

TRAFFIC IMPACT ASSESSMENT

274 – 276 Hector Street, Bass Hill

PREPARED FOR: Mahomed Abbas

REFERENCE: 0502r02v01

DATE: 27/09/2022



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Revision History

VERSION	DATE	PREPARED	REVIEWED	APPROVED	SIGNED
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1. Introduction

1.1. Overview

PDC Consultants has been commissioned by Mahomed Abbas to undertake a traffic impact assessment of a Development Application (DA) relating to a proposed childcare centre for the site at 274 – 276 Hector Street, Bass Hill. Specifically, the DA proposes the demolition of the existing buildings and structure and construction of a childcare centre development consisting of:

- 160 childcare places;
- 42 car parking spaces within the Basement Level car park;
- 6.0-metre-wide entry / exit driveway onto Hector Street.

Having regard for the above, it is evident that development is not of a scale that requires referral of the DA to Transport for New South Wales (TfNSW), under the provisions of the State Environmental Planning Policy (Transport and Infrastructure) 2021.

The site is located in the Canterbury Bankstown local government area (LGA). A consolidated Development Control Plan for the Canterbury Bankstown LGA is yet to come into effect and be finalised. As such, the proposed development has been assessed in accordance with Bankstown Development Control Plan 2015 (BDCP 2015) and Bankstown Local Environmental Plan 2015 (BLEP 2015).

1.2. Structure of this Report

This report documents the findings of our investigations in relation to the anticipated traffic and parking impacts of the proposed development and should be read in the context of the Statement of Environmental Effects (SEE), prepared separately. The remainder of this report is structured as follows:

- Section 2: Describes the site and existing traffic and parking conditions in the locality;
- Section 3: Describes the proposed development;
- Section 4: Assesses the parking requirements of the development;
- Section 5: Assesses the traffic impacts of the development;
- Section 6: Discusses the proposed access and internal design arrangements;
- Section 7: Presents the overall study conclusions.



1.3. References

In preparing this report, reference has been made to the following guidelines / standards:

- Bankstown Local Environmental Plan 2015 (BLEP 2015).
- Bankstown Development Control Plan 2015 (BDCP 2015).
- Draft Canterbury Bankstown Development Control Plan (Draft CBDCP).
- NSW Child Care Planning Guideline August 2017 (Child Care Planning Guideline).
- State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP 2021)
- State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 (Childcare SEPP 2017) .
- Disability (Access to Premises -Buildings) Standards 2010 (Disability Standard 2010).
- Australian Standard AS 2890.1-2004, Part 1: Off-Street Car Parking (AS 2890.1).
- Australian Standard AS 2890.1-2004, Part 2: Off-Street Commercial Vehicle Facilities (AS 2890.2).
- Australian Standard AS 2890.6-2009, Part 6: Off-Street Parking for People with Disabilities (AS 2890.6).
- RMS Guide to Traffic Generating Development 2002 (RMS Guide).
- RMS Technical Direction TDT 2013/04a Guide to Traffic Generating Developments, Updated Traffic Surveys (RMS Guide Update).
- RMS Validation Trip Generation Surveys Child Care Centres-Analysis Report prepared by TEF Consulting dated September 2015 (RMS Childcare Surveys Report).



2. Existing Conditions

2.1. Location and Site

The site is located at 274 – 276 Hector Street, Bass Hill, being approximately 19 kilometres southwest of the Sydney CBD and 1.4 kilometres southwest of Sefton Railway Station. More specifically, the site is located on the western side of Hector Street between its intersection with Merle Street to the south and Broad Street to the north.

The site is rectangular in configuration with a total area of approximately 2,350 m². It has a single street frontage being Hector Street to the east having a length of approximately 33 metres. The western, northern, and southern boundaries border neighbouring residential developments with both northern and southern boundaries having a length of 70 metres, and western boundary having a length of 33 metres.

The site currently accommodated two (2) residential dwellings. Vehicular accesses are provided via two separate 3-metre-wide combined entry and exit driveways onto Hector Street.

Figure 1 and Figure 2 provide an appreciation of the site's location in both a local and broad context respectively.

2.2. Road Network

The road hierarchy in the vicinity of the site is shown by Figure 2, with the following roads considered noteworthy:

- Hume Highway (A22): a classified state highway that runs in a northeast-southwest direction between Sydney CBD and the Victorian Border. Near the site, it is subject to 70 km/h speed zoning restrictions and carries three (3) lanes of traffic in each direction within a divided carriageway.
- Hector Street: an unclassified regional road that runs in a north-south direction between Boundary Road in the north and Hume Highway in the south. Near the site, it is subject to 60 km/h speed zoning restrictions and accommodates a single lane of traffic in each direction within a 12-metre-wide undivided carriageway. Unrestricted parallel parking is permitted along both kerbsides.
- Buist Street: a local road that runs in an east-west direction between Rose Street in the east and Chester Hill Road in the west. Near the site, it is subject to 50 km/h speed zoning restrictions and accommodates a single lane of traffic in each direction within a 10-metre-wide undivided carriageway. Unrestricted parallel parking is permitted along both kerbsides.





