



67-73 St Hilliers Road, Auburn Planning Proposal Transport Impact Assessment

Client // Community First Credit Union
Office // NSW
Reference // 16S1051000
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67-73 St Hilliers Road, Auburn

Planning Proposal

Transport Impact Assessment

Issue: A 23/02/16

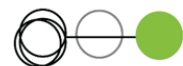
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1. Introduction

1.1 Background

It is understood that a Planning Proposal is to be lodged with Auburn Council to amend the existing planning controls for the site located at 67 St Hilliers Road in Auburn.

The Planning Proposal seeks to allow additional permitted land uses for the site, including office, child care, education facility and community facility uses, which are currently prohibited under the General Industrial Zone (IN1).

It is not specifically proposed to construct any new building on the site but rather accommodate the additional land uses within the existing building (approximately 2,800sqm).

GTA Consultants was commissioned by Community First Credit Union in August 2015 to undertake a transport impact assessment for the proposed development.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- i existing traffic and parking conditions surrounding the site
- ii suitability of the proposed parking in terms of supply (quantum)
- iii pedestrian and bicycle requirements
- iv the traffic generating characteristics of the proposed development
- v the transport impact of the development proposal on the surrounding road network.

1.3 References

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

- o an inspection of the site and its surrounds
- o Auburn Council Development Control Plan (DCP) 2010
- o RMS Guide to Traffic Generating Developments October 2002
- o RMS Guide to Traffic Generating Developments – Technical Direction August 2013
- o Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- o traffic and car parking surveys undertaken by GTA Consultants as referenced in the context of this report
- o other documents and data as referenced in this report.

