



TaylorThomsonWhitting

TRAFFIC and TRANSPORT ACCESSIBILITY REPORT **Wollongong Hospital Redevelopment**

for Health Infrastructure

September 2011 v10.1

Job No: 101498

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TABLE OF CONTENTS

1.0	INTRODUCTION.....	3
1.1	Development Proposal	3
1.2	Planning Context	4
1.3	Methodology	4
2.0	SITE CHARACTERISTICS	5
2.1	Hospital Campus	5
2.2	Travel Mode.....	6
3.0	PARKING.....	8
3.1	Existing Parking Conditions	8
3.1.1	Existing Parking Capacity.....	8
3.1.2	Hospital Car Parking Usage	9
3.1.3	On Street Car Parking Usage.....	10
3.2	Parking Requirements	12
4.0	TRAFFIC ASSESSMENT	14
4.1	Level of Service	14
4.2	Approved New Developments	15
4.3	Road System	15
4.4	Traffic Impact.....	16
5.0	ACCESSIBILITY	21
5.1	Pedestrian and Cyclist Access.....	21
5.2	Public Transport.....	22
5.3	Transport Management Strategy	23
6.0	SITE ACCESS	24
6.1	Access and Circulation	24
6.2	Service Vehicle Access.....	24
6.3	Kiss and Ride Area	24
7.0	CONSTRUCTION MANAGEMENT PLAN	27
8.0	RESPONSE TO DGR	28
9.0	SUMMARY.....	32

APPENDIX A:	Traffic and Parking Plans
APPENDIX B:	Data and Information Documents
APPENDIX C:	Intersection Modelling Results

1.0 INTRODUCTION

1.1 Development Proposal

The proposed redevelopment of Wollongong Hospital is to include a new Elective Surgery Unit, an expansion of the Emergency Department, and a new Ambulatory Care Unit. Some of these services will be developed within existing accommodation at the Hospital, however others will be new facilities. The project is known as the Illawarra Elective Surgical Services unit (IESS).

Wollongong Hospital is a principal referral hospital for the Southern Hospitals Network (SHN) which extends from Helensburgh in the north to North Durras in the south and has a catchment population of approximately 350,000.

The Wollongong Hospital Site is owned by the Health Administration Corporation and is located approximately 1 kilometre to the west of the Wollongong CBD. The hospital site is elevated and prominent from the surrounding precinct. It has extensive views to Mt Keira to the north-west and coastal view to the south and north. The majority of buildings on the site are orientated in a northeast-southwest axis with their primary facades facing northwest or southeast.

The site is mainly bounded by New Dapto Rd to the east, Loftus St to the north, Crown St to the south and Darling St to the east. The main hospital entry is at the corner of New Dapto Rd and Loftus St with vehicular access from Loftus St. As outlined above the Hospital is located on an elevated site with a fall across the site from the highest point to lowest of approximately 14 metres.

It is proposed to provide a new entrance to the facilities of the existing hospital, located on the north east corner of the site, adjacent to the current main entry.

This project is made up of three (3) key components – Elective Surgical service (ESS) with increase in GFA of 7330m²; Ambulatory Care Unit (with increase in GFA of about 470m²) and expansion of the Emergency Department (with increase in GFA of 470m²).

A separate project involves the addition of a third radiotherapy bunker to the current Illawarra Cancer Care Centre (ICCC). The impact of this expansion is considered in this report. Included in this development is the provision of 14 additional car parking spaces adjacent to the Engineering Building on Dudley Street.

Master planning for the site shows the provision of a new multi-deck carpark as a future stage of works, located adjacent to the current carpark to the west of New Dapto Road.

As part of the proposed Wollongong Hospital redevelopment Taylor Thomson Whitting have been engaged by Health Infrastructure to advise on structural, civil and traffic aspects of the project.

This report relates to the overall master planning for the site with respect to traffic engineering and parking issues. These include pedestrian and traffic access, parking capacity increase and the effect of the redevelopment on the surrounding street system.

1.2 Planning Context

Wollongong is the second largest city in New South Wales and a strategic employment and services hub for the South Coast region. Over the next 20 years it is anticipated that the population of Wollongong LGA will grow by more than 50,000 people, creating demand for 32,000 new dwellings within the LGA. The majority of this new growth will be located as medium to high density housing around the Wollongong city centre.

Wollongong Council recognises that expanding service and knowledge based industries such as health and education are important long term growth strategy. The existing specialist health services also elements of the wider Illawarra region. Health is the largest industry in the Wollongong city centre employing over 3500 people representing, nearly a fifth of all jobs.

In recognition of the impact of regional population growth and services, the Wollongong City Centre Vision (2006), prepared by the Department of Planning, identified that the existing cluster of health activities in Crown Street west has the potential to double by 2031. In response, the Department formally identified the **'Wollongong Medical Precinct'** to promote and enable the development of long term health activities to meet regional demand. The recent proposal for a 160 bed private hospital further west along Crown Street further reinforces this regional role of this precinct. Further to this, a proposal for development of a major private Medical Centre at 46 Loftus Street with 20 consulting rooms and 2 operating rooms has also been initiated. These proposals both have recently been approved by the authorities.

As part of the project application process a number of items have been identified by Department of Planning in Section 8 of the Director General Requirements as stated in Section 8. These have been specifically addressed in Chapter 8 of this document.

1.3 Methodology

The study has been carried out on the basis of relevant guidelines and standards such as RTA's Guide to Traffic Generating Developments, AUSTRROADS and State and regional planning documents. The study also been carried out in accordance with the Director's General Requirements.

Further, documents from previous studies or reports related to the study area have also been utilised. The following traffic and parking related surveys have also been carried out:

- Parking Surveys of on street car parking occupancies
- Car parking occupancy survey of the Hospital carpark
- Survey of pick up and set down activities of the Hospital patrons at Crown Street and entry to Loftus Street
- Intersection traffic counts at
 - o Crown and Darling Streets
 - o Crown Street and New Dapto Road
 - o New Dapto Road and Loftus Street
 - o Loftus Street and Darling Street
 - o Darling Street and Hospital Road
- Traffic Volume and speed data along streets near the Hospital

2.0 SITE CHARACTERISTICS

2.1 Hospital Campus

The Study Area includes Wollongong Hospital Campus and its environs within the Wollongong Local Government Area, NSW. The Hospital is located on the northern side of Princes Highway (Crown Street) and west of Darling Street (at south-eastern section of Darling and Crown Street intersection) while some facilities are located along Loftus Street and west of New Dapto Road. The location of the Hospital site is shown in **Figure 2.1**.



Figure 2.1 Site Location

The Hospital currently has some 1725 staff while accommodating 464,747 outpatients annually. It is expected that future activities of the Hospital will increase to 557,700 outpatients annually by the year 2019. The additional staff for the new project when fully operational will be in order of 481 comprising of:

- Emergency Dept.: 31 FTE
- Ambulatory Care: 25 FTE
- Elective Surgery: 388 FTE
- Cancer Care: 37 FTE

The total number of beds at the Hospital will increase by 70 beds from 444 to 514 beds.

The proposed redevelopment of the Hospital at its full capacity in 2019 will provide clinical services with estimated of over 375 additional outpatients per day and some additional 480 staff. **Table 2.1** provides a summary of the Hospital characteristics.

Table 2.1 Summary of Hospital Population

Category	Year 2010	2019	Increase
Total No of Staff	1725	2206	481
Outpatients annually	464,747*	557,700^	92953
Outpatients per day	1870	2245	375
No of Beds	444	514	70

*per 2008 yellow book

^subject to verification by study management/LHN

2.2 Travel Mode

It should be noted that the community profile for the Wollongong based on ABS data indicates that in 2006, there were 4,849 people who caught public transport to work (train, bus, tram or ferry) in Wollongong City, compared with 54,397 who drove in private vehicles (car –as driver, car – as passenger, motorbike, or truck).

Analysis of the method of travel to work of the residents in Wollongong City in 2006 compared to New South Wales shows that **6.3%** used public transport, while **71.1%** used a private vehicle, compared with 12.3% and 64.4% respectively in New South Wales.

The Regional Transport Indicators for Illawarra (TDC, 2005) reports that over **78%** of trips within the area take place by car (54.7% car driver and 23.6% car passenger).

It should also be noted that the assessment of travel patterns among staff and visitors at other Hospitals such as Wagga Wagga Hospital (URaP-TTW 2009), Westmead Hospital (URaP-TTW, 2002) and Concord Hospital (URaP-TTW, 2008) all showed overall car use of about 80% among staff and outpatients with over 85% among visitors (with 100% among VMO's and doctors). Accordingly, an appropriate assumption has been made for the Wollongong Hospital's travel mode among its users with consideration to its community profile and journey to work data.

Table 2.3 **Travel Data Wollongong (Profile id)**

Travel to work (includes multi-mode journeys)	Wollongong						Change 2001 to 2006
	2006			2001			
	number	%	Wollongong City %	number	%	Wollongong City %	
Enumerated data							
Train	309	4.9	5.1	419	7.7	6.3	-110
Bus	79	1.3	1.2	131	2.4	1.6	-52
Tram or Ferry	0	0	0	0	0	0	0
Taxi	35	0.6	0.2	23	0.4	0.2	12
Car - as driver	3,298	52.5	62.8	2,615	47.8	59.6	683
Car - as passenger	378	6.0	6.4	369	6.8	7.2	9
Truck	28	0.4	1.2	44	0.8	1.6	-16
Motorbike	45	0.7	0.7	34	0.6	0.6	12
Bicycle	81	1.3	0.9	85	1.5	0.9	-3
Walked only	866	13.8	3.2	752	13.8	3.3	114
Other	57	0.9	0.8	89	1.6	1.3	-33
Worked at home	165	2.6	2.8	134	2.5	2.8	31
Did not go to work	834	13.3	12.7	684	12.5	12.6	150
Not stated	111	1.8	1.9	87	1.6	1.9	24
Total	6,285	100.0	100.0	5,465	100.0	100.0	821

Source: Australian Bureau of Statistics, Census of Population and Housing, 2006, 2001, 1996, and 1991.

3.0 PARKING

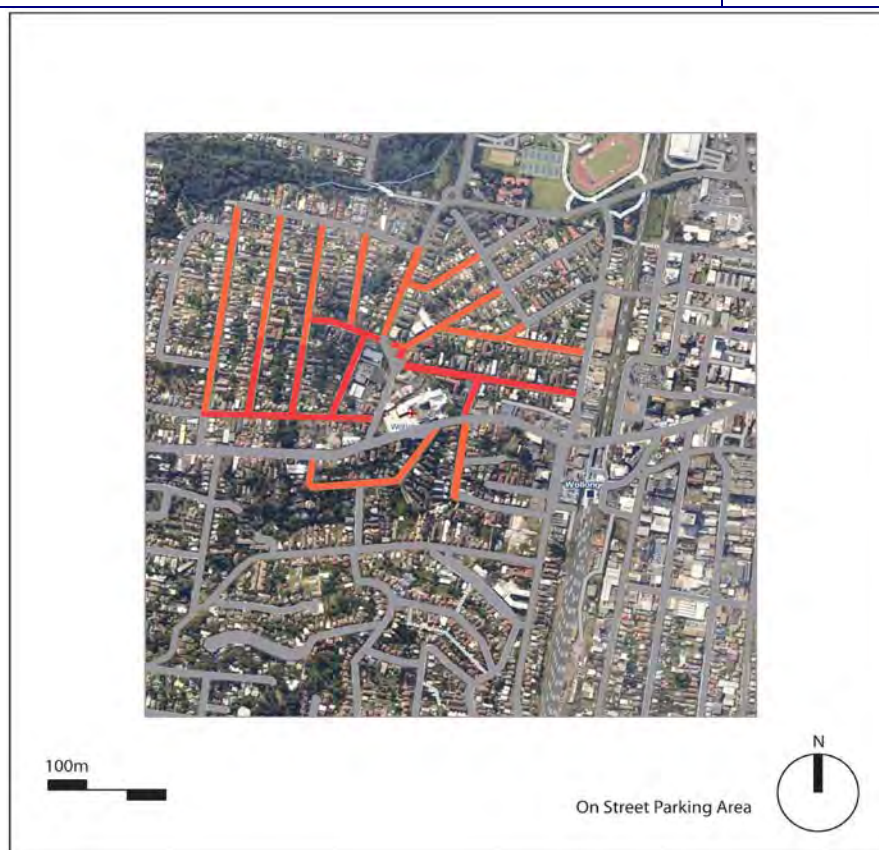
3.1 Existing Parking Conditions

3.1.1 Existing Parking Capacity

The existing car parking provision at the Hospital has been recorded at **746** spaces. A total of some 1000 car parking spaces are also available along streets in the vicinity of the Hospital. Of these a total of some **792** spaces could be available for the Hospital's users. **Figure 3.1** shows on street parking areas near the Hospital. It should be noted that this parking is within the Health Services Precinct. The off street and on street parking supplies for the Hospital are shown in the following Tables 3.1 and 3.2 indicating a total parking supply of **1538** spaces.

Table 3.1 Existing Parking Supply within the Hospital Campus

CAR PARKING AREAS	No of Spaces
Multideck Carpark	591
Outside area attached to multideck carpark	70
Renal Centre	14
Renal Centre 10 min parking	4
Entrance off Loftus	9
Cancer Care off Dapto Rd	14
Loading Dock (car parking)	8
Engineering	8
Hospital Road (16 angle + 10 parallel)	26
Mental Health (above ambulance bay + 2 parking)	2
TOTAL EXISTING PARKING SUPPLY ON SITE	746



Key: Red: 2-5 minutes walking distance; Orange: 5-10 minutes walking distance

Figure 3.1 On Street Parking Areas

Table 3.2 On Street Parking Supply Surrounding the Hospital

STREET	CAP
Rosemont (using less than 50% of the street's capacity)	70
Hillcrest	125
Matthews	122
Northcott	53
Mercury	39
Bligh	55
New Dapto	52
Hercules	71
Robinson	14
Macquarie	45
Staff	85
Osborne	18
Sperry	27
Urunga	40
New Dapto	13
TOTAL UNRESTRICTED (829 - less 25% for resident use = 622)	622
Loftus (2P)	66
Darling (2P)	4
Dudley (2P)	44
Urunga (2P)	82
½ P and odd time restricted parking	16
TOTAL TIME RESTRICTED	170
TOTAL EXISTING ON STREET PARKING SUPPLY	792

Table 3.3 Existing Parking Supply within the Study Area

CAR PARKING AREAS	No of Spaces
Total On Street Parking for Hospital Users	792
Total Hospital Campus Parking (including internal roads)	746
TOTAL EXISTING PARKING SUPPLY IN STUDY AREA	1538

3.1.2 Hospital Car Parking Usage

Table 3.4 shows that by about 9.30 AM, the car park experiences a parking occupancy of 95% and will continue until about 3.30PM. The restricted parking for renal centre with capacity of 14 parking spaces experiences a utility of 85% after mid-day.

Table 3.4 Parking Occupancy at Multilevel Car Park - Number of Empty Spaces

Type	830	930	1030	1130	1230	1330	1430	1530	1630	1730
Normal	46	18	7	0	15	9	8	39	123	247
2hr Vis.	20	11	5	5	0	0	0	0	0	3
Disability	5	5	5	5	8	8	7	4	4	5
Total	71	34	17	10	23	17	15	43	127	255

Survey Date: Friday 19.11.2010;

Note: the area also includes an area outside but attached to the carpark i.e. total capacity 661 spaces

3.1.3 On Street Car Parking Usage

On street parking surveys also carried out for along the streets close to the Hospital and streets within a reasonable walking distance to the Hospital. The results and dates of these surveys are shown in Tables 3.5 and 3.6. When referring to on street parking, these spaces are confined within the Health/Medical Precinct.

For the purpose of our assessment we have assumed that a 5 minute walk is deemed "Close" to the Hospital, and a 10 minute walk is deemed "Surrounding" the Hospital.

Table 3.5a On Street Parking Occupancy Close to the Hospital-No. of Occupied Spaces

Street	8:00	9:00	10:00	11:00	12:00	13:00	14:30	16:00	17:00	18:00	Capacity
Loftus	39	45	58	61	65	66	61	59	57	59	66
New Dapto	13	13	13	13	13	13	12	11	10	12	13
Urunga	42	62	62	69	71	69	73	45	37	34	82
Dudley	14	22	29	35	40	42	41	32	34	33	44
Sperry	19	25	25	27	27	23	24	14	6	4	27
Darling	4	3	4	4	4	3	4	4	4	4	4
Total	131	170	191	209	220	216	215	165	148	146	236

Survey Date: March 9, 2011

Table 3.5b On Street Parking Percentile (%) Occupancy Close to the Hospital

Street	8:00	9:00	10:00	11:00	12:00	13:00	14:30	16:00	17:00	18:00
Loftus	59	68	88	92	98	100	92	89	86	89
New Dapto	100	100	100	100	100	100	92	85	77	92
Urunga	51	76	76	84	87	84	89	55	45	41
Dudley	32	50	66	80	91	95	93	73	77	75
Sperry	70	93	93	100	100	85	89	52	22	15
Darling	100	75	100	100	100	75	100	100	100	100
Total	56	72	81	89	93	92	91	70	63	62

Survey Date: March 9, 2011

Table 3.6a On Street Parking Occupancy Surrounding the Hospital

STREET	800	930	1100	1230	1400	1530	1700	CAP
Hillcrest	25	28	29	29	31	32	36	125
Matthews	50	76	85	87	95	78	53	122
Northcott	28	40	41	39	39	35	19	53
Mercury	34	34	34	33	33	30	22	39
Bligh	38	34	36	37	38	36	24	55
New Dapto	49	48	49	49	49	46	42	52
Hercules	53	65	71	67	67	64	46	71
Robinson	8	11	13	14	14	10	12	14
Macquarie	11	24	29	31	35	33	25	45
Staff	16	31	52	32	47	31	0	85
Osborne	8	15	14	16	18	16	0	18
TOTAL	320	406	453	434	466	411	279	679

Survey Date: June 23, 2011

Table 3.6b On Street Parking Occupancy % Surrounding the Hospital

STREET	800	930	1100	1230	1400	1530	1700
Hillcrest	20	22	23	23	25	26	29
Matthews	41	62	70	71	78	64	43
Northcott	53	75	77	74	74	66	36
Mercury	87	87	87	85	85	77	56
Bligh	69	62	65	67	69	65	44
New Dapto	94	92	94	94	94	88	81
Hercules	75	92	100	94	94	90	65
Robinson	57	79	93	100	100	71	86
Macquarie	24	53	64	69	78	73	56
Staff	19	36	61	38	55	36	0
Osborne	44	83	78	89	100	89	0
TOTAL	47	60	67	64	69	61	41

Note: **Close** to Hospital: within 5 minutes walking distance
Surrounding the Hospital: within 10 minutes walking distance

The results of the parking surveys indicate that the streets within the immediate vicinity of the Hospital experience a high car parking occupancy rate of 80 to 90% between hours of 10.00am to 3.00pm. However, most streets within the study area surrounding the Hospital have a car parking occupancy of around 65%.

