestrians		211	26.5	LOS C			0.59	0.59

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.

SITE LAYOUT

Site: [Limestone Avenue_Coranderrk Street]

AM Existing
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: [Limestone Avenue_Coranderrk Street]

Network: 1 [Existing AM]

AM Existing
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	30	0.0	30	0.0	0.237	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	58.0
2	T1	891	0.0	891	0.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach		921	0.0	921	0.0	0.237	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
North: Limestone Avenue North														
8	T1	2175	0.0	2175	0.0	0.558	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		2175	0.0	2175	0.0	0.558	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
West: Coranderrk Street														
10	L2	30	0.0	30	0.0	0.035	7.5	LOS A	0.1	0.9	0.44	0.65	0.44	48.3
Approach		30	0.0	30	0.0	0.035	7.5	LOS A	0.1	0.9	0.44	0.65	0.44	48.3
All Vehicles		3126	0.0	3126	0.0	0.558	0.2	NA	0.1	0.9	0.00	0.01	0.00	59.6

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

MOVEMENT SUMMARY

Site: [Limestone Avenue_Coranderrk Street (2)]

Network: 1 [Existing PM]

PM Existing
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

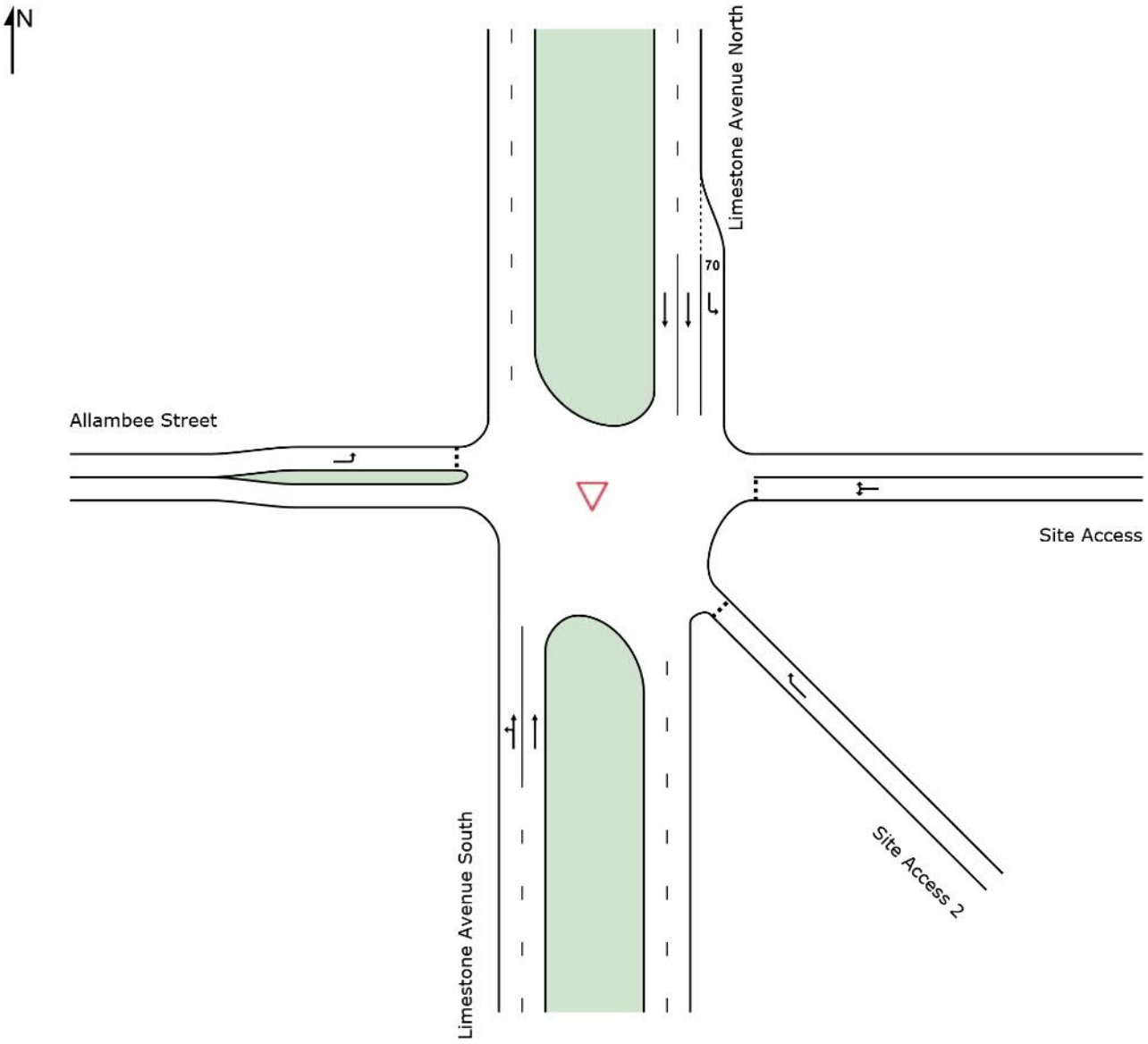
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	40	0.0	40	0.0	0.435	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	58.0
2	T1	1656	0.0	1656	0.0	0.435	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		1696	0.0	1696	0.0	0.435	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.6
North: Limestone Avenue North														
8	T1	1028	0.0	1028	0.0	0.264	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1028	0.0	1028	0.0	0.264	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Coranderrk Street														
10	L2	40	0.0	40	0.0	0.075	10.9	LOS A	0.3	1.9	0.62	0.83	0.62	44.3
Approach		40	0.0	40	0.0	0.075	10.9	LOS A	0.3	1.9	0.62	0.83	0.62	44.3
All Vehicles		2764	0.0	2764	0.0	0.435	0.3	NA	0.3	1.9	0.01	0.02	0.01	59.4

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

SITE LAYOUT

Site: [Limestone Avenue_Allambee Street_Site Access]

AM Existing
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: [Limestone Avenue_Allambee Street_Site Access]

Network: 1 [Existing AM]

AM Existing
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	20	0.0	20	0.0	0.234	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	58.1
2	T1	891	0.0	891	0.0	0.234	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		911	0.0	911	0.0	0.234	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
SouthEast: Site Access 2														
23a	R1	1	0.0	1	0.0	0.002	9.7	LOS A	0.0	0.0	0.54	0.55	0.54	45.7
Approach		1	0.0	1	0.0	0.002	9.7	LOS A	0.0	0.0	0.54	0.55	0.54	45.7
East: Site Access														
4	L2	1	0.0	1	0.0	0.008	14.2	LOS A	0.0	0.2	0.83	0.76	0.83	34.4
6	R2	1	0.0	1	0.0	0.008	31.8	LOS C	0.0	0.2	0.83	0.76	0.83	34.4
Approach		2	0.0	2	0.0	0.008	23.0	LOS B	0.0	0.2	0.83	0.76	0.83	34.4
North: Limestone Avenue North														
7	L2	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	2175	0.0	2175	0.0	0.558	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		2176	0.0	2176	0.0	0.558	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
West: Allambee Street														
10	L2	20	0.0	20	0.0	0.013	7.0	LOS A	0.1	0.6	0.26	0.54	0.26	48.9
Approach		20	0.0	20	0.0	0.013	7.0	LOS A	0.1	0.6	0.26	0.54	0.26	48.9
All Vehicles		3110	0.0	3110	0.0	0.558	0.2	NA	0.1	0.6	0.00	0.01	0.00	59.6

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

MOVEMENT SUMMARY

Site: [Limestone Avenue_Allambee Street_Site Access (2)] Network: 1 [Existing PM]

