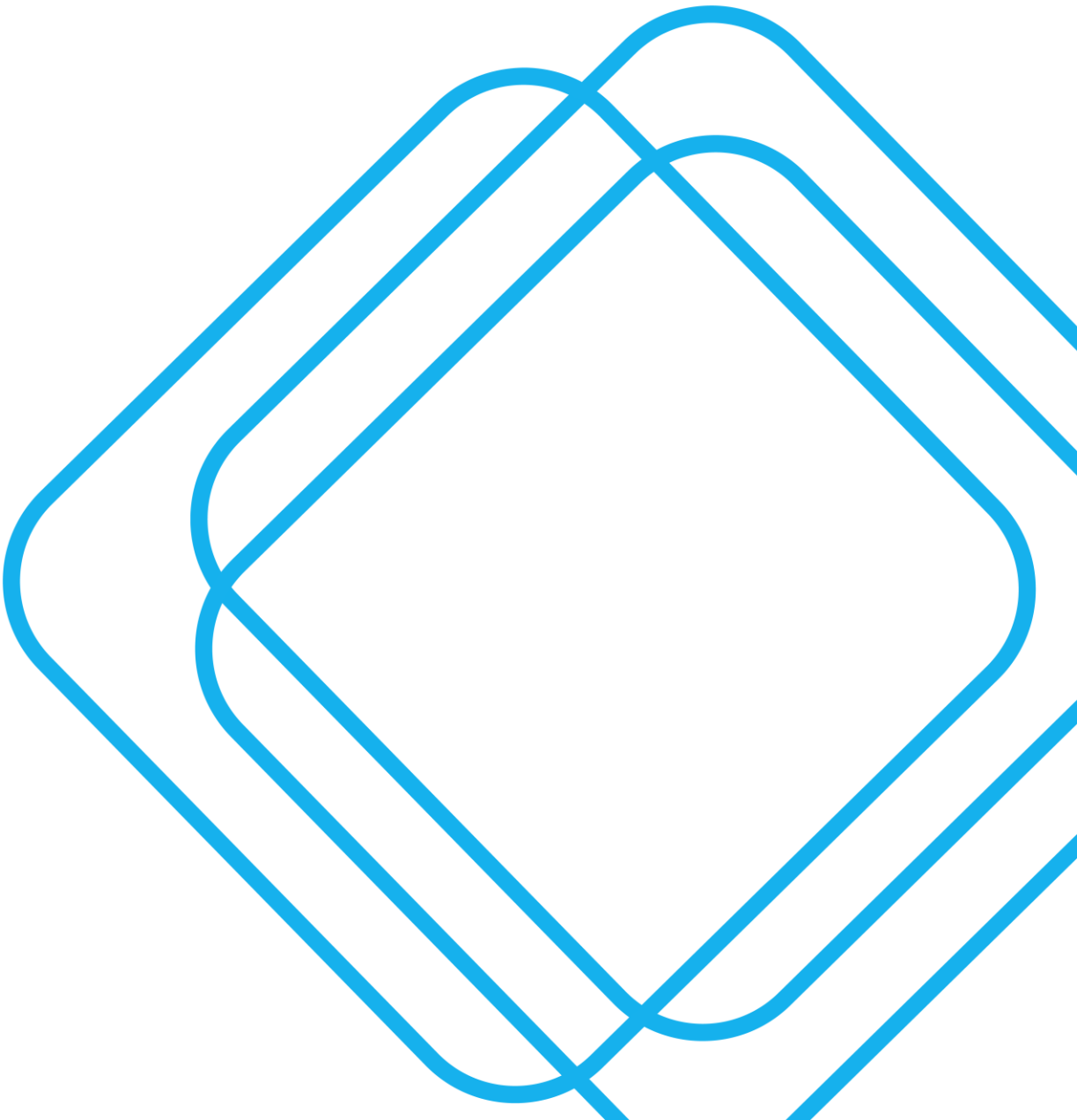
SCT Consulting

10 BRISBANE AVENUE, BARTON

Traffic, Parking and Access Study

19 AUGUST 2022



Quality Assurance

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Executive summary

Purpose of this report

SCT Consulting was engaged by Willemsen to carry out a Traffic, Parking and Access Study to support a Major Works application for the redevelopment at Block 23 Section 6 Barton (the site).

The site covers an area of approximately 3,739m^2 and has street frontages to Brisbane Avenue. The current land use is a corporate office of 3,680m^2 with around 113 parking spaces. The proposed development would accommodate a nine-storey office tower totalling a GFA of 14,488m^2 and two-level basement parking. A total of 237 parking spaces would be provided.

Existing transport conditions

The major roads in the vicinity of the site include many arterial roads such as State Circle, Brisbane Avenue and Wentworth Avenue. Barton, where the site sits, showed an 80 per cent private car mode share and nine per cent public transport mode share by the local employees. The active transport mode share was around nine per cent.

The site is within a short walk from the bus stops on Brisbane Avenue, which provides services up to one per four minutes in the peak. The four bus routes cover many major transport hubs in Canberra.

Pedestrian footpaths are provided along the majority of the nearby roads. Multiple mid-block pedestrian crossings are available to the west of the site on Brisbane Avenue. Some on-road bicycle lanes in the vicinity of the site are available on National Circuit, Wentworth Avenue/Brisbane Avenue and Capital Circle. Macquarie Street, Brisbane Avenue, Commonwealth Avenue and Wentworth Avenue are identified as principal bicycle routes (that link town centres and employment centres), which provide a sustainable transport alternative for the employees for short and medium-distance trips.

Brisbane Avenue between Bowen Drive and Young Street recorded four crashes during 2016-2020. The main crash type was straight ahead through-through crashes, accounting for 32 per cent.

The proposal

The proposed master plan includes an office tower with the main pedestrian entrance to the west. A shared zone is provided outside the office tower for drop off/pick up activity, which ensures a safe walking environment for pedestrians.

The provided loading bay next to the internal driveway (equivalent to Small Rigid Vehicle) is capable of handling a small Pantech truck, delivery van or delivery utility. Refuse collection is expected to be conducted by an 8.8m length service vehicle (equivalent to Medium Rigid Vehicle) with rear loading on the internal driveway. The on-street loading zone to the east of the site on Brisbane Avenue would resolve the loading/unloading by trucks larger than a Medium Rigid Vehicle.

The proposed three-level car park would accommodate about 237 car parking spaces (including four accessible parking spaces) and 24 motorcycle parking spaces. Bicycle parking and end-of-trip facilities are both located on ground floor.

Transport appraisal

The proposed vehicular accesses will generally remain at the existing locations on Brisbane Avenue with modifications on the access width. There is no significant change to the entering sight distance condition on Brisbane Avenue or to the minimum sightline to pedestrians on the footpath. There is limited impact on the on-street parking on the northern side of Brisbane Avenue given the minor change to the access widths. A queueing analysis has been conducted to justify the current design and ensure there is no vehicles overspill on the public road.

The delivery of this site would support development with sustainable travel behaviour, by providing increased land use density in proximity to high-frequency public transport services. Impacts on the public transport system are expected to be limited and little capacity issue would be expected.

Strategic cycle routes are available around the site and the footpaths are generally wide enough to accommodate cyclists. The development will encourage the uptake of cycling through the provision of 114 bicycle parking spaces and good quality end-of-trip facilities.

Safe pedestrian crossings are available on Brisbane Avenue in conjunction with a permeable pedestrian network, which would ensure a safe walking environment and crossing to access to/from major destinations including public transport facilities.

The total provision of 237 parking spaces is around 80 per cent of the requirement for the office component in the designated zone. It is noted that the parking requirement is not a mandatory target that the proposal needs to achieve. The proposed lower parking rate of around one space every 62m^2 GFA is acceptable and could reduce the car mode share in the future.

The proposed development would generate 173 and 130 additional vehicle trips during AM and PM peak hours, respectively. The network operates at satisfactory levels in all modelled periods including future year with development and does not require any upgrades given a relatively low car trip increase on the local road network.

Conclusion

The Traffic, Parking and Access Assessment concluded that the impacts of the proposal are limited and are at a level able to be accommodated by the existing and planned infrastructure.

1.0 Introduction

1.1 Purpose of the report

This Traffic, Parking and Access Study is prepared for submission to National Capital Authority (NCA) in support of a Major Works application for the redevelopment at Block 23 Section 6 Barton (the site).

The document considers:

– The existing context of the site and surrounding transport network

– An integrated approach to determining the optimal land uses and density concentrations as a means of minimising (where possible) trip generation and transport-related demand

– Estimated future transport demands given the site's location and public transport accessibility

– Maximise efficiency and safety of the existing/proposed transport systems in proximity to the subject site

– A review of proposed vehicle access, servicing, car parking and bicycle parking provision

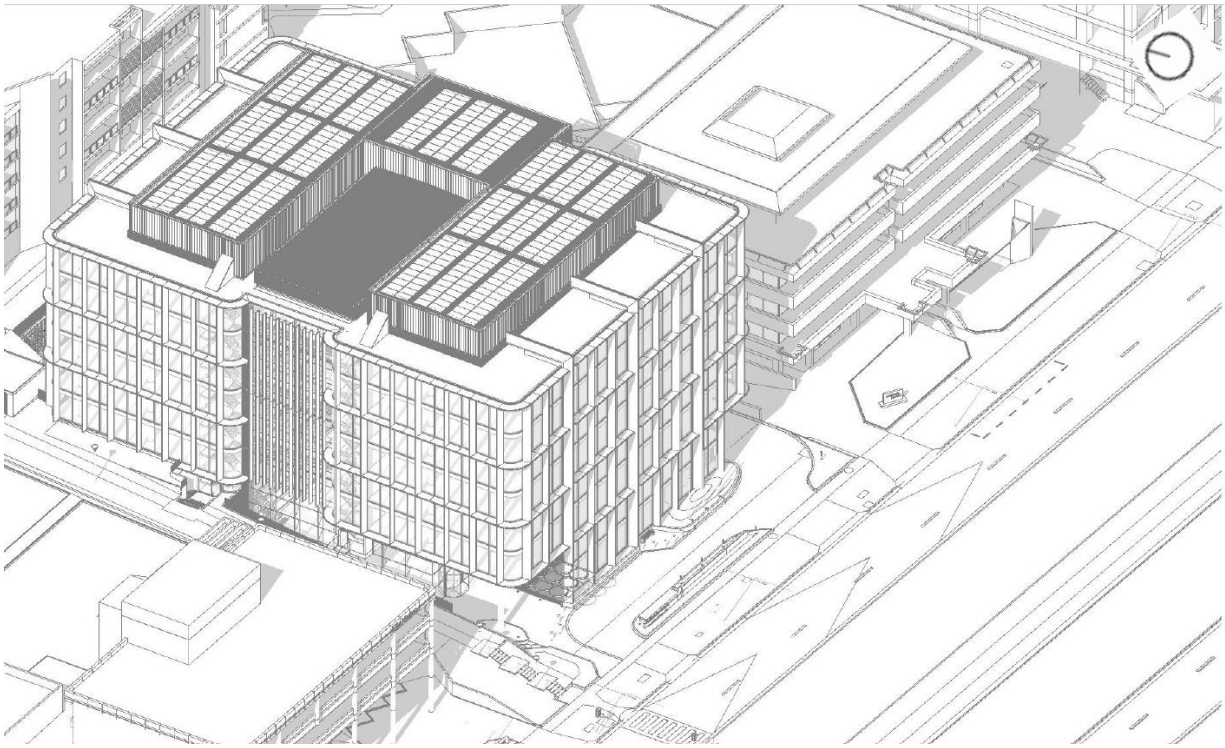
– An assessment of the traffic and transport impacts associated with the redevelopment.

1.2 Development context

The proposal is for the redevelopment of the existing facility at 10 Brisbane Avenue in Barton. The site covers an area of approximately 3,739m^2. It sits in one of the Designated Areas under the National Capital Plan which has street frontages to Brisbane Avenue.

The current building has a Gross Floor Area (GFA) of 3,680m^2 with around 113 parking spaces in total and landscape setbacks. The proposed development would accommodate a nine-storey office tower totalling a GFA of 14,488m^2 and two-level basement parking**.** A total of 237 parking spaces would be provided (**Figure 1-1**).

Figure 1-1 Indicative view from the southwest



Source: Willemsen, 2022

1.3 Report structure

This report has been structured into the following sections:

– **Section 2.0** describes the existing transport conditions.

– **Section 3.0** provides an overview of the proposed development, parking and access requirements.

– **Section 4.0** outlines the traffic appraisal which describes the likely trip generation and indicative impact as a result of the proposed development.

– **Section 5.0** summarises the study findings and presents the conclusions.

2.0 Existing conditions

The purpose of this chapter is to provide an understanding of the current traffic and transport condition in the vicinity of the site, located at 10 Brisbane Avenue, Barton. The site location is shown in **Figure 2-1**.

Figure 2-1 Location of the subject site (highlighted in red block)

Source: Nearmap, 2022

The site is about 1km to the east of Capital Hill and about 570m southeast of the parliament triangle. It has a frontage on Brisbane Avenue with the other three sides bounded by existing office buildings. 1P on-street parking is available on Brisbane Avenue.

2.1 Road network

The major roads in the vicinity of the site include State Circle, Brisbane Avenue, Wentworth Avenue, National Circuit, Macquarie Street and Bowen Drive as shown in **Figure 2-2**.

Figure 2-2 Road network around the site

The key characteristics of the roads around the site are:

– **State Circle** is an arterial road surrounding Capital Hill and forms a signal intersection with Brisbane Avenue to the west of the site. It has two lanes in the northbound direction and three lanes in the southbound direction, which merges into two lanes in the south of Brisbane Avenue. The speed limit is 70km/h with a median. Parking is not allowed between Kings Avenue and Brisbane Avenue.

– **Brisbane Avenue** is an arterial road between State Circle in the west and Wentworth Avenue in the east. It generally provides two lanes in each direction with a wide median for landscape. Brisbane Avenue has a speed limit of 60km/h. Parking is generally subject to time-based parking restrictions on the north side of the road (1P) whereas the southern side of the road has a mixture of unrestricted parking and no stopping/no parking zones. There is also a loading zone on the northern side of Brisbane Avenue close to the site.

– **Wentworth Avenue** is an arterial road connecting Canberra Avenue to the southeast and Bowen Drive to the north. It has a speed limit of 60km/h with two lanes in each direction and a wide median for landscape. It forms a priority intersection with Brisbane Avenue to the east of the site and extends to the north as Bowen Drive.

