TRAFFIC ASSESSMENT REPORT

Proposed Childcare Centre

16 Chapman Street, Werrington NOV 2021

ARCHIDROME

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TRAFFIC AND PARKING IMPACT ASSESSMENT

Proposed Childcare Centre

16 Chapman Street, Werrington

Prepared for: ARCHIDROME

N216480A (Report 1B)

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1. INTRODUCTION

Motion Traffic Engineers was commissioned by ARCHIDROME to undertake a traffic and parking impact assessment of a Childcare Centre at 16 Chapman Street in Werrington. The childcare

The proposed childcare centre is located in a residential sub-division that is approved but the internal roads are not yet completed and nor are the property lots occupied.

This traffic report presents an assessment of the anticipated transport implications of the proposed childcare centre, with the following considerations:

- Background and existing traffic and parking conditions of the proposed childcare centre
- Assessment of the public transport network within the vicinity of the site
- Adequacy of car, bicycle and motorcycle parking provision
- The projected traffic generation of the proposed development and;
- The transport impact of the proposed development on the surrounding road network.

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 in a not yet completed residential sub-division. The sub-division is is located north east of Western Sydney University - Werrington North and south west of Werrington Station.

Figure 3a presents a photograph of the childcare site from Chapman Street and show the residential sub-division to be built.

Figure 1: Location of the Childcare centre site on Aerial

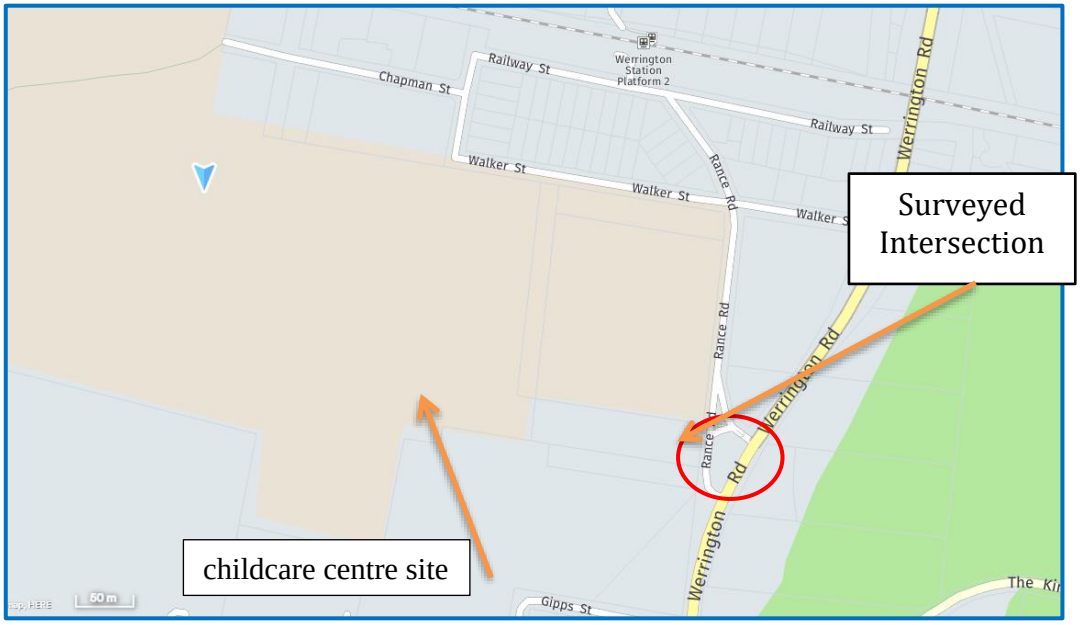

Figure 2: Street Map of the Location of the Childcare centre Site

Figure 3a: Photograph of the Childcare Centre site from Chapman Street

2.2 Road Network

This section describes the roads near the Childcare centre site

Werrington Road is a major collector road with one lane each way with double barrier centrelines separating the opposing traffic lanes. The sign posted speed limit of this road is 60 km/hr. On-street parking is prohibited on both sides of the road. Part of the road is subjected to school zone speed limit of 40 km/hr. Figure 4a and 4b show photographs of Werrington Road.

Rance Road is a local road with one lane each way. The default posted speed limit is 50km/hr. Time unrestricted on-street parking is permitted on both sides of the road. Figure 4c and 4d presents a photograph of Rance Road

Walker Street is a local road with one lane each way. The default posted speed limit is 50km/hr. On-street parking is permitted on both sides of the road. Walker Street is connected to Rance road from the north approach of the road. Figure 4e and 4f presents a photograph of Walker Street.

