TRAFFIC AND PARKING IMPACT ASSESSMENT OF A PROPOSED CHILDCARE CENTRE

15-17 Garswood Road, Glenmore Park

Traffic and Parking Impact Report

Prepared for: Rammy Associates Pty Ltd

N2062320A (Version 1c)

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1. INTRODUCTION

Motion Traffic Engineers was commissioned by Rammy Associates to undertake a traffic and parking impact assessment of a proposed childcare at15-17 Garswood Road in Glenmore Park. The site is currently utilised as a residential property.

This traffic report focuses on the proposed childcare centre and changes in car usage and car park utilisation and additional trips from the proposed childcare centre.

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED LOCATION

2.1 Location and Land Use

The proposed Childcare Centre is located in an environmental living area (E4) with the Penrith Golf and Recreation Club at south. Residential area of Glenmore park is located in west and north of the childcare centre.

Figures 1 and 2 show the location of the development site from the aerial and street map perspective respectively.

Figure 3 shows photographs of the site.

Figure 1: Location of the Subject Site on Aerial

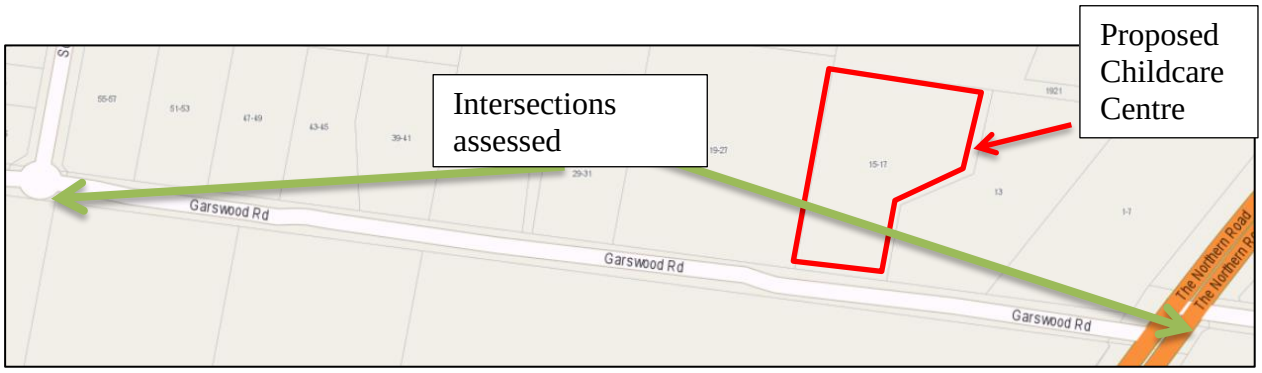

Figure 2: Street Map of the Location of the Development Site and assessed intersections

Figure 3: Photo of site from Garswood Road

2.2 Road Network

This section describes the roads near the proposed childcare centre.

Garswood Road is a collector road and has one lane each way. The default posted speed limit is 50km/hr. On-street parking is not permitted on either side of the road due to narrow width of the road. Figure 4a shows a photograph of Garswood Road.

South Street is a local road with one lane each way. No Parking is permitted on the street at any time due to narrow width. The default speed limit for the road is 50km/hr. Figure 4b shows a photograph of South Street.

The Northern Road is an arterial road with two lane each way on a divided carriageway. On street parking is not permitted on either side of the road. The sign-posted speed limit for the road is 70km/hr. Figure 4c shows a photograph of intersection of The Northern Road with Garswood Road.

Figure 4a: Garswood Road looking west

Figure 4b: South Street looking north

Figure 4c: Stop intersection of The Northern Road with Garswood Road

2.3 Public Parking Opportunities

The development site is located in an Environmental living area(E4). Site investigation shows that there are no convenient on street parking near the childcare. Garswood Road and South Street are too narrow for on-street parking.

2.4 Intersection Description

As part of the traffic assessment, two intersections are assessed:

- Stop intersection of The Northern Road with Garswood Road
- Roundabout intersection of Garswood Road with South Street

External traffic travelling to and from the development site will most likely need to travel through the above intersection.

The stop intersection of The Northern Road with Garswood Road is a three-leg intersection with all turn movements permitted except the right turn from Garswood into The Northern Road. Figure 5 presents the layout of this intersection using SIDRA – an industry standard intersection software. The number on the lane represents a short lane in metres.

The roundabout intersection of Garswood Road with South Street is a three-leg intersection with all turning movements permitted. The roundabout has one

circulating lane. The numbers on the layout represent the length of island diameter. Figure 6 presents the layout of this intersection using SIDRA.