Figure 1: Site Plan





Figure 2: Location & Road Hierarchy Plan



2.3. Public Transport

2.3.1. Rail Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan railway stations includes all areas within an 800-metre radius of a station. Two (2) Railway Stations, Sefton and Chester Hill, are located approximately 1.4 kilometres and 1.5 kilometres to the northeast and northwest of the site respectively, and hence fall outside the typical walking catchment area. Notwithstanding, it is considered that staff and visitors of the development would still have convenient access to the aforementioned railway stations and the Sydney rail network as part of a multi-modal trip (rail and walk or rail and bus).

Sefton Station and Chester Hill Station are both serviced by two (2) railway lines, being the T2 Inner West & Leppington Line and T3 Bankstown Line. **Table 1** below shows the notable town centres that are accessible along the T2 and T3 Lines and the average service headways during peak and off-peak periods.

RAIL LINE	NOTABLE TOWN CENTRES ALONG LINE	AVERAGE HEADWAY
T2 Line	Parramatta, Lidcombe, Homebush, Strathfield, Ashfield, Newtown, Redfern, Sydney CBD, Guildford, Cabramatta, Liverpool, Glenfield & Leppington	Weekdays: 4 – 15 minutes Weekends: 15 minutes
T3 Line	Liverpool, Cabramatta, Chester Hill, Lidcombe, Berala, Birrong, Bankstown, Punchbowl, Belmore, Campsie, Canterbury, Dulwich Hill, Marrickville, Sydenham, Central Station	Weekdays: 4 – 15 minutes Weekends: 15 minutes

Table 1: Rail Services

2.3.2. Bus Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan bus services includes all areas within a 400-metre radius of a bus stop. As can be seen from **Figure 3**, the site is situated within 50 metres of bus stops located on Hector Street and within 400 metres of stops on Buist Street, which are serviced by the high-frequency, high-capacity M91 bus service.

The M91 bus service runs between Hurstville and Parramatta, and traverses through the major town centres of Padstow and Chester Hill, providing staff and visitors of the proposed development with convenient access to high-frequency public bus services. Several further stops and services are accessible within 800 metres of the site as shown by **Figure 3**.

Table 2 shows the notable town centres that are accessible via these bus services and the average service headways during peak and off-peak periods.



ROUTE NO.	ROUTE (TO / FROM)	ROUTE DESCRIPTION	AVERAGE HEADWAY
907	Bankstown to Parramatta	Via Yagoona, Bass Hill, Villawood, Guildford, Granville	Weekdays: 20 minutes Weekends: 30 minutes
908	Merrylands to Bankstown	Via Granville, Guildford, South Granville, Auburn, Berala, Birrong, Potts Hill	Weekdays: 1 hour Weekends: 1 hour
911	Auburn to Bankstown	Via Chester Hill, Bass Hill, Georges Hall	Weekdays: 30 minutes Weekends: 1 hour on Saturdays / No Services on Sundays
M91	Hurstville to Parramatta	Via Peakhurst, Padstow, Yagoona, Sefton, Chester Hill, South Granville, Granville	Weekdays: 10 minutes Weekends: 20 minutes
S2	Sefton to Granville	Via Chester Hill, South Granville	Weekdays: 6 services all day Weekends: No services

Table 2: Bus Services

2.3.3. Cycle Network

Figure 3 shows that the site has relatively good access to the local bicycle network with on-road cycle paths provided along Robertson Road and off-road cycle paths are located along both sides of Chester Hill Road to the west of the site. These cycle paths provide connections to the wider bicycle network.

2.4. Existing Traffic Generation

The site currently accommodates two (2) residential dwellings. The RMS Guide Update recommends application of a peak period traffic generation rate of 0.95 trips per dwelling during the 7-9am (AM) peak period and 0.99 trips per dwelling during the 4-6pm (PM) peak period. Application of these rates to the existing dwellings results in the following estimated traffic generation:

- 2 vehicle trips / hour (0 in, 2 out), during the AM peak period.
- 2 vehicle trips / hour (2 in, 0 out), during the PM peak period.

The above assumes a 20% inbound and 80% outbound distribution during the AM peak period noting that residents would typically depart the site for work in the morning, and vice versa for the weekday PM peak period.

Notwithstanding, it is considered that the most relevant use of the above is to determine the net change in traffic generation resulting from the proposed development, as is discussed in Section 5.1 of this report.









2.5. Existing Intersection Performance

Intersection turn count surveys were undertaken at the intersection of Hector Street and Buist Street on Thursday 25/11/2021 between 6-9:30am and 2:30-6pm, representing typical AM and PM peak traffic periods for a childcare centre. Raw intersection turn counts are provided as **Appendix A**.

The results of the surveys and site visits were used to develop existing (base case) SIDRA models of the intersections for the weekday AM and PM peak hours.