Chapman Street is a local road with one lane each way and ends in a cul-de-sac to the west. . The default posted speed limit is 50km/hr. Chapman Street is connected to Walker Street from the East-south approach. On-street parking is permitted on both sides of the road. Figure 4g presents a photograph of Chapman Street

Figure 4a: Werrington Road looking south from Rance Road

Figure 4b: Werrington Road looking north from the Rance Road

Figure 4e: Rance Road looking North from Werrington Road

Figure 4f: Rance Road looking south from walker Street

Figure 4c: Walker Street

Figure 4d: Chapman Street

2.3 Public transport

Werrington Train Station is approximately 800 meters away from the proposed site. Werrington train Station is serviced by T1 train, The route passes through a number of business districts and major centres, namely Hornsby, Chatswood, North Sydney, the Central Business District, Parramatta, Blacktown and Penrith. There are bus services to the north of the train station.

Overall, the site has excellent access to the local public transport network for commuters needing childcare as well as staff.

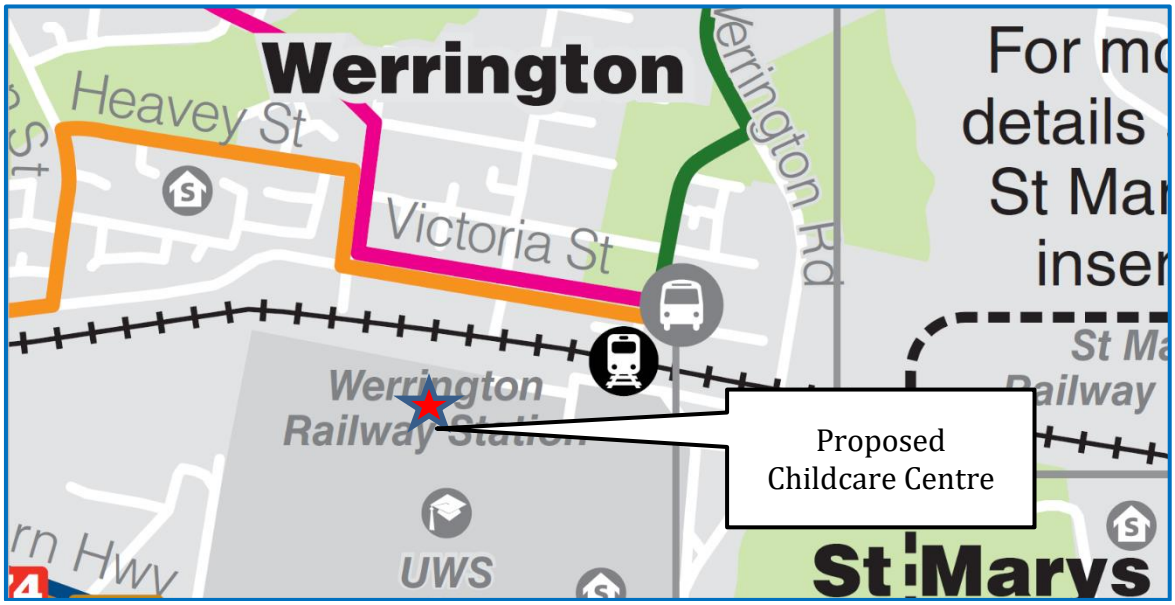

Figure 5: Location of the proposed Childcare Centre site in Relation to the Public Transport

2.4 Public Parking

On-street parking will be available on Chapman Street (when the road is fully built) where parking is time unrestricted on both sides of the road. Chapman Street is a residential street and when occupied by dwellings, it is expected there be vacant car spaces on-street since the residential dwellings have on-site parking and do not necessarily need to park on-street.

These vacant on-street parking spaces can be utilised by visitors should any additional visitor parking demand arises.

2.5 Intersection Description

As part of the traffic impact assessment, the performance of the nearby intersection was surveyed and assessed:

- Priority intersection of Werrington Road with Rance Road

The priority intersection of Werrington Road with Rance Road is a three-leg intersection with all turn movements permitted. A short right and a left turn lanes are provided for vehicles on Werrington Road turning right or left into Rance Road. Drivers on Rance Road need to give a way to vehicles on Werrington Road. Rance Road approach and exit intersection arms are separated by a median island.

Figure 6a presents the layout of the intersection using SIDRA – an industry standard intersection software. Figure 6b presents an aerial view of this intersection. The number on the lane represents