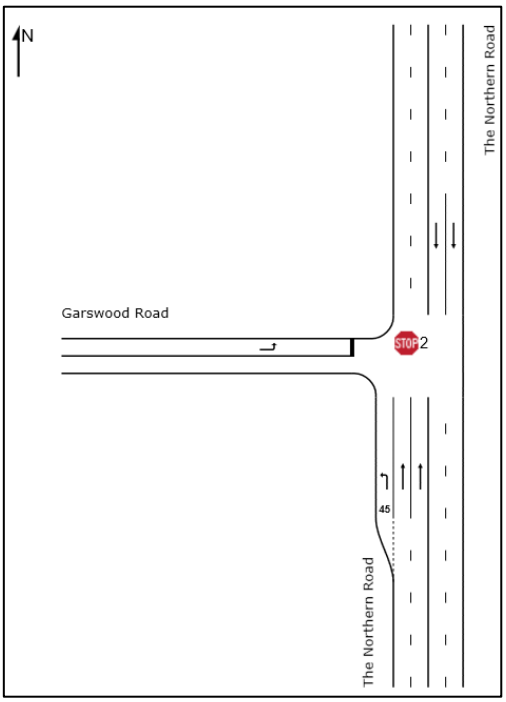

Figure 5: Stop intersection of The Northern Road with Garswood Road (SIDRA)

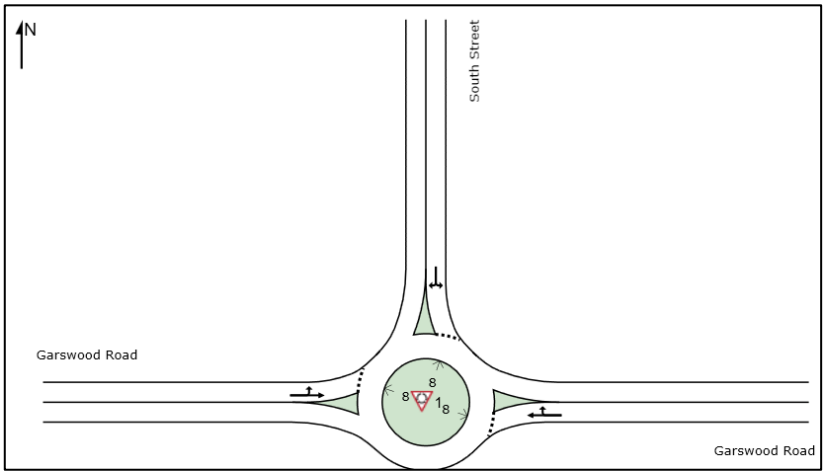

Figure 6: Roundabout intersection of Garswood Road with South Street (SIDRA)

2.5 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the intersection for the weekday AM period. The AM peak hour was 8am to 9am. The traffic surveys were undertaken on a weekday in January 2020.

The following Figures present the traffic volumes in vehicles for the weekday peak hours.

