Proposed Childcare Centre

170 Derby Street, Penrith

TRAFFIC AND PARKING ASSESSMENT REPORT

15 December 2020

Ref 20285

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants

Suite 6, 20 Young Street, Neutral Bay NSW 2089 - PO Box 1868, Neutral Bay NSW 2089, Ph: 9904 3224

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LIST OF ILLUSTRATIONS

1. INTRODUCTION

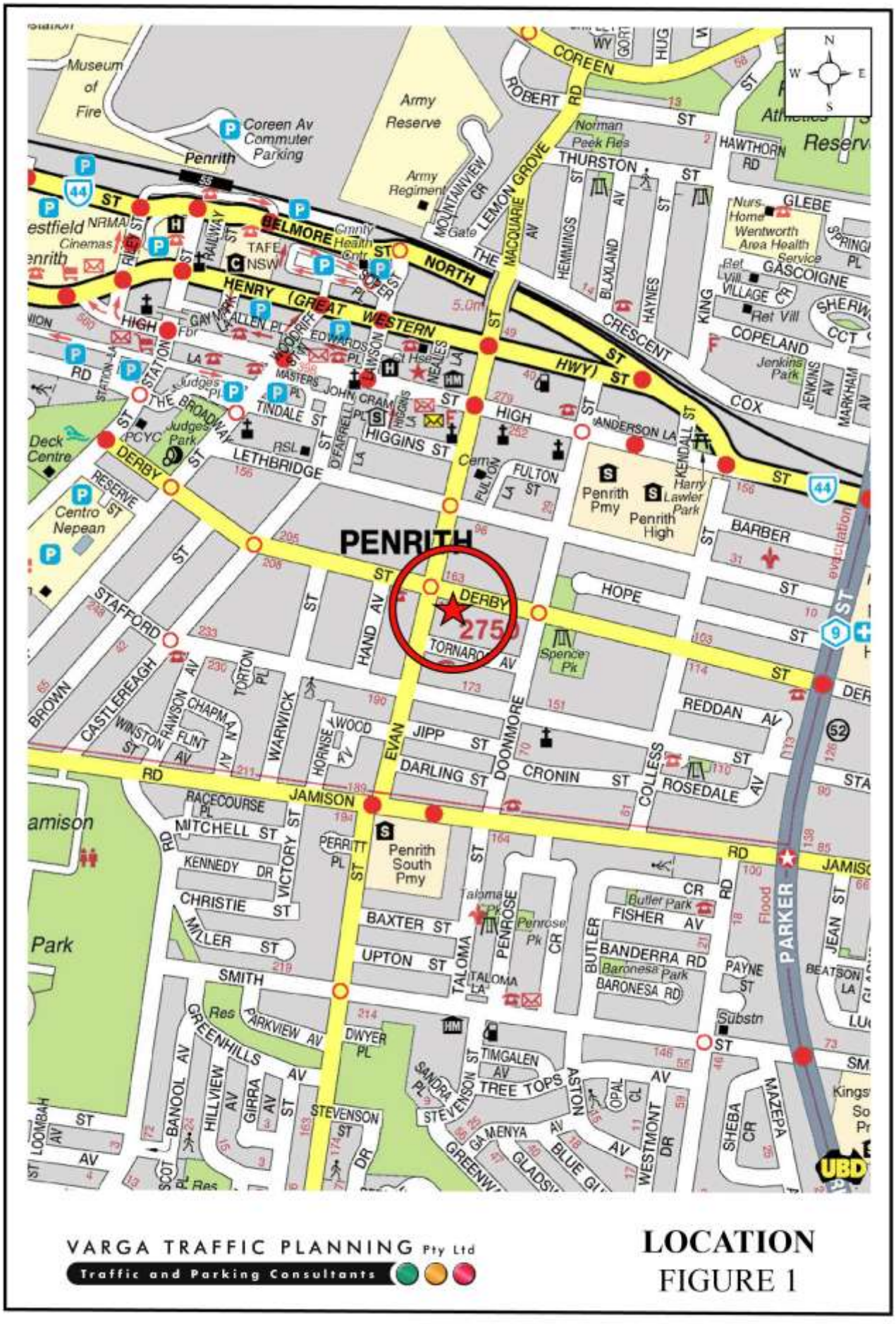
This report has been prepared to accompany a development application to Council for a proposal to construct a new childcare centre which is to be located at 170 Derby Street, Penrith (Figures 1 and 2).

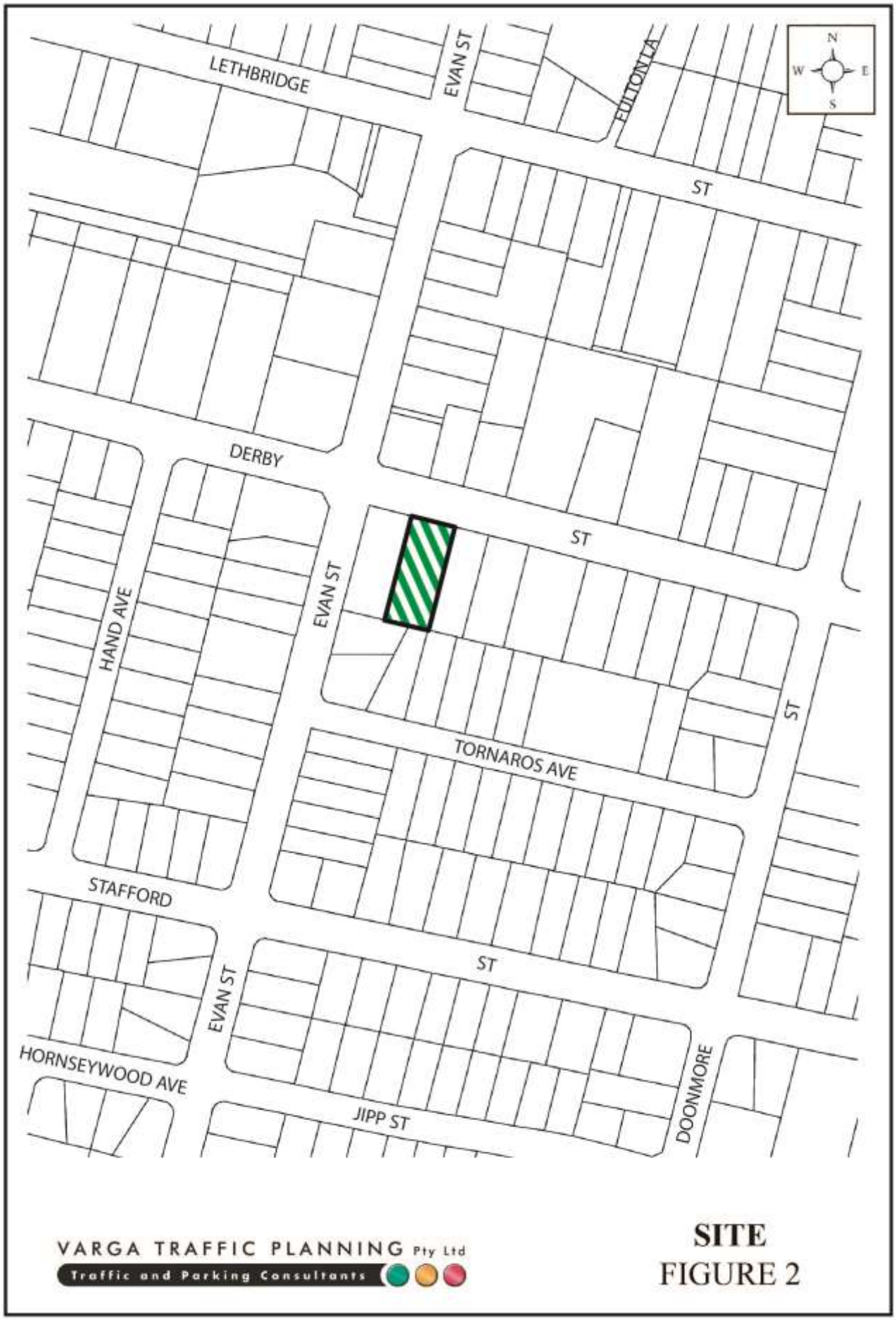
The proposed development involves the demolition of the existing building on the site to facilitate the construction of a new purpose-built childcare centre which seeks to accommodate up to 86 children and 14 staff and operate between 7:00am and 6:00pm, Monday to Friday.

