

MT Management Pty Ltd

**Preliminary Traffic and Transport
Assessment**

87 Bay Street Glebe

221610-A

Issue | October 2011

Arup
Arup Pty Ltd ABN 18 000 966 165

Arup
Level 10
201 Kent Street
Sydney
NSW 2000
Australia
www.arup.com



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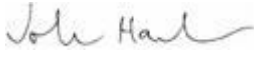
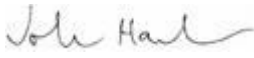
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Contents

	Page
1 Introduction	1
2 Existing Condition	2
2.1 Site Location	2
2.2 Existing Site Access	2
2.3 Surrounding Road Network	3
2.4 Public and Active Transport	4
2.5 Parking	7
3 Proposed Housing NSW Development	8
3.1 Housing NSW Proposal	8
4 Development Proposal	11
4.1 Description of the Development	11
4.2 Vehicular Access	12
4.3 Pedestrian Access	12
4.4 Parking Provision	13
4.5 Service Vehicle Provision	15
4.6 Bicycle Provision	15
5 Preliminary Transport Impact Assessment	16
5.1 Site Location and Land Use Aspect	16
5.2 Footpath	17
5.3 Traffic Impact Assessment	17
6 Conclusions	19

Tables

Table 1: Land use Component of the Proposed Development

Table 2: Car Parking Requirements as per Sydney Local Environmental Plan 2011

Table 3: Bicycle Parking Requirements as per Draft Sydney DCP 2010

Figures

Figure 1: Site Location

Figure 2: Existing Bicycleway Routes in the vicinity of the site

Figure 3: Pedestrian Route to the existing Public Transport Facilities and Educational Institutions

Figure 4: Housing NSW Site Development

Figure 5: Housing NSW Site Proposed Land Use

Figure 6: Breakdown of the Residential Component of the Housing NSW Development

Figure 7: Example of a Raised Threshold at the intersection of Dunmore St & Monomeeth St, Bexley

Figure 8: Schematic view of the Proposal

Figure 9: Proposed Vehicular Accesses

Figure 10: Pedestrian Connection to the Proposed Site

Figure 11: Public Area and Pedestrian Connectivity

Appendices

Appendix A

Tube Count Data

1 Introduction

Arup has been commissioned by MT Management Pty Ltd. to undertake a preliminary traffic and transport assessment due to the proposed mixed use development at 87 Bay Street, Glebe, Sydney.

The proposal is to rezone the site to allow more intensive urban development. This report details preliminary traffic and transport assessments which are likely to occur as a result of the proposed mixed use development. This preliminary transport assessment report will be submitted to City of Sydney Council with the rezoning application.

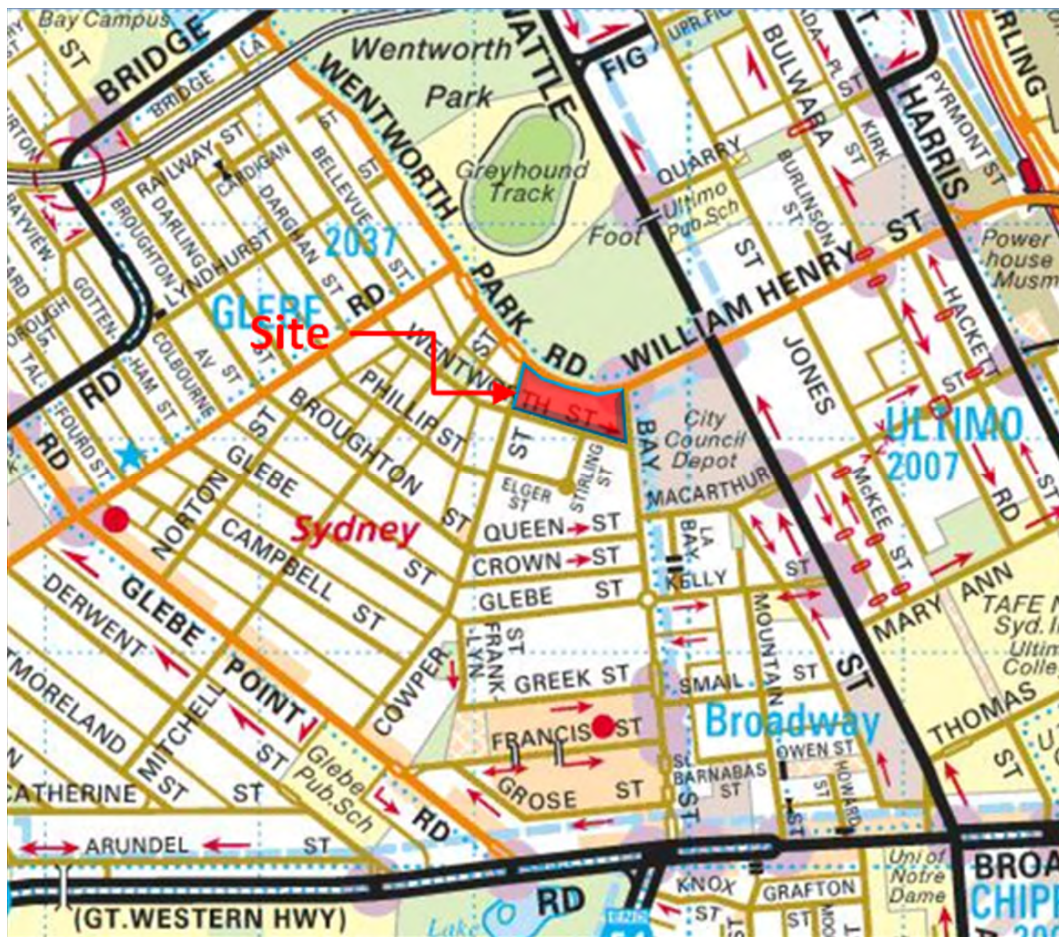
2 Existing Condition

2.1 Site Location

Glebe is a suburb in inner western Sydney located 2km southwest of the Central Business District (CBD). The suburb is bounded by Pyrmont to the north, Ultimo to the east, Chippendale to the southeast, Camperdown to the southwest and Forest Lodge and Annandale to the west.

The site area is 5,427m² and is currently occupied by buildings designed for industrial and commercial use. The site is bounded by Wentworth Park Road to the north, Bay Street to the east, Wentworth Street to the south and Cowper Street to the west (refer to Figure 1).

Figure 1: Site Location



2.2 Existing Site Access

The existing site accesses are provided by a number of driveways at Wentworth Park Road, Wentworth Street and Cowper Street.

2.3 Surrounding Road Network

Wentworth Park Road provides acts as a Collector Road which provides east – west connection between Bridge Road (west) and George Street (east) (refer to photograph 1). East of Bay Street Wentworth Park Road is renamed as William Henry Street. It is predominately a two lane two way road with restricted speed limit to 50 km/h.

A bidirectional tube count survey has been undertaken on Wentworth Park Road (between Bay Street & Cowper Street) by Arup appointed private contractor CFEIT. The survey data shows that the Five Day AADT (Average Annual Daily Traffic) on Wentworth Park Road was 7269. The average 85thile speed on Wentworth Park road was recorded as 40 km/h which is acceptable for a collector road next to the CBD fringe.

Wentworth Street runs along the southern boundary of the site. It provides east west connection between Copwer Street (west) and Bay Street (east). It is a two lane two – way local road primarily provides access to residential properties. A bidirectional tube count is undertaken at Wentworth Street. The data shows that Wentworth Street carried 387 vehicles (Five day AADT) which equates to approximately 40 vehicles in the peak hour. The details of the traffic survey data is attached in Appendix A.

