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14 October 2021

Anna Johnston
FPD Pty Ltd
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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 undertakes a traffic and parking assessment for the subject planning proposal. The initial proposal for this site was considered in late 2017 and EMM Consulting, on behalf of NSW Land and Housing Corporation, prepared the traffic impact assessment (TIA, dated 28 November 2017) 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 council's appointed consultant Bitzios Consulting. Bitzios has made a number of traffic and parking related comments. This letter also addresses their comments.

1 Current proposal

The planning proposal has been amended to address issues raised by council, which has resulted in a reduction in FSR from 2.5:1 to 2:1. This is consistent with the current permissible FSR of 2:1, however, the current proposal seeks to increase the height to enable an improved built form outcome. The proposal also seeks to remove a requirement for active street frontages facing Botany Road which means that residential uses will face Botany Road, rather than retail/commercial uses as per the previous proposal. The setbacks to Botany Road have also been significantly increased to allow street trees to be retained and to provide an appropriate level of amenity for the ground floor residential uses.

Access will be via Botany Road. Currently with the existing footprint there are four driveways on Botany Road, 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. Access via Botany Road rather than Henry Kendall Crescent also improves the traffic safety on the Coward Street/Henry Kendall Crescent intersection.

A comparison of the current and previous proposals is tabulated below.

Table 1.1 A comparison of existing use and planning proposals

Land use	Existing	2017 Proposal	2021 proposal
Residential (units)	25	155	152
Commercial/ retail (m^2 GLFA)	0	723	0

2 Parking assessment

2.1 Car parking

The development provides the following apartment mix:

- 1 bedroom – 106 apartments; and
- 2 bedroom – 46 apartments.

The site is located within 800 m of Mascot Train Station. NSW Apartment Design Guide specifies that for developments within 800 m of a railway station in Sydney, the **minimum** car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less.

Bayside Council's DCP requires the following car parking rates for residential flat buildings:

- 1 space per studio or one bedroom dwelling;
- 2 spaces per dwelling with two or more bedrooms;
- 1 designated visitor space per 5 dwellings; and
- 1 car wash bay (visitor parking may be equipped with cold water tap and sewer connection and used as a car wash bay).

The Guide to Traffic Generating Developments requires the following car parking rates for residential flat buildings:

- 0.6 space per one bedroom dwelling;
- 0.9 spaces per two bedrooms dwelling; and
- 1 designated visitor space per 5 dwellings.

The Guide to Traffic Generating Developments has the lower car parking rate and is therefore adopted as the car parking requirement.

It is noted that the development will have a component for social housing, however it is not determined at this stage how many of these units will be dedicated as social housing units. The *State Environmental Planning Policy (Affordable Rental Housing) 2009* applies for the social housing units and has a lower car parking rate. For the purpose of assessing the car parking requirement, the standard residential car parking rate is considered for all units.

Table 2.1 The Guide to Traffic Generating Developments car parking requirement

Land use	Number of dwellings	Car parking rate	Car parking requirement
1 bedroom apartments	106	0.6	63.6
2 bedroom apartments	46	0.9	41.4
Visitor parking	152	1 space per 5 units	30.4
Total			135.4

Based on the above table, the proposed development would require 136 car parking spaces. The development will provide sufficient car parking to satisfy the requirement.

In accordance with the *Botany Bay DCP Part 3C: Access and Mobility*, 20% of the proposed dwellings are to be designed as adaptable dwellings with half of these dwellings (10%) to be provided with an allocated accessible parking bay. This equates to a requirement of 16 accessible parking spaces.

As per the DCP, at least 80% of these accessible spaces will be designed in accordance with AS2499 and a maximum of 20% of spaces are to be compliant with AS2890.6.

2.2 Bicycle parking

Council's DCP also stipulates bicycle parking provision as 10% of the required car spaces, therefore requiring 14 bicycle spaces.