PM Existing
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

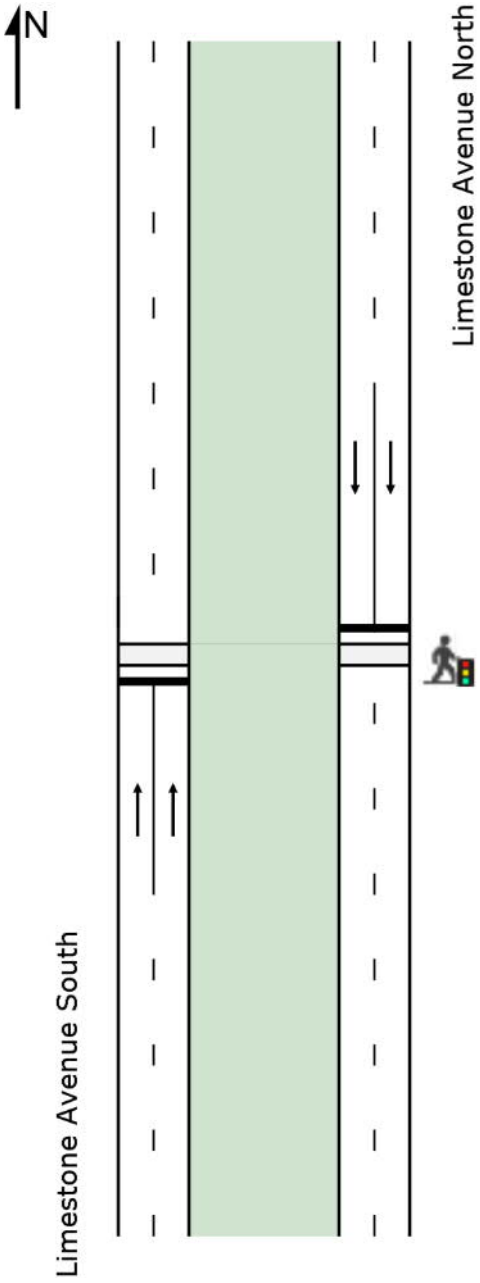
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	30	0.0	30	0.0	0.433	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
2	T1	1656	0.0	1656	0.0	0.433	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		1686	0.0	1686	0.0	0.433	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.6
SouthEast: Site Access 2														
23a	R1	1	0.0	1	0.0	0.005	21.8	LOS B	0.0	0.1	0.81	0.75	0.81	35.2
Approach		1	0.0	1	0.0	0.005	21.8	LOS B	0.0	0.1	0.81	0.75	0.81	35.2
East: Site Access														
4	L2	1	0.0	1	0.0	0.003	7.9	LOS A	0.0	0.1	0.52	0.58	0.52	45.5
6	R2	1	0.0	1	0.0	0.003	11.9	LOS A	0.0	0.1	0.52	0.58	0.52	45.5
Approach		2	0.0	2	0.0	0.003	9.9	LOS A	0.0	0.1	0.52	0.58	0.52	45.5
North: Limestone Avenue North														
7	L2	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1028	0.0	1028	0.0	0.264	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1029	0.0	1029	0.0	0.264	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Allambee Street														
10	L2	30	0.0	30	0.0	0.027	9.4	LOS A	0.2	1.1	0.48	0.58	0.48	46.1
Approach		30	0.0	30	0.0	0.027	9.4	LOS A	0.2	1.1	0.48	0.58	0.48	46.1
All Vehicles		2748	0.0	2748	0.0	0.433	0.2	NA	0.2	1.1	0.01	0.01	0.01	59.5

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

SITE LAYOUT

Site: [Limestone Avenue_Pedestrian Crossing]

AM Existing
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated



MOVEMENT SUMMARY

Site: [Limestone Avenue_Pedestrian Crossing] Network: 1 [Existing AM]

AM Existing
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
2	T1	891	0.0	891	0.0	0.326	1.9	LOS A	2.6	18.2	0.41	0.36	0.41	56.4
Approach		891	0.0	891	0.0	0.326	1.9	LOS A	2.6	18.2	0.41	0.36	0.41	56.4
North: Limestone Avenue North														
8	T1	2175	0.0	2175	0.0	0.797	6.9	LOS A	14.3	99.9	0.73	0.78	0.91	48.9
Approach		2175	0.0	2175	0.0	0.797	6.9	LOS A	14.3	99.9	0.73	0.78	0.91	48.9
All Vehicles		3066	0.0	3066	0.0	0.797	5.5	LOS A	14.3	99.9	0.64	0.66	0.77	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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
P11	South Stage 1	21	9.6	LOS A	0.0	0.0	0.80	0.80
P12	South Stage 2	21	9.6	LOS A	0.0	0.0	0.80	0.80
All Pedestrians		42	9.6	LOS A			0.80	0.80

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

MOVEMENT SUMMARY

Site: [Limestone Avenue_Pedestrian Crossing (2)] Network: 1 [Existing PM]

PM Existing
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 20 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
2	T1	1656	0.0	1656	0.0	0.708	4.4	LOS A	6.9	48.0	0.74	0.73	0.89	52.4
Approach		1656	0.0	1656	0.0	0.708	4.4	LOS A	6.9	48.0	0.74	0.73	0.89	52.4
North: Limestone Avenue North														
8	T1	1028	0.0	1028	0.0	0.439	2.5	LOS A	2.9	20.2	0.58	0.50	0.58	55.3
Approach		1028	0.0	1028	0.0	0.439	2.5	LOS A	2.9	20.2	0.58	0.50	0.58	55.3
All Vehicles		2684	0.0	2684	0.0	0.708	3.7	LOS A	6.9	48.0	0.68	0.64	0.77	53.5

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

Movement Performance - Pedestrians

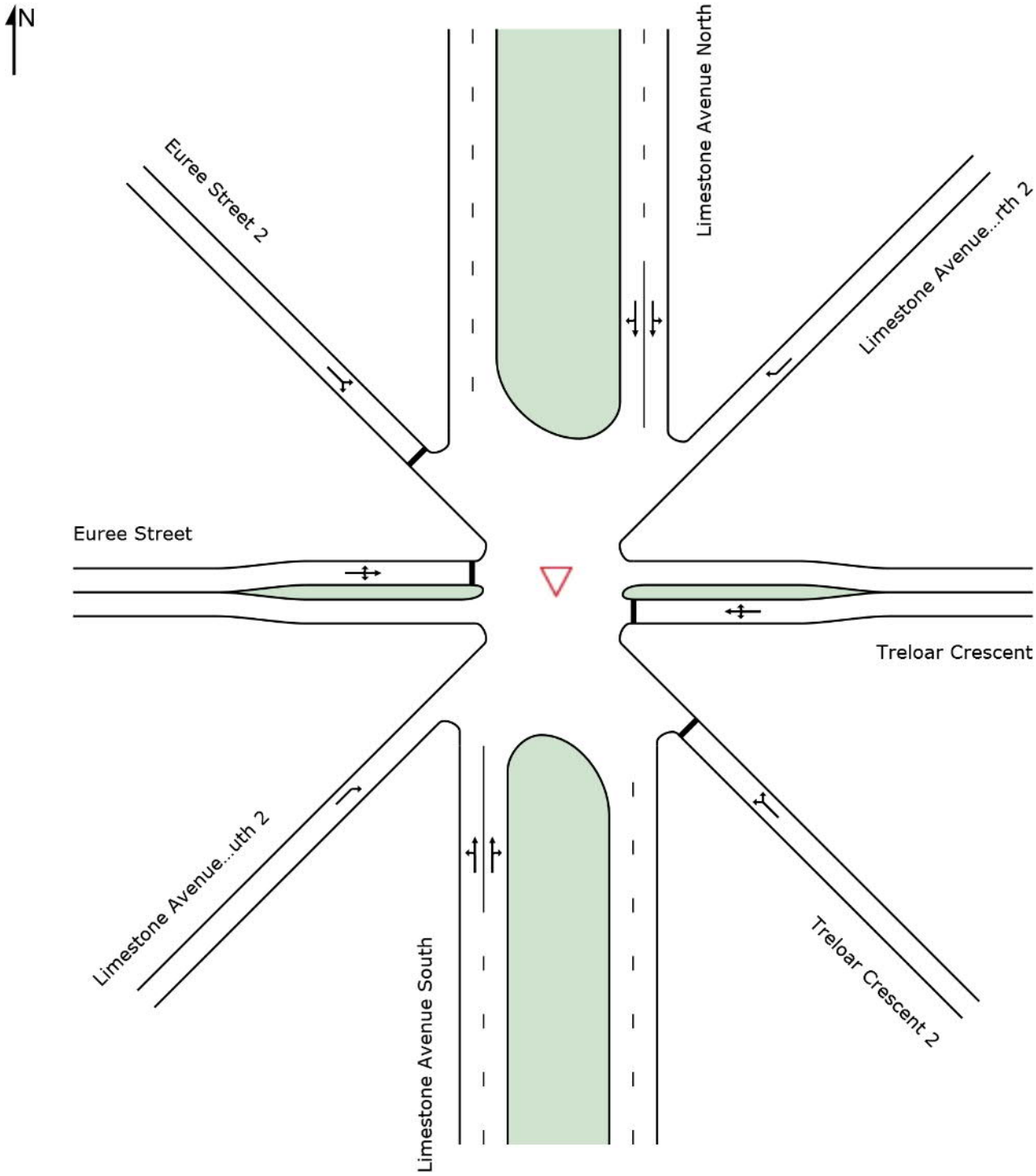
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P11	South Stage 1	21	4.9	LOS A	0.0	0.0	0.70	0.70
P12	South Stage 2	21	4.9	LOS A	0.0	0.0	0.70	0.70
All Pedestrians		42	4.9	LOS A			0.70	0.70