Photograph 1: Wentworth Park Road



2.4 Public and Active Transport

2.4.1 Bus routes

The current bus network provides several bus routes from Glebe to the city, Balmain, Coogee and Leichhardt. The nearest bus stop is located approximately 400 metres away at the corner of Cowper Street and Glebe Point Road. This bus stop provides access to the Route 370 bus from Leichhardt to Coogee. The bus stop on Mountain Street at Broadway, which is located approximately 500 metres (10 minutes walk) from the site gives access to a much wider selection of bus routes, namely;

- **Route M10:** Maroubra Junction – Pioneer Memorial Park, Leichhardt via City and CBD:
- **Route 431:** Glebe Point - Millers Point/The Rocks; via Central Station, City and CBD:
- **Route 432:** Birchgrove - Millers Point; via Glebe, Central Station, City and CBD:
- **Route 433:** Balmain - Millers Point; via Glebe, Central Station, City and CBD:
- **Route 434:** Balmain - Millers Point; via Glebe Point, Glebe, Central Station, City and CBD:
- **Route 370:** Leichhardt to Coogee; via Glebe, Newtown, Alexandria, Randwick, Kensington and the University of New South Wales:
- **Route 449:** Pyrmont/Star City to Glebe; via Harris Street, Broadway Shopping Centre, Wentworth Park; and
- **Route 470:** Lilyfield/Leichhardt Marketplace - Circular Quay, via Forest Lodge.

2.4.2 Central Train Station

The closest train station to the site is Central Station, located 1.5km to the east (about a 30 minute walk for commuters). Central Station is situated on all lines except for Cumberland, Carlingford and Hunter. Connections to Central Station can be made via the light rail system closer to the site.

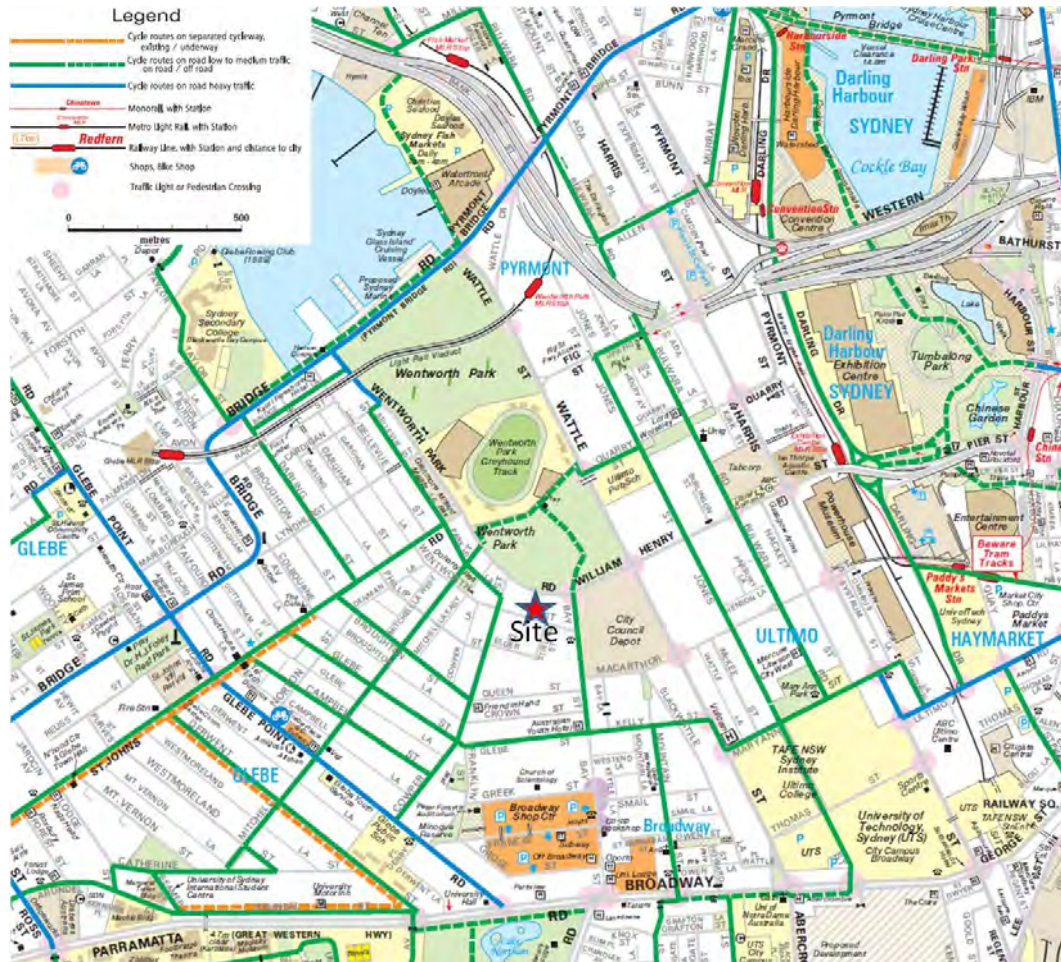
2.4.3 Light Rail

The Metro Light Rail tram runs between Central Station and Lilyfield. Wentworth Park tram stop is located approximately 600m to the north of the site at which trams operate every 10 to 15 minutes in either direction typically throughout the day (7-8 minute frequency in peak periods). The most direct pedestrian route from the site to the tram stop is through Wentworth Park which is equipped with pedestrian footpaths and pedestrian bridges reducing the number of potential conflicts between pedestrians and vehicles.

2.4.4 Cycling

There is an existing on street shared bicycleway along Bay Street (refer to Figure 2). This cycleway route runs through the middle of Wentworth Park and joins at Quarry Street at north of the park. This shared pedestrian and cycleway provides improved connections to the Sydney CBD.

Figure 2: Existing Bicycleway Routes in the vicinity of the site



Source: City of Sydney website

2.4.5 Pedestrians

The speed limit on Wentworth Park Road, Wentworth Street, Bay Street and Cowper Street is 50km per hour. The reduced speed limits lower pedestrian to vehicle conflicts and therefore provide a safer environment for pedestrians.

The area surrounding the site is equipped with many pedestrian facilities. Footpaths are in place in the surrounding area with pram ramps at designated crossing points. Pedestrian crossing facilities are currently provided in all the major intersections between the site and the Broadway shopping centre.

Wide footpaths are provided on both sides of Bay Street. However, the footpaths widths which are currently provided along Wentworth Street may be considered deficient due to trees imbedded in the footpath (refer to Photograph 2). This

encourages pedestrians to walk on the road, creating potential vehicular and pedestrian conflicts.

Photograph 2: Existing Tree on the Footpath (southern side of Wentworth Street)



Access to the park can be achieved by a raised pedestrian priority crossing at the Wentworth Park Road – Cowper Street intersection on the north-west corner of the site. Pedestrians crossing Wentworth Park Road from the site to travel to the tram stop are more likely to use the signalised pedestrian crossings on the Wentworth Park Road - Bay Street intersection bordering the north-east corner of the site as this crossing provides a more direct route.

As previously stated, a shared pedestrian and cyclist path is in place across Wentworth Park leading to a pedestrian bridge over Wattle Street, facilitating safe pedestrian movements towards the Sydney CBD and access to the light rail station. The pedestrian connection to existing public transport facilities and education institutions are shown in Figure 3.