2. Existing Conditions

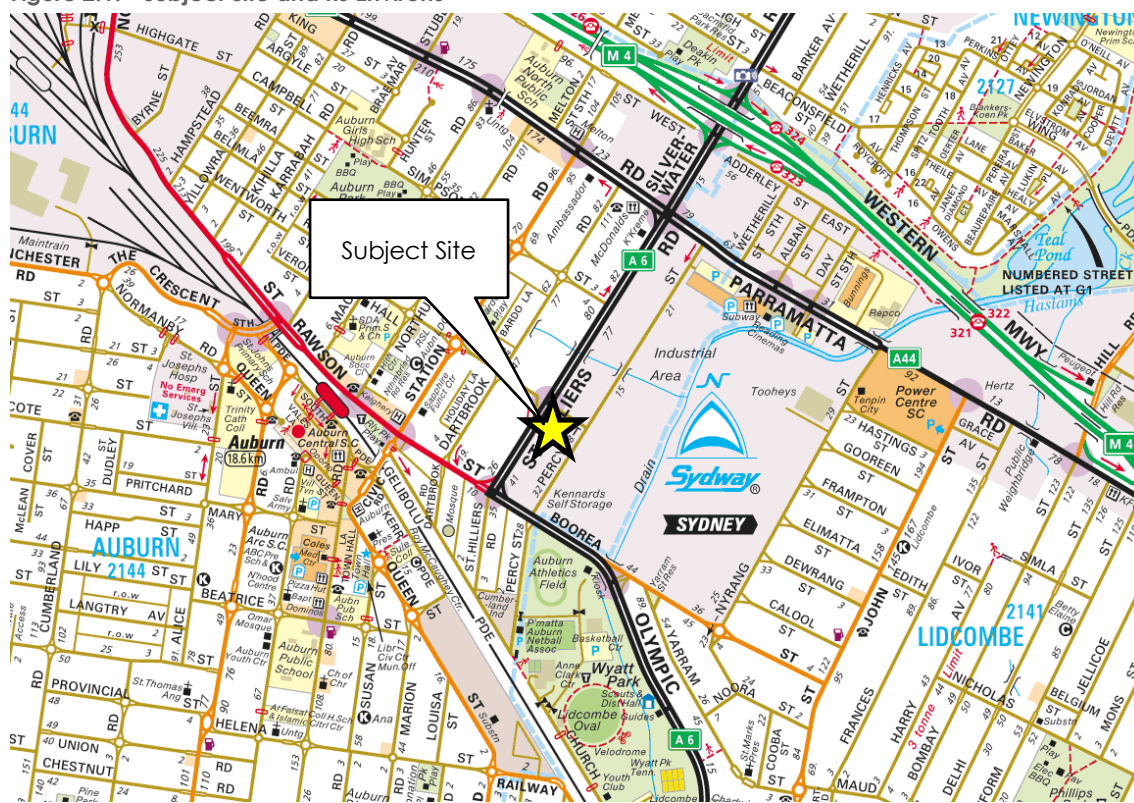
2.1 Subject Site

The subject site is located at 67-73 St Hilliers Road in Auburn. The site of approximately 2,800sqm has a frontage of 30m to St Hilliers Road, 30m to Percy Street and 95m to Hall Street. The site currently has a land use classification as General Industrial Zone (IN1) and is occupied by a three level office building.

The surrounding properties predominantly include industrial and residential uses. Auburn Town Centre is located approximately 700m to the west of the site.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and Its Environs



Basemap source: Sydway Publishing Pty Ltd

2.2 Road Network

2.2.1 Adjoining Roads

St Hilliers Road

St Hilliers Road is a classified State Road (RMS controlled) and in the vicinity of the site is aligned in a north-south direction. It is a two-way road configured with a six-lane, 25 metre wide divided carriageway, set within a 32 metre wide road reserve (approx).

St Hilliers Road is shown in Figure 2.2 and Figure 2.3 and carries approximately 46,775 vehicles per day¹.

Figure 2.2: St Hilliers Road (looking North)



Figure 2.3: St Hilliers Road (looking South)



Hall Street

Hall Street is classified as a local road and in the vicinity of the site is aligned in an east-west direction. It is a two-way road configured with a two-lane, 12 metre wide carriageway, set within a 27 metre wide road reserve (approx). Unrestricted kerbside parking is permitted on both sides of Hall Street in the vicinity of the subject site.

Hall Street is shown in Figure 2.4 and Figure 2.5 and carries approximately 4,400 vehicles per day¹.

Figure 2.4: Hall Street (looking East)



Figure 2.5: Hall Street (looking West)



Percy Street

Percy Street is classified as a local road and in the vicinity of the site is aligned in a north-south direction. It is a two-way road configured with a two-lane, 12 metre wide carriageway, set within a 30 metre wide road reserve (approx). Unrestricted kerbside parking is permitted along both sides of Percy Street in the vicinity of the subject site. Vehicle access to the existing site is provided from Percy Street.

Percy Street is shown in Figure 2.6 and Figure 2.7.

¹ Based on the peak hour traffic counts undertaken by GTA in August 2015 and assuming a peak-to-daily ratio of 10%

Figure 2.6: Percy Street (looking North)



Figure 2.7: Percy Street (looking South)



2.3 Traffic Volumes

GTA Consultants undertook traffic movement counts at the St Hilliers Road/ Hall Street intersection on 18 August 2015 during the following peak periods:

- 8:00am and 9:00am
- 5:00pm and 6:00pm.

The AM and PM peak hour traffic volumes are summarised in Figure 2.8 and Figure 2.9.