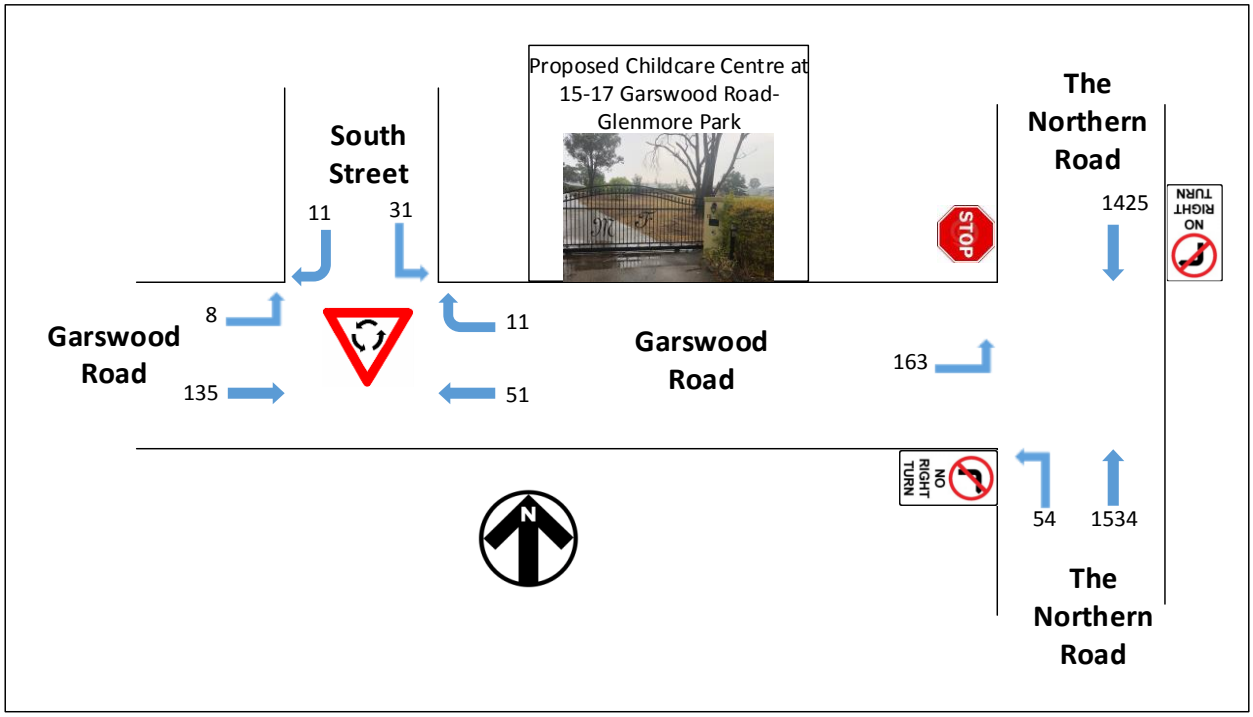

Figure 9: Existing Weekday Traffic Volumes AM Peak Hour

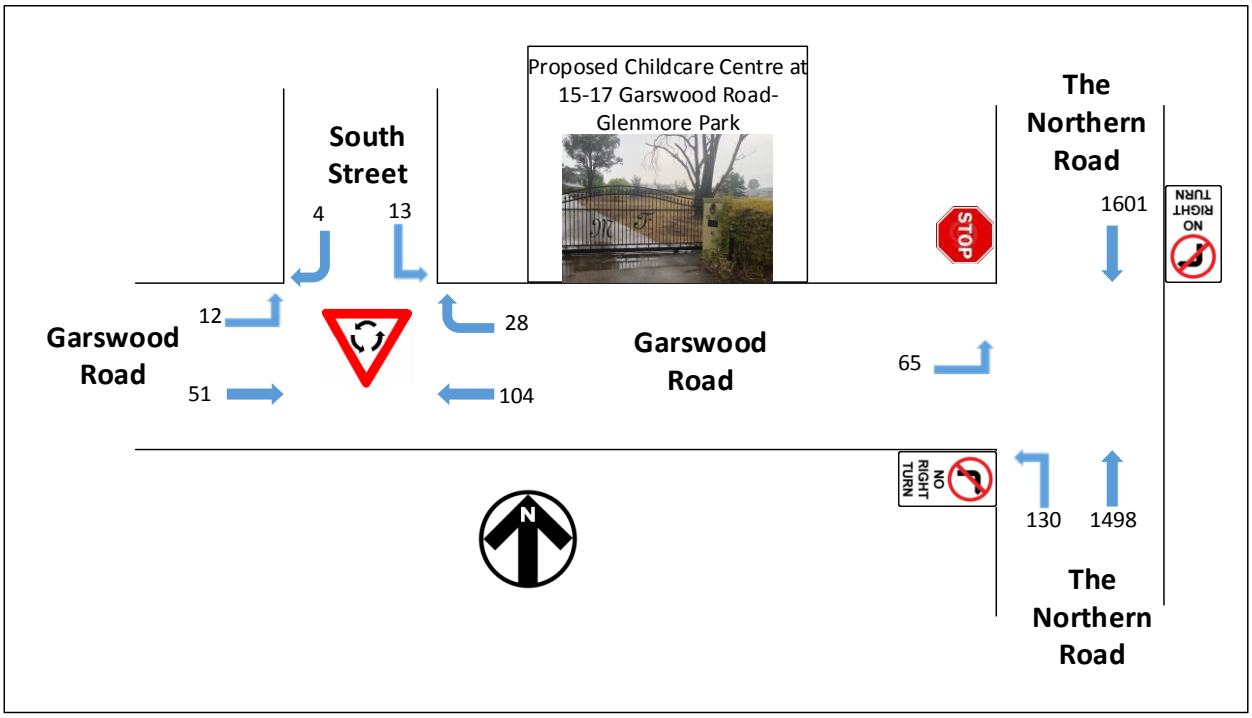

Figure 10: Existing Weekday Traffic Volumes PM Peak Hour

2.6 Intersection Assessment

An intersection assessment has been undertaken for:

- Stop intersection of the Northern Road with Garswood Road
- Roundabout intersection of Garswood Road with South Street

The existing intersection operating performance was assessed using the SIDRA software package (version 8) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
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 & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep

DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection analysis are as follows:

Stop intersection of The Northern Road with Garswood Road

- All turn movements have Los A or B for AM and PM peak hours
- There is spare capacity at this intersection

Roundabout intersection of Garswood Road with South Street

- The roundabout has an overall LoS A for both peak hours
- There is spare capacity at this intersection

The full Sidra results are presented in Appendix A.

2.7 Public Transport

The nearest bus stop to the development site is 1.1 km away on Saint Andrew Drive. This stop is serviced by the 799 bus routes and travels from Glenmore Park to Penrith and the adjacent suburbs. Figure 11 shows the proximity of the site to public transport services.

Overall, the site has access to public transport.