Figure 3: Pedestrian Route to the existing Public Transport Facilities and Educational Institutions



2.5 Parking

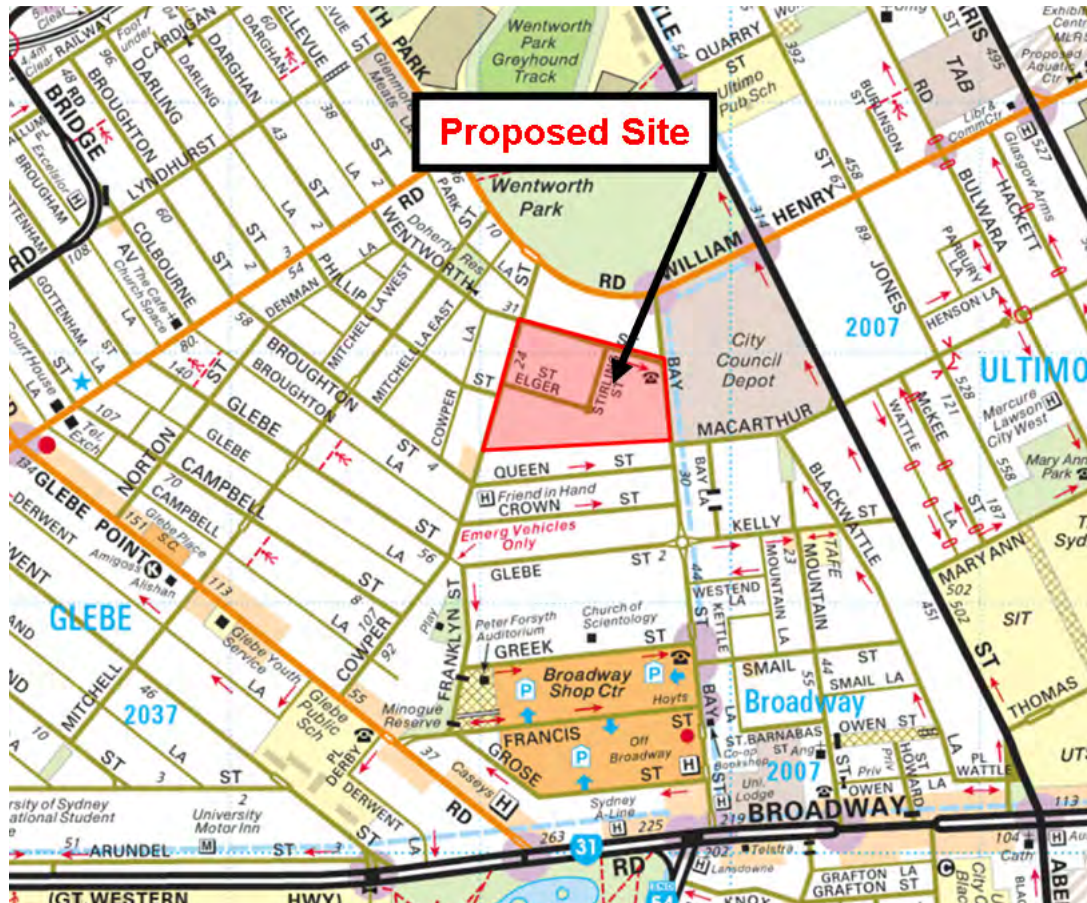
On street car parking is provided on all streets in the area surrounding the development site. Two hour parking exists on both sides of Wentworth Park Road. The western end of Wentworth Street contains two hour on-street parking, while there is unrestricted all-day parking at the eastern end.

The eastern end of Wentworth Street is a one way street (between Stirling Street and Bay Street). Cowper Street contains two hour on street parking on both sides of the street between 8am – 6pm. Elger Street allows unmetered two hour on street parking with parallel and 90 degree parking on either side between 8am and 6pm. Stirling Street permits unmetered two hour on street parking.

3 Proposed Housing NSW Development

The Housing NSW is currently undertaking a major new development in the vicinity. The site is located at 1 – 3 Elger Street, Glebe and is bounded by Bay Street, Wentworth Street and Cowper Street (refer to Figure 4). The site is currently occupied by 134 old style medium density housing with 30 - 35 off – street parking spaces.

Figure 4: Housing NSW Site Development



3.1 Housing NSW Proposal

The development proposal includes demolition of the existing dwellings and construction of approximately 153 social housing, 90 affordable housing, 250 private units with 151m² community facilities and 504m² of retail space as shown in Figure 5 and Figure 6. Arup prepared a number of traffic and transport assessment reports for the development.

Two vehicular accesses are proposed via Wentworth Street into building B and A (approximately 20m east and 40m west of Stirling Street). In addition, another vehicular access is proposed to building C along its southern boundary. There will be no vehicular access to building D which will be allocated for social housing.

Figure 5: Housing NSW Site Proposed Land Use



Figure 6: Breakdown of the Residential Component of the Housing NSW Development

	Studio	1 Bed	2 bed	3 bed	Totals
Market Housing					
Building A1 + A3		48	18		66
Building A2		55	25	6	86
Building C1+C2	9	51	34	4	98
Market Housing Total	9 4%	154 62%	77 31%	10 4%	250
Affordable Housing Buildings					
Building B1 + B2		25	41	24	90
Affordable Housing Total		25 28%	41 46%	24 27%	90
Social Housing					
Building B3		42	4		46
Building D1		43	17		60
Building D2		40	7		47
Social Housing Total		125 82%	28 18%		153
Total					493

In total 175 off – street parking spaces are proposed (145 spaces for private housing and 30 for affordable housing). 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 are proposed:

- Heavy vehicle restriction (three ton or over) in Elger Street and Stirling Street;
- Introduction of a 40 km/h speed limit on Elger Street and Stirling Street;

- 'No Right' turn from Elger Street to Cowper Street and give way 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 pedestrian 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; and
- 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 7. However, this option may have some negative impact e.g. traffic noise.

Figure 7: Example of a Raised Threshold at the intersection of Dunmore St & Monomeeth St, Bexley



The above proposed traffic calming devices have been discussed with the RTA but no traffic calming treatment has been finalised yet.

The net traffic generation for the development is approximately 40 vehicle trips in the peak traffic hour. This is relatively a low increase of vehicular traffic and has not required a full Traffic Impact Assessment report.

4 Development Proposal

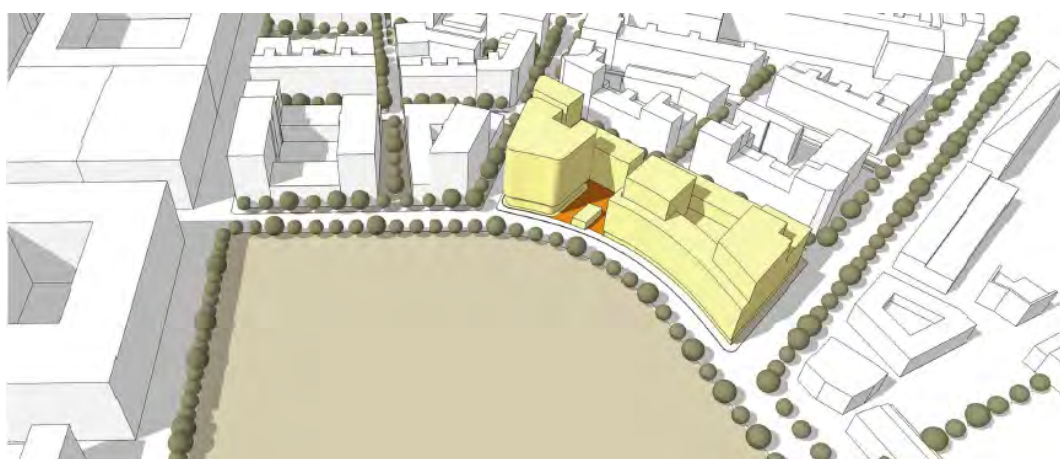
4.1 Description of the Development

The future subdivision at the site could potentially accommodate up to 157 private units, 25 affordable housing, as well as approximately 1200 m² retail and 7000 m² commercial floorspace. The current proposal of the site plan is illustrated in Figure 8 below. The building alignment is proposed to be setback to 5 – 6m from the existing kerb line to allow boulevard tree planting.

Figure 8: Schematic view of the Proposal



Concept plan building envelope



Visualisation (looking south)

As shown in Figure 8, a public domain and pedestrian connection is proposed between Wentworth Street (south) and Wentworth Park Road (north) at Stirling

Street alignment. This proposed pedestrian access divides the site into two distinct blocks, e.g. Bay Street (east block) and Cowper Street (west block).

A breakdown of the proposed private housing component is tabulated below.