The evaluation of overall on street parking activities show an availability of some 300 parking spaces along streets within walking distances to the Hospital (see Table 3.7).

Table 3.7a Overall On Street Parking Occupancy within the Study Area

Area	8.00	10.00	11.00	13.00	15.00	16.00	17.00	Capacity
Close to Hospital	131	191	209	216	215	165	148	236
Surrounding Hospital	320	406	453	434	466	411	279	679
TOTAL	451	597	662	650	681	576	427	915*

* survey did not include Rosemont Street

Table 3.7b Overall On Street Parking Occupancy % within the Study Area

Area	8.00	10.00	11.00	13.00	15.00	16.00	17.00
Close to Hospital	56	81	89	92	91	70	63
Surrounding Hospital	47	60	67	64	69	61	41
TOTAL	49	65	72	71	74	63	47

Currently, the multilevel car park has a charge rate of \$4.00 per hour with maximum of \$11.00 per day for public use while staff rate is at \$2.60 per day.

3.2 Parking Requirements

The parking requirements for the Wollongong Hospital Campus have been assessed based on its current and future activities. The Wollongong Council Development Control Plan identifies the following parking provisions for the hospitals:

- 1 car parking space per medical practitioner plus 1 car parking space per 2 employee plus 1 car parking space per 2 beds.
- Provision of 1% accessible parking for the Hospital's non outpatients parking
- Provision of 2% accessible parking for the first 1000 spaces of outpatients area (and 1 per 100 for in excess of 1000)

The Council's DCP also states that it has the discretion to waive or reduce the minimum number of car spaces required for a particular site if the reduced provision can be justified in the accompanying Car Parking and Traffic Impact Assessment study, in terms of:

- The amount of public car spaces in the locality;
- Proximity to public transport nodes;
- Opportunity for cross utilisation with another use; and
- An empirical assessment of car parking.

Table 3.8 Hospital Staff and Bed Numbers

Category	Existing Situation	Future Situation
Medical (15% of Total Staff Numbers)	260 (Staff No Existing =1725)	330 (Staff No. Future = 2206)
Staff Numbers (excl. Medical)	1465	1876
No of Beds	444	514

Table 3.9 Parking Requirements per DCP – No of Spaces

Category	Existing Situation	Future Situation
Medical Parking 15% of 1725 Existing Staff 15% of 2206 Future Staff	260	330
Staff Parking	733	938
Visitors Parking	222	257
TOTAL PARKING	1215	1525

Note: (based on the number of staff present on site)

The assumption of 15% of all staff as Medical is based on advice through the Hospital, and is consistent with the other hospitals throughout NSW.

Parking Summary

Based on Wollongong Council's DCP, a car parking provision of some **1525** spaces would be required for the future activities of the Hospital.

The Hospital is located within the designated "Health Precinct" with availability of some **1526** (based on loss of 26 spaces along Hospital Road and provision off 14 spaces for Cancer Care) and includes on street parking spaces for the Hospital's users.

Therefore, this level of parking provision is within the Council's parking requirement. It should be noted that the catchment area of 15 minutes (as shown in Figure 3.2) provides a higher level of parking provision which is not included as part of this evaluation. Additionally, although the Wollongong Rail Station parking is nearby, we have not considered it within our study area.

The proposed parking provision is also in line with relevant State and Regional sustainable transport strategies that aim to reduce car travel by way of measures to increase the use of active and public transport within the community.

These measures are further supported by implementation of policies and measures as detailed in Section 5 of this report.

4.0 TRAFFIC ASSESSMENT

4.1 Level of Service

Street System Operation

The term “level of service” for **road capacity** has been defined by AUSTROADS as: *A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and or passengers.*

A level of service definition generally describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. In general there are six levels of service designated from A to F, with level of service A representing the best operating conditions (ie free flow) and level of service F the worst (ie forced or breakdown flow).

One-way hourly volumes for urban roads during peak hours and recommended level of service are shown in **Table 4.1**.

Table 4.1 Urban Road Peak Hour Flows per Direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Source: RTA Guidelines 1995

Intersections Operation

The adequacy of the capacity of an intersection is judged by whether it can physically and operationally cater for the traffic using it. The parameters of the performance of an intersection include the degree of saturation (DoS) and the average delay per vehicle (AD). Satisfactory operation of an intersection would normally continue up to 56 seconds as Average Delay/Vehicle. At this Level of Service (LoS), operating speeds are still reasonable and acceptable delays are experienced. The recommended criteria for evaluating capacity of intersections are shown in **Table 4.2**.

Table 4.2 – Criteria for Evaluating Capacity of Intersection

Level of Service	Degree of Saturation (DoS)	Ave. Delay/ Veh. (Secs)
A/B good operation	less than 0.80	Less than 28
C satisfactory	0.80 to 0.85	29-42
D poor but manageable	0.85 to 0.90	43-56
E at capacity	0.90 to 1.0	57-70
F unsatisfactory, extra capacity required	Over 1.0	Over 70

4.2 Approved New Developments

Currently, two new health facilities have been approved by the authorities within the Hospital's precinct. These are:

- A Medical Centre at 46-48 Loftus Street with 20 consulting rooms, 2 operating rooms and a parking for 109 cars with an estimated 198 vehicle trips during a peak hour (Cardno 2010).
- A Private Hospital with 156 beds and a car park with capacity of 331 spaces at 360 Crown Street. The estimated vehicular trip generations for the site are 180 and 380 vph during AM and PM peak hour respectively (CBHK, 2010).

The traffic reports for the above developments indicate that the all intersections in the vicinity of the Hospital are operating at LoS "A" and will continue to operate at a similar LoS of "A/B".

The traffic reports for the approved developments have stated that the current pedestrian network for the area is well established and is in accordance with relevant access requirements/guides.

4.3 Road System

The Hospital site is served with Hospital Road which connects Darling Street and New Dapto Road. This is mainly an internal road with one way direction and limited uses. There are vehicular access points off Loftus Street and New Dapto Road. The Hospital Car park is accessed from New Dapto and Dudley Roads.

The main approach routes to the Hospital Campus are via Crown, Darling, Loftus Streets and New Dapto Road. All the above roads are two way roads while a section of New Dapto Road has a median and fence along its centre.

The traffic volumes and speed data for the street system in the vicinity of the site has been obtained and are shown in Table 4.3.

Table 4.3 Traffic Volumes and Speed Data (5 Day Average)

Street	Two way Veh/hr	85% Speed Km/hr	Average Daily Veh/day
Darling St (2009)	262	42	3027
(2011)	286	40	3021
New Dapto Rd (bet Loftus-Urunga)	985	50	11,568
Urunga Parade (2011)	146	47	1466
Loftus St (2009)	386	45	4407
(2011)	343	40	3911
Crown St – East bound (one way: ow)	943 (ow)	52 (ow)	9785 (ow)
Crown St – West bound	908 (ow)	50 (ow)	9272 (ow)

Source: Wollongong Council (2009); TTW Traffic Data Survey (May 2011)

The intersections of Crown Street with Darling Street and New Dapto Road are controlled with Traffic signals (including pedestrian crossing facilities) while the intersection of New Dapto Road and Loftus Street has a roundabout.

Contacts have been made with Wollongong Council and the RTA to discuss the existing conditions in the area, and any future plans for the road network. The Council have produced an extensive report on the streets surrounding the hospital (City Centre West, Parking Management Plan), predominantly to do with pedestrian safety and parking. There are a number of recommendations for the area within the Council report; however, discussions with the Council have indicated that there are no works planned to be implemented in the short to medium term.

The RTA has provided some information to date, and have indicated they have no specific plans for the area.

Table 4.3 indicates that the street systems operate at a good level of service with ample capacity based on traffic engineering terms/guidelines.

4.4 Traffic Impact

The impact of the Hospital redevelopment has been assessed on the basis of its future activities/population in comparison to its existing activities/population.

As stated earlier, the redevelopment proposal will involve an additional 481 staff, 375 outpatients and 70 beds in comparison to its existing operation. Therefore the additional traffic generation for the site would be in order of **375** vehicle trips during a one hour peak period. This is on the basis of the following:

- 481 staff x 0.85 present due to shift works, holiday, sick etc x 0.75 car use as a travel mode and considering that not all will arrive or depart during a one hour period using an upper limit of 0.65% = 200 vph
- 375 outpatients arriving and departing within a 6 hour period ($375/6 \times 2$ for a worst case scenario) = 125 vph
- 14 visitors arrive and depart for 70 beds (2 visitors per bed during a 10 hour period as most visits occur after hours) = 28 vph say 30
- 10 service or delivery vehicles in and out during peak hour = 20 vph
- Total additional vehicle trips per peak hour = 375 vph

Considering that the current vehicle movements (are recorded at 60% arrival-40% departure for AM and reverse for PM) at intersections near the Hospital an arrival/departure rate of 65%/35% and 35%/65% for AM and PM peak hour has been utilised (a more conservative rate).

Accordingly the distribution of additional vehicular traffic along streets adjacent to the Hospital site has been carried out and are utilised as part of the evaluation of intersections operation (using SIDRA).

The assessments of the intersections operation at the main approach intersections to the Hospital site have been undertaken for the following scenarios and the results are shown in Table 4.4:

- **S1** Existing situation
- **S2** Existing situation + Hospital redevelopment
- **S3** Existing situation + Hospital redevelopment + new approved Developments

The above Existing situation for Scenarios S2 and S3 are shown in Table 4.4 and 4.5 as Future Scenario that includes a growth of 1.2% per annum.

The overall assessment of these intersections indicates that these intersections are currently operating at a good level of service and will continue to operate with similar level of service (LoS) after the completion of the Hospital's redevelopment program.

It should be noted that in order for traffic signals to maintain their LoS, some adjustments in phasing of traffic signals would be required. Accordingly, these adjustments have been made as part of the intersection modelling.

A maximum queue length of 51m would occur along Darling Street (north approach) during morning peak period at the intersection of Crown and Darling Streets while the queue length during an afternoon peak period extends to 115m along Crown Street (east approach) for Scenario 3.

The intersection of Crown Street and New Dapto Road would experience a maximum queue length of 158m and 150m along Crown Street (west) and New Dapto Road during AM and PM, respectively.

Tables 4.4 and 4.5 illustrate that all streets surrounding the Hospital campus will continue to operate at a good and satisfactory level of service based on their available capacity and relevant guidelines (See Section 4.1). The results of the analyses are shown in Appendix C.

It should however be noted that a much higher use of public and active transport will be experienced among the users of the Hospital in future years together with the introduction of more staggered working hours among the staff. These measures would lead to less car use particularly among staff and hence lower intensity of car movements during peak hours.

**Table 4.4 Performance of Access Intersections Existing and Future
AM and PM Commuter Peak Hour Traffic on a Weekday**

Intersection	Traffic Controls	Degree of Saturation (DoS)	Level of Service (LoS)	Highest Delay/Veh Sec/Veh	Average Delay/Veh (Sec/Veh)
Crown St & Darling St	Traffic Signal				
AM Peak Hour	Existing	0.44	A	30	4.5
PM Peak Hour	Existing	0.78	A	34	6.6
AM Peak Hour	Future	0.53	A	30	4.5
PM Peak Hour	Future	0.81	A	44	8.0
AM Peak Hour	+Hospital	0.62	A	31	5.4
PM Peak Hour	+Hospital	0.88	A	52	12.7
Loftus St & New Dapto Rd	Roundabout				
AM Peak Hour	Existing	0.36	A	14	9.2
PM Peak Hour	Existing	0.35	A	15	9.2
AM Peak Hour	Future	0.41	A	14	9.4
PM Peak Hour	Future	0.44	A	15	9.5
AM Peak Hour	+Hospital	0.47	A	15	9.9
PM Peak Hour	+Hospital	0.45	A	16	9.9
Crown St & New Dapto Rd	Traffic Signal				
AM Peak Hour	Existing	0.90	B	49	18.6
PM Peak Hour	Existing	0.86	B	58	26.8
AM Peak Hour	Future	1.01	C	53	36.0
PM Peak Hour	Future	0.96	C	67	34.0
AM Peak Hour	+Hospital	0.87	B	56	16.8
PM Peak Hour	+Hospital	0.97	B	43	27.5
Loftus St & Darling St	Sign				
AM Peak Hour	Existing	0.12	A	9.5	4.9
PM Peak Hour	Existing	0.15	A	9.9	5.5
AM Peak Hour	Future	0.12	A	9.7	5.6
PM Peak Hour	Future	0.18	A	10.0	6.3
AM Peak Hour	+Hospital	0.14	A	10.0	6.2
PM Peak Hour	+Hospital	0.20	A	10.4	7.2

Note:

Future: existing + future growth of 1.2% per annum

signal phasing adjustments have been utilised for S3 to reduce delays

Table 4.5 Performance of Access Intersections for Future (Hospital + Developments)
AM and PM Commuter Peak Hour Traffic on a Weekday

Intersection	Traffic Controls	Degree of Saturation (DoS)	Level of Service (LoS)	Highest Delay/Veh Sec/Veh	Average Delay/Veh (Sec/Veh)
Crown St & Darling St	Traffic Signal				
AM Peak Hour	Future+Hos+Dev	0.84	A	30	7.9
PM Peak Hour	Future+Hos+Dev	1.00	C	95	36
Loftus St & New Dapto Rd	Roundabout				
AM Peak Hour	Future+Hos+Dev	0.54	A	15	10.5
PM Peak Hour	Future+Hos+Dev	0.55	A	17	10.8
Crown St & New Dapto Rd	Traffic Signal				
AM Peak Hour	Future+Hos+Dev	0.87	B	50	15.8
PM Peak Hour	Future+Hos+Dev	0.86	B	40	24.6
Loftus St & Darling St	Sign				
AM Peak Hour	Future+Hos+Dev	0.21	A	10.2	9.7
PM Peak Hour	Future+Hos+Dev	0.26	A	11.0	13.0

Note: signal phasing adjustments have been utilised for S3 to reduce delays

The assessment of vehicular traffic as the result of the proposed redevelopment of the Hospital provides the following main points:

The proposed redevelopment of the Hospital would generate some additional 375 vehicular trips during peak period.

The impact of additional vehicular trips on the main approach routes to the Hospital would result in a maximum of some 170 vehicles per hour along major routes surrounding the Hospital (using 65% rate of arrival or departure during AM or PM peak hour and considering that a maximum of 70% of all vehicles enter the area from one direction). This level of vehicular traffic is well within the capacity of the road system as shown in Table 4.1 and therefore would have minimal impact on operation of the road network and its capacity.

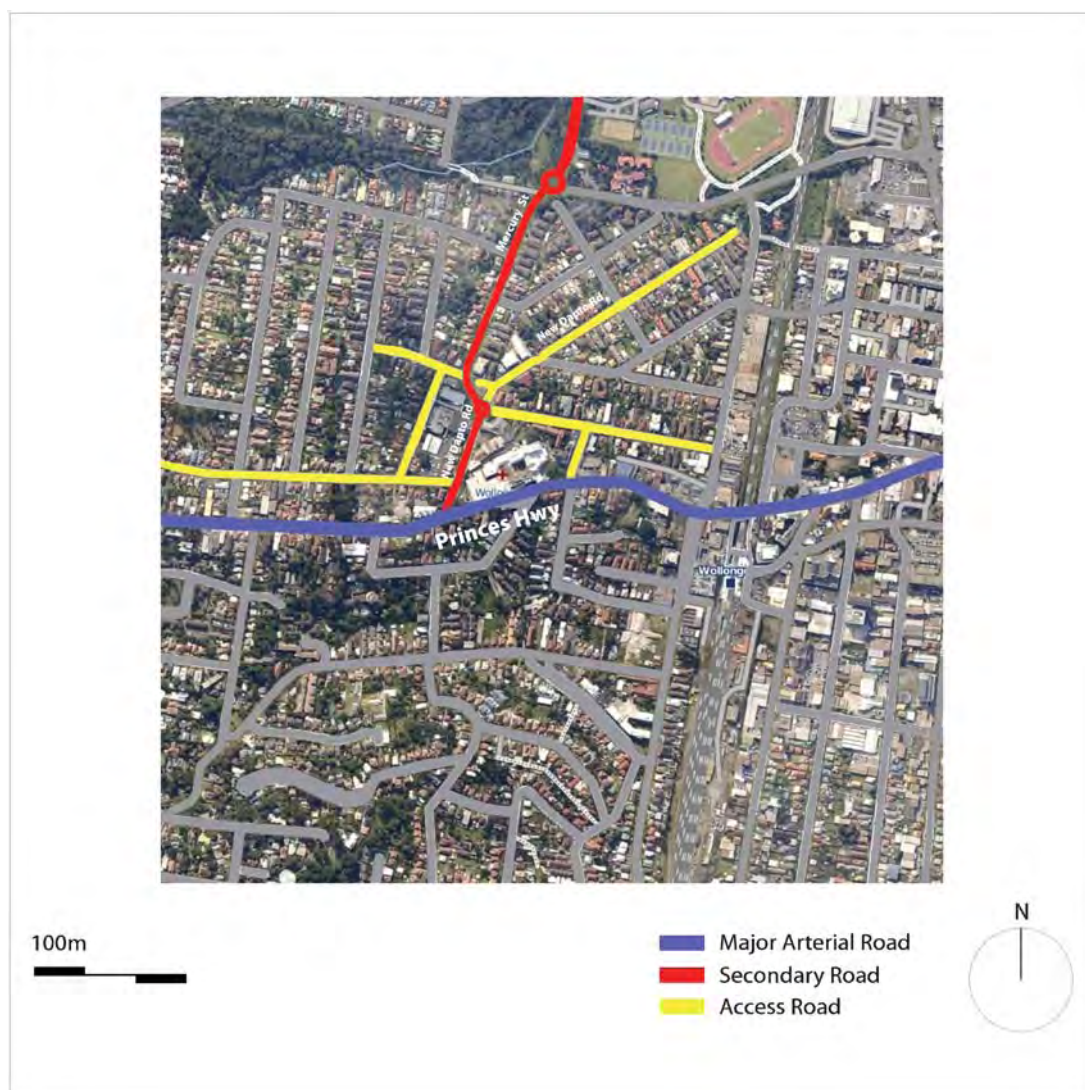


Figure 4.1

Road Network

5.0 ACCESSIBILITY

5.1 Pedestrian and Cyclist Access

The pedestrian network is well established along the streets surrounding the Hospital. Traffic signals along Crown Street provide pedestrian facilities while streets such as Loftus and Darling Streets have a low speed environment with vehicular speed of 40km/hr based on the survey results.