Figure 2.8: Existing AM Peak Hour Traffic Volumes

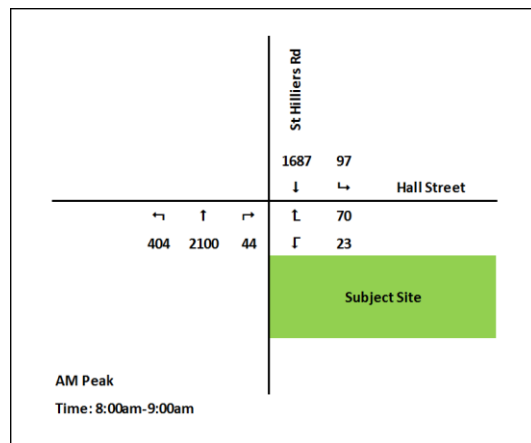
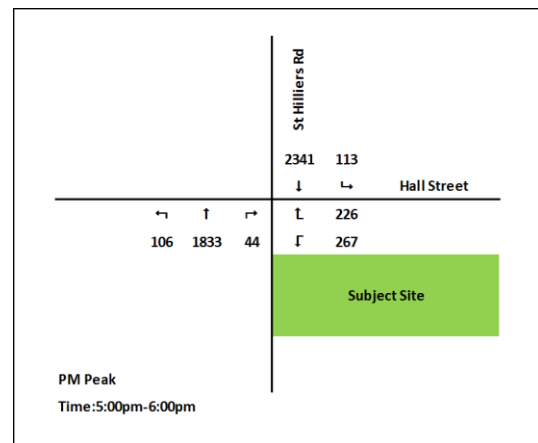


Figure 2.9: Existing PM Peak Hour Traffic Volumes



2.4 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION², a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RMS, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

² Program used under license from Akcelik & Associates Pty Ltd.

Table 2.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.1: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
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	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 presents a summary of the existing operation of the intersection, with full results presented in Appendix B of this report.

Table 2.2: Existing Operating Conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue	Level of Service (LOS)
St Hilliers Road/ Hall Street	AM	St Hilliers Road (South)	0.57	8 sec	163m	A
		Hall Street (East)	0.25	53 sec	30m	D
		St Hilliers Road (North)	0.55	16 sec	168m	B
		Intersection	0.57	12 sec	168m	A
	PM	St Hilliers Road (South)	0.52	9 sec	121m	A
		Hall Street (East)	0.81	47 sec	90m	D
		St Hilliers Road (North)	0.81	21 sec	265m	B
		Intersection	0.81	18 sec	265m	B

On the basis of the above assessment, it is evident that whilst the intersection of St Hilliers Road/ Hall Street currently operates satisfactorily.

2.5 Car Parking

2.5.1 Supply

GTA Consultants compiled an inventory of publicly available on-street car parking within approximately 200m of the subject site. The inventory identified a total of 132 unrestricted on-street spaces.

The full inventory is presented in Appendix A of this report.

2.5.2 Demand

Parking demand surveys were undertaken by GTA Consultants within the nominated area throughout a typical weekday (on 18 August 2015 at 8:00am, 9:00am, 10:00am, 4:00pm, 5:00pm and 6:00pm).

The peak results are summarised in Table 2.3 with the full results provided in Appendix A.

Table 2.3: Summary of Peak Public Parking Demand Surveys

Location	Restrictions	Supply (No of spaces)	Peak Demand (Vehicles)		Minimum Vacancies (4:00pm)*
			AM (9:00am)	PM (4:00pm)	
On-street	Unrestricted	132	98	113	19

* Peak demand for whole of study area

Table 2.3 indicates that public on-street car parking demands in the nominated area are relatively high, with peak demands equal to an occupancy rate of 85% (19 vacancies) for parking in the vicinity of the site.

2.6 Public Transport

A review of the public transport available in the vicinity of the site is summarised in Table 2.4.

Table 2.4: Public Transport Provision

Service	Route #	Route Description	Location of Stop	Distance to Nearest Stop	Frequency On Peak
Bus	909	Parramatta to Bankstown via Harris Park & Auburn	Station Road	300m West	30 minutes peak
Bus	M92	Sutherland to Parramatta	Parramatta Road	500m North	10 minutes peak
Train	n/a	Airport, Inner West & South Line	Auburn Station (Rawson Street)	720m West	6 minutes peak/ 30 minutes off peak
		North Shore, Northern & Western Line			