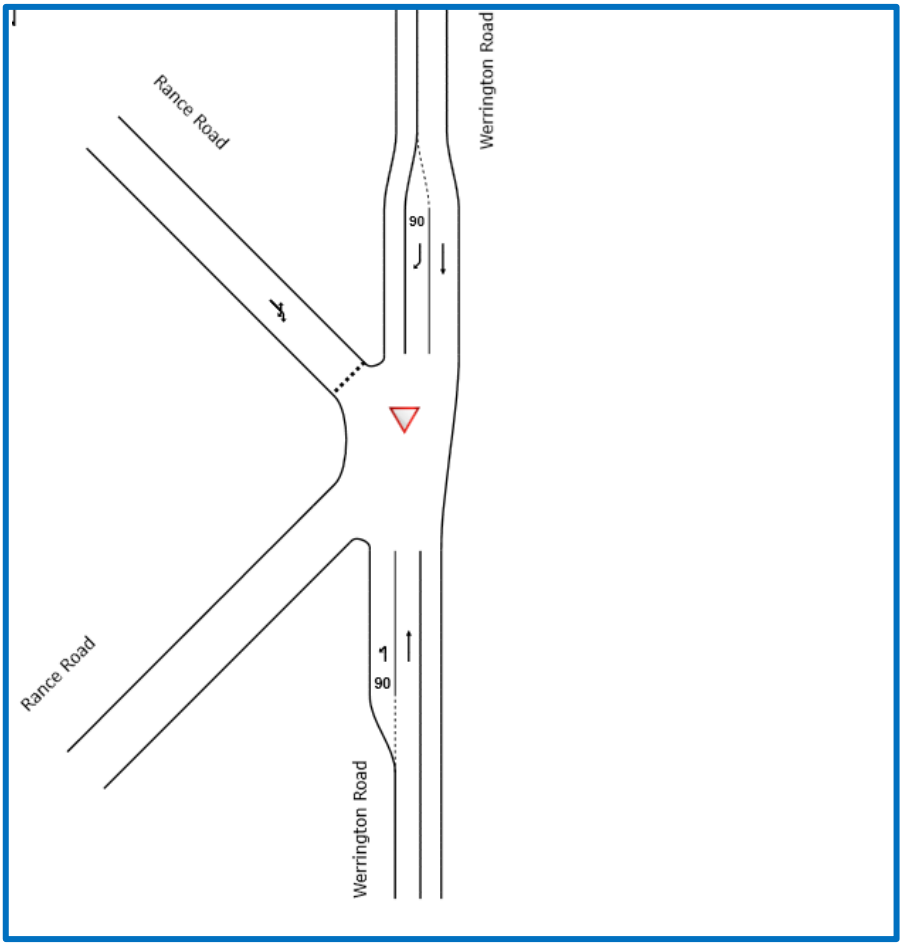

Figure 6a: Priority intersection of Werrington Road with Rance Road (SIDRA)

Figure 6b: Priority intersection of Werrington Road with Rance Road (Aerial View)

2.6 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the two intersections for the weekday AM and PM period. The AM peak hour is 8am to 9am and the PM peak hour is 5:00 to 6:00. The traffic surveys were undertaken on November 2021.

The following Figures presents the traffic volumes in vehicles for the weekday AM peak hour.