Currently pedestrian crossing facilities are provided at certain locations within the Campus. These are mainly located between car parking areas and main activity areas of the Hospital. A pedestrian bridge is also connecting the Hospital to the carpark.

As part of the redevelopment planning process, pedestrian desire lines have been identified and are shown in **Figure 5.1**. Accordingly, pedestrian facilities and links will be provided as part of the Hospital redevelopment plan.

Introduction of bicycle parking at various locations within the Hospital Campus should also provide additional amenities for the users of the Hospital and would promote active transport particularly among the Hospital's staff. It is proposed to provide 100 bicycle parking spaces within the Hospital Campus (equivalent to 5% of future staff numbers).

A plan of cycleway for the area is also shown Appendix A (extract from Wollongong Council Bike Plan).



Figure 5.1 Pedestrian Facilities

5.2 Public Transport

Wollongong Hospital is a 10-15 minute walk from Wollongong Station. The Station is located south of Crown Street and east of Denison Street. Pedestrian pathway and crossing facilities are readily available between the Hospital and Train Station.

Wollongong City Plan envisages a major upgrade of the Station as part of its revitalisation program for the City. This measure will include increasing platforms to accommodate higher number of travellers.

Premier Illawarra Buses provide 11 bus routes along Crown Street. These include bus routes 23, 24, 30, 31, 32, 33, 34, 35, 36 37 and 57. Buses operate every 30 minutes or 1 hour (depending on bus routes) from Monday to Friday and every 1 and 2 hour on Saturdays and Sundays respectively. Bus stops are provided along Crown Street near the Hospital.

Gong Shuttle bus also provide bus services along Crown Street and New Dapto Road. These take place every 10 minutes during peak period and every 20 minutes during non-peak period.

All the relevant bus routes and time tables are shown in Appendix B.

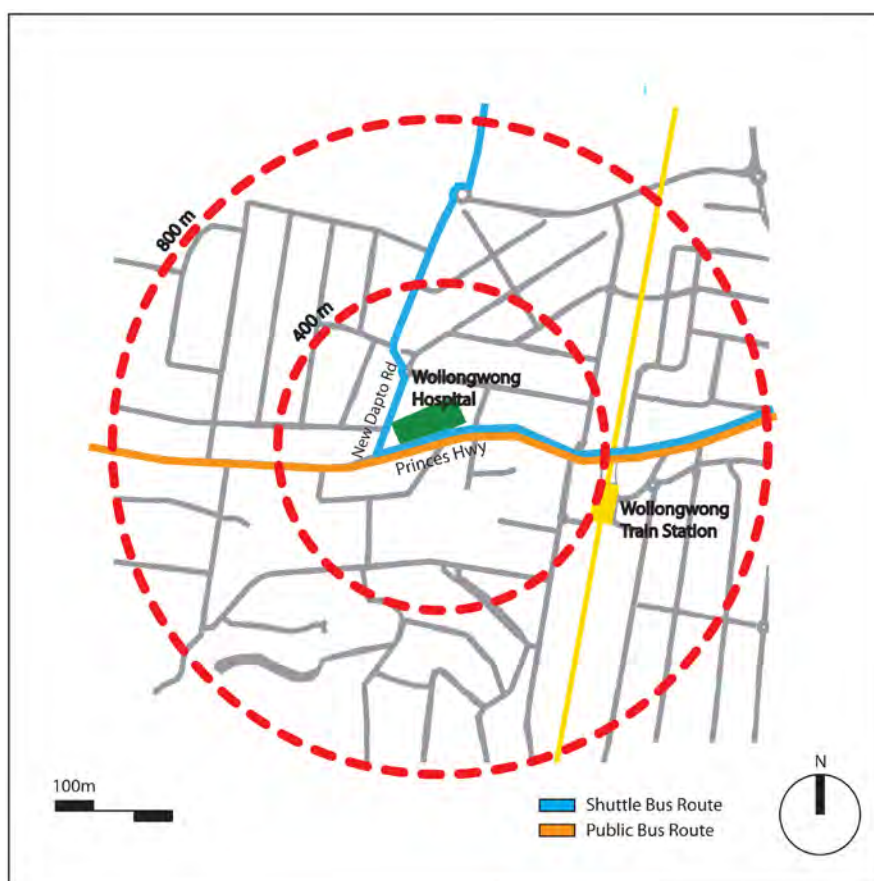


Figure 5.2 Public Transport and Pedestrian Accessibility

Wheelchair accessible buses operate on most bus routes at selected times. Community Transport Inc. provides transport for frail aged people, younger people with a disability and their carers.

Cycling access to the hospital, generally, is on wide shoulders on major roads. These options are for confident cyclists. Bicycle parking is available in front of the Emergency Department. Shower and locker facilities are available for staff.

Limited mobility parking is available at the Hospital for people displaying their current Mobility Parking Scheme. Taxi on call is also available from the Hospital while patient transport and community transport provide services to their patrons.

5.3 Transport Management Strategy

As part of the transport strategy for the Wollongong Hospital, a number of strategies are suggested for implementation or further investigations. It is vital to take into account the future level of population increase within the region and to provide solutions that are complementary to State, regional and local transport plans.

Therefore, the higher use of public and active transport will not only create a healthier environment but will also improve the road safety and character of the built environment.

Further, decreased use of the car, particularly by staff, will reduce the need for construction of car parks and their associated costs. This means freeing funds for other activities and needs. The following measures are put forward as a guide to encouraging a reduction in car usage:

- provision of incentive schemes among staff e.g. subsidised bus tickets
- establishment of a waiting list for parking space for new Hospital staff. This means that any new staff will not have a parking space until one becomes available.
- higher parking fees for new Hospital staff, possibly combined with provision of subsidised public transport tickets.
- provision of better, safer (in terms of route alignment as well as security) bicycle and pedestrian routes. This measure should be devised in consultation with Council and other authorities.
- promotion of the merits of walking and bicycle riding in order to encourage staff living near the Hospital to leave their cars at home.
- provision of safer and higher quality bus shelters or waiting areas.
- As part of the Project's Change Management processes, communications to the hospital's workforce should be provided around the existing Transport Access routes, and any impact that has occurred to these access pathways as a result of the project. This should be prepared to assist staff and hospital users understand public transport options for the site prior to occupation.

6.0 SITE ACCESS

6.1 Access and Circulation

The proposal involves closure of Hospital Road at its midblock west of Imaging Unit. The main access to the Hospital via Loftus Street will be improved by way of better circulation area and wider ingress and egress access points.

The proposed internal road network within the Hospital campus and main entry and exit points are shown in **Figure 6.1**.

The pick up and set down activities will continue to take place off main entry to the Hospital at Loftus Street.

The proposal will not have any impact on operation of the road network surrounding the Hospital as traffic volumes associated with Hospital Road are minimal (see Appendix B indicating about 17 vehicles per peak hour entering Hospital Road from Darling Street).

6.2 Service Vehicle Access

The access points for ambulances and service vehicles to and from the Hospital campus are shown in Figure 6.1 while are detailed as part of the architectural drawings.

The ambulance access will be off Darling Street close to Crown Street for fast response to emergencies. The loading dock will be maintained at its current location with access off New Dapto Road near the roundabout while the existing Loftus Street access will be blocked.

Appropriate improvements are made for better turning movements and access facilities for both ambulances and services vehicles as part of the proposed plans. Turning paths for these manoeuvres are shown in Appendix A.

6.3 Kiss and Ride Area

A survey of drop off and pick up activities associated with the Hospital has been carried out. The results of the survey are shown in Table 6.1.

The results of the survey (please see the Appendix) revealed that at any 15 minute interval no more than 9 cars are using the Loftus Street drop off area (i.e. for both drop off and pick up activities). The survey also shows that during a 15 minute interval between 5 to 10 cars use the on site parking spaces.

The above results indicates that the Hospital experiences a maximum of 162 drop off/pick up activities (i.e. number of cars) during a 5 hour period between 7.30 AM to 12.30 Noon. The peak activity at Loftus Street area occurs between hours of 10.15 to 11.15 AM with 21 cars representing 35% of total AM activities (at Loftus St area 21 out of 60 cars).

Table 6.1 Pick Up and Set Down Activities at Wollongong Hospital

Location	Drop Off No (1 P)	Drop Off No (2 P)	Drop Off No (3 P)	Pick Up No (1 P)	Pick Up No (1 P)	Pick Up No (1 P)	Total Cars
Loftus St							
7.30-12.30	35	5	1	16	3	0	60
12.30-17.00	28	1	0	26	6	1	61
Crown St							
7.30-12.30	52	14	0	17	2	0	85
12.30-17.00	24	15	1	20	6	0	66
Emergency							
7.30-12.30	14	1	0	1	1	0	17
12.30-17.00	10	3	0	8	1	0	22

Key: 2P: two persons dropped off or picked up

Future Situation:

The Hospital Master Plan provides a reconfiguration of Loftus Street drop off area allowing for a short stay parking (i.e. 15 minute) for 17 cars with 3 parking spaces for pick up and drop off activities.

Considering that there will be 17 parking spaces that could be used for 15 minutes parking and 3 drop off spaces for 2 minutes pick up/set down, a total of some 158 vehicles per hour would result ($17 \times 4 = 68$ plus $3 \times 30 = 90$).

The additional outpatient number of the Hospital as part of its future development is estimated at 375 per day. This could result in an additional 75 pick up and set down activities (based on 20% of travel mode of outpatients using a car ride- most other hospital traffic studies show a lower % - note: for Wollongong Hospital currently is about 11% based on total drop offs of 202 per day out of 1870 outpatients).

Therefore, to add this level of activity to the existing situation of 162 vehicles would result in a total of some 237 say 240 vehicles during a 5 hour period. Therefore, a maximum of 84 vehicles per hour would be using the area during a peak period; assuming that the highest level of pickup/set down activities occurs at 35% of total movements. This level of vehicular movements could easily be accommodated as part of the proposal.

It should be noted that the function of the Loftus Street drop off area would mainly dependent on vehicular movements exiting the area onto Loftus Street. Any delay on vehicular departure will have an impact on operation of the area. In general the entry and exit point of the area could accommodate some 10 vehicles. This in fact reflects a higher turnover than the above estimated figures.

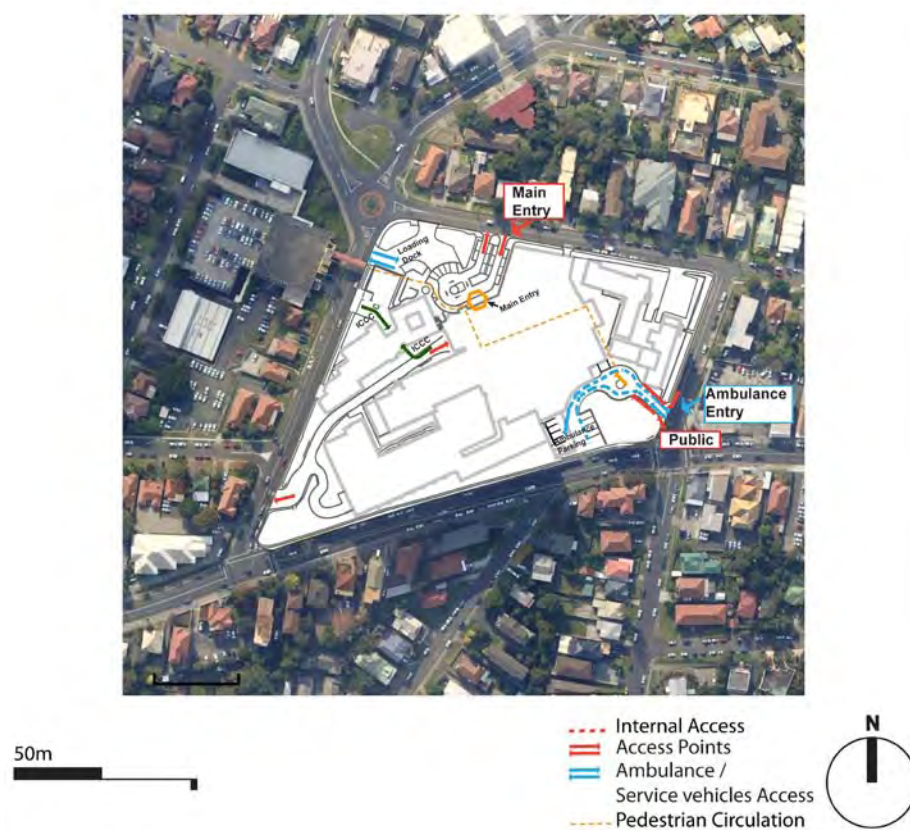


Figure 6.1 Traffic Circulation

7.0 CONSTRUCTION MANAGEMENT PLAN

A construction traffic management plan (CTMP) should be prepared prior to the commencement of works. It is envisaged that main approach routes to the Hospital will be utilised for construction related activities.

The designated routes and time of operation for construction works will be included as part of the CTMP. The CTMP will indicate the required traffic control measures and related information such as truck traffic activities during the construction period. The impact of construction activities will be detailed as part of a report accompanying the CTMP.

8.0 RESPONSE TO DGR

As part of the development application process a number of items have been identified by Department of Planning under Director's General Requirements (DGR). These include:

4. Transport and Accessibility Impacts (Construction and Operational)

- Provide a Transport & Accessibility Study prepared with reference to the Metropolitan Transport Plan – Connecting the City of Cities, Draft Illawarra Regional Transport Strategy, the NSW State Plan, the NSW Planning Guidelines for Walking and Cycling, the Integrated Land Use and Transport policy package and the RTA's Guide to Traffic Generating Development, considering the following:

- 1 – Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets;
 - 2 – Detail the existing pedestrian and cycle movements within the vicinity of the site and determine the adequacy of the proposal to meet the likely future demand for increased public transport and pedestrian and cycle access, including the preparation of a disability access plan;
 - 3 – Identify potential traffic impacts during the construction and operational stages of the project, and measures to mitigate these impacts, including the preparation of a Traffic Impact Study;
 - 4 – Describe the measures to be implemented to promote sustainable means of transport including public transport usage and opportunities to improve access to Wollongong Station and pedestrian and bicycle linkages in addition to addressing the potential for implementing a location specific sustainable travel plan;
 - 5 – Daily and peak traffic movements likely to be generated by the proposed development, including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required). The traffic impact assessment should consider base models with future traffic generated by the proposed redevelopment;
 - 6 – Details of the proposed access, parking provisions and service vehicle movements associated with the proposed development;
 - 7 – Identify and consider any environment impacts associated with any proposed roadworks in the EA, including the proposed closure of the Hospital internal driveway on Crown Street on existing vehicle access arrangements (e.g. taxis, community transport vehicles and other vehicles), and measures to mitigate these impacts; and
 - 8 – Minimal levels of on site car parking for the proposed development having regard to the level of accessibility of the site to public transport, opportunities for car sharing, local planning controls and RTA guidelines (note: The Department supports reduced parking provisions, if adequate public transport is available to access the site).
- The Roads and Traffic Authority shall be provided with details of the expected traffic generation of the site to enable the RTA to determine if network modelling, using PARAMICS, is considered necessary. This is to be undertaken prior to the Proponent undertaking any SIDRA modelling.
 - Intersection modelling using SIDRA shall be undertaken for the junctions of Crown Street/New Dapto Road, Crown Street/Darling Street and any other local road junctions identified by Council considering the following:
 - AM and PM peaks volumes and holiday peak volumes; and
 - Existing traffic volumes with and without development and 10 year projected volumes with and without development, taking into consideration other known developments in the "Wollongong Health Precinct".
 - Electronic copies of modelling shall be forwarded to the RTA for review and comment.

It should however be noted that the Department has qualified some conditions might not be applicable, as stated below:

Under section 75F(3) of the Environmental Planning and Assessment Act, the Director General may alter or supplement these requirements if necessary and in light of any additional information that may be provided prior to the proponent seeking approval for the project.

Prior to exhibiting the Environmental Assessment, the Department will review the document to determine if it adequately addresses the DGRs. If the Director General considers that the Environmental Assessment does not adequately address the DGRs, the Director General may require the proponent to revise the Environmental Assessment to address the matters notified to the proponent.

Accordingly, this study has considered these requirements as part of the assessment and evaluation of traffic and parking requirements for the Hospital site. The following provides comments on these issues.