Resident bicycle parking shall be provided as Class B security level and visitor parking shall be provided as Class C security level, in accordance with AS2890.3.

The development will provide sufficient bicycle parking spaces with appropriate security level.

2.3 Waste collection

The basement car park and driveway will be designed to be able to accommodate a median rigid vehicle (MRV) for waste collection, in accordance with Council's DCP and relevant Australian Standards.

3 Traffic assessment

3.1 Baseline traffic

Due to the current COVID-19 lockdown in Sydney, any new traffic survey for the traffic assessment is not considered feasible. Instead, the historical traffic volumes in the road network at this locality have been analysed to determine the 2021 traffic volumes.

The Transport for NSW (TfNSW) Traffic Volume Viewer publishes the traffic volume history for O'Riordan Street at 100 m north of Johnson Street, Alexandria (station id: 02309), as presented in Table 3.1.

Table 3.1 O'Riordan Street historical traffic data

Direction	Period	2017	2018	2019	2020	2021
Northbound	AM peak hour	3,291	3,185	2,733	2,019	2,266
	PM peak hour	3,512	3,366	2,850	2,366	2,344
	Daily	13,938	13,623	11,712	8,788	8,732
Southbound	AM peak hour	3,565	3,621	3,586	2,268	2,327
	PM peak hour	3,526	3,488	3,476	2,555	2,741
	Daily	13,697	13,585	13,644	9,329	9,664

This permanent station shows a generally decreasing trend in traffic volumes (even in pre-COVID periods) during the peak periods of the day in the past five years. This is possibly due to opening of M8 motorway which has resulted reduction of surface traffic in the locality.

Therefore, 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.

The result of the 2017 traffic survey is presented in Figure 3.1.

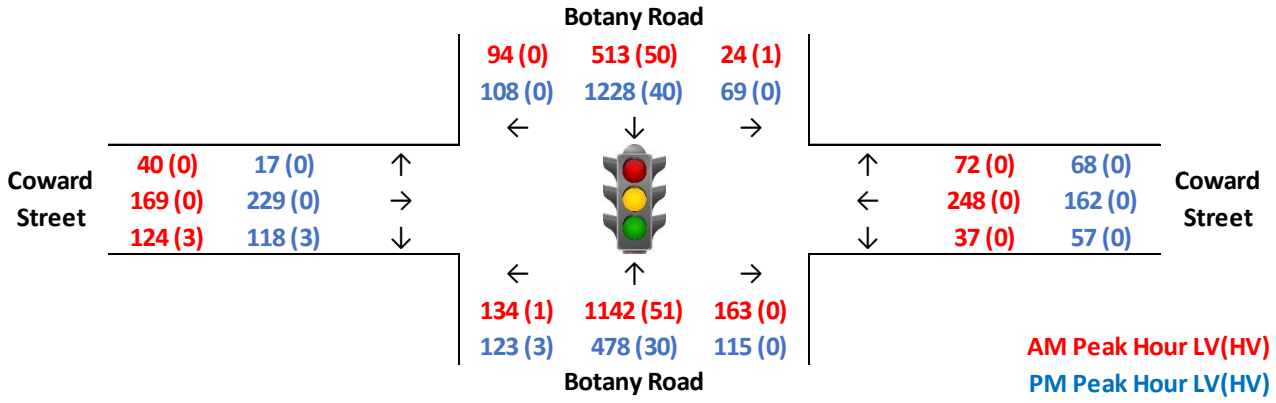

Figure 3.1 Baseline peak hourly traffic

The traffic data show that there are high volumes of northbound (citybound) and westbound (towards Mascot Station) traffic during the AM peak and vice versa during the PM peak traffic.