Table 1: Land use Component of the Proposed Development

Land Use	Units	GFA (m ²)
Studio Apartments	9	
1 Bed Apartments	57	
2 Bed Apartments	79	
3 Bed Apartments	12	
Residential Bay St Block		8,899
Residential Cowper St Block		5,880
Retail		1,190
Commercial		6,900
Total	157	22,869
Affordable Housing	25	1,551
Total	182	24,420

Note: Total GFA 24,420 m²

4.2 Vehicular Access

A number of vehicular accesses are proposed at Wentworth Street and Cowper Street (refer to Figure 9). No vehicular access is proposed either in Wentworth Park Road or Bay Street. Compared to the existing situation, there will be net reduction of vehicular accesses in the proposed site.

Figure 9: Proposed Vehicular Accesses



4.3 Pedestrian Access

Each individual building will be served by footpaths from the surrounding roads, car parks and adjacent buildings. Pedestrian access to each building is shown in

Figure 10. As stated earlier, public domain and pedestrian thoroughfare are proposed between the two blocks.

Figure 10: Pedestrian Connection to the Proposed Site



4.4 Parking Provision

The proposal includes dwellings for the purposes of private ownership as well as affordable housing, and retail/commercial land uses. An assessment of the amount of car parking required to be provided has been undertaken in regard to the proposed land uses. City of Sydney Council desire is to minimise car parking in the Local Government Area (LGA), which is demonstrated by new provisions being proposed in their draft Sydney Local Environmental Plan 2011 (Draft SLEP 2011). In accordance with clause 7.5 (1) (b) of the Draft SLEP 2011, the development falls under Category B (for residential) and F (for commercial and retail). The applicable parking rate under the Draft SLEP 2011 is provided in Table 2.

Table 2: Car Parking Requirements as per Sydney Local Environmental Plan 2011

Land Use	No of Units/ GFA (m ²)	Maximum Parking Rate	Maximum no of Parking
Studio	9	0.2	1.8
1 - bed	57	0.4	22.8
2 - bed	79	0.8	63.2
3 - bed	12	1.1	13.2
Visitor	157	*	13.35
Retail	1,190 m ²	1space/ 50 m ² GFA (for retail space no more than 2,000m ² GFA, FSR<3.5:1)	23.8
Commercial	6,900 m ²	**	30.67
Total number of Allowable Maximum Parking			168

*- Residential visitor parking rate: First 30 units – 0.167, next 40 units – 0.1 and remaining units – 0.05

** - For floor space ratio over 3.5:1, the maximum number of parking should be calculated as follows:

$$M = (G \times A) \div (50 \times T) = (6900 \times 5427) / (50 \times 24,420) = 30.67$$

where:

M – the maximum number of parking spaces;

G – GFA (m²) of all office premises and business premises;

A – the site area in m², and

T – the total gross floor area of all buildings on the site in m².

The above table identifies that based on the provisions in the Draft SLEP 2011 for the proposed land uses, the proposal would require approximately 168 car spaces. The table above only allows car parking for the privately owned dwellings. The number of affordable housing dwellings have not been included in calculation (refer to section 4.4.1). Notwithstanding the findings of the calculation in the table above, it is proposed that the future development of the site is to provide approximately 220 car spaces. This is based on allowing one car space for every 50m² of gross building area (GBA) of the total gross building floor area of the basement levels, which equate to approximately 11,000m² GBA.

Assuming one car parking space for every 50 m² GFA, the concept plan of the development is proposing approximately 215 – 220 car parking spaces. Although the parking provision exceeds the maximum parking requirements as per City of Sydney LEP 2011 by approximately 31%, the final car parking provision will be subject to further analysis and assessment.

4.4.1 Parking Provision for Affordable Housing

Research shows that the car ownership in 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 affordable housing developments in close proximity to CBD fringe (e.g. Redfern, Waterloo social and affordable housing). However, in the Affordable Housing Design Guidelines, Queensland Government Department of Housing (September 2004) the car parking rates in the 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).

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

Another reason the affordable housing should have no 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 \$40,000 - \$60,000 per parking space. 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.

4.5 Service Vehicle Provision

Two vehicular accesses are proposed on Wentworth Park Road (refer to Figure 9). Loading bays, suitable for a Medium Rigid Vehicle (8.8m truck), will be adequate to for retail and commercial components of the development.

4.6 Bicycle Provision

The bicycle parking for the development will be provided based on Draft Sydney Development Control Plan 2010. The applicable bicycle parking rate under the current LEP is provided in Table 2.

Table 3: Bicycle Parking Requirements as per Draft Sydney DCP 2010

Land Use	No of Units/ GFA (m ²)	Residents/ Employees Rate	Parking Required	Visitors/ Customers Rate	Parking Required	Total Parking Required
Residential	182	1 per unit	182	1 per 10 units	18.2	200.2
Retail (shopping centre)	1,190 m ²	1 per 200 m ² Sales area	5.95	1 per 300 m ² sales area	3.97	9.92
Commercial	6,900 m ²	1 per 150 m ²	46	1 per 400 m ²	17.25	63.25
					Total	273

The development will provide sufficient bicycle parking as required by the Council DCP.

5 Preliminary Transport Impact Assessment

5.1 Site Location and Land Use Aspect

5.1.1 Development Location

Nearby community facilities are in place which will lower the requirement for residents to travel to facilities further afield. The proximity of the nearby parkland, playgrounds, schools and public libraries lowers the requirement for residents in this area to use vehicular transport to reach their destination and as a result lower vehicle trips will be expected from the development (refer to Photograph 3). Commuter trips are also less likely to be made by vehicle as a result of the nearby buses and light rail facilities and the proximity of Sydney CBD which is within 20 minutes walk from the development.

Photograph 3: Wentworth Park facilities



Wentworth Park pedestrian bridge



Wentworth Park shared cycle and footpath

5.1.2 Retail Aspects

The site allows for a portion of retail of 1,190m². This is likely to be used to provide locally accessible goods. The provision of local retail has potential to cater for future employees and future immediate residents on the site. Given the proximity to residential and employment and the size of the retail aspect of the development the majority of trips associated with the retail are expected to be by foot. As a result, the expected vehicular movements of the retail land uses are considered to be minimal. However, detailed investigations would be undertaken as part of future detailed development applications.

Future residents would also have an option to shop at Broadway Shopping Centre providing a potentially wider range of goods and services. The Broadway Shopping Centre is within 400 metres (5 minutes) walking distance.

5.2 Footpath

The proposals for the site include enhancement to the interconnectivity of the site via provision of pedestrian connections improvements and a public amenity area. The area is proposed opposite Stirling Street and is illustrated on Figure 11.



Figure 11: Public Area and Pedestrian Connectivity

Further improvements are proposed to Wentworth Street to improve public amenity and connectivity. These amendments include minor widening of the footpath, the formalisation of car parking and the provision of new trees along Wentworth Street to provide improved amenity to the site.

5.3 Traffic Impact Assessment

Based on the RTA rate¹ the development is likely to generate 38 residential trips (assuming 0.24 trips/ unit in the metropolitan regional CBD centres). There will be some additional retail and commercial trips based on the parking provision. The site will be subject to future development applications. It is anticipated that future traffic assessments will be undertaken as part of this separate process.

The provision of the safest possible vehicle access into the proposed development at Wentworth Street should ensure satisfactory sightlines as Wentworth Street is on a gradient.

As Wentworth Street is one way eastbound between Stirling Street to Bay Street, the exiting vehicles from the proposed eastern driveways on Wentworth Street will have to exit the site via Bay Street (refer to Photograph 4). The site vehicles turning right from Wentworth Street to Bay Street may experience longer delay during the peak traffic periods due to the high volume of traffic on Wentworth Street (refer to Photograph 4). Therefore 'DO NOT QUEUE ACROSS INTERSECTION' (G9-237) signs and its associated line marking may be required on Bay Street at Wentworth Street intersection to facilitate traffic entering from Wentworth Street to Bay Street.