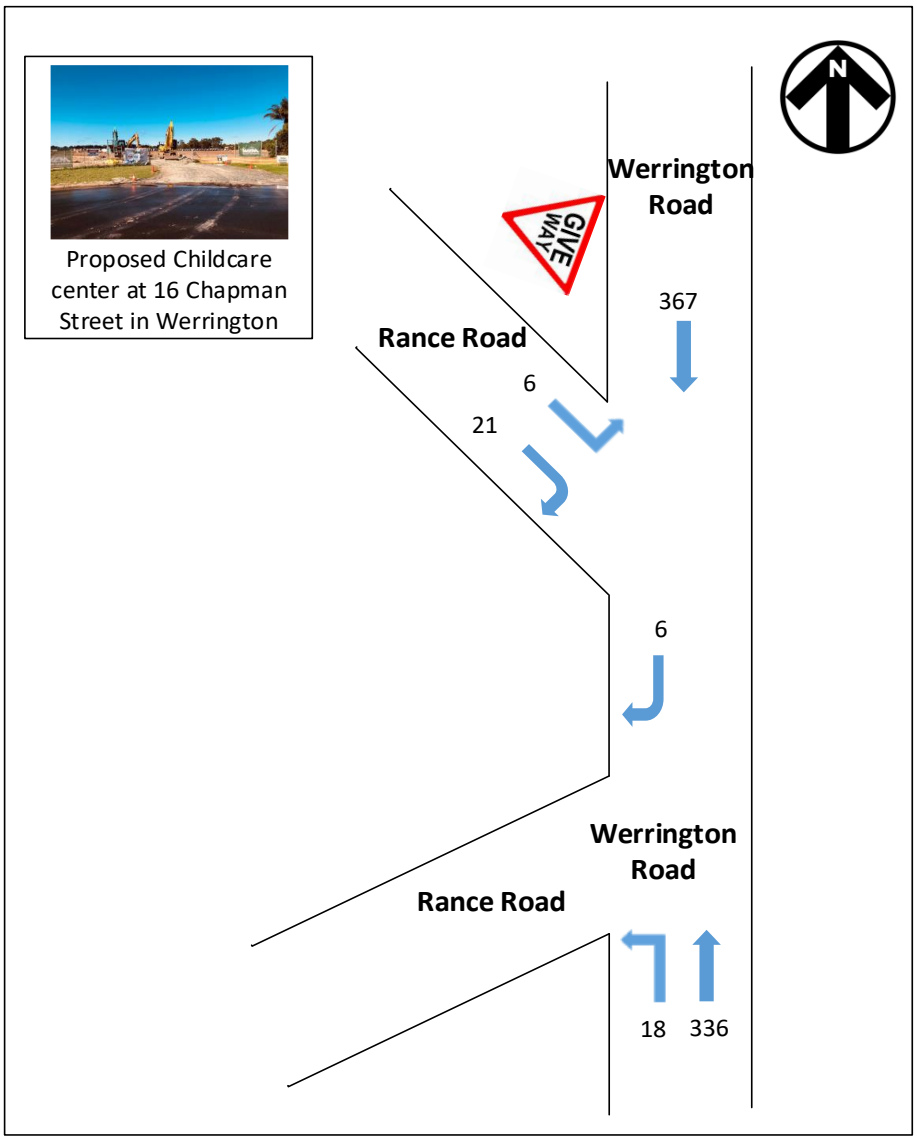

Figure 7: Existing Weekday Traffic Volumes AM Peak Hour

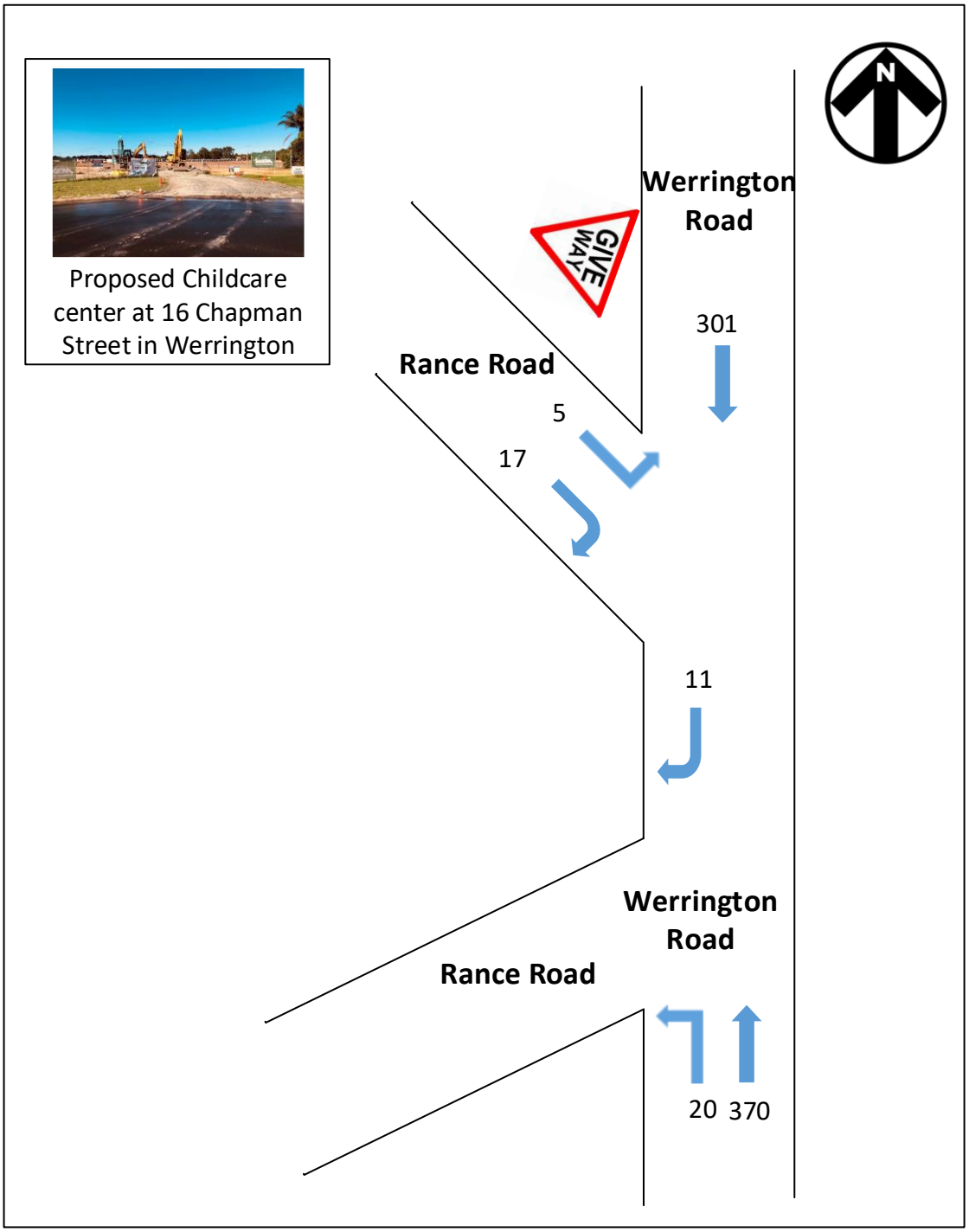

Figure 8: Existing Weekday Traffic Volumes PM Peak Hour

2.7 Intersection Assessment with Existing Traffic

An intersection assessment has been undertaken for:

- Priority intersection of Werrington Road with Rance Road

The existing intersection operating performance was assessed using the SIDRA software package (version 9) 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:

Intersection/ Performance criteria	AM Peak Hour Existing	PM Peak Hour Existing
Werrington Road / Rance Road		
LoS	A (worst case)	A (worst case)
AVD	0.6	0.6
DS	0.19	0.19

Table 3: Existing Intersection Performances

As presented in Table 3, both intersections are currently overall operating at excellent condition with spare capacity to accommodate additional traffic both AM and PM peak hours.

The full intersection assessment are presented in Appendix A.

2.8 Conclusions on the Existing Conditions

The proposed Childcare centre is in a residential area with suitable on-street parking along Chapman Street.

The nearby intersections have spare capacity to accommodate additional traffic.

The site has excellent access to public transport.

3. PROPOSED CHILDCARE CENTRE

The Childcare centre will accommodate 116 children in total and 16 staff.

The car park is on the basement level with vehicle access and egress via driveways runs off another residential road (not Chapman Road) and at the cul-de-sac end.

Thirty-seven car spaces will be provided on the basement level:

- 17 car spaces for staff including one disabled car space
- 20 car spaces for visitors including two disable car park spaces
- A total of 37 car spaces are provided

The Child Care Centre will cater for children ranging from 0-5 years old.

A full scaled plan of the proposed childcare is provided as part of the Development Application.

4. PARKING REQUIREMENTS

4.1 Car Parking

The car parking requirements for a Childcare are presented in *Penrith Council's Development Control Plan 2015* with the car parking rates as follows as it applies to the proposed childcare cente:

- 1 space per 10 children
- 1 space per employee

The Childcare centre will accommodate 116 children and 16 staff. Table 4 summarises the car parking requirements for the Childcare centre The Childcare centre complies with council's car parking requirements.

	Number	Car Parking Rate	Car Spaces Required	Car Spaces Provided
Staff	16	1 space per staff	16	16
Children	116	1 space per 10 children	12	20
		Total	28	36

Table 4a: Summary of DCP Car Parking Requirements

4.2 Accessible parking

Penrith Council's Development Control Plan 2014 does not outline the requirements for accessible parking. There are two visitor accessible car spaces and one accessible car space for staff.

4.3 Traffic management plan

A traffic management plan will be implemented to encourage staff to use public bus services, car share, cycle or walk.

4.4 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. TRAFFIC GENERATION AND IMPACT

5.1 Proposed Traffic Generation

The *NSW RTA Guide to Traffic Generating Developments* outlines the trip generation rates for a Childcare centre as follows.

- 0.8 trips per child for the AM peak hour
- 0.7 trips per child for the PM peak hour

Application of the above-mentioned rates to the proposed childcare centre results the peak hour trip generation presented in Table 5 below:. The childcare centre is a moderately high trip generator.

Peak Hour	Land Use	Number of Children	Trip Generation Rate	Trip Generated
AM	Childcare Centre	116	0.8	93
PM			0.7	83

Table 5: Trips generated by the increase in Childcare Children t in weekday peak hours

5.2 Trip Distribution

The proposed childcare Centre is a moderately high trip generator in both AM and PM peak hours

The predicted Childcare development trips are distributed to the road network assuming 50% origin trips 50% destination trips for the AM peak hour and 50% origin trips 50% destination trips for the PM peak hour, which results the following trips:

- AM peak hour: 46 origin trips and 47 destination trips
- PM peak hour: 41 origin trips and 42 destination trips