The proposed redevelopment plan for Wollongong Hospital has been developed in consideration with current planning initiatives and relevant documents such as (it should be noted that the document Metropolitan Transport Plan does not apply to Wollongong area as it applies to Sydney metropolitan):

:

- Illawarra Regional Strategy 2006-2031
- NSW State Plan 2006
- Integrating Land Use and Transport (2001) - **ILT**
- Planning Guidelines for Walking and Cycling (2004) –**PGWC**
- Wollongong City Plan
- Traffic and Parking Report for Private Hospital at Crown Street(2010)
- Traffic and Parking Report for Medical Centre at Loftus Street (2010).

This report has been developed on the basis of current traffic engineering and transport planning principles and guidelines particularly the RTA's Guide to Traffic Generating Developments.

Specific Response to the above items 1 to 8:

Item 1: Refer to Section 5 of this report which addresses accessibility of the site including public transport and a proposed transport management strategy.

The location of the Hospital within the identified "Health Precinct" and its close proximity to Train Station with bus routes providing services to the site satisfies the above planning objectives such as:

- Providing upgrade and expanded health services (NSW State Plan)
- Increasing the patronage of the transport services (NSW State Plan)
- Reducing car dependency to reduce green gas emission (ILT)
- Integrating land use and public transport (ILT)
- Providing bus services/shuttle bus services (Wollongong City Plan)
- Land use planning decisions must consider transport access implications to minimise the need to travel and encourage energy and resource efficiency (Illawarra Regional Transport Strategy, 2007)

- ILT states that achieving sustainability in transport requires us to look differently at travel. We need to focus on: a) the movement of people and of goods, rather than the movement of vehicles, and b) maximising **accessibility** (the ability to undertake a range of daily activities with a minimum of travel), rather than **mobility** (the ability to move freely)

Item 2: Existing pedestrian and cycle routes within the vicinity of the site are presented in Section 5.1. A statement of commitment to a disability access plan is contained in the Part 3A Planning report.

Item 3: Construction Traffic Management is addressed in Section 7 of this report.

Item 4: Refer to Section 5 of this report. Considering that PGWC highlights :

- Improve walkability within the neighbourhood
- Ensure Walking and cycling and use of public transport is direct and convenient
- Provision of safe and secure paths for walking and cycling
- Encourage active uses at street level
- Locate centres near passenger transport stops

The above objectives are achieved by a number of strategies including:

- Expanding the Hospital facilities at a location which is close to public transport with direct pedestrian access to bus stops and train station.
- Appropriate strategies are taken to encourage higher use of active and public transport among users of the Hospital with minimal car parking provision.
- Commitment to introduce Workplace Travel Plan for the Hospital
- Communication to the Hospital's patrons showing the availability of public transport services in the vicinity of the Hospital.
- Provision of bicycle parking and shower facilities for cyclists as an end of trip facilities.

Item 5: Traffic Movements and assessment due to the development are presented in Section 4 of this report.

Item 6: Access, parking provisions and service vehicle movements are presented in Section 3 and Section 6 of this report.

Item 7: The impact of road closures, including Hospital Road, is assessed in Section 8 of this report.

Item 8: The current proposal meets the requirements to minimise levels of on site parking.

The Roads and Traffic Authority's requirements are addressed per below:

The following works have also been carried out to assess the impact of the proposal in terms of traffic, transport and parking:

- Traffic generation of the proposal has been assessed and its impact (based on criteria as shown in the RTA's Guide to Traffic Generating Developments) on road network and intersection operation has been evaluated.
- The intersections assessments using SIDRA have been carried out and the results are shown as part of the report and Appendix.
- The assessment would not require network modelling such as Paramics as the expected traffic generation is relatively low. The recently approved Public Hospital (near the Wollongong Hospital) that would have higher traffic generation did not require any network modelling as part of its approval process.
- A construction Traffic Management Plan for the site will be prepared prior to the commencement of works.

9.0 SUMMARY

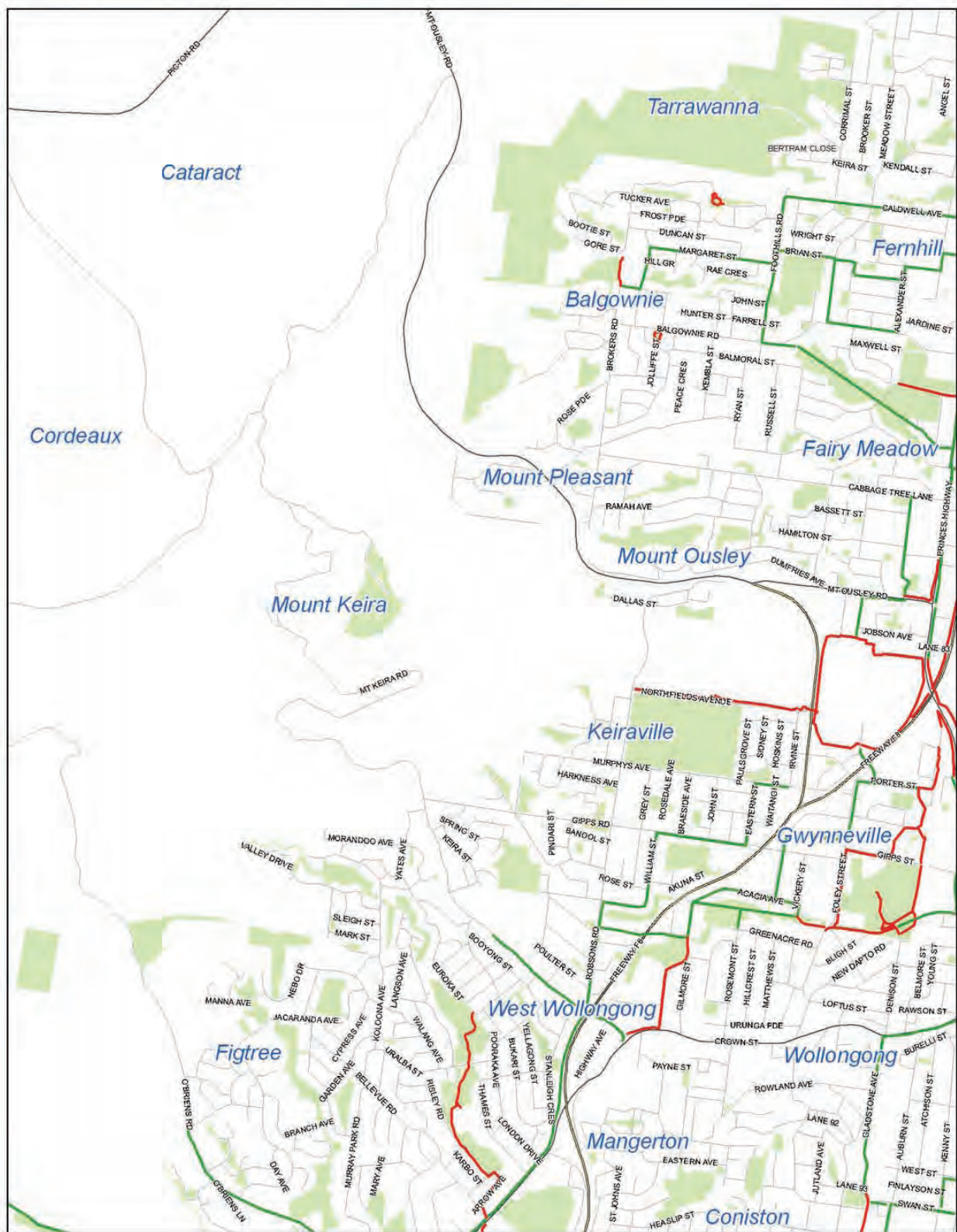
The existing road system and access arrangements operate at good level of service and will continue to operate at similar level of service once the redevelopment of the Hospital is completed.

Pedestrian desire lines have been identified and are included as part of the proposed plan for the campus which will form the basis for pedestrian links and facilities.

The car parking supply for the Hospital use is within the Wollongong Council's DCP requirements.

A construction traffic management plan should also be prepared prior to commencement of construction work.

APPENDIX A



Map 8

- Cycleway
- Proposed Cycleway
- Wollongong LGA Boundary
- ★ Learn To Ride Facility



250 0 250 500 750 1000
Meters

GIS ref. g05773-05

Printed: 4/04/2006

ArcGIS 9.1 - ArcMap - ArcInfo

Scale 1:30,000

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WOLLONGONG HOSPITAL

Walk-time model

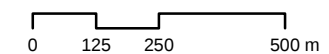
This map shows aggregated 5, 10 and 15 minute catchments originating from the three entry locations marked on the site.

KEY

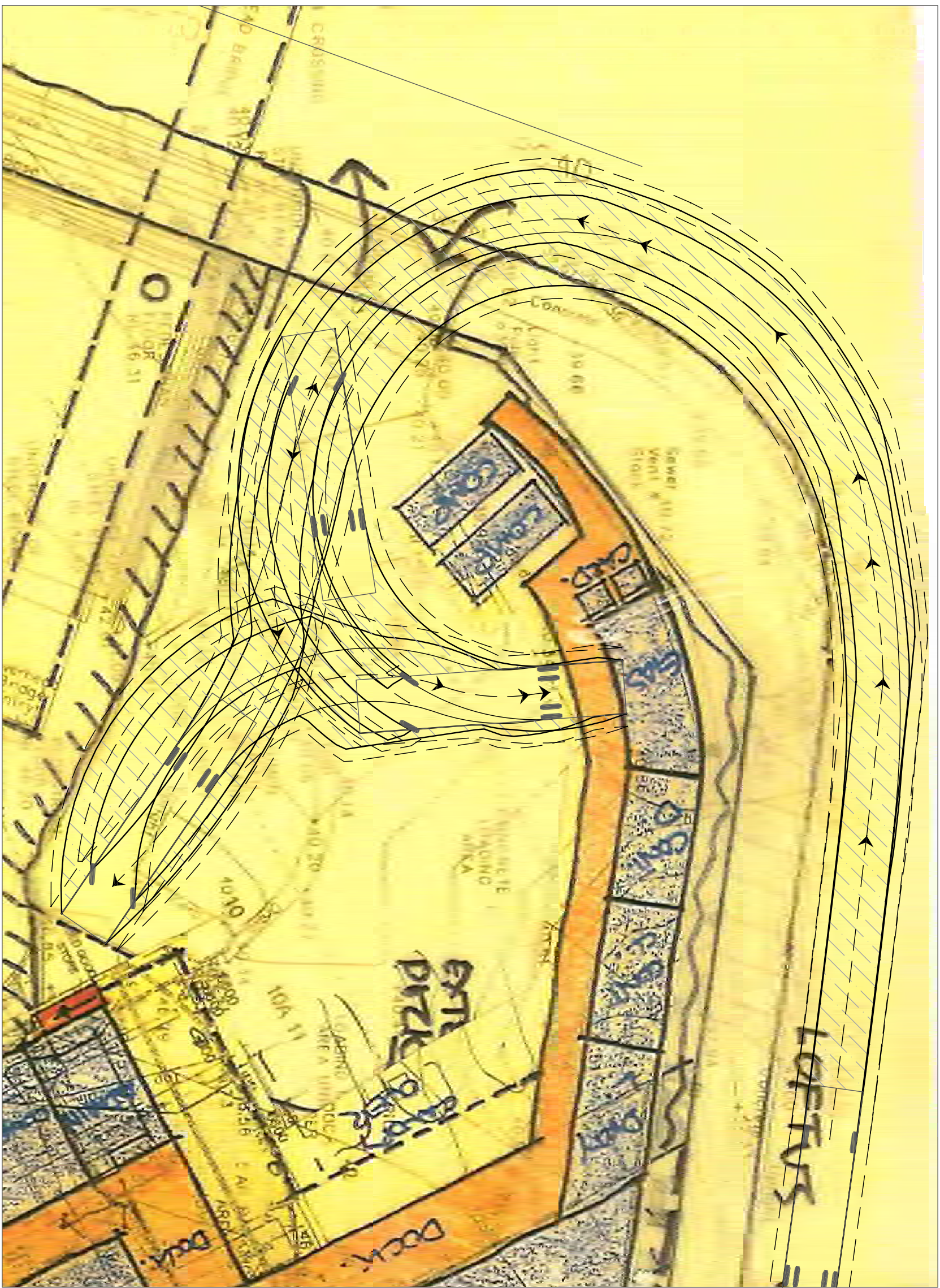
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	Railway	
	Street	 5
	Site	 10
	Proposed entry locations	 15

*Assumed walking speed 5km per hour

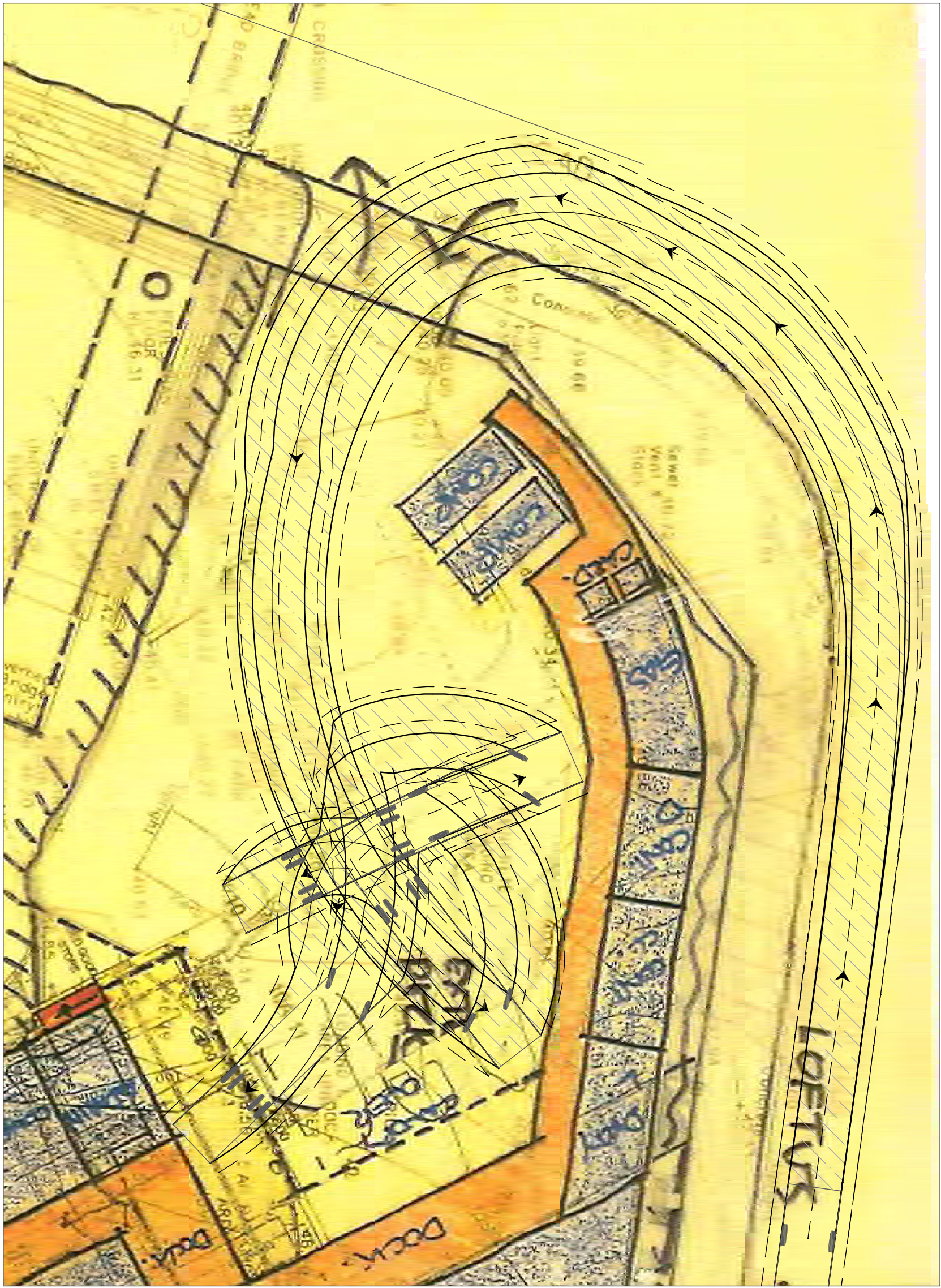
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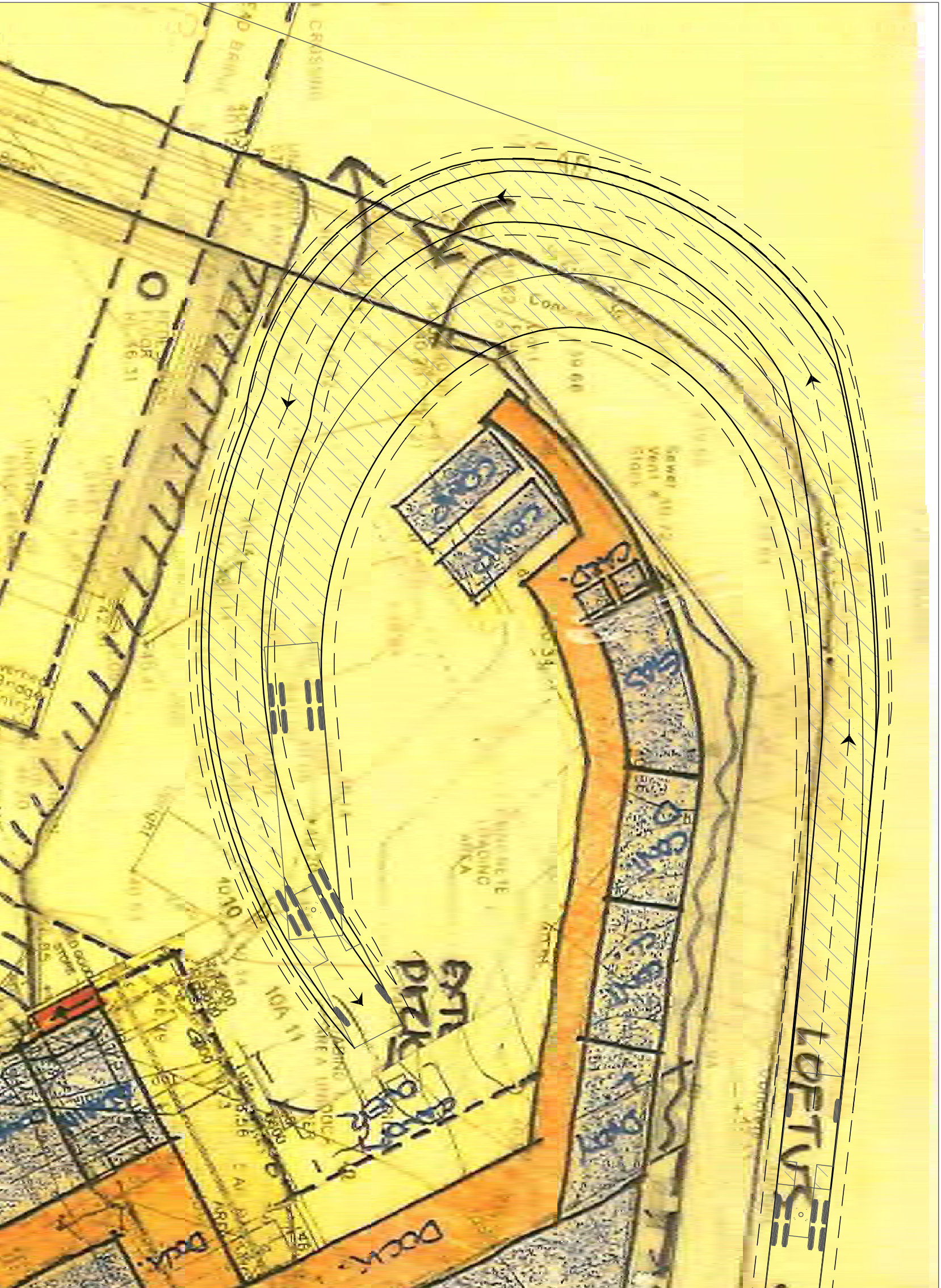
Note: This map has been prepared using data from various sources. HASSELL assumes no responsibility for their accuracy, completeness or any loss resulting from its use.