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.

SITE LAYOUT

Site: [Limestone Avenue_Euree Street_Treloar Crescent]

AM Existing
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: [Limestone Avenue_Euree Street_Treloar Crescent] Network: 1 [Existing AM]

AM Existing
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	6	0.0	6	0.0	0.226	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.3
2	T1	850	0.0	850	0.0	0.226	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
3	R2	23	0.0	23	0.0	0.226	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.8
Approach		879	0.0	879	0.0	0.226	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
SouthEast: Treloar Crescent 2														
21a	L1	3	0.0	3	0.0	0.091	11.2	LOS A	0.3	2.2	0.59	1.01	0.59	48.1
23a	R1	34	0.0	34	0.0	0.091	16.5	LOS B	0.3	2.2	0.59	1.01	0.59	41.3
Approach		37	0.0	37	0.0	0.091	16.0	LOS B	0.3	2.2	0.59	1.01	0.59	42.1
East: Treloar Crescent														
4	L2	6	0.0	6	0.0	0.491	29.7	LOS C	1.5	10.7	0.95	1.04	1.10	29.0
5	T1	3	0.0	3	0.0	0.491	61.8	LOS E	1.5	10.7	0.95	1.04	1.10	29.1
6	R2	34	0.0	34	0.0	0.491	71.8	LOS F	1.5	10.7	0.95	1.04	1.10	19.7
Approach		43	0.0	43	0.0	0.491	65.2	LOS E	1.5	10.7	0.95	1.04	1.10	22.1
NorthEast: Limestone Avenue North 2														
26a	R1	41	0.0	41	0.0	0.037	6.3	LOS A	0.1	1.0	0.39	0.55	0.39	53.9
Approach		41	0.0	41	0.0	0.037	6.3	NA	0.1	1.0	0.39	0.55	0.39	53.9
North: Limestone Avenue North														
7	L2	126	0.0	126	0.0	0.551	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.6
8	T1	1972	0.0	1972	0.0	0.551	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	59.4
9	R2	41	0.0	41	0.0	0.551	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	57.7
Approach		2139	0.0	2139	0.0	0.551	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
NorthWest: Euree Street 2														
27a	L1	7	0.0	7	0.0	0.034	21.2	LOS B	0.1	0.8	0.85	0.98	0.85	43.1
29a	R1	1	0.0	1	0.0	0.034	58.1	LOS E	0.1	0.8	0.85	0.98	0.85	43.2
Approach		8	0.0	8	0.0	0.034	25.8	LOS B	0.1	0.8	0.85	0.98	0.85	43.1
West: Euree Street														
10	L2	7	0.0	7	0.0	0.024	10.4	LOS A	0.1	0.6	0.51	0.86	0.51	43.5
11	T1	7	0.0	7	0.0	0.024	15.0	LOS B	0.1	0.6	0.51	0.86	0.51	49.3
12	R2	1	0.0	1	0.0	0.024	15.2	LOS B	0.1	0.6	0.51	0.86	0.51	48.9
Approach		15	0.0	15	0.0	0.024	12.9	LOS A	0.1	0.6	0.51	0.86	0.51	47.3
SouthWest: Limestone Avenue South 2														
32a	R1	23	0.0	23	0.0	0.056	14.0	LOS A	0.2	1.3	0.78	0.87	0.78	48.4
Approach		23	0.0	23	0.0	0.056	14.0	NA	0.2	1.3	0.78	0.87	0.78	48.4
All Vehicles		3185	0.0	3185	0.0	0.551	1.8	NA	1.5	10.7	0.03	0.08	0.04	57.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

MOVEMENT SUMMARY

Site: [Limestone Avenue_Euree Street_Treloar Crescent (2)]

Network: 1 [Existing PM]

PM Existing
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	17	0.0	17	0.0	0.403	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
2	T1	1549	0.0	1549	0.0	0.403	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
3	R2	4	0.0	4	0.0	0.403	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.0
Approach		1570	0.0	1570	0.0	0.403	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.7
SouthEast: Treloar Crescent 2														
21a	L1	3	0.0	3	0.0	0.437	19.4	LOS B	1.5	10.7	0.89	1.06	1.04	37.9
23a	R1	69	0.0	69	0.0	0.437	38.4	LOS C	1.5	10.7	0.89	1.06	1.04	28.4
Approach		72	0.0	72	0.0	0.437	37.6	LOS C	1.5	10.7	0.89	1.06	1.04	28.9
East: Treloar Crescent														
4	L2	62	0.0	62	0.0	0.271	11.5	LOS A	1.1	7.8	0.62	0.96	0.64	47.8
5	T1	6	0.0	6	0.0	0.271	17.4	LOS B	1.1	7.8	0.62	0.96	0.64	48.0
6	R2	69	0.0	69	0.0	0.271	18.0	LOS B	1.1	7.8	0.62	0.96	0.64	41.5
Approach		137	0.0	137	0.0	0.271	15.0	LOS B	1.1	7.8	0.62	0.96	0.64	45.5
NorthEast: Limestone Avenue North 2														
26a	R1	9	0.0	9	0.0	0.013	9.2	LOS A	0.0	0.3	0.63	0.66	0.63	51.8
Approach		9	0.0	9	0.0	0.013	9.2	NA	0.0	0.3	0.63	0.66	0.63	51.8
North: Limestone Avenue North														
7	L2	69	0.0	69	0.0	0.257	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	57.6
8	T1	921	0.0	921	0.0	0.257	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.5
9	R2	9	0.0	9	0.0	0.257	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	57.9
Approach		999	0.0	999	0.0	0.257	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.4
NorthWest: Euree Street 2														
27a	L1	5	0.0	5	0.0	0.014	11.5	LOS A	0.0	0.3	0.54	0.91	0.54	49.6
29a	R1	3	0.0	3	0.0	0.014	16.9	LOS B	0.0	0.3	0.54	0.91	0.54	49.8
Approach		8	0.0	8	0.0	0.014	13.5	LOS A	0.0	0.3	0.54	0.91	0.54	49.7
West: Euree Street														
10	L2	38	0.0	38	0.0	0.107	14.6	LOS B	0.4	2.7	0.73	0.96	0.73	39.7
11	T1	5	0.0	5	0.0	0.107	28.6	LOS C	0.4	2.7	0.73	0.96	0.73	46.8
12	R2	3	0.0	3	0.0	0.107	32.0	LOS C	0.4	2.7	0.73	0.96	0.73	46.5
Approach		46	0.0	46	0.0	0.107	17.3	LOS B	0.4	2.7	0.73	0.96	0.73	41.6
SouthWest: Limestone Avenue South 2														
32a	R1	4	0.0	4	0.0	0.004	6.6	LOS A	0.0	0.1	0.43	0.51	0.43	53.7
Approach		4	0.0	4	0.0	0.004	6.6	NA	0.0	0.1	0.43	0.51	0.43	53.7
All Vehicles		2845	0.0	2845	0.0	0.437	2.3	NA	1.5	10.7	0.07	0.11	0.07	57.0