5.3 Future Traffic Volume

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

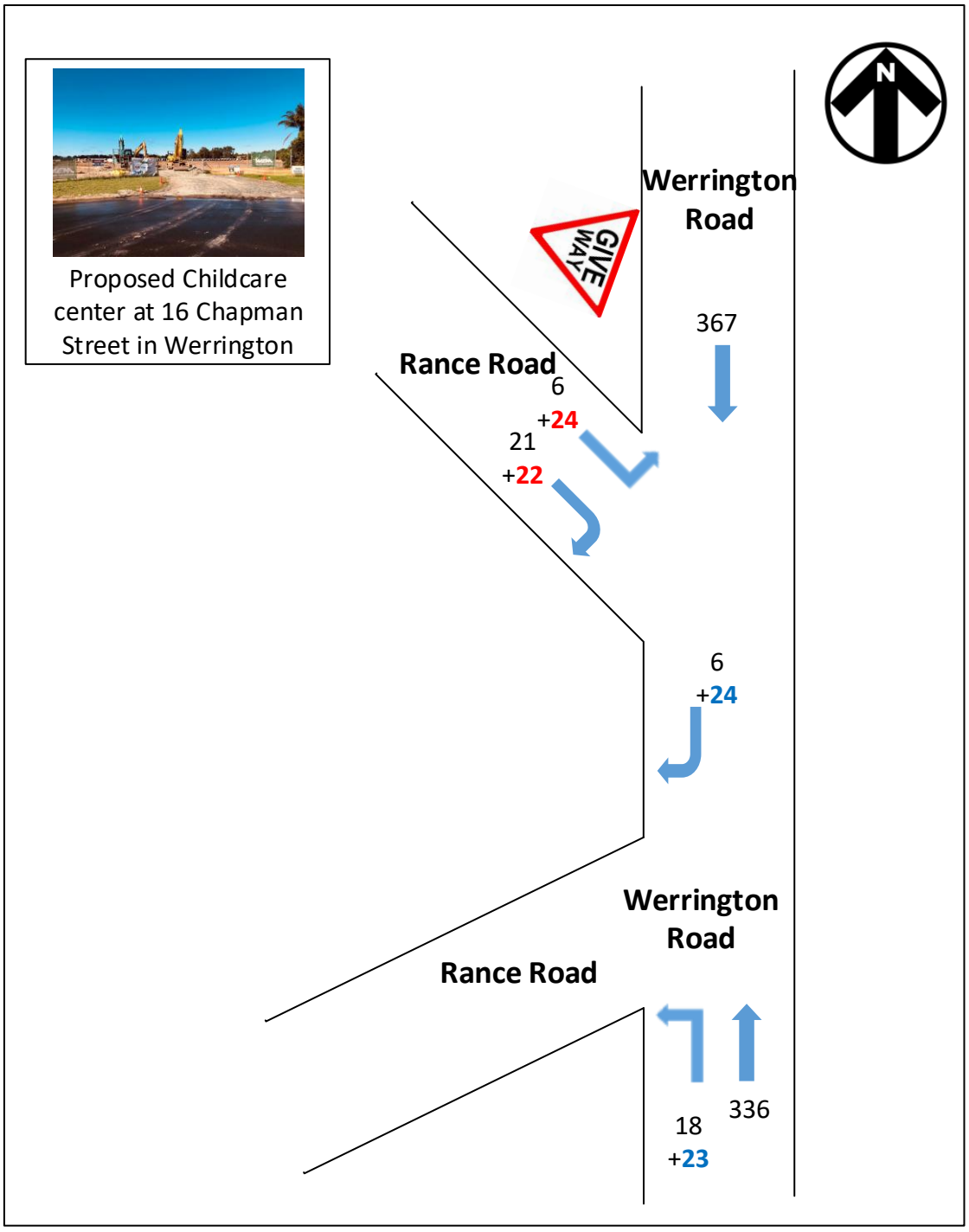

Figure 10: Weekday AM Peak Hour Traffic Volumes with childcare traffic (Development Origin Trips in Red and Destination Trips in Blue)