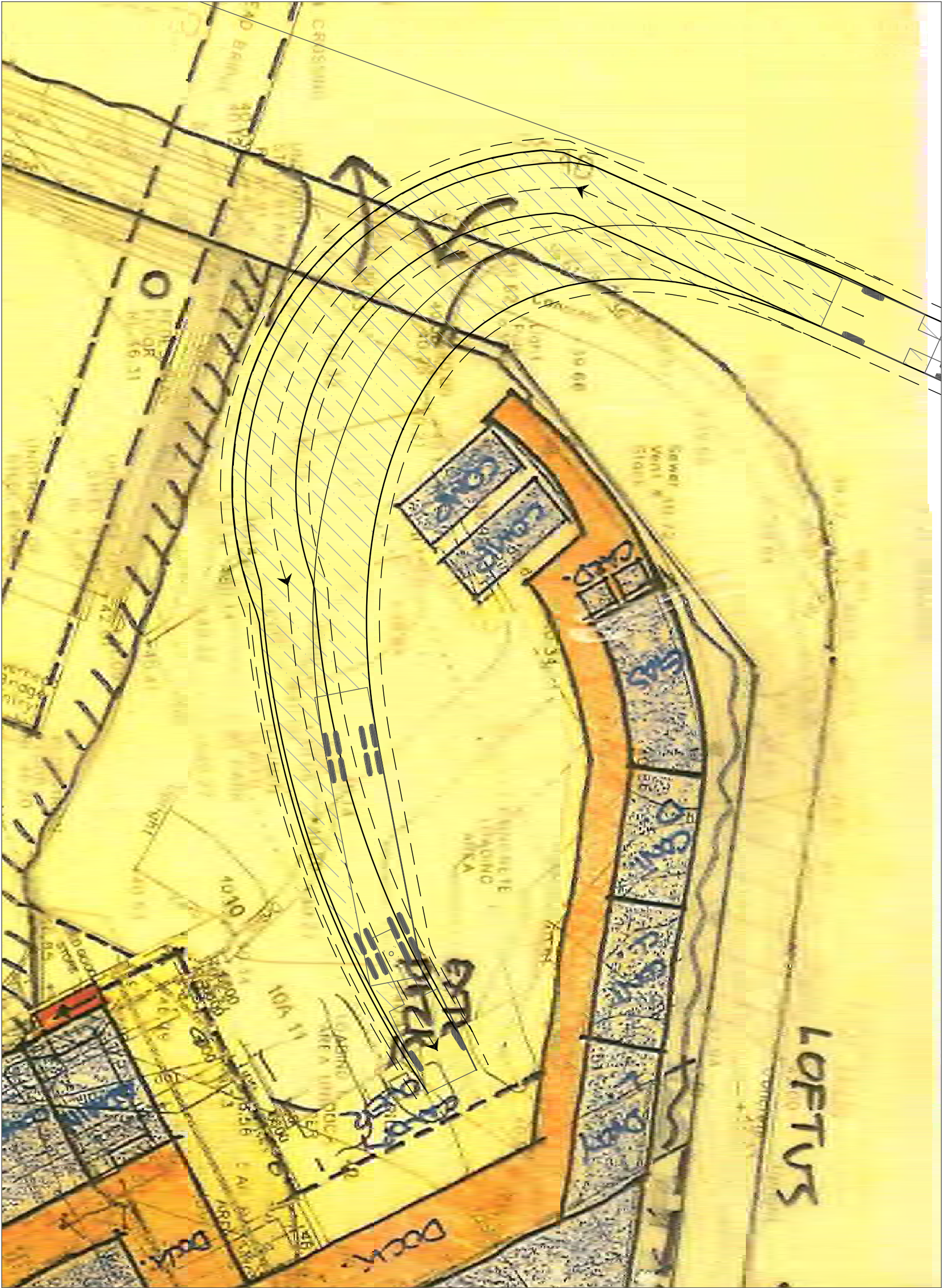
12.5m TRUCK TURNING PATH AT
IESS LOADING DOCK AREA -
POSITION AT GAS TANK



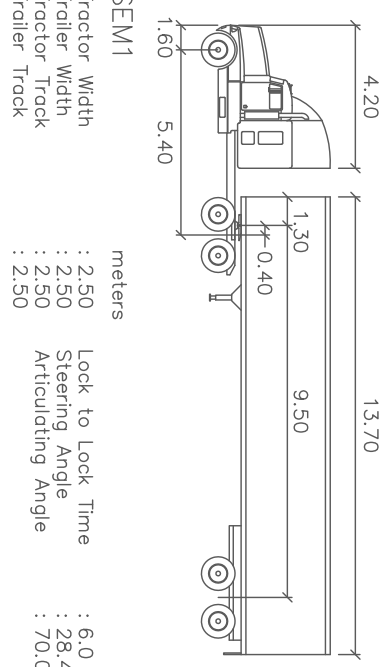
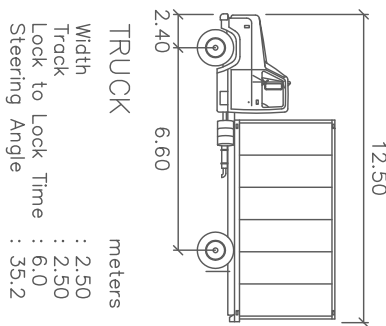
12.5m TRUCK TURNING PATH AT
IESS LOADING DOCK AREA -
TO EXISTING LOADING DOCK



19m SEMI TRUCK TURNING PATH AT
IESS LOADING DOCK AREA -
ENTRY PATH FROM LOFTUS & NEW DAPTO
ROAD



19m SEMI TRUCK TURNING PATH AT
IESS LOADING DOCK AREA -
ENTRY PATH FROM NEW DAPTO ROAD



WOLLONGONG HOSPITAL,
ELECTIVE SURGICAL SERVICE,
AMBULATORY CARE &
EMERGENCY DEPT.
SHEET 2 OF 2
19m SEMI & 12.5m TRUCK TURNING PATH
AT IESS LOADING DOCK AREA -
SHEET 2 OF 2

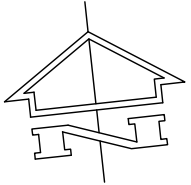
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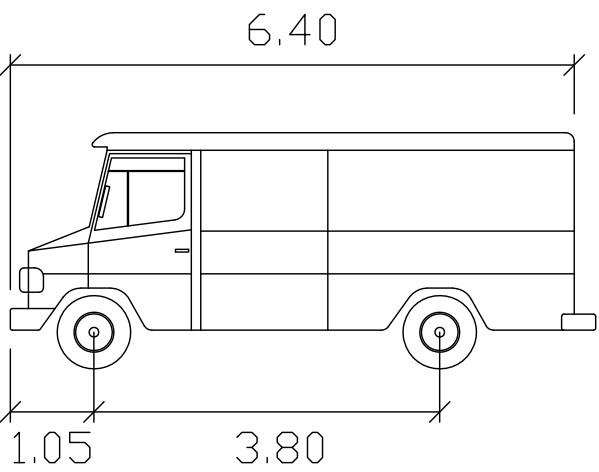
PRELIMINARY



LOFTUS

STREET

ROOF OVERHEAD



SRV meters
Width : 2.30
Track : 2.30
Lock to Lock Time 6.0
Steering Angle : 38.0

P3	PRELIMINARY	AW	MK	02.06.11
P2	PRELIMINARY	AW	MK	24.05.11
P1	PRELIMINARY	AW	MK	10.05.11
Rev	Description	Eng	Draft	Date

Project
WOLLONGONG HOSPITAL,
ELECTIVE SURGICAL SERVICE,
AMBULATORY CARE &
EMERGENCY DEPT.

Sheet Subject
AMBULANCE TURNING PATH
PLAN

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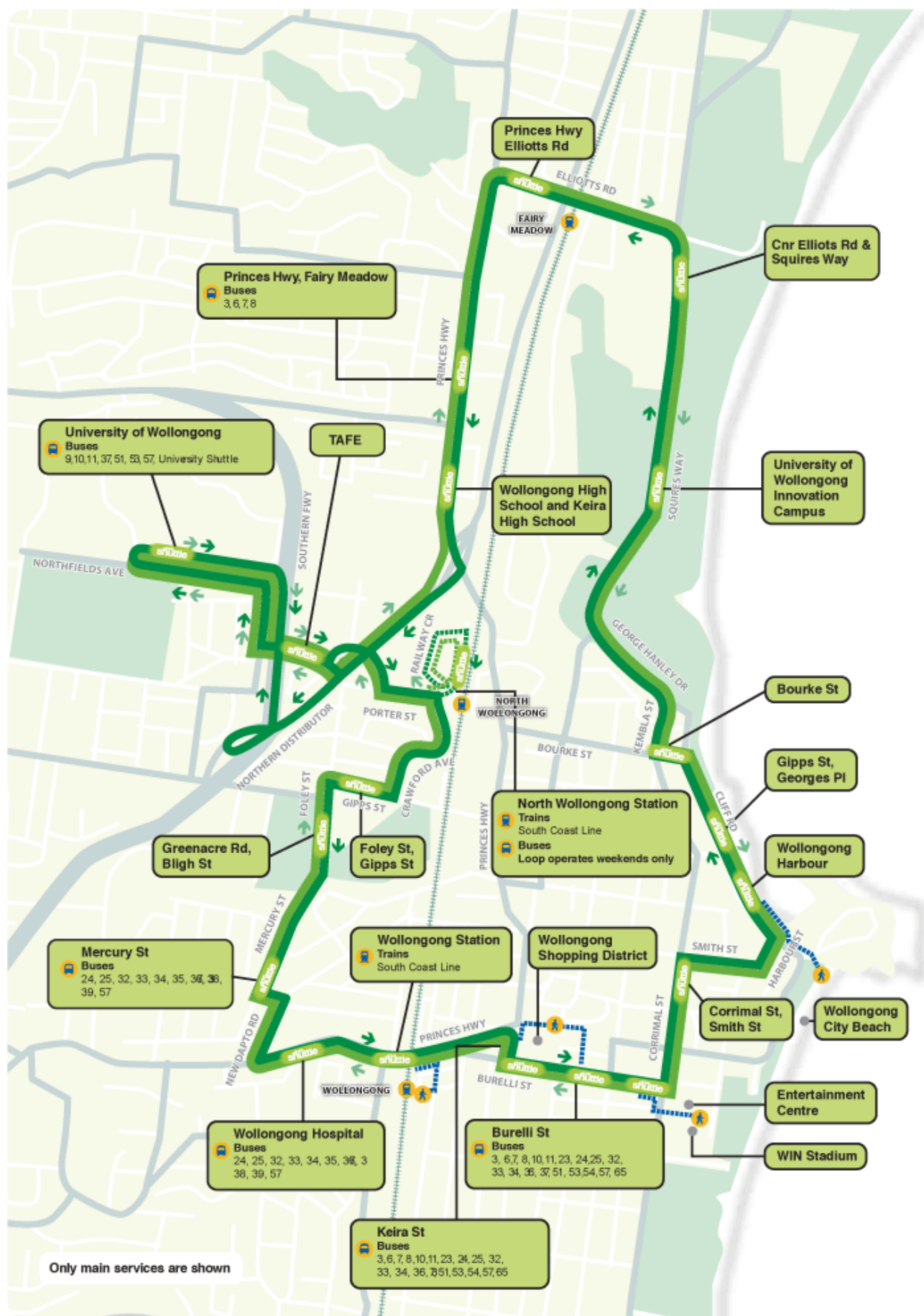
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101498 SKC402 P3

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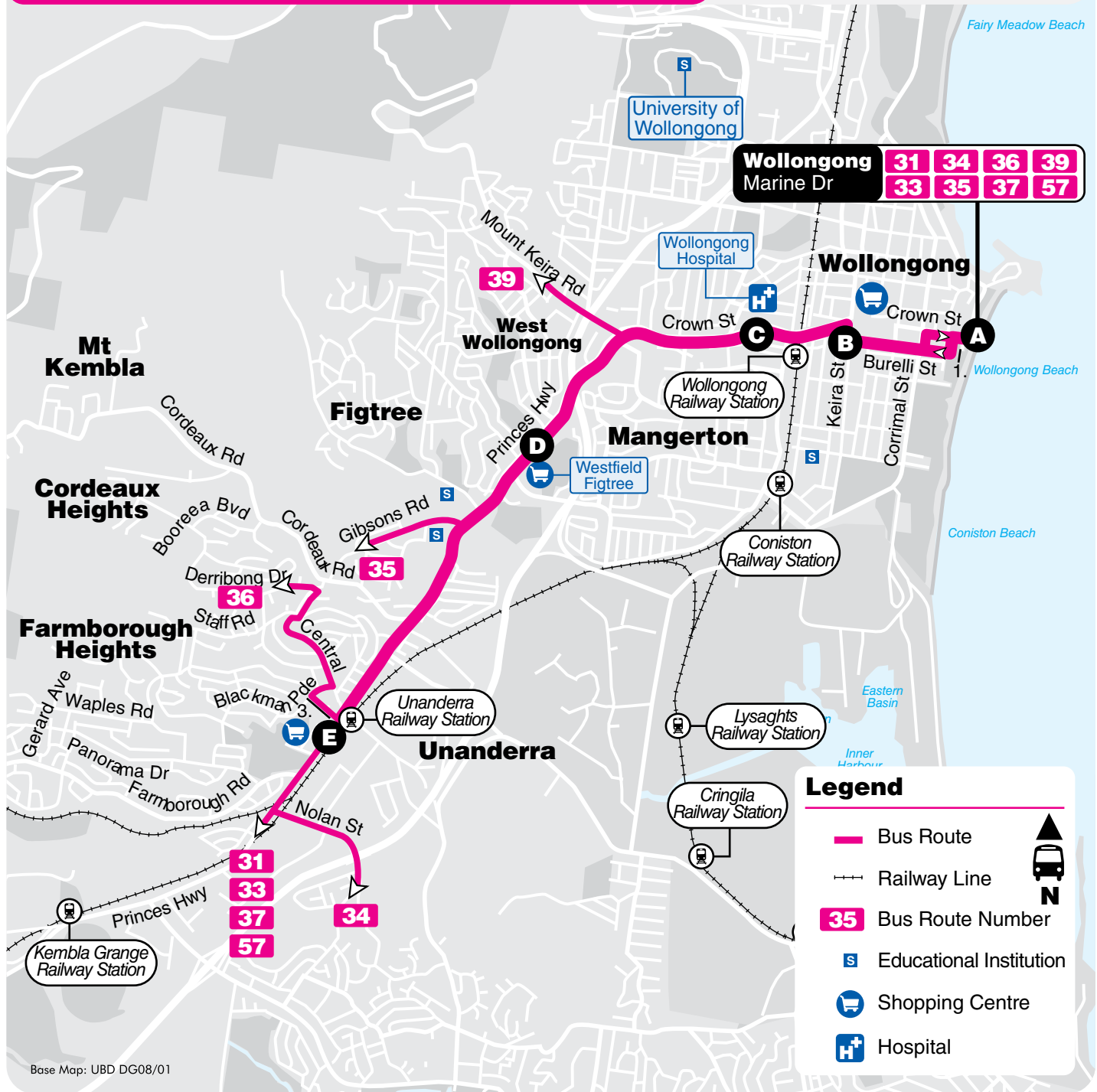
PRELIMINARY

APPENDIX B





Routes

31/33/34/35/36/37/39/57**Princes Highway Bus Route Map**



PREMIER
ILLAWARRA

 Hospital

1. Harbour St
2. McGrath St
3. Hamilton St
4. Vereker St
5. Dawson St
6. Ryan St

Base Map: UBD DG08/01



Wollongong

Legend

- Bus Route
- Railway Line
- 37 Bus Route Number
- S Educational Institution
- Shopping Centre
- H+ Hospital



Street Legend

1. New Lake Entrance Rd
2. Leamington Rd
3. David Ave
4. Lake Entrance Rd
5. Government Rd

Count Number 2941

Lat/Long : S34 25 28.8 / E150 53 05.4

UBD 35 K-2

Street DARLING ST : Between CROWN ST & LOFTUS ST (bidirectional)