¹ RTA Guide to Traffic Generating Developments; October 2002

Photograph 4: Wentworth Street from Bay Street



It is likely that there may be an increase in vehicle numbers on Wentworth Street due to the provision of the proposed vehicular access on this street. However the total volume of traffic on Wentworth Street should be at or near the RTA's recommended maximum environmental capacity (300 vehicles/h) as stated in Table 4.6 in RTA Guide¹.

6 Conclusions

This report has been prepared to assess potential transport and traffic issues that may occur as a result of the mixed use development at the 87 Bay Street, Glebe. The development concept for the site is to provide approximately 182 residential units (approximately 157 private and 25 affordable) with associated retail and commercial components.

The key issues of this report is summarised below:

- The site is well located for a mixed-use development based development due to the nearby facilities which will decrease the amount of vehicle based trips from the proposed development;
- The commercial aspect of the development will also lower the demand for vehicle based trips from the development and the directly surrounding area as a whole;
- The provision of a development with underground car parking may lower the existing demand for on street car parking;
- Wentworth Street is suitable for vehicular access. Final access arrangements and design to basement parking is to be undertaken as part of separate future development applications;
- A 'DO NOT QUEUE ACROSS INTERSECTION' (G9-237) signs and its associated line marking may be warranted on Bay Street at Wentworth Street intersection to facilitate traffic entering from Wentworth Street to Bay Street; and
- The traffic, transport and parking impact of the development may require a full scale TIA.

Appendix A

Tube Count Data

Count Number 7838

Lat/Long : S33 52 45.1 / E151 11 36.1

UBD 235 P-14

Street WENTWORTH PARK ROAD, GLEBE : Between BAY STREET & BRIDGE ROAD (bidirectional)

Location Between Bay Street and Cowper Street, 10 Mtrs north of ELP LE 11416, on tree opposite Cowper Street

Start Date 18-SEP-11

Start Time 100

Duration 7 DAYS

Interval 1 HOUR

Speed Limit 60

SOUTH EAST

NONE

COMBINED

Weekly 50th Percentile Speed

33

33

33

Weekly 85th Percentile Speed

39

39

39

Five Day AADT

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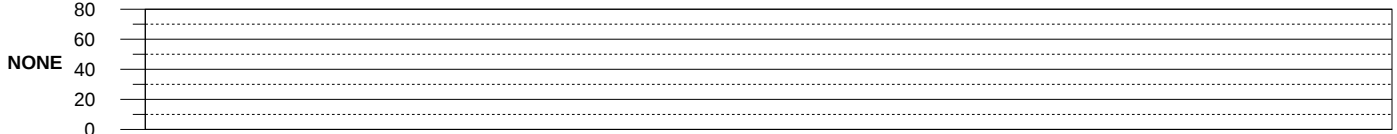
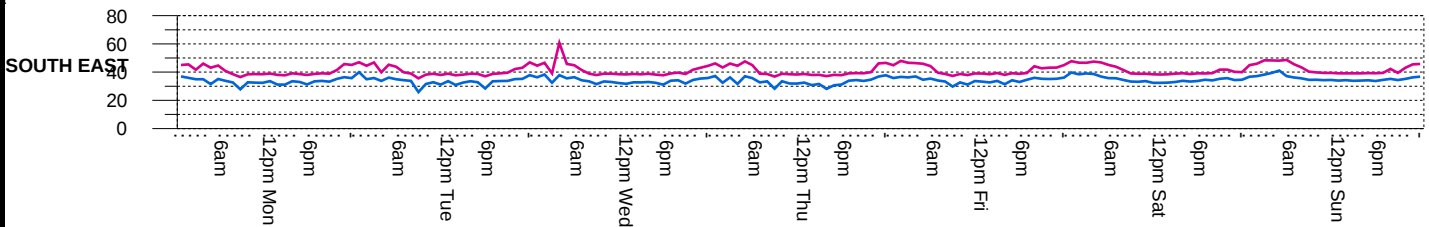
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Seven Day AADT

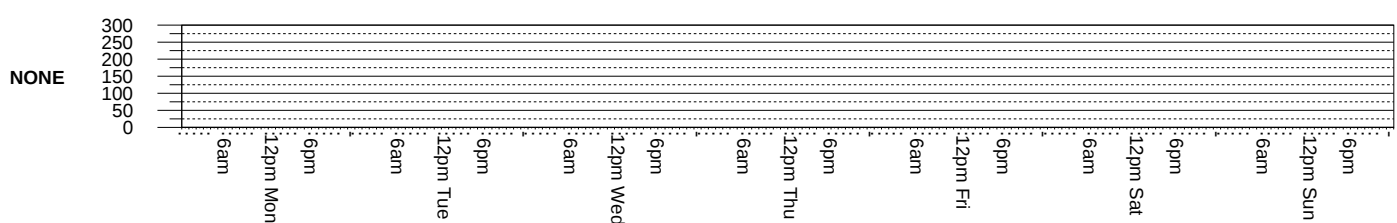
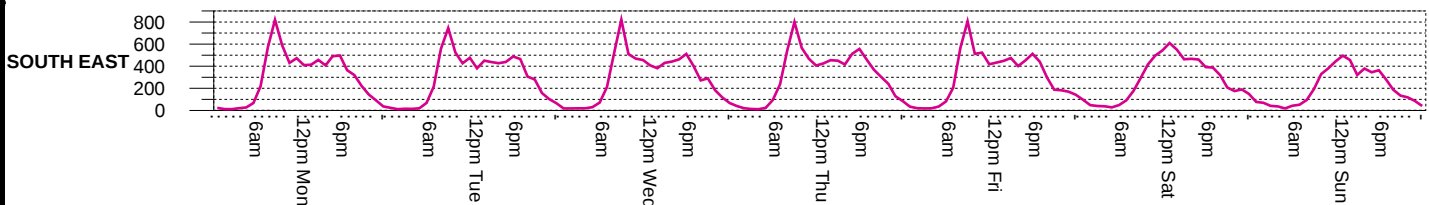
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Med %	3.2		3.2	3.3			3.3	3.4			3.4	3.3			3.3	3.4			3.4	1.6			1.6	1.5			1.5	2.9			2.9
Long %	.4		.4	.3			.3	.4			.4	.4			.4	.2			.2	.2			.2	.2			.2	.3			.3
AM Pk Vo	819		819	745			745	821			821	800			800	807			807	543			543	444			444	711			711
PM Pk Vo	497		497	488			488	511			511	557			557	512			512	610			610	496			496	524			524
7-7pm 24Hr Tot	5921		5921	5822			5822	5811			5811	6058			6058	5990			5990	5260			5260	4084			4084	5564			5564
	7113		7113	7100			7100	7126			7126	7622			7622	7382			7382	6689			6689	4984			4984	6859			6859
Class 0	113		113	85			85	133			133	110			110	99			99	59			59	63			63	95			95
Class 1	6731		6731	6748			6748	6713			6713	7210			7210	6997			6997	6497			6497	4833			4833	6533			6533
Class 2	14		14	12			12	13			13	17			17	20			20	12			12	4			4	13			13
Class 3	196		196	214			214	222			222	227			227	231			231	98			98	74			74	180			180
Class 4	25		25	16			16	18			18	20			20	16			16	9			9	2			2	15			15
Class 5	4		4	2			2	1			1	5			5	3			3	2			2	0			0	2			2
Class 6	5		5	9			9	7			7	9			9	4			4	3			3	3			3	6			6
Class 7	12		12	7			7	8			8	14			14	8			8	3			3	3			3	8			8
Class 8	6		6	2			2	1			1	1			1	1			1	0			0	1			1	2			2
Class 9	7		7	5			5	10			10	9			9	3			3	6			6	1			1	6			6
Class 10	0		0	0			0	0			0	0			0	0			0	0			0	0			0	0			0
Class 11	0		0	0			0	0			0	0			0	0			0	0			0	0			0	0			0
Class 12	0		0	0			0	0			0	0			0	0			0	0			0	0			0	0			0
Class 13	0		0	0			0	0			0	0			0	0			0	0			0	0			0	0			0