Off-street parking for the childcare centre is to be provided for a total of 23 cars in a new single-level basement car parking area, in accordance with Council's requirements. Vehicular access to the car parking facilities is to be provided via separate entry and exit driveways located off Derby Street.

The purpose of this report is to assess the traffic and parking implications of the development proposal and to that end this report:

- describes the site and provides details of the development proposal
- reviews the road network in the vicinity of the site, and the traffic conditions on that road network
- estimates the traffic generation potential of the development proposal
- assesses the traffic implications of the development proposal in terms of road network capacity
- reviews the geometric design features of the proposed car parking facilities for compliance with the relevant codes and standards
- assesses the adequacy and suitability of the quantum of off-street car parking provided on the site.





2. PROPOSED DEVELOPMENT

Site

The subject site is located on the southern side of Derby Street, approximately 50m east of Evan Street. The site has a street frontage of approximately 24m in length to Derby Street and occupies an area of approximately 1,296m².

The subject site is currently occupied by a psychology practice building which consists of 7 consulting rooms, a reception area and a meeting room.

A recent aerial image of the site and its surroundings is reproduced below.

Source: Nearmap

Off-street parking is provided for 7 cars in an at-grade car parking area. Vehicular access to the car parking area is provided via an entry/exit driveway located towards the eastern end of the Derby Street site frontage, as indicated on the *Streetview* image on the following page.

In addition, off-street parking is available for a further 3 cars along the western boundary in a tandem arrangement, accessed via a driveway located at the western end of the Derby Street site frontage, as indicated on the *Streetview* image below.

Directly outside the site frontage is a bus zone which is serviced by the 774, 775 & 776 services. Notwithstanding, there is no bus shelter or seat at the bus stop.

Proposed Development

The proposed development involves the demolition of the existing building on the site to facilitate the construction of a new purpose-built childcare centre. The proposed childcare centre seeks to cater for 86 children and 14 staff and operate between 7:00am and 6:00pm, Monday to Friday.

Off-street parking is proposed for a total of 23 cars, comprising 9 drop-off/pick-up spaces (including a disabled space) and 14 staff spaces, in accordance with Council's requirement. Vehicular ingress to the car parking facilities is to be provided via a new entry-only driveway located at the eastern end of the Derby Street site frontage whilst vehicular egress is to be provided via a new exit-only driveway located at the western end of the Derby Street site frontage.

Deliveries to the proposed childcare centre are expected to be undertaken by a variety of light commercial vehicles such as vans, utilities and the like, which are capable of fitting into a conventional parking space. In this regard, deliveries will be scheduled to arrive *outside* of peak periods when the on-site car park will be largely empty, with the exception of the staff parking area.

Waste collection for the proposed development is to be undertaken from the kerbside area directly outside the site frontage in Derby Street and will be collected by a private contractor. In this regard, collection will be undertaken between the hours of 4am and 5am weekdays, *prior to* the first weekday bus service which arrives approximately 5:20am.

Plans of the proposed development have been prepared by *Cullen Feng Architects* and are reproduced in the following pages.

BASEMENT FLOOR PLAN
1:200 @ A3

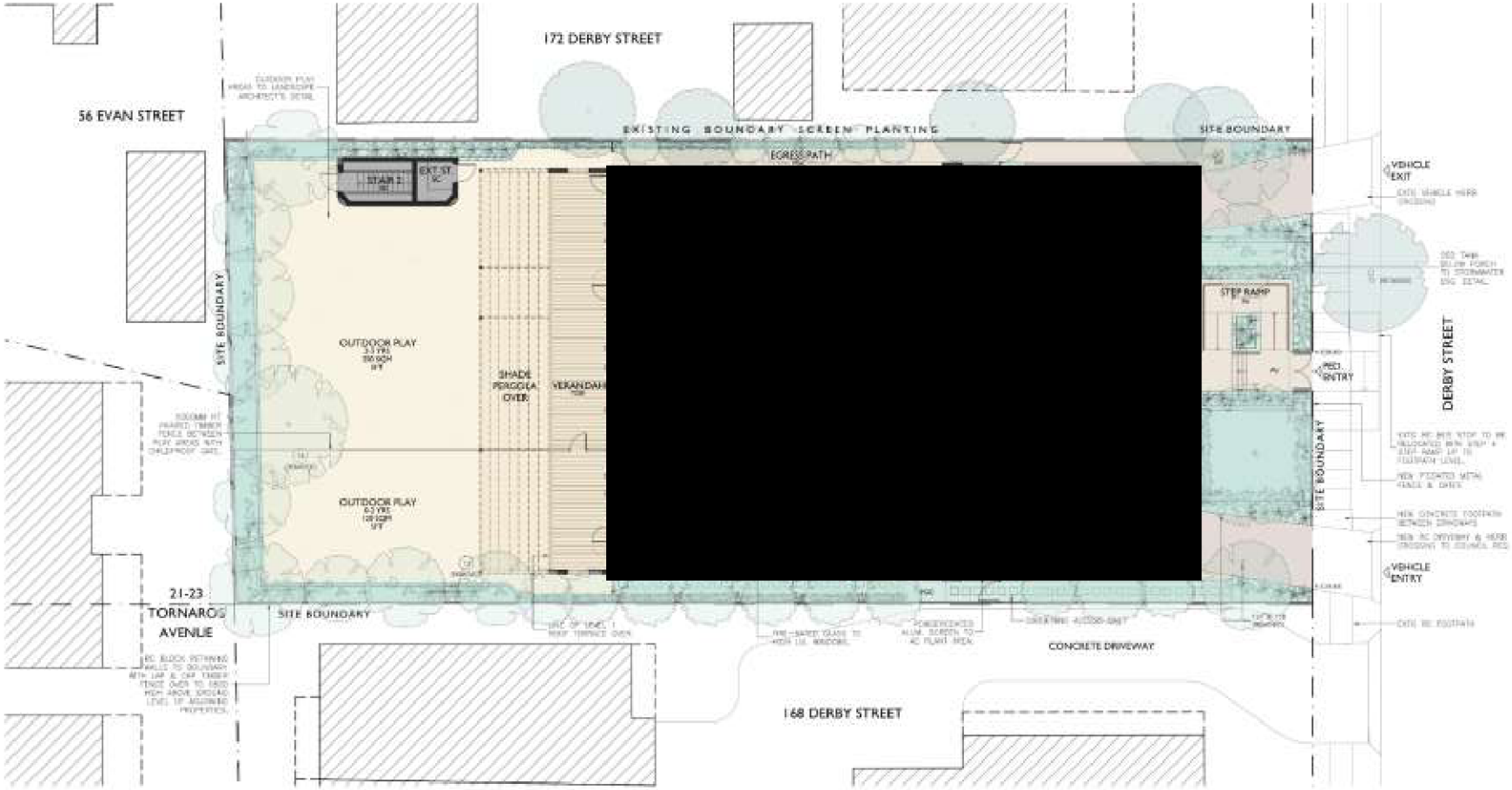
FOR DEVELOPMENT APPLICATION

PROJECT 170 DERBY STREET, PENRITH
CLIENT MONTESSORI ACADEMY
DRAWING PROPOSED BASEMENT PLAN
DATE NOV 2020 SCALE 1:200 @ A3 DRAWN JL
JOB no. 2023 DWG no. DA06 REV -