SIDRA modelling outputs a range of performance measures, in particular:

- Degree of Saturation (DOS) The DOS, or vehicle to capacity ratio (V/C), is used to measure the performance of intersections, where a value of 1.0 represents an intersection at theoretical capacity. As the performance of an intersection approaches DOS of 1.0, queue lengths and delays increase rapidly. The RMS Guide notes a DOS upper limit of 0.9 is appropriate, with satisfactory operation generally achieved with DOS of 0.7 0.8.
- Average Vehicle Delay (AVD) The AVD (or average delay per vehicle, in seconds) for intersections provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service. For roundabouts, the AVD is that for the movement with the highest AVD.
- Level of Service (LOS) A comparative measure that provides an indication of the operating performance, based on AVD.

 Table 3 provides a recommended baseline for assessment of intersection performance as per the RMS Guide.

LOS	AVD (s)	TRAFFIC SIGNALS	GIVE WAY
А	Less than 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	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, incidents will cause excessive delays	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires major treatment

Table 3: Intersection Performance Criteria

A summary of the modelling results for the existing (base case) models is provided in **Table 4** below. Reference should also be made to the detailed SIDRA outputs provided in **Appendix B**, which give additional information regarding intersection performance.



Table 4: Summary of SIDRA Modelling Results - Existing

INTERSECTION	PERIOD	DOS	AVD (s)	LOS
Llootor Street / Duirt Street	AM	0.500	6.4	А
Hector Street / Buist Street	PM	0.546	6.7	А

From **Table 4**, it is evident that the intersection of Hector Street / Buist Street performs well, with low DOS, minimal AVD and LOS A during both the weekday AM and PM peak periods.

Nevertheless, that the most relevant use of these results is to compare the relative change in performance resulting from the proposed development, as discussed in Section 5.



3. Proposed Development

A detailed description of the proposed development for which approval is now sought, is outlined in the Statement of Environmental Effects prepared separately. In summary, the subject application relates to the demolition of the existing building and construction of a childcare centre development consisting of:

- 160 childcare places;
- 42 car parking spaces within the Basement Level car park;
- 6.0-metre-wide entry / exit driveway onto Hector Street.

The parking and traffic implications arising from the proposed development are discussed in Sections 4 and 5, respectively. A copy of the relevant architectural drawings, prepared by ES Design, are included in **Appendix C**.



4. Parking Requirements

4.1. Car Parking

The car parking provision of the proposed childcare centre has been assessed against the requirements of the BDCP 2015. **Table 5** below shows the minimum car parking requirement based on the BDCP 2015, and the proposed provision in response.

TYPE	NUMBER	DCP PARKING RATE	DCP REQUIREMENT	PROVISION
Children	160	1 space per 4 children	40	42

Table 5: Car Parking Requirement & Provision

It is evident from **Table 5** that the proposed childcare centre is required to provide a minimum of 40 car parking spaces on-site under BDCP 2015. In response, the proposed childcare centre development provides a total of 42 car parking spaces, thereby satisfying the requirements of the BDCP 2015. The proposed car parking provision is therefore considered to be acceptable and ensures that all car parking demands of the proposed development to be accommodated on-site, with no reliance on the on-street parking spaces.

4.2. Accessible Car Parking

The development provides two (2) accessible car parking space. The Access consultant has reviewed the proposal and confirmed that the provision of two (2) accessible car parking space satisfies the relevant requirements and is an acceptable level of provision.

4.3. Motorcycle and Bicycle Parking

The BDCP 2015 doesn't specify motorcycle or bicycle parking requirements for childcare centres. As such, the development does not require or provide any motorcycle or bicycle parking, which is considered acceptable.

4.4. Service Vehicle Parking & Waste Collection

The BDCP 2015 does not specify a rate for the provision of service vehicle parking for childcare centres. In any event, the development will generate minor demand for service vehicle parking, no designated service vehicle bays are required or proposed.

Car parking demand for the site will be tidal, with high demand during morning drop-offs and afternoon pick-ups and low on-site demand throughout the day. It is therefore proposed that servicing vehicles of size up to a B99 Design Vehicle, as defined by AS 2890.1, service the site outside of peak hours (10:00am – 2:00pm) and use vacant visitor car parking spaces to load and unload. This would ensure that servicing can be undertaken on-site and allow for the 'shared use' of visitor parking spaces which is considered a sustainable design outcome.



The basement car park and access driveway has been designed in accordance with AS 2890.1 and is therefore capable of accommodating vehicles up to and including a B99 Design Vehicle. Swept path analysis has been undertaken and is provided as **Appendix D**, which demonstrates the B99 Design Vehicle is able to enter and exit the site in a forward direction.

Waste collection for the development would be undertaken by a private contractor along Hector Street. To facilitate this, staff shall be responsible for transferring bins from the bin room to the kerbside prior to collection being undertaken by private waste contractors. The staff shall then promptly return the bins to the bin room following collection. Waste collection will be scheduled outside of peak drop off and pick up periods to avoid conflict between staff and visitors entering and exiting the car park. This arrangement is considered acceptable and will ensure that waste can be collected safely and efficiently.