Count Number 7212 Ref : ARUP Lat/Long : S33 52 46.3 / E151 11 38.8 UBD 235 P-14
 Street WENTWORTH PARK ROAD, GLEBE : From BAY STREET to BRIDGE ROAD : NORTH WEST
 Location Between Bay Street and Cowper Street, midsection Carriageway

Start Date 02-APR-11
 Start Time 100
 Duration 7 DAYS
 Interval 1 HOUR

Weekly 50th Percentile Speed 35
 Weekly 85th Percentile Speed 41
 Five Day AADT 7843
 Seven Day AADT 7489

TOTAL COUNT MATRIX

	MON 4TH	TUE 5TH	WED 6TH	THU 7TH	FRI 8TH	SAT 2ND	SUN 3RD	5 Day		7 Day	
								Total	Average	Total	Average
Midnight - 1am	93	78	113	113	105	122	119	502	100	743	106
1am - 2am	32	36	40	50	53	63	81	211	42	355	51
2am - 3am	17	21	22	13	38	70	71	111	22	252	36
3am - 4am	15	7	15	13	20	39	56	70	14	165	24
4am - 5am	11	11	17	18	21	22	31	78	16	131	19
5am - 6am	18	16	27	12	20	36	26	93	19	155	22
6am - 7am	42	45	43	44	39	61	30	213	43	304	43
7am - 8am	118	111	106	130	119	112	66	584	117	762	109
8am - 9am	222	220	245	216	236	245	96	1139	228	1480	211
9am - 10am	408	389	425	364	358	320	216	1944	389	2480	354
10am - 11am	346	361	356	388	382	397	320	1833	367	2550	364
11am - Midday	292	373	346	340	398	478	406	1749	350	2633	376
Midday - 1pm	343	392	381	390	429	622	482	1935	387	3039	434
1pm - 2pm	367	466	451	434	492	567	500	2210	442	3277	468
2pm - 3pm	445	487	523	439	579	570	255	2473	495	3298	471
3pm - 4pm	468	507	523	540	548	536	482	2586	517	3604	515
4pm - 5pm	600	618	663	598	686	665	502	3165	633	4332	619
5pm - 6pm	672	655	699	747	873	633	492	3646	729	4771	682
6pm - 7pm	1049	983	1020	959	925	476	458	4936	987	5870	839
7pm - 8pm	805	766	829	758	642	351	442	3800	760	4593	656
8pm - 9pm	436	462	460	492	403	268	276	2253	451	2797	400
9pm - 10pm	266	285	299	386	268	209	210	1504	301	1923	275
10pm - 11pm	208	257	253	336	229	228	195	1283	257	1706	244
11pm - Midnight	130	185	189	158	237	196	105	899	180	1200	171
Total	7403	7731	8045	7938	8100	7286	5917	39217	7843	52420	7488

Count Number 7838 Ref : ARUP Lat/Long : S33 52 45.1 / E151 11 36.1 UBD 235 P-14
 Street WENTWORTH PARK ROAD, GLEBE : From BAY STREET to BRIDGE ROAD : SOUTH EAST
 Location Between Bay Street and Cowper Street, 10 Mtrs north of ELP LE 11416, on tree opposite Cowper Street Carriageway

Start Date 18-SEP-11
 Start Time 100
 Duration 7 DAYS
 Interval 1 HOUR

Weekly 50th Percentile Speed 33
 Weekly 85th Percentile Speed 39
 Five Day AADT 7269
 Seven Day AADT 6859

TOTAL COUNT MATRIX

	MON 19TH	TUE 20TH	WED 21ST	THU 22ND	FRI 23RD	SAT 24TH	SUN 18TH	5 Day Total Average		7 Day Total Average	
Midnight - 1am	23	24	18	40	34	96	77	139	28	312	45
1am - 2am	12	11	18	20	20	48	69	81	16	198	28
2am - 3am	11	15	19	13	18	40	41	76	15	157	22
3am - 4am	20	14	19	11	19	37	36	83	17	156	22
4am - 5am	27	19	30	23	35	28	18	134	27	180	26
5am - 6am	67	68	71	94	82	49	42	382	76	473	68
6am - 7am	220	215	211	236	204	91	52	1086	217	1229	176
7am - 8am	570	559	517	541	567	177	95	2754	551	3026	432
8am - 9am	819	745	821	800	807	296	193	3992	798	4481	640
9am - 10am	588	525	509	566	512	417	329	2700	540	3446	492
10am - 11am	430	427	469	468	523	496	381	2317	463	3194	456
11am - Midday	473	477	456	406	418	543	444	2230	446	3217	460
Midday - 1pm	410	381	408	425	433	610	496	2057	411	3163	452
1pm - 2pm	414	450	382	454	449	550	456	2149	430	3155	451
2pm - 3pm	458	438	430	451	475	463	321	2252	450	3036	434
3pm - 4pm	408	428	442	416	401	467	379	2095	419	2941	420
4pm - 5pm	491	439	462	512	452	461	345	2356	471	3162	452
5pm - 6pm	497	488	511	557	512	392	364	2565	513	3321	474
6pm - 7pm	363	465	404	462	441	388	281	2135	427	2804	401
7pm - 8pm	320	306	272	369	300	319	187	1567	313	2073	296
8pm - 9pm	222	281	290	304	188	207	134	1285	257	1626	232
9pm - 10pm	144	157	183	241	182	175	118	907	181	1200	171
10pm - 11pm	90	103	117	128	169	190	86	607	121	883	126
11pm - Midnight	36	65	67	85	141	149	40	394	79	583	83
Total	7113	7100	7126	7622	7382	6689	4984	36343	7268	48016	6859