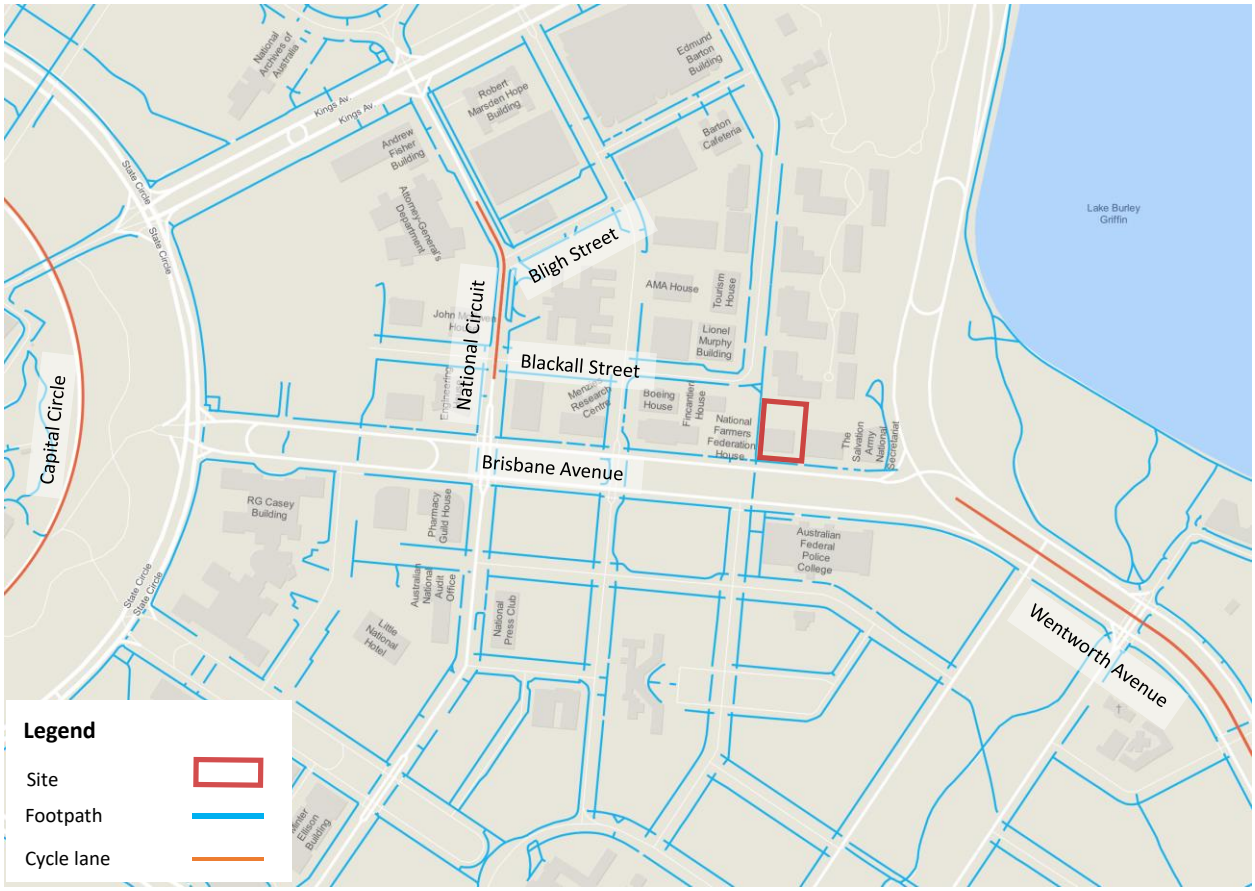
– **National Circuit** is a minor collector road from Adelaide Avenue in the west to Canberra Avenue in the east. It becomes a major collector road from Canberra Avenue in the south/west to Kings Avenue in the north. National Circuit has generally three lanes (two approach lanes and one departure lane) at the signalised intersections with Brisbane Avenue. National Circuit has a speed limit of 60km/h. Parking is not allowed on National Circuit.

– **Macquarie Street** is an access road connecting Kings Avenue in the north and New South Wales Crescent in the south. Macquarie Street provides 2P parking on its western side (south of Brisbane Avenue) and 1P parking on its eastern side (north of Brisbane Avenue). A stop sign is provided at the intersection with Brisbane Avenue and no speed limit is signposted.

2.2 Active transport

An active transport network map for the site is shown in **Figure 2-3**.

Figure 2-3 Active transport network



Footpaths are provided along the majority of the nearby roads. Walking is generally encouraged in Barton with the provision of footpaths of various widths. Pedestrian crossings are provided at the two signal intersections of State Circle and National Circuit with Brisbane Avenue. Multiple mid-block pedestrian crossings are available to the west of the site.

According to the ACT road rules, cyclists are permitted to use footpaths provided they give way to pedestrians. As a result, almost all footpaths/shared paths are attractive for cyclists. Some on-road bicycle lanes in the vicinity of the site are available on:

– National Circuit between Bligh Street and Blackall Street

– Wentworth Avenue/Brisbane Avenue to the east of the site

– Capital Circle.

According to Active Travel Infrastructure Practitioner Tool[1], Macquarie Street, Brisbane Avenue Commonwealth Avenue and Wentworth Avenue are identified as principal bicycle routes (that link town centres and employment centres).

Given the relatively high density and availability of employment and services, the provision of the cycling facility provides a sustainable transport alternative for the employees for short and medium-distance trips.

[1] Active Travel Infrastructure (activeinfrastructure.net.au)

2.3 Public transport

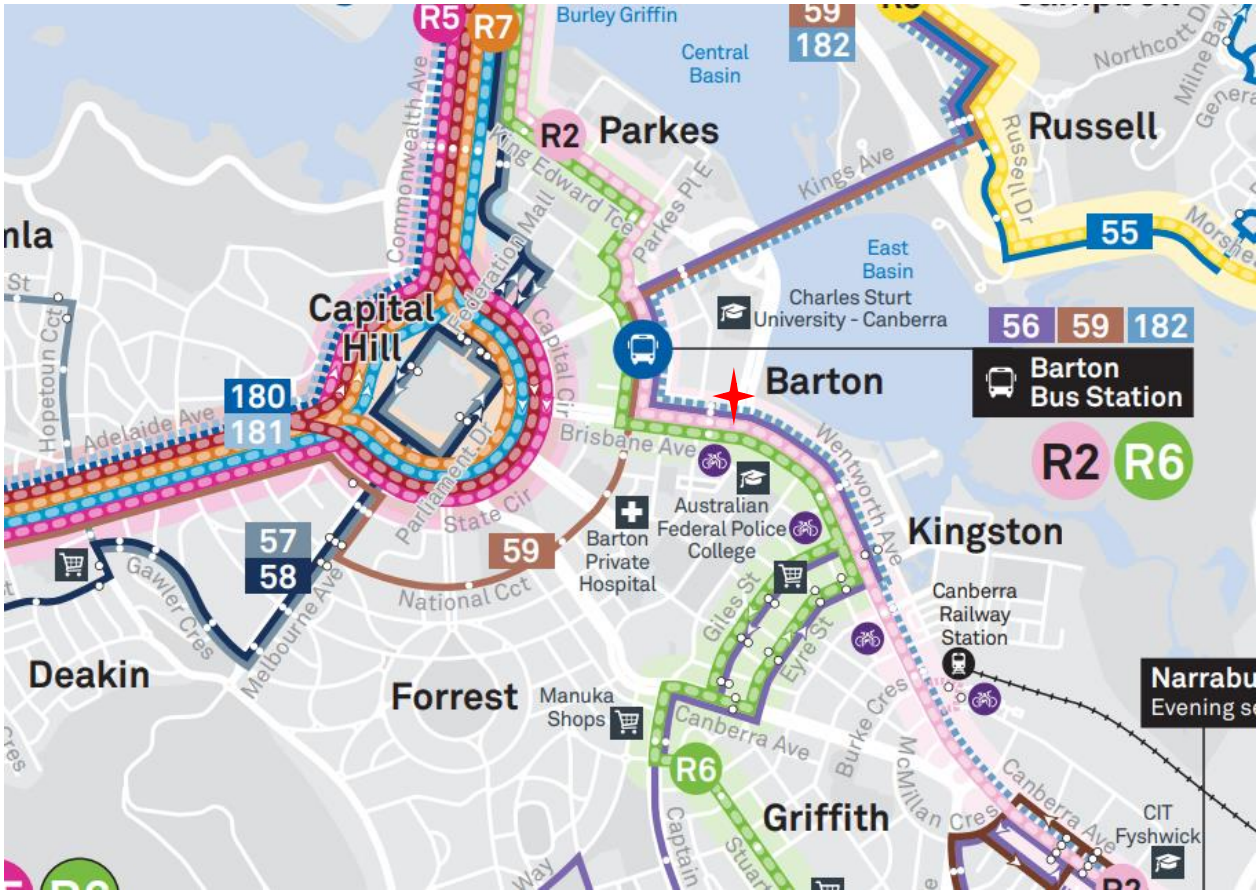
Canberra's public transport system is predominately serviced by its bus network.

A pair of bus stops are located on Brisbane Avenue in close vicinity of the site, which provides four bus routes including R2, R6, Route 56 and Route 182. Bus frequencies at those two stops are around 11-15 services per hour in during a typical AM peak.

The destinations of those routes cover many major transport hubs such as Fishwick Park and Ride, Fraser West Terminus, City Interchange, Woden Interchange, City West, Narrabundah Terminus and Lanyon Marketplace etc.

Figure 2-4 shows the nearby public transport services.

Figure 2-4 Public transport servicing the site

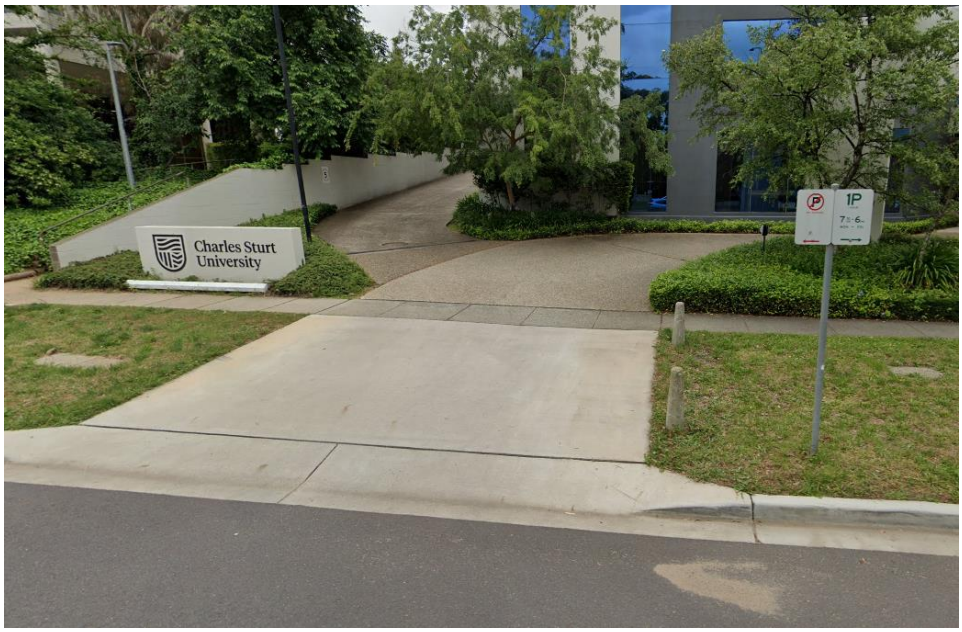


Source: 20051_TC_network_map_420x792 (act.gov.au)

2.4 Existing access arrangements

There are two accesses to service the current site, which are located at the development frontage along Brisbane Avenue as shown in **Figure 2-5** and **Figure 2-6**. The width of the western and eastern accesses are 6.1 and 4.7m, respectively.

Figure 2-5 Existing western access



Source: Google street view, 2021

Figure 2-6 Existing western access

Source: Google street view, 2021

2.5 Crash data

Table 2-1 lists crash data on Brisbane Avenue between 2016 and 2020, where the road section outside the site (Bowen Drive - Young Street) recorded four crashes.

Table 2-1 Details of crash data

Location type	Location description	Number of property damage crashes	Number of injury crashes	Total number of crashes
Mid Block	Wentworth Ave - Telopea Park	2	0	2
Intersection	Brisbane Avenue / Telopea Park	15	2	17
Mid Block	Telopea Park - Bowen Drive	1	0	1
Intersection	Brisbane Avenue / Bowen Drive	12	1	13
Mid Block	**Bowen Drive - Young Street**	**2**	**2**	**4**
Intersection	Brisbane Avenue / Young Street	1	1	2
Mid Block	Young Street - Macquarie Street	4	0	4
Intersection	Brisbane Avenue / Macquarie Street	14	7	21
Mid Block	Macquarie Street - National Circuit	4	0	4
Intersection	Brisbane Avenue / National Circuit	8	0	8
Mid Block	National Circuit - John McEwen Crescent	1	0	1
Mid Block	John McEwen Crescent - State Circuit	2	0	2
Intersection	Brisbane Avenue / State Circuit	8	3	11

The three major crash types on Brisbane Avenue were as follows:

– Straight ahead through-through crashes (RUM code 101) accounted for 32 per cent of all crashes.

– Rear-end crashes (RUM Code 301) accounted for 13 per cent of all crashes.

– Left side rear-end crashes (RUM code 302) accounted for nine per cent of all crashes.

2.6 Existing traffic conditions

A SIDRA model has been prepared for the three intersections around the site to understand the existing network performance and to test the impacts associated with the proposal. Intersection performance has been assessed for the weekday AM and PM peak hours for the intersections including given the office land use:

– National Circuit/Brisbane Avenue (signal)

– Brisbane Avenue interchange with Bowen Drive (give way)

– Brisbane Avenue/State Circle (signal).

2.6.1 Key assumptions for base year model

2.6.1.1 Traffic data

Traffic turning counts for the two signal intersections for base year were extracted from *7999 Barton Section 12 Block 6 Transport Impact Assessment Report* (Indesco, 2021). A traffic survey was carried out for Brisbane Avenue and Bowen Drive interchange on 12 August 2022.

Based on the highest network traffic volume, the peak hours for the data are specified as below:

– Weekday AM peak hour: 8:15 am to 9:15 am

– Weekday PM peak hour: 4:45 pm to 5:45 pm.

2.6.1.2 Site layouts and signal timing

Intersection layouts were derived from a combination of the Nearmap imagery and Google Streetview and signal timing data were provided by Transport Canberra and City Services Directorate.

2.6.2 Model calibration

The intersection models were calibrated using the input data to reflect observations of traffic behaviours on site. One of the key goals is to calibrate the models such that the degree of saturation of all movements was 1.0 or below. This is a standard procedure to ensure that the models are not over-predicting congestion under current conditions.

2.6.3 Intersection level of service

Intersection Level of Service (LoS) is a typical design tool used by traffic engineers to identify when roads are congested. The Level of Service as defined in TfNSW Traffic Modelling Guidelines is provided in **Table 2-2**. It is acknowledged that for SIDRA modelling purposes, Transport Canberra and City Services (TCCS) has adopted the Roads and Maritime Services (RMS) NSW Traffic Modelling Guidelines as its primary technical reference.

Table 2-2 Level of Service definitions

Level of Service	Average delay per vehicle (seconds)	Performance explanation
A	Less than 14.5	Good operation
B	14.5 to 28.4	Good with acceptable delays and spare capacity
C	28.5 to 42.4	Satisfactory
D	42.5 to 56.4	Operating near capacity
E	56.5 to 70.4	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control method.
F	70.5 or greater	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control method.

Source: Roads and Maritime Services (2002), Traffic Modelling Guidelines

In addition, **Degree of Saturation (DoS)** is included to complement Level of Service. It is a measure of the volume/capacity for the worst turning movement at the intersection. DoS is one implies that the turning movement is at capacity.

2.6.4 2022 intersection performance

The outcomes of the intersection modelling are presented in **Table 2-3** based on a modelling assessment by SIDRA Intersection 9.0 software.

