

ATTACHMENT I

City of Sydney Transport Issues

Housing NSW

**Cowper Street Glebe
Development**

City of Sydney Transport
Issues

April 2010

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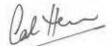
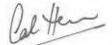
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Contents

	Page
1 Introduction	1
2 Council Issues	1
2.1 Traffic and Parking	1
3 Subject Development Proposal	2
3.1 Existing Site Conditions	2
3.2 On – Street Parking	2
3.3 Proposed Development	3
4 Arup Analysis with Reference to Council Issues	4
4.1 Transport Issues	4
4.2 Parking Issues	11
5 Conclusions	14

Appendices

Appendix A

Photographs of the Existing Conditions

Appendix B

Site Plans, Hill Thalys

Appendix C

Transit Oriented Development References

1 Introduction

The preliminary transport study report for this site based on early draft development proposals was prepared by Arup dated 25/11/2009. Based on the Arup report, CoS has raised a number of transport issues that requires further clarification, discussion and analysis.

This report has been prepared by Arup in response to City of Sydney Council's (CoS) comments on a number of transport issues on its letter dated 11/03/2010 for the Cowper Street Glebe Redevelopment Proposal (see page 5, reproduced as section 2.1 below).

This report also provides transport related advice for future redevelopment of the site incorporating sustainable transport principles, such as optimising the use of walking, cycling, public transport.

2 Council Issues

Council has raised a number of issues in regards to traffic and parking in the proposal. The issues are discussed under the following headings.

2.1 Traffic and Parking

"The Council needs details on a number of areas the submitted traffic and transport report fails to address. As noted earlier, the report appears to be for a different proposal to that identified in the planning proposal, and confirmation that the conclusions are accurate and relevant will need to be provided.

The potential trip generation rates also need to be provided, and the analysis will need to consider:

- The impact a major retail facility within 500m walking distance and good access to public transport (light rail and a major bus corridor within 600m of the site) will have on reducing the rate;*
- Any traffic diversion or calming proposals to discourage 'rat runs' through the site to avoid the signalised intersection and Bay Street and Wentworth Park Road; and in consequence*
- Any expected impacts on existing road congestion the proposed development will generate.*

A more thorough analysis of parking forecast should also be undertaken, and should:

- Use existing car ownership rates from this site, which is social housing, rather than a Canadian car ownership rate reduction for social housing*
- Consider the impact of the major bus corridor located approximately 500m from the site, and the good access to cycling facilities; and*
- Consider the fact that any on street parking would be time limited and future residents would not be eligible for parking permits. "*

3 Subject Development Proposal

3.1 Existing Site Conditions

The site is currently occupied by 134 old style medium density housing and 30 - 35 parking spaces. Most of the parking associated to the dwellings is undesignated off – street parking and 9 on – street 90° parking is allocated for Housing NSW tenants. During the site inspection on 30 March 2010 at around 10am only about 5 – 10% tenants parking were occupied.

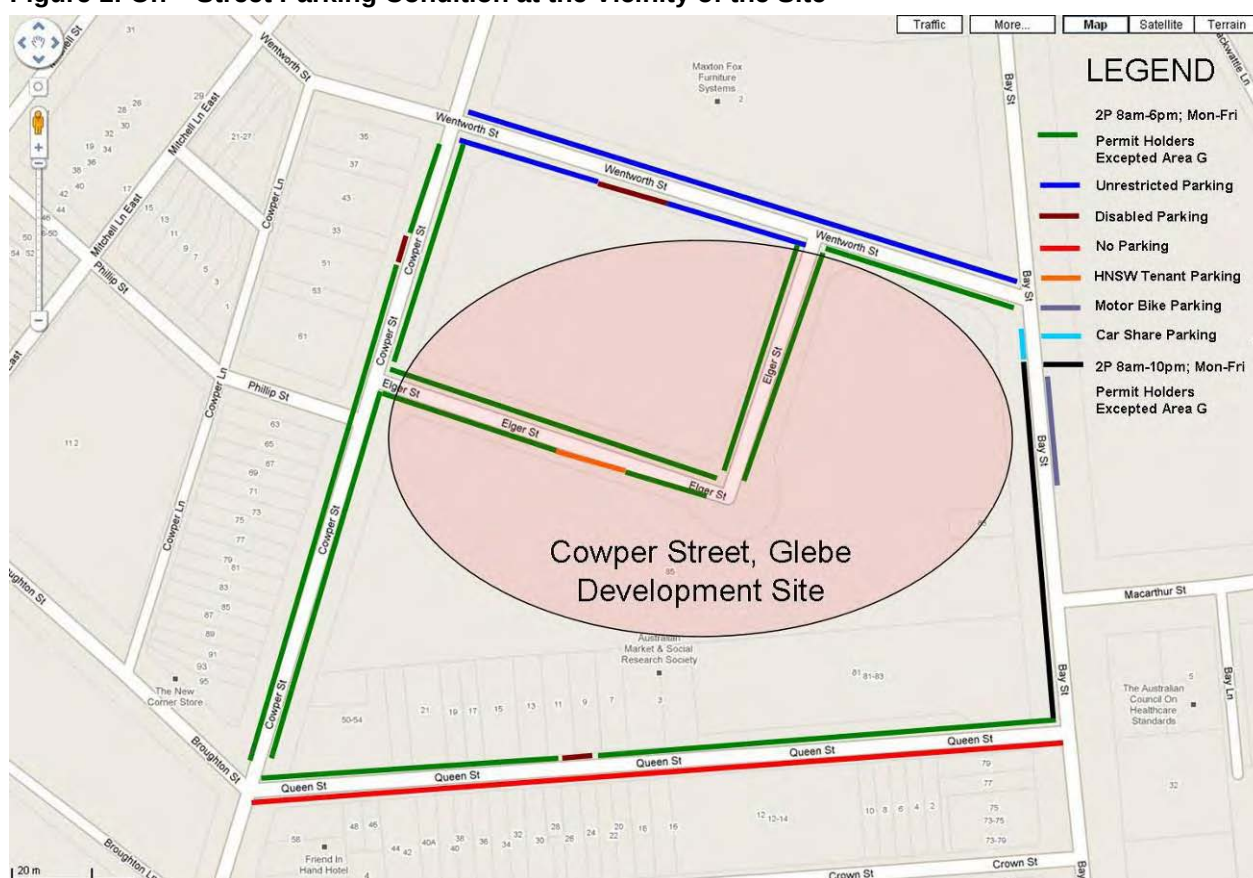
Adjacent land uses are predominantly old residential dwellings, retail towards Parramatta Road, CoS Depot, Wentworth Park etc. Photographs of the existing condition are attached in **Appendix A**.