3.2 Traffic generation

The TfNSW Guide to Traffic Generating Developments Updated Traffic Surveys (2013) suggests the following traffic generation rates for high density residential developments:

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

Table 3.2 Traffic generation

Period	Traffic generation rate	Existing traffic generation (25 units)	Proposed traffic generation (152 units)	Net traffic generation
AM peak hour	0.19	4.8	28.9	24.1
PM peak hour	0.15	3.8	22.8	19.0
Daily	1.52	38.0	231.1	193.1

Assuming 80% of the traffic movements are outbound movements in the AM peak and 80% inbound movements in the PM peak hour, the peak hour net traffic distribution for the Botany Road/Coward Street intersection is presented in Figure 3.2.

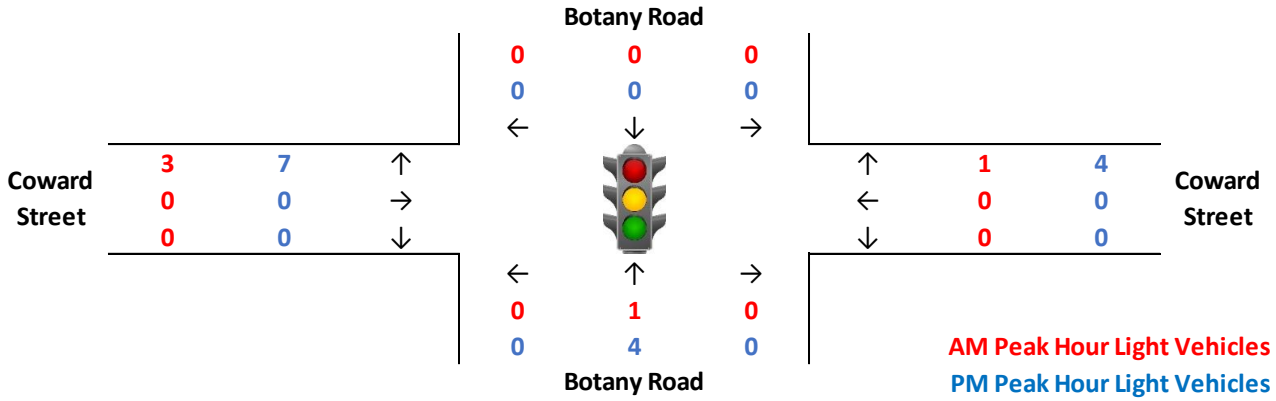

Figure 3.2 Net peak hourly traffic generation

The post development traffic (baseline with net development traffic) is presented in Figure 3.3.

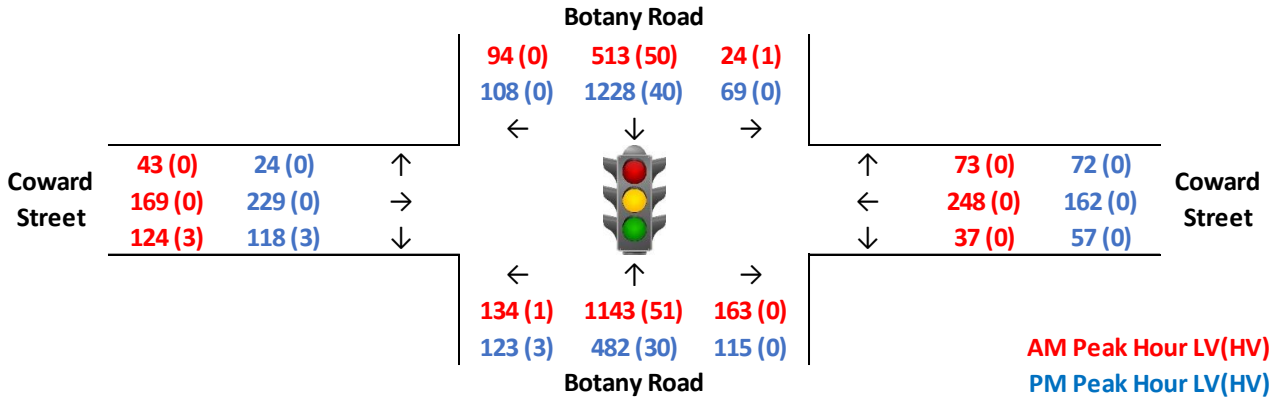

Figure 3.3 Post development peak hourly traffic

3.3 Intersection performance

The key intersection has been modelled with the SIDRA Intersection 9.0 software: a micro-analytical tool for individual intersections and linked intersection-network modelling. SIDRA provides the following performance indicators:

- Degree of saturation (DOS) – the total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation (eg 0.8 = 80% saturation). In practice the target degrees of saturation of 0.90 for signals, 0.85 for roundabouts and 0.80 for unsignalised intersections are generally agreed to. These are usually called 'practical degrees of saturation';
- Average delay (DEL) – the average delay in seconds encountered by all vehicles passing through the intersection. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay;
- Level of service (LOS) – this is a categorisation of average delay, intended for simple reference; and
- 95% queue lengths (Q95) – is defined to be the queue length in metres that has only a 5% probability of being exceeded during the analysed time period. It transforms the average delay into measurable distance units.

The LOS is a good indicator of overall performance for individual intersections, with each level summarised in Table 3.3.

Table 3.3 Intersection LOS standards

Level of service	Average delay (seconds per vehicle)	Traffic signals, roundabout	Priority intersection ('Stop' and 'Give Way')
A	<14	Good operation	Good operations
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At traffic signals, incidents will cause extensive delays. Roundabouts require other control mode.	At capacity; required other control mode
F	>71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; required other control mode

Source: *RTA Guide to Traffic Generating Development* (RTA 2002)

The SIDRA results are presented in Table 3.4. The more up to date version of the SIDRA software has been used (version 9) which resulted in an improvement of the baseline intersection performance over the 2017 study.

Table 3.4 2021 SIDRA results for the Botany Road/Coward Street intersection

Peak hour	Scenario	Intersection volumes	DOS	LOS	DEL	Q95
AM	Baseline	2,866	1.374	D	53.9	285.5 (LT and TH from Botany Road south)
	Post development	2,871	1.113	E	59.6	265.6 (LT and TH from Botany Road south)
PM	Baseline	2,848	1.230	F	141.1	1161.1 (TH from Botany Road north)
	Post development	2,863	1.230	F	145.1	1162.3 (TH from Botany Road north)

The results show the Botany Road/Coward Street intersection is already operating over the capacity in both the AM and PM peak hours with a LOS D and F in the respective peak hours. With the anticipated traffic generated from the proposed development permissible under this planning proposal, the intersection performance during the AM peak will become LOS E with marginal amendment in the performance parameters. The results of the SIDRA modelling are attached at the end of this letter.

The development traffic passing through the Botany Road/Coward Street intersection will only make up less than 1% of the total peak hourly traffic movements at the intersection. The traffic impact will be minimal on the peak hour traffic operation of the intersection. As such, it is unreasonable to consider any upgrade of this intersection as part of this development for such minor increase of traffic. It is understood that TfNSW has long term plan to upgrade this intersection. The details are not known at this stage.

Table 3.5 Peak hourly traffic at the Botany Road/Coward Street intersection

	Baseline traffic	Development traffic	Percentage
AM	2866	5	0.2%
PM	2848	15	0.5%

3.4 Safety assessment

Bitzios noted that there are potential impacts of development traffic turning right from Coward Street into Henry Kendall Crescent to access the site which could cause queuing extending to the Botany Road/Coward Street intersection. However, traffic could alternatively assess the site via the Botany Road driveway which is the more desired route for traffic from the east and south. 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.

4 Response to traffic and parking related comments raised by Bitzios Consulting

Bitzios Consulting has peer reviewed the EMM TIA (28 November 2017) for the original planning proposal. Bitzios at its letter dated 8 March 2018 raised a number of traffic and parking related comments. Their comments and EMM's responses are provided in Table 4.1.