Location In section, just north of Crown Street, Red Cross Blood Bank, ELP 3C1212

Start Date 26-MAY-11

Start Time 1200

Duration 7 DAYS

Interval 1 HOUR

Speed Limit 60

NORTH

SOUTH

COMBINED

Weekly 50th Percentile Speed

34

32

33

Weekly 85th Percentile Speed

41

39

40

Five Day AADT

1369

1652

3021

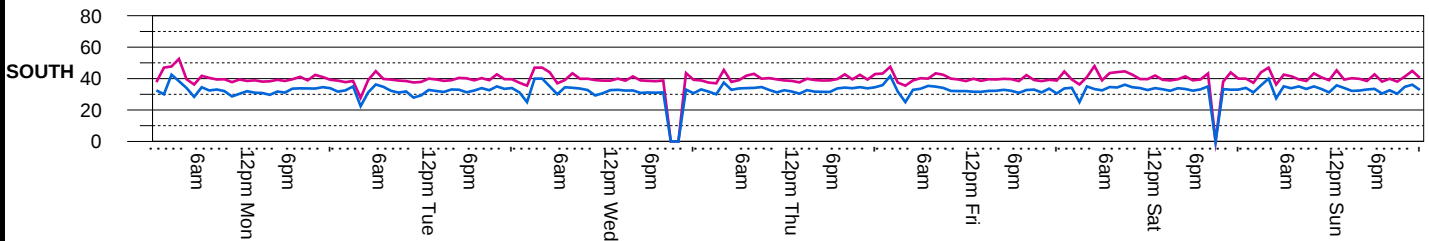
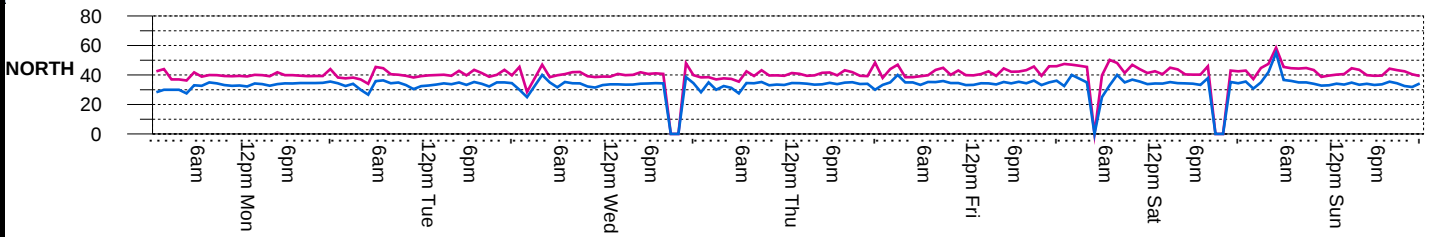
Seven Day AADT

1215

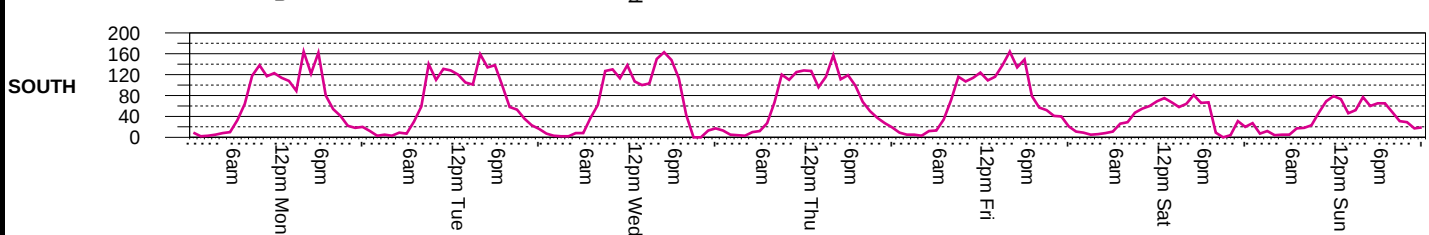
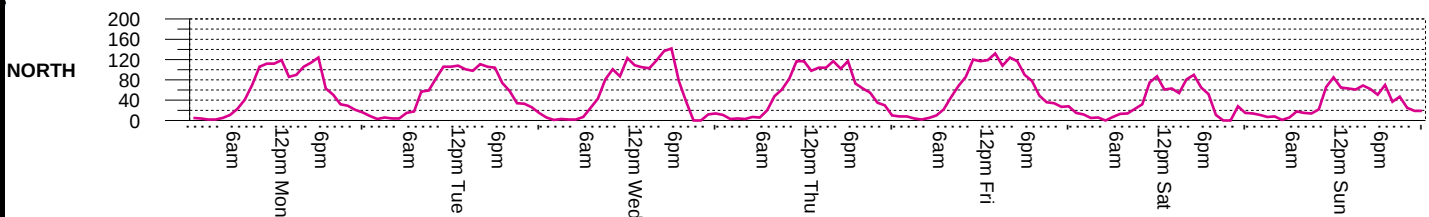
1433

2649

	MON 30-MAY-11			TUE 31-MAY-11			WED 01-JUN-11			THU 26-MAY-11			FRI 27-MAY-11			SAT 28-MAY-11			SUN 29-MAY-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
85%ile	39.6	39.1	39.4	39.9	39.1	39.5	39.9	39.3	39.6	40.1	39.4	39.7	42.1	39.6	40.3	43.3	40.3	42.0	41.7	40.0	40.8	40.9	39.5	40.2
50%ile	33.6	31.8	32.7	33.7	32.0	32.8	33.7	32.0	32.9	34.0	32.7	33.3	34.4	32.5	33.5	34.6	33.6	34.1	33.9	33.2	33.6	34.0	32.5	33.3
> 70 k	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1429	2857	4286
%age	.1	.0	.0	.0	.0	.0	.0	.1	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
> 80 k	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1429	1429	2857
%age	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0



Short %	94.8	89.7	92.0	94.2	89.5	91.6	94.6	90.2	92.2	95.5	92.6	93.9	95.5	91.0	93.0	96.9	91.9	94.3	97.2	90.6	93.8	95.3	90.7	92.8
Med %	2.1	7.5	5.0	2.5	7.6	5.3	2.2	7.8	5.3	1.8	5.7	3.9	1.9	6.6	4.4	1.2	6.4	3.9	1.2	8.2	4.7	1.9	7.1	4.7
Long %	3.1	2.8	3.0	3.4	2.9	3.1	3.2	1.9	2.5	2.7	1.7	2.2	2.6	2.5	2.5	1.9	1.7	1.8	1.6	1.2	1.4	2.8	2.2	2.5
AM Pk Vo	112	138	244	106	140	237	123	138	261	117	128	245	120	124	241	87	69	156	85	79	164	107	117	221
PM Pk Vo	124	164	286	111	159	270	142	163	300	117	157	274	132	164	288	90	81	171	70	77	146	112	138	248
7-7pm 24Hr Tot	1143	1399	2542	1113	1424	2537	1228	1454	2682	1140	1375	2515	1205	1421	2626	697	738	1435	643	674	1317	1024	1212	2236
	1344	1624	2968	1338	1679	3017	1337	1594	2931	1387	1650	3037	1438	1713	3151	809	878	1687	855	895	1750	1215	1433	2649
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Class 1	1269	1451	2720	1251	1499	2750	1258	1430	2688	1319	1526	2845	1371	1553	2924	783	805	1588	830	811	1641	1154	1296	2451
Class 2	5	6	11	9	4	13	7	8	15	5	2	7	3	5	8	1	2	3	1	0	1	4	4	8
Class 3	24	111	135	29	119	148	23	111	134	20	86	106	19	95	114	10	53	63	10	72	82	19	92	112
Class 4	3	9	12	3	8	11	4	11	15	4	7	11	8	15	23	0	3	3	0	0	0	3	8	11
Class 5	1	1	2	1	0	1	2	3	5	1	1	2	0	3	3	0	0	0	0	1	1	1	1	2
Class 6	1	2	3	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Class 7	3	8	11	3	6	9	3	5	8	2	10	12	4	6	10	1	2	3	1	1	2	2	5	8
Class 8	1	1	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Class 9	10	2	12	9	2	7	1	3	10	4	0	4	1	2	3	0	0	0	0	1	1	4	2	6
Class 10	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Class 12	2	0	2	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
Class 13	25	33	58	32	36	68	31	22	53	32	18	50	31	34	65	14	13	27	13	8	21	25	23	49



Count Number **2943** Ref : **URAP** Lat/Long : **S34 25 30.7 / E150 52 51.8** UBD **35 H-3**
 Street **URUNGA PDE : Between DUDLEY ST & NEW DAPTO RD (bidirectional) :**
 Location **Just west of New Dapto Road, House No. 9, on No Stopping Sign** Carriageway

Start Date 26-MAY-11
 Start Time 1200
 Duration 7 DAYS
 Interval 1 HOUR

Weekly 50th Percentile Speed 31
 Weekly 85th Percentile Speed 47
 Five Day AADT 1466
 Seven Day AADT 1295

TOTAL COUNT MATRIX

	MON 30TH	TUE 31ST	WED 1ST	THU 26TH / 2ND	FRI 27TH	SAT 28TH	SUN 29TH	5 Day Total Average		7 Day Total Average	
Midnight - 1am	5	2	2	5	6	6	12	20	4	38	5
1am - 2am	2	4	2	10	3	8	7	21	4	36	5
2am - 3am	2	0	4	2	3	8	7	11	2	26	4
3am - 4am	2	0	2	3	1	4	7	8	2	19	3
4am - 5am	2	1	3	2	0	0	4	8	2	12	2
5am - 6am	9	15	14	14	11	3	2	63	13	68	10
6am - 7am	41	30	44	47	38	21	20	200	40	241	34
7am - 8am	83	68	75	64	63	34	33	353	71	420	60
8am - 9am	123	121	107	105	142	50	26	598	120	674	96
9am - 10am	110	106	110	100	111	59	38	537	107	634	91
10am - 11am	106	119	84	106	109	87	62	524	105	673	96
11am - Midday	95	67	114	115	122	70	71	513	103	654	93
Midday - 1pm	88	84	108	97	104	80	75	481	96	636	91
1pm - 2pm	93	91	96	116	80	59	54	476	95	589	84
2pm - 3pm	100	103	106	104	109	60	51	522	104	633	90
3pm - 4pm	115	102	123	138	126	76	53	604	121	733	105
4pm - 5pm	111	132	135	130	146	74	56	654	131	784	112
5pm - 6pm	116	131	123	125	117	57	52	612	122	721	103
6pm - 7pm	71	66	67	80	68	48	47	352	70	447	64
7pm - 8pm	48	40	45	54	45	37	33	232	46	302	43
8pm - 9pm	35	38	36	38	32	26	18	179	36	223	32
9pm - 10pm	28	46	38	38	39	42	26	189	38	257	37
10pm - 11pm	25	18	20	34	24	36	19	121	24	176	25
11pm - Midnight	4	9	8	12	19	14	6	52	10	72	10
Total	1414	1393	1466	1539	1518	959	779	7330	1466	9068	1295

Count Number **2942** Ref : **URAP** Lat/Long : **S34 25 26.3 / E150 53 00.2** UBD **35 J-2**
 Street **LOFTUS ST : Between NEW DAPTO RD & DARLING ST (bidirectional) :**
 Location **In section, near Wollongong Hospital Main Entrance, 15 metres west, on Hospital Sign** Carriageway

Start Date 26-MAY-11
 Start Time 1200
 Duration 7 DAYS
 Interval 1 HOUR

Weekly 50th Percentile Speed 34
 Weekly 85th Percentile Speed 40
 Five Day AADT 3911
 Seven Day AADT 3442

TOTAL COUNT MATRIX

	MON 30TH	TUE 31ST	WED 1ST	THU 26TH / 2ND	FRI 27TH	SAT 28TH	SUN 29TH	5 Day		7 Day	
								Total	Average	Total	Average
Midnight - 1am	19	20	13	27	13	24	40	92	18	156	22
1am - 2am	9	5	3	9	12	26	21	38	8	85	12
2am - 3am	5	8	6	10	9	13	12	38	8	63	9
3am - 4am	5	4	6	8	4	9	14	27	5	50	7
4am - 5am	17	17	15	11	13	10	5	73	15	88	13
5am - 6am	28	29	22	19	20	12	18	118	24	148	21
6am - 7am	83	83	92	72	79	53	50	409	82	512	73
7am - 8am	194	178	183	173	176	70	62	904	181	1036	148
8am - 9am	296	294	254	247	251	99	57	1342	268	1498	214
9am - 10am	300	276	272	249	258	132	94	1355	271	1581	226
10am - 11am	310	310	253	286	306	166	170	1465	293	1801	257
11am - Midday	293	284	287	318	309	198	204	1491	298	1893	270
Midday - 1pm	276	270	294	275	299	179	164	1414	283	1757	251
1pm - 2pm	278	258	272	258	275	175	129	1341	268	1645	235
2pm - 3pm	268	269	277	279	278	147	133	1371	274	1651	236
3pm - 4pm	343	357	344	348	326	205	218	1718	344	2141	306
4pm - 5pm	299	322	353	312	333	182	157	1619	324	1958	280
5pm - 6pm	303	316	314	306	265	156	165	1504	301	1825	261
6pm - 7pm	179	192	229	239	213	127	149	1052	210	1328	190
7pm - 8pm	117	147	143	151	141	118	92	699	140	909	130
8pm - 9pm	90	100	111	123	102	69	60	526	105	655	94
9pm - 10pm	70	93	99	103	88	90	63	453	91	606	87
10pm - 11pm	59	56	67	70	75	76	42	327	65	445	64
11pm - Midnight	34	30	30	31	54	47	37	179	36	263	38
Total	3875	3918	3939	3924	3899	2383	2156	19555	3911	24094	3442

Count Number **2941** Ref : **URAP** Lat/Long : **S34 25 28.8 / E150 53 05.4** UBD **35 K-2**
 Street **DARLING ST : Between CROWN ST & LOFTUS ST (bidirectional) :**
 Location **In section, just north of Crown Street, Red Cross Blood Bank, ELP 3C1212** Carriageway

Start Date 26-MAY-11
 Start Time 1200
 Duration 7 DAYS
 Interval 1 HOUR

Weekly 50th Percentile Speed 33
 Weekly 85th Percentile Speed 40
 Five Day AADT 3021
 Seven Day AADT 2649

TOTAL COUNT MATRIX

	MON 30TH	TUE 31ST	WED 1ST	THU 26TH / 2ND	FRI 27TH	SAT 28TH	SUN 29TH	5 Day Total Average		7 Day Total Average	
Midnight - 1am	14	21	13	24	17	26	41	89	18	156	22
1am - 2am	6	6	4	8	13	21	18	37	7	76	11
2am - 3am	5	11	5	8	9	10	19	38	8	67	10
3am - 4am	7	7	4	6	5	12	12	29	6	53	8
4am - 5am	13	13	10	17	17	8	6	70	14	84	12
5am - 6am	21	22	15	18	23	18	11	99	20	128	18
6am - 7am	56	48	62	47	56	39	35	269	54	343	49
7am - 8am	105	116	105	115	117	43	33	558	112	634	91
8am - 9am	188	199	208	181	184	70	37	960	192	1067	152
9am - 10am	244	193	231	192	193	87	69	1053	211	1209	173
10am - 11am	229	237	200	242	234	135	135	1142	228	1412	202
11am - Midday	235	234	261	245	241	156	164	1216	243	1536	219
Midday - 1pm	233	228	216	225	228	136	138	1130	226	1404	201
1pm - 2pm	194	206	205	200	248	130	109	1053	211	1292	185
2pm - 3pm	179	199	206	220	246	112	113	1050	210	1275	182
3pm - 4pm	270	270	269	274	288	145	146	1371	274	1662	237
4pm - 5pm	236	240	300	213	251	171	122	1240	248	1533	219
5pm - 6pm	286	242	290	236	239	131	116	1293	259	1540	220
6pm - 7pm	143	173	191	172	157	119	135	836	167	1090	156
7pm - 8pm	105	116	80	131	106	20	85	538	108	643	92
8pm - 9pm	73	87	0	105	88	0	78	353	71	431	62
9pm - 10pm	51	69	0	72	75	4	54	267	53	325	46
10pm - 11pm	39	49	25	57	67	59	36	237	47	332	47
11pm - Midnight	36	31	31	29	49	35	38	176	35	249	36
Total	2968	3017	2931	3037	3151	1687	1750	15104	3020	18541	2648

Count Number 2943

Lat/Long : S34 25 30.7 / E150 52 51.8

UBD 35 H-3

Street URUNGA PDE : Between DUDLEY ST & NEW DAPTO RD (bidirectional)