3.2 On – Street Parking

Most of the on – street parking at the vicinity of the site are unmetered restricted parking between 8am – 6pm Mon – Fri. Parking on Wentworth Street are mostly unrestricted. A number of disabled parking is provided at the vicinity of the site.

Two car share parking is provided in the western side of Bay Street in close proximity of the site, the first being just south of Glebe Street and the other just south of Wentworth Street. Motor bike parking is provided on the eastern side of Bay Street. During the site inspection about 85 – 90% of the on – street parking were occupied. The on – street parking condition at the vicinity of the site is shown in Figure 1.

Figure 1: On – Street Parking Condition at the Vicinity of the Site



3.3 Proposed Development

The latest proposal has evolved from the draft proposal addressed in the Arup report of 25/11/2009.

The current development proposal includes demolition of the existing dwellings and construction of approximately 153 social housing units, 83 affordable housing units, 250 private dwellings, 151m² community facilities and 504m² of retail space (refer to drawings to Appendix A drawing nos. 12,11,01B,01,02; drawings dated 16/12/2009, prepared by Hill Thalys). The whole development will comprise of the following four unit blocks:

- **Block A** – comprise of buildings A1 & A2 (116 private housing), A3 (23 Affordable housing) and 113m² ground level retail and 55 basement parking
- **Block B** – comprise of buildings B1& B2 (97 private housing), B3 (37 affordable housing) and 216m² retail and 73 basement parking
- **Block C** – comprise of buildings C1 (23 affordable housing) and C2 (93 social housing) and 50m² community facilities with building C2, and
- **Block D** – comprise of buildings D1 (60 social housing and 101m² community facilities) and D2 (37 private housing and 175m² retail space) and 16 basement parking

In total 144 basement parking spaces are proposed for the private housing component and two on – street disabled parking with buildings C2 & D1. A number of on – street shared car parking spaces (estimated 4 to 6 spaces) are proposed. Two combined (in and out) driveways are proposed with the development from block A and B at Starling Street, located about 20m south of Wentworth Street. Elger Street is proposed to be linked with Bay Street with this development.

4 Arup Analysis with Reference to Council Issues

4.1 Transport Issues

4.1.1 Journey to Work Travel Data (2006 Census)

The 2006 Census data for Journey to Work data for Glebe area was analysed (refer to Figure 2 and Table 1).

The data in Table 1 shows that with the existing public transport facilities and services, about 35% of the Glebe residents travelled to work by car (mostly as a car driver). Whereas at least one mode of public transport was used to get to work by 34% of residents.

In comparison to public transport, bicycle journey to work usage was comparatively low 2.5% typically, but this proportion is nevertheless relatively high in comparison to the Sydney region average. Walk only mode was also significant, about 18%.

Glebe Affordable Housing has been identified as one of the 10 major project ideas in the CoS 'Sustainable Sydney 2030' vision. The CoS vision also targets 80% of city workers commuting on public transport and 80% of work trips by city residents in non private vehicles. The reduced number of parking provision for the development will align with this philosophy.

For the Cowper Street development site, closest to the CBD, Central and the Universities precinct, with significantly increased accessibility and provision for more frequent and direct bus services, the future car travel journey to work mode share should be targeted to no more than 20%.