Table 4.1 Bitzios comments and EMM's responses

Section	Bitzios comments	Response
2.1 Parking	Compliance of the car parking provision for residential and visitor spaces.	The updated land use and car parking requirement are provided in Section 2.1.
2.1 Disability parking	Requirement of disability parking for the development and its compliance with AS2890.6	Accessible parking requirement is discussed in Section 2.1.
2.2 Bicycle parking	Requirement of bicycle parking for the development and its compliance with AS2890.3	Bicycle parking requirement is discussed in Section 2.2.
2.2 Servicing	Provision of service vehicle parking within the site, its forward in/ forward out onto Botany Road and compliance with AS2890.2.	Waste collection requirement is discussed in Section 2.3.
2.3 Traffic	Traffic generation rate as per TfNSW's Guide to Traffic Generating Developments Technical Direction 04a (2013). Sight distance and visibility at Coward Street while exiting Henry Kendall Crescent. Potential solutions: • peak right-turn bans out of the eastern Coward Street/Henry Kendall Crescent intersection; • provision of a channelised right-turn (CHR) treatment on Coward Street or passing lane opportunity; or • widening Coward Street to a four-lane alignment from Botany Road to the western intersection with Henry Kendall Crescent. Due to the narrowness of Henry Kendall Crescent, consider discouraging development traffic from entering/exiting Henry Kendall Crescent via the western intersection with Coward Street. Potential parking restriction on Henry Kendall Crescent near the proposed access and the eastern intersection with Coward Street. These bans are to facilitate service vehicle access and encourage development traffic to use the eastern Coward Street/Henry Kendall Crescent intersection. A road safety impact statement should accompany the application.	Updated traffic generation rates have been used and the traffic impacts are discussed in Section 3. The recommended traffic and/or parking management measures could be considered in detail design stage when the driveways of the subject development are finalised. Any traffic management and parking restriction measures should be implemented with collaboration with TfNSW and Bayside Council as it will affect the local residents living in Henry Kendall Crescent.
2.4 Active transport	There is no existing pedestrian protection at the Botany Road/Coward Street signalised intersection and the footpath fronting the development on Coward Street is narrow. Pedestrian ramps at the signalised crossings of the Botany Road/Coward Street intersection are also deteriorating and do not comply with modern safety standards. Pedestrian desire lines also indicate that people may cross the road west of the signalised crossing from the development into the parkland opposite.	This matter is not related to this development application. However, this matter could be referred to TfNSW for appropriate action.

I hope the above addresses all the issues. If you require any further information or clarification, please do not hesitate to contact me.

Yours sincerely

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Appendix A

SIDRA Intersection Results

MOVEMENT SUMMARY

Site: 101 [Botany Road/Coward Street baseline AM Peak (Site Folder: General)]