CULLEN FENDLEY ARCHITECTS

VARGA TRAFFIC PLANNING PTY LTD

7



GROUND FLOOR PLAN
1:200 @ A3

FOR DEVELOPMENT APPLICATION

170 DERBY STREET, PENRITH
MONTESSORI ACADEMY
PROPOSED GROUND FLOOR PLAN
2023
DA07

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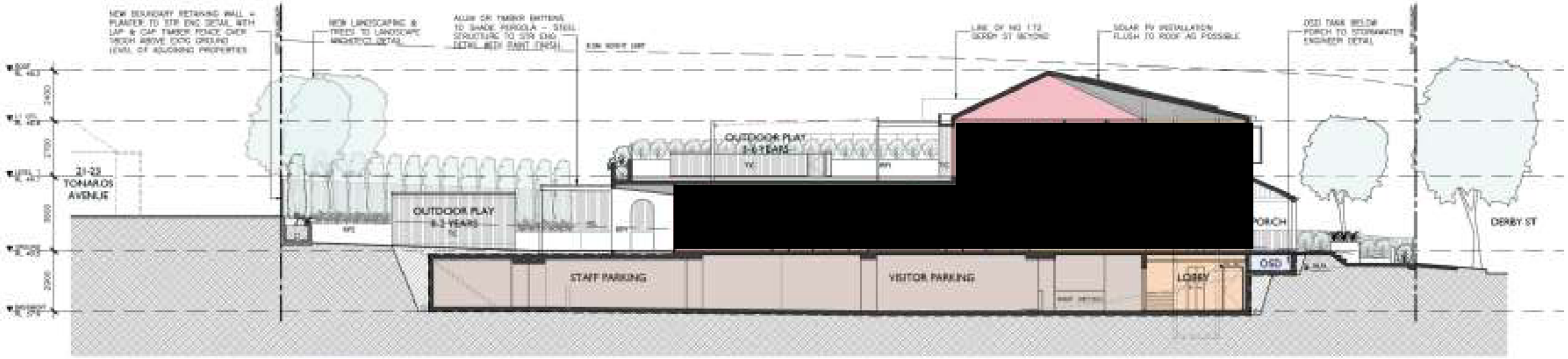
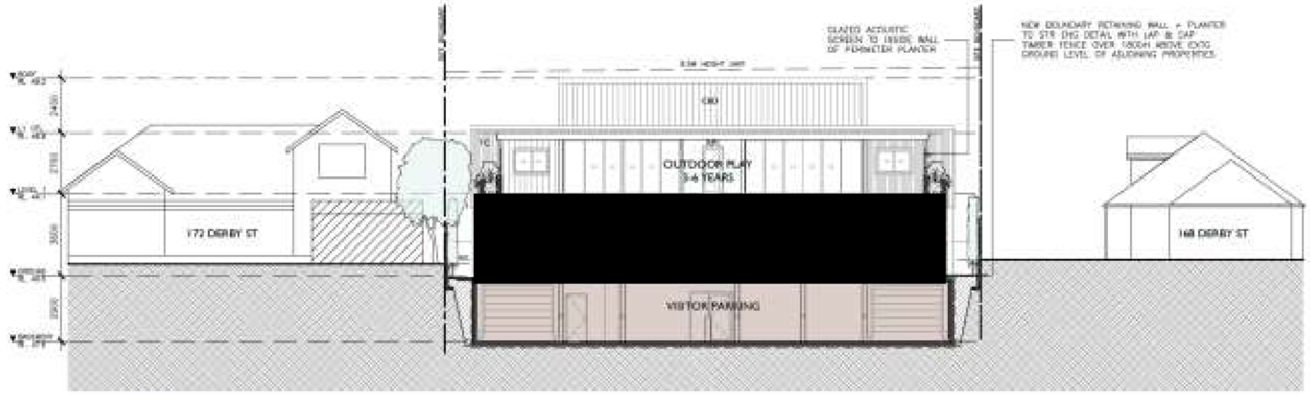


LONG SECTION
1:200 @ A3



CROSS SECTION
1:200 @ A3

6

FINISHES LEGEND

COLOUR LEGEND

FOR DEVELOPMENT APPLICATION

170 DERBY STREET, PENRITH
MONTESSORI ACADEMY
LONG & CROSS SECTIONS
2023
DA10

VARGA TRAFFIC PLANNING PTY LTD

3. TRAFFIC ASSESSMENT

Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the Roads and Maritime Services is illustrated on Figure 3.

High Street and Henry Street form part of the Great Western Highway which is classified by the RMS as a *State Road*, providing the key east-west road link through the area, linking the City to the Blue Mountains. It typically carries two traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a central median island. Kerbside parking is not permitted on either side of the road in the vicinity of the site.

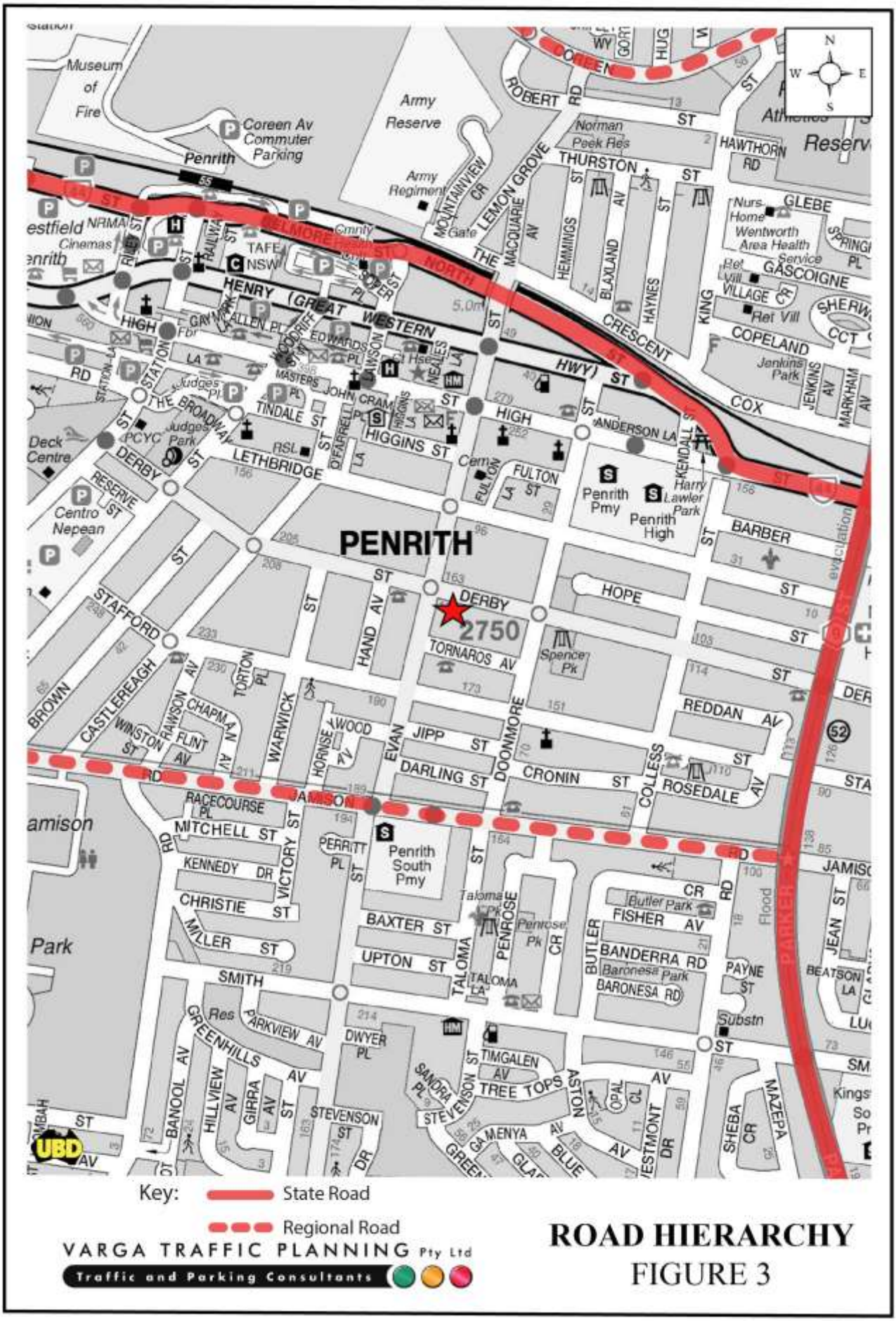
Mulgoa Road and Castlereagh Road are also classified by the RMS as *State Roads*, providing the key north-south road link in the area, linking Richmond to Wallacia. It typically carries two to three traffic lanes in each direction in the vicinity of the site with turning bays provided at key locations.