Figure 2: Glebe Census Area



Table 1: 2006 Census Data Journey to Work Data for Residents of Glebe

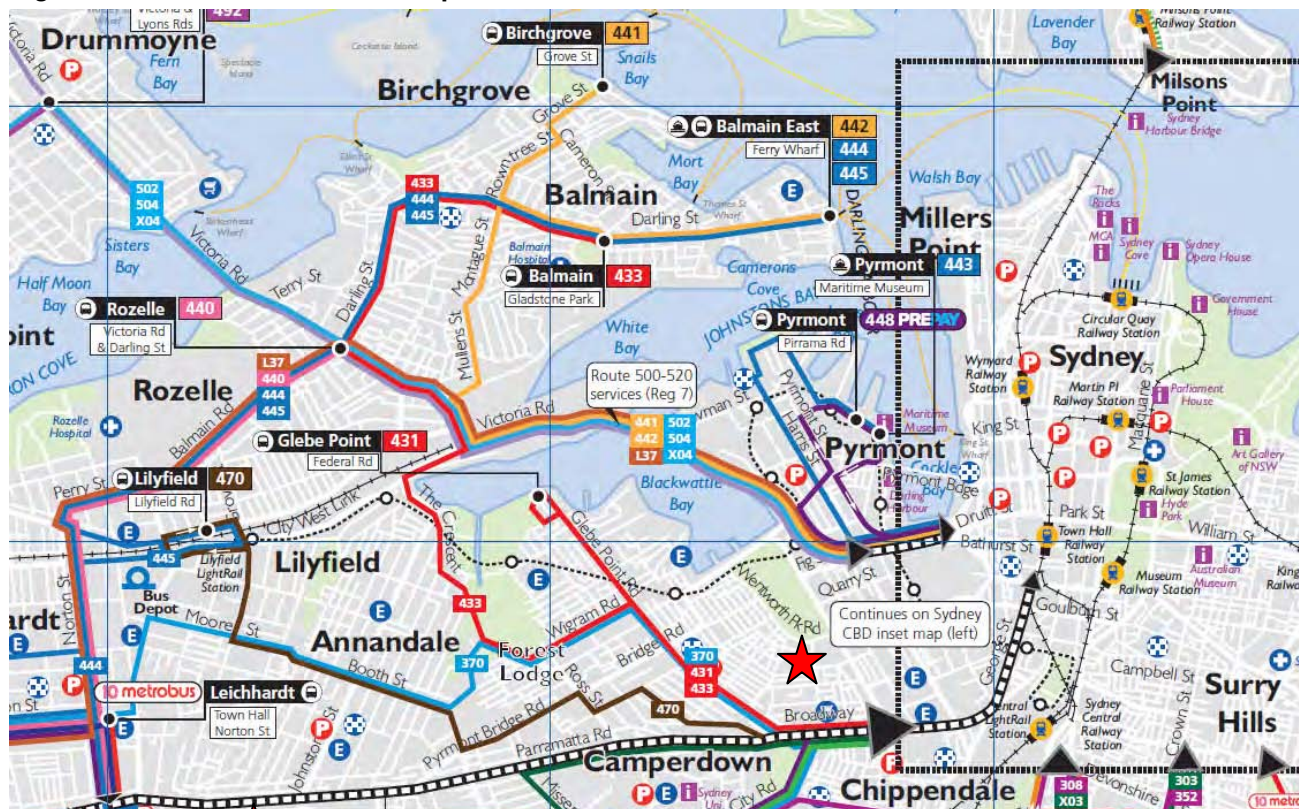
Mode	Persons	%
Train	74	1.5
Bus	1,082	22.2
Light Rail	64	1.3
Combined mode, at least one public transport	364	7.5
Taxi	73	1.5
Car, as driver	1,537	31.5
Car, as passenger	192	3.9
Bike	129	2.6
Walk only	886	18.2
Other modes	100	2.0
Worked at home	279	5.7
Not stated	100	2.0
Total	4,880	100