5. Traffic Impacts

5.1. Trip Generation

The RMS Guide recommends application of a peak period traffic generation rate of 0.8 trips / child / hour during the AM peak period and 0.7 trips / child / hour during the PM peak period for childcare centre developments. Application of these rates to the 160-place childcare centre development, results in the following peak period traffic generation:

- 128 vehicle trips / hour (64 in, 64 out), during the AM peak period.
- 112 vehicle trips / hour (56 in, 56 out), during the PM peak period.

The above is not a net increase in traffic generation as it does not take into consideration the generation development as discussed in Section 2.4. In this regard, the net increase in traffic generation resulting from the development will be as follows:

- 126 vehicle trips / hour (63 in, 63 out) during the AM peak period.
- 110 vehicle trips / hour (55 in, 55 out) during the PM peak period.

5.2. Traffic Distribution & Impacts

The intersection of Hector Street and Buist Street is considered the only nearby intersection at which assessment of traffic impacts is required, given traffic using Hector Street otherwise has priority over all side arms for approximately one (1) kilometre to the north and south of the site.

Trip distribution of inbound and outbound trips generated by the proposal have been informed by traffic surveys discussed in Section 2.5. To provide a conservative assessment, 75% of all trips generated by the proposed development are distributed to / from the south on Hector Street, with the remaining 25% trips to the north.

The resultant proportions of the trips generated making each movement through the Hector Street / Buist Street intersection to get to and from the site is illustrated by **Figure 4**.





Figure 4: Trip Generation & Distribution of the Proposed Childcare Centre

The traffic impacts of the increased volumes through the intersections were analysed using SIDRA. A summary of the modelling results is presented in **Table 6**, with the detailed SIDRA outputs provided in **Appendix B Table 6** also provides a comparison against the existing intersection performance, which has been extracted from **Table 4**.

Table 6: Summary	v of SIDRA Modelling	z Results – Existing (& With Development
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INTERSECTION	SCENARIO	PERIOD	DOS	AVD (s)	LOS
	Existing	AM	0.500	6.4	А
Hastar Street / Duist Street		PM	0.546	6.7	A
Hector Street / Buist Street	Existing +	AM	0.541	6.8	А
	Development	PM	0.582	7.2	A

Table 6 highlights the proposed development traffic will have a minimal impact on the performance of the intersections, which will experience minor increases in DOS and AVD, with no change to the existing LOS.

The increase in traffic generation resulting from the proposed development can therefore be accommodated by the existing road network, with no external improvements required. The traffic impacts of the proposed development are therefore considered acceptable.



6. Design Aspects

6.1. Access

With 42 car parking spaces of User Class 3A and User Class 1A, the proposed development requires a Category 2 Driveway under Table 3.1 of AS 2890.1, being a combined entry / exit driveway of width 6.0 metres to 9.0 metres. In response, the development proposes a combined entry / exit driveway onto Hector Street, having a width of 6.0 metres between kerbs. This arrangement meets the requirements of AS 2890.1.

The proposed arrangements have also been assessed using swept path analysis which confirms compliance with AS 2890.1, and that the proposed access arrangements will operate safely and efficiently. The results of this analysis are included in **Appendix D** for reference.

The proposed access arrangements are therefore considered acceptable and comply with the relevant requirements of AS 2890.1.

6.2. Internal Design

The proposed internal parking arrangements comply with the relevant requirements of AS 2890.1 and AS 2890.6, with the following design aspects considered noteworthy:

6.2.1. Roadway / Ramp

- The driveway has a grade of 5% (1 in 20) for the first 6.0 metres inside the property boundary and therefore complies with the requirements of Clause 3.3 of AS 2890.1.
- The vehicular ramp has a maximum grade of 20% (1 in 5) with a 2.0 metre crest transitions of 12.5% (1 in 8) and at the top and bottom, thereby satisfying AS 2890.1.
- The vehicular ramp has a width of 5.5 metres between kerbs and will accommodate two-lane, two-way traffic flow. This arrangement complies with AS 2890.1 and is considered appropriate.

6.2.2. Parking Modules

- All staff car parking spaces have been provided in accordance with the User Class 1A requirements of AS 2890.1 having a minimum space width of 2.7 metres and length of 5.4 metres, with an aisle width of 6.2 metres, thereby satisfying the requirements of AS 2890.1.
- All visitor car parking spaces are provided in accordance with User Class 3A requirements of AS 2890.1 having a space width of 2.7 metres and a length of 5.4 metres, with an aisle width of 6.2 metres, thereby satisfying the requirements of AS 2890.1.



- Two (2) accessible car parking spaces are provided with a minimum space width of 2.4 metres and length of 5.4 metres which is located immediately adjacent to a 2.4-metre-wide and 5.4-metre-long shared area, thereby satisfying the requirements of AS 2890.6.
- All walls / columns are located outside of the space design envelope, as required under Figure 5.2 of AS 2890.1.