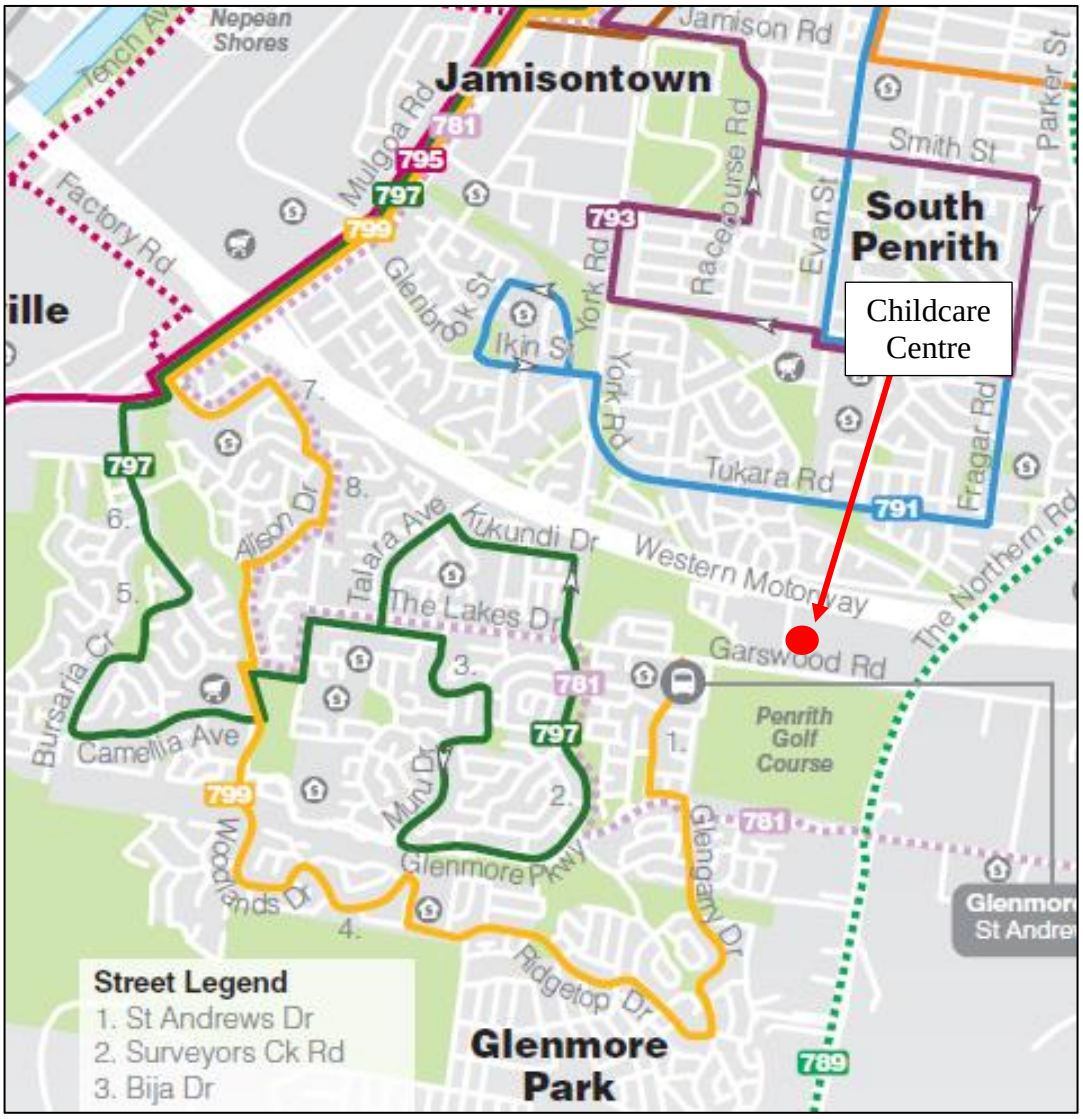

Figure 11: Public Transport Services Nearby

2.8 Conclusions on the Existing Conditions

The proposed childcare centre is located in a residential area Site investigation shows that Garswood Road and South Street are narrow for on-street parking.

The nearby intersection has spare capacity to accommodate additional traffic.

The site has access to public transport.

3. PROPOSED CHILDCARE

The proposed childcare will accommodate up to 200 children along with twenty-five staff:

- 20 children from 0-2 years old
- 30 children from 2-3 years old
- 120 children from 3-5 years old
- 30 children ages over preschool age

There is car park area on the ground floor level with vehicle access and egress via Garswood Road.

A total of forty-five (45) car spaces will be provided on the ground floor carpark; the details are as follows:

- Twenty-five staff car spaces
- Twenty visitor car spaces including;
- One accessible car space

A full scaled plan of the proposed childcare centre is provided as part of the Development Application. Scaled measurements should use these plans.