Existing Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated 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 [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: Botany Road														
1	L2	135	1	142	0.7	0.872	43.2	LOS D	39.6	285.5	0.96	0.96	1.08	36.3
2	T1	1193	51	1256	4.3	0.872	37.1	LOS C	39.6	285.5	0.94	0.95	1.07	37.1
3	R2	163	0	172	0.0	* 0.709	52.1	LOS D	9.1	63.8	1.00	0.89	1.09	32.0
Approach		1491	52	1569	3.5	0.872	39.3	LOS C	39.6	285.5	0.95	0.94	1.07	36.4
East: Coward Street														
4	L2	37	0	39	0.0	0.181	43.5	LOS D	3.4	23.5	0.84	0.71	0.84	35.7
5	T1	248	0	261	0.0	* 0.874	52.5	LOS D	17.5	122.4	0.97	0.97	1.22	31.9
6	R2	72	0	76	0.0	0.874	60.7	LOS E	17.5	122.4	0.99	1.02	1.28	31.0
Approach		357	0	376	0.0	0.874	53.2	LOS D	17.5	122.4	0.96	0.95	1.19	32.1
North: Botany Road														
7	L2	25	1	26	4.0	0.050	36.1	LOS C	1.0	7.3	0.75	0.70	0.75	37.2
8	T1	563	50	593	8.9	0.767	34.5	LOS C	21.6	162.4	0.89	0.80	0.93	38.4
9	R2	94	0	99	0.0	* 1.374	393.1	LOS F	17.0	119.1	1.00	1.58	3.57	7.7
Approach		682	51	718	7.5	1.374	84.0	LOS F	21.6	162.4	0.90	0.90	1.28	24.8
West: Coward Street														
10	L2	40	0	42	0.0	0.206	51.0	LOS D	2.6	18.5	0.92	0.74	0.92	32.6
11	T1	169	0	178	0.0	* 0.869	56.1	LOS D	17.8	126.0	0.99	0.99	1.24	30.7
12	R2	127	3	134	2.4	0.869	62.4	LOS E	17.8	126.0	1.00	1.01	1.27	30.1
Approach		336	3	354	0.9	0.869	57.9	LOS E	17.8	126.0	0.99	0.97	1.21	30.7
All Vehicles		2866	106	3017	3.7	1.374	53.9	LOS D	39.6	285.5	0.94	0.94	1.15	31.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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. 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
South: Botany Road												
P1	Full	88	93	49.4	LOS E	0.3	0.3	0.95	0.95	83.0	43.8	0.53
East: Coward Street												
P2	Full	28	29	31.4	LOS D	0.1	0.1	0.76	0.76	58.4	35.2	0.60

North: Botany Road											
P3	Full	29	31	49.2	LOS E	0.1	0.1	0.95	0.95	82.9	43.8	0.53
West: Coward Street											
P4	Full	22	23	22.9	LOS C	0.0	0.0	0.65	0.65	50.0	35.2	0.70
All Pedestrians		167	176	42.8	LOS E	0.3	0.3	0.88	0.88	74.5	41.2	0.55

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

MOVEMENT SUMMARY

Site: 101 [Botany Road/Coward Street baseline PM Peak (Site Folder: General)]

Existing Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 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 [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: Botany Road														
1	L2	126	3	133	2.4	0.301	20.7	LOS B	10.8	78.9	0.53	0.57	0.53	45.9
2	T1	508	30	535	5.9	0.301	14.8	LOS B	11.1	81.6	0.53	0.51	0.53	47.8
3	R2	115	0	121	0.0	* 0.889	87.5	LOS F	9.0	63.3	1.00	1.05	1.39	24.4
Approach		749	33	788	4.4	0.889	27.0	LOS B	11.1	81.6	0.60	0.60	0.66	41.4
East: Coward Street														
4	L2	57	0	60	0.0	0.222	62.9	LOS E	4.2	29.2	0.90	0.75	0.90	30.1
5	T1	162	0	171	0.0	* 1.073	150.2	LOS F	26.2	183.3	0.99	1.31	1.86	16.9
6	R2	68	0	72	0.0	1.073	162.2	LOS F	26.2	183.3	1.00	1.35	1.92	16.3
Approach		287	0	302	0.0	1.073	135.7	LOS F	26.2	183.3	0.98	1.21	1.68	18.3
North: Botany Road														
7	L2	69	0	73	0.0	0.083	27.4	LOS B	2.7	18.6	0.58	0.70	0.58	40.8
8	T1	1268	40	1335	3.2	* 1.230	207.1	LOS F	161.5	1161.1	0.91	1.65	1.94	13.4
9	R2	108	0	114	0.0	0.354	35.6	LOS C	5.4	37.5	0.72	0.77	0.72	37.2
Approach		1445	40	1521	2.8	1.230	185.7	LOS F	161.5	1161.1	0.88	1.54	1.78	14.6
West: Coward Street														
10	L2	17	0	18	0.0	0.278	65.8	LOS E	4.3	30.1	0.94	0.74	0.94	29.5
11	T1	229	0	241	0.0	* 1.172	195.0	LOS F	44.5	314.4	0.99	1.45	1.99	13.8
12	R2	121	3	127	2.5	1.172	236.4	LOS F	44.5	314.4	1.00	1.64	2.26	12.0
Approach		367	3	386	0.8	1.172	202.7	LOS F	44.5	314.4	0.99	1.48	2.03	13.5
All Vehicles		2848	76	2998	2.7	1.230	141.1	LOS F	161.5	1161.1	0.83	1.25	1.51	17.8

