

9 September 2022

Anna Johnston
FPD Pty Ltd
PO BOX H219
Australia Square
NSW 1215

Re: Traffic assessment for the planning proposal at 776 & 792-794 Botany Road and 33-37 Henry Kendall Crescent, Mascot

Dear Anna,

This letter responds to the traffic related matters raised by Cardno, on behalf of Bayside Council, in the form of an agency submission¹ for the subject planning proposal.

1 Background

The initial proposal for this site was considered in late 2017 and EMM Consulting (EMM), on behalf of NSW Land and Housing Corporation, prepared the traffic impact assessment (TIA²) to accompany the planning proposal to Bayside Council.

Following submission of the proposal, a number of urban design, planning and traffic related issues were raised by council which has resulted amendment of the land use and design. In addition, EMM's traffic report was independently reviewed by Bayside Council's appointed consultant Bitzios Consulting. Bitzios has made a number of traffic and parking related comments. A letter³ was prepared by EMM in response to the issues raised by Bitzios.

Subsequently EMM's letter and SIDRA files have been reviewed by a council appointed traffic consultant, Cardno, who has raised further traffic related matters for this development. This letter responds to Cardno's traffic related matters.

¹ Bayside Council's email dated 23 June 2022

² EMM report dated 28 November 2017

³ EMM letter dated 14 October 2021

2 Intersection survey

Cardno has suggested to validate the queue length for Botany Road/Coward Street intersection SIDRA model. As the traffic count data is currently over five years old and the traffic on the road network is now back to a new (post Covid) normal, a new set of traffic counts was organised on Tuesday, 16 August 2022 (non-school holiday period) between the following peak hours:

- 6 to 9 am
- 3 to 6 pm

Concurrent to the survey, the intersection queuing was observed in both the AM and PM peak hours. The peak hour periods are determined to be 8:00 am to 9:00 am and 4:45 pm to 5:45 pm respectively. The peak hour traffic volumes are presented in Figure 2.1.

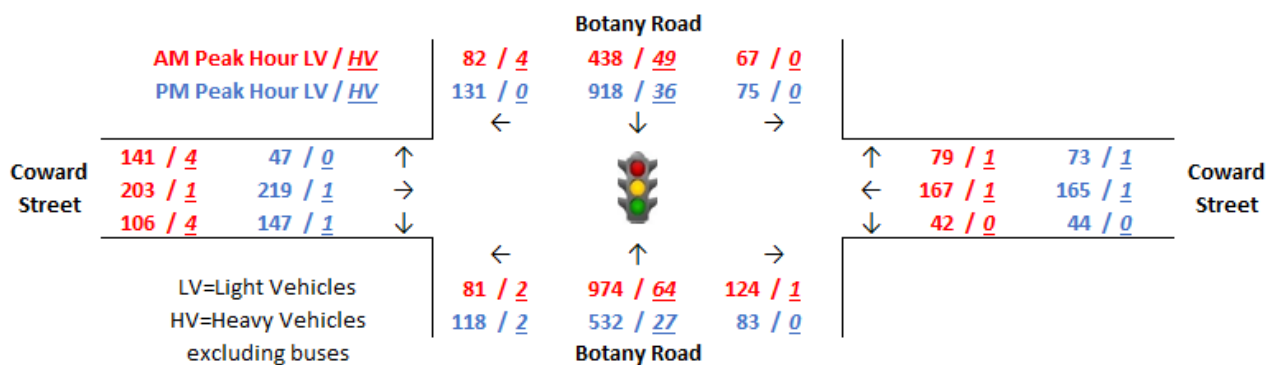


Figure 2.1 AM and PM peak intersection count data for Botany Road/Coward Street intersection

Bus traffic volumes were collected separately from heavy vehicle traffic volumes. Bus traffic volumes during the AM and PM peak hour are presented in Figure 2.2.

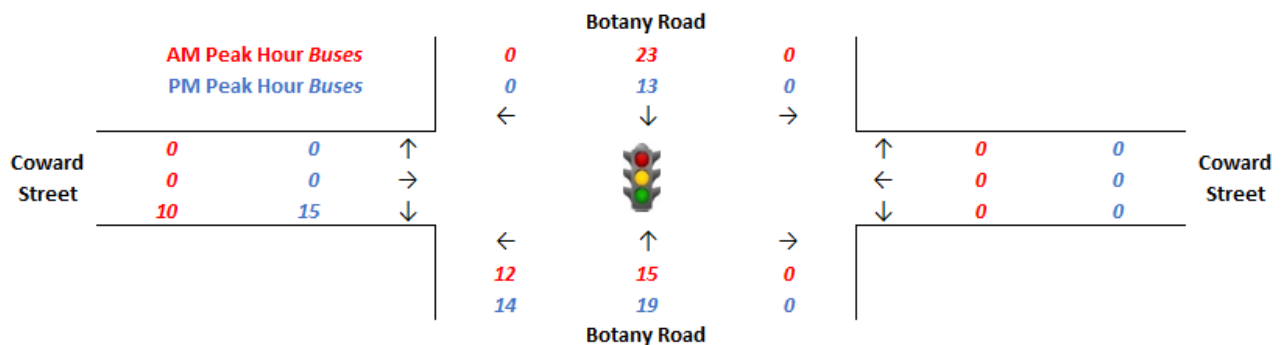


Figure 2.2 Bus volumes in the AM and PM peak for Botany Road/Coward Street intersection

The traffic volumes at the Botany Road/Coward Street intersection from Tuesday 16 August 2022 are compared with the traffic volumes from Thursday 18 May 2017. The results are shown in Table 2.1.

Table 2.1 Comparison of peak hour traffic volumes at Botany Road/Coward Street intersection

Year	AM		PM	
	Peak hour	Total peak hour traffic volume	Peak hour	Total peak hour traffic volume
2017	7:45 am–8:45 am	2,866	4:30 pm–5:30 pm	2,848
2022	8:00 am–9:00 am	2,695	4:45 pm–5:45 pm	2,683

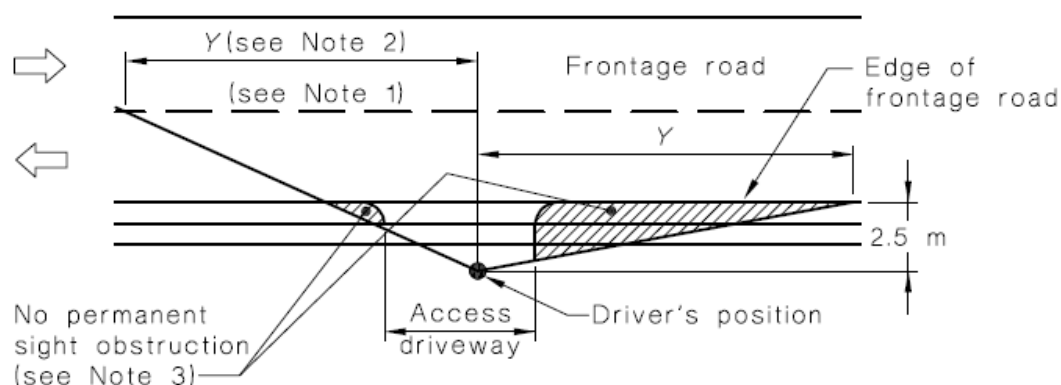
It should be noted that on 16 August 2022, Greater Sydney was not subject to any COVID restrictions that may have impacted the level of traffic. Hence, the current traffic conditions are considered the new normal, but may still be subject to future variations due to new regional transport infrastructure, such as the M8 Motorway.

It can be observed from Table 2.1 that there was a 6% reduction in traffic in the AM and PM peak hour in 2022 when compared to 2017 levels. This can be attributed to the M8 opening on 5 July 2020, which has reduced traffic volumes in the Mascot area.

3 Proposed driveway

The site driveway access is proposed to be retained on Botany Road due to the following reasons:

- Currently with the existing site footprint there are four driveways on Botany Road. It is proposed that the four driveways will be consolidated to one single left-in/left-out driveway on Botany Road, however, if the ambulance use is retained on site, the ambulance driveway could be separated from the residential driveway. The reduced number of driveways will improve traffic safety on Botany Road.
- The traffic volumes in the locality, including Botany Road, is decreasing which will continue over the next decade due to a number of major transport infrastructure projects in the area. This has been discussed in subsequent sections of this letter. The reduced traffic volumes along Botany Road would have less safety impact in the future, compared to the current situation of four driveways with higher traffic volumes in Botany Road.
- The traffic speed along Botany Road, at the site frontage, has been restricted to 50 km/h in recent years. This reduced traffic speed would minimise any rear end type of crashes for the entering vehicles onto the site driveway. Furthermore, the minimum sight distance for the driveway access will be achieved as stipulated in AS2890.1 (Figure 3.1).



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2 nd and 3 rd columns
100	139	160	
110	153	190	

Figure 3.1 Site distance requirements for access driveways

- During the detailed design stage, the driveway width could be minimised as much as possible, based on the swept path assessments, to minimise pedestrian/vehicular conflicts at the driveway. The turning traffic would be aware of the presence of pedestrians on the footpath. However, to improve visibility, the proposed driveway could be line marked (hatching). This would alert both motorists and pedestrians to the presence of this driveway.
- During the detailed design, the sightlines of the driveway will be specified to comply with the pedestrian sight triangles as stipulated in AS2890.1.