Location Just west of New Dapto Road, House No. 9, on No Stopping Sign

Start Date 26-MAY-11

Start Time 1200

Duration 7 DAYS

Interval 1 HOUR

Speed Limit 50

EAST

WEST

COMBINED

Weekly 50th Percentile Speed

30

33

31

Weekly 85th Percentile Speed

47

47

47

Five Day AADT

974

492

1466

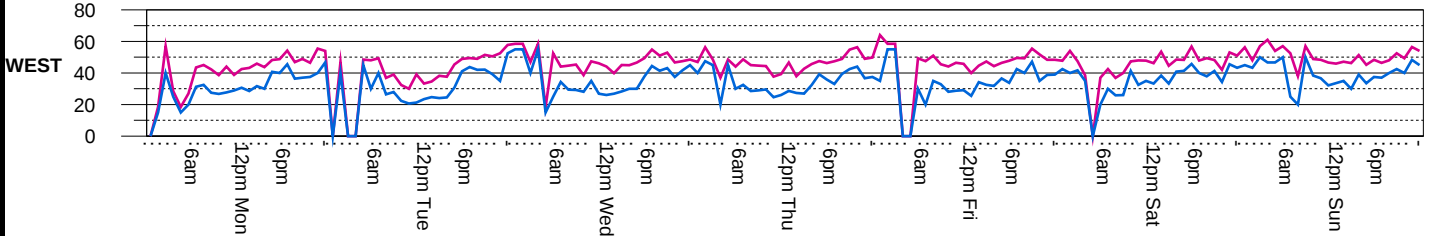
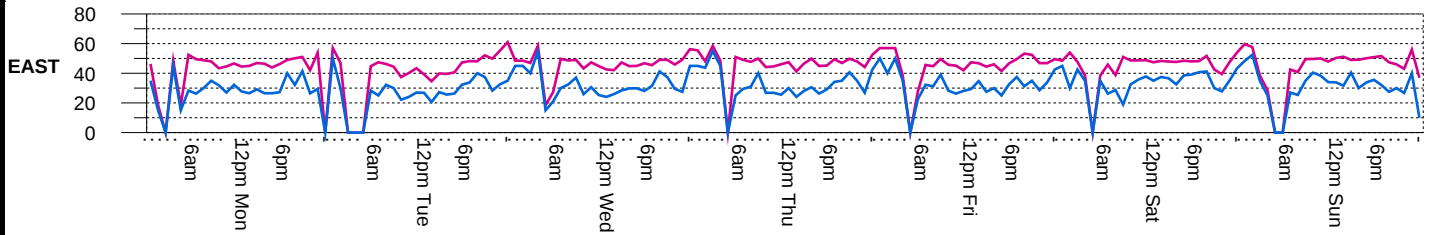
Seven Day AADT

848

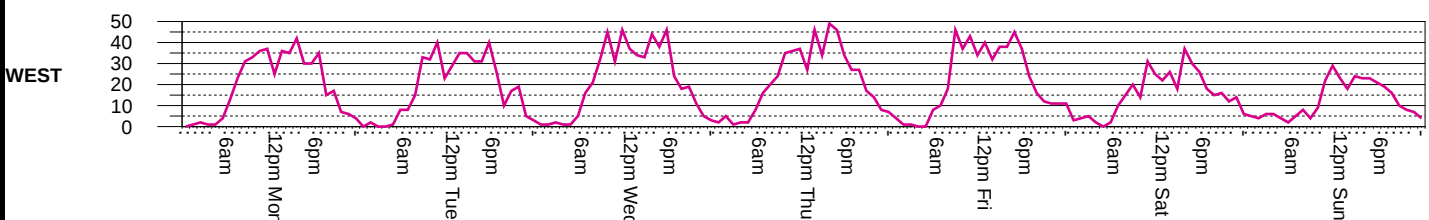
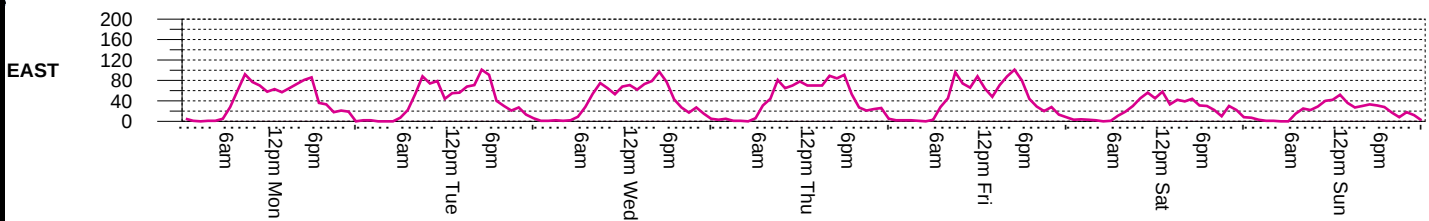
448

1295

	MON 30-MAY-11			TUE 31-MAY-11			WED 01-JUN-11			THU 26-MAY-11			FRI 27-MAY-11			SAT 28-MAY-11			SUN 29-MAY-11			SEVENDAY AVERAGE		
	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir
85%ile	46.6	46.3	46.5	44.1	44.7	44.3	46.5	47.1	46.7	47.1	46.3	46.9	46.7	47.2	46.9	48.0	48.6	48.2	49.4	49.1	49.3	46.9	47.0	47.0
50%ile	29.3	32.8	30.6	27.5	28.4	27.8	29.0	31.3	29.7	29.0	31.9	29.9	30.9	33.3	31.8	34.9	37.4	36.0	33.7	37.2	35.2	30.6	33.2	31.6
> 60 k	10	1	11	3	0	3	6	1	7	11	3	14	10	3	13	2	6	8	10	1	11	7.429	2.143	9.571
%age	1.1	2	8	3	0	2	6	2	5	1.1	6	9	1.0	6	9	3	1.6	8	2.1	3	1.4	9	5	8
> 70 k	0	0	0	1	0	1	1	0	1	0	2	2	3	1	4	0	1	1	2	0	2	1	5.714	1.571
%age	0	0	0	1	0	1	1	0	1	0	4	1	3	2	3	0	3	1	4	0	3	1	1	1



Short %	94.8	96.1	95.3	91.1	91.6	91.2	93.1	93.8	93.3	92.3	94.8	93.2	93.6	94.2	93.8	93.9	95.1	94.4	97.3	99.0	97.9	93.4	94.7	93.9
Med %	2.9	3.0	3.0	6.0	6.3	6.1	4.1	5.3	4.5	4.6	4.6	4.6	3.5	4.3	3.8	2.9	3.0	2.9	1.7	.7	1.3	3.9	4.1	4.0
Long %	2.2	.9	1.8	2.9	2.0	2.7	2.8	1.0	2.2	3.1	.6	2.2	2.9	1.5	2.4	3.2	1.9	2.7	1.0	.3	.8	2.7	1.2	2.2
AM Pk Vo	92	37	123	88	40	121	75	46	114	81	37	115	96	46	142	56	31	87	42	29	71	76	38	110
PM Pk Vo	86	42	116	101	40	132	97	46	135	91	49	138	101	45	146	58	37	80	52	24	75	84	40	117
7-7pm 24Hr Tot	818	393	1211	820	370	1190	817	431	1248	865	415	1280	865	432	1297	472	282	754	395	223	618	722	364	1085
	950	464	1414	950	443	1393	952	514	1466	1015	524	1539	1001	517	1518	588	371	959	479	300	779	848	448	1295
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Class 1	899	445	1344	864	405	1269	881	479	1360	935	495	1430	934	481	1415	547	351	898	465	297	762	789	422	1211
Class 2	2	1	3	1	1	2	5	3	8	2	2	4	3	6	9	5	2	7	1	0	1	3	2	5
Class 3	15	12	27	18	14	32	19	21	40	20	13	33	17	15	32	8	6	14	0	2	2	14	12	26
Class 4	7	1	8	20	13	33	12	5	17	14	10	24	7	6	13	4	4	8	5	0	5	10	6	15
Class 5	6	1	7	19	1	20	8	1	9	13	1	14	11	1	12	5	1	6	3	0	3	9	1	10
Class 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Class 7	4	2	6	3	1	4	3	1	9	0	0	9	3	2	5	1	0	1	1	0	1	3	1	4
Class 8	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Class 9	1	0	1	2	0	2	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2
Class 10	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Class 11	0	0	0	0	0	0	1	0	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	0	0	0	0	0	0	0	0
Class 13	16	2	18	21	6	27	22	3	25	22	3	25	19	4	23	13	2	15	4	1	5	17	3	20



Count Number 2942

Lat/Long : S34 25 26.3 / E150 53 00.2

UBD 35 J-2

Street LOFTUS ST : Between NEW DAPTO RD & DARLING ST (bidirectional)

Location In section, near Wollongong Hospital Main Entrance, 15 metres west, on Hospital Sign

Start Date 26-MAY-11

Start Time 1200

Duration 7 DAYS

Interval 1 HOUR

Speed Limit 50

EAST

WEST

COMBINED

Weekly 50th Percentile Speed

35

32

34

Weekly 85th Percentile Speed

43

39

40

Five Day AADT

2171

1740

3911

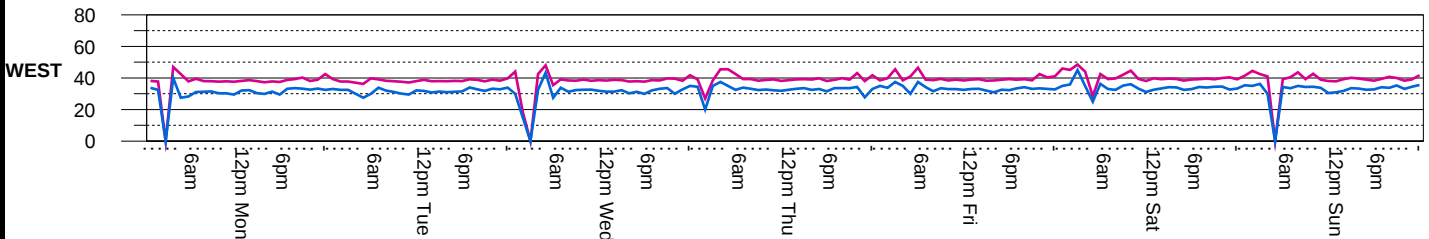
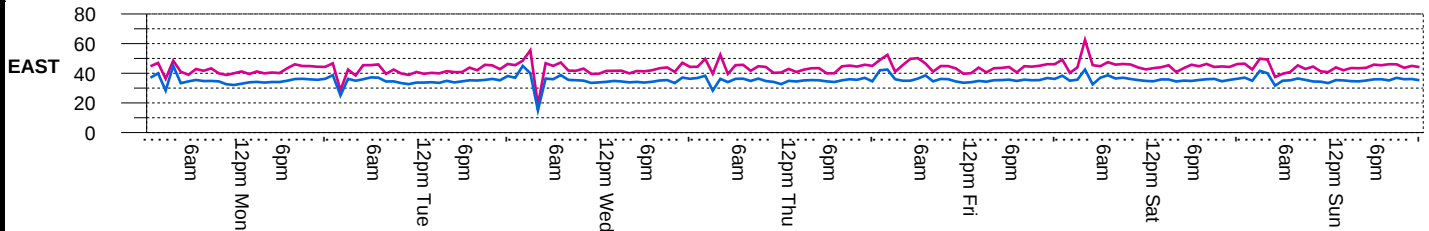
Seven Day AADT

1926

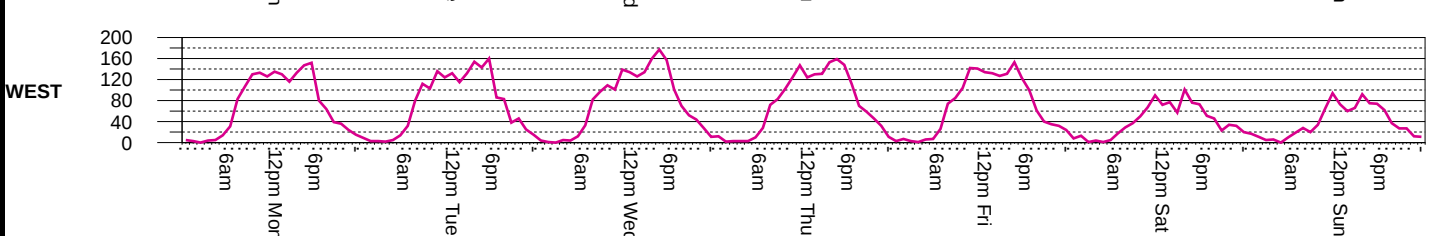
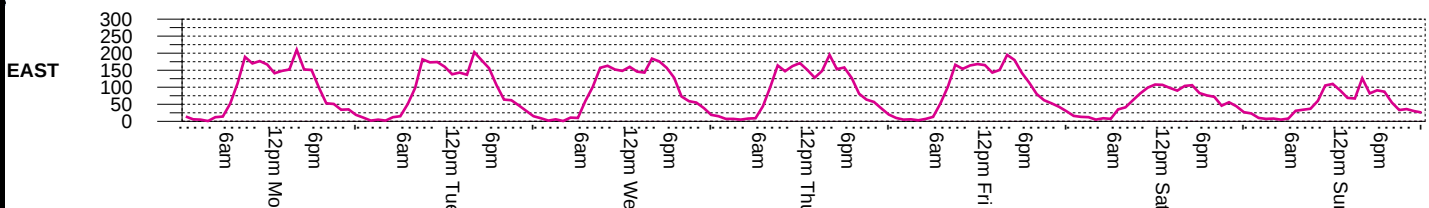
1516

3442

	MON 30-MAY-11			TUE 31-MAY-11			WED 01-JUN-11			THU 26-MAY-11			FRI 27-MAY-11			SAT 28-MAY-11			SUN 29-MAY-11			SEVENDAY AVERAGE		
	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir	EAST	WEST	BiDir
85%ile	41.2	38.1	39.4	41.6	38.2	39.5	42.2	38.5	39.7	43.0	39.0	40.5	43.7	39.0	41.2	44.7	39.6	42.8	44.1	39.3	41.9	42.9	38.8	40.7
50%ile	34.2	31.2	33.0	34.3	31.6	33.2	34.6	31.8	33.4	34.9	32.8	34.0	35.1	32.8	34.1	35.6	33.5	34.7	35.2	33.2	34.3	34.8	32.4	33.8
> 60 k	4	3	7	3	3	6	4	4	8	2	3	5	2	2	4	6	0	6	4	1	5	3.571	2.286	5.857
%age	.2	.2	.2	.1	.2	.2	.2	.2	.2	.1	.1	.1	.1	.1	.1	.4	0	.3	.3	.1	.2	.2	.1	.2
> 70 k	1	1	2	2	1	3	1	1	2	1	2	3	0	0	0	1	0	1	0	0	0	.8571	.7143	1.571
%age	.0	.1	.1	.1	.1	.1	.0	.1	.1	.0	.1	.1	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0



Short %	94.0	93.8	93.9	93.2	95.5	94.2	93.4	93.9	93.6	94.4	95.4	94.8	92.8	94.4	93.5	96.1	96.9	96.4	96.3	97.7	96.9	94.1	95.1	94.5
Med %	2.4	2.3	2.4	2.7	2.1	2.5	2.3	3.0	2.6	2.2	1.8	2.0	2.9	2.5	2.7	1.8	1.3	1.6	1.6	.9	1.3	2.4	2.1	2.2
Long %	3.6	3.9	3.7	4.1	2.3	3.3	4.3	3.1	3.8	3.5	2.8	3.2	4.3	3.1	3.7	2.1	1.8	2.0	2.0	1.4	1.8	3.6	2.8	3.2
AM Pk Vo	189	133	310	182	136	310	163	139	287	171	147	318	168	142	309	108	90	198	110	94	204	156	126	277
PM Pk Vo	210	152	343	203	160	357	184	177	353	195	159	348	195	153	333	107	101	205	126	92	218	174	142	308
7-7pm	1867	1472	3339	1849	1477	3326	1815	1517	3332	1805	1485	3290	1843	1446	3289	1056	780	1836	959	743	1702	1599	1274	2873
24Hr Tot	2163	1712	3875	2166	1752	3918	2158	1781	3939	2160	1764	3924	2208	1691	3899	1398	985	2383	1231	925	2156	1926	1516	3442
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1809	1437	3247
Class 1	2029	1603	3632	2016	1669	3685	2011	1666	3677	2036	1680	3716	2046	1587	3633	1343	952	2295	1185	903	2088	1809	1437	3247
Class 2	4	3	7	2	5	7	4	6	10	2	3	10	4	10	14	0	2	2	1	1	2	2	4	7
Class 3	43	26	69	52	27	79	45	38	83	40	25	65	55	31	86	23	8	31	18	6	24	39	23	62
Class 4	8	11	19	4	10	14	3	14	17	7	7	14	8	10	18	2	2	7	2	2	4	5	8	13
Class 5	1	3	4	3	0	3	2	1	3	0	0	0	1	1	2	0	0	0	0	0	0	1	1	2
Class 6	3	1	4	1	0	1	2	1	3	0	2	2	2	2	3	0	0	0	0	0	0	1	1	2
Class 7	1	4	5	3	2	5	6	4	10	2	3	5	8	3	11	3	2	5	1	0	1	3	3	6
Class 8	0	0	0	1	1	1	1	1	2	1	0	1	1	1	1	0	0	0	0	0	0	1	1	1
Class 9	11	7	18	13	2	15	16	3	19	7	4	11	9	8	17	3	0	3	0	0	3	9	3	12
Class 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Class 11	0	0	0	0	0	0	0	2	2	0	1	1	0	1	1	0	0	0	0	0	0	3	1	1
Class 12	3	1	4	3	3	6	3	2	5	3	2	5	6	1	7	1	1	1	1	2	3	2	4	4
Class 13	60	53	113	68	34	102	65	43	108	62	37	99	68	38	106	23	16	39	20	11	31	52	33	85



Joray Enterprises Pty Ltd

ABN 80 061 513 933

Telephone and Fax (02) 9624 5472

1 Ajax Place Blacktown, NSW 2148

Count Number J11-85 Client URAP
Location CROWN ST / NEW DAPTO RD
Weather Fine

Count Date Wednesday 30 March 2011
Suburb WOLLONGONG
Job Number

Comments

Vehicle Movements

All Vehicles

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
7:00 - 7:15	11	49	52	14	42	89	257
7:15 - 7:30	9	55	49	14	66	104	297
7:30 - 7:45	10	53	61	25	73	129	351
7:45 - 8:00	15	60	62	16	91	159	403
8:00 - 8:15	19	54	78	25	104	167	447
8:15 - 8:30	9	69	78	26	107	200	489
8:30 - 8:45	20	86	82	20	99	179	486
8:45 - 9:00	25	52	80	26	110	203	496
Period Ending	118	478	542	166	692	1230	3226

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
7:00 - 8:00	45	217	224	69	272	481	1308
7:15 - 8:15	53	222	250	80	334	559	1498
7:30 - 8:30	53	236	279	92	375	655	1690
7:45 - 8:45	63	269	300	87	401	705	1825
8:00 - 9:00	73	261	318	97	420	749	1918