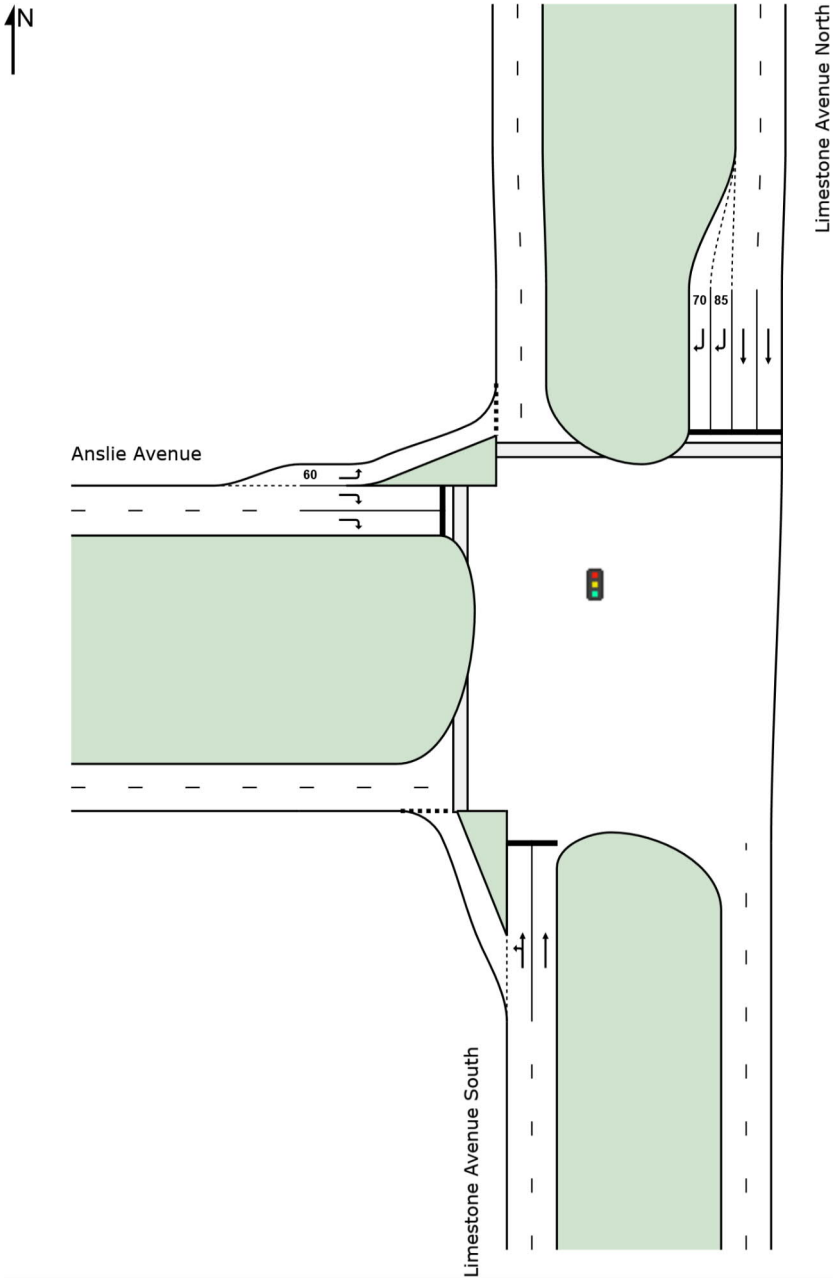
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

SITE LAYOUT

Site: [Limestone Avenue_Ainslie Avenue AM]

AM Proposed
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: [Limestone Avenue_Ainslie Avenue AM]

Network: 1 [Future AM]

AM Proposed
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	139	0.0	139	0.0	0.440	15.4	LOS B	9.5	66.6	0.39	0.46	0.49	50.0
2	T1	827	0.0	827	0.0	0.440	10.5	LOS A	10.6	74.1	0.40	0.40	0.44	50.8
Approach		966	0.0	966	0.0	0.440	11.2	LOS A	10.6	74.1	0.40	0.41	0.45	50.6
North: Limestone Avenue North														
8	T1	2100	0.0	2100	0.0	0.666	0.5	LOS A	3.5	24.2	0.06	0.06	0.06	59.0
9	R2	317	0.0	317	0.0	0.452	52.4	LOS D	7.9	55.5	0.89	0.79	0.89	31.9
Approach		2417	0.0	2417	0.0	0.666	7.3	LOS A	7.9	55.5	0.17	0.15	0.17	49.4
West: Anslie Avenue														
10	L2	53	0.0	53	0.0	0.053	5.8	LOS A	0.0	0.3	0.02	0.55	0.02	54.2
12	R2	154	0.0	154	0.0	0.410	62.1	LOS E	4.3	30.0	0.96	0.76	0.96	20.0
Approach		207	0.0	207	0.0	0.410	47.7	LOS D	4.3	30.0	0.72	0.71	0.72	26.8
All Vehicles		3590	0.0	3590	0.0	0.666	10.7	LOS A	10.6	74.1	0.26	0.26	0.28	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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
P31	North Stage 1	53	54.3	LOS E	0.2	0.2	0.95	0.95
P32	North Stage 2	53	28.8	LOS C	0.1	0.1	0.69	0.69
P41	West Stage 1	53	3.3	LOS A	0.0	0.0	0.23	0.23
P42	West Stage 2	53	13.6	LOS B	0.1	0.1	0.48	0.48
All Pedestrians		211	25.0	LOS C			0.59	0.59

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.

PHASING SUMMARY

Site: [Limestone Avenue_Ainslie Avenue AM]

Network: 1 [Future AM]

AM Proposed
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Green Split Priority has been specified
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	73	102
Green Time (sec)	67	23	12
Phase Time (sec)	73	29	18
Phase Split	61%	24%	15%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

MOVEMENT SUMMARY

Site: [Limestone Avenue_Ainslie Avenue PM]

Network: 1 [Future PM]

PM Proposed
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	134	0.0	134	0.0	0.612	8.3	LOS A	7.4	52.0	0.17	0.24	0.25	56.0
2	T1	1531	0.0	1531	0.0	0.612	2.9	LOS A	8.6	60.0	0.18	0.21	0.22	56.9
Approach		1665	0.0	1665	0.0	0.612	3.3	LOS A	8.6	60.0	0.18	0.21	0.22	56.9
North: Limestone Avenue North														
8	T1	933	0.0	933	0.0	0.299	0.3	LOS A	0.8	5.3	0.03	0.03	0.03	59.3
9	R2	116	0.0	116	0.0	0.635	71.0	LOS F	3.6	25.2	1.00	0.78	1.08	27.5
Approach		1049	0.0	1049	0.0	0.635	8.2	LOS A	3.6	25.2	0.14	0.11	0.15	48.4
West: Anslie Avenue														
10	L2	366	0.0	366	0.0	0.555	5.9	LOS A	0.9	6.0	0.05	0.57	0.05	54.0
12	R2	255	0.0	255	0.0	0.627	63.0	LOS E	7.3	51.2	0.99	0.80	1.01	19.8
Approach		621	0.0	621	0.0	0.627	29.4	LOS C	7.3	51.2	0.44	0.66	0.44	37.3
All Vehicles		3335	0.0	3335	0.0	0.635	9.7	LOS A	8.6	60.0	0.22	0.26	0.24	50.2

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

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
P31	North Stage 1	53	54.3	LOS E	0.2	0.2	0.95	0.95
P32	North Stage 2	53	40.9	LOS E	0.1	0.1	0.83	0.83
P41	West Stage 1	53	3.5	LOS A	0.0	0.0	0.24	0.24
P42	West Stage 2	53	7.0	LOS A	0.1	0.1	0.34	0.34
All Pedestrians		211	26.4	LOS C			0.59	0.59

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.