Table 2-3 Existing (2022) intersection performance

Intersection	Weekday AM peak			Weekday PM peak		
	Delay	LoS	DoS	Delay	LoS	DoS
National Circuit/Brisbane Avenue (N)	27.2s	B	0.71	23.8s	B	0.54
National Circuit/Brisbane Avenue (S)	25.8s	B	0.61	22.2s	B	0.60
Brisbane Avenue interchange with Bowen Drive	7.1s	A	0.49	6.6s	B	0.35
Brisbane Avenue/State Circle	13.5s	A	0.97	15.8s	B	0.77

Note that the delay is average of all arms of the signal intersection and the worst approach for priority.

The SIDRA results show that the network currently performs at a Level of Service B or better. Brisbane Avenue/State Circle is operating close to capacity during the AM peak hour under the current signal timing plan.

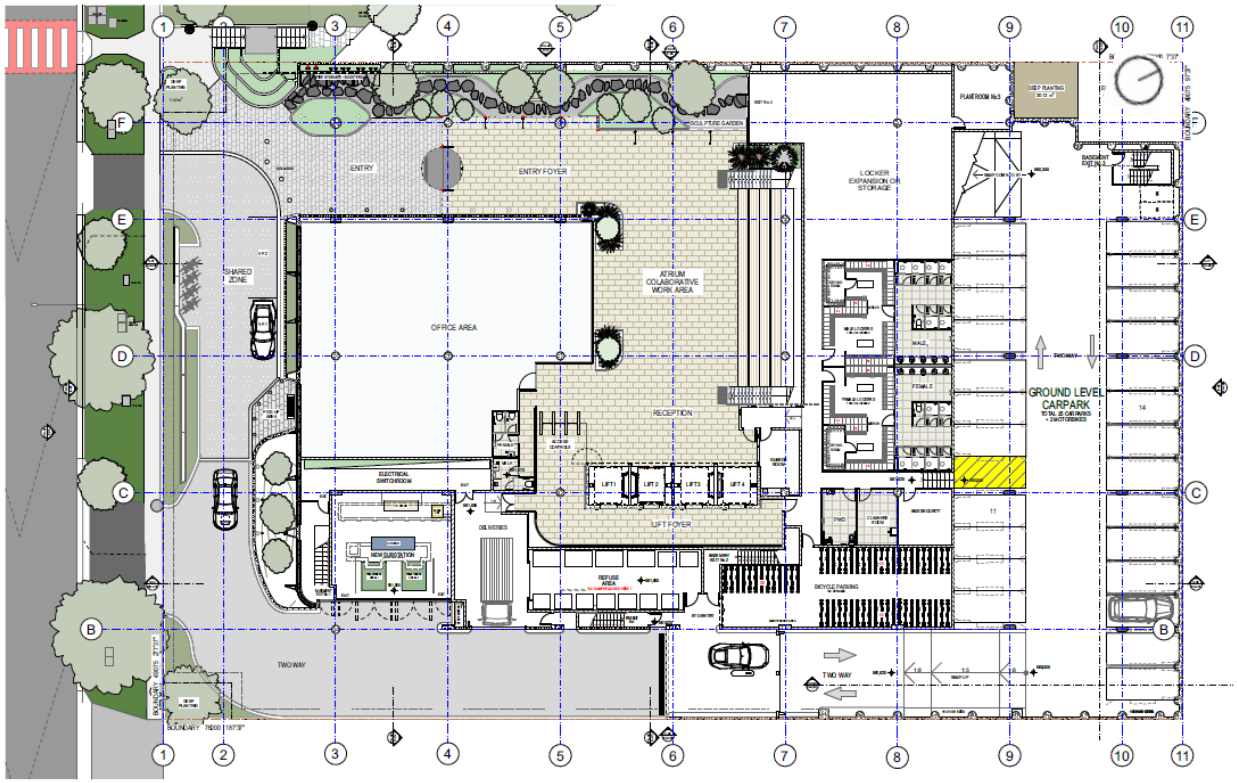
A summary of the detailed SIDRA modelling outputs is included in **Appendix A**.

3.0 Proposed development

3.1 Proposed master plan

The proposed development at 10 Brisbane Avenue seeks the revitalisation of an existing building that sits in one of the Designated Areas under the *National Capital Plan*. The development would consist of nine storeys of office GFA, totalling 14,488 m^2. The proposed master plan is shown in **Figure 3-1**.

Figure 3-1 Proposed master plan



Ground Floor

Source: Willemsen, 2022

3.2 Proposed transport access

The transport access of the proposed development needs to cater for the travel characteristics of the proposal as well as integrate appropriately with the surrounding road network.

3.2.1 Active transport access

The main entrance of the office atrium is located to the west which facilitates pedestrian access to/from the bus stops on both sides of Brisbane Avenue. A shared zone is provided outside the office tower for drop off/pick up activity, which ensures a safe walking environment for pedestrians.

Given the provision of bicycle parking at the ground level, the cyclists are expected to use the internal driveway to the east to access the bicycle storage room, which further connects with the lift foyer and end-of-trip facilities on ground floor.

3.2.2 Vehicular access

The proposed vehicular accesses will generally remain at the existing locations on Brisbane Avenue:

– The western access will reduce to 4m (from 6.1m) given the entry-only configuration to the drop off/pick up zone.

– The eastern access would increase to 7.1m (from 4.7m) given the two-way function for both cars and service vehicles.

A boom gate would be in operation at ground level prior to the parking area to limit access to the employees and visitors. AS2890.1 requires that the queuing space formed between the "control point" (i.e. the boom gate or other device stopping traffic) and the road boundary is of sufficient length to "not adversely affect traffic or pedestrian flows in the frontage road".

An AS2890.1 queueing analysis was undertaken to determine the required queueing area. It is estimated that the queue length would be about two cars in the AM peak hour[2]. Therefore, around 12m of space is required for queuing between the control point and the road boundary to avoid vehicles overspilling onto the public road. The design allows for sufficient room for this queue storage to occur given up to a 50m driveway between the boom gate and the road frontage.

Given the modification to the existing accesses is limited to the access width, it is expected that there is no change to the entering sight distance condition on Brisbane Avenue or to the minimum sightline to pedestrians on the footpath.

3.2.3 Service vehicle access

It is acknowledged that a loading dock is not a mandatory requirement for a commercial office building within the *National Capital Plan*. From an operational perspective, the provided loading vehicle parking bay next to the internal driveway (equivalent to Small Rigid Vehicle) is capable of handling a small Pantech truck, delivery van or delivery utility.

Refuse collection is expected to be conducted by an 8.8m length service vehicle (equivalent to Medium Rigid Vehicle/ MRV) with rear loading. The contractor will park on the driveway and will roll out the bins from the refuse enclosure. The vehicle will reverse back to the drop-off/pick-up area and exit in a forward direction.

AS2890.2 permits minor service areas on part of the internal roadway system provided the occasional obstruction to other traffic is tolerated.

It is expected that trucks larger than an MRV would not be able to access the site to constraints such as roadway widths and site structure. The on-street loading zone to the east of the site on Brisbane Avenue would resolve the loading/unloading by trucks larger than an MRV.

3.3 Proposed parking

3.3.1 Parking requirement and provision

The parking rates for the site and the proposed parking provision are compared in **Table 3-1** according to *Parking and Vehicular Access General Code by* ACT Planning and Land Authority and the requirement for the designated zone.

Table 3-1 Parking requirement and provision

Scale of the development	Vehicle type	Parking rates	Required spaces	Proposed spaces
14,448m^2 GFA	Car parking	1 space per 50m^2 GFA	290 spaces	237 spaces*
	Motorcycle parking	3 spaces per 100 car parking spaces	9 spaces	24 spaces
	Bicycle parking	1 space per 250m^2 GFA after the first 250m^2 GFA	57 spaces	114 spaces
		1 space per 950m^2 GFA after the first 400m^2 GFA	15 spaces	

*Including 2 visitor parking spaces on the ground floor

[2] The assumptions of the M/G/1 queue analysis include 211 inbound cars (90% arrival rate during AM peak hour) at full development stage, 12 second service time based on AS2890.1's automatic ticket issuer and boom gate, a 60 minuite process window and 20% deviation of the service time.

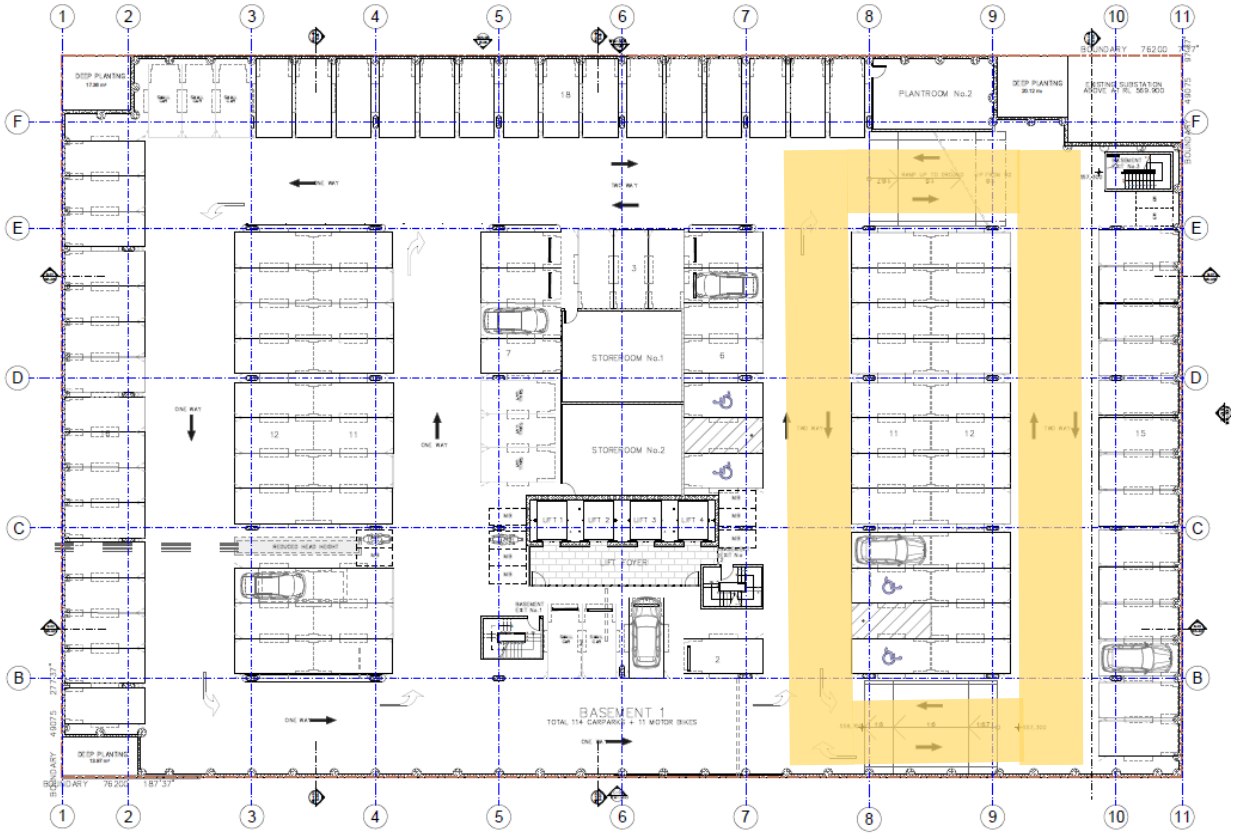
3.3.2 Basement car park

The proposed two-level basement car park and the ground level parking could accommodate about 237 car parking spaces, i.e. 27 spaces at ground level, 115 spaces at basement level one and 95 spaces at level two.

A total of four accessible parking spaces are proposed across the three parking levels. There is a two-way circulation roadway formed by the two ramps and two parking aisles in the north to provide access to different parking levels. (

Figure 3-2).

Figure 3-2 Proposed basement parking level one (Main circulation highlighted in yellow)



Source: Willemsen, 2022

3.4 Swept path assessment

Being a staff parking area for the proposed office tower, the site is identified as a User Class 1/1A structure according to AS2890.1. The aisle width could be a minimum of 5.8m as long as 90-degree parking is provided, which the current design satisfies.

It is proposed that a multi-tier racking system will be provided in the bicycle storage room. The spacing between the bicycle parking space is 450mm, which is acceptable given there is evidence that similar designs and associated products have been adopted in other development.

An AS2890.1 car park review and related swept path assessment were conducted based on the latest drawings. The review identified that non-compliant design exists across different basement levels due to site constraints. The corresponding mitigation measures have been proposed as shown in **Table 3-2**.

Table 3-2 Key design issues and mitigations

Hazard	Root cause	Mitigation measures
Challenging vehicle manoeuvres using the ramp and driveway in the basement. Drivers need to cross the centre line when turning and the opposing vehicles need to give way to it.	The site is a constraint. The turning radii are not compliant with AS2890. No turning radii are provided especially at the two ends of the ramp between the two levels when it connects with the roadway. Provision of the turning radius would cause a significant loss of the parking provision.	– The poor sightlines will need to be mitigated at multiple locations so that vehicles travelling in opposing directions can wait appropriately – with mirrors at all ramp locations and bending of the driveways. Vehicle holding areas are recommended on the driveway/ramps to ensure no collision between the two opposing vehicles. – Delineate turning radius on the ramp to avoid collision on the structure. – Considering the majority of the parking area will be office parking, the car park would likely have a lower than normal rate of traffic meeting each other in opposing directions given the tidal traffic effect, hence, minimising the conflicts.

It is recommended to conduct further refinements in subsequent stages. The detailed swept path analysis for the loading dock and cars at multiple pinch points are shown in **Appendix B**.

4.0 Traffic and transport impacts appraisal

This section assesses the impact of the proposed development on the transport network. The future year for the assessment is assumed to be 2032, a 10-year window after the existing condition.

4.1 Background traffic growth

The *7999 Barton Section 12 Block 6 – Transport Impact Assessment* recorded an annual growth rate of 1.5 per cent for all turning movements in the road network based on the Canberra Strategic Transport Model (CSTM). Hence, the annual growth was applied to 2022 traffic volumes as the background traffic growth to understand traffic volumes and potential impacts at the peak hours of 2032. This results in a compound growth of about 16 per cent on the surrounding road network.

It is estimated that the development of Section 12 Block 6 would generate 304 and 228 car trips in the AM peak hour and PM peak hour, respectively based on a total office GFA of 19,000m^2. The related additional traffic was therefore superimposed on the three modelled intersections.

Hence, the background traffic growth includes both an annual growth rate of 1.5 per cent for the background traffic and the nearby development at Section 12 Block 6.

4.2 Trip generation

4.2.1 Vehicle trips of the development

Trip generation rates for commercial developments were derived from the RMS *Technical Direction (TDT 2013/04a)*. It is assumed that the trip rates for office development for AM and PM peak hours would be 1.6 and 1.2 per 100m^2 GFA during a typical weekday.

It is observed that the current office building has around 3,680m^2 GFA. Hence, the net car trip increase associated with the proposed development is calculated in **Table 4-1** based on a GFA yield of 10,808m^2.

Table 4-1 Net traffic increase

Yield^	Trip rates		Trip generation*	
	AM peak	PM peak	AM peak	PM peak
+10,808m^2	1.6 trips per 100m^2 GFA	1.2 trips per 100m^2 GFA	138 veh in/35 veh out	26 veh in/104 veh out

^The yield is calculated from the area difference between the proposal and the existing development.