4.1.2 Public Transport

4.1.2.1 Buses

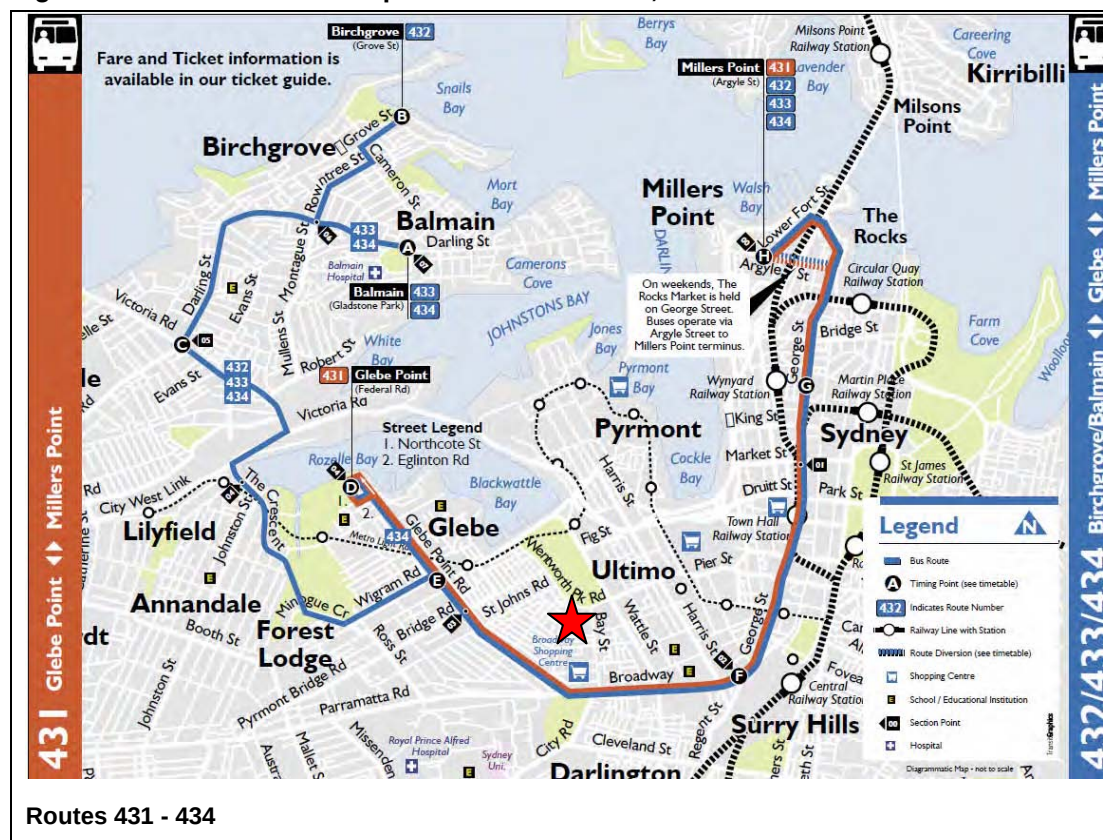
Parramatta Road is about 400m south of the site. Numerous bus services travel along Parramatta Road in both directions as shown in Figure 3. Buses also run along Glebe Point Road, which is about 350m south – west of the site. Some of the specific bus routes which run in the vicinity of the site are shown in Figure 4.

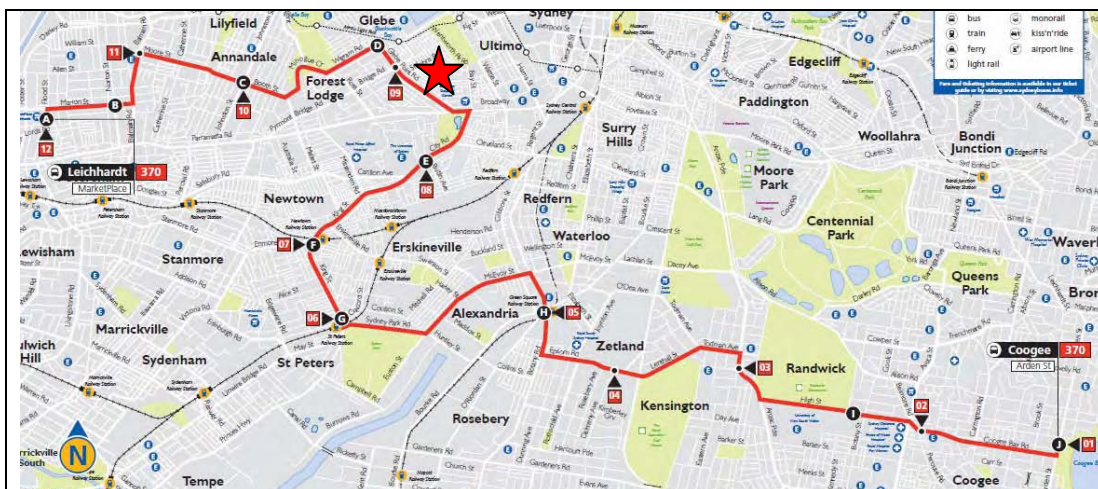
Figure 3: Current Bus Network Map around Glebe Area