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.

* 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
South: Botany Road												
P1	Full	49	52	64.3	LOS F	0.2	0.2	0.96	0.96	98.0	43.8	0.45
East: Coward Street												
P2	Full	34	36	22.3	LOS C	0.1	0.1	0.57	0.57	49.4	35.2	0.71

North: Botany Road											
P3	Full	29	31	64.2	LOS F	0.1	0.1	0.96	0.96	97.9	43.8	0.45
West: Coward Street											
P4	Full	9	9	16.0	LOS B	0.0	0.0	0.48	0.48	43.1	35.2	0.82
All Pedestrians		121	127	48.9	LOS E	0.2	0.2	0.81	0.81	80.2	40.7	0.51

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

MOVEMENT SUMMARY

Site: 101 [Botany Road/Coward Street dev AM Peak (Site Folder: General)]

Existing Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 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 [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: Botany Road														
1	L2	135	1	142	0.7	0.723	30.5	LOS C	36.8	265.6	0.79	0.75	0.79	41.5
2	T1	1194	51	1257	4.3	0.723	23.5	LOS B	36.8	265.6	0.77	0.71	0.77	43.0
3	R2	163	0	172	0.0	* 0.503	40.3	LOS C	9.1	63.4	0.85	0.81	0.85	35.7
Approach		1492	52	1571	3.5	0.723	26.0	LOS B	36.8	265.6	0.78	0.72	0.78	41.9
East: Coward Street														
4	L2	37	0	39	0.0	0.224	58.7	LOS E	4.5	31.8	0.89	0.73	0.89	31.1
5	T1	248	0	261	0.0	* 1.083	146.4	LOS F	34.9	244.5	0.98	1.32	1.77	17.2
6	R2	73	0	77	0.0	1.083	168.6	LOS F	34.9	244.5	1.00	1.42	1.92	15.9
Approach		358	0	377	0.0	1.083	141.9	LOS F	34.9	244.5	0.98	1.28	1.71	17.8
North: Botany Road														
7	L2	25	1	26	4.0	0.034	30.5	LOS C	1.0	7.3	0.60	0.68	0.60	39.4
8	T1	563	50	593	8.9	0.722	26.4	LOS B	18.5	139.3	0.70	0.61	0.70	42.0
9	R2	94	0	99	0.0	* 1.113	211.0	LOS F	13.5	94.7	1.00	1.34	2.29	13.0
Approach		682	51	718	7.5	1.113	52.0	LOS D	18.5	139.3	0.74	0.71	0.92	32.1
West: Coward Street														
10	L2	43	0	45	0.0	0.252	66.7	LOS E	3.5	24.4	0.95	0.75	0.95	28.5
11	T1	169	0	178	0.0	* 1.062	142.0	LOS F	33.2	234.1	1.00	1.34	1.78	17.5
12	R2	127	3	134	2.4	1.062	152.4	LOS F	33.2	234.1	1.00	1.37	1.83	17.0
Approach		339	3	357	0.9	1.062	136.4	LOS F	33.2	234.1	0.99	1.28	1.69	18.2
All Vehicles		2871	106	3022	3.7	1.113	59.6	LOS E	36.8	265.6	0.82	0.86	1.04	30.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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. 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
South: Botany Road												
P1	Full	88	93	63.4	LOS F	0.4	0.4	0.95	0.95	97.1	43.8	0.45
East: Coward Street												
P2	Full	28	29	25.8	LOS C	0.1	0.1	0.61	0.61	52.9	35.2	0.67