*A 80%:20% ratio has been applied for inbound and outbound trips for AM peak and vice versa for PM peak

4.2.2 Traffic distribution

Based on the residential location of the employees in Barton, the traffic distribution is estimated in **Table 4-2**. This has considered strategic access routing for entering and leaving the site and traffic management measures for the local road system.

Table 4-2 Traffic distribution

Travel directions/Road	Proportion
Bowen Drive (North)	45%
State Circle (Southwest)	24%
Wentworth Avenue (Southeast)	26%
National Circuit (South)	5%
Total	**100%**

4.3 Road network impacts

The performance of the intersections under each modelling scenario is shown in **Table 4-3** and **Table 4-4**.

– Future year base

– Future year base with development traffic.

The network operates at satisfactory levels in all modelled periods and does not require any upgrades given a relatively low car trip increase. This is expected as the proposed development will support the growing Blacktown CBD which can be accessed generally by walking and cycling and the site's proximity to excellent public transport access would minimise the dependency on car travel by future residents and hotel customers.

A summary of the detailed SIDRA modelling outputs is included in **Appendix A**.

Table 4-3 Future year base (2032) intersection performance

Intersection	Weekday AM peak			Weekday PM peak		
	Delay	LoS	DoS	Delay	LoS	DoS
National Circuit/Brisbane Avenue (N)	36.5s	C	0.99	29.9s	C	0.82
National Circuit/Brisbane Avenue (S)	27.8s	B	0.75	24.2s	B	0.78
Brisbane Avenue interchange with Bowen Drive	7.3s	A	0.51	6.6s	A	0.35
Brisbane Avenue/State Circle	22.5s	B	0.65	17.5s	B	0.89

Note that the delay is average of all arms of the signal intersection and the worst approach for priority.

Table 4-4 Future year base with development traffic (2032) intersection performance

Intersection	Weekday AM peak			Weekday PM peak		
	Delay	LoS	DoS	Delay	LoS	DoS
National Circuit/Brisbane Avenue (N)	38.4s	C	1.00	29.9s	B	0.82
National Circuit/Brisbane Avenue (S)	27.8s	B	0.75	24.2s	B	0.78
Brisbane Avenue interchange with Bowen Drive	7.3s	A	0.51	6.6s	A	0.35
Brisbane Avenue/State Circle	23.3s	B	0.69	17.6s	B	0.89

Note that the delay is average of all arms of the signal intersection and the worst approach for priority.

As discussed in **Section 4.2**, the additional traffic increase associated with the development are 173 and 130 for the AM peak and PM peak hour. The network operates at satisfactory levels in all modelled periods and does not require any upgrades given a relatively low car trip increase on the local road network.

4.4 Public transport impact

The site is located in the vicinity of the bus stops on Brisbane Avenue. The frequency of up to one service every four minutes during peak hours will ensure the attractiveness of commuting by bus. The delivery of this site would support development with sustainable travel behaviour, by providing increased land-use density in proximity to high-frequency public transport services.

The 2016 Census data showed around nine per cent public transport mode share for employees in Barton, one per cent higher than the average ACT. There is potential to encourage more office users to use public transport. It is expected that these additional trips during peak hours can be accommodated through high-frequency bus services. Impacts on the public transport system are expected to be limited and little capacity issue would be expected.

4.5 Active transport impact

It is important to ensure a safe and well-connected, high-quality footpath around the site, to promote sustainable transport use, especially for short-distance trips. Safe pedestrian crossings are available on Brisbane Avenue in conjunction with a permeable pedestrian network. These ensure a safe walking environment and crossing to access to/from major destinations including public transport facilities.

Strategic cycle routes are available around the site and the footpaths are generally wide enough to accommodate cyclists, which facilitates cyclists to safely reach a wider cycle network. The development will encourage the uptake of cycling through the provision of 114 bicycle parking spaces and good quality end-of-trip facilities. The bicycle parking spaces for such an office development means that the development will cater for a relatively large mode share of cyclists, both for workers as well as visitors to the site. Those cycle trips would become an important component for short-distance trips by the commuters, which is consistent with about nine per cent active transport mode share in Barton according to the 2016 Census data.

Given the scale of the development, the number of person/bicycle trips generated by the proposal during the peak periods could be accommodated by the existing infrastructure.

4.6 Parking impact

The current design has maximised the parking provision within the available space at grade and in the basement. The proposed car parking provision is around 80 per cent of the requirement for the office component in the designated zone. It is noted that the parking requirement is not a mandatory target that the proposal needs to achieve.

On the contrary, the reduced parking would support the initiative of mode shift to green transport and reduce car use in an area that is located near public transport and in proximity to service and high-density development. The 2016 Census data showed that the car mode share for the employees was around 80 per cent. The proposed lower parking rate of around one space every 62m^2 GFA is acceptable and could reduce the car mode share in the future.

It is acknowledged that the provision of accessible parking, bicycle parking and motorcycle parking spaces would be satisfied.

It is expected that there is limited impact on the on-street parking on the northern side of Brisbane Avenue given the minor change to the access widths.

5.0 Conclusion

The proposal would contain an office tower that would achieve a total GFA of 14,480m^2 for commercial premises. In summary:

– The proposed development would generate 173 and 130 additional vehicle trips during AM and PM peak hours, respectively.

– The SIDRA modelling was undertaken to assess the impact on key external intersections

  - National Circuit/Brisbane Avenue
  - Brisbane Avenue interchange with Bowen Drive
  - Brisbane Avenue/State Circle.

– The network operates at satisfactory levels in all modelled periods including future year with development and does not require any upgrades given a relatively low car trip increase on the local road network.

– The proposed vehicular accesses will generally remain at the existing locations on Brisbane Avenue with modifications on the access width. It is expected that there is no change to the entering sight distance condition on Brisbane Avenue or to the minimum sightline to pedestrians on the footpath. There is limited impact on the on-street parking on the northern side of Brisbane Avenue given the minor change to the access widths.

– A queueing analysis has been conducted to justify the current design and ensure there is no vehicles overspill on the public road.

– The total provision of 237 parking spaces is around 80 per cent of the requirement for the office component in the designated zone. It is noted that the parking requirement is not a mandatory target that the proposal needs to achieve. The proposed lower parking rate of around one space every 62m^2 GFA is acceptable and could reduce the car mode share in the future.

– The provided loading bay next to the internal driveway (equivalent to Small Rigid Vehicle) is capable of handling a small Pantech truck, delivery van or delivery utility. Refuse collection is expected to be conducted by an 8.8m length service vehicle (equivalent to Medium Rigid Vehicle) with rear loading on the internal driveway. The on-street loading zone to the east of the site on Brisbane Avenue would resolve the loading/unloading by trucks larger than an MRV.

– Strategic cycle routes are available around the site and the footpaths are generally wide enough to accommodate cyclists. The development will encourage the uptake of cycling through the provision of 114 bicycle parking spaces and good quality end-of-trip facilities.

– Safe pedestrian crossings are available on Brisbane Avenue in conjunction with a permeable pedestrian network, which would ensure a safe walking environment and crossing to access to/from major destinations including public transport facilities.

– There is potential to encourage more office users to use public transport since the site is located in close vicinity of the bus stops on Brisbane Avenue. The delivery of this site would support development with sustainable travel behaviour, by providing increased land-use density in proximity to high-frequency public transport services. Impacts on the public transport system are expected to be limited and little capacity issue would be expected.

– A car park review identified that non-compliant design exists across different basement levels due to site constraints. The corresponding mitigation measures have been proposed.

The Traffic, Parking and Access Study concluded that the impacts of the proposal are limited and are at a level able to be accommodated by the existing and planned infrastructure.

APPENDIX A

SIDRA modelling output

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [1]

Network: N101 [Brisbane Ave_National Cct AM 2022 (Network Folder: AM)]

EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 92 seconds (CCG User-Given Phase Times)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 106 [Brisbane Ave_National CCT N AM 2022]														
South: Mediuan														
2	T1	371	5.0	371	5.0	* 0.713	16.2	LOS B	3.8	28.0	0.68	0.60	0.69	39.9
3	R2	48	5.0	48	5.0	0.143	20.5	LOS B	0.9	6.8	0.52	0.59	0.52	35.6
Approach		419	5.0	419	5.0	0.713	16.7	LOS B	3.8	28.0	0.66	0.60	0.67	39.3
North: National Circuit - N														
7	L2	54	5.0	54	5.0	0.446	38.2	LOS C	4.7	34.5	0.90	0.76	0.90	37.6
8	T1	245	5.0	245	5.0	0.446	33.1	LOS C	4.7	34.5	0.90	0.75	0.90	28.5
Approach		299	5.0	299	5.0	0.446	34.0	LOS C	4.7	34.5	0.90	0.75	0.90	30.7
West: Brisbane Avenue - W														
10	L2	168	5.0	168	5.0	0.542	34.2	LOS C	6.9	50.5	0.88	0.79	0.88	38.7
11	T1	272	5.0	272	5.0	* 0.542	29.0	LOS C	6.9	50.5	0.88	0.78	0.88	39.5
12	R2	84	5.0	84	5.0	0.542	34.9	LOS C	5.2	38.0	0.88	0.78	0.88	29.7
Approach		524	5.0	524	5.0	0.542	31.6	LOS C	6.9	50.5	0.88	0.78	0.88	38.1
All Vehicles		1242	5.0	1242	5.0	0.713	27.2	LOS B	6.9	50.5	0.81	0.71	0.81	36.6
Site: 106 [Brisbane Ave_National CCT S AM 2022]														
South: National Circuit - S														
1	L2	43	5.0	43	5.0	0.406	37.0	LOS C	2.8	20.6	0.87	0.74	0.87	37.9
2	T1	277	5.0	277	5.0	0.406	30.8	LOS C	4.6	33.7	0.87	0.73	0.87	29.6
Approach		320	5.0	320	5.0	0.406	31.7	LOS C	4.6	33.7	0.87	0.73	0.87	31.2
East: Brisbane Avenue - E														
4	L2	59	5.0	59	5.0	0.477	33.2	LOS C	6.2	45.1	0.86	0.74	0.86	39.9
5	T1	342	5.0	342	5.0	0.477	27.8	LOS B	6.2	45.1	0.86	0.76	0.86	40.4
6	R2	142	5.0	142	5.0	0.477	33.8	LOS C	6.0	44.0	0.86	0.77	0.86	29.8
Approach		543	5.0	543	5.0	0.477	30.0	LOS C	6.2	45.1	0.86	0.76	0.86	38.2
North: Median														
8	T1	278	5.0	278	5.0	* 0.613	12.3	LOS A	3.8	28.0	0.49	0.44	0.49	43.0
9	R2	52	5.0	52	5.0	0.613	17.9	LOS B	3.8	28.0	0.60	0.55	0.60	38.4
Approach		329	5.0	329	5.0	0.613	13.2	LOS A	3.8	28.0	0.51	0.46	0.51	42.2
All Vehicles		1193	5.0	1193	5.0	0.613	25.8	LOS B	6.2	45.1	0.77	0.67	0.77	37.2

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov	Dem.	Aver.	Level of	AVERAGE BACK OF	Prop.	Effective	Travel	Travel	Aver.

ID	Crossing	Flow	Delay	Service	QUEUE [Ped	Dist]	Que	Stop Rate	Time	Dist.	Speed
		ped/h	sec		ped	m			sec	m	m/sec
Site: 106 [Brisbane Ave_National CCT N AM 2022]											
East: Brisbane Avenue - E											
P2	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
North: National Circuit - N											
P3	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	207.4	217.2	1.05
West: Brisbane Avenue - W											
P4	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
All Pedestrians		158	40.3	LOS E	0.1	0.1	0.94	0.94	203.0	211.5	1.04
Site: 106 [Brisbane Ave_National CCT S AM 2022]											
South: National Circuit - S											
P1	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	206.9	216.6	1.05
East: Brisbane Avenue - E											
P2	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
West: Brisbane Avenue - W											
P4	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
All Pedestrians		158	40.3	LOS E	0.1	0.1	0.94	0.94	202.8	211.3	1.04

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: [Brisbane Ave_Bowen Dr W AM 2022 (Site Folder: AM 2022 Base)]

Network: N101 [Brisbane Ave_Bowen Dr AM 2022 (Network Folder: AM)]

8:15-9:15 AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowen Drive - S														
1	L2	663	2.9	663	2.9	0.489	5.8	LOS A	0.0	0.0	0.00	0.40	0.00	55.8
2	T1	1177	2.4	1177	2.4	0.489	0.2	LOS A	0.0	0.0	0.00	0.08	0.00	58.8
Approach		1840	2.6	1840	2.6	0.489	2.2	NA	0.0	0.0	0.00	0.19	0.00	57.7
West: Brisbane Avenue														
10	L2	32	3.3	32	3.3	0.024	6.4	LOS A	0.0	0.3	0.32	0.54	0.32	53.0
11	T1	226	12.6	226	12.6	0.231	7.1	LOS A	0.3	2.2	0.66	0.86	0.72	48.9
Approach		258	11.4	258	11.4	0.231	7.0	LOS A	0.3	2.2	0.61	0.82	0.67	49.7
All Vehicles		2098	3.7	2098	3.7	0.489	2.8	NA	0.3	2.2	0.08	0.27	0.08	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 92 [Brisbane Ave_State CCT AM 2022 (Site Folder: AM 2022 Base)]

8:15-9:15 AM
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 106 seconds (Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 1 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: State Circle - S														
1	L2	3	5.0	3	5.0	0.261	9.7	LOS A	5.1	37.2	0.28	0.25	0.28	60.3
2	T1	719	5.0	768	5.0	0.261	3.2	LOS A	5.3	38.8	0.29	0.26	0.29	66.0
3	R2	120	5.0	128	5.0	* 0.842	66.5	LOS E[11]	7.4	54.1	1.00	0.93	1.36	29.4
Approach		842	5.0	900	5.0	0.842	12.2	LOS A	7.4	54.1	0.39	0.35	0.44	56.0
East: Brisbane Avenue - E														
4	L2	210	5.0	224	5.0	0.310	8.1	LOS A	2.6	19.2	0.31	0.65	0.31	53.9
5	T1	5	5.0	5	5.0	* 0.965	78.3	LOS F[11]	11.1	80.9	1.00	1.14	1.72	25.4
6	R2	148	5.0	158	5.0	0.965	84.0	LOS F[11]	11.1	80.9	1.00	1.14	1.72	25.5
Approach		363	5.0	388	5.0	0.965	40.0	LOS C	11.1	80.9	0.60	0.85	0.90	36.7
North: State Circle - N														
7	L2	599	5.0	640	5.0	0.384	6.8	LOS A	1.0	7.5	0.03	0.55	0.03	57.9
8	T1	941	5.0	1005	5.0	* 0.384	7.9	LOS A	11.0	80.0	0.46	0.43	0.46	60.6
9	R2	4	5.0	4	5.0	0.253	74.7	LOS F[11]	0.3	1.9	1.00	0.62	1.00	27.5
Approach		1544	5.0	1650	5.0	0.384	7.7	LOS A	11.0	80.0	0.30	0.48	0.30	59.3
West: Brisbane Ave Extension														
10	L2	3	5.0	3	5.0	0.039	55.2	LOS D[11]	0.3	1.9	0.94	0.64	0.94	32.5
11	T1	2	5.0	2	5.0	0.039	49.6	LOS D[11]	0.3	1.9	0.94	0.64	0.94	32.2
12	R2	3	5.0	3	5.0	* 0.189	73.4	LOS F[11]	0.2	1.5	1.00	0.61	1.00	27.3
Approach		8	5.0	9	5.0	0.189	60.6	LOS E[11]	0.3	1.9	0.96	0.63	0.96	30.3
All Vehicles		2757	5.0	2946	5.0	0.965	13.5	LOS A	11.1	80.9	0.37	0.49	0.42	53.8

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Brisbane Avenue - E												
P21	Stage 1	50	54	47.3	LOS E[12]	0.2	0.2	0.95	0.95	204.4	204.3	1.00
P22	Stage 2	50	54	47.3	LOS	0.2	0.2	0.95	0.95	207.0	207.6	1.00

				E[12]							
All Pedestrians	100	107	47.3	LOS E[12]	0.2	0.2	0.95	0.95	205.7	206.0	1.00

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.