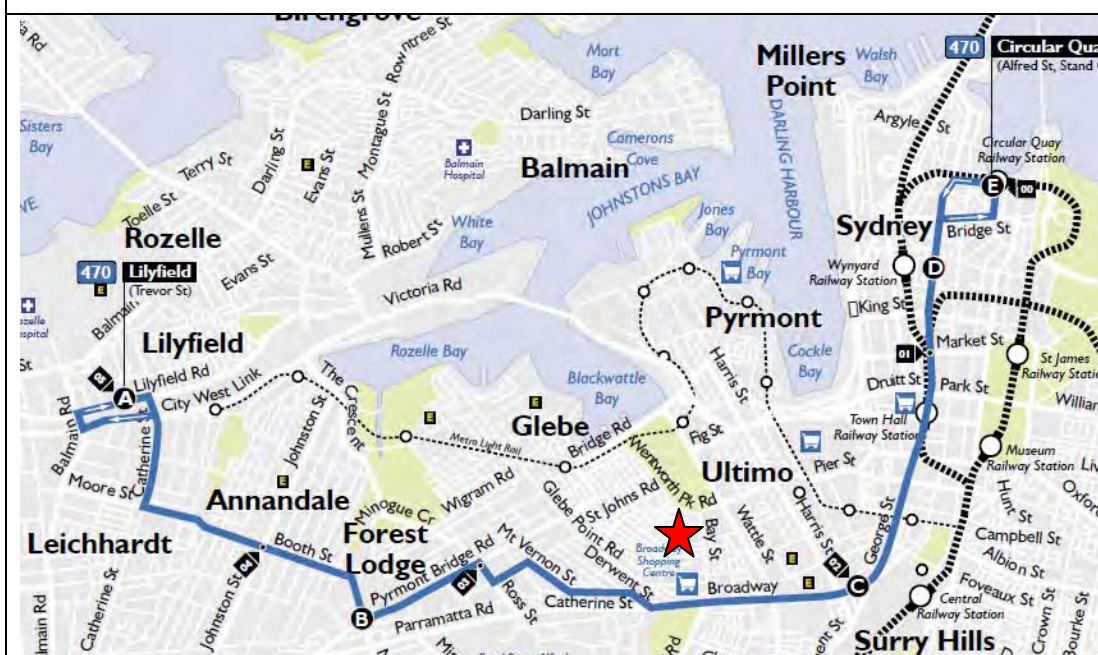
Source: Sydney Buses,  - Cowper Street Development Site

Figure 4: Individual Route Map for Route 432 – 434, 370 and 470





Route 370



Route 470

 - Cowper Street Development Site

The following STA bus routes and services operate in the vicinity of the site:

- **Route 370** – between Coogee and Leichhardt via City Road – Sydney Park Road crossing Annandale – Glebe – Sydney University - Newtown – St Peters – Alexandria – Zetland – Randwick. Peak hour service frequency is about 10 minutes during the weekdays and half hour frequency during the weekends.
- **Route 432, 433 and 434** – between Millers Point and Birchgrove (432) and Balmain (433 and 434) via George Street – Broadway – Glebe Point Road – Wigram Road – The Crescent – Victoria Road – Darling Street crossing Pyrmont, Ultimo, Glebe, Forest Lodge. Am peak hour service frequency is less than 5 minutes and pm peak hour frequency is about 5 -10 minutes during the weekdays and a lesser frequency during the weekends and public holidays.
- **Route 470** – between Bridge Street, Sydney and Lilyfield via George Street – Broadway – Catherine Street – Pyrmont Bridge Road – Booth Street crossing Forest Lodge, Annandale and Leichhardt. Am peak service frequency is about 5 minutes and pm peak

frequency is about 15 – 20 minutes during the weekdays and reduced frequency during the weekends and public holidays.

The proposed subject development would provide additional patronage to buses. If wider patronage grows in the future, extra bus services may need to be discussed with STA in due course.

4.1.2.2 Light Rail

Both Glebe and Wentworth Park Light Rail stations are located approximately 650 – 700m north – west and north of the site. The Light Rail services operate every 10-15 minutes on Sunday to Thursday (6am to 11pm) and Fri & Sat (6am to midnight). Travel time from Central to Glebe is about 20 minutes. The existing light rail route network map is illustrated in Figure 5.

Figure 5 : Existing Light Rail Route



The pedestrian access to Wentworth Park station is provided via Wentworth Park. Pedestrian paths are reasonably level to both the stations from the site. Of the two light rail stations, a more direct path is currently available to Wentworth Park station; the street light level also appears to be adequate.

4.1.2.3 Train

Most of Glebe is relatively distant from train services, except via interchange with bus and light rail at Central Station. The subject site is only 1.5 kilometres from Central station which will be acceptable for some residents.

4.1.2.4 Taxis

The subject site is well serviced by the high frequency of taxis in inner Sydney, and the site proximity to major taxi thoroughfares such as Parramatta Road and Central.

4.1.2.5 Bikes

This subject site is in an area with increasing bike usage in Sydney, and supported by CoS initiatives to encourage cycling (See also Section 4.2.4).

4.1.2.6 Public Transport Availability

The availability of the frequent and direct public transport facilities within walking distance of the site will certainly contribute reduced trips generation to/ from the site.

4.1.3 Retail Facilities

Broadway Shopping centre is located only about 300m south of the site. Wide footpaths are provided on both sides of Bay Street. Pedestrian crossing facilities are currently provided in all the major intersections between the site and the shopping centre. Due to the close proximity of the retail precinct, the demand for retail vehicular trip generation to/ from the site will be significantly lower.