PHASING SUMMARY

Site: [Limestone Avenue_Ainslie Avenue PM]

Network: 1 [Future PM]

PM Proposed
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Green Split Priority has been specified
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	89	101
Green Time (sec)	83	6	13
Phase Time (sec)	89	12	19
Phase Split	74%	10%	16%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

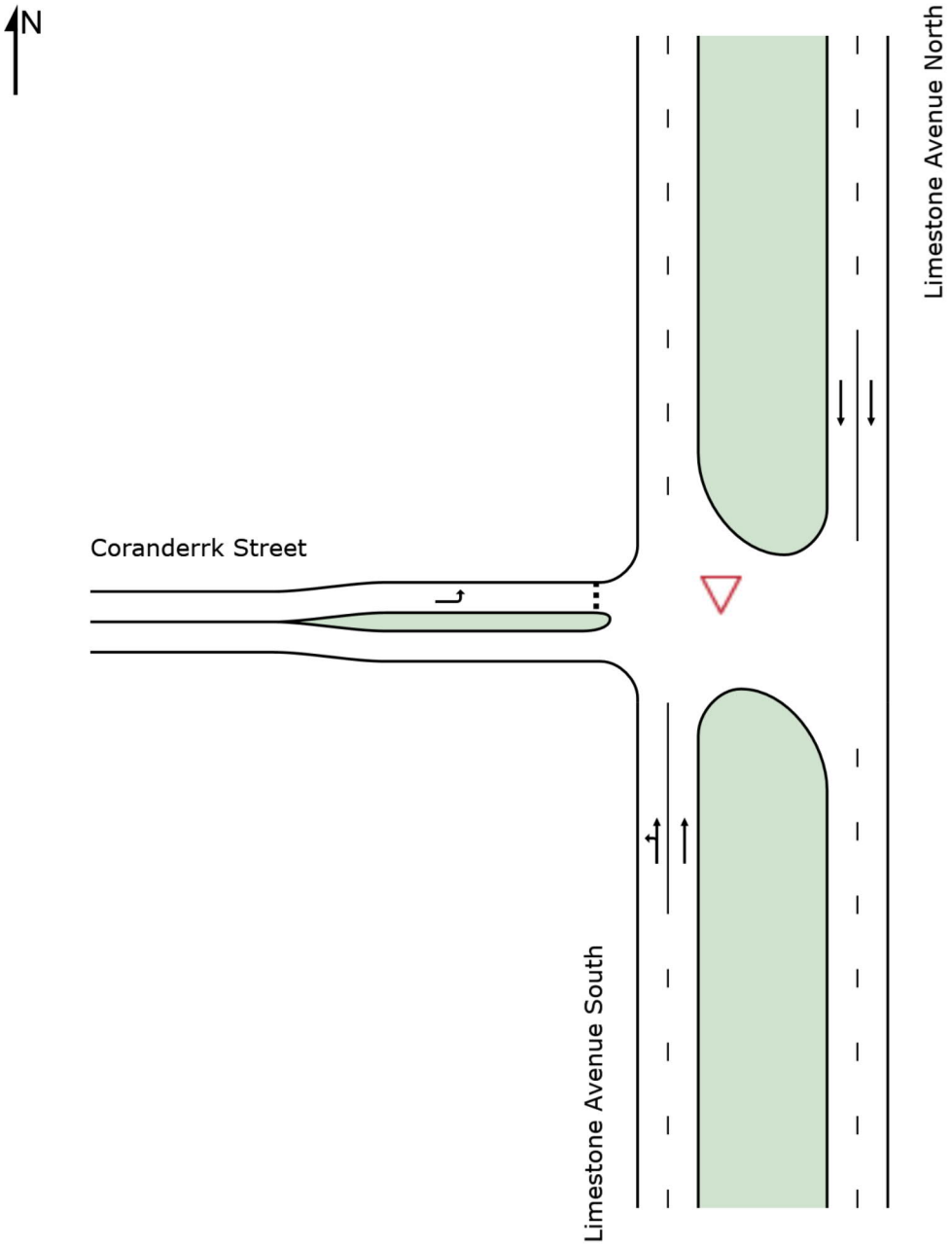
REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

SITE LAYOUT

Site: [Limestone Avenue_Coranderrk Street AM]

AM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: [Limestone Avenue_Coranderrk Street AM]

Network: 1 [Future AM]

AM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	31	0.0	31	0.0	0.242	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	58.0
2	T1	911	0.0	911	0.0	0.242	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach		942	0.0	942	0.0	0.242	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
North: Limestone Avenue North														
8	T1	2265	0.0	2265	0.0	0.581	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		2265	0.0	2265	0.0	0.581	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
West: Coranderrk Street														
10	L2	31	0.0	31	0.0	0.037	7.6	LOS A	0.1	0.9	0.44	0.65	0.44	48.2
Approach		31	0.0	31	0.0	0.037	7.6	LOS A	0.1	0.9	0.44	0.65	0.44	48.2
All Vehicles		3238	0.0	3238	0.0	0.581	0.2	NA	0.1	0.9	0.00	0.01	0.00	59.6

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

MOVEMENT SUMMARY

Site: [Limestone Avenue_Coranderrk Street PM]

Network: 1 [Future PM]

PM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

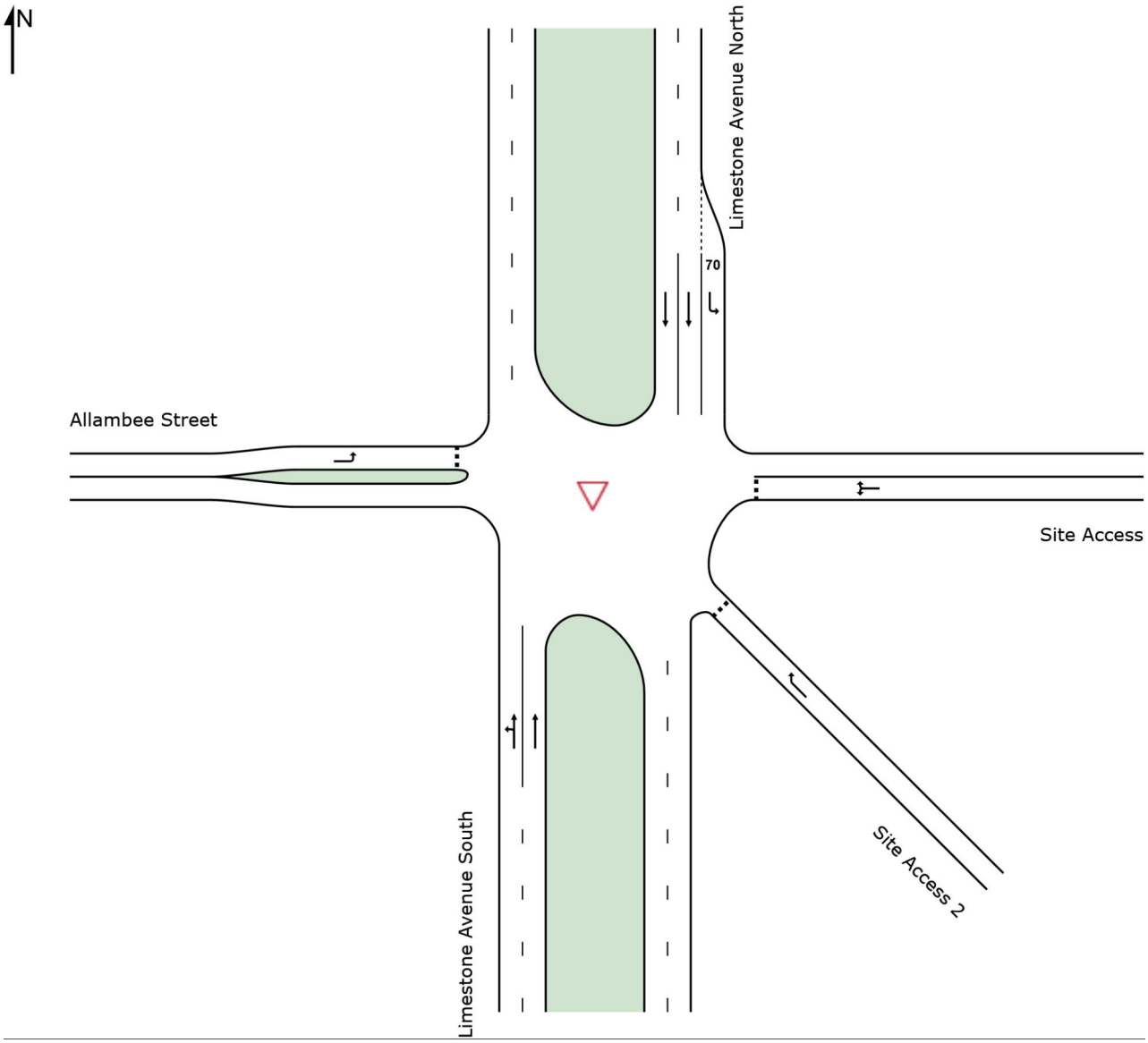
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	42	0.0	42	0.0	0.454	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	58.0
2	T1	1727	0.0	1727	0.0	0.454	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		1769	0.0	1769	0.0	0.454	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.5
North: Limestone Avenue North														
8	T1	1082	0.0	1082	0.0	0.277	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1082	0.0	1082	0.0	0.277	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Coranderrk Street														
10	L2	42	0.0	42	0.0	0.082	11.4	LOS A	0.3	2.1	0.64	0.85	0.64	43.9
Approach		42	0.0	42	0.0	0.082	11.4	LOS A	0.3	2.1	0.64	0.85	0.64	43.9
All Vehicles		2893	0.0	2893	0.0	0.454	0.3	NA	0.3	2.1	0.01	0.02	0.01	59.4