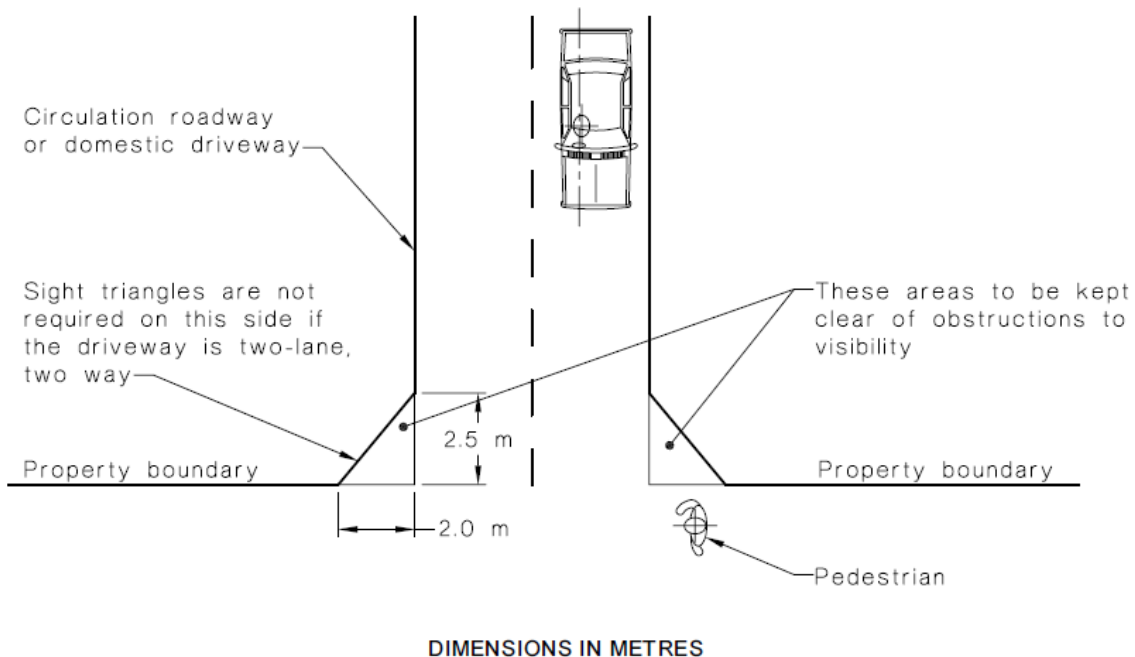


Figure 3.2 Minimum sightlines for pedestrian safety

- The existing residential amenity would potentially be compromised by any alternative Henry Kendall Crescent access driveway due to increased vehicular activity and the operation of heavy vehicles, eg waste collection and removalist vehicles.
- If the proposed driveway is provided in Henry Kendall Crescent, the traffic congestion at both accesses of Henry Kendall Crescent with Coward Street would be increased in the future. During the site inspections, vehicles on Coward Street were frequently observed to queue across these intersections resulting in significant access difficulty for the existing Henry Kendall Crescent residents. On one occasion a vehicle was observed to take nearly five minutes to turn right from Henry Kendall Crescent to Coward Street due to the queued vehicles along Coward Street. This situation is likely to worsen for the existing residents and the future occupants of this site if the vehicular access was to be provided via Henry Kendall Crescent.

Due to the above reasons, the proposed vehicular access to the site is preferred on Botany Road, over Henry Kendall Crescent.

4 Trip distribution

Australian Bureau of Statistics (ABS) data from the Census of Population and Housing 2016 is published on home.id.com.au (ID). In our traffic impact assessment, ID data has been used to determine the trip distribution, based on the employment locations of residents from Bayside Local Government Area (LGA). The route selection for each journey is taken as the fastest route between the site and the destination.

Based on the ID data, the following trip distribution has been devised for the general distribution of traffic at the Botany Road/Coward Street intersection for a person resident in the Bayside LGA during the AM peak:

- 45.3% of traffic will be travelling north along Botany Road.
- 23.5% of traffic will be travelling west along Coward Street.

- 27.8% of traffic will be travelling south along Botany Road.
- 3.3% of traffic will be travelling east along Coward Street.

It is assumed that these traffic flows will be reversed in the PM peak.

It is noted that the revised percentages all differ from the original estimates by no more than 10% (the original TIA estimates were 40%, 30%, 20% and 10% respectively). Hence, for this project, any net trip generation for any lane turning movement will only differ by a maximum of 1 vehicle per hour, which will have negligible impacts on the assessed intersection performance. Nevertheless, the latest revised trip distributions have been used for this analysis.

The TfNSW Guide to Traffic Generating Developments Updated Traffic Surveys (2013) suggests the following traffic generation rates for high density residential developments, which is used to generate Table 4.1:

- 0.19 trips per unit in the AM peak hour;
- 0.15 trips per unit in the PM peak hour; and
- 1.52 daily trips per unit.

Table 4.1 Trip generation

Period	Trip generation rate	Proposed trip generation (152 units)	Net trip generation
AM peak hour	0.19	28.9	24.1
PM peak hour	0.15	22.8	19.0
Daily	1.52	231.1	193.1

The proportion of inbound and outbound traffic movements for each type of land use is presented in Table 4.2.

Table 4.2 Inbound and outbound movement proportion during peak hours

Land use	AM peak hour		PM peak hour	
	Inbound	Outbound	Inbound	Outbound
Residential	20%	80%	80%	20%

To analyse the trip distribution, 80% of the hourly trip movements are assumed to be outbound movements in the AM peak and 80% inbound movements in the PM peak hour as this is a residential development.

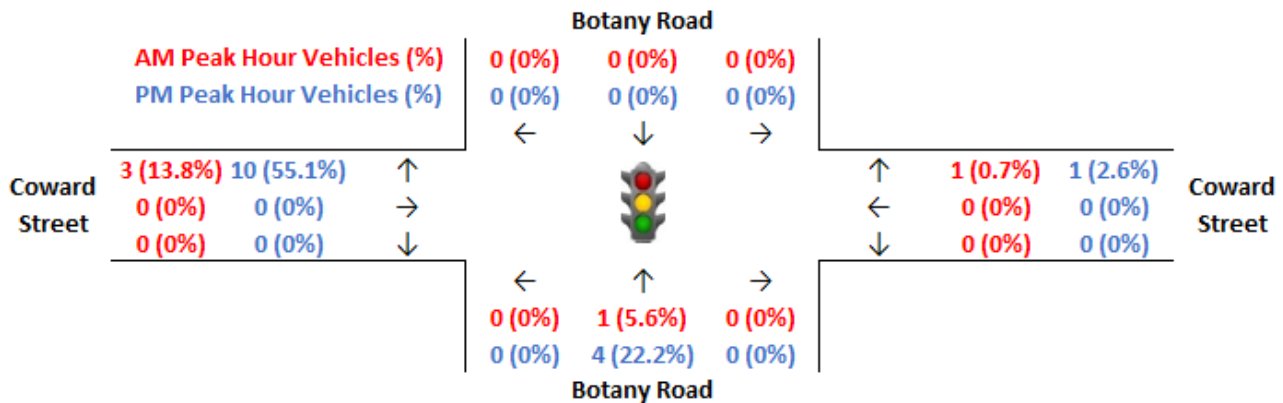
4.1 Traffic Distribution

The traffic distribution has been analysed based on the residential driveway access via Botany Road. Ambulances will also access Botany Road via a separate driveway.

All the site exiting traffic will be turning left and travelling in the northbound direction. All the site entering traffic will pass through the Botany Road/Coward Street intersection and turn left into the driveway.

In the AM and PM peak, the following trip distribution in Figure 4.1 is estimated based on ID data, which is used to calculate the number of vehicles per approach. The inbound movements that will pass through the Botany

Road/Coward Street intersection will account for only 20% of trip movements in the AM peak, hence the total number of net additional trips travelling via the intersection is 5 (20% of 24.1 total net trips). The inbound site movements that pass through the Botany Road/Coward Street intersection will account for 80% of trip movements in the PM peak, hence the total number of net trips travelling via the intersection is 15 (80% of 19.0 total net trips).



1. % = proportion of total trips generated to and from the site during the AM or PM peak.
2. Due to rounding, 1 vehicle has been added to the Coward Street (east) approach during the AM peak to ensure that the total number of trip movements equals to 5.
3. Due to rounding, the total percentage does not add up to 20% and 80% in the AM and PM peaks respectively.

Figure 4.1 Peak hour net trip generation at Botany Road/Coward Street intersection

5 Cumulative traffic impact assessment

This project is anticipated to be completed in Q1 2026. The following sections highlight other projects that will affect the traffic volumes at the Botany Road/Coward Street intersection.

5.1 Mascot Commercial and Civic Precinct

The site is located at the north-east corner of Botany Road/Coward Street (997–1005 Botany Road & 124–128 Coward Street, Roseberry) which is proposed to be a part of the Mascot Commercial and Civic Precinct.

Searches for the development application on this project yielded no results, so as a conservative measure, the highest net traffic volumes from a previous traffic impact assessment is used to model the cumulative scenario. In both the morning and afternoon peak hours, the net additional traffic from 997–1005 Botany Road & 124–128 Coward Street, Roseberry is forecast to be a maximum of 288 vehicle trips, generally travelling inbound in the AM peak hour and outbound in the PM peak hour.

Based on the ID data, the following trip distribution has been devised for the general distribution of traffic at the Botany Road/Coward Street intersection for a worker employed in the Bayside LGA during the AM peak:

- 50.3% of traffic will be travelling from the south on Botany Road.
- 22.5% of traffic will be travelling from the west on Coward Street.
- 24.9% of traffic will be travelling from the north on Botany Road.

- 2.2% of traffic will be travelling from the east on Coward Street.

It is assumed that these traffic flows will be reversed in the PM peak.

Based on the distribution of 100% inbound traffic during the AM peak and 100% outbound traffic during the PM peak for commercial trip generation movements, the peak hour net trip generation from 997–1005 Botany Road & 124–128 Coward Street, Roseberry is shown in Figure 5.1.