12 Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [CCGName]

Network: N101 [Brisbane Ave_National Cct PM 2022 (Network Folder: PM)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 87 seconds (CCG User-Given Phase Times)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 106 [Brisbane Ave_National CCT N PM 2022]														
South: Mediuan														
2	T1	260	5.0	260	5.0	* 0.537	5.9	LOS A	1.8	13.1	0.28	0.24	0.28	50.6
3	R2	45	5.0	45	5.0	0.107	10.5	LOS A	0.3	2.2	0.24	0.56	0.24	43.0
Approach		305	5.0	305	5.0	0.537	6.6	LOS A	1.8	13.1	0.27	0.29	0.27	49.3
North: National Circuit - N														
7	L2	104	5.0	104	5.0	0.507	32.3	LOS C	6.3	45.9	0.87	0.77	0.87	39.9
8	T1	356	5.0	356	5.0	0.507	27.1	LOS B	6.3	45.9	0.87	0.75	0.87	31.3
Approach		460	5.0	460	5.0	0.507	28.3	LOS B	6.3	45.9	0.87	0.75	0.87	34.0
West: Brisbane Avenue - W														
10	L2	78	5.0	78	5.0	0.427	36.8	LOS C	4.1	29.7	0.90	0.76	0.90	37.9
11	T1	180	5.0	180	5.0	* 0.427	31.5	LOS C	4.1	29.7	0.90	0.76	0.90	38.6
12	R2	59	5.0	59	5.0	0.427	37.4	LOS C	3.1	22.8	0.90	0.76	0.90	28.4
Approach		317	5.0	317	5.0	0.427	33.9	LOS C	4.1	29.7	0.90	0.76	0.90	37.0
All Vehicles		1082	5.0	1082	5.0	0.537	23.8	LOS B	6.3	45.9	0.71	0.62	0.71	37.8
Site: 106 [Brisbane Ave_National CCT S PM 2022]														
South: National Circuit - S														
1	L2	63	5.0	63	5.0	0.352	34.7	LOS C	3.6	26.0	0.87	0.74	0.87	38.8
2	T1	269	5.0	269	5.0	0.352	29.1	LOS C	3.6	26.6	0.87	0.72	0.87	30.4
Approach		333	5.0	333	5.0	0.352	30.2	LOS C	3.6	26.6	0.87	0.72	0.87	32.6
East: Brisbane Avenue - E														
4	L2	25	5.0	25	5.0	0.385	35.9	LOS C	3.7	27.3	0.88	0.73	0.88	38.9
5	T1	273	5.0	273	5.0	0.385	30.6	LOS C	3.7	27.3	0.89	0.74	0.89	39.5
6	R2	36	5.0	36	5.0	0.385	36.6	LOS C	3.7	27.0	0.89	0.74	0.89	29.4
Approach		334	5.0	334	5.0	0.385	31.7	LOS C	3.7	27.3	0.89	0.74	0.89	38.7
North: Median														
8	T1	277	5.0	277	5.0	* 0.600	6.5	LOS A	3.6	26.1	0.32	0.37	0.32	48.9
9	R2	138	5.0	138	5.0	0.600	11.1	LOS A	3.6	26.1	0.42	0.49	0.42	43.8
Approach		415	5.0	415	5.0	0.600	8.0	LOS A	3.6	26.1	0.36	0.41	0.36	47.1
All Vehicles		1081	5.0	1081	5.0	0.600	22.2	LOS B	3.7	27.3	0.68	0.61	0.68	38.8

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov	Dem.	Aver.	Level of	AVERAGE BACK OF	Prop.	Effective	Travel	Travel	Aver.

ID	Crossing	Flow	Delay	Service	QUEUE [Ped	Dist]	Que	Stop Rate	Time	Dist.	Speed
		ped/h	sec		ped	m			sec	m	m/sec
Site: 106 [Brisbane Ave_National CCT N PM 2022]											
East: Brisbane Avenue - E											
P2	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
North: National Circuit - N											
P3	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	204.9	217.2	1.06
West: Brisbane Avenue - W											
P4	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
All Pedestrians		158	37.8	LOS D	0.1	0.1	0.93	0.93	200.5	211.5	1.05
Site: 106 [Brisbane Ave_National CCT S PM 2022]											
South: National Circuit - S											
P1	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	204.4	216.6	1.06
East: Brisbane Avenue - E											
P2	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
West: Brisbane Avenue - W											
P4	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
All Pedestrians		158	37.8	LOS D	0.1	0.1	0.93	0.93	200.3	211.3	1.05

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: [Brisbane Ave_Bowen Dr W PM 2022 (Site Folder: PM 2022 Base)]

Network: N101 [Brisbane Ave_Bowen Dr PM 2022 (Network Folder: PM)]

16:30-17:30
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowen Drive - S														
1	L2	344	5.2	344	5.2	0.345	5.8	LOS A	0.0	0.0	0.00	0.29	0.00	56.8
2	T1	968	0.4	968	0.4	0.345	0.1	LOS A	0.0	0.0	0.00	0.09	0.00	58.9
Approach		1313	1.7	1313	1.7	0.345	1.6	NA	0.0	0.0	0.00	0.14	0.00	58.4
West: Brisbane Avenue														
10	L2	64	0.0	64	0.0	0.051	6.6	LOS A	0.1	0.6	0.36	0.58	0.36	53.0
11	T1	341	4.6	341	4.6	0.239	5.7	LOS A	0.3	2.2	0.50	0.74	0.53	50.2
Approach		405	3.9	405	3.9	0.239	5.9	LOS A	0.3	2.2	0.48	0.71	0.50	50.9
All Vehicles		1718	2.2	1718	2.2	0.345	2.6	NA	0.3	2.2	0.11	0.28	0.12	57.1

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

MOVEMENT SUMMARY

Site: 92 [Brisbane Ave_State CCT PM 2022 (Site Folder: PM 2022 Base)]

16:45-17:45 PM
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 117 seconds (Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 1 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: State Circle - S														
1	L2	1	5.0	1	5.0	0.320	17.7	LOS B	9.9	72.3	0.50	0.45	0.50	53.2
2	T1	705	5.0	753	5.0	* 0.320	11.0	LOS A	9.9	72.4	0.50	0.44	0.50	57.8
3	R2	16	5.0	17	5.0	* 0.186	67.4	LOS E[11]	1.0	7.3	0.99	0.69	0.99	29.2
Approach		722	5.0	771	5.0	0.320	12.2	LOS A	9.9	72.4	0.51	0.45	0.51	56.6
East: Brisbane Avenue - E														
4	L2	387	5.0	413	5.0	0.482	8.0	LOS A	5.9	43.0	0.34	0.67	0.34	53.9
5	T1	1	5.0	1	5.0	* 0.767	52.2	LOS D[11]	14.9	108.6	1.00	0.89	1.10	30.9
6	R2	241	5.0	257	5.0	0.767	57.8	LOS E[11]	14.9	108.6	1.00	0.89	1.10	31.1
Approach		629	5.0	672	5.0	0.767	27.2	LOS B	14.9	108.6	0.59	0.75	0.63	42.0
North: State Circle - N														
7	L2	187	5.0	200	5.0	0.295	14.8	LOS B	8.2	60.0	0.44	0.57	0.44	53.4
8	T1	803	5.0	858	5.0	0.295	10.2	LOS A	9.0	65.4	0.48	0.46	0.48	57.9
9	R2	1	5.0	1	5.0	0.012	64.9	LOS E[11]	0.1	0.4	0.97	0.59	0.97	29.6
Approach		991	5.0	1059	5.0	0.295	11.1	LOS A	9.0	65.4	0.47	0.48	0.47	57.0
West: Brisbane Ave Extension														
10	L2	3	5.0	3	5.0	0.013	26.0	LOS B	0.1	0.9	0.76	0.60	0.76	43.4
11	T1	1	5.0	1	5.0	0.013	20.3	LOS B	0.1	0.9	0.76	0.60	0.76	42.9
12	R2	1	5.0	1	5.0	* 0.070	78.7	LOS F[11]	0.1	0.5	1.00	0.57	1.00	26.2
Approach		5	5.0	5	5.0	0.070	35.4	LOS C	0.1	0.9	0.81	0.59	0.81	38.3
All Vehicles		2347	5.0	2508	5.0	0.767	15.8	LOS B	14.9	108.6	0.52	0.54	0.53	51.9

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Brisbane Avenue - E												
P21	Stage 1	50	54	52.8	LOS E[12]	0.2	0.2	0.95	0.95	209.9	204.3	0.97
P22	Stage 2	50	54	52.8	LOS	0.2	0.2	0.95	0.95	212.5	207.6	0.98

				E[12]							
All Pedestrians	100	107	52.8	LOS E[12]	0.2	0.2	0.95	0.95	211.2	206.0	0.98

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.

12 Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [CCGName]

Network: N101 [Brisbane Ave_National Cct AM 2032 No Development (Network Folder: AM)]

EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 92 seconds (CCG User-Given Phase Times)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 106 [Brisbane Ave_National CCT N AM No Dev 2032]														
South: Mediuan														
2	T1	528	5.0	528	5.0	* 0.993	38.6	LOS C	3.8	28.0	0.97	1.07	1.28	27.3
3	R2	56	5.0	56	5.0	0.199	23.1	LOS B	1.5	11.1	0.60	0.61	0.60	34.2
Approach		584	5.0	584	5.0	0.993	37.1	LOS C	3.8	28.0	0.94	1.02	1.22	27.9
North: National Circuit - N														
7	L2	62	5.0	62	5.0	0.516	38.9	LOS C	5.6	40.8	0.92	0.78	0.92	37.4
8	T1	284	5.0	284	5.0	0.516	33.8	LOS C	5.6	40.8	0.92	0.77	0.92	28.2
Approach		346	5.0	346	5.0	0.516	34.7	LOS C	5.6	40.8	0.92	0.77	0.92	30.4
West: Brisbane Avenue - W														
10	L2	285	5.0	285	5.0	0.759	38.4	LOS C	10.8	79.0	0.95	0.88	1.01	36.7
11	T1	332	5.0	332	5.0	* 0.759	34.2	LOS C	10.8	79.0	0.96	0.90	1.05	37.3
12	R2	116	5.0	116	5.0	0.759	40.7	LOS C	8.5	61.9	0.96	0.91	1.07	27.2
Approach		733	5.0	733	5.0	0.759	36.9	LOS C	10.8	79.0	0.95	0.89	1.04	35.9
All Vehicles		1663	5.0	1663	5.0	0.993	36.5	LOS C	10.8	79.0	0.94	0.91	1.08	32.5
Site: 106 [Brisbane Ave_National CCT S AM No Dev 2032]														
South: National Circuit - S														
1	L2	51	5.0	51	5.0	0.516	38.1	LOS C	13.1	95.8	0.90	0.77	0.90	37.5
2	T1	354	5.0	354	5.0	0.516	31.9	LOS C	13.1	95.8	0.90	0.76	0.90	29.1
Approach		404	5.0	404	5.0	0.516	32.7	LOS C	13.1	95.8	0.90	0.76	0.90	30.6
East: Brisbane Avenue - E														
4	L2	68	5.0	68	5.0	0.614	34.7	LOS C	8.4	61.2	0.91	0.79	0.91	39.3
5	T1	397	5.0	397	5.0	0.614	29.3	LOS C	8.4	61.2	0.91	0.80	0.91	39.7
6	R2	231	5.0	231	5.0	0.614	35.4	LOS C	8.1	59.3	0.91	0.82	0.91	28.7
Approach		696	5.0	696	5.0	0.614	31.8	LOS C	8.4	61.2	0.91	0.80	0.91	36.8
North: Median														
8	T1	325	5.0	325	5.0	* 0.745	14.5	LOS B	3.8	28.0	0.60	0.55	0.62	40.9
9	R2	75	5.0	75	5.0	0.745	20.8	LOS B	3.8	28.0	0.75	0.68	0.77	36.3
Approach		400	5.0	400	5.0	0.745	15.7	LOS B	3.8	28.0	0.63	0.57	0.64	40.0
All Vehicles		1500	5.0	1500	5.0	0.745	27.8	LOS B	13.1	95.8	0.83	0.73	0.84	35.8

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
Site: 106 [Brisbane Ave_National CCT N AM No Dev 2032]											
East: Brisbane Avenue - E											
P2	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
North: National Circuit - N											
P3	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	207.4	217.2	1.05
West: Brisbane Avenue - W											
P4	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
All Pedestrians		158	40.3	LOS E	0.1	0.1	0.94	0.94	203.0	211.5	1.04
Site: 106 [Brisbane Ave_National CCT S AM No Dev 2032]											
South: National Circuit - S											
P1	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	206.9	216.6	1.05
East: Brisbane Avenue - E											
P2	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
West: Brisbane Avenue - W											
P4	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
All Pedestrians		158	40.3	LOS E	0.1	0.1	0.94	0.94	202.8	211.3	1.04

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: [Brisbane Ave_Bowen Dr W AM No Dev 2032 (Site Folder: AM 2032 No Dev)]

Network: N101 [Brisbane Ave_Bowen Dr AM 2032 No Development (Network Folder: AM)]

8:15-9:15 AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowen Drive - S														
1	L2	729	2.6	729	2.6	0.507	5.8	LOS A	0.0	0.0	0.00	0.42	0.00	55.6
2	T1	1177	2.4	1177	2.4	0.507	0.2	LOS A	0.0	0.0	0.00	0.07	0.00	58.9
Approach		1906	2.5	1906	2.5	0.507	2.4	NA	0.0	0.0	0.00	0.20	0.00	57.5
West: Brisbane Avenue														
10	L2	32	3.3	32	3.3	0.024	6.3	LOS A	0.0	0.3	0.29	0.53	0.29	53.1
11	T1	243	11.7	243	11.7	0.255	7.3	LOS A	0.3	2.5	0.67	0.87	0.76	48.6
Approach		275	10.7	275	10.7	0.255	7.2	LOS A	0.3	2.5	0.63	0.83	0.71	49.5
All Vehicles		2181	3.5	2181	3.5	0.507	3.0	NA	0.3	2.5	0.08	0.28	0.09	56.9

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

MOVEMENT SUMMARY

Site: 92 [Brisbane Ave_State CCT AM No Dev 2032 - user given cycle time (Site Folder: AM 2032 No Dev)]