4.1.4 Traffic Diversion through the Site ('Rat Run')

Elger Street is proposed to be connected to Bay Street. Due to this new extension, non – site vehicles may turn left at Elger Street and then turn right at either Stirling Street or Cowper Street to proceed north – west via Wentworth Park Road, thereby avoiding traffic signals at Bay Street/ Wentworth Park Road intersection. To reduce any traffic intrusion, the proposed new Bay Street and Elger Street intersection is already proposed as a left – in/ left – out junction. To prevent westbound traffic intrusion, a number of traffic calming devices could be considered as follows:

- Heavy vehicle restriction (three ton or over) in Elger Street and Stirling Street.
- Introduction of 40 km/h speed limit on Elger Street and Stirling Street.
- 'No Right' turn from Elger Street to Cowper Street and giveaway to Stirling Street vehicles at Elger Street to reduce any benefit to take short cut by the westbound vehicles avoiding the traffic signal at Bay Street and Wentworth Park Road.
- A zebra crossing on Elger Street on the east approach of Elger Street and Stirling Street intersection to facilitate pedestrians crossing as well as discouraging traffic bypass via Elger Street.
- A large raised threshold at the intersection of Elger Street and Stirling Street intersection to slow down vehicular speed, thus improving safety as shown in the example in Figure 6. However, this option may have some negative impact e.g. traffic noise.

One of the above traffic calming treatments or a combination of a number of treatments could be considered to reduce the potential 'rat runs' through the site.

Figure 6: Raised Threshold at the intersection of Dunmore St & Monomeeth St, Bexley



4.1.5 Traffic Impact on the Road Network

Traffic generation from the proposed development has been calculated based on the parking generation. According to the current scheme (refer to **Appendix B**, Drawing Prepared by Hill Thalys, Drawing Nos. 01B,01, dated 16 December 2009), in total 144 off – street parking spaces will be provided for the 250 private (market) housing component at a rate of 0.58 space/ unit. This rate is lower than RTA rate (RTA Guide to Traffic Generating Developments, October 2002, issue 2). Therefore, RTA parking rate and corresponding trip generation rate has been adjusted based on the allocated parking rate as shown Table 2 and Table 3.

Table 2: Parking Provision Calculation

Land Use	Unit	Proposed Parking Rate	Proposed Parking Provision	RTA Rate (excludes visitor parking) *	Parking Required as per RTA Rate	Adjustment to RTA rate based on parking provision
Studio	15	0.58	144	0.4	6	0.73
1 – bed	117			0.6	70	
2 – bed	87			0.9	78	
3 - bed	31			1.4	43	
Total	250				198	

* - Metropolitan sub – Regional Centres

Table 3: Trip Generation Calculation

Unit	RTA Rate (trip in peak hour)*	Rate adjusted by parking provision	Trip generation based on parking provision	Number of Trips			
250	0.29	0.21	53	AM		PM	
				In (20%)	Out(80%)	In (70%)	Out(30%)
				11	42	37	16

* - High Density Residential Flat Building, Metropolitan sub – Regional Centres

The traffic impact for the estimated 53 trips in the am and peak hours may be subject to Traffic Impact Assessment (TIA) of the development. If a TIA is required, future traffic generation should be offset against the existing traffic generation of the subject site, estimated as 134 units at a generation rate of 0.21 vehicle trips per hour per dwelling or 28 trips in the peak hour. Therefore, the net increase is approximately 25 vehicle trips in the peak hour. This is a very low increase of vehicular traffic and may not warrant a full TIA of the development.

If a TIA is required, traffic impact on Bay Street, Wentworth Park Road and Cower Street would need to be determined and therefore the major intersections at the vicinity of the site such as Bay Street/ Wentworth Park Road, Cower Street/ Wentworth Park road would need to be surveyed and modelled by Sidra intersection modelling program.

4.2 Parking Issues

4.2.1 Private Housing

According to 2006 Census data, the car ownership in Glebe area is about 55% of households. A comparison of the car ownership between Glebe & Forest Lodge area and greater Sydney shows that car ownership is significantly lower in Glebe and Forest Lodge areas (refer to Table 4). However, it should be noted that the site being located within 500m of the frequent and well established public transport facilities and the major retail precinct, car ownership is expected to be further lower than the whole Glebe – Forest Lodge Area. Therefore, a reduced parking provision for the private housing component (0.58 space/ unit) is considered justified.

Table 4: Comparison of Car Ownership in Glebe & Forest Lodge and Sydney

Car Ownership per household	Glebe – Forest Lodge Area (%)	Greater Sydney (%)
No Vehicle	27.7	12.6
1 vehicle	38.0	36.4
2 vehicles	14.1	30.2
3 or more vehicles	2.6	11.5
Not stated	17.5	9.3

The NSW Government and CoS are seeking to reduce the demand for travel by private car for developments located in close proximity of public transport services. The CoS 'Sustainable Sydney 2030' vision aims to target *improved transport, greater safety, more affordable housing and limiting cars in the City Centre*. The relatively low parking provision for the development is in keeping with this philosophy.