2.7 Active Transport

2.7.1 Pedestrian Infrastructure

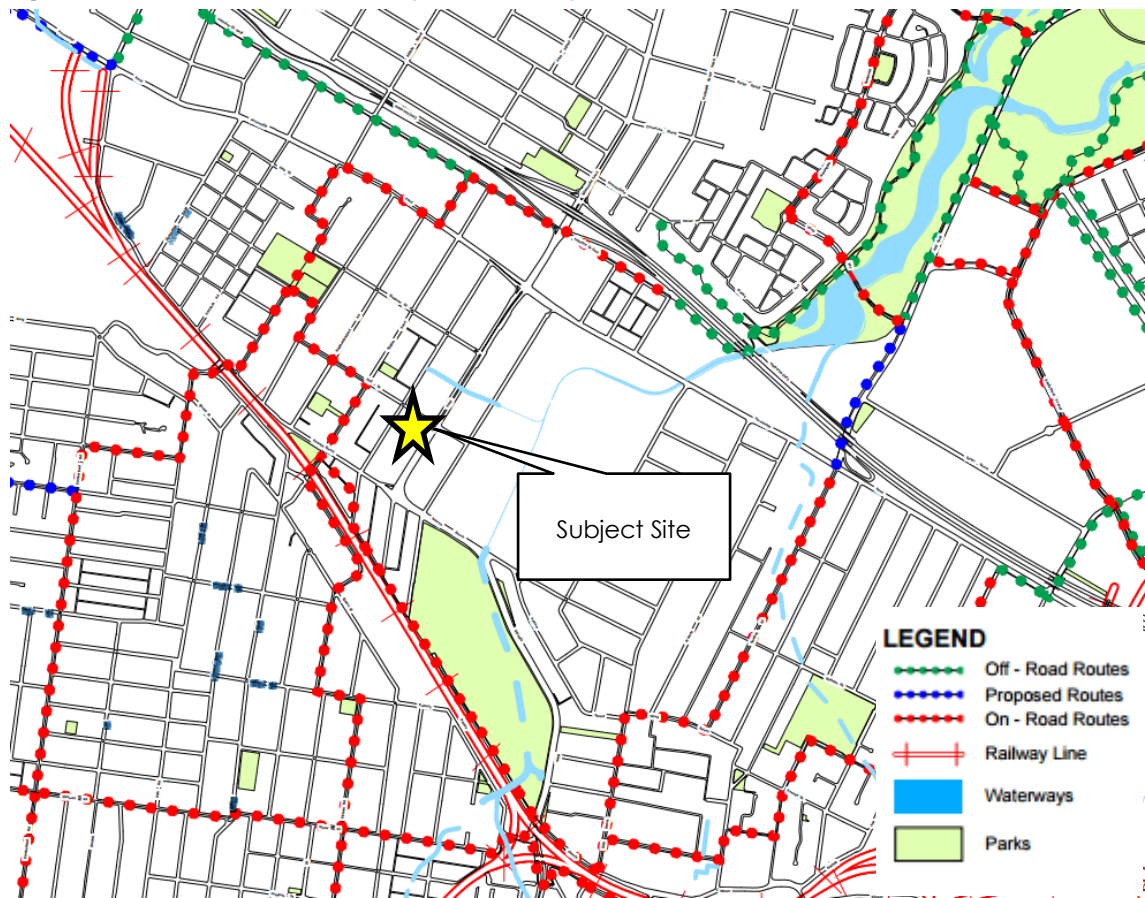
Pedestrian paths are located along both sides of the majority of roads in the vicinity of the site. In addition fully signalised pedestrian crossing opportunities are provided at the intersection of St Hilliers Road and Hall Street and at the intersection of Rawson Street and St Hilliers Road.

The existing pedestrian infrastructure provides a convenient link between the site and Auburn Town Centre (including Auburn railway station).

2.7.2 Cycle Infrastructure

In the vicinity of the site are a range of existing bicycle facilities. These are best illustrated through the Auburn bicycle route map. An extract of the map is presented in Figure 2.10.

Figure 2.10: Extract of the Auburn Bicycle Route Map



Source: Auburn City Council

Based on the Auburn bicycle route map, on-road bicycle lanes are located along Station Road and Rawson Street in the vicinity of the subject site. These bike paths provide connectivity to off-road cycle route along the M4 Western Motorway to the north and the suburb of Lidcombe to the south.