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

SITE LAYOUT

Site: [Limestone Avenue_Allambee Street_Site Access AM]

AM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: [Limestone Avenue_Allambee Street_Site Access AM] Network: 1 [Future AM]

AM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	20	0.0	20	0.0	0.259	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
2	T1	988	0.0	988	0.0	0.259	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		1008	0.0	1008	0.0	0.259	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.7
SouthEast: Site Access 2														
23a	R1	20	0.0	20	0.0	0.043	11.1	LOS A	0.2	1.1	0.59	0.70	0.59	44.1
Approach		20	0.0	20	0.0	0.043	11.1	LOS A	0.2	1.1	0.59	0.70	0.59	44.1
East: Site Access														
4	L2	99	0.0	99	0.0	0.323	17.3	LOS B	1.5	10.3	0.84	0.96	0.94	35.8
6	R2	20	0.0	20	0.0	0.323	38.9	LOS C	1.5	10.3	0.84	0.96	0.94	35.8
Approach		119	0.0	119	0.0	0.323	21.0	LOS B	1.5	10.3	0.84	0.96	0.94	35.8
North: Limestone Avenue North														
7	L2	30	0.0	30	0.0	0.016	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	2225	0.0	2225	0.0	0.571	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		2255	0.0	2255	0.0	0.571	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.6
West: Allambee Street														
10	L2	20	0.0	20	0.0	0.013	7.3	LOS A	0.1	0.6	0.29	0.54	0.29	48.6
Approach		20	0.0	20	0.0	0.013	7.3	LOS A	0.1	0.6	0.29	0.54	0.29	48.6
All Vehicles		3422	0.0	3422	0.0	0.571	1.0	NA	1.5	10.3	0.03	0.05	0.04	58.1

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

MOVEMENT SUMMARY

Site: [Limestone Avenue_Allambee Street_Site Access PM] Network: 1 [Future PM]

PM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

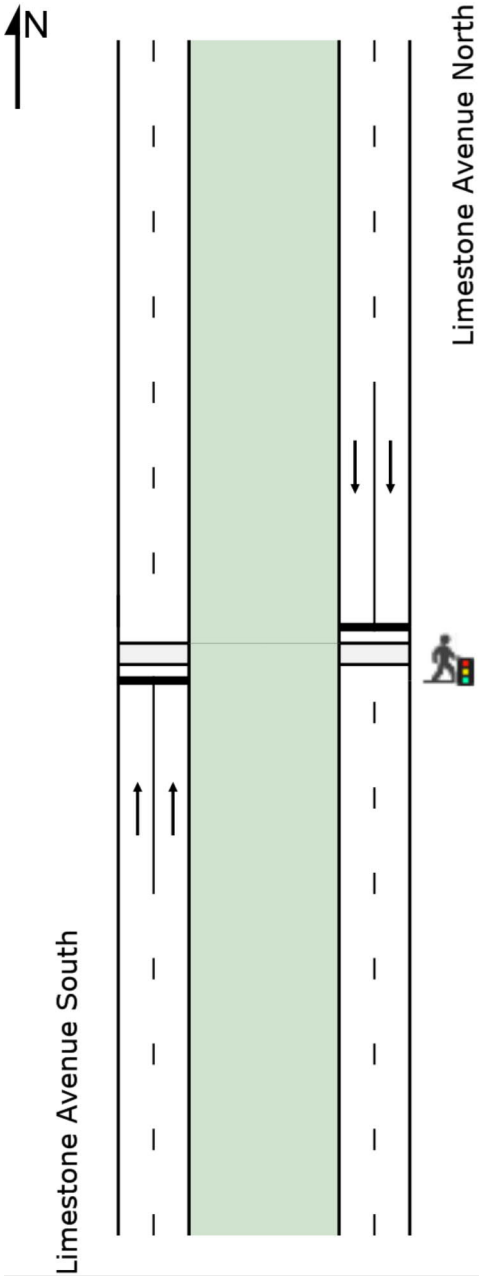
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	31	0.0	31	0.0	0.456	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
2	T1	1746	0.0	1746	0.0	0.456	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		1777	0.0	1777	0.0	0.456	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.6
SouthEast: Site Access 2														
23a	R1	6	0.0	6	0.0	0.032	25.0	LOS B	0.1	0.7	0.84	0.92	0.84	33.2
Approach		6	0.0	6	0.0	0.032	25.0	LOS B	0.1	0.7	0.84	0.92	0.84	33.2
East: Site Access														
4	L2	22	0.0	22	0.0	0.036	8.7	LOS A	0.1	1.0	0.56	0.67	0.56	45.4
6	R2	6	0.0	6	0.0	0.036	14.4	LOS A	0.1	1.0	0.56	0.67	0.56	45.4
Approach		28	0.0	28	0.0	0.036	9.9	LOS A	0.1	1.0	0.56	0.67	0.56	45.4
North: Limestone Avenue North														
7	L2	117	0.0	117	0.0	0.063	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1188	0.0	1188	0.0	0.305	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1305	0.0	1305	0.0	0.305	0.5	NA	0.0	0.0	0.00	0.05	0.00	58.8
West: Allambee Street														
10	L2	31	0.0	31	0.0	0.029	9.8	LOS A	0.2	1.2	0.50	0.59	0.50	45.6
Approach		31	0.0	31	0.0	0.029	9.8	LOS A	0.2	1.2	0.50	0.59	0.50	45.6
All Vehicles		3147	0.0	3147	0.0	0.456	0.5	NA	0.2	1.2	0.01	0.04	0.01	58.9

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

SITE LAYOUT

Site: [Limestone Avenue_Pedestrian Crossing AM]

AM Proposed
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated



MOVEMENT SUMMARY

Site: [Limestone Avenue_Pedestrian Crossing AM]

Network: 1 [Future AM]