8:15-9:15 AM
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 1 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: State Circle - S														
1	L2	3	5.0	3	5.0	0.465	25.2	LOS B	15.2	111.1	0.69	0.61	0.69	48.0
2	T1	834	5.0	891	5.0	0.465	18.5	LOS B	15.3	111.4	0.69	0.61	0.69	51.7
3	R2	139	5.0	149	5.0	* 0.651	58.1	LOS E[11]	8.0	58.1	1.00	0.82	1.04	31.5
Approach		976	5.0	1043	5.0	0.651	24.2	LOS B	15.3	111.4	0.73	0.64	0.74	47.3
East: Brisbane Avenue - E														
4	L2	258	5.0	276	5.0	0.310	11.7	LOS A	5.3	38.4	0.45	0.69	0.45	51.1
5	T1	6	5.0	6	5.0	* 0.647	47.9	LOS D[11]	9.9	72.0	0.99	0.83	1.01	32.1
6	R2	172	5.0	184	5.0	0.647	53.5	LOS D[11]	9.9	72.0	0.99	0.83	1.01	32.3
Approach		436	5.0	466	5.0	0.647	28.7	LOS C	9.9	72.0	0.67	0.75	0.68	41.3
North: State Circle - N														
7	L2	753	5.0	805	5.0	0.653	13.2	LOS A	22.3	162.4	0.51	0.73	0.51	52.9
8	T1	1092	5.0	1167	5.0	* 0.653	24.7	LOS B	22.7	165.4	0.82	0.75	0.82	47.3
9	R2	5	5.0	5	5.0	0.055	62.1	LOS E[11]	0.3	2.1	0.97	0.65	0.97	30.3
Approach		1850	5.0	1977	5.0	0.653	20.1	LOS B	22.7	165.4	0.70	0.74	0.70	49.4
West: Brisbane Ave Extension														
10	L2	3	5.0	3	5.0	0.017	24.2	LOS B	0.1	0.9	0.80	0.60	0.80	44.8
11	T1	2	5.0	2	5.0	0.017	18.5	LOS B	0.1	0.9	0.80	0.60	0.80	44.2
12	R2	3	5.0	3	5.0	* 0.033	60.9	LOS E[11]	0.2	1.2	0.97	0.63	0.97	30.1
Approach		8	5.0	9	5.0	0.033	36.5	LOS C	0.2	1.2	0.86	0.61	0.86	37.8
All Vehicles		3270	5.0	3494	5.0	0.653	22.5	LOS B	22.7	165.4	0.70	0.71	0.71	47.5

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Brisbane Avenue - E												
P21	Stage 1	50	54	49.3	LOS E[12]	0.2	0.2	0.95	0.95	206.4	204.3	0.99
P22	Stage 2	50	54	49.3	LOS	0.2	0.2	0.95	0.95	209.0	207.6	0.99

				E[12]							
All Pedestrians	100	107	49.3	LOS E[12]	0.2	0.2	0.95	0.95	207.7	206.0	0.99

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.

12 Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [CCGName]

Network: N101 [Brisbane Ave_National Cct PM 2032 No Development (Network Folder: PM)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 87 seconds (CCG User-Given Phase Times)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 106 [Brisbane Ave_National CCT N PM No Dev 2032]														
South: Mediuan														
2	T1	316	5.0	316	5.0	* 0.648	7.3	LOS A	3.0	22.1	0.39	0.34	0.39	48.9
3	R2	53	5.0	53	5.0	0.130	11.6	LOS A	0.4	3.0	0.28	0.56	0.28	42.0
Approach		368	5.0	368	5.0	0.648	7.9	LOS A	3.0	22.1	0.37	0.37	0.37	47.8
North: National Circuit - N														
7	L2	121	5.0	121	5.0	0.614	33.5	LOS C	7.9	58.0	0.91	0.80	0.91	39.4
8	T1	413	5.0	413	5.0	0.614	28.4	LOS B	7.9	58.0	0.91	0.79	0.91	30.6
Approach		534	5.0	534	5.0	0.614	29.6	LOS C	7.9	58.0	0.91	0.79	0.91	33.3
West: Brisbane Avenue - W														
10	L2	189	5.0	189	5.0	* 0.822	45.3	LOS D	9.5	69.3	1.00	0.97	1.19	34.6
11	T1	258	5.0	258	5.0	0.822	41.1	LOS C	9.5	69.3	1.00	0.98	1.23	34.8
12	R2	123	5.0	123	5.0	0.822	48.8	LOS D	6.5	47.7	1.00	1.00	1.29	24.0
Approach		571	5.0	571	5.0	0.822	44.2	LOS D	9.5	69.3	1.00	0.98	1.23	32.9
All Vehicles		1473	5.0	1473	5.0	0.822	29.8	LOS C	9.5	69.3	0.81	0.76	0.90	35.1
Site: 106 [Brisbane Ave_National CCT S PM No Dev 2032]														
South: National Circuit - S														
1	L2	74	5.0	74	5.0	0.452	35.9	LOS C	3.9	28.4	0.89	0.76	0.89	38.2
2	T1	315	5.0	315	5.0	0.452	30.1	LOS C	4.8	35.1	0.89	0.75	0.89	29.9
Approach		388	5.0	388	5.0	0.452	31.2	LOS C	4.8	35.1	0.89	0.75	0.89	32.1
East: Brisbane Avenue - E														
4	L2	29	5.0	29	5.0	0.461	36.5	LOS C	4.6	33.4	0.90	0.75	0.90	38.6
5	T1	316	5.0	316	5.0	0.461	31.3	LOS C	4.6	33.4	0.91	0.76	0.91	39.2
6	R2	54	5.0	54	5.0	0.461	37.2	LOS C	4.5	32.9	0.91	0.76	0.91	28.9
Approach		399	5.0	399	5.0	0.461	32.5	LOS C	4.6	33.4	0.91	0.76	0.91	38.1
North: Median														
8	T1	331	5.0	331	5.0	0.777	10.4	LOS A	3.8	28.0	0.53	0.52	0.54	44.4
9	R2	205	5.0	205	5.0	0.777	16.8	LOS B	3.8	28.0	0.71	0.71	0.73	38.7
Approach		536	5.0	536	5.0	0.777	12.9	LOS A	3.8	28.0	0.60	0.59	0.62	42.0
All Vehicles		1323	5.0	1323	5.0	0.777	24.2	LOS B	4.8	35.1	0.78	0.69	0.78	37.4

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
Site: 106 [Brisbane Ave_National CCT N PM No Dev 2032]											
East: Brisbane Avenue - E											
P2	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
North: National Circuit - N											
P3	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	204.9	217.2	1.06
West: Brisbane Avenue - W											
P4	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
All Pedestrians		158	37.8	LOS D	0.1	0.1	0.93	0.93	200.5	211.5	1.05
Site: 106 [Brisbane Ave_National CCT S PM No Dev 2032]											
South: National Circuit - S											
P1	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	204.4	216.6	1.06
East: Brisbane Avenue - E											
P2	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
West: Brisbane Avenue - W											
P4	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
All Pedestrians		158	37.8	LOS D	0.1	0.1	0.93	0.93	200.3	211.3	1.05

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: [Brisbane Ave_Bowen Dr W PM No Dev 2032 (Site Folder: PM 2032 No Dev)]

Network: N101 [Brisbane Ave_Bowen Dr PM 2032 No Development (Network Folder: PM)]

16:30-17:30
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowen Drive - S														
1	L2	358	5.0	358	5.0	0.349	5.8	LOS A	0.0	0.0	0.00	0.30	0.00	56.7
2	T1	968	0.4	968	0.4	0.349	0.1	LOS A	0.0	0.0	0.00	0.09	0.00	58.9
Approach		1327	1.7	1327	1.7	0.349	1.6	NA	0.0	0.0	0.00	0.15	0.00	58.3
West: Brisbane Avenue														
10	L2	64	0.0	64	0.0	0.051	6.6	LOS A	0.1	0.6	0.35	0.57	0.35	53.0
11	T1	391	4.0	391	4.0	0.274	5.8	LOS A	0.4	2.7	0.51	0.76	0.57	50.1
Approach		455	3.5	455	3.5	0.274	5.9	LOS A	0.4	2.7	0.49	0.73	0.54	50.8
All Vehicles		1782	2.1	1782	2.1	0.349	2.7	NA	0.4	2.7	0.13	0.30	0.14	56.9

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

MOVEMENT SUMMARY

Site: 92 [Brisbane Ave_State CCT PM No Dev 2032 (Site Folder: PM 2032 No Dev)]

16:45-17:45 PM
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 117 seconds (Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 1 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: State Circle - S														
1	L2	1	5.0	1	5.0	0.371	18.2	LOS B	12.0	87.5	0.53	0.47	0.53	52.9
2	T1	818	5.0	874	5.0	* 0.371	11.4	LOS A	12.0	87.5	0.53	0.47	0.53	57.4
3	R2	19	5.0	20	5.0	* 0.221	67.7	LOS E[11]	1.2	8.7	0.99	0.70	0.99	29.1
Approach		838	5.0	895	5.0	0.371	12.7	LOS A	12.0	87.5	0.54	0.47	0.54	56.2
East: Brisbane Avenue - E														
4	L2	492	5.0	526	5.0	0.661	10.5	LOS A	13.8	100.6	0.57	0.76	0.57	50.5
5	T1	1	5.0	1	5.0	* 0.890	62.8	LOS E[11]	19.6	142.9	1.00	0.99	1.30	28.4
6	R2	280	5.0	299	5.0	0.890	68.4	LOS E[11]	19.6	142.9	1.00	0.99	1.30	28.1
Approach		773	5.0	826	5.0	0.890	31.6	LOS C	19.6	142.9	0.73	0.84	0.84	39.2
North: State Circle - N														
7	L2	228	5.0	244	5.0	0.345	14.8	LOS B	9.9	72.0	0.45	0.58	0.45	53.3
8	T1	931	5.0	995	5.0	0.345	10.6	LOS A	10.9	79.5	0.50	0.48	0.50	57.6
9	R2	1	5.0	1	5.0	0.012	64.9	LOS E[11]	0.1	0.4	0.97	0.59	0.97	29.6
Approach		1160	5.0	1239	5.0	0.345	11.4	LOS A	10.9	79.5	0.49	0.50	0.49	56.7
West: Brisbane Ave Extension														
10	L2	3	5.0	3	5.0	0.013	24.0	LOS B	0.1	0.8	0.76	0.60	0.76	44.4
11	T1	1	5.0	1	5.0	0.013	18.3	LOS B	0.1	0.8	0.76	0.60	0.76	43.9
12	R2	1	5.0	1	5.0	* 0.070	78.7	LOS F[11]	0.1	0.5	1.00	0.57	1.00	26.2
Approach		5	5.0	5	5.0	0.070	33.8	LOS C	0.1	0.8	0.80	0.59	0.80	39.0
All Vehicles		2776	5.0	2966	5.0	0.890	17.5	LOS B	19.6	142.9	0.57	0.59	0.60	50.2

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Brisbane Avenue - E												
P21	Stage 1	50	54	52.8	LOS E[12]	0.2	0.2	0.95	0.95	209.9	204.3	0.97
P22	Stage 2	50	54	52.8	LOS	0.2	0.2	0.95	0.95	212.5	207.6	0.98

				E[12]							
All Pedestrians	100	107	52.8	LOS E[12]	0.2	0.2	0.95	0.95	211.2	206.0	0.98

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.

12 Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [CCGName]

Network: N101 [Brisbane Ave_National Cct AM 2032 With Development (Network Folder: AM)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 92 seconds (CCG User-Given Phase Times)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 106 [Brisbane Ave_National CCT N AM With Dev 2032]														
South: Mediuan														
2	T1	528	5.0	528	5.0	* 1.006	44.6	LOS D	3.8	28.0	0.97	1.11	1.35	25.2
3	R2	63	4.4	63	4.4	0.201	21.8	LOS B	1.4	10.5	0.57	0.61	0.57	34.9
Approach		592	4.9	592	4.9	1.006	42.1	LOS C	3.8	28.0	0.93	1.06	1.27	25.9
North: National Circuit - N														
7	L2	96	3.2	96	3.2	0.567	39.4	LOS C	6.2	45.2	0.93	0.80	0.93	37.0
8	T1	284	5.0	284	5.0	0.567	34.3	LOS C	6.2	45.2	0.93	0.78	0.93	27.8
Approach		380	4.6	380	4.6	0.567	35.6	LOS C	6.2	45.2	0.93	0.79	0.93	30.9
West: Brisbane Avenue - W														
10	L2	285	5.0	285	5.0	0.759	38.4	LOS C	10.8	79.0	0.95	0.88	1.01	36.7
11	T1	332	5.0	332	5.0	* 0.759	34.2	LOS C	10.8	79.0	0.96	0.90	1.05	37.3
12	R2	116	5.0	116	5.0	0.759	40.7	LOS C	8.5	61.9	0.96	0.91	1.07	27.2
Approach		733	5.0	733	5.0	0.759	36.9	LOS C	10.8	79.0	0.95	0.89	1.04	35.9
All Vehicles		1704	4.9	1704	4.9	1.006	38.4	LOS C	10.8	79.0	0.94	0.93	1.09	31.8
Site: 106 [Brisbane Ave_National CCT S AM With Dev 2032]														
South: National Circuit - S														
1	L2	51	5.0	51	5.0	0.525	38.2	LOS C	14.3	104.4	0.91	0.77	0.91	37.5
2	T1	361	4.9	361	4.9	0.525	32.0	LOS C	14.3	104.4	0.91	0.77	0.91	29.1
Approach		412	4.9	412	4.9	0.525	32.8	LOS C	14.3	104.4	0.91	0.77	0.91	30.6
East: Brisbane Avenue - E														
4	L2	68	5.0	68	5.0	0.614	34.7	LOS C	8.4	61.2	0.91	0.79	0.91	39.3
5	T1	397	5.0	397	5.0	0.614	29.3	LOS C	8.4	61.2	0.91	0.80	0.91	39.7
6	R2	231	5.0	231	5.0	0.614	35.4	LOS C	8.1	59.3	0.91	0.82	0.91	28.7
Approach		696	5.0	696	5.0	0.614	31.8	LOS C	8.4	61.2	0.91	0.80	0.91	36.8
North: Median														
8	T1	325	5.0	325	5.0	* 0.745	14.5	LOS B	3.8	28.0	0.60	0.55	0.62	40.9
9	R2	75	5.0	75	5.0	0.745	20.8	LOS B	3.8	28.0	0.75	0.68	0.77	36.3
Approach		400	5.0	400	5.0	0.745	15.7	LOS B	3.8	28.0	0.63	0.57	0.64	40.0
All Vehicles		1507	5.0	1507	5.0	0.745	27.8	LOS B	14.3	104.4	0.83	0.73	0.84	35.8

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
Site: 106 [Brisbane Ave_National CCT N AM With Dev 2032]											
East: Brisbane Avenue - E											
P2	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
North: National Circuit - N											
P3	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	207.4	217.2	1.05
West: Brisbane Avenue - W											
P4	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
All Pedestrians		158	40.3	LOS E	0.1	0.1	0.94	0.94	203.0	211.5	1.04
Site: 106 [Brisbane Ave_National CCT S AM With Dev 2032]											
South: National Circuit - S											
P1	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	206.9	216.6	1.05
East: Brisbane Avenue - E											
P2	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
West: Brisbane Avenue - W											
P4	Full	53	40.3	LOS E	0.1	0.1	0.94	0.94	200.7	208.6	1.04
All Pedestrians		158	40.3	LOS E	0.1	0.1	0.94	0.94	202.8	211.3	1.04