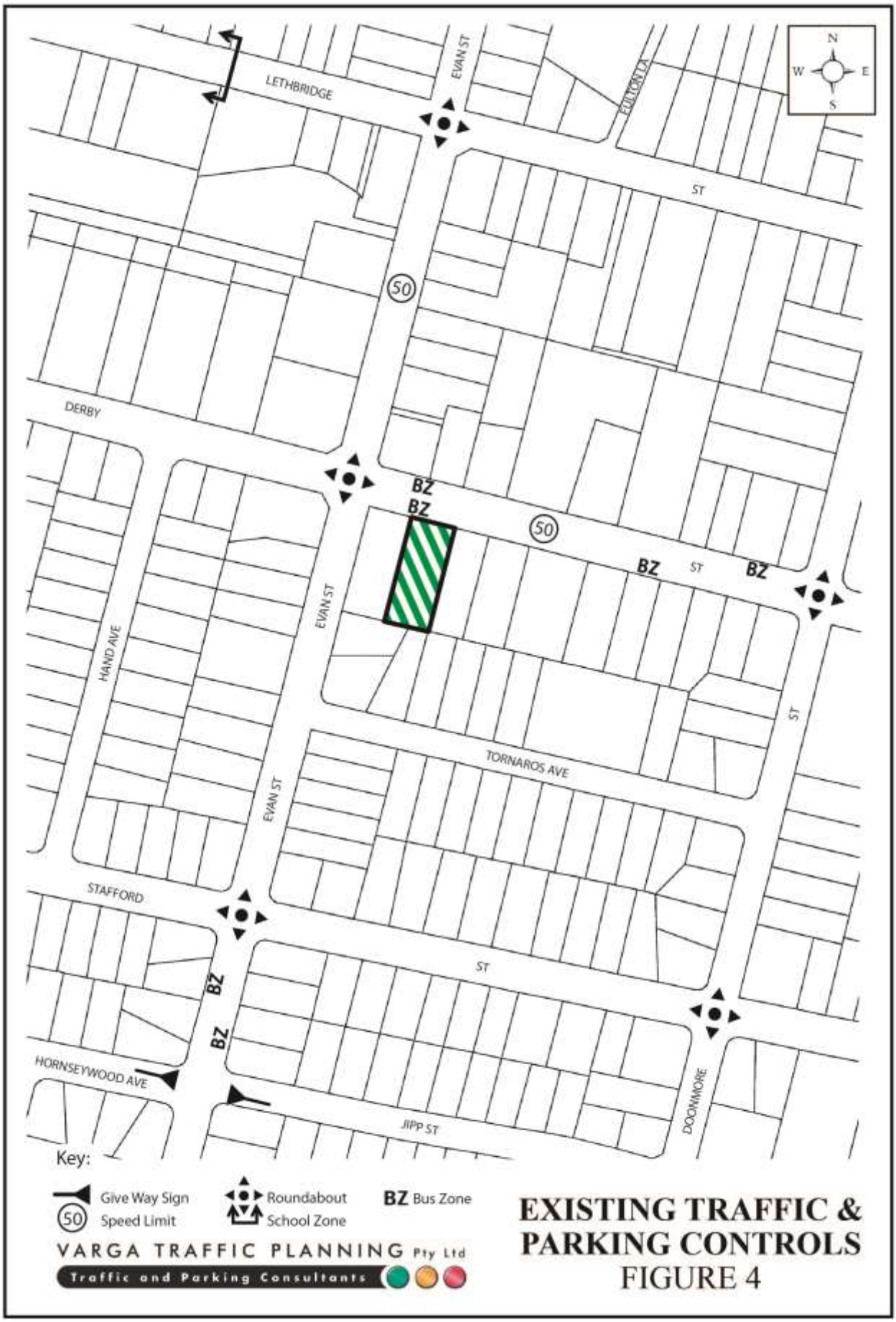
Jamison Road (west of Parker Street) is classified by the RMS as a *Regional Road* and provides a secondary east-west road link through the local area between Parker Street and Mulgoa Road. It typically carries two traffic lanes in each direction in the vicinity of the site with kerbside parking permitted at selected locations.

Derby Street is a local, unclassified road which is primarily used to provide vehicular and pedestrian access to frontage properties. Kerbside parking is generally permitted on both sides of the road.

Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:





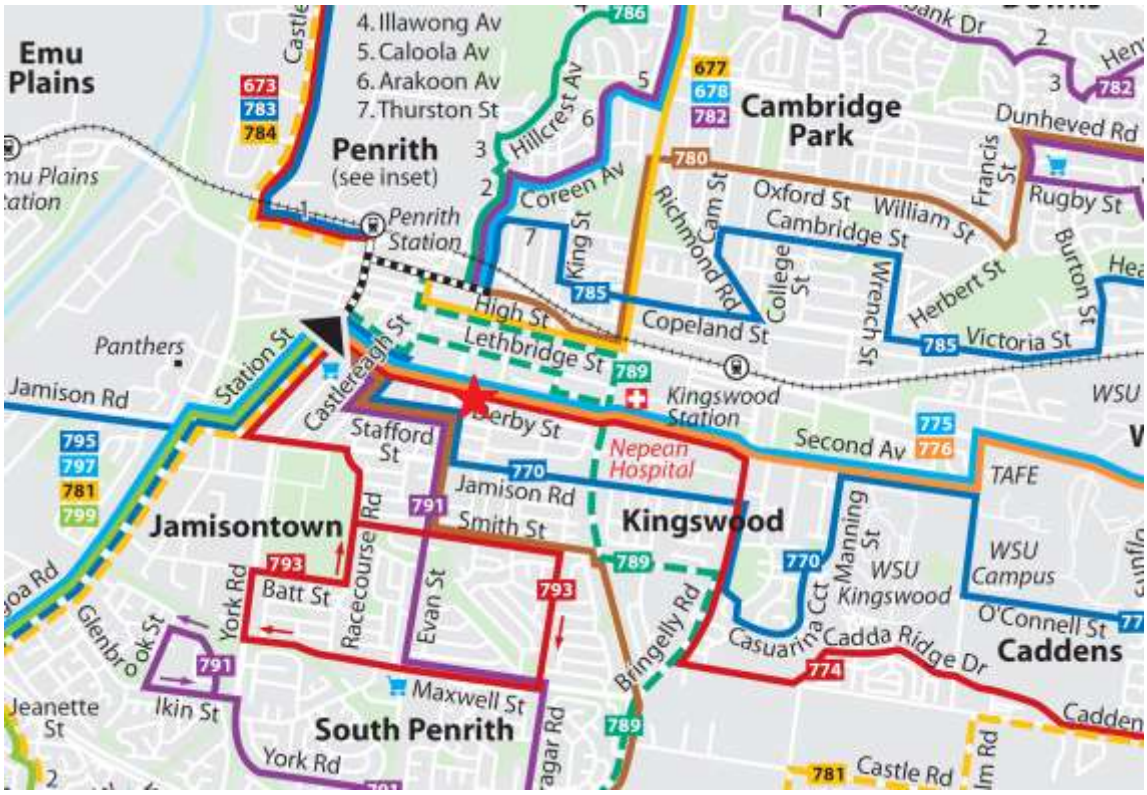
- a 50 km/h SPEED LIMIT which applies to Derby Street and all other local roads in the surrounding area

- ROUNDABOUTS in Derby Street where it intersects with Evan Street and Doonmore Street

- ROUNDABOUTS in Evan Street where it intersects with Lethbridge Street and Stafford Street.