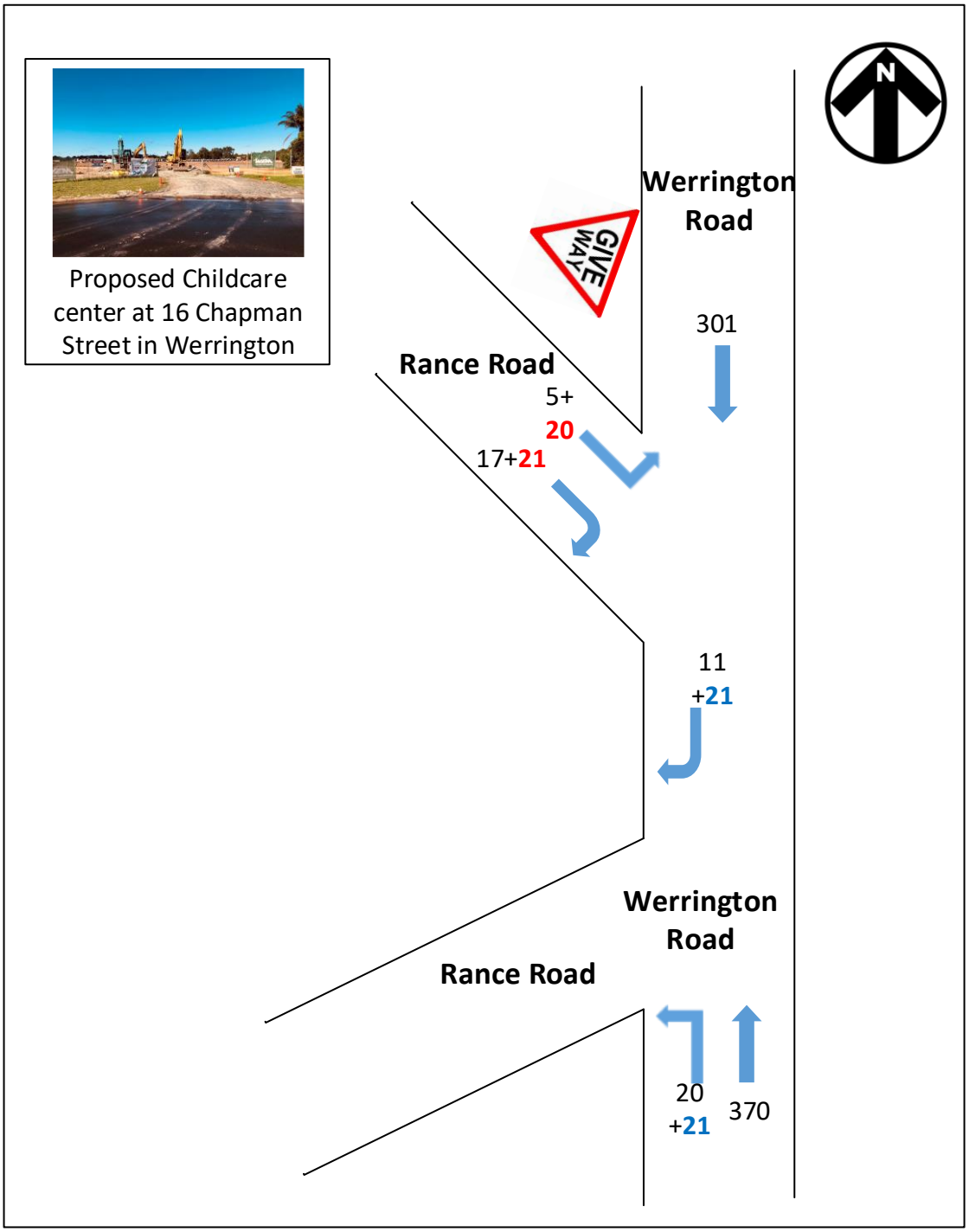

Figure 11: Weekday PM Peak Hour Traffic Volumes with childcare traffic (Development Origin Trips in Red and Destination Trips in Blue)

5.4 Traffic Impact

This section assesses the following intersections for the existing traffic with the Childcare Centre traffic. The results of the intersection assessment are as follows:

Intersection/ Performance criteria	Performance with Existing Traffic		Projected Performance with Existing and Childcare Centre traffic	
	AM Peak Hour Existing	PM Peak Hour Existing	AM Peak Hour Projected	PM Peak Hour Projected
Werrington Road / Rance Road *LoS* *AVD* *DS*	 A (worst case) 0.6 0.19	 A (worst case) 0.6 0.19	 A (worst case) 1.5 0.19	 A (worst case) 1.3 0.19

Table 7: Projected intersection performance with Childcare Centre traffic

As presented in Table 7 above, the childcare trips generated by the proposed Childcare centre have minimum impact on the intersection performances in both AM and PM peak hours. The LoS, AVD and DS of each intersection are not significantly affected by the addition of Childcare Centre traffic.

The traffic impacts of the proposed childcare are therefore considered acceptable.

The full SIDRA results are presented in Appendix B for the future conditions with the Childcare Centre traffic.

6. CONCLUSIONS

This traffic impact assessment reports relates to a proposed childcare Centre at 316 Chapman Street in Werrington. Based on the analysis and discussions presented in this report, the following conclusions are made:

- The Childcare Centre site is located in a *Low Density Residential (R2) Zone* with a good access to local public transport service. Vacant on-street parking spaces can be located on Chapman Street nearby (when the sub-division roads are completed)
- The surrounding intersection currently operates at acceptable Level of Service
- The proposed childcare overall complies with council's car parking requirements
- The childcare is expected to generate a moderate-high number of additional trips in both AM and PM peak hours.
- According to the intersection assessment, the additional trips can be accommodated in the nearby intersections without significantly affecting the performance of any turn movement, approach arm or the overall intersection. The traffic impacts of the proposed childcare are therefore considered acceptable.

  There are no traffic engineering reasons why a development consent for the proposed Childcare Centre at *316 Chapman Street in Werrington* should be refused

APPENDIX A

INTERSECTION ASSESSMENT FOR EXISTING TRAFFIC

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Werrington Road														
1b	L3	18	0	19	0.0	0.011	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	46.5
2	T1	336	0	354	0.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		354	0	373	0.0	0.175	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
North: Werrington Road														
8	T1	367	0	386	0.0	0.185	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9a	R1	6	0	6	0.0	0.006	5.9	LOS A	0.0	0.2	0.41	0.52	0.41	53.9
Approach		373	0	393	0.0	0.185	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.8
NorthWest: Rance Road														
27b	L3	6	0	6	0.0	0.066	7.0	LOS A	0.2	1.6	0.22	0.56	0.22	43.7
29a	R1	15	0	16	0.0	0.066	13.9	LOS A	0.2	1.6	0.22	0.56	0.22	43.8
29	R2	6	0	6	0.0	0.066	4.8	LOS A	0.2	1.6	0.22	0.56	0.22	43.0
Approach		27	0	28	0.0	0.066	10.3	LOS A	0.2	1.6	0.22	0.56	0.22	43.6
All Vehicles		754	0	794	0.0	0.185	0.6	NA	0.2	1.6	0.01	0.04	0.01	54.0