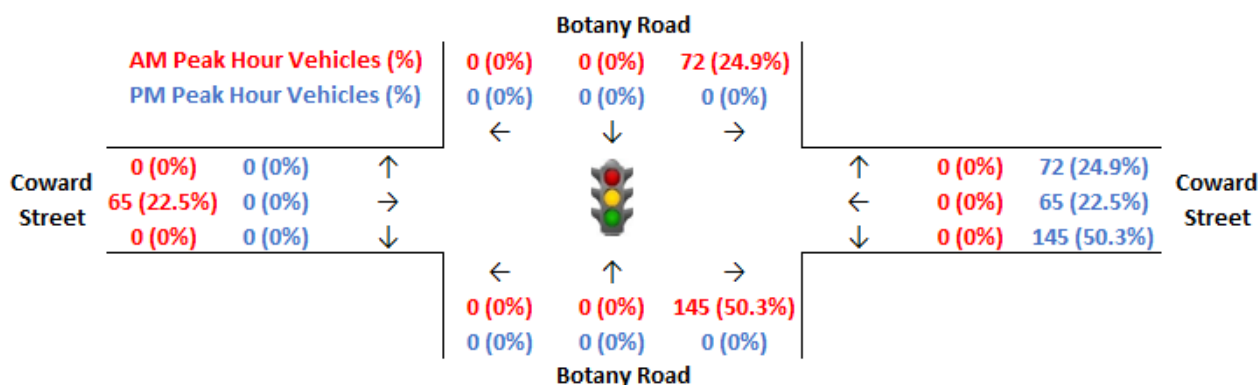


Figure 5.1 997- 1005 Botany Road & 124-128 Coward Street, Roseberry peak hour net trip generation

5.2 Planned development in Mascot

Other current development in the Mascot area is focused further west in the area near the Mascot Rail Station (Bourke Road/Coward Street intersection) so there is only limited future development potential in the Botany Road locality. Consequently, the requirements for assessing cumulative traffic impacts from other developments are minimal.

5.3 Major infrastructure projects

The following major road projects will be opened ahead of the anticipated completion date of this project and will be part of any cumulative scenario:

- M4–M5 link and the Rozelle Interchange planned for completion in 2023;
- Sydney Gateway planned for completion in Q4 2023;
- M6 Stage 1 planned for completion in Q4 2024; and
- Western Harbour Tunnel planned for completion in Q1 2026.

The combination of all these projects is expected to significantly drop traffic on Botany Road and therefore improve any future intersection performance at the Botany Road/Coward Street intersection.

According to the M4–M5 link Environmental Impact Statement (EIS), overall traffic on Botany Road is forecast to be 9% lower in the 2023 cumulative scenario compared to the 2023 baseline scenario. Overall traffic is still forecast to be 1% lower in the 2033 cumulative scenario compared to the 2023 baseline scenario. The 2023 baseline scenario is defined as the traffic conditions that would occur without the M4–M5 link.

The Sydney Gateway EIS also highlights that Botany Road would handle 25 to 30 per cent less traffic in 2036 than it would without the Sydney Gateway project.

Overall, it can be seen that due to the planned substantial improvements to the road network in the surrounding area beyond 2023, there will almost certainly be a further substantial drop in background traffic volumes at the Botany Road/Coward Street intersection.

With substantial drops to the baseline traffic in the future, any modelling of a cumulative traffic scenario would only see improvements to the current intersection performance. Similarly, a sensitivity test in the 5 to 10 year horizon may not be accurate due to the forecast drop in background traffic on Botany Road, as mentioned previously.

6 SIDRA analysis

SIDRA analyses at the Botany Road/Coward Street have been performed on the following scenarios:

- Existing traffic volumes in 2022; and
- Existing and development traffic volumes in 2026.

As highlighted in Section 5.3, traffic volumes near the Botany Road/Coward Street intersection are expected to drop. Therefore, the usual method of applying a growth rate to background traffic does not apply. However to perform a conservative SIDRA analysis, the development scenarios will maintain the existing 2022 levels of traffic.

Cumulative scenarios and sensitivity tests have not been performed due to the forecast drop in traffic mentioned previously.

The SIDRA results for the Botany Road/Coward Street intersection are shown in Table 6.1.

Table 6.1 SIDRA results for the existing and development scenarios at the Botany Road/Coward Street intersection

Peak hour	Scenario	Intersection volumes	DOS	LOS	DEL (s)	Q95 (m)	Q95 approach (direction)
AM	Existing	2,695	0.891	D	44.3	320.5	South (LT and TH)
PM	Existing	2,682	0.900	D	43.6	221.0	North (TH)
AM	With Development	2,700	0.892	D	44.4	321.3	South (LT and TH)
PM	With Development	2,697	0.915	D	44.0	221.0	North (TH)

1. LT = left turning movement
2. TH = through movement
3. DOS = Degree of Saturation
4. LOS = Level of Service
5. DEL = average delay
6. Q95 = 95%ile queue

The above SIDRA results show the model parameters will marginally increase (eg DOS and 95%ile queue) due to the proposed development, but there will be no change of LOS. Therefore, the net traffic impact at Botany Road/Coward Street intersection due to this development would be marginal.

7 SIDRA model validation

Model validation is the term used to describe the independent verification process used to demonstrate that a model has been calibrated to a sufficient extent to accurately reproduce on-street conditions.

As shown in Table 7.1 and Table 7.2, the queue lengths and phase timing for the survey and model are compared.

Table 7.1 Queue lengths for Botany Road/Coward Street intersection

Approach	AM		PM	
	Observed queue (m)	Modelled queue (m)	Observed queue (m)	Modelled queue (m)
Botany Road (north approach)	55	63.1	210	221.0
Coward Street (east approach)	95	113.6	60	86.4
Botany Road (south approach)	335	320.5	110	125.8
Coward Street (west approach)	180	159.9	150	163.9

Table 7.2 Phase time for Botany Road/Coward Street intersection

Phase	AM		PM	
	Observed phase time (s)	Modelled phase time (s)	Observed phase time (s)	Modelled phase time (s)
A	60	56	41	43
D	25	26	23	25
E	28	36	27	30
F	17	12	14	12
Total cycle time	130	130	104	110

The observed queue lengths of the signalised intersection have been recorded for the 2022 survey period. The observed queue and the modelled queue lengths at the signalised intersection are found to be generally consistent. The photographs of the queue lengths on each surveyed period are attached in Appendix C.

The observed and modelled phase times are also found to be generally consistent.

8 Response table

Cardno comments and EMM responses are summarised in Table 8.1.

Table 8.1 Cardno comments and EMM responses

Item no.	Item summary	Cardno comments	EMM responses
1	It is proposed that the four driveways will be consolidated to one single driveway on Botany Road which will improve traffic safety on Botany Road.	<p>Cardno supports TfNSW's concerns for the proposed singular vehicle access located off Botany Road (State Road No. 170) for the following reasons:</p> <ul style="list-style-type: none"> > As per Clause 2(a) in Section 101 of the NSW State Environmental Planning Policy (Infrastructure) 2007, "where practicable and safe, vehicular access to the land is provided by a road other than the classified road." Considering that an access driveway off Henry Kendall Crescent is feasible and already proposed, an access driveway off Botany Road should not be provided. > As per Part 3A3.1 of the Botany Bay DCP 2013, Control C 15(i) states that "vehicle access points of the property should not be located in places with high traffic volumes, such as classified or arterial roads", and Control C17 states that "Parking and servicing areas shall be provided from a secondary street frontage or rear lane where possible". The Council DCP further supports the legal requirement outlined above. > As per the NSW Ambulance Vehicle Access Specifications, "ambulance driveways should be exclusive to ambulance vehicles"¹. A single shared driveway off Botany Road between ambulances and future residents is not safe, as ambulances require unimpeded access to and from the ambulance station. > An access driveway off a classified road is likely to be considered less safe than off a local road. Drivers accessing the site are at more risk of being rear-ended when slowing down due to the higher traffic volumes on classified roads. > The DCP nominates Botany Road as the active frontage. Providing vehicular access for the majority of generated traffic off Botany Road would result in poor pedestrian outcomes along Botany Road. <p>For these reasons, it is recommended that the applicant consider a single driveway off Botany Road for ambulances only, and that the residential flat building only be accessible from Henry Kendall Crescent.</p>	Refer to Section 3.