Existing Public Transport

The existing public transport services available in the vicinity of the site are illustrated below.



There are currently three bus services which operate along Derby Street, directly outside the site frontage. This include the 774 bus service which travels between Penrith and Mount Druitt via Nepean Hospital, the 775 bus service which travels between Penrith and Mount Druitt via Erskine Park and the 776 bus service which travels between Penrith and Mount Druitt via St Clair.

There are currently 200 bus services per day travelling in the vicinity of the site on weekdays, including 104 services directly along the site frontage. The abovementioned bus services also connect with train services at numerous suburban railway stations including Penrith, St Marys and Mount Druitt.

It is pertinent to note that the first weekday westbound bus service (i.e. travelling directly along the site frontage from Mount Druitt to Penrith) arrives at approximately 5:20am. As noted in the foregoing, waste collection of the proposed development is to be undertaken from the kerbside area directly outside the Derby Street site frontage by a private contractor between the hours of 4am and 5pm which will not interfere with ***any*** current bus services.

Existing Traffic Conditions

An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by "tube" traffic surveys undertaken as part of this traffic study. The "tube" traffic surveys were undertaken over a 24/7 period in Derby Street, directly outside the subject site between the 10th and 17th November, 2020. The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- the average weekday *morning* on-road peak period occurred between 8am and 9am, with approximately 700 vehicles per hour (vph), bi-directional, comprising 250 vph eastbound and 450 vph westbound

- the average weekday *afternoon* on-road peak period occurred between 4pm and 5pm, with approximately 800 vph, bi-directional, comprising 400 vph eastbound and 400 vph westbound

- the subject site is located 50m west from a roundabout at the Derby Street and Evan Street intersection which has affected vehicle speeds whilst travelling outside the subject site

- the weekly 85th percentile speed is 40km/h bi-directional, comprising 44km/h eastbound and 38km/h westbound

Projected Traffic Generation

An indication of the traffic generation potential of the development proposal is provided by reference to the Roads and Maritime Services publication *Guide to Traffic Generating Developments, Section 3 - Landuse Traffic Generation (October 2002).*

The RMS *Guidelines* are based on extensive surveys of a wide range of land uses and nominates the following traffic generation rates which are applicable to the development proposal:

Childcare Centres

AM: 0.8 peak vehicle trips per child

PM: 0.7 peak vehicle trips per child

Application of the above traffic generation rates to the 86 children outlined in the development proposal yields a traffic generation potential of approximately 69 vehicle trips during the weekday AM peak period (i.e. 34 vehicle movements TO and 35 vehicle movements FROM) and approximately 60 vehicle trips during the weekday PM peak period (i.e. 30 vehicle movements TO and 30 vehicle movements FROM).

Given the site's location within a large residential catchment area, it is likely that traffic will be fairly evenly distributed to the north, south, east and west. When the above traffic volumes are distributed across the surrounding road network, the impact on any particular nearby intersections is expected to be minimal.

That projected increase in the traffic generation potential of the site as a consequence of the development proposal is relatively minimal, representing approximately 1 vehicle trip every minute, and will not have any unacceptable traffic implications in terms of road network capacity.

Traffic Implications - Road Network Capacity

In order to determine the effect of the additional traffic on the adjacent road network, reference is also made to the industry-standard Roads and Maritime Services publication *Guide to Traffic Generating Developments, Section 4 – Interpretations of Traffic Impacts (October 2002).* Table 4.4 (reproduced below) sets out two-way hourly road capacity for one-lane per direction roads for different *Levels of Service.* As a guide, a *Level of Service "A"* for a one-lane per direction road is in the order of *200 vehicles per hour.*

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Source: RMS *Guidelines*

Reference to the "tube surveys" undertaken as part of this traffic study has indicated that the weekday average traffic volumes along Derby Street is in the order of 250 vph to 450 vph per direction. Based on the above table, this represents an existing *Level of Service "B".*

If the proposed traffic movements detailed on the previous page are added to the existing peak traffic movements, traffic along Derby Street will still *not* exceed *600 vehicles per hour*, thereby comfortably remaining at a *Level of Service "B".*

Furthermore, assessing the effects that any *additional* traffic flows may have on the operational performance of the nearby road network can also be assessed using the SIDRA program which is widely used by the RMS and many LGA's for this purpose. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

The results of the SIDRA analysis of the Derby Street and the two proposed site access driveway intersections (i.e. the entry and the exit driveways servicing the basement car parking area) are summarised on Table 3.1 and Table 3.2 below and on the following page. The results indicate that under the projected future traffic demands expected to be generated by the development proposal, the two site access driveway intersections are expected to operate at *Level of Service "A"*, with average vehicle delays in the order of ***less than 1*** second/vehicle. The SIDRA analysis movement summaries are also reproduced in full in Appendix B.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF DERBY STREET & PROPOSED SITE ENTRY DRIVEWAY

Key Indicators		**Projected Development Traffic Demand**	
		AM	**PM**
Level of Service		A	A
Degree of Saturation		0.258	0.239
Average Vehicle Delay (secs/veh)			
Derby Street (west)	T R	0.2 6.4	0.1 6.3
Derby Street (east)	L T	8.2 0.1	8.2 0.1
TOTAL AVERAGE VEHICLE DELAY		**0.4**	**0.3**

TABLE 3.2 - RESULTS OF SIDRA ANALYSIS OF DERBY STREET & PROPOSED SITE EXIT DRIVEWAY			
Key Indicators		**Projected Development Traffic Demand**	
		AM	**PM**
Level of Service		A	A
Degree of Saturation		0.249	0.231
Average Vehicle Delay (secs/veh)			
Derby Street (west)	T	0.0	0.1
Derby Street (east)	T	0.0	0.0
Site Exit Driveway (south)	L R	7.4 10	7.2 10.5
TOTAL AVERAGE VEHICLE DELAY		**0.4**	**0.3**

Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
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 signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

[1] *The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.*

4. PARKING IMPLICATIONS

Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 4 and comprise:

- BUS ZONES located at regular intervals along both sides of the Derby Street, including directly outside the site frontage

- generally UNRESTRICTED kerbside parking elsewhere throughout the local area.

Off-Street Parking Provisions

The off-street parking rates applicable to the development proposal are specified in Council's *Development Control Plan 2014, Section C10 Transport Access and Parking* in the following terms:

> **Childcare centres**
> 1 space per 10 children, *plus*
> 1 per employee

Application of the above parking requirements to the 86 children and 14 staff outlined in the development proposal yields an off-street parking requirement of 23 off-street parking spaces as set out below:

Parents (86 children):	8.6 spaces
Staff (14 staff):	14.0 spaces
TOTAL:	**22.6 spaces**

The proposed development makes provision for a total of 23 off-street parking spaces, comprising 9 parent pick-up/drop-off spaces and 14 staff spaces, thereby satisfying Council's *DCP 2014* requirements.

By way of comparison, reference is also made to the parking rates nominated in the Roads and Maritime Services' publication *Guide to Traffic Generating Developments, Section 5 – Parking Requirements for Specific Land Uses (October 2002).* The RMS *Guidelines* are based on extensive surveys of a wide range of land uses and nominates the following parking rate (including staff parking) for childcare centres:

> **Childcare Centres**
> 1 space per 4 children

Application of the above parking requirements to the 86 children outlined in the development proposal yields an off-street parking requirement of 22 parking spaces.

The proposed development makes provision for a total of 23 off-street parking spaces, thereby also satisfying the RMS *Guidelines* requirements.