6.2.3. Head Heights

- A clear head height of 2.2 metres is required all car parking areas in accordance with Clause 5.3.1 of AS 2890.1.
- A minimum clear head height of 2.5 metres is required above the accessible car parking space and shared area in accordance with Clause 2.4 of AS 2890.6.

6.2.4. Other Design Aspects

• A 2.5 metre by 2.0 metre visual splay is provided on the egress side of the car park driveway, at the property boundary, in accordance with Figure 3.3 of AS 2890.1. This area is to be kept clear of all vertical obstructions with a height greater than 0.6 metres.

In summary, the internal and external parking arrangements have been designed in accordance with the relevant requirements of AS 2890.1 and AS 2890.6. Any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.



7. Conclusions

In summary:

- PDC Consultants has been commissioned by Mahomed Abbas to undertake a traffic impact assessment of a DA relating to a proposed childcare centre for the site at 274 276 Hector Street, Bass Hill. Specifically, the DA proposes the demolition of the existing buildings and structure and construction of a childcare centre development consisting of:
 - 160 childcare places;
 - 42 car parking spaces within the Basement Level car park;
 - 6.0-metre-wide entry / exit driveway onto Hector Street.
- The traffic generation assessment confirms that the development will generate a net increase of 126 vehicle trips / hour during the weekday AM peak period and 110 vehicle trips / hour during the weekday PM peak periods.
- The traffic impacts of the increased volumes through the intersections were analysed using SIDRA. Results of traffic modelling confirms that the proposed development traffic will have a minimal impact on the performance of the Hector Street / Buist Street intersection, which will experience minor increases in DOS and AVD, with no change to the existing LOS. The increase in traffic generation resulting from the proposed development can therefore be accommodated by the existing road network, with no external improvements required. The traffic impacts of the proposed development are therefore considered acceptable.
- The proposed childcare centre is required to provide a minimum of 40 car parking spaces on-site under BDCP 2015. In response, the proposed childcare centre development provides a total of 42 car parking spaces, thereby satisfying the requirements of the BDCP 2015. The proposed car parking provision is therefore considered to be acceptable and ensures that all car parking demands of the proposed development to be accommodated on-site, with no reliance on the on-street parking spaces.
- The proposed access and internal parking arrangements comply with the relevant requirements of AS 2890.1 and AS 2890.6.

It is therefore concluded that the proposed development is supportable on traffic planning grounds.



Appendix A

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	Approach Time Period		Hector St				Buist St			Hector St				Buist St				otal		
			riod	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Grand 7
AM	8:15	to	9:15	469	22	2	493	290	2	8	300	508	31	8	547	105	0	0	105	1,445
PM	14:45	to	15:45	499	19	0	518	409	9	6	424	626	9	7	642	123	1	0	124	1,708

Ap	oproa	ich		Hect	or St		Buist St				Hector St				Buist St				
Tim	ie Pei	riod	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Grand T
6:30	to	7:30	280	17	2	299	117	3	5	125	298	27	7	332	36	1	0	37	793
6:45	to	7:45	325	20	2	347	123	3	8	134	297	26	9	332	52	0	1	53	866
7:00	to	8:00	357	21	2	380	158	3	7	168	343	22	13	378	74	0	1	75	1,001
7:15	to	8:15	398	21	1	420	194	5	6	205	369	22	13	404	94	0	1	95	1,124
7:30	to	8:30	440	22	0	462	242	4	7	253	425	26	12	463	107	0	1	108	1,286
7:45	to	8:45	450	23	1	474	273	3	6	282	477	27	9	513	114	0	0	114	1,383
8:00	to	9:00	459	21	2	482	286	3	6	295	495	29	8	532	117	0	0	117	1,426
8:15	to	9:15	469	22	2	493	290	2	8	300	508	31	8	547	105	0	0	105	1,445
8:30	to	9:30	425	23	2	450	267	7	8	282	475	30	10	515	86	0	0	86	1,333
AN	/ Tot	als	1,145	62	4	1,211	626	14	20	660	1,198	83	29	1,310	229	1	1	231	3,412
14:30	to	15:30	493	16	0	509	393	10	5	408	595	12	5	612	129	1	0	130	1,659
14:45	to	15:45	499	19	0	518	409	9	6	424	626	9	7	642	123	1	0	124	1,708
15:00	to	16:00	511	22	1	534	368	8	8	384	600	15	8	623	118	2	0	120	1,661
15:15	to	16:15	538	19	2	559	335	6	8	349	581	15	9	605	120	1	1	122	1,635
15:30	to	16:30	510	21	3	534	314	3	9	326	566	12	14	592	118	1	1	120	1,572
15:45	to	16:45	531	16	3	550	312	4	9	325	539	14	11	564	120	1	1	122	1,561
16:00	to	17:00	502	8	2	512	314	4	8	326	536	14	10	560	127	0	1	128	1,526
16:15	to	17:15	499	11	1	511	307	6	7	320	541	12	9	562	115	0	0	115	1,508
16:30	to	17:30	479	11	0	490	307	6	6	319	516	12	5	533	107	1	0	108	1,450
16:45	to	17:45	458	11	0	469	309	6	5	320	520	8	6	534	99	1	0	100	1,423
17:00	to	18:00	488	11	0	499	294	4	5	303	543	2	6	551	76	1	0	77	1,430
PN	/I Tot	als	1,739	51	3	1,793	1,162	20	23	1,205	1,951	38	28	2,017	387	3	1	391	5,406