3. Development Proposal

3.1 Land Uses

The Planning Proposal seeks to allow additional permitted uses for the site, including office, child care, education facility and community facility uses, which are currently prohibited under the current General Industrial Zone (IN1).

A preferred development yield has not yet been determined, but rather a number of potential development options. The two development options considered as part of this assessment, as well as the existing site uses, are summarised in Table 3.1.

Table 3.1: Development Schedule (Indicative Land Uses)

Option	Land Use		
	Office	Child Care Centre	Education Facility
Current	2,800sq.m	-	-
Option 1	2,000sq.m	-	800sq.m (40 students and 10 staff)
Option 2	2,000sq.m	800sq.m (50 children & 10 staff)	-

3.2 Vehicle Access and Car Parking

A total of 76 spaces, accessed from Percy Street, are currently provided on-site. It is not proposed to alter the existing vehicle access arrangements to the site. It is understood that approximately 25 spaces are proposed to be allocated to either the child care centre or education facility, with the remaining 51 spaces to be allocated to the office uses.

The suitability of the proposed access arrangements is discussed in Section 4.5 of this report.

4. Car & Bicycle Parking

4.1 Car Parking Requirements

The parking provision objectives detailed in the Auburn Council 'Parking and Loading DCP' are reproduced below:

"a. To promote greater bicycle use, decrease the reliance on private vehicles and encourage alternative, more sustainable modes of transport.

b. To provide convenient and safe access and parking to meet the needs of all residents and visitors.

c. To provide access arrangements which do not impact upon the efficient or safe operation of the surrounding road system.

d. To encourage the integrated design of access and parking facilities to minimise visual and environmental impacts"

The car parking requirements for different development types are set out in Auburn Council's 'Parking and Loading DCP'. A review of the car parking rates and the floor area schedule results in a parking requirement for the proposed development is summarised in Table 4.1.

Table 4.1: DCP Car Parking Requirements

Option	Description	Use	Size	DCP Parking Rate	DCP Parking Requirement
Option 1	Office	Business and office premises	2,000sqm	1 space per 40sqm of GFA	50 spaces
	Education Facility	Tertiary Institutions	800sqm (40 students + 10 staff)	1 space per 6 students + 1 space per 2 staff	12 spaces
Option 1 - Total					62 spaces
Option 2	Office	Business and office premises	2,000sqm	1 space per 40sqm of GFA	50 spaces
	Child Care Centre	Child Care Centres	800sqm (50 students + 10 staff)	1 space per 35sqm or 1 space per four (4) children whichever is greater + drop-off pick-up facility	23 spaces
Option 2 - Total					73 spaces

Based on the above, development Option 1 will generate a requirement to provide 62 car spaces and Option 2 will generate a requirement for 73 car spaces (and a drop-off/ pick-up facility).

4.2 Empirical Assessment of Car Parking Demand

Reference has been made to the Guide to Traffic Generating Developments (RMS, 2002) and the GTA database to determine the likely car parking requirements of the child care centre use.

RMS Guide

The RMS Guide recommends that child care centre car parking be provided at a rate of 1 space per 4 children. This rate includes staff parking requirements as well as pick-up/ drop-off spaces for

parents. The Guide continues to state that “consideration could be given to reducing parking required if convenient and safe on-street parking is available (e.g. indented parking bays), provided that the use of such parking does not adversely affect the amenity of the adjacent area.”

GTA Database

The GTA database includes car parking survey results of 18 child care centres. The data indicates the following peak hour car parking demands:

- Average: 0.19 spaces per child
- 85th Percentile: 0.26 spaces per child

This rate includes staff parking requirements as well as pick-up/ drop-off spaces for parents/ carers.

Summary

Application of the above rates (conservatively using 0.26 spaces per child) indicates a peak car parking demand of 13 spaces for the child care centre use, incorporating staff and pick up/ drop off spaces.

Moreover, it is considered more appropriate to calculate the car parking requirement on a per child basis rather than by floor area as stipulated by the DCP.