Furthermore:

- it is anticipated that many of the children attending the centre will be drawn from the local residential area. Many of these children are therefore expected to be walked to/from the subject site

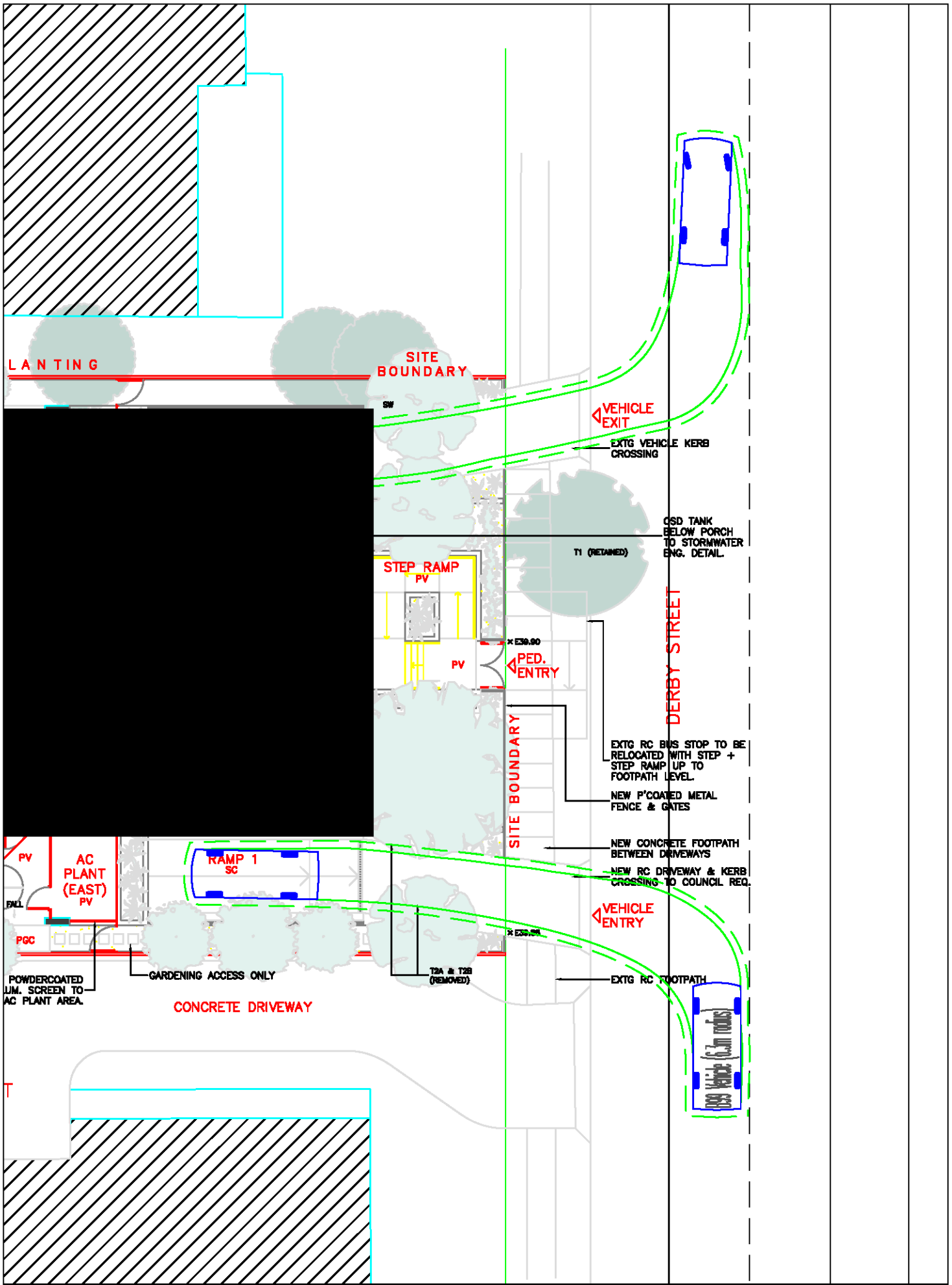
- the site is located in close proximity to a range of bus services that provide opportunities for interchange with the suburban rail network at Penrith, St Marys and Mt Druitt. The accessibility of the site by public transport will facilitate reduced car usage rates by employees

- *Montessori Academy's* operate approximately 30 childcare centres in greater Sydney alone, giving them access to real travel mode data of their staff. For their centres located in close proximity to good public transport services, such as the proposed, their data indicates that approximately 50% travel to/from work by public transport

The geometric design layout of the proposed car parking facilities has been designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 1 - Off-Street Car Parking AS2890.1 – 2004* in respect of parking space dimensions (including 2.6m wide spaces for drop-off/pick-up spaces), aisle width, driveway gradients and widths, blind aisle extension and overhead clearances.

The vehicular access arrangements have been designed to accommodate the swept turning path requirements of the B99 design vehicles, as specified in *AS2890.1:2004,* allowing them to enter and exit the site and circulate through the basement in a forward direction at all times.

In summary, the proposed parking facilities satisfy the relevant requirements specified in both Council's *DCP 2014* as well as the Australian Standards and it is therefore concluded that the proposed development will not have any unacceptable parking implications.



VARGA TRAFFIC PLANNING Pty Ltd
ABN 56 071 792 527
Suite 8, Level 1
20 Young Street
Neutral Bay, NSW 2089

Phone +61 2 9904 3224
PO Box 1585
Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
CHILDCARE CENTRE DEVELOPMENT