AM Proposed
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
2	T1	942	0.0	942	0.0	0.345	2.0	LOS A	2.8	19.6	0.42	0.37	0.42	56.4
Approach		942	0.0	942	0.0	0.345	2.0	LOS A	2.8	19.6	0.42	0.37	0.42	56.4
North: Limestone Avenue North														
8	T1	2265	0.0	2265	0.0	0.830	8.9	LOS A	16.9	118.4	0.77	0.87	1.02	46.5
Approach		2265	0.0	2265	0.0	0.830	8.9	LOS A	16.9	118.4	0.77	0.87	1.02	46.5
All Vehicles		3207	0.0	3207	0.0	0.830	6.9	LOS A	16.9	118.4	0.67	0.72	0.85	49.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate
P11	South Stage 1	21	9.6	LOS A	0.0	0.0	0.80	0.80
P12	South Stage 2	21	9.6	LOS A	0.0	0.0	0.80	0.80
All Pedestrians		42	9.6	LOS A			0.80	0.80

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

PHASING SUMMARY

Site: [Limestone Avenue_Pedestrian Crossing AM] — Network: 1 [Future AM]

AM Proposed
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

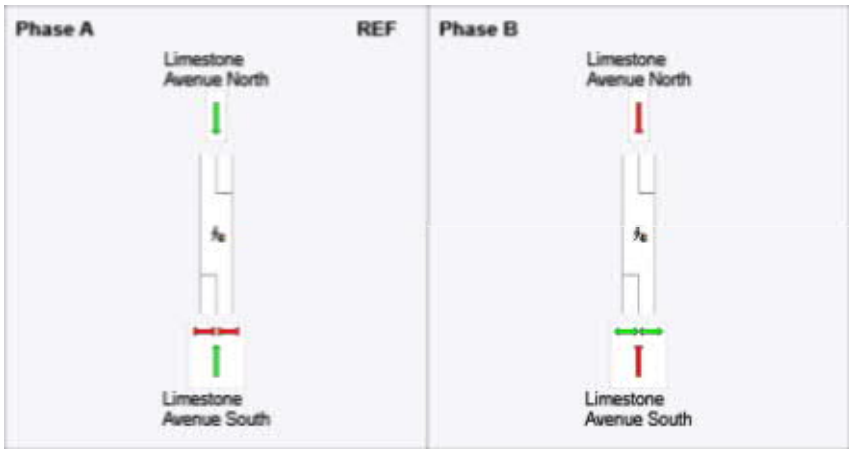
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Green Split Priority has been specified
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	27
Green Time (sec)	21	2
Phase Time (sec)	22	8
Phase Split	73%	27%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

MOVEMENT SUMMARY

Site: [Limestone Avenue_Pedestrian Crossing PM]

Network: 1 [Future PM]

PM Proposed
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 20 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
2	T1	1769	0.0	1769	0.0	0.756	5.6	LOS A	8.3	57.9	0.78	0.81	1.01	50.8
Approach		1769	0.0	1769	0.0	0.756	5.6	LOS A	8.3	57.9	0.78	0.81	1.01	50.8
North: Limestone Avenue North														
8	T1	1082	0.0	1082	0.0	0.462	2.5	LOS A	3.1	21.6	0.59	0.51	0.59	55.2
Approach		1082	0.0	1082	0.0	0.462	2.5	LOS A	3.1	21.6	0.59	0.51	0.59	55.2
All Vehicles		2851	0.0	2851	0.0	0.756	4.4	LOS A	8.3	57.9	0.71	0.70	0.85	52.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
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	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate
P11	South Stage 1	21	4.9	LOS A	0.0	0.0	0.70	0.70
P12	South Stage 2	21	4.9	LOS A	0.0	0.0	0.70	0.70
All Pedestrians		42	4.9	LOS A			0.70	0.70

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.

PHASING SUMMARY

Site: [Limestone Avenue_Pedestrian Crossing PM] Network: 1 [Future PM]

PM Proposed
Site Category: (None)
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 20 seconds (Site Practical Cycle Time)

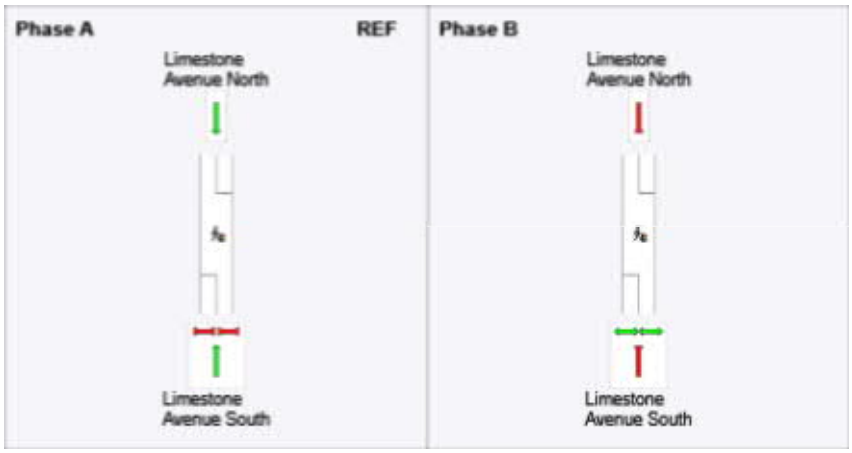
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Green Split Priority has been specified
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B
Output Phase Sequence: A, B

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	18
Green Time (sec)	12	1
Phase Time (sec)	13	7
Phase Split	65%	35%

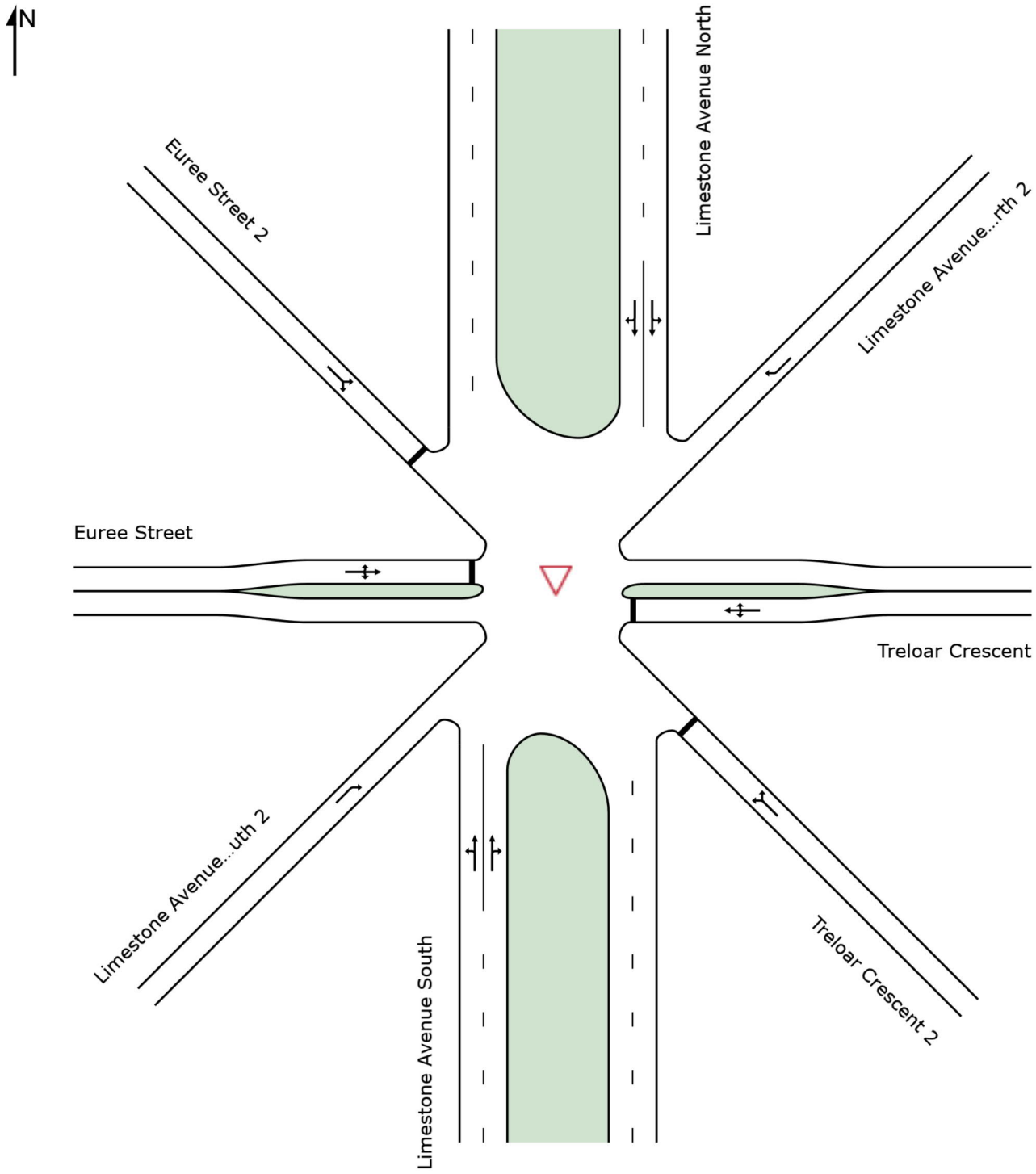
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied


N
Euree Street 2
Limestone Avenue North
Limestone Avenue...rth 2
Euree Street
Treloar Crescent
Limestone Avenue...uth 2
Limestone Avenue South
Treloar Crescent 2

MOVEMENT SUMMARY

Site: [Limestone Avenue_Euree Street_Treloar Crescent AM]

Network: 1 [Future AM]

AM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	6	0.0	6	0.0	0.231	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.3
2	T1	870	0.0	870	0.0	0.231	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
3	R2	24	0.0	24	0.0	0.231	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.8
Approach		900	0.0	900	0.0	0.231	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
SouthEast: Treloar Crescent 2														
21a	L1	3	0.0	3	0.0	0.096	11.3	LOS A	0.3	2.3	0.60	1.01	0.60	47.9
23a	R1	35	0.0	35	0.0	0.096	16.8	LOS B	0.3	2.3	0.60	1.01	0.60	41.0
Approach		38	0.0	38	0.0	0.096	16.4	LOS B	0.3	2.3	0.60	1.01	0.60	41.9
East: Treloar Crescent														
4	L2	6	0.0	6	0.0	0.575	36.9	LOS C	1.8	12.6	0.96	1.05	1.16	26.3
5	T1	3	0.0	3	0.0	0.575	74.0	LOS F	1.8	12.6	0.96	1.05	1.16	26.3
6	R2	35	0.0	35	0.0	0.575	85.8	LOS F	1.8	12.6	0.96	1.05	1.16	17.3
Approach		44	0.0	44	0.0	0.575	78.3	LOS F	1.8	12.6	0.96	1.05	1.16	19.5
NorthEast: Limestone Avenue North 2														
26a	R1	52	0.0	52	0.0	0.047	6.4	LOS A	0.2	1.3	0.40	0.56	0.40	53.8
Approach		52	0.0	52	0.0	0.047	6.4	NA	0.2	1.3	0.40	0.56	0.40	53.8
North: Limestone Avenue North														
7	L2	129	0.0	129	0.0	0.574	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.6
8	T1	2047	0.0	2047	0.0	0.574	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	59.4
9	R2	52	0.0	52	0.0	0.574	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	57.7
Approach		2228	0.0	2228	0.0	0.574	0.6	NA	0.0	0.0	0.00	0.05	0.00	59.2
NorthWest: Euree Street 2														
27a	L1	7	0.0	7	0.0	0.038	22.6	LOS B	0.1	0.8	0.86	0.99	0.86	42.0
29a	R1	1	0.0	1	0.0	0.038	65.2	LOS E	0.1	0.8	0.86	0.99	0.86	42.2
Approach		8	0.0	8	0.0	0.038	27.9	LOS B	0.1	0.8	0.86	0.99	0.86	42.0
West: Euree Street														
10	L2	7	0.0	7	0.0	0.025	10.5	LOS A	0.1	0.7	0.52	0.86	0.52	43.3
11	T1	7	0.0	7	0.0	0.025	15.2	LOS B	0.1	0.7	0.52	0.86	0.52	49.2
12	R2	1	0.0	1	0.0	0.025	15.5	LOS B	0.1	0.7	0.52	0.86	0.52	48.8
Approach		15	0.0	15	0.0	0.025	13.0	LOS A	0.1	0.7	0.52	0.86	0.52	47.2
SouthWest: Limestone Avenue South 2														
32a	R1	24	0.0	24	0.0	0.063	15.1	LOS B	0.2	1.5	0.80	0.89	0.80	47.8
Approach		24	0.0	24	0.0	0.063	15.1	NA	0.2	1.5	0.80	0.89	0.80	47.8
All Vehicles		3309	0.0	3309	0.0	0.575	2.0	NA	1.8	12.6	0.04	0.09	0.04	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: [Limestone Avenue_Euree Street_Treloar Crescent PM]

Network: 1 [Future PM]

PM Proposed
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Limestone Avenue South														
1	L2	18	0.0	18	0.0	0.420	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
2	T1	1616	0.0	1616	0.0	0.420	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
3	R2	4	0.0	4	0.0	0.420	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.0
Approach		1638	0.0	1638	0.0	0.420	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.7
SouthEast: Treloar Crescent 2														
21a	L1	3	0.0	3	0.0	0.502	21.8	LOS B	1.8	12.5	0.91	1.06	1.11	36.1
23a	R1	72	0.0	72	0.0	0.502	43.2	LOS D	1.8	12.5	0.91	1.06	1.11	26.5
Approach		75	0.0	75	0.0	0.502	42.4	LOS C	1.8	12.5	0.91	1.06	1.11	27.0
East: Treloar Crescent														
4	L2	65	0.0	65	0.0	0.290	11.9	LOS A	1.2	8.5	0.65	0.97	0.69	47.4
5	T1	3	0.0	3	0.0	0.290	18.4	LOS B	1.2	8.5	0.65	0.97	0.69	47.6
6	R2	72	0.0	72	0.0	0.290	19.2	LOS B	1.2	8.5	0.65	0.97	0.69	40.9
Approach		140	0.0	140	0.0	0.290	15.8	LOS B	1.2	8.5	0.65	0.97	0.69	44.9
NorthEast: Limestone Avenue North 2														
26a	R1	12	0.0	12	0.0	0.019	9.6	LOS A	0.1	0.5	0.65	0.69	0.65	51.4
Approach		12	0.0	12	0.0	0.019	9.6	NA	0.1	0.5	0.65	0.69	0.65	51.4
North: Limestone Avenue North														
7	L2	72	0.0	72	0.0	0.271	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	57.6
8	T1	968	0.0	968	0.0	0.271	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
9	R2	12	0.0	12	0.0	0.271	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	57.9
Approach		1052	0.0	1052	0.0	0.271	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.4
NorthWest: Euree Street 2														
27a	L1	5	0.0	5	0.0	0.014	11.7	LOS A	0.1	0.4	0.56	0.91	0.56	49.4
29a	R1	3	0.0	3	0.0	0.014	17.7	LOS B	0.1	0.4	0.56	0.91	0.56	49.6
Approach		8	0.0	8	0.0	0.014	14.0	LOS A	0.1	0.4	0.56	0.91	0.56	49.5
West: Euree Street														
10	L2	40	0.0	40	0.0	0.119	15.2	LOS B	0.4	3.0	0.75	0.98	0.75	39.1
11	T1	5	0.0	5	0.0	0.119	30.8	LOS C	0.4	3.0	0.75	0.98	0.75	46.4
12	R2	3	0.0	3	0.0	0.119	34.8	LOS C	0.4	3.0	0.75	0.98	0.75	46.0
Approach		48	0.0	48	0.0	0.119	18.1	LOS B	0.4	3.0	0.75	0.98	0.75	40.9
SouthWest: Limestone Avenue South 2														
32a	R1	4	0.0	4	0.0	0.004	6.8	LOS A	0.0	0.1	0.45	0.52	0.45	53.6
Approach		4	0.0	4	0.0	0.004	6.8	NA	0.0	0.1	0.45	0.52	0.45	53.6
All Vehicles		2977	0.0	2977	0.0	0.502	2.4	NA	1.8	12.5	0.07	0.12	0.08	56.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.