4.2.2 Social and Affordable Housing

Research shows that the car ownership in social and affordable housing is significantly lower especially if the development is located within close proximity of public transport fringe. There is no survey based data available for the social and affordable housing developments in close proximity to CBD fringe (e.g. Redfern, Waterloo social and affordable housing). Therefore, the following two interstate examples from Queensland and Melbourne are provided below:

Affordable Housing Design Guidelines, Queensland Government Department of Housing (September 2004)

Car parking rates for Affordable Housing: Car parking rates in planning schemes for one, two and three-bedroom dwellings are generally reduced by **25 percent** where housing is within 400 metres of public transport (train, ferry, bus).

Review of Social Housing Car Parking Demands: Inner Melbourne, GTA Consultants (2009)

A study was undertaken by consultants on behalf of the City of Port Phillip (an inner metropolitan area) to research and update social housing land use rates. All current social housing sites identified within the study were considered to be well serviced by public transport. Data collected for the nominated social housing sites found for single bedroom units, the number of cars owned per unit was **0.19**, and for family units (between 2 and 4 bedrooms), the rate was **0.35**.

The above two examples justify that parking demand for social and affordable housing residents is significantly lower. In comparison to the above two examples in Melbourne and

Queensland, social and affordable housing development at Glebe which is located on the western boundary of the Sydney CBD do not warrant any off – street parking. No parking provision will result less congestion, pollution, decay and sprawl in the suburb of Glebe.

Another reason the social and affordable housing should not have any parking provision is to reduce the capital cost of each unit. The cost of basement parking is significant due consideration of ventilation, water level, fire hydrant etc. It is estimated that basement parking costs within a range \$35,000 - \$40,000 per parking space. Social and Affordable housing which are aimed to build for people with low income bracket, a parking space attached with the apartment will unnecessarily increase the overall cost of the apartment.

A summary of further research undertaken into these issues and Transit Oriented Design is included in **Appendix C** of this report

4.2.3 On – Street Parking Restriction

In the vicinity of the site there are about 30 – 35 unrestricted parking spaces available on both sides of Wentworth Street. Other parking spaces in the vicinity are restricted either metered or unmetered parking. Therefore, due to constrained on site parking with the development, future parking restriction may require in the whole section of Wentworth Street.

Glebe Point Road has been recognised as an ‘Activity Hubs’ for meeting, shopping, creative activities, learning and working as an integrated Global Sydney in the CoS ‘Sustainable Sydney 2030’ vision. According to the vision, Glebe Point Road ‘Activity Hub’ will be built to support community needs which will accomplish active role for future character of community life. Therefore, future residents in the area may not need a parking permit anyway as social and recreational facility will be available within the walking distance in the ‘Activity Hub’.

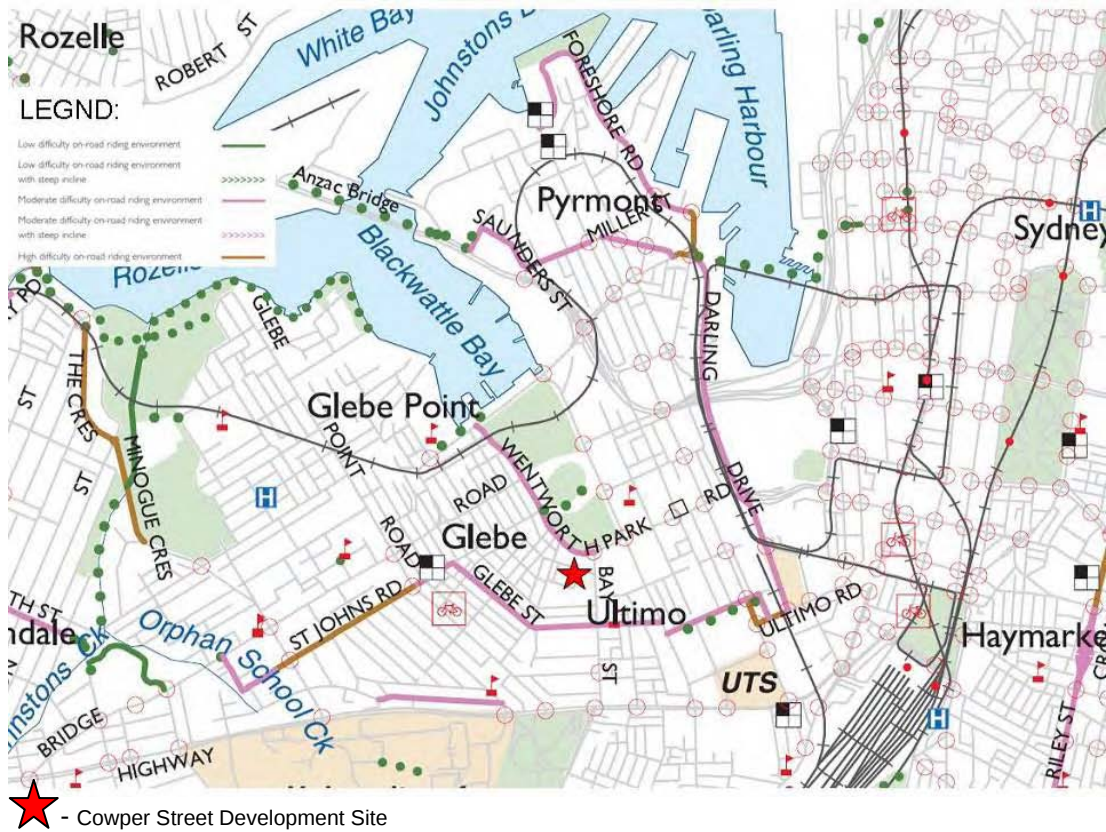
A number of car share scheme is proposed with the development and therefore suitable alternatives to private car travel will be readily available if any resident in the area need access to a car.