4. CAR PARKING CONSIDERATIONS

4.1 City of Penrith Planning Scheme

The car parking requirements for a childcare are presented in *Penrith Council's Development Control Plan 2014* with the car parking rates as follows as it applies to the proposed childcare centre:

Child Care Centres

- 1 car space per 10 children plus;
- 1 car space per 1 employee

The proposed childcare will accommodate 200 children and twenty-five (25) educators. Table 3 summarises the car parking requirements for the proposed childcare. The proposed childcare complies with Council's parking requirements.

There is no convenient on street parking available. The additional car spaces beyond Council's minimum requirements will ensure all parking demand will be met on site.

Use	Number	Car Parking Rate	Car Spaces Required	Car Spaces Provided
Children	200	1 per 10 children	20	20
Staff	25	1 per staff	25	25
Total			45	45

Table 3: Summary of car parking requirements

4.2 Staff Car Parking demand

Staff arrivals and departures are staged/staggered to ensure that the staff-student ratio is maintained with all staff on site in the core 9am to 5pm hour with peak staff car parking demand in the core period and does not coincide with the main drop off and pick up periods.

5. VEHICLE TRAFFIC IMPACT CONSIDERATIONS

This section discusses the vehicle traffic impacts of the proposed childcare centre.

5.1 Traffic Generation

The NSW RTA Guide to Traffic Generating Development document publishes trip generation rates for "long day care" for childcare centres as follows:

- 0.8 trips per child between 7am and 9am
- 0.3 trips per child between 2:30pm and 4pm
- 0.7 trips per child between 4pm and 6pm

Staff will arrive and leave before the drop off period (7am to 9am) and the pickup period (4pm to 6pm) respectively. Table 4 presents the estimated peak period trips.

Peak Hour	Land Use	Number of children	Trip Generation Rate per child	Trip Generated
AM	Childcare Centre	200	0.8	160
PM			0.7	140

Table 4: Trips generated by the proposed Childcare centre in the weekday peak periods

Peak Hour	Land Use	Number of Dwellings	Trip Generation Rate per dwelling	Trip Generated
AM	Residential	2	0.95	2
PM		2	0.99	2

Table 5: Trips generated by the existing development in the weekday peak periods

Table 6 presents the peak hour trips and trip distribution.

Peak Hour	Existing Trips	Proposed Trips	Net Trips
AM	2	160	158
PM	2	140	138
Peak Hour	**Origin**	**Destination**	**Total**
AM	79	79	158
PM	69	69	138

Table 6: Trips generated and distributed by the childcare in the weekday peak hours

5.2 Traffic Volumes

The additional development trips are assigned onto the local traffic network. The following figures present the existing with the development trips (in red for origin trips and blue for destination trips) for the weekday AM and PM peak hours.

The additional development trips represent a small proportion of the existing traffic volumes.