Appendix B

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V Site: 1 [Hector Street / Buist Street AM (Site Folder: General)]

New Site Site Category: (None) Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INP VOLU [Total	UT IMES HV 1	DEM FLO [Total	DEMAND FLOWS [Total HV]		Aver. Delay	Level of Service	95% BA QUI I Veh	ACK OF EUE Dist 1	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	veh/h	veh/h	%	v/c	sec		veh	m		1 (610)	0,000	km/h
Sout	h: Hect	tor Street												
1	L2	12	0	13	0.0	0.484	5.3	LOS A	3.8	27.4	0.59	0.61	0.59	45.2
2	T1	404	22	425	5.4	0.484	5.4	LOS A	3.8	27.4	0.59	0.61	0.59	45.9
3	R2	66	1	69	1.5	0.484	8.6	LOS A	3.8	27.4	0.59	0.61	0.59	45.8
Appr	oach	482	23	507	4.8	0.484	5.8	LOS A	3.8	27.4	0.59	0.61	0.59	45.9
East	Buist	Street												
4	L2	116	2	122	1.7	0.399	7.5	LOS A	2.6	19.0	0.74	0.80	0.74	44.3
5	T1	82	0	86	0.0	0.399	7.4	LOS A	2.6	19.0	0.74	0.80	0.74	45.1
6	R2	97	7	102	7.2	0.399	11.0	LOS A	2.6	19.0	0.74	0.80	0.74	45.0
Appr	oach	295	9	311	3.1	0.399	8.6	LOS A	2.6	19.0	0.74	0.80	0.74	44.7
North	n: Hect	or Street												
7	L2	71	8	75	11.3	0.500	5.3	LOS A	3.9	28.9	0.53	0.55	0.53	45.7
8	T1	436	28	459	6.4	0.500	5.1	LOS A	3.9	28.9	0.53	0.55	0.53	46.3
9	R2	19	0	20	0.0	0.500	8.2	LOS A	3.9	28.9	0.53	0.55	0.53	46.2
9u	U	6	1	6	16.7	0.500	11.4	LOS A	3.9	28.9	0.53	0.55	0.53	49.2
Appr	oach	532	37	560	7.0	0.500	5.3	LOS A	3.9	28.9	0.53	0.55	0.53	46.3
West	: Buist	Street												
10	L2	22	0	23	0.0	0.172	7.6	LOS A	1.0	7.2	0.70	0.74	0.70	44.5
11	T1	78	1	82	1.3	0.172	7.6	LOS A	1.0	7.2	0.70	0.74	0.70	45.2
12	R2	18	0	19	0.0	0.172	10.8	LOS A	1.0	7.2	0.70	0.74	0.70	45.1
Appr	oach	118	1	124	0.8	0.172	8.1	LOS A	1.0	7.2	0.70	0.74	0.70	45.1
All Vehio	cles	1427	70	1502	4.9	0.500	6.4	LOS A	3.9	28.9	0.61	0.64	0.61	45.7

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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.

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V Site: 1 [Hector Street / Buist Street PM (Site Folder: General)]

New Site Site Category: (None) Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INP VOLU	UT IMES	DEM/ FLO	AND WS	Deg. Satn	Aver. Delay	Level of Service	95% BA QUE	CK OF	Prop. Effective Que Stop		Aver. No.	Aver. Speed
		[Total	HV]	[Total	HV]				[Veh.	Dist]		Rate	Cycles	l cues /le
Sout	hi Haat	ven/n	ven/n	ven/n	%	V/C	sec	_	ven	m	_	_	_	Km/n
Sout	п. песі	or Street												
1	L2	24	0	25	0.0	0.546	6.1	LOS A	4.4	31.6	0.69	0.68	0.70	45.0
2	T1	431	10	454	2.3	0.546	6.1	LOS A	4.4	31.6	0.69	0.68	0.70	45.7
3	R2	58	1	61	1.7	0.546	9.3	LOS A	4.4	31.6	0.69	0.68	0.70	45.5
Appr	oach	513	11	540	2.1	0.546	6.4	LOS A	4.4	31.6	0.69	0.68	0.70	45.6
East:	Buist	Street												
4	L2	100	2	105	2.0	0.443	7.9	LOS A	3.1	22.5	0.76	0.83	0.79	44.1
5	T1	114	2	120	1.8	0.443	7.9	LOS A	3.1	22.5	0.76	0.83	0.79	44.8
6	R2	112	8	118	7.1	0.443	11.4	LOS A	3.1	22.5	0.76	0.83	0.79	44.8
Appr	oach	326	12	343	3.7	0.443	9.1	LOS A	3.1	22.5	0.76	0.83	0.79	44.6
North	n: Hect	or Street												
7	L2	96	7	101	7.3	0.513	5.1	LOS A	4.1	30.1	0.52	0.55	0.52	45.7
8	T1	430	17	453	4.0	0.513	4.9	LOS A	4.1	30.1	0.52	0.55	0.52	46.4
9	R2	34	0	36	0.0	0.513	8.1	LOS A	4.1	30.1	0.52	0.55	0.52	46.2
9u	U	5	0	5	0.0	0.513	10.9	LOS A	4.1	30.1	0.52	0.55	0.52	49.7
Appr	oach	565	24	595	4.2	0.513	5.2	LOS A	4.1	30.1	0.52	0.55	0.52	46.3
West	: Buist	Street												
10	L2	37	1	39	2.7	0.198	8.1	LOS A	1.2	8.6	0.73	0.77	0.73	44.4
11	T1	75	1	79	1.3	0.198	7.9	LOS A	1.2	8.6	0.73	0.77	0.73	45.1
12	R2	17	0	18	0.0	0.198	11.1	LOS A	1.2	8.6	0.73	0.77	0.73	44.9
Appr	oach	129	2	136	1.6	0.198	8.4	LOS A	1.2	8.6	0.73	0.77	0.73	44.9
All Vehio	cles	1533	49	1614	3.2	0.546	6.7	LOS A	4.4	31.6	0.65	0.67	0.65	45.6