DRAWING TITLE
Ground Floor: B99 Vehicle Entry & Exit Swept Turning Paths

1:200 @ A4

ADDRESS
170 Derby Street, Penrith

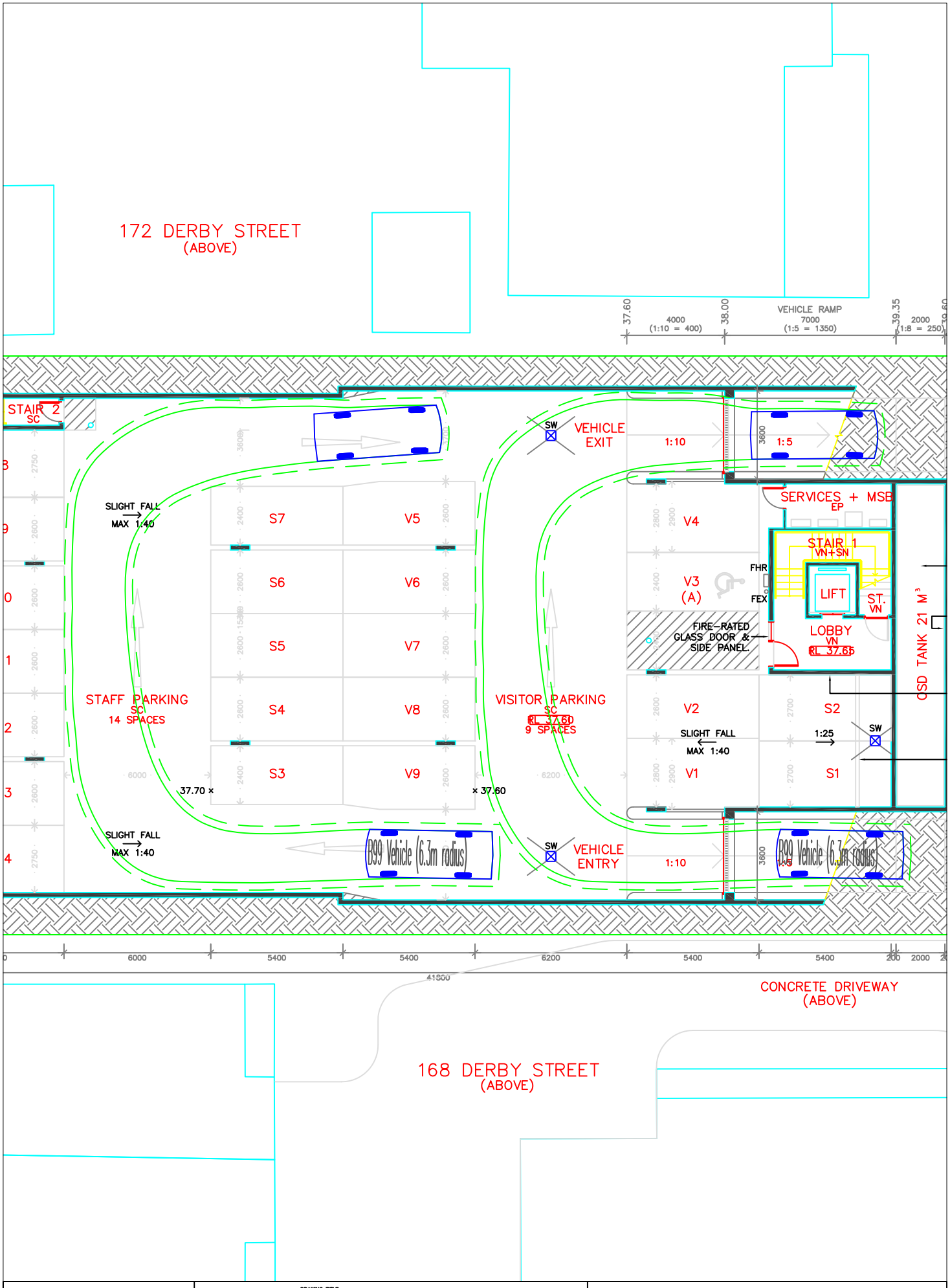
PROJECT NO.
20255

DRAWN
CP

DATE DRAWN
2020-12-7

PREPARED
TN

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants



VARGA TRAFFIC PLANNING Pty Ltd
ABN 88 071 762 537
Suite 6, Level 1
20 Young Street
Neutral Bay, NSW 2089
Phone +61 2 9904 3224
PO Box 1868
Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
CHILDCARE CENTRE DEVELOPMENT

N

DRAWING TITLE
Basement: B99 Vehicle Entry & Exit Swept Turning Paths

ADDRESS
170 Derby Street, Penrith

PROJECT NO.
20285

REVIEWED
CP

1:200 @ A4

DATE DRAWN
2020-12-7

PREPARED
TN

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants

APPENDIX A

TRAFFIC SURVEY DATA

CfeIT [redacted]

Traffic Count Summary Report

Count Number	9326	Ref : VAR	Lat/Long : S33 45.514 / E150 42.106	UBD 31 F-1
Street	DERBY STREET, PENRITH : Between STATION STREET & BRINGELLY ROAD (bidirectional) :			
Location	Just east of Evan St, House No. 170 X 161 on ELP 505243			*Carriageway*

TOTAL COUNT MATRIX

Start Date	10-NOV-20
Start Time	1600
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	34
Weekly 85th Percentile Speed	40
Five Day AADT	9528
Seven Day AADT	8677

	MON	TUE	WED	THU	FRI	SAT	SUN	5 Day		7 Day	
	16TH	*10TH / 17TH*	*11TH*	*12TH*	*13TH*	*14TH*	*15TH*	Total	Average	Total	Average
Midnight - 1am	31	31	24	41	32	45	53	**159**	**32**	**257**	**37**
1am - 2am	18	17	14	18	14	34	40	**81**	**16**	**155**	**22**
2am - 3am	14	11	11	16	11	18	29	**63**	**13**	**110**	**16**
3am - 4am	15	16	11	12	10	18	19	**64**	**13**	**101**	**14**
4am - 5am	23	26	27	22	24	14	15	**122**	**24**	**151**	**22**
5am - 6am	75	75	91	81	84	36	28	**406**	**81**	**470**	**67**
6am - 7am	221	219	226	196	223	120	66	**1085**	**217**	**1271**	**182**
7am - 8am	412	411	424	394	398	263	131	**2039**	**408**	**2433**	**348**
8am - 9am	**770**	745	708	675	662	352	226	**3560**	**712**	**4138**	**591**
9am - 10am	681	**777**	717	**696**	664	559	421	**3535**	**707**	**4515**	**645**
10am - 11am	572	665	**737**	676	624	584	433	**3274**	**655**	**4291**	**613**
11am - Midday	628	667	702	685	**673**	**631**	**537**	**3355**	**671**	**4523**	**646**
Midday - 1pm	655	637	703	654	673	**648**	**491**	**3322**	**664**	**4461**	**637**
1pm - 2pm	640	616	651	654	684	565	441	**3245**	**649**	**4251**	**607**
2pm - 3pm	748	748	698	714	674	491	442	**3582**	**716**	**4515**	**645**
3pm - 4pm	734	802	784	814	**837**	507	373	**3971**	**794**	**4851**	**693**
4pm - 5pm	**780**	**827**	800	**821**	833	480	417	**4061**	**812**	**4958**	**708**
5pm - 6pm	698	733	**828**	803	769	457	383	**3831**	**766**	**4671**	**667**
6pm - 7pm	431	497	511	542	523	377	352	**2504**	**501**	**3233**	**462**
7pm - 8pm	324	368	341	443	397	362	320	**1873**	**375**	**2555**	**365**
8pm - 9pm	238	251	236	341	332	275	242	**1398**	**280**	**1915**	**274**
9pm - 10pm	165	151	157	264	294	212	166	**1031**	**206**	**1409**	**201**
10pm - 11pm	101	120	147	140	219	163	119	**727**	**145**	**1009**	**144**
11pm - Midnight	71	58	78	60	85	86	55	**352**	**70**	**493**	**70**
Total	**9045**	**9468**	**9626**	**9762**	**9739**	**7297**	**5799**	**47640**	**9528**	**60736**	**8676**

 CFE Information Technologies

Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

CfeIT [redacted]

Traffic Count Summary Report

Count Number	**9326**	Ref : **VAR**	**Lat/Long : S33 45.514 / E150 42.106**	**UBD 31 F-1**
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Location	Just east of Evan St, House No. 170 X 161 on ELP 505243			*Carriageway*

TOTAL COUNT MATRIX

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Weekly 50th Percentile Speed	36
Weekly 85th Percentile Speed	44
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Seven Day AADT	4142

	MON *16TH*	TUE *10TH / 17TH*	WED *11TH*	THU *12TH*	FRI *13TH*	SAT *14TH*	SUN *15TH*	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight - 1am	18	19	14	19	19	24	31	**89**	**18**	**144**	**21**
1am - 2am	8	7	3	7	5	15	26	**30**	**6**	**71**	**10**
2am - 3am	7	6	8	5	5	9	18	**31**	**6**	**58**	**8**
3am - 4am	7	9	6	7	8	13	10	**37**	**7**	**60**	**9**
4am - 5am	15	13	13	15	8	7	9	**64**	**13**	**80**	**11**
5am - 6am	43	42	50	46	45	21	16	**226**	**45**	**263**	**38**
6am - 7am	114	108	116	97	115	57	20	**550**	**110**	**627**	**90**
7am - 8am	186	205	215	203	185	84	36	**994**	**199**	**1114**	**159**
8am - 9am	**289**	281	247	234	239	103	81	**1290**	**258**	**1474**	**211**
9am - 10am	257	291	251	244	240	208	166	**1283**	**257**	**1657**	**237**
10am - 11am	257	**304**	**317**	**317**	277	265	173	**1472**	**294**	**1910**	**273**
11am - Midday	282	292	315	297	**311**	**303**	**241**	**1497**	**299**	**2041**	**292**
Midday - 1pm	307	295	359	320	328	**316**	216	**1609**	**322**	**2141**	**306**
1pm - 2pm	330	303	338	353	363	294	**236**	**1687**	**337**	**2217**	**317**
2pm - 3pm	384	405	339	359	371	253	216	**1858**	**372**	**2327**	**332**
3pm - 4pm	318	358	339	368	424	261	192	**1807**	**361**	**2260**	**323**
4pm - 5pm	**393**	377	410	376	411	266	223	**1967**	**393**	**2456**	**351**
5pm - 6pm	390	**406**	**476**	**425**	**438**	246	208	**2135**	**427**	**2589**	**370**
6pm - 7pm	200	234	248	266	265	180	184	**1213**	**243**	**1577**	**225**
7pm - 8pm	169	190	169	251	206	182	159	**985**	**197**	**1326**	**189**
8pm - 9pm	124	136	142	184	194	149	133	**780**	**156**	**1062**	**152**
9pm - 10pm	97	79	78	161	153	105	89	**568**	**114**	**762**	**109**
10pm - 11pm	55	55	77	80	125	84	63	**392**	**78**	**539**	**77**
11pm - Midnight	38	23	37	26	39	49	24	**163**	**33**	**236**	**34**
Total	**4288**	**4438**	**4567**	**4660**	**4774**	**3494**	**2770**	**22727**	**4545**	**28991**	**4141**

Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

CfeIT [redacted]

Traffic Count Summary Report

Count Number	9326	Ref : VAR	Lat/Long : S33 45.514 / E150 42.106	UBD 31 F-1
Street	DERBY STREET, PENRITH : From BRINGELLY ROAD to STATION STREET : WEST BOUND			
Location	Just east of Evan St, House No. 170 X 161 on ELP 505243			*Carriageway*

TOTAL COUNT MATRIX

Start Date	10-NOV-20
Start Time	1600
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	32
Weekly 85th Percentile Speed	38
Five Day AADT	4983
Seven Day AADT	4535

	MON 16TH	TUE 10TH / 17TH	WED 11TH	THU 12TH	FRI 13TH	SAT 14TH	SUN 15TH	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight - 1am	13	12	10	22	13	21	22	70	14	113	16
1am - 2am	10	10	11	11	9	19	14	51	10	84	12
2am - 3am	7	5	3	11	6	9	11	32	6	52	7
3am - 4am	8	7	5	5	2	5	9	27	5	41	6
4am - 5am	8	13	14	7	16	7	6	58	12	71	10
5am - 6am	32	33	41	35	39	15	12	180	36	207	30
6am - 7am	107	111	110	99	108	63	46	535	107	644	92
7am - 8am	226	206	209	191	213	179	95	1045	209	1319	188
8am - 9am	481	464	461	441	423	249	145	2270	454	2664	381
9am - 10am	424	486	466	452	424	351	255	2252	450	2858	408
10am - 11am	315	361	420	359	347	319	260	1802	360	2381	340
11am - Midday	346	375	387	388	362	328	296	1858	372	2482	355
Midday - 1pm	348	342	344	334	345	332	275	1713	343	2320	331
1pm - 2pm	310	313	313	301	321	271	205	1558	312	2034	291
2pm - 3pm	364	343	359	355	303	238	226	1724	345	2188	313
3pm - 4pm	416	444	445	446	413	246	181	2164	433	2591	370
4pm - 5pm	387	450	390	445	422	214	194	2094	419	2502	357
5pm - 6pm	308	327	352	378	331	211	175	1696	339	2082	297
6pm - 7pm	231	263	263	276	258	197	168	1291	258	1656	237
7pm - 8pm	155	178	172	192	191	180	161	888	178	1229	176
8pm - 9pm	114	115	94	157	138	126	109	618	124	853	122
9pm - 10pm	68	72	79	103	141	107	77	463	93	647	92
10pm - 11pm	46	65	70	60	94	79	56	335	67	470	67
11pm - Midnight	33	35	41	34	46	37	31	189	38	257	37
Total	4757	5030	5059	5102	4965	3803	3029	24913	4982	31745	4535

Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

APPENDIX B

SIDRA MOVEMENT SUMMARIES

MOVEMENT SUMMARY

Site: 101 [DER_ENTP AM (Site Folder: General)]

Network: N101 [Network1 (Network Folder: General)]

Derby Street & Entry Driveway, Penrith
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Derby St (east)														
4	L2	17	0.0	17	0.0	0.258	8.2	LOS A	0.0	0.0	0.00	0.04	0.00	48.4
5	T1	486	0.0	486	0.0	0.258	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	49.5
Approach		503	0.0	503	0.0	0.258	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.4
West: Derby St (west)														
11	T1	307	0.0	307	0.0	0.175	0.2	LOS A	0.1	0.6	0.08	0.06	0.08	49.3
12	R2	18	0.0	18	0.0	0.175	6.4	LOS A	0.1	0.6	0.08	0.06	0.08	10.4
Approach		325	0.0	325	0.0	0.175	0.6	NA	0.1	0.6	0.08	0.06	0.08	40.8
All Vehicles		828	0.0	828	0.0	0.258	0.4	NA	0.1	0.6	0.03	0.05	0.03	45.7

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

MOVEMENT SUMMARY

Site: 101 [DER_ENTP PM (Site Folder: General)]

Network: N102 [Network2 (Network Folder: General)]

Derby Street & Entry Driveway, Penrith
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Derby St (east)														
4	L2	15	0.0	15	0.0	0.239	8.2	LOS A	0.0	0.0	0.00	0.04	0.00	48.4
5	T1	450	0.0	450	0.0	0.239	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	49.5
Approach		465	0.0	465	0.0	0.239	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.5
West: Derby St (west)														
11	T1	408	0.0	408	0.0	0.223	0.1	LOS A	0.1	0.5	0.05	0.04	0.05	49.5
12	R2	15	0.0	15	0.0	0.223	6.3	LOS A	0.1	0.5	0.05	0.04	0.05	10.5
Approach		423	0.0	423	0.0	0.223	0.4	NA	0.1	0.5	0.05	0.04	0.05	43.7
All Vehicles		888	0.0	888	0.0	0.239	0.3	NA	0.1	0.5	0.03	0.04	0.03	46.6

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

MOVEMENT SUMMARY

Site: 101 [DER_EXTP AM (Site Folder: General)]

Network: N101 [Network1 (Network Folder: General)]

Derby Street & Entry Driveway, Penrith
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Exit Driveway														
1	L2	17	0.0	17	0.0	0.049	7.4	LOS A	0.1	0.5	0.51	0.74	0.51	51.2
3	R2	18	0.0	18	0.0	0.049	10.0	LOS A	0.1	0.5	0.51	0.74	0.51	46.7
Approach		35	0.0	35	0.0	0.049	8.7	LOS A	0.1	0.5	0.51	0.74	0.51	49.6
East: Derby St (east)														
5	T1	486	0.0	486	0.0	0.249	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		486	0.0	486	0.0	0.249	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Derby St (west)														
11	T1	307	0.0	307	0.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		307	0.0	307	0.0	0.157	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		828	0.0	828	0.0	0.249	0.4	NA	0.1	0.5	0.02	0.03	0.02	49.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

MOVEMENT SUMMARY

▽ Site: 101 [DER_EXTP PM (Site Folder: General)]

Network: N102 [Network2 (Network Folder: General)]

Derby Street & Entry Driveway, Penrith
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Exit Driveway														
1	L2	15	0.0	15	0.0	0.042	7.2	LOS A	0.1	0.4	0.50	0.73	0.50	51.1
3	R2	15	0.0	15	0.0	0.042	10.5	LOS A	0.1	0.4	0.50	0.73	0.50	46.6
Approach		30	0.0	30	0.0	0.042	8.8	LOS A	0.1	0.4	0.50	0.73	0.50	49.5
East: Derby St (east)														
5	T1	450	0.0	450	0.0	0.231	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		450	0.0	450	0.0	0.231	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Derby St (west)														
11	T1	408	0.0	408	0.0	0.209	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		408	0.0	408	0.0	0.209	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		888	0.0	888	0.0	0.231	0.3	NA	0.1	0.4	0.02	0.02	0.02	49.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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