4.3 Adequacy of Car Parking Supply

The existing on-site car parking supply of 76 spaces will be able to accommodate the car parking requirements of both development Options, noting that it is proposed to allocate 51 spaces to the office use and 25 spaces to the child care or education facility.

Should the child care centre use be provided, it is recommended that a mix of staff only and dedicated pick-up/ drop-off spaces be provided within the existing on-site car park.

4.4 Bicycle Parking Requirements

The Auburn Council ‘Parking and Loading’ DCP nominates a bicycle parking rate of 1 bicycle space per 10 employees for office uses.

In addition, the *NSW Planning Guidelines for Walking and Cycling* (Department of Infrastructure, Planning and Natural Resources, 2004) aims to assist land use planners and related professionals to improve consideration of walking and cycling in their work. The guidelines have been designed to provide a walking and cycling focus to the NSW Government’s *Integrating Land Use & Transport Planning* policy package. The *Planning Guidelines for Walking and Cycling* contain suggested bicycle parking provision rates for different land use types.

On the above basis, the suggested bicycle parking provision for the development is summarised in Table 4.2.

Table 4.2: Suggested Bicycle Parking Rates

Option	Land Use Type	Size	Suggested Bicycle Parking Rate		Suggested Bicycle Parking Provision	
			Staff	Customers/Visitors	Staff	Customers/Visitors
Option 1	Office	133 staff [1]	1 space per 10 employees		13 spaces	
	Education Facility	40 students + 10 staff	3-5% of Staff & 5-10% of Full Time Students	5-10% of Staff	2 – 5 spaces	1 space
	Option 1 – Total				16 – 19 spaces	
Option 2	Office	133 staff [1]	1 space per 10 employees		13 spaces	
	Child Care Centre	50 children + 10 staff	3-5% of Staff	5-10% of Staff	0-1 space	1 space
	Option 2 - Total				14 – 15 spaces	

[1] Assuming one staff member per 15sqm GFA (approx.).

Table 4.2, indicates that a bicycle parking provision of between 16 and 19 spaces should be provided for Option 1 and 14-15 spaces be provided for Option 2. It is therefore recommended that the above bicycle parking provisions be provided and shown on detailed plans to be prepared as part of any future development application for the site.

5. Traffic Impact Assessment

5.1 Traffic Generation

5.1.1 Design Rates

Office

Traffic generation estimates for the office component of the proposed development have been sourced from the 'Guide to Traffic Generating Developments' (RMS Technical Direction TDT/2013-04a) dated August 2013.

The guide nominated the following traffic generation rates for office developments:

- AM Peak Hour – 1.6 movements per 100sqm of GFA
- PM Peak Hour – 1.2 movements per 100sqm of GFA.

Child Care Centre

Guidance on appropriate traffic generation rates for the Child Care Centre have been sourced from the 'Guide to Traffic Generating Developments' (RMS, 2002), which suggests the following traffic generation rates for Child Care Centres³:

- AM Peak Hour – 0.9 vehicle movements per child
- PM Peak Hour – 0.7 vehicle movements per child.

Education Facility

No specific traffic generation rate is provided in the RMS Guide for tertiary education uses. As such, in order to estimate the anticipated traffic generation of the proposed education facility, a first principles based assessment has been undertaken.

The proposed education facility generates a DCP requirement to provide 12 car parking spaces on-site including five staff spaces and seven student spaces. It has been conservatively assumed that each of these 12 spaces will generate one vehicle movement in the AM and PM peak hours, representing staff and students arriving to and departing from classes. In reality, staff and students may arrive at various points throughout the day dependent on class schedules.

5.1.2 Existing Site

Adopting the standard RMS traffic generation rate for office indicates that the existing office use (2,800sqm) is anticipated to currently generate 45 and 34 vehicle movements during the AM and PM peak periods respectively, from a planning perspective.

5.1.3 Development Options

On the basis of the above traffic generation rates, Table 5.1 has been prepared outlining the anticipated traffic generation of each of the development options.