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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.

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W Site: 1 [Hector Street / Buist Street AM - DEV (Site Folder: General)]

New Site Site Category: (None) Roundabout

Vehicle Movement Performance														
Mov	Turn		PUT IMES	DEM.	AND	Deg. Satn	Aver. Delav	Level of Service	95% BA		Prop.	Effective Stop	Aver.	Aver. Speed
		[Total	HV 1	[Total	HV 1	Jain	Delay		[Veh.	Dist 1	Que	Rate	Cvcles	Opeed
		veh/h	veh/h	veh/h	%	v/c	sec		veh	m			- 5	km/h
Sout	h: Hec	tor Street												
1	L2	12	0	13	0.0	0.521	5.6	LOS A	4.2	30.3	0.64	0.64	0.64	45.3
2	T1	428	22	451	5.1	0.521	5.8	LOS A	4.2	30.3	0.64	0.64	0.64	46.2
3	R2	66	1	69	1.5	0.521	8.8	LOS A	4.2	30.3	0.64	0.64	0.64	45.8
Appr	oach	506	23	533	4.5	0.521	6.2	LOS A	4.2	30.3	0.64	0.64	0.64	46.1
East:	Buist	Street												
4	L2	116	2	122	1.7	0.432	8.2	LOS A	3.0	21.7	0.78	0.85	0.81	44.1
5	T1	82	0	86	0.0	0.432	8.0	LOS A	3.0	21.7	0.78	0.85	0.81	44.8
6	R2	109	7	115	6.4	0.432	11.8	LOS A	3.0	21.7	0.78	0.85	0.81	45.0
Appr	oach	307	9	323	2.9	0.432	9.4	LOS A	3.0	21.7	0.78	0.85	0.81	44.6
North	n: Hect	or Street												
7	L2	83	8	87	9.6	0.541	5.5	LOS A	4.5	32.9	0.55	0.57	0.55	46.3
8	T1	460	28	484	6.1	0.541	5.2	LOS A	4.5	32.9	0.55	0.57	0.55	46.7
9	R2	31	0	33	0.0	0.541	8.7	LOS A	4.5	32.9	0.55	0.57	0.55	47.7
9u	U	6	1	6	16.7	0.541	11.4	LOS A	4.5	32.9	0.55	0.57	0.55	49.4
Appr	oach	580	37	611	6.4	0.541	5.5	LOS A	4.5	32.9	0.55	0.57	0.55	46.7
West	: Buist	Street												
10	L2	34	0	36	0.0	0.199	8.4	LOS A	1.2	8.5	0.73	0.77	0.73	45.8
11	T1	78	1	82	1.3	0.199	8.0	LOS A	1.2	8.5	0.73	0.77	0.73	45.3
12	R2	18	0	19	0.0	0.199	11.2	LOS A	1.2	8.5	0.73	0.77	0.73	45.2
Appr	oach	130	1	137	0.8	0.199	8.5	LOS A	1.2	8.5	0.73	0.77	0.73	45.4
All Vehio	cles	1523	70	1603	4.6	0.541	6.8	LOS A	4.5	32.9	0.64	0.67	0.65	46.0

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.

Roundabout Capacity Model: SIDRA Standard.

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.