Table 8.1 **Cardno comments and EMM responses**

Item no.	Item summary	Cardno comments	EMM responses
2	Access via Botany Road rather than Henry Kendall Crescent also improves the traffic safety on the Coward Street/Henry Kendall Crescent intersection.	<p>The improved safety of Coward Street/Henry Kendall Crescent appears to be solely on the basis of not providing vehicular access via Henry Kendall Crescent, however does not take into account safety concerns on the higher volume, higher speed road of Botany Road.</p> <p>The raised safety concerns in the Bitzios peer review do not appear to have been addressed, other than to defer to the DA stage and providing access from Botany Road only.</p> <p>In light of Item 1, it is suggested that the application identify what measures are required to maintain a safe intersection and access arrangement for vehicles access Henry Kendall Crescent.</p>	Refer to Section 3.
3	It is reasonable and conservative to adopt the 2017 traffic survey volumes (as presented in the original planning proposal prepared by EMM) as the baseline traffic, without any adjustment factors.	<p>Cardno agrees that the 2017 traffic survey would provide a conservative estimate of the baseline traffic in 2022 considering the current impact of Covid-19 on traffic volumes.</p> <p>However, it is not clear what the estimated opening year of development is, and no assessment has been provided for a future year development scenario.</p> <p>A future year development scenario usually assumes a background annual traffic growth factor (often 1-2% per annum) to consider and analyse the traffic impact in a future year after the development is complete (e.g. 5 or 10 years).</p> <p>It is suggested that the applicant propose a future year development scenario and model this scenario in SIDRA. This is to consider appropriate impacts of Sydney Gateway upgrades and other network changes in the future.</p>	<p>The 2022 traffic survey shows that traffic volumes have dropped from 2017. Considering that there are no Covid travel restrictions at the time the traffic survey was taken, traffic volumes in 2022 can be considered to be the new normal.</p> <p>As highlighted in Section 5.3, background traffic volumes are forecast to drop by up to 30% along Botany Road when the development is proposed to open in Q1 2026.</p> <p>Due to the forecast drop in traffic volumes, modelling a development scenario with the assumption of traffic growth of 1-2% per annum is not warranted.</p> <p>A 2026 development scenario has been modelled based on the conservative assumption that traffic volumes will not change from the 2022 volumes.</p>
4	In the Mascot area, these traffic distributions will correspond to the following proportions of the future site peak hourly and daily traffic movements.	<p>No information has been provided to justify the trip distribution assumptions.</p> <p>Consideration should be given to reviewing Journey to Work I ABS data to identify places of work for residents.</p>	<p>Trip distribution estimates have been updated based on ABS data to identify places of work for residents as described in Section 4.</p> <p>It was noted that the trip distributions to either the north, south, east or west did not vary by more than 10% from the original estimates in the 2017 report. In reality, this only creates a difference of a maximum of one car per hour on any approach to the Botany Road/Coward Street intersection when performing a SIDRA analysis.</p>

Table 8.1 **Cardno comments and EMM responses**

Item no.	Item summary	Cardno comments	EMM responses
5	Net peak hourly traffic generation.	<p>Further to the above item, no information has been provided to explain the trip distribution assumptions, including which site access driveway vehicles are using (i.e. Henry Kendall Crescent or Botany Road).</p> <p>The majority of vehicles are assumed to originate from Coward Street (west), which appears illogical if Botany Road is a State Road, more heavily trafficked and is the most direct route to and from the Sydney CBD.</p> <p>Consideration should be given to reviewing Journey to Work/ ABS data to identify places of work for residents to improve the accuracy of trip distribution assumptions.</p>	<p>The trip distributions have been revised for the latest analysis.</p> <p>ABS data was used to identify trip distributions, as discussed above.</p>
6	SIDRA modelling - phasing, cycle times and queue lengths	<p>No information has been provided on how the traffic signal phasing and cycle times were derived, therefore Cardno cannot review the operation of the traffic signals in the SIDRA models. It is possible that the phasing or cycle times in the model may not accurately reflect the site conditions.</p> <p>No queue length data has been provided to assist with validating the queue length results from the SIDRA models.</p>	<p>As stated in Section 2, a site visit was conducted on 16 August 2022 at the Botany Road/Coward Street intersection. Traffic signal phasing, cycle times and queue lengths were recorded, which has been used to validate the queue length results from the SIDRA models.</p>
7	Only traffic from the north would potentially use the Henry Kendall Crescent driveway which equates to six vehicles in an hour, or one in every ten minutes.	<p>It is unclear how the value of 6 veh/h was derived for vehicles originating from a northerly direction.</p> <p>This statement conflicts with Figure 3.2 which shows 0 vehicles originating from a northerly direction in the AM and PM peak hours.</p>	<p>Figure 4.1 has been updated to show the development traffic.</p>

Table 8.1 **Cardno comments and EMM responses**

Item no.	Item summary	Cardno comments	EMM responses
8	SIDRA Intersection Results	<p>A number of issues have been identified in the SIDRA model, which may be creating inaccurate outputs:</p> <ul style="list-style-type: none"> > There is no input traffic volume data on buses, which is of particular importance at this location given the southbound Bus Lane on Botany Road. > Northern approach lane 1 is a Bus Lane in the PM Peak, which should be a short lane with parking and have a through movement in addition to the left turn movement. > Given the PM Peak southbound Bus Lane, there should be a third through southbound lane exclusive to buses in the PM SIDRA models. > Eastern approach lane 1 is a No Parking lane in the AM Peak (approximately 65m lane length) which is not reflected in the AM SIDRA models. > None of the pedestrian movements have been selected as opposing movements in the Priorities tab and therefore delays as a result of left and/or right turning vehicles is not accounted for. > Approach cruise speeds and exit cruise speeds in SIDRA don't match the 50km/h speed limits on all roads. 	<p>Bus data has been collected separately in the traffic survey from 16 August 2022, which has then input separately in SIDRA.</p> <p>The northern approach lane 1 has been converted to a short lane in parking in the AM peak and consists of a left turn and through movement.</p> <p>Northern approach lane 1 has been converted to a through movement bus lane in the PM peak, with an allowance for general traffic to turn left at the intersection. A southbound lane exclusive to buses in the PM peak has been added after the intersection.</p> <p>The eastern approach lane 1 has been extended to 65 m.</p> <p>Pedestrian movements have been selected as opposing movements.</p> <p>Approach speeds have been updated to match 50 km/h speed limit on all roads.</p>
9	Cumulative traffic growth	<p>No consideration has been in regards to the cumulative impact of proposed developments adjacent to or in close proximity to the Subject Site, particularly developments that will impact the Botany Road I Coward Street signalised intersection.</p> <p>The main development of concern is the Mascot Commercial and Civic Precinct, proposed to be located on the north-eastern corner of Botany Road / Coward Street (997-1005 Botany Road & 124-128 Coward Street, Roseberry).</p> <p>It is suggested that the applicant review the relevant Traffic Impact Assessment for this development and model a cumulative development scenario at the Botany Road / Coward Street intersection.</p> <p>Consideration of Sydney Gateway and other major projects in the area should be taken into account.</p>	<p>As mentioned in Section 5.3, traffic volumes are forecast to drop by up to 30% once the Sydney Gateway and other major projects in the area open.</p> <p>As a result, a cumulative traffic assessment has not been conducted.</p>

9 Conclusions

This letter addresses traffic related matters raised by TfNSW's appointed traffic consultant Cardno. Our further analysis shows that the proposal warrants granting of approval from a traffic and transport perspective based on the intersection modelling at Botany Road/Coward Street, safety assessment of the Coward Street/Henry Kendall Crescent intersections and the proposed site driveway access on Botany Road.

I trust the above information meets your requirements, however, please feel free to call me on 0425 478 650 if you require any further clarification.

Yours sincerely

A handwritten signature in black ink, appearing to read 'A. Uddin'.

Abdullah Uddin
Associate Traffic Engineer

auddin@emmconsulting.com.au

Appendix A

Intersection count data (2022)

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

Intersection of Coward St and Botany Rd, Nasco

GPS - 31.925525, 151.135512

Date: Tue 10/08/22

Weather: Fine

Suburban: Mascot

Customer: ENM

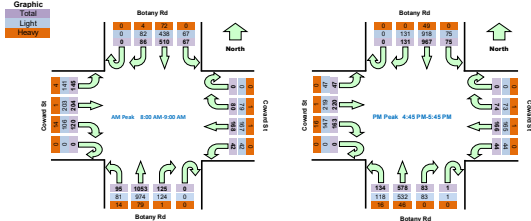
North: Botany Rd
East: Coward St
South: Botany Rd
West: Coward St

Survey Period: AM: 8:00 AM-9:00 AM
PM: 3:00 PM-4:00 PM
Traffic Peak: AM: 8:00 AM-9:00 AM
PM: 4:45 PM-5:45 PM

Time	North Approach Botany Rd				East Approach Coward St				South Approach Botany Rd				West Approach Coward St				Hourly Total
Period Start/Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour
6:00 6:15	0	11	78	0	0	7	19	2	0	8	117	11	0	14	27	20	1507
6:15 6:30	0	10	57	0	0	9	22	1	0	13	142	15	0	15	35	17	1791
6:30 6:45	0	5	100	10	0	11	23	1	0	15	154	13	0	15	30	17	2027
6:45 7:00	0	9	100	6	0	9	21	7	0	11	207	17	0	26	42	25	2278
7:00 7:15	0	13	98	5	0	10	42	9	0	19	223	31	0	24	38	26	2437
7:15 7:30	0	15	115	9	0	13	40	4	0	21	291	23	0	35	30	19	2555
7:30 7:45	0	19	126	10	0	17	32	8	1	31	278	29	0	31	40	23	2636
7:45 8:00	0	19	108	12	0	9	58	4	0	21	282	28	0	35	45	18	2673
8:00 8:15	0	19	119	18	0	14	37	10	0	35	275	33	0	32	51	14	2695
8:15 8:30	0	27	118	19	0	21	43	10	0	37	280	25	0	29	62	25	
8:30 8:45	0	27	120	16	0	24	55	8	0	26	258	21	0	29	52	46	
8:45 9:00	0	13	153	13	0	21	33	14	0	27	242	16	0	30	39	60	
9:00 9:15	0	38	189	14	0	21	29	18	0	39	135	28	0	41	34	11	2381
9:15 9:30	0	28	188	8	0	14	43	11	0	23	140	36	0	37	31	9	2371
9:30 9:45	0	24	202	10	0	19	41	13	0	19	118	36	0	45	46	18	2464
9:45 10:00	0	23	226	11	0	28	43	16	0	21	152	24	0	35	36	10	2469
10:00 10:15	0	23	229	19	0	14	20	13	0	19	130	28	0	35	42	15	2474
10:15 10:30	0	34	239	22	0	19	35	8	0	21	153	33	0	40	44	13	2593
10:30 10:45	0	22	219	11	0	14	33	6	0	17	144	35	0	35	51	9	2574
10:45 11:00	0	19	215	16	0	22	47	8	0	26	147	30	0	35	52	13	2683
11:00 11:15	0	35	205	23	0	12	36	11	0	21	145	37	0	50	50	11	2621
11:15 11:30	0	37	216	17	0	18	44	17	1	14	137	35	0	43	59	14	
11:30 11:45	0	40	271	19	0	22	39	8	0	22	149	32	0	35	59	9	
11:45 12:00	0	23	200	21	0	5	33	5	0	16	119	41	0	38	53	14	