³ Average of available child care centre rates provided in RMS 'Guide to Traffic Generating Developments'.

Table 5.1: Traffic Generation Estimates

Scenario	Use	Size	Traffic Generation Rate		Traffic Generation	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Option 1	Office	2,000sqm	1.6 movements per 100sqm	1.2 movements per 100sqm	32 movements per hour	24 movements per hour
	Education Facility	800sqm (12 car spaces)	1 movement per car space	1 movement per car space	12 movements per hour	12 movements per hour
	Option 1 - Total				44 movements per hour	36 movements per hour
Option 2	Office	2,000sqm	1.6 movements per 100sqm	1.2 movements per 100sqm	32 movements per hour	24 movements per hour
	Child Care Centre	50 Children + 10 staff	0.90 movements per child	0.70 movements per child	45 movements per hour	35 movements per hour
	Option 2 - Total				77 movements per hour	59 movements per hour

Table 5.1 indicates that Option 1 could be anticipated to generate some 44 and 36 vehicle movements during the AM and PM peak periods respectively, with Option 2 anticipated to generate 77 and 59 movements per hour.

5.2 Summary

A summary of the anticipated existing and potential future traffic generation estimates for the site are provided in Table 5.2.

Table 5.2: Summary of Traffic Generation Estimates

Development Scenario	Traffic Generation		Net Change	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Existing	45	34	-	-
Option 1	44	36	-1	+2
Option 2	77	59	+32	+25

When compared to the traffic generation of the existing office use, both development options represent similar levels of traffic generation. Option 1 represents almost identical levels of traffic generation to the existing use, with Option 2 representing an increase of 32 movements per hour during the AM peak and 25 movements per hour during the PM, equating to an additional movement every 2 minutes and 2 ½ minutes in the AM and PM peak hours respectively. The level of additional peak hour traffic through the intersection represents less than 1% of the existing traffic through the intersection.

Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development options represents a negligible increase and could not be expected to compromise the safety or function of the surrounding road network. Indeed the St Hilliers Road/ Hall Street intersection would be expected to continue to operate at LOS C, which is considered to be a satisfactory outcome.

6. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- i The Planning Proposal seeks to allow additional permitted uses for the site, including office, child care, education facility and community facility uses, which are currently prohibited under the current General Industrial Zone (IN1).
- ii Two development options are proposed for the site. Option 1 includes office and education facility uses and Option 2 includes office and child care uses.
- iii It is proposed to maintain the existing 76 space on-site car park, with the proposed allocation consistent with DCP requirements.
- iv Development Option 1 generates a DCP parking requirement to provide 62 car parking spaces and Option 2 generates a requirement to provide 73 spaces.
- v The existing on-site car parking supply of 76 spaces is capable of accommodating the DCP parking requirements of both development options.
- vi It is recommended that Option 1 provides between 16 and 19 bicycle parking spaces and Option 2 provides 14 or 15 spaces.
- vii Development Option 1 is anticipated to generate up to 44 and 36 vehicle movements in the AM and PM peak hours respectively. Development Option 2 is anticipated to generate 77 and 59 vehicle movements in the AM and PM peak hours respectively.
- viii The traffic generation associated with the development options is generally consistent with the existing traffic generating potential of the site.
- ix There is adequate capacity in the surrounding road network to cater for the traffic generated by the either development option.