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W Site: 1 [Hector Street / Buist Street PM - DEV (Site Folder: General)]

New Site Site Category: (None) Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INP VOLL	UT IMES	DEM. FLO	AND WS	Deg. Satn	Aver. Delay	Level of Service	95% BA QUE	CK OF	Prop. I Que	Effective Stop	Aver. No.	Aver. Speed
		[Total	HV]	[Total	HV]				[Veh.	Dist]		Rate	Cycles	l cues /b
Sout	h: Hoo	ven/n tor Stroot	ven/n	ven/n	%	V/C	sec	_	ven	m	_	_	_	Km/n
Jour			-											
1	L2	24	0	25	0.0	0.582	6.8	LOSA	5.2	36.9	0.74	0.73	0.78	45.0
2	T1	452	10	476	2.2	0.582	6.8	LOS A	5.2	36.9	0.74	0.73	0.78	45.8
3	R2	58	1	61	1.7	0.582	10.0	LOS A	5.2	36.9	0.74	0.73	0.78	45.5
Appr	oach	534	11	562	2.1	0.582	7.2	LOS A	5.2	36.9	0.74	0.73	0.78	45.8
East:	Buist	Street												
4	L2	100	2	105	2.0	0.474	8.7	LOS A	3.5	25.6	0.80	0.88	0.86	43.8
5	T1	114	2	120	1.8	0.474	8.6	LOS A	3.5	25.6	0.80	0.88	0.86	44.4
6	R2	122	8	128	6.6	0.474	12.3	LOS A	3.5	25.6	0.80	0.88	0.86	44.6
Appr	oach	336	12	354	3.6	0.474	10.0	LOS A	3.5	25.6	0.80	0.88	0.86	44.3
North	n: Hect	or Street												
7	L2	106	7	112	6.6	0.548	5.3	LOS A	4.6	33.6	0.54	0.56	0.54	46.2
8	T1	451	17	475	3.8	0.548	5.1	LOS A	4.6	33.6	0.54	0.56	0.54	46.7
9	R2	44	0	46	0.0	0.548	8.4	LOS A	4.6	33.6	0.54	0.56	0.54	47.1
9u	U	5	0	5	0.0	0.548	10.9	LOS A	4.6	33.6	0.54	0.56	0.54	49.9
Appr	oach	606	24	638	4.0	0.548	5.4	LOS A	4.6	33.6	0.54	0.56	0.54	46.7
West	: Buist	Street												
10	L2	47	1	49	2.1	0.223	8.6	LOS A	1.4	9.9	0.76	0.80	0.76	45.2
11	T1	75	1	79	1.3	0.223	8.3	LOS A	1.4	9.9	0.76	0.80	0.76	45.1
12	R2	17	0	18	0.0	0.223	11.5	LOS A	1.4	9.9	0.76	0.80	0.76	45.0
Appr	oach	139	2	146	1.4	0.223	8.8	LOS A	1.4	9.9	0.76	0.80	0.76	45.1
All Vehio	cles	1615	49	1700	3.0	0.582	7.2	LOS A	5.2	36.9	0.68	0.70	0.71	45.7

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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.

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Appendix C

0502r02v01 | 27/09/2022 TRAFFIC IMPACT ASSESSMENT | 274 – 276 Hector Street, Bass Hill











dwg №. 22028 - 04

COUSTIC NOTE FFFR TO ACQUISTIC REPORT NO. 7453-1 1R WITH DATE ISSUED	N O T E S 1. All dimensions are in millimeters	C O P Y R I G H T These drawings have been prepared by Es			CH	IILDCARE CENTER	DRAWING		
3 MAY 2022 FROM DAY DESIGN PTY LTD FOR A OMPREHENSIVE LIST OF ACOUSTICAL TREATMENTS. ALL	2. VERIFY ALL DIMENSIONS ON SITE 3. DO NOT SCALE, USE FIGURED DIMENSIONS ONLY 4. VERIFY ALL DISCREPANCIES WITH THE DESIGNER 5. ALL WORKS TO COMPLY WITH THE NATIONAL	ENGINEERING & DESIGN, AND SHALL REMAIN THE PROPERTY OF THE SAME. NO PORTION OF THESE DRAWINGS, WHETHER IN PART OR WHOLE, SHALL BE USED IN ANY FORM, DUPLICATED OR OTHERWISE,				274-276 HECTOR STREET, BASS HILL	PROPOSED BASEMEN	NT FLOOR PLA	4Ν
REATMENTS DETAILED IN THE APPROVED COUSTIC REPORT MUST BE INSTALLED TO THE BUILDING.	CONSTRUCTION CODE (B.C.A) & AUSTRALIAN STANDARDS	WITHOUT PRIOR WRITTEN PERMISSION OF THE ARCHITECT/ DESIGNER. THESE DRAWINGS ARE SUBJECT TO COPYRIGHT LAWS.	www.es.com.au	BUILDING DESIGNER	DESIGN MICHEL TOUBIA DRAFTED KATERINA NIKOVSKA	NSW 2197 MAHMOUD ABBAS	SCALE 1 : 100/A1 ISSUE F 20.09.2022	DWG No.	220



Appendix D

0502r02v01 | 27/09/2022 TRAFFIC IMPACT ASSESSMENT | 274 – 276 Hector Street, Bass Hill







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