Peak Time	North Approach Botany Rd				East Approach Coward St				South Approach Botany Rd				West Approach Coward St				Peak hour total
Period Start/Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00 9:00	0	86	910	0	0	80	158	42	0	125	1033	99	0	129	249	145	2695
16:45 17:45	0	131	967	75	0	74	166	44	1	83	578	134	0	163	220	47	2683

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Time	North Approach Botany Rd				East Approach Coward St				South Approach Botany Rd				West Approach Coward St				Hourly Total
Period Start/Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour
6:00 6:15	0	11	69	0	0	7	19	1	0	7	103	7	0	11	22	20	
6:15 6:30	0	10	82	2	0	9	21	1	0	13	129	12	0	11	32	17	
6:30 6:45	0	5	86	10	0	11	23	1	0	15	141	11	0	13	30	16	
6:45 7:00	0	9	88	6	0	8	21	7	0	10	186	16	0	21	40	24	
7:00 7:15	0	13	81	5	0	9	41	9	0	19	205	24	0	20	37	26	
7:15 7:30	0	13	54	9	0	13	40	4	0	20	268	20	0	31	30	19	
7:30 7:45	0	18	108	10	0	17	32	8	1	31	257	24	0	27	38	22	
7:45 8:00	0	18	90	11	0	9	57	4	0	19	265	22	0	32	43	18	
8:00 8:15	0	18	103	19	0	14	37	10	0	35	255	28	0	30	50	14	
8:15 8:30	0	25	101	19	0	21	43	10	0	36	257	23	0	23	62	23	
8:30 8:45	0	26	106	16	0	24	55	8	0	26	236	17	0	26	52	44	
8:45 9:00	0	13	128	13	0	14	0	27	0	27	224	13	0	27	39	60	
9:00 9:15	0	37	178	14	0	21	29	18	0	39	120	25	0	37	34	11	
9:15 9:30	0	27	169	8	0	14	43	11	0	23	124	32	0	34	30	9	
9:30 9:45	0	23	187	10	0	18	41	13	0	17	102	32	0	42	45	18	
9:45 10:00	0	23	206	11	0	28	42	16	0	21	132	18	0	31	36	10	
10:00 10:15	0	22	216	17	0	14	20	13	0	19	110	23	0	31	42	14	
10:15 10:30	0	34	230	22	0	19	35	8	0	21	139	29	0	36	43	12	
10:30 10:45	0	22	208	11	0	14	33	6	0	16	132	31	0	32	50	9	
10:45 11:00	0	19	201	16	0	22	47	8	0	26	128	26	0	31	52	13	
11:00 11:15	0	35	244	23	0	12	35	11	0	21	134	33	0	46	50	11	
11:15 11:30	0	37	211	17	0	18	44	17	1	14	129	32	0	40	58	14	
11:30 11:45	0	40	262	19	0	21	39	8	0	22	141	27	0	30	59	9	
11:45 12:00	0	23	190	21	0	5	33	5	0	16	111	38	0	35	53	14	

Peak Time	North Approach Botany Rd				East Approach Coward St				South Approach Botany Rd				West Approach Coward St				Peak hour total
Period Start/Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00 9:00	0	82	838	67	0	79	158	44	0	124	974	81	0	129	249	145	2694
16:45 17:45	0	131	918	75	0	73	165	44	1	83	532	118	0	147	219	47	2553

Time	North Approach Botany Rd				East Approach Coward St				South Approach Botany Rd				West Approach Coward St				Hourly Total
Period Start/Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour
6:00 6:15	0	0	6	0	0	0	0	0	1	0	1	12	2	0	0	5	0
6:15 6:30	0	0	13	0	0	1	0	0	0	0	8	0	0	1	3	0	
6:30 6:45	0	0	11	0	0	0	0	0	0	0	11	0	0	0	0	1	
6:45 7:00	0	0	10	0	0	1	0	0	0	1	15	0	0	1	2	1	
7:00 7:15	0	0	13	0	0	1	1	0	0	0	14	2	0	1	1	0	
7:15 7:30	0	2	13	0	0	0	0	0	0	1	19	1	0	2	0	0	
7:30 7:45	0	1	12	0	0	0	0	0	0	0	18	2	0	0	2	0	
7:45 8:00	0	1	15	1	0	0	1	0	0	2	15	3	0	0	2	0	
8:00 8:15	0	1	12	0	0	0	0	0	0	0	13	1	0	0	1	0	
8:15 8:30	0	2	10	0	0	0	0	0	0	1	20	0	0	2	0	2	
8:30 8:45	0	1	10	0	0	0	0	0	0	0	17	1	0	0	0	2	
8:45 9:00	0	0	17	0	0	1	1	0	0	0	14	0	0	2	0	0	
9:00 9:15	0	1	10	0	0	0	0	0	0	0	13	1	0	0	0	0	
9:15 9:30	0	0	16	0	0	0	0	0	0	0	10	1	0	0	1	0	
9:30 9:45	0	0	14	0	0	1	0	0	0	2	13	1	0	1	1	0	
9:45 10:00	0	0	19	0	0	1	0	0	0	0	15	2	0	0	0	0	
10:00 10:15	0	0	9	2	0	0	0	0	0	0	18	1	0	0	0	0	
10:15 10:30	0	0	5	0	0	0	0	0	0	0	8	0	0	0	0	1	
10:30 10:45	0	0	6	0	0	0	0	0	0	1	8	0	0	0	1	0	
10:45 11:00	0	0	10	0	0	0	0	0	0	0	13	0	0	0	0	0	
11:00 11:15	0	0	17	0	0	0	1	0	0	0	6	1	0	0	0	0	
11:15 11:30	0	0	2	0	0	0	0	0	0	3	9	0	0	1	1	0	
11:30 11:45	0	0	7	0	0	1	0	0	0	0	5	1	0	0	0	0	
11:45 12:00	0	0	6	0	0	0	0	0	0	0	5	0	0	0	0	0	

Peak Time	North Approach Botany Rd				East Approach Coward St	
-----------	--------------------------	--	--	--	-------------------------	--

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

Intersection of Coward St and Henry Kendall Cres East, M

GPS -33.925334, 151.194665

Date: Tue 16/08/22
Weather: Fine
Suburban: Mascot
Customer: EMU

North: Henry Kendall Cres East
East: Coward St
South: N/A
West: Coward St

Survey Period: AM 6:00 AM-9:00 AM
Traffic: PM 3:00 PM-6:00 PM
Peak: PM 7:45 PM-9:45 PM
Peak: PM 5:00 PM-6:00 PM

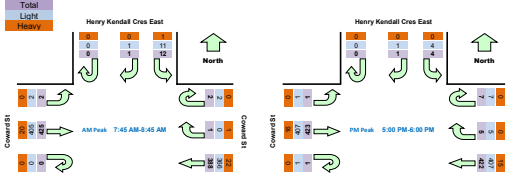
All Vehicles

Time		Approach Henry Kendall Cr			East Approach Coward St			West Approach Coward St			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
6:00	6:15	0	1	1	1	0	39	0	59	0	453	
6:15	6:30	0	0	1	1	0	47	0	66	0	521	
6:30	6:45	0	0	1	1	0	37	0	83	0	571	
6:45	7:00	0	0	1	2	0	45	0	87	0	641	
7:00	7:15	0	0	4	1	1	83	1	78	1	712	
7:15	7:30	0	0	1	0	0	75	0	88	1	726	
7:30	7:45	0	1	2	1	1	76	1	89	1	779	
7:45	8:00	0	0	2	2	0	102	0	99	1	831	Peak
8:00	8:15	0	0	1	0	0	87	0	94	1		
8:15	8:30	0	0	3	0	1	96	0	118	0		
8:30	8:45	0	1	6	0	0	103	0	114	0		
8:45	9:00	0	0	7	10	0	53	0	111	2	183	
9:00	9:15	0	0	0	0	4	91	0	81	0	741	
9:15	9:30	0	0	5	1	5	101	0	73	2	726	
9:30	9:45	0	1	2	4	2	96	0	98	1	749	
9:45	10:00	0	0	0	2	1	87	0	83	1	729	
10:00	10:15	0	0	1	0	0	74	0	86	0	743	
10:15	10:30	0	0	2	0	1	105	0	100	2	802	
10:30	10:45	0	0	2	3	0	90	0	89	0	823	
10:45	17:00	0	0	0	0	0	93	0	95	0	855	
17:00	17:15	0	0	0	1	1	107	0	111	0	864	Peak
17:15	17:30	0	0	2	2	2	112	1	112	0		
17:30	17:45	0	1	1	2	2	104	0	106	0		
17:45	18:00	0	0	1	2	0	99	0	94	1		

Peak Time		Approach Henry Kendall Cr			East Approach Coward St			West Approach Coward St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
7:45	8:45	0	1	12	2	1	388	0	425	2	831
17:00	18:00	0	1	4	7	5	422	1	423	1	854

Note: Site sketch is for illustrative traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic



Pedestrians Crossing

Pedestrians Crossing		In Approach Henry Kendall Cres		East Approach Coward St		West Approach Coward St		Hourly Total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	
6:00	6:15	0	1	0	0	1	1	17
6:15	6:30	2	2	1	1	0	0	19
6:30	6:45	1	2	1	1	0	0	23
6:45	7:00	2	1	0	0	0	0	23
7:00	7:15	1	0	1	2	0	1	24
7:15	7:30	2	2	1	0	2	3	45
7:30	7:45	1	1	1	1	0	1	53
7:45	8:00	1	3	0	0	0	0	66
8:00	8:15	8	13	2	0	1	2	
8:15	8:30	10	7	1	0	0	0	
8:30	8:45	9	8	0	1	0	0	
8:45	9:00	3	7	1	0	0	0	11
9:00	9:15	8	5	0	0	0	0	48
9:15	9:30	11	2	0	2	0	0	43
9:30	9:45	3	3	1	2	0	0	39
9:45	10:00	6	3	1	1	0	0	41
10:00	10:15	2	5	0	1	0	0	39
10:15	10:30	1	6	2	2	0	0	44
10:30	10:45	2	9	0	0	0	0	46
10:45	17:00	4	3	1	1	0	0	44
17:00	17:15	4	7	1	1	0	0	48
17:15	17:30	4	9	0	0	0	0	
17:30	17:45	3	6	0	0	0	0	
17:45	18:00	3	7	0	0	2	1	

Peak Time		th Approach Henry Kendall Cres		East Approach Coward St		West Approach Coward St		Peak total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	
7:45	8:45	28	31	3	1	1	2	66
17:00	18:00	14	29	1	1	2	1	48

Bicycles and Scooters

Cycles and Scooters		In Approach Henry Kendall Cres		East Approach Coward St		West Approach Coward St		Hourly Total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	
6:00	6:15	0	0	0	0	0	0	1
6:15	6:30	0	1	0	0	0	0	1
6:30	6:45	0	0	0	0	0	0	0
6:45	7:00	0	0	0	0	0	0	0
7:00	7:15	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0
7:30	7:45	0	0	0	0	0	0	1
7:45	8:00	0	0	0	0	0	0	2
8:00	8:15	0	0	0	0	0	0	0
8:15	8:30	0	1	0	0	0	0	0
8:30	8:45	1	0	0	0	0	0	0
8:45	9:00	2	0	0	0	0	0	2
9:00	9:15	0	0	0	0	0	0	0
9:15	9:30	0	0	0	0	0	0	0
9:30	9:45	0	0	0	0	0	0	0
9:45	10:00	0	0	0	0	0	0	0
10:00	10:15	0	0	0	0	0	0	1
10:15	10:30	0	0	0	0	0	0	3
10:30	10:45	0	0	0	0	0	0	4
10:45	17:00	0	0	0	0	0	0	4
17:00	17:15	0	2	0	0	0	0	3
17:15	17:30	0	1	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	3

Peak Time		In Approach Henry Kendall Cres		East Approach Coward St		West Approach Coward St		Peak
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	total
7:45	8:45	1	1	0	0	0	0	2
17:00	18:00	0	3	0	0	0	0	3

Light Vehicles

Time		Approach Henry Kendall Cr East Approach Coward St West Approach Coward St									
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
6:00	6:15	0	1	1	1	0	35	0	51	0	
6:15	6:30	0	0	1	1	0	43	0	60	0	
6:30	6:45	0	0	1	1	0	35	0	60	0	
6:45	7:00	0	0	0	2	0	44	0	80	0	
7:00	7:15	0	0	4	1	1	75	1	73	1	
7:15	7:30	0	0	1	0	0	70	0	83	1	
7:30	7:45	0	1	2	1	1	70	1	82	1	
7:45	8:00	0	0	2	2	0	94	0	94	1	
8:00	8:15	0	0	1	0	0	82	0	91	1	
8:15	8:30	0	0	2	0	0	92	0	111	0	
8:30	8:45	0	1	6	0	0	98	0	109	0	
8:45	9:00	0	0	7	10	0	49	0	108	2	
9:00	9:15	0	0	0	0	4	87	0	77	0	
9:15	9:30	0	0	5	1	5	96	0	89	2	
9:30	9:45	0	1	2	4	2	91	0	95	1	
9:45	10:00	0	0	0	2	1	80	0	79	1	
10:00	10:15	0	0	1	0	0	68	0	81	0	
10:15	10:30	0	0	2	0	1	100	0	94	2	
10:30	10:45	0	0	2	3	0	86	0	85	0	
10:45	17:00	0	0	0	0	0	89	0	91	0	
17:00	17:15	0	0	0	1	1	102	0	107	0	
17:15	17:30	0	0	2	2	2	110	1	107	0	
17:30	17:45	0	1	1	2	2	99	0	100	0	
17:45	18:00	0	0	1	2	0	96	0	93	1	

Peak Time		Approach Henry Kendall Cr			East Approach Coward St			West Approach Coward St			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
7:45	8:45	0	1	11	2	0	366	0	405	2	797
17:00	18:00	0	1	4	7	5	407	1	407	1	833

Heavy Vehicles

Period		Approach Henry Kendall Cr			East Approach Coward St			West Approach Coward St			Hourly Total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
6:00	6:15	0	0	0	0	0	2	0	8	0	100
6:15	6:30	0	0	0	0	0	1	0	3	0	
6:30	6:45	0	0	0	0	0	0	0	1	0	
6:45	7:00	0	0	1	0	0	0	0	3	0	
7:00	7:15	0	0	0	0	0	3	0	2	0	
7:15	7:30	0	0	0	0	0	3	0	3	0	
7:30	7:45	0	0	0	0	0	3	0	1	0	
7:45	8:00	0	0	0	0	0	5	0	2	0	
8:00	8:15	0	0	0	0	0	2	0	1	0	
8:15	8:30	0	0	1	0	1	1	0	3	0	
8:30	8:45	0	0	0	0	0	2	0	2	0	
8:45	9:00	0	0	0	0	0	1	0	2	0	
9:00	9:15	0	0	0	0	0	2	0	0	0	
9:15	9:30	0	0	0	0	0	1	0	1	0	
9:30	9:45	0	0	0	0	0	1	0	1	0	
9:45	10:00	0	0	0	0	0	3	0	0	0	
10:00	10:15	0	0	0	0	0	1	0	0	0	
10:15	10:30	0	0	0	0	0	0	0	1	0	
10:30	10:45	0	0	0	0	0	0	0	1	0	
10:45	17:00	0	0	0	0	0	0	0	0	0	
17:00	17:15	0	0	0	0	0	0	0	0	0	
17:15	17:30	0	0	0	0	0	1	0	0	0	
17:30	17:45	0	0	0	0	0	0	0	0	0	

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

Intersection of Coward St and Henry Kendall Cres West, Mascot

GPS	23 92526, 151 132095
Date:	Tue 16/08/22
Weather:	Time
Suburban:	Mascot
Customer:	LMV
North:	Henry Kendall Cres West
East:	Coward St
South:	Aloha St
West:	Coward St
Survey	AM: 6:00 AM-9:00 AM
Period:	PM: 3:00 PM-6:00 PM
Traffic	AM: 7:45 AM-8:15 PM
Peak:	PM: 5:00 PM-6:00 PM

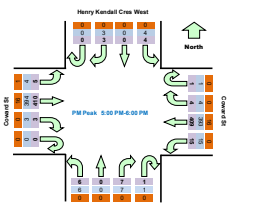
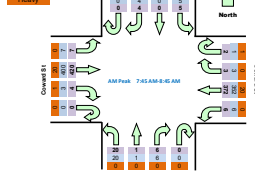
Time		North Approach Henry Kendall Cres Wt				East Approach Coward St				South Approach Aloha St				West Approach Coward St				Hourly Total	Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	WB	L		
6:00	6:15	0	0	0	0	0	0	0	38	1	0	0	0	0	0	1	59	1	448
6:15	6:30	0	0	0	2	0	0	48	0	0	0	0	0	0	0	63	2	514	
6:30	6:45	0	0	0	0	0	0	36	0	0	0	0	0	1	0	64	0	575	
6:45	7:00	0	0	0	0	0	0	45	0	0	3	0	0	0	2	82	0	641	
7:00	7:15	0	0	0	1	0	2	74	6	0	3	0	1	0	3	76	0	725	
7:15	7:30	0	0	0	2	1	0	74	1	0	4	0	4	0	3	87	0	752	
7:30	7:45	0	0	0	0	1	1	73	1	0	4	0	4	0	1	82	0	800	
7:45	8:00	0	2	0	2	0	0	101	1	0	3	0	5	0	2	99	1	850	Peak
8:00	8:15	0	1	0	0	1	1	83	1	0	0	0	7	0	2	97	0	805	
8:15	8:30	0	1	0	3	0	1	92	3	0	2	1	4	0	0	114	3		
8:30	8:45	0	0	0	0	1	1	96	1	0	1	0	4	0	0	110	3		
8:45	9:00	0	0	0	1	1	2	46	6	0	0	0	3	0	1	109	2		
9:00	9:15	0	0	0	1	0	1	87	3	0	1	0	2	0	2	79	0	734	
9:15	9:30	0	3	0	1	0	1	97	5	0	2	0	2	0	2	74	1	722	
9:30	9:45	0	1	0	1	0	2	92	3	0	4	0	1	0	0	91	0	740	
9:45	10:00	0	0	0	1	0	0	82	5	0	1	0	2	0	0	84	0	731	
10:00	10:15	0	1	0	0	1	1	72	2	0	2	0	1	0	1	83	0	749	
10:15	10:30	0	0	0	1	0	0	96	4	0	3	0	3	0	1	98	0	808	
10:30	10:45	0	0	0	0	0	1	81	8	0	1	0	3	0	1	90	1	834	
10:45	11:00	0	1	0	0	1	1	88	5	0	1	0	3	0	0	94	0	858	
11:00	11:15	0	0	0	0	1	0	99	7	0	1	0	0	0	0	113	2	868	Peak
11:15	11:30	0	1	0	1	0	2	108	5	1	1	0	2	0	0	109	2		
11:30	11:45	0	0	0	1	0	1	99	2	0	2	0	2	0	0	102	1		
11:45	12:00	0	2	0	2	0	1	103	1	0	3	0	2	0	3	86	0		

Peak Time		North Approach Henry Kendall Cres Wt				East Approach Coward St				South Approach Aloha St				West Approach Coward St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	4	0	5	2	3	372	6	0	6	1	20	0	4	420	7	850
17:00	18:00	0	3	0	4	1	4	409	15	1	7	0	6	0	3	410	5	868

Note: Site sketch is for illustrating traffic flows. Direction is indicative only; drawings is not to scale and not an exact streets configuration.