North: Botany Road											
P3	Full	29	31	64.2	LOS F	0.1	0.1	0.96	0.96	97.9	43.8	0.45
West: Coward Street											
P4	Full	22	23	19.1	LOS B	0.0	0.0	0.52	0.52	46.1	35.2	0.76
All Pedestrians		167	176	51.4	LOS E	0.4	0.4	0.84	0.84	83.1	41.2	0.50

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

MOVEMENT SUMMARY

Site: 101 [Botany Road/Coward Street dev PM Peak (Site Folder: General)]

Existing Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 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 [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: Botany Road														
1	L2	126	3	133	2.4	0.303	20.7	LOS B	10.9	79.5	0.53	0.57	0.53	45.9
2	T1	512	30	539	5.9	0.303	14.8	LOS B	11.2	82.2	0.53	0.51	0.53	47.7
3	R2	115	0	121	0.0	* 0.889	87.5	LOS F	9.0	63.3	1.00	1.05	1.39	24.4
Approach		753	33	793	4.4	0.889	26.9	LOS B	11.2	82.2	0.60	0.60	0.66	41.4
East: Coward Street														
4	L2	57	0	60	0.0	0.225	63.0	LOS E	4.2	29.6	0.90	0.75	0.90	30.1
5	T1	162	0	171	0.0	* 1.089	160.8	LOS F	27.6	193.5	0.99	1.34	1.91	16.1
6	R2	72	0	76	0.0	1.089	174.0	LOS F	27.6	193.5	1.00	1.39	1.99	15.5
Approach		291	0	306	0.0	1.089	144.9	LOS F	27.6	193.5	0.98	1.24	1.73	17.5
North: Botany Road														
7	L2	69	0	73	0.0	0.083	27.4	LOS B	2.7	18.6	0.58	0.70	0.58	40.8
8	T1	1268	40	1335	3.2	* 1.230	207.6	LOS F	161.7	1162.3	0.91	1.65	1.94	13.4
9	R2	108	0	114	0.0	0.356	35.7	LOS C	5.4	37.6	0.72	0.77	0.72	37.2
Approach		1445	40	1521	2.8	1.230	186.1	LOS F	161.7	1162.3	0.88	1.54	1.79	14.6
West: Coward Street														
10	L2	24	0	25	0.0	0.285	66.0	LOS E	4.2	29.6	0.95	0.74	0.95	29.3
11	T1	229	0	241	0.0	* 1.203	222.2	LOS F	48.4	341.9	0.99	1.54	2.13	12.5
12	R2	121	3	127	2.5	1.203	261.9	LOS F	48.4	341.9	1.00	1.71	2.38	11.1
Approach		374	3	394	0.8	1.203	225.0	LOS F	48.4	341.9	0.99	1.55	2.14	12.4
All Vehicles		2863	76	3014	2.7	1.230	145.1	LOS F	161.7	1162.3	0.83	1.26	1.53	17.4

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. 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
South: Botany Road												
P1	Full	49	52	64.3	LOS F	0.2	0.2	0.96	0.96	98.0	43.8	0.45
East: Coward Street												
P2	Full	34	36	22.3	LOS C	0.1	0.1	0.57	0.57	49.4	35.2	0.71

North: Botany Road											
P3	Full	29	31	64.2	LOS F	0.1	0.1	0.96	0.96	97.9	43.8	0.45
West: Coward Street											
P4	Full	9	9	16.0	LOS B	0.0	0.0	0.48	0.48	43.1	35.2	0.82
All Pedestrians		121	127	48.9	LOS E	0.2	0.2	0.81	0.81	80.2	40.7	0.51

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.