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: [Brisbane Ave_Bowen Dr W AM With Dev 2032 (Site Folder: AM 2032 With Dev)]

Network: N101 [Brisbane Ave_Bowen Dr AM 2032 With Development (Network Folder: AM)]

8:15-9:15 AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowen Drive - S														
1	L2	729	2.6	729	2.6	0.507	5.8	LOS A	0.0	0.0	0.00	0.42	0.00	55.6
2	T1	1177	2.4	1177	2.4	0.507	0.2	LOS A	0.0	0.0	0.00	0.07	0.00	58.9
Approach		1906	2.5	1906	2.5	0.507	2.4	NA	0.0	0.0	0.00	0.20	0.00	57.5
West: Brisbane Avenue														
10	L2	48	2.2	48	2.2	0.036	6.3	LOS A	0.1	0.4	0.29	0.54	0.29	53.2
11	T1	263	10.8	263	10.8	0.273	7.3	LOS A	0.3	2.7	0.68	0.88	0.78	48.6
Approach		312	9.5	312	9.5	0.273	7.1	LOS A	0.3	2.7	0.62	0.83	0.71	49.8
All Vehicles		2218	3.5	2218	3.5	0.507	3.0	NA	0.3	2.7	0.09	0.29	0.10	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 92 [Brisbane Ave_State CCT AM With Dev 2032 - user given cycle time (Site Folder: AM 2032 With Dev)]

8:15-9:15 AM
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 1 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: State Circle - S														
1	L2	3	0	3	5.0	0.651	37.2	LOS C	20.0	145.7	0.89	0.79	0.89	39.1
2	T1	834	42	891	5.0	0.651	31.5	LOS C	20.0	145.9	0.89	0.78	0.89	39.6
3	R2	172	7	183	4.1	0.447	45.5	LOS D[11]	8.6	62.0	0.91	0.80	0.91	33.9
Approach		1009	49	1078	4.8	0.651	33.8	LOS C	20.0	145.9	0.90	0.79	0.90	38.5
East: Brisbane Avenue - E														
4	L2	258	13	276	5.0	0.283	12.6	LOS A	5.5	39.9	0.46	0.69	0.46	49.1
5	T1	6	0	6	5.0	*0.773	55.0	LOS D[11]	10.6	77.6	1.00	0.90	1.16	30.2
6	R2	172	9	184	5.0	*0.773	60.7	LOS E[11]	10.6	77.6	1.00	0.90	1.16	29.9
Approach		436	22	466	5.0	0.773	32.1	LOS C	10.6	77.6	0.68	0.78	0.75	38.9
North: State Circle - N														
7	L2	785	38	838	4.8	0.773	18.9	LOS B	34.6	252.0	0.75	0.82	0.75	46.2
8	T1	1092	55	1167	5.0	*0.773	32.7	LOS C	34.6	252.0	0.93	0.86	0.96	38.9
9	R2	5	0	5	5.0	0.013	40.6	LOS C	0.2	1.6	0.80	0.65	0.80	35.3
Approach		1882	93	2010	4.9	0.773	27.0	LOS B	34.6	252.0	0.86	0.84	0.87	41.6
West: Brisbane Ave Extension														
10	L2	3	0	3	5.0	0.007	15.9	LOS B	0.1	0.7	0.59	0.53	0.59	48.4
11	T1	2	0	2	5.0	0.007	10.3	LOS A	0.1	0.7	0.59	0.53	0.59	49.1
12	R2	3	0	3	5.0	*0.033	60.9	LOS E[11]	0.2	1.2	0.97	0.63	0.97	29.6
Approach		8	0	9	5.0	0.033	31.4	LOS C	0.2	1.2	0.73	0.57	0.73	39.2
All Vehicles		3335	164	3562	4.9	0.773	29.7	LOS C	34.6	252.0	0.85	0.82	0.86	40.3

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Brisbane Avenue - E												
P21	Stage 1	50	54	49.3	LOS E[12]	0.2	0.2	0.95	0.95	206.4	204.3	0.99
P22	Stage 2	50	54	49.3	LOS	0.2	0.2	0.95	0.95	209.0	207.6	0.99

				E[12]							
All Pedestrians	100	107	49.3	LOS E[12]	0.2	0.2	0.95	0.95	207.7	206.0	0.99

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.

12 Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [CCGName]

Network: N101 [Brisbane Ave_National Cct PM 2032 With Development (Network Folder: PM)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 87 seconds (CCG User-Given Phase Times)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 106 [Brisbane Ave_National CCT N With No Dev 2032]														
South: Mediuan														
2	T1	316	5.0	316	5.0	* 0.650	7.3	LOS A	3.0	22.2	0.39	0.34	0.39	48.9
3	R2	54	4.9	54	4.9	0.130	11.5	LOS A	0.4	3.0	0.28	0.57	0.28	42.1
Approach		369	5.0	369	5.0	0.650	7.9	LOS A	3.0	22.2	0.37	0.37	0.37	47.8
North: National Circuit - N														
7	L2	127	4.8	127	4.8	0.622	33.6	LOS C	8.1	58.8	0.91	0.80	0.91	39.3
8	T1	413	5.0	413	5.0	0.622	28.6	LOS C	8.1	58.8	0.91	0.79	0.92	30.5
Approach		540	4.9	540	4.9	0.622	29.8	LOS C	8.1	58.8	0.91	0.80	0.92	33.3
West: Brisbane Avenue - W														
10	L2	189	5.0	189	5.0	* 0.822	45.3	LOS D	9.5	69.3	1.00	0.97	1.19	34.6
11	T1	258	5.0	258	5.0	0.822	41.1	LOS C	9.5	69.3	1.00	0.98	1.23	34.8
12	R2	123	5.0	123	5.0	0.822	48.8	LOS D	6.5	47.7	1.00	1.00	1.29	24.0
Approach		571	5.0	571	5.0	0.822	44.2	LOS D	9.5	69.3	1.00	0.98	1.23	32.9
All Vehicles		1480	5.0	1480	5.0	0.822	29.9	LOS C	9.5	69.3	0.81	0.76	0.90	35.1
Site: 106 [Brisbane Ave_National CCT S PM With Dev 2032]														
South: National Circuit - S														
1	L2	74	5.0	74	5.0	0.454	35.9	LOS C	3.9	28.4	0.89	0.76	0.89	38.2
2	T1	316	5.0	316	5.0	0.454	30.1	LOS C	4.8	35.4	0.89	0.75	0.89	29.9
Approach		389	5.0	389	5.0	0.454	31.2	LOS C	4.8	35.4	0.89	0.75	0.89	32.1
East: Brisbane Avenue - E														
4	L2	29	5.0	29	5.0	0.461	36.5	LOS C	4.6	33.4	0.90	0.75	0.90	38.6
5	T1	316	5.0	316	5.0	0.461	31.3	LOS C	4.6	33.4	0.91	0.76	0.91	39.2
6	R2	54	5.0	54	5.0	0.461	37.2	LOS C	4.5	32.9	0.91	0.76	0.91	28.9
Approach		399	5.0	399	5.0	0.461	32.5	LOS C	4.6	33.4	0.91	0.76	0.91	38.1
North: Median														
8	T1	331	5.0	331	5.0	0.777	10.4	LOS A	3.8	28.0	0.53	0.52	0.54	44.4
9	R2	205	5.0	205	5.0	0.777	16.8	LOS B	3.8	28.0	0.71	0.71	0.73	38.7
Approach		536	5.0	536	5.0	0.777	12.9	LOS A	3.8	28.0	0.60	0.59	0.62	42.0
All Vehicles		1324	5.0	1324	5.0	0.777	24.2	LOS B	4.8	35.4	0.78	0.69	0.79	37.4

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
Site: 106 [Brisbane Ave_National CCT N With No Dev 2032]											
East: Brisbane Avenue - E											
P2	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
North: National Circuit - N											
P3	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	204.9	217.2	1.06
West: Brisbane Avenue - W											
P4	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
All Pedestrians		158	37.8	LOS D	0.1	0.1	0.93	0.93	200.5	211.5	1.05
Site: 106 [Brisbane Ave_National CCT S PM With Dev 2032]											
South: National Circuit - S											
P1	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	204.4	216.6	1.06
East: Brisbane Avenue - E											
P2	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
West: Brisbane Avenue - W											
P4	Full	53	37.8	LOS D	0.1	0.1	0.93	0.93	198.3	208.6	1.05
All Pedestrians		158	37.8	LOS D	0.1	0.1	0.93	0.93	200.3	211.3	1.05

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: [Brisbane Ave_Bowen Dr W PM With Dev 2032 (Site Folder: PM 2032 With Dev)]

Network: N101 [Brisbane Ave_Bowen Dr PM 2032 With Development (Network Folder: PM)]

16:30-17:30
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowen Drive - S														
1	L2	358	5.0	358	5.0	0.349	5.8	LOS A	0.0	0.0	0.00	0.30	0.00	56.7
2	T1	968	0.4	968	0.4	0.349	0.1	LOS A	0.0	0.0	0.00	0.09	0.00	58.9
Approach		1327	1.7	1327	1.7	0.349	1.6	NA	0.0	0.0	0.00	0.15	0.00	58.3
West: Brisbane Avenue														
10	L2	115	0.0	115	0.0	0.091	6.6	LOS A	0.1	1.0	0.36	0.59	0.36	53.0
11	T1	450	3.5	450	3.5	0.314	5.9	LOS A	0.5	3.2	0.53	0.78	0.62	50.1
Approach		565	2.8	565	2.8	0.314	6.1	LOS A	0.5	3.2	0.49	0.74	0.57	51.0
All Vehicles		1891	2.0	1891	2.0	0.349	3.0	NA	0.5	3.2	0.15	0.32	0.17	56.7

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 92 [Brisbane Ave_State CCT PM With Dev 2032 (Site Folder: PM 2032 With Dev)]

16:45-17:45 PM
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 117 seconds (Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 1 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: State Circle - S														
1	L2	1	0	1	5.0	0.371	18.2	LOS B	12.0	87.5	0.53	0.47	0.53	52.9
2	T1	818	41	874	5.0	* 0.371	11.4	LOS A	12.0	87.5	0.53	0.47	0.53	57.4
3	R2	25	1	27	3.8	* 0.287	68.0	LOS E[11]	1.6	11.3	1.00	0.71	1.00	29.0
Approach		844	42	902	5.0	0.371	13.1	LOS A	12.0	87.5	0.54	0.47	0.54	55.8
East: Brisbane Avenue - E														
4	L2	492	25	526	5.0	0.661	10.5	LOS A	13.8	100.8	0.57	0.76	0.57	52.0
5	T1	1	0	1	5.0	* 0.890	62.8	LOS E[11]	19.6	142.9	1.00	0.99	1.30	28.4
6	R2	280	14	299	5.0	0.890	68.4	LOS E[11]	19.6	142.9	1.00	0.99	1.30	28.5
Approach		773	39	826	5.0	0.890	31.6	LOS C	19.6	142.9	0.73	0.84	0.84	40.0
North: State Circle - N														
7	L2	234	11	250	4.9	0.346	14.8	LOS B	9.9	72.5	0.45	0.59	0.45	53.3
8	T1	931	47	995	5.0	0.346	10.6	LOS A	10.9	79.9	0.50	0.48	0.50	57.6
9	R2	1	0	1	5.0	0.012	64.9	LOS E[11]	0.1	0.4	0.97	0.59	0.97	29.6
Approach		1166	58	1246	5.0	0.346	11.5	LOS A	10.9	79.9	0.49	0.50	0.49	56.6
West: Brisbane Ave Extension														
10	L2	3	0	3	5.0	0.013	24.0	LOS B	0.1	0.8	0.76	0.60	0.76	44.4
11	T1	1	0	1	5.0	0.013	18.3	LOS B	0.1	0.8	0.76	0.60	0.76	43.9
12	R2	1	0	1	5.0	* 0.070	78.7	LOS F[11]	0.1	0.5	1.00	0.57	1.00	26.2
Approach		5	0	5	5.0	0.070	33.8	LOS C	0.1	0.8	0.80	0.59	0.80	39.0
All Vehicles		2788	139	2979	5.0	0.890	17.6	LOS B	19.6	142.9	0.57	0.59	0.60	50.5

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Brisbane Avenue - E												
P21	Stage 1	50	54	52.8	LOS E[12]	0.2	0.2	0.95	0.95	209.9	204.3	0.97
P22	Stage 2	50	54	52.8	LOS	0.2	0.2	0.95	0.95	212.5	207.6	0.98

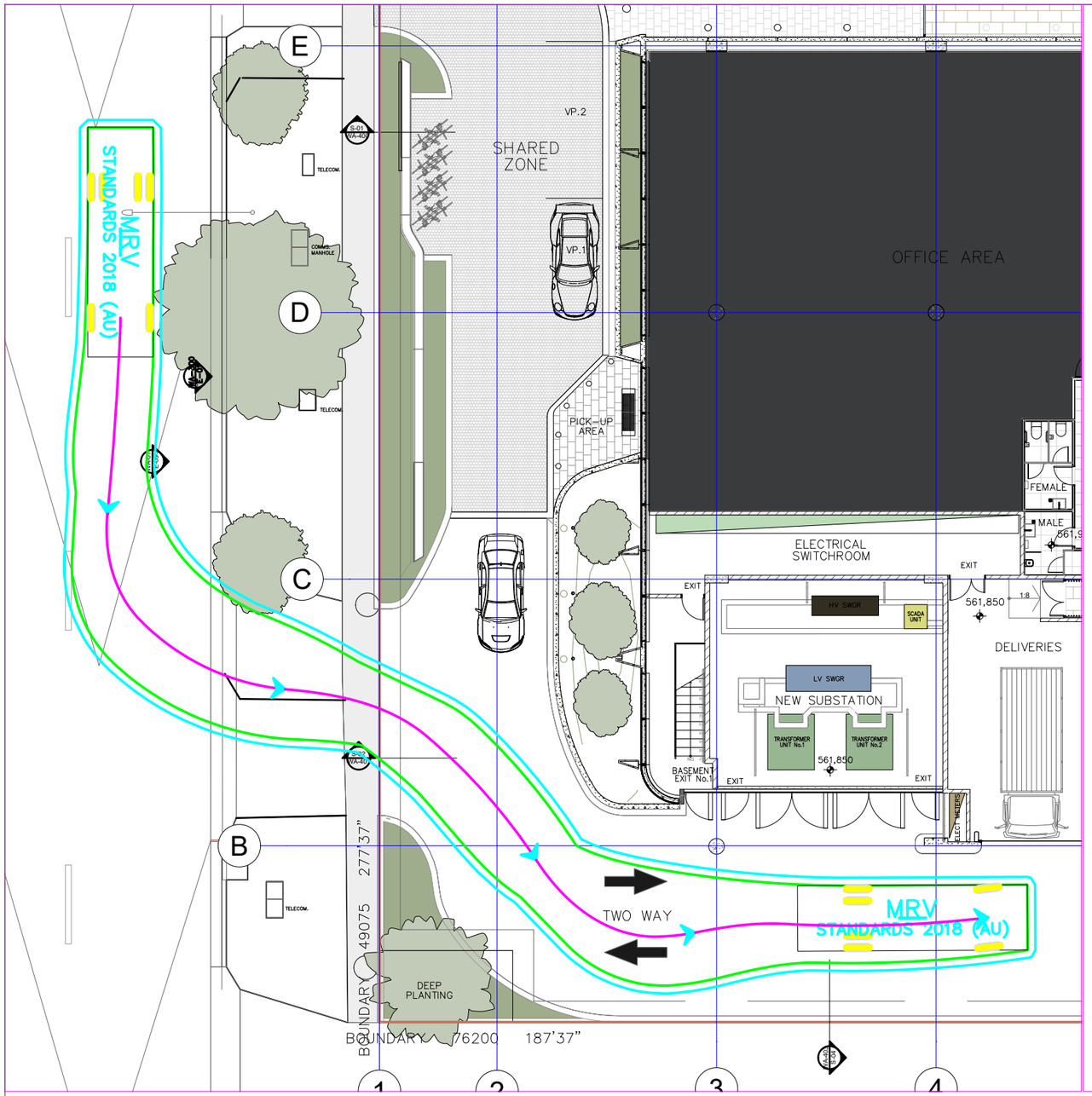
				E[12]							
All Pedestrians	100	107	52.8	LOS E[12]	0.2	0.2	0.95	0.95	211.2	206.0	0.98