Graphic:

Total
Left
Heavy



Time		North Approach Henry Kendall Cres Wt				East Approach Coward St				South Approach Aloha St				West Approach Coward St				Hourly Total	Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	WB	L		
6:00	6:15	0	0	0	0	0	0	34	1	0	0	0	0	0	0	1	51	1	
6:15	6:30	0	0	0	2	0	0	44	0	0	0	0	0	0	0	0	57	2	
6:30	6:45	0	0	0	0	0	0	34	0	0	0	0	1	0	0	61	0		
6:45	7:00	0	0	0	0	0	0	44	0	0	0	0	2	0	2	75	0		
7:00	7:15	0	0	0	1	0	2	67	5	0	3	0	1	0	3	71	0		
7:15	7:30	0	0	0	2	1	0	69	1	0	4	0	4	0	2	81	0		
7:30	7:45	0	0	0	0	1	1	67	1	0	4	0	4	0	1	77	0		
7:45	8:00	0	2	0	2	0	0	93	1	0	3	0	5	0	1	94	1		
8:00	8:15	0	1	0	0	1	1	79	1	0	0	0	7	0	2	94	0		
8:15	8:30	0	1	0	3	0	1	88	3	0	2	1	4	0	0	106	3		
8:30	8:45	0	0	0	0	0	1	82	1	0	1	0	4	0	0	106	3		
8:45	9:00	0	0	0	1	1	2	41	6	0	0	0	3	0	1	106	2		
9:00	9:15	0	0	0	1	0	1	82	3	0	1	0	2	0	2	76	0		
9:15	9:30	0	3	0	1	0	1	92	5	0	2	0	2	0	2	70	1		
9:30	9:45	0	1	0	1	0	2	87	3	0	4	0	1	0	0	88	0		
9:45	10:00	0	0	0	1	0	0	75	5	0	1	0	2	0	0	79	0		
10:00	10:15	0	1	0	0	1	0	66	2	0	2	0	1	0	1	78	0		
10:15	10:30	0	0	0	1	0	0	91	4	0	3	0	3	0	1	92	0		
10:30	10:45	0	0	0	0	0	1	77	8	0	1	0	3	0	1	86	1		
10:45	11:00	0	1	0	0	0	1	84	5	0	1	0	3	0	0	90	0		
11:00	11:15	0	0	0	0	1	0	95	7	0	1	0	0	0	0	109	2		
11:15	11:30	0	1	0	1	0	2	105	5	1	1	0	2	0	0	104	1		
11:30	11:45	0	0	0	1	0	1	94	2	0	2	0	2	0	0	96	1		
11:45	12:00	0	2	0	2	0	1	99	1	0	3	0	2	0	1	85	0		

Peak Time		North Approach Henry Kendall Cres Wt					East Approach Coward St					South Approach Aloha St				West Approach Coward St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total		
7:45	8:45	0	4	0	5	1	3	352	6	0	6	1	20	0	3	450	7	850		
17:00	18:00	0	3	0	4	1	4	393	15	1	7	0	6	0	3	394	4	835		

Heavy Vehicles

Period Start / Period End		North Approach Henry Kendall Cres Wt				East Approach Coward St				South Approach Aloha St				West Approach Coward St				
		U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	WB	L	
6:00	6:15	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5	0
6:15	6:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0
6:30	6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6:45	7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
7:00	7:15	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	7	0
7:15	7:30	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	3
7:30	7:45	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	1
7:45	8:00	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	2
8:00	8:15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8:15	8:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0
8:30	8:45	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0
8:45	9:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
9:00	9:15	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
9:15	9:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:30	9:45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
9:45	10:00	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0
10:00	10:15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
10:15	10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10:30	10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	11:00	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0
11:00	11:15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:15	11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:00	12:15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

Appendix B

SIDRA modelling results

MOVEMENT SUMMARY

 **Site: 101 [Botany Road/Coward Street Ex AM Peak (Site Folder: Existing)]**

Existing Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 130 seconds (Site Practical Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Botany Road														
1	L2	95	14	100	14.7	* 0.891	59.8	LOS E	42.2	320.5	1.00	1.04	1.15	28.3
2	T1	1053	79	1108	7.5	* 0.891	52.6	LOS D	42.2	320.5	0.98	1.02	1.14	29.0
3	R2	125	1	132	0.8	* 0.374	28.2	LOS B	5.1	36.2	0.73	0.72	0.73	36.0
Approach		1273	94	1340	7.4	0.891	50.7	LOS D	42.2	320.5	0.96	0.99	1.10	29.5
East: Coward Street														
4	L2	42	0	44	0.0	0.176	30.5	LOS C	1.8	12.5	0.86	0.71	0.86	35.4
5	T1	168	1	177	0.6	* 0.853	53.6	LOS D	16.1	113.6	0.99	0.91	1.10	28.6
6	R2	80	1	84	1.3	0.853	60.0	LOS E	16.1	113.6	1.00	0.92	1.12	28.2
Approach		290	2	305	0.7	0.853	52.0	LOS D	16.1	113.6	0.98	0.88	1.07	29.3
North: Botany Road														
7	L2	67	0	71	0.0	0.157	30.8	LOS C	3.6	30.3	0.63	0.66	0.63	35.6
8	T1	510	72	537	14.1	0.391	18.2	LOS B	8.3	63.1	0.51	0.44	0.51	40.0
9	R2	86	4	91	4.7	0.589	37.9	LOS C	3.5	25.2	0.99	0.78	1.01	32.7
Approach		663	76	698	11.5	0.589	22.0	LOS B	8.3	63.1	0.58	0.50	0.58	38.4
West: Coward Street														
10	L2	145	4	153	2.8	0.294	43.5	LOS D	7.5	54.0	0.83	0.77	0.83	31.1
11	T1	204	1	215	0.5	0.821	56.2	LOS D	22.0	159.9	1.00	0.94	1.12	28.0
12	R2	120	14	126	11.7	0.821	60.8	LOS E	22.0	159.9	1.00	0.94	1.12	27.9
Approach		469	19	494	4.1	0.821	53.5	LOS D	22.0	159.9	0.95	0.89	1.03	28.9
All Vehicles		2695	191	2837	7.1	0.891	44.3	LOS D	42.2	320.5	0.87	0.84	0.96	31.1

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Botany Road												
P1	Full	58	61	59.3	LOS E	0.2	0.2	0.96	0.96	93.0	43.8	0.47
East: Coward Street												
P2	Full	23	24	31.2	LOS D	0.1	0.1	0.69	0.69	58.3	35.2	0.60

North: Botany Road												
P3	Full	66	69	52.8	LOS E	0.2	0.2	0.90	0.90	86.5	43.8	0.51
West: Coward Street												
P4	Full	28	29	31.2	LOS D	0.1	0.1	0.69	0.69	58.3	35.2	0.60
All		175	184	48.7	LOS E	0.2	0.2	0.86	0.86	80.4	41.3	0.51
Pedestrians												

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.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: EMM CONSULTING | Licence: NETWORK / 1PC | Processed: Monday, 29 August 2022 6:22:27 PM

Project: \\emmsvr1\EMM3\2021\E210803 - Botany Road Henry Kendall\Technical studies\Transport\SIDRA\2022\E210803_Botany Road Henry Kendall Crescent Planning Proposal_JM_v1.3.sip9

MOVEMENT SUMMARY

 **Site: 101 [Botany Road/Coward Street Ex PM Peak (Site Folder: Existing)]**

Existing Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Site Practical Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Botany Road														
1	L2	134	16	141	11.9	0.606	36.6	LOS C	15.1	117.3	0.88	0.84	0.88	34.2
2	T1	578	46	608	8.0	0.606	32.2	LOS C	17.3	125.8	0.89	0.80	0.89	34.5
3	R2	83	0	87	0.0	0.442	31.3	LOS C	3.0	20.7	0.94	0.76	0.94	34.9
Approach		795	62	837	7.8	0.606	32.9	LOS C	17.3	125.8	0.89	0.80	0.89	34.5
East: Coward Street														
4	L2	44	0	46	0.0	0.172	25.0	LOS B	1.6	11.2	0.83	0.70	0.83	37.5
5	T1	166	1	175	0.6	*0.833	41.9	LOS C	12.3	86.4	0.94	0.86	1.05	31.4
6	R2	74	1	78	1.4	0.833	48.5	LOS D	12.3	86.4	0.95	0.88	1.07	30.9
Approach		284	2	299	0.7	0.833	41.0	LOS C	12.3	86.4	0.93	0.84	1.02	32.1
North: Botany Road														
7	L2	75	0	79	0.0	0.164	32.6	LOS C	2.6	20.2	0.74	0.71	0.74	34.7
8	T1	967	49	1018	5.1	*0.900	50.2	LOS D	30.6	221.0	0.96	1.05	1.22	29.7
9	R2	131	0	138	0.0	*0.540	29.6	LOS C	4.8	33.9	0.90	0.77	0.90	35.3
Approach		1173	49	1235	4.2	0.900	46.7	LOS D	30.6	221.0	0.94	1.00	1.15	30.5
West: Coward Street														
10	L2	47	0	49	0.0	0.213	41.1	LOS C	4.0	28.0	0.84	0.71	0.84	32.4
11	T1	220	1	232	0.5	*0.899	54.9	LOS D	22.5	163.9	0.97	1.00	1.23	28.2
12	R2	163	16	172	9.8	0.899	63.5	LOS E	22.5	163.9	1.00	1.06	1.31	27.2
Approach		430	17	453	4.0	0.899	56.7	LOS E	22.5	163.9	0.97	0.99	1.22	28.2
All Vehicles		2682	130	2823	4.8	0.900	43.6	LOS D	30.6	221.0	0.93	0.92	1.07	31.3