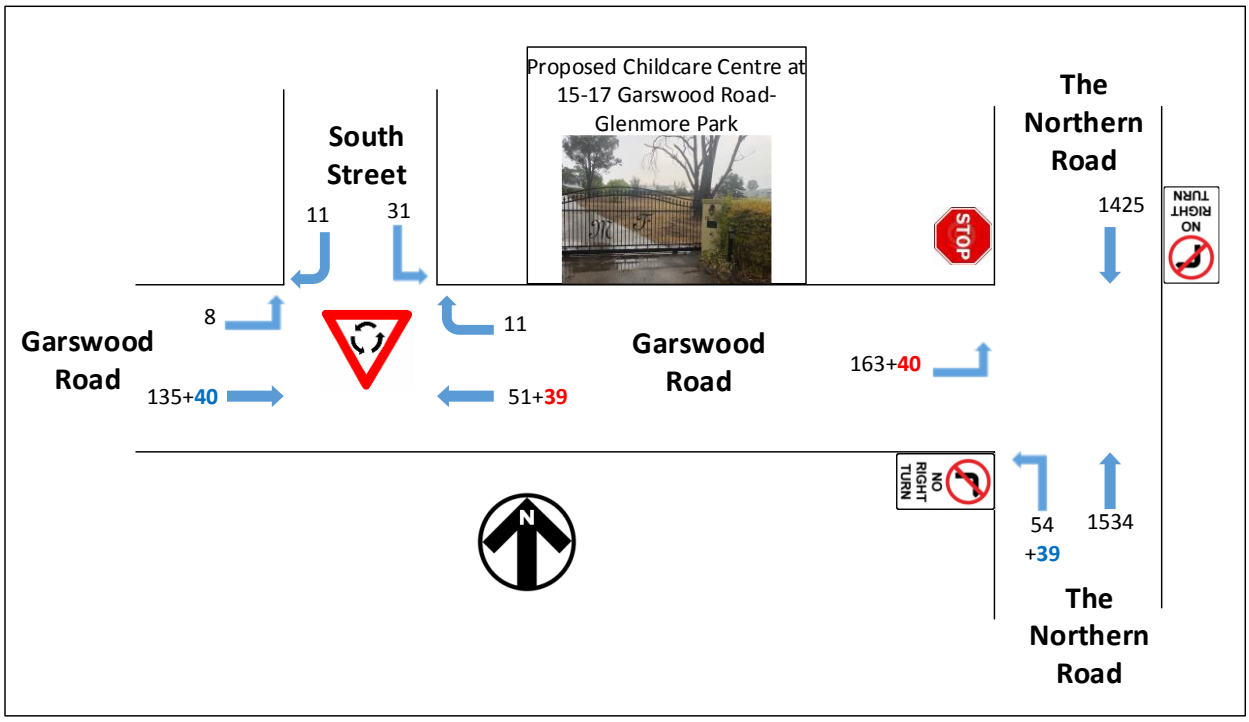

Figure 12: Weekday AM Peak Hour Traffic Volumes (Development Origin Trips in Red and Destination Trips in Blue)

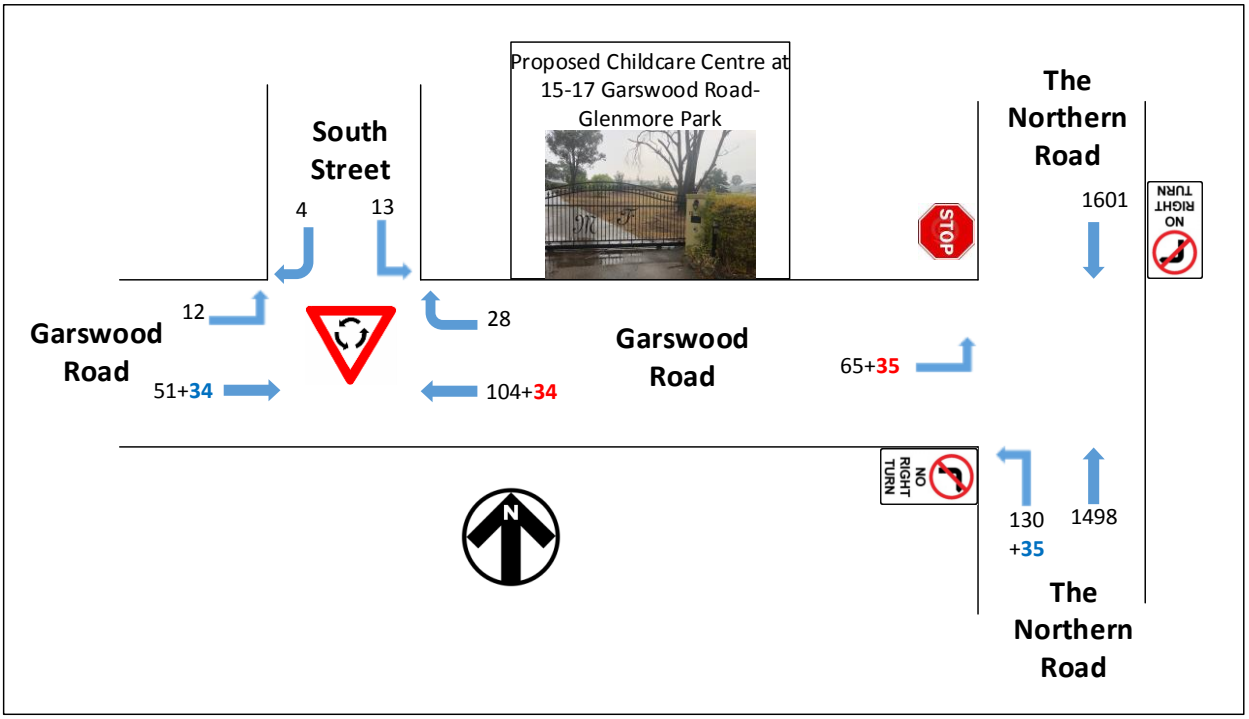

Figure 13: Weekday PM Peak Hour Traffic Volumes (Development Origin Trips in Red and Destination Trips in Blue)

5.3 Intersection Assessment

An intersection assessment has been undertaken for the two nearby intersections.

The results of the intersection analysis are as follows for the AM and PM peak hours:

Stop intersection of The Northern Road with Garswood Road

- All turn movements have Los A or B for AM and PM peak hours
- The additional trips do not change the LoS of any turn movement

Roundabout intersection of Garswood Road with South Street

- The roundabout has an overall LoS A for both peak hours
- The additional trips do not change the LoS of the overall intersection

The full Sidra results with the development traffic are presented in Appendix B. The existing conditions are presented in Appendix A.

6. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

Parking

- The proposed childcare centre complies with Council's car parking requirements

Traffic

- The proposed childcare centre is a high trip generator for the weekday AM and PM peak hours.
- The additional trips from the proposed childcare centre can be accommodated at the nearby intersections and road network without noticeably affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a planning consent for the proposed childcare centre at 15-17 Garswood Road, Glenmore Park, should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: The Northern Road												
1	L2	57	0.0	0.031	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	1615	0.0	0.414	2.1	LOS A	0.0	0.0	0.00	0.31	0.00	76.2
Approach		1672	0.0	0.414	2.1	NA	0.0	0.0	0.00	0.31	0.00	74.6
North: The Northern Road												
8	T1	1500	0.0	0.385	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach		1500	0.0	0.385	0.1	NA	0.0	0.0	0.00	0.00	0.00	79.8
West: Garswood Road												
10	L2	172	0.0	0.444	20.1	LOS B	2.0	13.8	0.79	1.07	1.11	46.6
Approach		172	0.0	0.444	20.1	LOS B	2.0	13.8	0.79	1.07	1.11	46.6
All Vehicles		3343	0.0	0.444	2.1	NA	2.0	13.8	0.04	0.21	0.06	74.5

Table A1: Weekday Stop intersection of The Northern Road with Garswood Road AM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Garswood Road												
5	T1	54	0.0	0.047	3.8	LOS A	0.2	1.7	0.07	0.47	0.07	45.7
6	R2	12	0.0	0.047	6.7	LOS A	0.2	1.7	0.07	0.47	0.07	46.7
Approach		65	0.0	0.047	4.3	LOS A	0.2	1.7	0.07	0.47	0.07	46.0
North: South Street												
7	L2	33	0.0	0.040	4.8	LOS A	0.2	1.3	0.30	0.54	0.30	45.6
9	R2	12	0.0	0.040	7.3	LOS A	0.2	1.3	0.30	0.54	0.30	44.4
Approach		44	0.0	0.040	5.5	LOS A	0.2	1.3	0.30	0.54	0.30	45.4
West: Garswood Road												
10	L2	8	0.0	0.103	4.1	LOS A	0.5	3.5	0.07	0.43	0.07	45.3
11	T1	142	0.0	0.103	3.8	LOS A	0.5	3.5	0.07	0.43	0.07	46.1
Approach		151	0.0	0.103	3.8	LOS A	0.5	3.5	0.07	0.43	0.07	46.1
All Vehicles		260	0.0	0.103	4.2	LOS A	0.5	3.5	0.11	0.46	0.11	45.9

Table A2: Weekday roundabout intersection of Garswood Road with South Street AM Peak Hour

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: The Northern Road												
1	L2	137	0.0	0.074	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	1577	0.0	0.404	2.0	LOS A	0.0	0.0	0.00	0.31	0.00	76.2
Approach		1714	0.0	0.404	2.3	NA	0.0	0.0	0.00	0.32	0.00	72.5
North: The Northern Road												
8	T1	1685	0.0	0.432	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach		1685	0.0	0.432	0.1	NA	0.0	0.0	0.00	0.00	0.00	79.8
West: Garswood Road												
10	L2	68	0.0	0.170	16.5	LOS B	0.6	4.0	0.71	1.00	0.71	48.8
Approach		68	0.0	0.170	16.5	LOS B	0.6	4.0	0.71	1.00	0.71	48.8
All Vehicles		3467	0.0	0.432	1.5	NA	0.6	4.0	0.01	0.18	0.01	75.1

Table A3: Weekday Stop intersection of The Northern Road with Garswood Road PM Peak Hour

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Garswood Road												
5	T1	109	0.0	0.089	3.7	LOS A	0.4	3.1	0.04	0.49	0.04	45.8
6	R2	29	0.0	0.089	6.6	LOS A	0.4	3.1	0.04	0.49	0.04	46.8
Approach		139	0.0	0.089	4.3	LOS A	0.4	3.1	0.04	0.49	0.04	46.0
North: South Street												
7	L2	14	0.0	0.015	4.4	LOS A	0.1	0.5	0.17	0.52	0.17	45.9
9	R2	4	0.0	0.015	6.9	LOS A	0.1	0.5	0.17	0.52	0.17	44.8
Approach		18	0.0	0.015	4.9	LOS A	0.1	0.5	0.17	0.52	0.17	45.7
West: Garswood Road												
10	L2	13	0.0	0.052	4.2	LOS A	0.2	1.7	0.12	0.44	0.12	45.0
11	T1	54	0.0	0.052	3.9	LOS A	0.2	1.7	0.12	0.44	0.12	45.9
Approach		66	0.0	0.052	3.9	LOS A	0.2	1.7	0.12	0.44	0.12	45.7
All Vehicles		223	0.0	0.089	4.3	LOS A	0.4	3.1	0.07	0.48	0.07	45.9

Table A4: Weekday roundabout intersection of Garswood Road with South Street PM Peak Hour