Table A1: Weekday Priority Intersection Performance of Werrington Road with Rance Road AM Peak Hour

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Werrington Road														
1b	L3	20	0	21	0.0	0.013	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	46.5
2	T1	370	0	389	0.0	0.193	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		390	0	411	0.0	0.193	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
North: Werrington Road														
8	T1	301	0	317	0.0	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9a	R1	11	0	12	0.0	0.012	6.1	LOS A	0.0	0.3	0.44	0.55	0.44	53.8
Approach		312	0	328	0.0	0.151	0.2	NA	0.0	0.3	0.02	0.02	0.02	59.7
NorthWest: Rance Road														
27b	L3	5	0	5	0.0	0.064	7.2	LOS A	0.2	1.6	0.50	0.69	0.50	43.1
29a	R1	17	0	18	0.0	0.064	13.1	LOS A	0.2	1.6	0.50	0.69	0.50	43.2
29	R2	1	0	1	0.0	0.064	4.9	LOS A	0.2	1.6	0.50	0.69	0.50	42.4
Approach		23	0	24	0.0	0.064	11.5	LOS A	0.2	1.6	0.50	0.69	0.50	43.2
All Vehicles		725	0	763	0.0	0.193	0.6	NA	0.2	1.6	0.02	0.05	0.02	53.3

Table A1: Weekday Priority Intersection Performance of Werrington Road with Rance Road AM Peak Hour

APPENDIX B

INTERSECTION ASSESSMENT OF EXISTING WITH CHILDCARE CENTRE TRAFFIC

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Werrington Road														
1b	L3	43	0	45	0.0	0.027	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	46.5
2	T1	336	0	354	0.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		379	0	399	0.0	0.175	0.7	NA	0.0	0.0	0.00	0.06	0.00	49.5
North: Werrington Road														
8	T1	367	0	386	0.0	0.186	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9a	R1	32	0	34	0.0	0.035	6.1	LOS A	0.1	0.9	0.44	0.58	0.44	53.8
Approach		399	0	420	0.0	0.186	0.5	NA	0.1	0.9	0.03	0.05	0.03	59.4
NorthWest: Rance Road														
27b	L3	32	0	34	0.0	0.176	7.1	LOS A	0.6	4.4	0.51	0.70	0.51	43.4
29a	R1	36	0	38	0.0	0.176	15.4	LOS B	0.6	4.4	0.51	0.70	0.51	43.5
29	R2	6	0	6	0.0	0.176	5.3	LOS A	0.6	4.4	0.51	0.70	0.51	42.7
Approach		74	0	78	0.0	0.176	11.0	LOS A	0.6	4.4	0.51	0.70	0.51	43.4
All Vehicles		852	0	897	0.0	0.186	1.5	NA	0.6	4.4	0.06	0.11	0.06	53.0

Table B1: Weekday Priority Intersection Performance of Werrington Road with Rance Road AM Peak Hour with Childcare Traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Werrington Road														
1b	L3	41	0	43	0.0	0.026	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	46.5
2	T1	370	0	389	0.0	0.193	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		411	0	433	0.0	0.193	0.6	NA	0.0	0.0	0.00	0.06	0.00	49.6
North: Werrington Road														
8	T1	301	0	317	0.0	0.153	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9a	R1	32	0	34	0.0	0.037	6.3	LOS A	0.1	1.0	0.46	0.59	0.46	53.7
Approach		333	0	351	0.0	0.153	0.6	NA	0.1	1.0	0.04	0.06	0.04	59.3
NorthWest: Rance Road														
27b	L3	5	0	5	0.0	0.139	7.2	LOS A	0.5	3.4	0.65	0.79	0.65	42.3
29a	R1	38	0	40	0.0	0.139	14.1	LOS A	0.5	3.4	0.65	0.79	0.65	42.4
29	R2	1	0	1	0.0	0.139	5.2	LOS A	0.5	3.4	0.65	0.79	0.65	41.7
Approach		44	0	46	0.0	0.139	13.1	LOS A	0.5	3.4	0.65	0.79	0.65	42.4
All Vehicles		788	0	829	0.0	0.193	1.3	NA	0.5	3.4	0.05	0.10	0.05	52.7

Table B2: Weekday Priority Intersection Performance of Werrington Road with Rance Road AM Peak Hour with Childcare Traffic