Count Number 7212

Ref : ARUP

Lat/Long : S33 52 46.3 / E151 11 38.8

UBD 235 P-14

Street WENTWORTH PARK ROAD, GLEBE : From BAY STREET to BRIDGE ROAD : NORTH WEST

Location Between Bay Street and Cowper Street, midsection

Carriageway

Start Date 02-APR-11

Start Time 100

Duration 7 DAYS

Interval 1 HOUR

Weekly 50th Percentile Speed 35

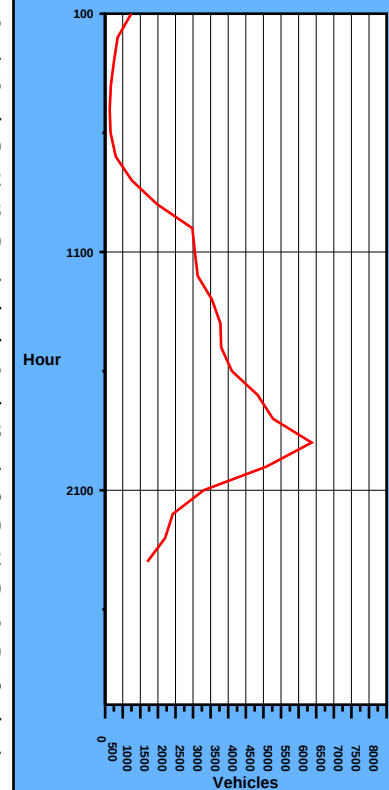
Weekly 85th Percentile Speed 41

Five Day AADT 7843

Seven Day AADT 7489

THE BODY OF THIS REPORT
SHOWS : SEVENDAY
TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	8	726	1	7	1	0	0	0	0	0	0	0	0	0	743	106
1am - 2am	2	350	0	3	0	0	0	0	0	0	0	0	0	0	355	51
2am - 3am	5	247	0	0	0	0	0	0	0	0	0	0	0	0	252	36
3am - 4am	1	160	0	3	1	0	0	0	0	0	0	0	0	0	165	24
4am - 5am	0	124	0	5	0	2	0	0	0	0	0	0	0	0	131	19
5am - 6am	0	146	0	9	0	0	0	0	0	0	0	0	0	0	155	22
6am - 7am	2	286	1	12	1	0	1	0	1	0	0	0	0	0	304	43
7am - 8am	5	694	0	48	11	1	2	1	0	0	0	0	0	0	762	109
8am - 9am	10	1370	1	74	8	7	6	2	0	2	0	0	0	0	1480	211
9am - 10am	30	2332	5	76	12	13	2	5	1	4	0	0	0	0	2480	354
10am - 11am	25	2401	4	89	16	14	1	0	0	0	0	0	0	0	2550	364
11am - Midday	15	2491	5	94	13	11	2	0	0	2	0	0	0	0	2633	376
Midday - 1pm	27	2883	5	96	13	9	3	2	0	1	0	0	0	0	3039	434
1pm - 2pm	25	3129	6	88	10	10	3	1	0	5	0	0	0	0	3277	468
2pm - 3pm	33	3129	4	100	13	12	4	2	1	0	0	0	0	0	3298	471
3pm - 4pm	28	3465	5	78	9	9	3	5	0	2	0	0	0	0	3604	515
4pm - 5pm	32	4207	4	65	9	9	2	3	0	1	0	0	0	0	4332	619
5pm - 6pm	39	4598	10	81	12	12	8	7	0	4	0	0	0	0	4771	682
6pm - 7pm	63	5680	8	77	14	6	7	9	1	5	0	0	0	0	5870	839
7pm - 8pm	56	4478	3	35	8	3	5	4	0	1	0	0	0	0	4593	656
8pm - 9pm	39	2718	1	30	3	3	1	1	0	1	0	0	0	0	2797	400
9pm - 10pm	22	1873	2	19	4	0	0	3	0	0	0	0	0	0	1923	275
10pm - 11pm	24	1669	3	6	4	0	0	0	0	0	0	0	0	0	1706	244
11pm - Midnight	7	1186	1	4	1	0	0	1	0	0	0	0	0	0	1200	171
Total	498	50342	69	1099	163	121	50	46	4	28	0	0	0	0	52420	7489
% of Total	1	96		2												



Count Number **7838** Ref : **ARUP** Lat/Long : **S33 52 45.1 / E151 11 36.1** UBD **235 P-14**
 Street **WENTWORTH PARK ROAD, GLEBE : From BAY STREET to BRIDGE ROAD : SOUTH EAST**
 Location **Between Bay Street and Cowper Street, 10 Mtrs north of ELP LE 11416, on tree opposite Cowper Street** *Carriageway*

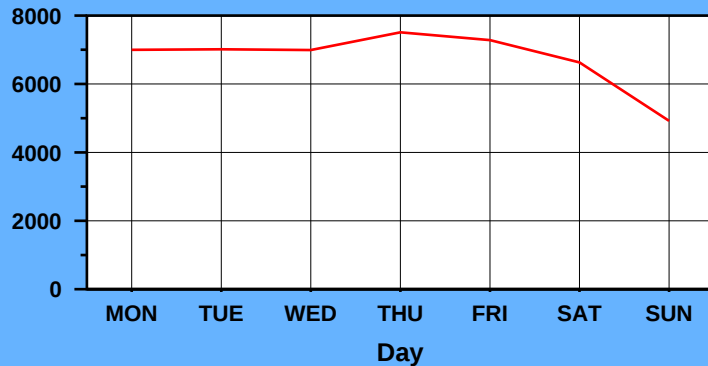
Start Date **18-SEP-11**
 Start Time **100**
 Duration **7 DAYS**
 Interval **1 HOUR**

Weekly 50th Percentile Speed **33**
Weekly 85th Percentile Speed **39**
Five Day AADT **7269**
Seven Day AADT **6859**

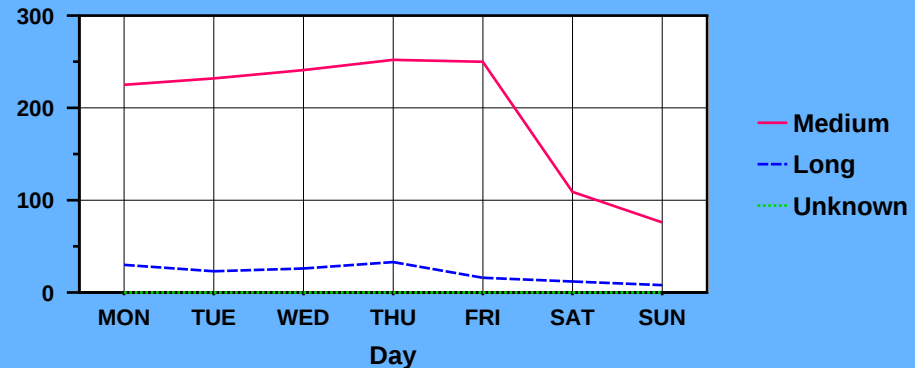
**THE BODY OF THIS REPORT
 SHOWS : SEVENDAY
 TRAFFIC**

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total
MONDAY	113	6731	14	196	25	4	5	12	6	7	0	0	0	0	7113
TUESDAY	85	6748	12	214	16	2	9	7	2	5	0	0	0	0	7100
WEDNESDAY	133	6713	13	222	18	1	7	8	1	10	0	0	0	0	7126
THURSDAY	110	7210	17	227	20	5	9	14	1	9	0	0	0	0	7622
FRIDAY	99	6997	20	231	16	3	4	8	1	3	0	0	0	0	7382
SATURDAY	59	6497	12	98	9	2	3	3	0	6	0	0	0	0	6689
SUNDAY	63	4833	4	74	2	0	3	3	1	1	0	0	0	0	4984
5 Day Total	540	34399	76	1090	95	15	34	49	11	34	0	0	0	0	36343
5 Day Pct	1	95		3											
7 Day Total	662	45729	92	1262	106	17	40	55	12	41	0	0	0	0	48016
7 Day Pct	1	95		3											

Volume



Class Volumes



Count Number 7213 Ref : ARUP Lat/Long : S33 52 47.7 / E151 11 36.1 UBD 12 M-13
 Street WENTWORTH STREET, GLEBE : Between ST JOHNS ROAD & BAY STREET (bidirectional) :
 Location Between Cowper Street and Bay Street, 20m east of Cowper in factory driveway Carriageway

Start Date 23-MAR-11
 Start Time 100
 Duration 7 DAYS
 Interval 1 HOUR

Weekly 50th Percentile Speed 23
 Weekly 85th Percentile Speed 29
 Five Day AADT 387
 Seven Day AADT 316

TOTAL COUNT MATRIX

	MON 28TH	TUE 29TH	WED 23RD	THU 24TH	FRI 25TH	SAT 26TH	SUN 27TH	5 Day Total Average		7 Day Total Average	
Midnight - 1am	3	5	3	3	2	4	2	16	3	22	3
1am - 2am	3	1	0	3	0	9	1	7	1	17	2
2am - 3am	0	0	1	0	0	0	0	1	0	1	0
3am - 4am	0	1	4	0	0	2	0	5	1	7	1
4am - 5am	0	0	0	0	1	0	0	1	0	1	0
5am - 6am	8	7	7	18	11	4	1	51	10	56	8
6am - 7am	7	22	16	18	19	3	2	82	16	87	12
7am - 8am	35	24	35	30	26	8	0	150	30	158	23
8am - 9am	59	45	59	54	41	6	3	258	52	267	38
9am - 10am	35	39	34	28	38	10	4	174	35	188	27
10am - 11am	23	29	24	25	17	12	10	118	24	140	20
11am - Midday	23	23	28	20	17	8	6	111	22	125	18
Midday - 1pm	29	27	22	22	13	13	13	113	23	139	20
1pm - 2pm	16	25	20	32	17	10	10	110	22	130	19
2pm - 3pm	21	33	31	33	14	23	12	132	26	167	24
3pm - 4pm	18	18	46	35	22	7	7	139	28	153	22
4pm - 5pm	19	27	23	21	20	4	7	110	22	121	17
5pm - 6pm	29	28	29	29	17	8	9	132	26	149	21
6pm - 7pm	19	8	15	18	16	9	9	76	15	94	13
7pm - 8pm	13	5	11	9	9	3	5	47	9	55	8
8pm - 9pm	6	7	10	6	7	3	7	36	7	46	7
9pm - 10pm	6	5	10	10	3	1	3	34	7	38	5
10pm - 11pm	4	1	3	5	4	0	4	17	3	21	3
11pm - Midnight	2	0	7	4	4	4	7	17	3	28	4
Total	378	380	438	423	318	151	122	1937	387	2210	315