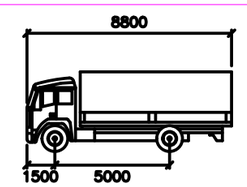
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

12 Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

APPENDIX B

Swept path assessment





MRV

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Width	: 2500
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

SCT Consulting

REV	DESCRIPTION	DATE
A	PRELIMINARY DRAFT	18/08/2022

PREPARED FOR
WILLEMSEN

QUALITY INFORMATION	
DATE	08/22
PREPARED	N.B
REVIEWED	S.C
AUTHORISED	JDB

SCALE @ A3
0 2 4
SCALE - 1:100

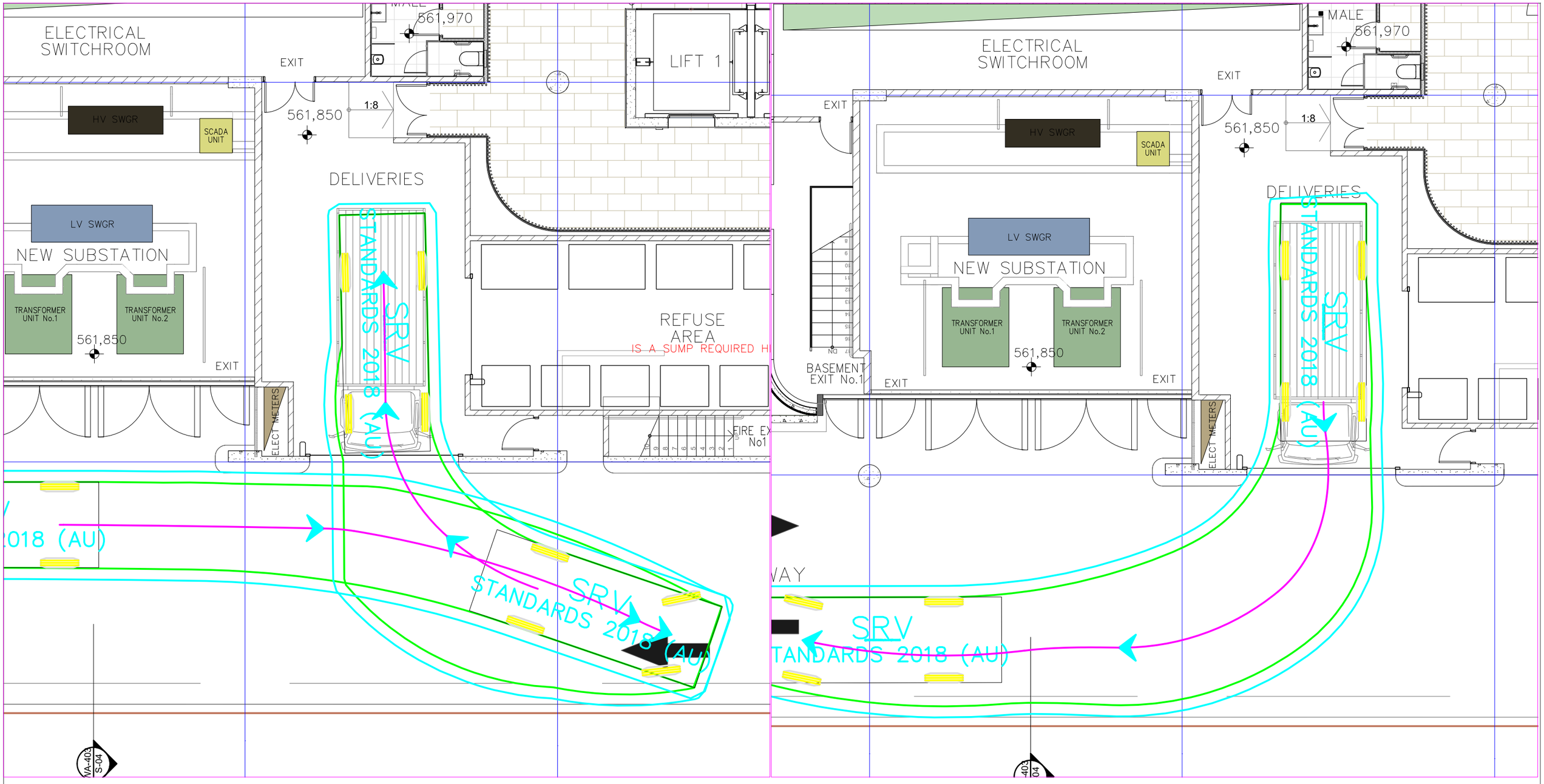
PROJECT
10 Brisbane Ave Barton Traffic Advice
Swept Path Analysis

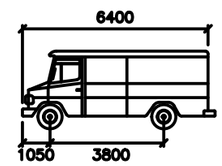
TITLE
MRV

DRAWING NUMBER
SCT_00344_01-003

SHEET 03 OF 03

A3





SRV

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Width	: 2300
Track	: 2300
Lock to Lock Time	: 6.0
Steering Angle	: 38.1

SCT Consulting

REV	DESCRIPTION	DATE
A	PRELIMINARY DRAFT	18/08/2022

PREPARED FOR
WILLEMSEN

QUALITY INFORMATION	
DATE	08/22
PREPARED	N.B
REVIEWED	S.C
AUTHORISED	JDR

SCALE @ A3
0 2 4
SCALE - 1:200

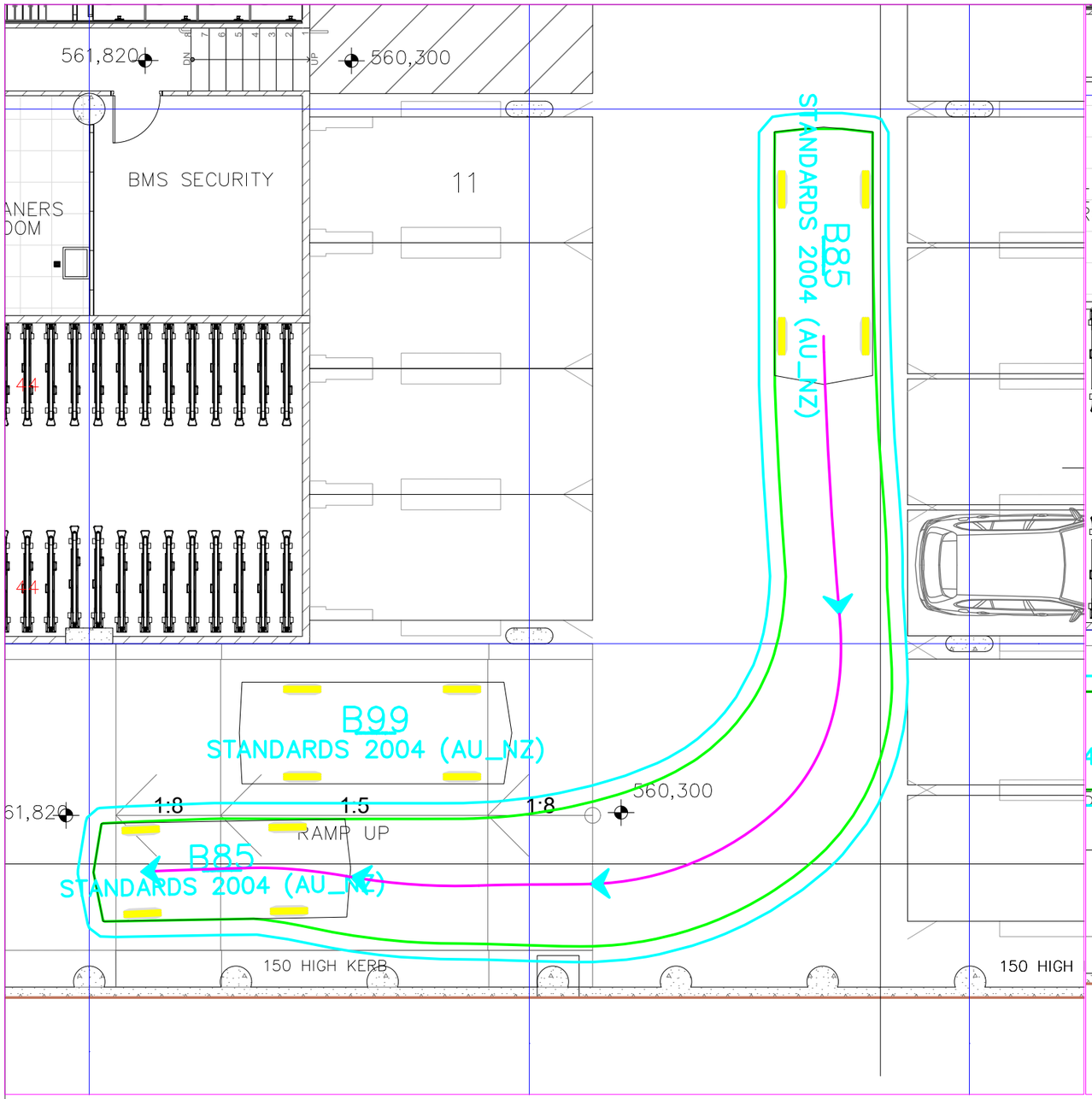
PROJECT
10 Brisbane Ave Barton Traffic Advice
Swept Path Analysis

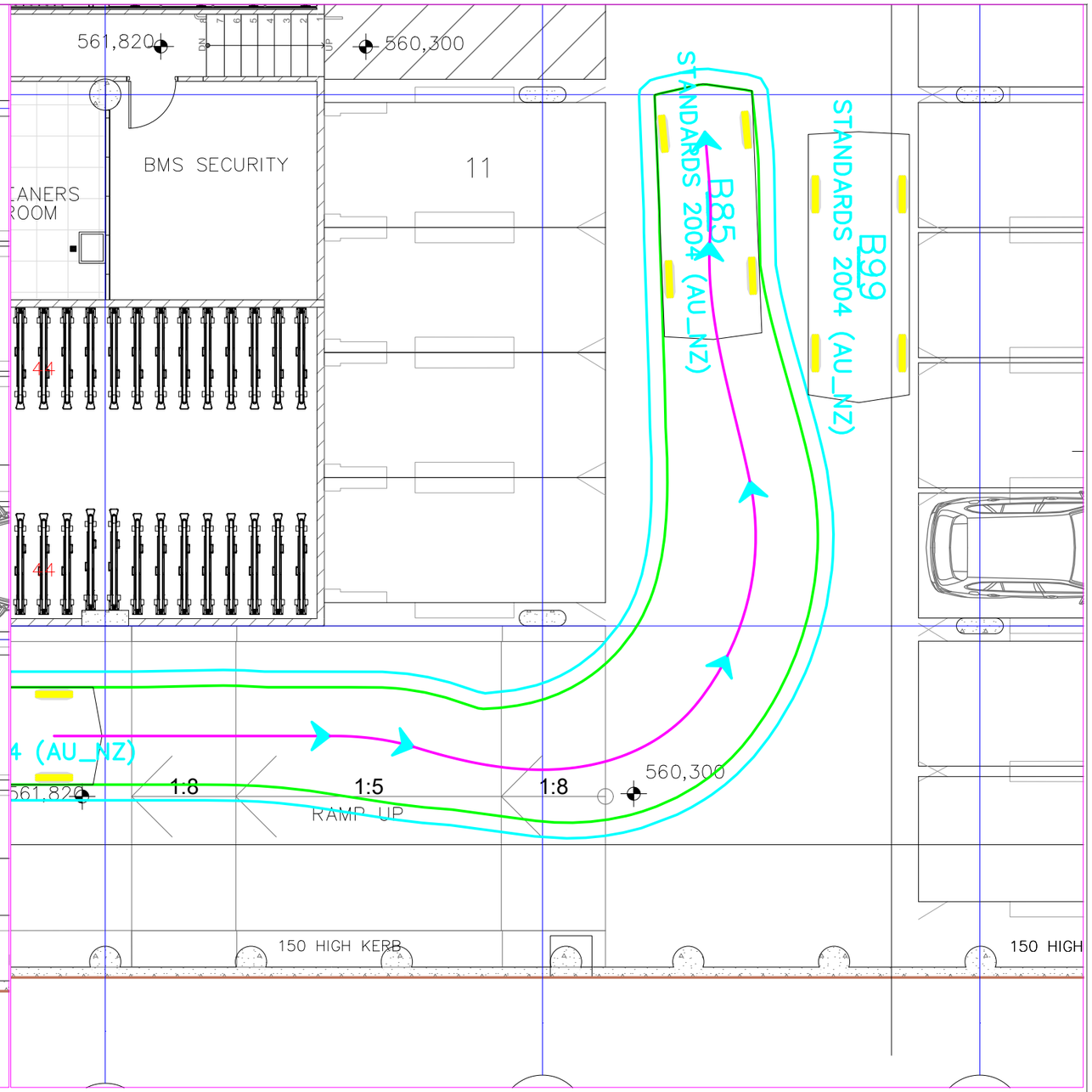
TITLE
SRV

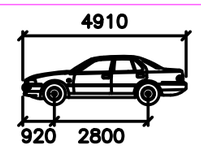
DRAWING NUMBER
SCT_00344_01-001

SHEET 01 OF 03

A3







B85

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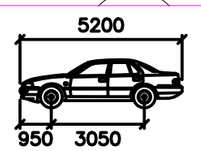
Track	: 1770
Lock to Lock Time	: 6.0
Steering Angle	: 34.1



B99

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Width	: 1940
Track	: 1840
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

SCT Consulting

REV	DESCRIPTION	DATE
A	PRELIMINARY DRAFT	18/08/2022

PREPARED FOR
WILLEMSEN

QUALITY INFORMATION	
DATE	08/22
PREPARED	N.B
REVIEWED	S.C
AUTHORISED	SDB

SCALE @ A3
0 2 4
SCALE - 1:200

PROJECT
10 Brisbane Ave Barton Traffic Advice
Swept Path Analysis

TITLE
B99

DRAWING NUMBER
SCT_00344_01-002

SHEET 02 OF 03

A3


SCT
Consulting