4.2.4 Bicycle Facilities

As discussed in the Arup initial report, the nearest bicycle route is along Glebe Street/ Kelly Street and Wentworth Park Road. These cycle routes have been assigned as moderately difficult on – road riding environment.

These bicycle routes next to the development will encourage future residents to start cycling. However, further improvements are required to attract more cyclists to use this route. There is an opportunity to provide a bicycle path along Bay Street between Wentworth Park Road and Glebe Street to connect the existing bicycle paths. However, this proposal may incur some loss of kerbside parking along Bay Street.

Figure 7: RTA Sydney Metropolitan Cycleway Map



5 Conclusions

1. This report provides details on transport issues raised by CoS for the proposed Cowper Street redevelopment project.
2. This report refers to the updated current development scheme as attached in Appendix B.
3. We confirm that these conclusions are accurate and relevant to the current proposal.
4. The potential trip generation rates are provided and the analysis considered:
 - The impact a major retail facility within 500m walking distance and good access to public transport (light rail and a major bus corridor within 600m of the site) will have on reducing the rate;
 - Any traffic diversion or calming proposals to discourage 'rat runs' through the site to avoid the signalised intersection and Bay Street and Wentworth Park Road; and in consequence
 - Any expected impacts on existing road congestion the proposed development will generate.
5. A thorough analysis of parking forecast was undertaken, including:
 - existing car ownership rates from this site, which is social housing,
 - the impact of the major bus corridor located approximately 500m from the site, and the good access to cycling facilities; and
 - the fact that any on street parking would be time limited and future residents would not be eligible for parking permits.
6. The current subject development is appropriate:
 - Due to the convenient location of the site with easy walking to shopping/ dining and most importantly, availability of alternative modes of transport close to future residents, it is considered that the demand for car parking is likely to be very low. Therefore, low parking provision is considered in accordance with State Government and CoS policy to reduce vehicle kilometres travelled (VKT) and reduce green house gas emissions.
 - Glebe Affordable Housing has been identified as one of the 10 major project ideas in the CoS 'Sustainable Sydney 2030' vision. The CoS vision also targets to achieve 80% of city workers commuting on public transport and 80% of work trips by city residents in non private vehicles. The reduced parking provision for the development will align with this philosophy.
 - Traffic generated by the proposed development will be modest. The traffic impact on the major and local roads may be determined in the detailed traffic impact assessment if required for this development.
 - A slow and safe traffic environment should be created in the internal road system favouring pedestrians. Therefore, a 40km/h speed limit should be designated in for the internal site road network. Appropriate Local Area Traffic Management (LATM) control devices should also be installed to further discourage potential 'rat runs', thus maximising local traffic and pedestrian safety.

Appendix A

**Photographs of the
Existing Conditions**



Typical existing HNSW dwelling in the site



Off – street parking via Elger St



On – Street parking in Elger St



Disabled Parking on Wentworth St



Bicycle lane on Kelly St



Wide footpath on the western side of Bay St



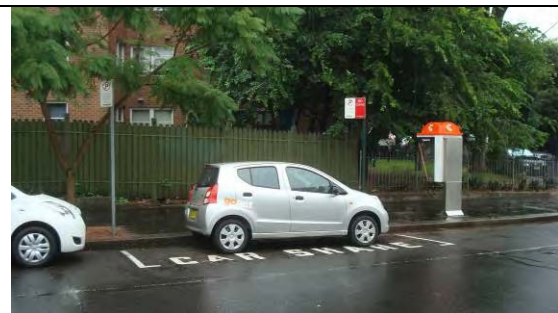
Wide footpath on the eastern side of Bay St



Motorbike parking on the eastern side of Bay St



Car share parking on the western side of Bay St (south of Glebe St)



Car share parking on the western side of Bay St (south of Wentworth St)

Appendix B

Site Plans, Hill Thalís

BLOCK A

BLOCK C



Cowper Street Elevation looking EAST

BLOCK D

BLOCK C



Elger Street Elevation looking SOUTH