Count Number 7213

Ref : ARUP

Lat/Long : S33 52 47.7 / E151 11 36.1

UBD 12 M-13

Street WENTWORTH STREET, GLEBE : From ST JOHNS ROAD to BAY STREET : EAST BOUND

Location Between Cowper Street and Bay Street, 20m east of Cowper in factory driveway

Carriageway

Start Date 23-MAR-11

Start Time 100

Duration 7 DAYS

Interval 1 HOUR

Weekly 50th Percentile Speed 23

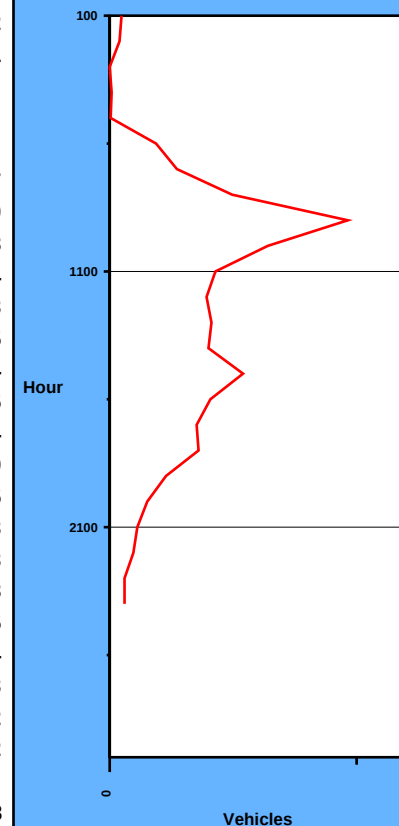
Weekly 85th Percentile Speed 29

Five Day AADT 293

Seven Day AADT 238

THE BODY OF THIS REPORT
SHOWS : SEVENDAY
TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12	2
1am - 2am	4	6	0	0	0	0	0	0	0	0	0	0	0	0	10	1
2am - 3am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
3am - 4am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	
4am - 5am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	47	7
5am - 6am	0	46	0	1	0	0	0	0	0	0	0	0	0	0	68	10
6am - 7am	5	63	0	0	0	0	0	0	0	0	0	0	0	0	124	18
7am - 8am	3	120	0	1	0	0	0	0	0	0	0	0	0	0	241	34
8am - 9am	13	219	0	9	0	0	0	0	0	0	0	0	0	0	160	23
9am - 10am	10	148	0	2	0	0	0	0	0	0	0	0	0	0	107	15
10am - 11am	3	94	0	10	0	0	0	0	0	0	0	0	0	0	98	14
11am - Midday	5	84	0	9	0	0	0	0	0	0	0	0	0	0	103	15
Midday - 1pm	3	97	0	3	0	0	0	0	0	0	0	0	0	0	100	14
1pm - 2pm	4	93	0	3	0	0	0	0	0	0	0	0	0	0	135	19
2pm - 3pm	6	124	0	5	0	0	0	0	0	0	0	0	0	0	102	15
3pm - 4pm	5	94	0	3	0	0	0	0	0	0	0	0	0	0	88	13
4pm - 5pm	2	81	0	4	1	0	0	0	0	0	0	0	0	0	90	13
5pm - 6pm	2	86	0	2	0	0	0	0	0	0	0	0	0	0	57	8
6pm - 7pm	6	49	0	2	0	0	0	0	0	0	0	0	0	0	38	5
7pm - 8pm	0	35	0	3	0	0	0	0	0	0	0	0	0	0	28	4
8pm - 9pm	1	27	0	0	0	0	0	0	0	0	0	0	0	0	24	3
9pm - 10pm	3	20	0	1	0	0	0	0	0	0	0	0	0	0	15	2
10pm - 11pm	1	14	0	0	0	0	0	0	0	0	0	0	0	0	15	2
11pm - Midnight	3	11	0	1	0	0	0	0	0	0	0	0	0	0		
Total	79	1526	0	59	1	0	0	0	0	0	0	0	0	0	1665	238
% of Total	5	92		4												



Count Number 7213

Ref : ARUP

Lat/Long : S33 52 47.7 / E151 11 36.1

UBD 12 M-13

Street WENTWORTH STREET, GLEBE : From BAY STREET to ST JOHNS ROAD : WEST BOUND

Location Between Cowper Street and Bay Street, 20m east of Cowper in factory driveway

Carriageway

Start Date 23-MAR-11

Start Time 100

Duration 7 DAYS

Interval 1 HOUR

Weekly 50th Percentile Speed 23

Weekly 85th Percentile Speed 29

Five Day AADT 94

Seven Day AADT 78

THE BODY OF THIS REPORT
SHOWS : SEVENDAY
TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	2	8	0	0	0	0	0	0	0	0	0	0	0	0	10	1
1am - 2am	1	6	0	0	0	0	0	0	0	0	0	0	0	0	7	1
2am - 3am	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
3am - 4am	2	2	0	0	0	1	0	0	0	0	0	0	0	0	5	1
4am - 5am	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5am - 6am	0	8	0	1	0	0	0	0	0	0	0	0	0	0	9	1
6am - 7am	1	18	0	0	0	0	0	0	0	0	0	0	0	0	19	3
7am - 8am	2	31	0	1	0	0	0	0	0	0	0	0	0	0	34	5
8am - 9am	4	21	0	1	0	0	0	0	0	0	0	0	0	0	26	4
9am - 10am	4	24	0	0	0	0	0	0	0	0	0	0	0	0	28	4
10am - 11am	4	27	0	0	2	0	0	0	0	0	0	0	0	0	33	5
11am - Midday	6	21	0	0	0	0	0	0	0	0	0	0	0	0	27	4
Midday - 1pm	10	26	0	0	0	0	0	0	0	0	0	0	0	0	36	5
1pm - 2pm	3	27	0	0	0	0	0	0	0	0	0	0	0	0	30	4
2pm - 3pm	3	29	0	0	0	0	0	0	0	0	0	0	0	0	32	5
3pm - 4pm	7	44	0	0	0	0	0	0	0	0	0	0	0	0	51	7
4pm - 5pm	3	30	0	0	0	0	0	0	0	0	0	0	0	0	33	5
5pm - 6pm	16	41	0	1	0	1	0	0	0	0	0	0	0	0	59	8
6pm - 7pm	7	30	0	0	0	0	0	0	0	0	0	0	0	0	37	5
7pm - 8pm	8	8	0	1	0	0	0	0	0	0	0	0	0	0	17	2
8pm - 9pm	7	10	0	1	0	0	0	0	0	0	0	0	0	0	18	3
9pm - 10pm	5	9	0	0	0	0	0	0	0	0	0	0	0	0	14	2
10pm - 11pm	2	4	0	0	0	0	0	0	0	0	0	0	0	0	6	1
11pm - Midnight	6	7	0	0	0	0	0	0	0	0	0	0	0	0	13	2
Total	103	432	0	6	2	2	0	0	0	0	0	0	0	0	545	78
% of Total	19	79		1												