APPENDIX B

SIDRA Intersection Results for Developed Childcare Traffic Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: The Northern Road												
1	L2	98	0.0	0.053	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	1615	0.0	0.414	2.1	LOS A	0.0	0.0	0.00	0.31	0.00	76.2
Approach		1713	0.0	0.414	2.2	NA	0.0	0.0	0.00	0.32	0.00	73.6
North: The Northern Road												
8	T1	1500	0.0	0.385	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach		1500	0.0	0.385	0.1	NA	0.0	0.0	0.00	0.00	0.00	79.8
West: Garswood Road												
10	L2	214	0.0	0.553	21.8	LOS B	2.8	19.4	0.82	1.11	1.32	45.7
Approach		214	0.0	0.553	21.8	LOS B	2.8	19.4	0.82	1.11	1.32	45.7
All Vehicles		3426	0.0	0.553	2.5	NA	2.8	19.4	0.05	0.23	0.08	73.3

Table B1: Weekday Stop intersection of The Northern Road with Garswood Road AM Peak Hour with Childcare Traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Garswood Road												
5	T1	95	0.0	0.074	3.8	LOS A	0.4	2.7	0.07	0.46	0.07	45.9
6	R2	12	0.0	0.074	6.7	LOS A	0.4	2.7	0.07	0.46	0.07	46.8
Approach		106	0.0	0.074	4.1	LOS A	0.4	2.7	0.07	0.46	0.07	46.0
North: South Street												
7	L2	33	0.0	0.042	5.1	LOS A	0.2	1.4	0.34	0.55	0.34	45.5
9	R2	12	0.0	0.042	7.6	LOS A	0.2	1.4	0.34	0.55	0.34	44.3
Approach		44	0.0	0.042	5.7	LOS A	0.2	1.4	0.34	0.55	0.34	45.3
West: Garswood Road												
10	L2	8	0.0	0.130	4.1	LOS A	0.7	4.6	0.07	0.43	0.07	45.3
11	T1	184	0.0	0.130	3.8	LOS A	0.7	4.6	0.07	0.43	0.07	46.1
Approach		193	0.0	0.130	3.8	LOS A	0.7	4.6	0.07	0.43	0.07	46.1
All Vehicles		343	0.0	0.130	4.1	LOS A	0.7	4.6	0.11	0.46	0.11	45.9

Table B2: Weekday Roundabout intersection of Garswood Road with South Street AM Peak Hour with Childcare Traffic

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: The Northern Road												
1	L2	174	0.0	0.094	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	1577	0.0	0.404	2.0	LOS A	0.0	0.0	0.00	0.31	0.00	76.2
Approach		1751	0.0	0.404	2.3	NA	0.0	0.0	0.00	0.33	0.00	71.7
North: The Northern Road												
8	T1	1685	0.0	0.432	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach		1685	0.0	0.432	0.1	NA	0.0	0.0	0.00	0.00	0.00	79.8
West: Garswood Road												
10	L2	105	0.0	0.262	17.5	LOS B	1.0	6.8	0.73	1.02	0.83	48.2
Approach		105	0.0	0.262	17.5	LOS B	1.0	6.8	0.73	1.02	0.83	48.2
All Vehicles		3541	0.0	0.432	1.7	NA	1.0	6.8	0.02	0.19	0.02	74.2

Table B3: Weekday Stop intersection of The Northern Road with Garswood Road PM Peak Hour with Childcare Traffic

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Garswood Road												
5	T1	145	0.0	0.111	3.7	LOS A	0.6	4.1	0.04	0.48	0.04	45.9
6	R2	29	0.0	0.111	6.6	LOS A	0.6	4.1	0.04	0.48	0.04	46.8
Approach		175	0.0	0.111	4.2	LOS A	0.6	4.1	0.04	0.48	0.04	46.1
North: South Street												
7	L2	14	0.0	0.015	4.5	LOS A	0.1	0.5	0.23	0.52	0.23	45.8
9	R2	4	0.0	0.015	7.0	LOS A	0.1	0.5	0.23	0.52	0.23	44.6
Approach		18	0.0	0.015	5.1	LOS A	0.1	0.5	0.23	0.52	0.23	45.6
West: Garswood Road												
10	L2	13	0.0	0.077	4.2	LOS A	0.4	2.6	0.12	0.44	0.12	45.1
11	T1	89	0.0	0.077	3.9	LOS A	0.4	2.6	0.12	0.44	0.12	45.9
Approach		102	0.0	0.077	3.9	LOS A	0.4	2.6	0.12	0.44	0.12	45.8
All Vehicles		295	0.0	0.111	4.2	LOS A	0.6	4.1	0.08	0.47	0.08	45.9

Table B4: Weekday roundabout intersection of Garswood Road with South Street PM Peak Hour with Childcare Traffic