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Botany Road												
P1	Full	41	43	49.3	LOS E	0.1	0.1	0.95	0.95	82.9	43.8	0.53
East: Coward Street												
P2	Full	23	24	31.3	LOS D	0.1	0.1	0.76	0.76	58.4	35.2	0.60

North: Botany Road												
P3	Full	35	37	48.3	LOS E	0.1	0.1	0.94	0.94	82.0	43.8	0.53
West: Coward Street												
P4	Full	31	33	31.4	LOS D	0.1	0.1	0.76	0.76	58.4	35.2	0.60
All		130	137	41.6	LOS E	0.1	0.1	0.87	0.87	72.5	40.2	0.55
Pedestrians												

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.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: EMM CONSULTING | Licence: NETWORK / 1PC | Processed: Monday, 29 August 2022 6:22:46 PM

Project: \\emmsvr1\EMM3\2021\E210803 - Botany Road Henry Kendall\Technical studies\Transport\SIDRA\2022\E210803_Botany Road Henry Kendall Crescent Planning Proposal_JM_v1.3.sip9

MOVEMENT SUMMARY

 **Site: 101 [Botany Road/Coward Street Dev AM Peak (Site Folder: Development)]**

Existing Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 130 seconds (Site Practical Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Botany Road														
1	L2	95	14	100	14.7	* 0.892	59.9	LOS E	42.3	321.3	1.00	1.04	1.15	28.2
2	T1	1054	79	1109	7.5	* 0.892	52.7	LOS D	42.3	321.3	0.98	1.02	1.14	29.0
3	R2	125	1	132	0.8	* 0.374	28.2	LOS B	5.1	36.2	0.73	0.72	0.73	36.0
Approach		1274	94	1341	7.4	0.892	50.9	LOS D	42.3	321.3	0.96	0.99	1.10	29.5
East: Coward Street														
4	L2	42	0	44	0.0	0.177	30.5	LOS C	1.8	12.6	0.86	0.71	0.86	35.4
5	T1	168	1	177	0.6	* 0.856	53.8	LOS D	16.2	114.3	0.99	0.91	1.11	28.5
6	R2	81	1	85	1.2	0.856	60.1	LOS E	16.2	114.3	1.00	0.92	1.12	28.1
Approach		291	2	306	0.7	0.856	52.2	LOS D	16.2	114.3	0.98	0.88	1.08	29.2
North: Botany Road														
7	L2	67	0	71	0.0	0.157	30.8	LOS C	3.6	30.3	0.63	0.66	0.63	35.6
8	T1	510	72	537	14.1	0.391	18.2	LOS B	8.3	63.1	0.51	0.44	0.51	40.0
9	R2	86	4	91	4.7	0.589	37.9	LOS C	3.5	25.2	0.99	0.78	1.01	32.7
Approach		663	76	698	11.5	0.589	22.0	LOS B	8.3	63.1	0.58	0.50	0.58	38.4
West: Coward Street														
10	L2	148	4	156	2.7	0.300	43.6	LOS D	7.7	55.2	0.83	0.77	0.83	31.1
11	T1	204	1	215	0.5	0.822	56.3	LOS D	22.0	160.0	1.00	0.94	1.12	28.0
12	R2	120	14	126	11.7	0.822	60.9	LOS E	22.0	160.0	1.00	0.94	1.12	27.9
Approach		472	19	497	4.0	0.822	53.5	LOS D	22.0	160.0	0.95	0.89	1.03	28.9
All Vehicles		2700	191	2842	7.1	0.892	44.4	LOS D	42.3	321.3	0.87	0.84	0.96	31.1

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped	Dist]					
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Botany Road												
P1	Full	58	61	59.3	LOS E	0.2	0.2	0.96	0.96	93.0	43.8	0.47
East: Coward Street												
P2	Full	23	24	31.2	LOS D	0.1	0.1	0.69	0.69	58.3	35.2	0.60

North: Botany Road												
P3	Full	66	69	52.8	LOS E	0.2	0.2	0.90	0.90	86.5	43.8	0.51
West: Coward Street												
P4	Full	28	29	31.2	LOS D	0.1	0.1	0.69	0.69	58.3	35.2	0.60
All		175	184	48.7	LOS E	0.2	0.2	0.86	0.86	80.4	41.3	0.51
Pedestrians												

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.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: EMM CONSULTING | Licence: NETWORK / 1PC | Processed: Monday, 29 August 2022 6:30:47 PM

Project: \\emmsvr1\EMM3\2021\E210803 - Botany Road Henry Kendall\Technical studies\Transport\SIDRA\2022\E210803_Botany Road Henry Kendall Crescent Planning Proposal_JM_v1.4.sip9

MOVEMENT SUMMARY

 **Site: 101 [Botany Road/Coward Street Dev PM Peak (Site Folder: Development)]**

Existing Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Site Practical Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Botany Road														
1	L2	134	16	141	11.9	0.609	36.7	LOS C	15.2	118.3	0.88	0.84	0.88	34.1
2	T1	582	46	613	7.9	0.609	32.3	LOS C	17.4	126.6	0.89	0.80	0.89	34.5
3	R2	83	0	87	0.0	0.442	31.3	LOS C	3.0	20.7	0.94	0.76	0.94	34.9
Approach		799	62	841	7.8	0.609	32.9	LOS C	17.4	126.6	0.89	0.80	0.89	34.5
East: Coward Street														
4	L2	44	0	46	0.0	0.173	25.0	LOS B	1.6	11.2	0.83	0.70	0.83	37.5
5	T1	166	1	175	0.6	* 0.837	42.0	LOS C	12.3	86.9	0.94	0.87	1.06	31.4
6	R2	75	1	79	1.3	0.837	48.7	LOS D	12.3	86.9	0.95	0.88	1.08	30.8
Approach		285	2	300	0.7	0.837	41.1	LOS C	12.3	86.9	0.93	0.84	1.03	32.0
North: Botany Road														
7	L2	75	0	79	0.0	0.164	32.6	LOS C	2.6	20.2	0.74	0.71	0.74	34.7
8	T1	967	49	1018	5.1	* 0.900	50.2	LOS D	30.6	221.0	0.96	1.05	1.22	29.7
9	R2	131	0	138	0.0	* 0.543	29.6	LOS C	4.8	33.9	0.90	0.77	0.90	35.3
Approach		1173	49	1235	4.2	0.900	46.7	LOS D	30.6	221.0	0.94	1.00	1.15	30.5
West: Coward Street														
10	L2	57	0	60	0.0	0.217	40.3	LOS C	4.1	28.9	0.84	0.72	0.84	32.5
11	T1	220	1	232	0.5	* 0.915	58.0	LOS E	23.6	172.0	0.97	1.03	1.27	27.5
12	R2	163	16	172	9.8	0.915	66.6	LOS E	23.6	172.0	1.00	1.09	1.35	26.6
Approach		440	17	463	3.9	0.915	58.9	LOS E	23.6	172.0	0.97	1.02	1.25	27.7
All Vehicles		2697	130	2839	4.8	0.915	44.0	LOS D	30.6	221.0	0.93	0.93	1.08	31.2

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Botany Road												
P1	Full	41	43	49.3	LOS E	0.1	0.1	0.95	0.95	82.9	43.8	0.53
East: Coward Street												
P2	Full	23	24	31.3	LOS D	0.1	0.1	0.76	0.76	58.4	35.2	0.60

North: Botany Road												
P3	Full	35	37	48.3	LOS E	0.1	0.1	0.94	0.94	82.0	43.8	0.53
West: Coward Street												
P4	Full	31	33	31.4	LOS D	0.1	0.1	0.76	0.76	58.4	35.2	0.60
All		130	137	41.6	LOS E	0.1	0.1	0.87	0.87	72.5	40.2	0.55
Pedestrians												

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.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: EMM CONSULTING | Licence: NETWORK / 1PC | Processed: Monday, 29 August 2022 6:31:33 PM

Project: \\emmsvr1\EMM3\2021\E210803 - Botany Road Henry Kendall\Technical studies\Transport\SIDRA\2022\E210803_Botany Road Henry Kendall Crescent Planning Proposal_JM_v1.4.sip9

Appendix C

Queuing photographs

C.1 AM peak queuing



Plate C.1 North approach queuing at the Botany Road/Coward Street intersection during AM peak



Plate C.2 East approach queuing at the Botany Road/Coward Street intersection during AM peak



Plate C.3 South approach queuing at the Botany Road/Coward Street intersection during AM peak



Plate C.4 **West approach queuing at the Botany Road/Coward Street intersection during AM peak**

C.2 PM peak queuing



Plate C.5 **North approach queuing at the Botany Road/Coward Street intersection during PM peak**



Plate C.6 **East approach queuing at the Botany Road/Coward Street intersection during PM peak**



Plate C.7 South approach queuing at the Botany Road/Coward Street intersection during PM peak



Plate C.8 West approach queuing at the Botany Road/Coward Street intersection during PM peak