Appendix A

Survey Results

MOVEMENT SUMMARY



Site: AM Peak - Existing

New Site

Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		veh	Distance m	per veh	km/h	
South: St Hilliers Road											
1	L2	425	5.0	0.237	5.7	LOS A	0.0	0.0	0.00	0.53	54.7
2	T1	2211	5.0	0.574	7.4	LOS A	22.3	162.7	0.46	0.42	53.5
3	R2	88	5.0	0.329	29.7	LOS C	4.3	31.3	0.79	0.80	39.7
Approach		2724	5.0	0.574	7.8	LOS A	22.3	162.7	0.40	0.45	53.1
East: Hall Street											
4	L2	24	5.0	0.045	39.8	LOS C	1.1	7.8	0.74	0.70	35.6
6	R2	74	5.0	0.254	57.5	LOS E	4.1	30.2	0.92	0.76	30.4
Approach		98	5.0	0.254	53.2	LOS D	4.1	30.2	0.87	0.74	31.5
North: St Hilliers Road											
7	L2	102	5.0	0.547	21.1	LOS B	22.3	162.7	0.62	0.60	46.1
8	T1	1776	5.0	0.547	15.7	LOS B	23.0	167.5	0.63	0.58	47.5
Approach		1878	5.0	0.547	16.0	LOS B	23.0	167.5	0.63	0.59	47.4
All Vehicles		4700	5.0	0.574	12.0	LOS A	23.0	167.5	0.50	0.51	50.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate		
		ped/h	sec		Pedestrian ped	Distance m	per ped		
P1	South Full Crossing	53	59.3	LOS E	0.2	0.2	0.96	0.96	
P2	East Full Crossing	53	13.9	LOS B	0.1	0.1	0.46	0.46	
All Pedestrians		105	36.6	LOS D			0.71	0.71	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY



Site: PM Peak - Existing

New Site

Signals - Fixed Time Isolated Cycle Time = 105 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: St Hilliers Road											
1	L2	112	5.0	0.062	5.7	LOS A	0.0	0.0	0.00	0.53	54.8
2	T1	1929	5.0	0.516	8.8	LOS A	16.5	120.6	0.53	0.48	52.4
3	R2	46	5.0	0.256	39.8	LOS C	2.1	15.2	0.88	0.77	35.7
Approach		2087	5.0	0.516	9.4	LOS A	16.5	120.6	0.51	0.49	52.0
East: Hall Street											
4	L2	112	5.0	0.192	33.1	LOS C	4.1	30.0	0.76	0.75	38.1
6	R2	238	5.0	0.808	52.8	LOS D	12.4	90.2	0.97	0.91	31.7
Approach		349	5.0	0.808	46.5	LOS D	12.4	90.2	0.90	0.86	33.5
North: St Hilliers Road											
7	L2	119	5.0	0.813	25.9	LOS B	34.9	254.7	0.85	0.80	43.5
8	T1	2464	5.0	0.813	20.7	LOS B	36.2	264.6	0.87	0.81	44.6
Approach		2583	5.0	0.813	21.0	LOS B	36.2	264.6	0.87	0.81	44.6
All Vehicles		5020	5.0	0.813	17.9	LOS B	36.2	264.6	0.72	0.68	46.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	53	46.8	LOS E	0.1	0.1	0.94	0.94	
P2	East Full Crossing	53	14.4	LOS B	0.1	0.1	0.52	0.52	
All Pedestrians		105	30.6	LOS D			0.73	0.73	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Appendix B

SIDRA INTERSECTION Results

		Between			Restriction				Demand					
Street	Side		To		Area	Type	Hours	Supply	8am	9am	10am	4pm	5pm	6pm
St Hilliers Road						Clearway	6am-10am,3pm-7pm M-F							
Hall St	N	Percy St	-	St Hilliers St		Unrestricted		9	2	8	8	8	5	2
Hall St	S	Percy St	-	St Hilliers St		Unrestricted		7	5	9	9	8	3	0
Percy St	W	St Hilliers St	-	North of St Hilliers St		Unrestricted		14	4*	11*	11^	11	8	4
Percy St	E	St Hilliers St	-	North of St Hilliers St		Unrestricted		18	6*	5*	6^	14	8	3
Percy St	E	St Hilliers St	-	Rawson St		Unrestricted		35	26	35	35	31	29	7
Percy St	W	St Hilliers St	-	Rawson St		Unrestricted		26	22	26	21	19	12	5
Hall St	N	St Hilliers St	-	Dartbrook Rd		Unrestricted		11	10	11	11	11	11	11
Hall St	S	St Hilliers St	-	Dartbrook Rd		Unrestricted		12	10	9	11	11	12	12
TOTAL								132	75	98	95	113	88	44

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