Joray Enterprises Pty Ltd

ABN 80 061 513 933

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1 Ajax Place Blacktown, NSW 2148

Count Number	J11-85	Client	URAP	Count Date	Wednesday 30 March 2011
Location	CROWN ST / NEW DAPTO RD			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments

Combined

ated

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
7:00 - 7:15	11	49	52	14	42	89	257
7:15 - 7:30	9	55	49	14	66	104	297
7:30 - 7:45	10	53	61	25	73	129	351
7:45 - 8:00	15	60	62	16	91	159	403
8:00 - 8:15	19	54	78	25	104	167	447
8:15 - 8:30	9	69	78	26	107	200	489
8:30 - 8:45	20	86	82	20	99	179	486
8:45 - 9:00	25	52	80	26	110	203	496
Period Ending	118	478	542	166	692	1230	3226

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
7:00 - 8:00	45	217	224	69	272	481	1308
7:15 - 8:15	53	222	250	80	334	559	1498
7:30 - 8:30	53	236	279	92	375	655	1690
7:45 - 8:45	63	269	300	87	401	705	1825
8:00 - 9:00	73	261	318	97	420	749	1918

Joray Enterprises Pty Ltd

ABN 80 061 513 933

Telephone and Fax (02) 9624 5472

1 Ajax Place Blacktown, NSW 2148

Count Number J11-85 Client URAP
Location CROWN ST / NEW DAPTO RD
Weather Fine

Count Date Wednesday 30 March 2011
Suburb WOLLONGONG
Job Number

Comments

Pedestrian Movements

All Pedestrians

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
7:00 - 7:15	2	1	0	3
7:15 - 7:30	3	0	0	3
7:30 - 7:45	8	6	0	14
7:45 - 8:00	13	11	0	24
8:00 - 8:15	5	3	0	8
8:15 - 8:30	10	4	0	14
8:30 - 8:45	12	5	0	17
8:45 - 9:00	12	8	0	20
Period Ending	65	38	0	103

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
7:00 - 8:00	26	18	0	44
7:15 - 8:15	29	20	0	49
7:30 - 8:30	36	24	0	60
7:45 - 8:45	40	23	0	63
8:00 - 9:00	39	20	0	59

Joray Enterprises Pty Ltd

ABN 80 061 513 933

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1 Ajax Place Blacktown, NSW 2148

Count Number J11-85 Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / NEW DAPTO RD

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Combined

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
7:00 - 7:15	2	1	0	3
7:15 - 7:30	3	0	0	3
7:30 - 7:45	8	6	0	14
7:45 - 8:00	13	11	0	24
8:00 - 8:15	5	3	0	8
8:15 - 8:30	10	4	0	14
8:30 - 8:45	12	5	0	17
8:45 - 9:00	12	8	0	20
Period Ending	65	38	0	103

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
7:00 - 8:00	26	18	0	44
7:15 - 8:15	29	20	0	49
7:30 - 8:30	36	24	0	60
7:45 - 8:45	40	23	0	63
8:00 - 9:00	39	20	0	59

Joray Enterprises Pty Ltd

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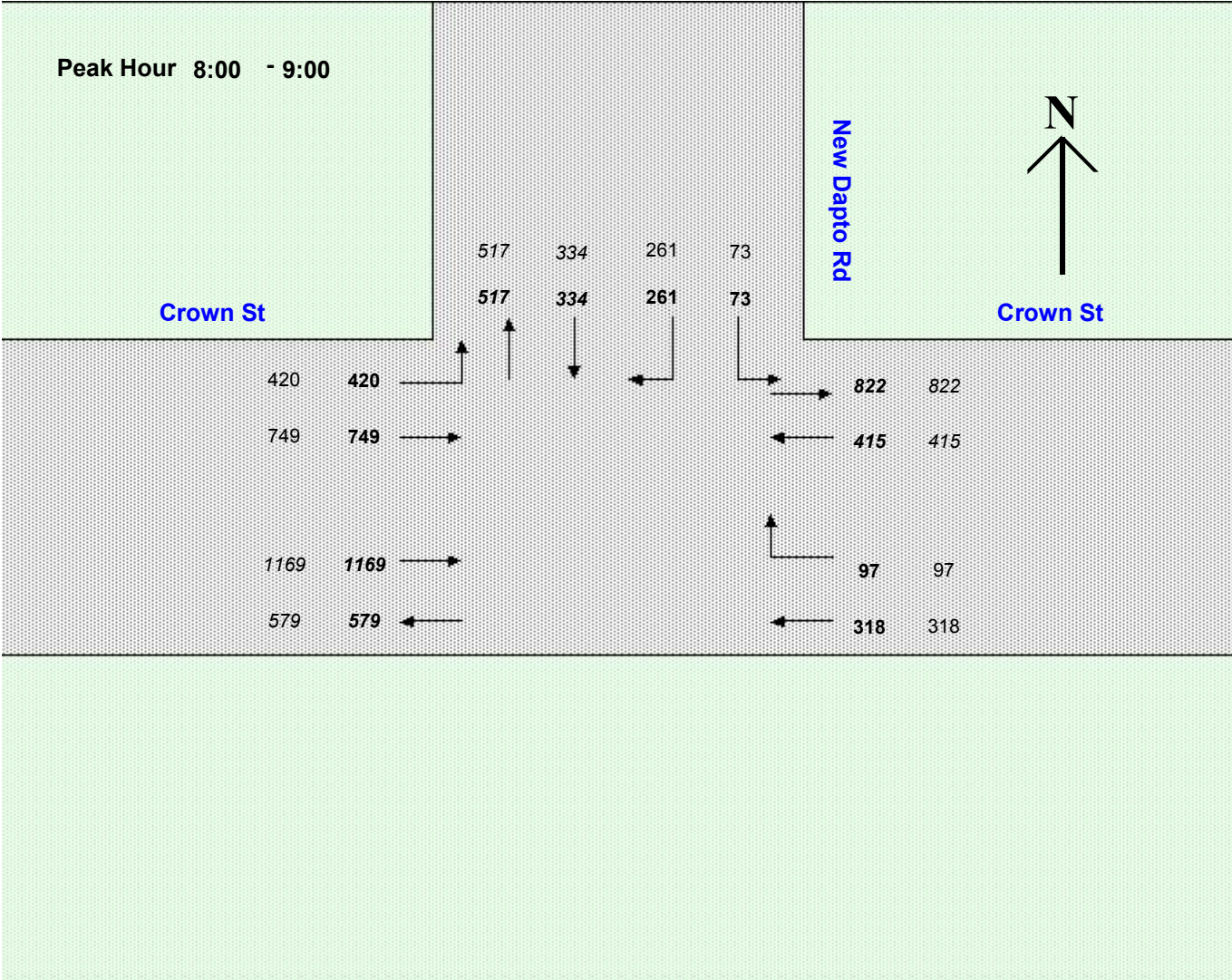
1 Ajax Place Blacktown, NSW 2148

Count Number	J11-85	Client	URAP	Count Date	Wednesday 30 March 2011
Location	CROWN ST / NEW DAPTO RD			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments

VEHICLES	New Dapto Rd		Crown St		Crown St		Total
	L	R	T	R	L	T	
All Vehicles	73	261	318	97	420	749	1918
Total	73	261	318	97	420	749	1918

PEDESTRIAN	New Dapto Rd	Crown St	Crown St	Total
All Pedestrians	39	20	0	59
Total	39	20	0	59



Joray Enterprises Pty Ltd

ABN 80 061 513 933

Telephone and Fax : (02) 9624 5472

1 Ajax Place Blacktown, NSW 2148

Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Vehicle Movements

All Vehicles

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
	L	T	R	L	T	R	L	T	R	L	T	R	
7:00 - 7:15	0	12	3	0	11	15	17	15	11	0	6	29	119
7:15 - 7:30	1	14	5	3	8	9	34	19	12	1	23	24	153
7:30 - 7:45	5	11	3	4	22	18	20	27	13	3	9	28	163
7:45 - 8:00	4	26	8	3	10	8	38	31	17	4	25	54	228
8:00 - 8:15	3	18	8	4	23	10	28	52	9	5	24	35	219
8:15 - 8:30	2	24	6	3	17	16	38	56	8	6	20	33	229
8:30 - 8:45	3	15	13	2	10	10	40	56	13	4	24	55	245
8:45 - 9:00	3	19	10	0	15	14	48	57	22	4	29	41	262
Period Ending	21	139	56	19	116	100	263	313	105	27	160	299	1618

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
7:00 - 8:00	10	63	19	10	51	50	109	92	53	8	63	135	663
7:15 - 8:15	13	69	24	14	63	45	120	129	51	13	81	141	763
7:30 - 8:30	14	79	25	14	72	52	124	166	47	18	78	150	839
7:45 - 8:45	12	83	35	12	60	44	144	195	47	19	93	177	921
8:00 - 9:00	11	76	37	9	65	50	154	221	52	19	97	164	955

Joray Enterprises Pty Ltd

ABN 80 061 513 933

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1 Ajax Place Blacktown, NSW 2148

Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Combined

Combined

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
7:00 - 7:15	0	12	3	0	11	15	17	15	11	0	6	29	119
7:15 - 7:30	1	14	5	3	8	9	34	19	12	1	23	24	153
7:30 - 7:45	5	11	3	4	22	18	20	27	13	3	9	28	163
7:45 - 8:00	4	26	8	3	10	8	38	31	17	4	25	54	228
8:00 - 8:15	3	18	8	4	23	10	28	52	9	5	24	35	219
8:15 - 8:30	2	24	6	3	17	16	38	56	8	6	20	33	229
8:30 - 8:45	3	15	13	2	10	10	40	56	13	4	24	55	245
8:45 - 9:00	3	19	10	0	15	14	48	57	22	4	29	41	262
Period Ending	21	139	56	19	116	100	263	313	105	27	160	299	1618

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
7:00 - 8:00	10	63	19	10	51	50	109	92	53	8	63	135	663
7:15 - 8:15	13	69	24	14	63	45	120	129	51	13	81	141	763
7:30 - 8:30	14	79	25	14	72	52	124	166	47	18	78	150	839
7:45 - 8:45	12	83	35	12	60	44	144	195	47	19	93	177	921
8:00 - 9:00	11	76	37	9	65	50	154	221	52	19	97	164	955

Joray Enterprises Pty Ltd

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1 Ajax Place Blacktown, NSW 2148

Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Pedestrian Movements

All Pedestrians

	NORTH	EAST	SOUTH	WEST	
Time Period	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	Total
7:00 - 7:15	4	5	3	0	12
7:15 - 7:30	2	10	15	2	29
7:30 - 7:45	9	9	5	2	25
7:45 - 8:00	6	19	25	0	50
8:00 - 8:15	16	14	6	2	38
8:15 - 8:30	5	19	20	0	44
8:30 - 8:45	6	12	12	0	30
8:45 - 9:00	3	10	10	0	23
Period Ending	51	98	96	6	251

	NORTH	EAST	SOUTH	WEST	
Time Period	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	Total
7:00 - 8:00	21	43	48	4	116
7:15 - 8:15	33	52	51	6	142
7:30 - 8:30	36	61	56	4	157
7:45 - 8:45	33	64	63	2	162
8:00 - 9:00	30	55	48	2	135

Joray Enterprises Pty Ltd

ABN 80 061 513 933

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1 Ajax Place Blacktown, NSW 2148

Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Combined

	NORTH	EAST	SOUTH	WEST	
Time Period	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	Total
7:00 - 7:15	4	5	3	0	12
7:15 - 7:30	2	10	15	2	29
7:30 - 7:45	9	9	5	2	25
7:45 - 8:00	6	19	25	0	50
8:00 - 8:15	16	14	6	2	38
8:15 - 8:30	5	19	20	0	44
8:30 - 8:45	6	12	12	0	30
8:45 - 9:00	3	10	10	0	23
Period Ending	51	98	6	6	251

	NORTH	EAST	WEST	WEST	
Time Period	New Dapto Rd	Loftus St	Mercury St	Mercury St	Total
7:00 - 8:00	21	43	4	4	68
7:15 - 8:15	33	52	6	6	91
7:30 - 8:30	36	61	4	4	101
7:45 - 8:45	33	64	2	2	99
8:00 - 9:00	30	55	2	2	87

Joray Enterprises Pty Ltd

ABN 80 061 513 933

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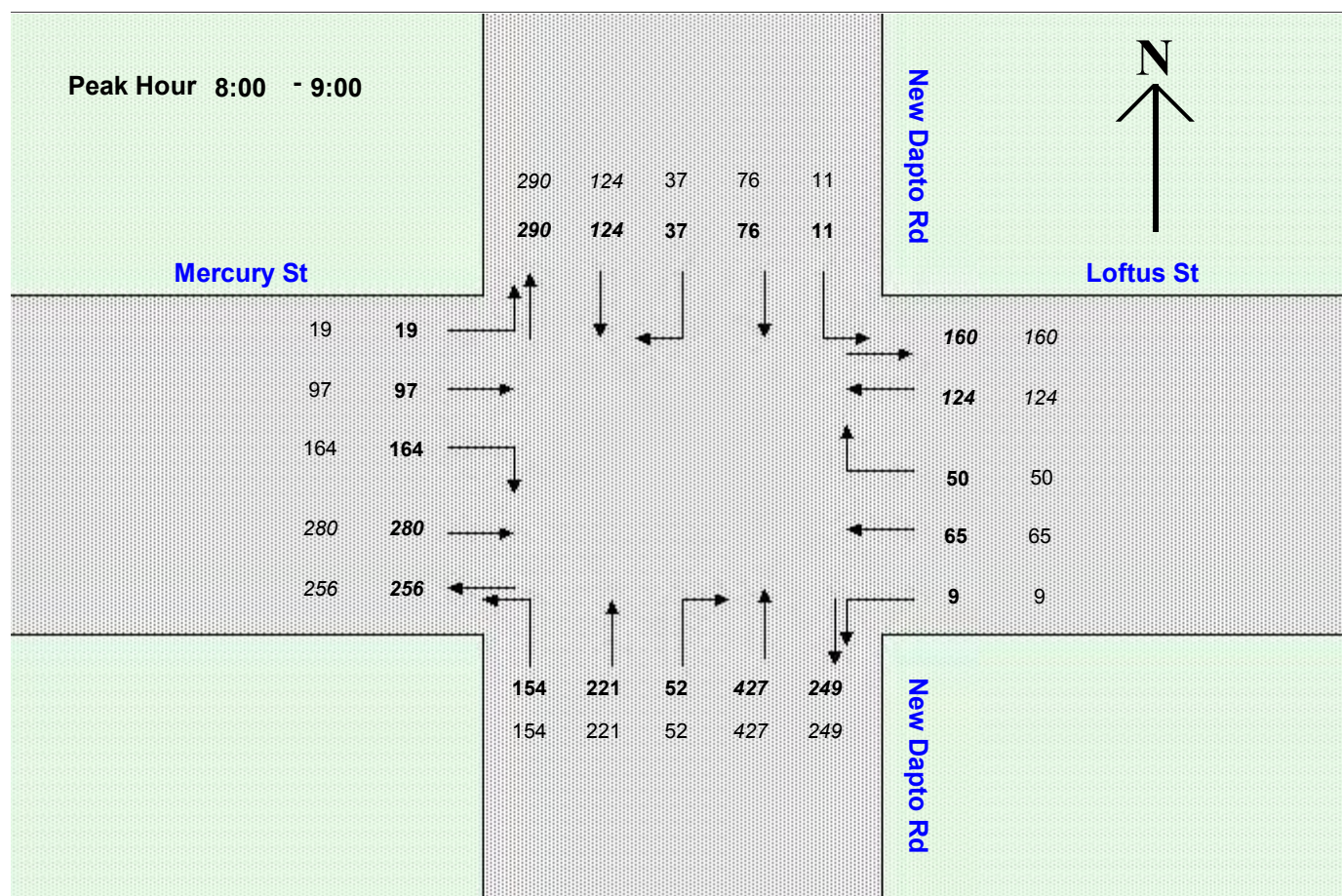
1 Ajax Place Blacktown, NSW 2148

Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Vehicle Class	L	T	R	L	T	R	L	T	R	L	T	R	Total
All Vehicles	11	76	37	9	65	50	154	221	52	19	97	164	955
Total	11	76	37	9	65	50	154	221	52	19	97	164	955

PEDESTRIAN	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	
All Pedestrians	30	55	48	2	135
Total	30	55	48	2	135



Joray Enterprises Pty Ltd

ABN 80 061 513 933

Telephone and Fax : (02) 9624 5472

1 Ajax Place, Blacktown, NSW 2148

Count Number J11-87

Client URAP

Count Date Wednesday 30 March 2011

Location DARLING ST / HOSPITAL ENTRANCE

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Vehicle Movements

All Vehicles

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total
16:00 - 16:15	0	1	9	0	0	1	11
16:15 - 16:30	0	0	7	0	0	2	9
16:30 - 16:45	0	0	9	0	0	0	9
16:45 - 17:00	0	11	0	0	0	1	12
17:00 - 17:15	0	2	3	0	0	0	5
17:15 - 17:30	0	2	2	0	0	0	4
17:30 - 17:45	0	7	0	0	0	0	7
17:45 - 18:00	0	1	3	0	0	0	4
Period Ending	0	24	33	0	0	4	61

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total
16:00 - 17:00	0	12	25	0	0	4	41
16:15 - 17:15	0	13	19	0	0	3	35
16:30 - 17:30	0	15	14	0	0	1	30
16:45 - 17:45	0	22	5	0	0	1	28
17:00 - 18:00	0	12	8	0	0	0	20

Joray Enterprises Pty Ltd

ABN 80 061 513 933

Telephone and Fax : (02) 9624 5472

1 Ajax Place, Blacktown, NSW 2148

Count Number J11-87

Client URAP

Count Date Wednesday 30 March 2011

Location DARLING ST / HOSPITAL ENTRANCE

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Combined

		NORTH		SOUTH		WEST		
		Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total	
16:00 - 16:15	0	1	9	0	0	1	11	
16:15 - 16:30	0	0	7	0	0	2	9	
16:30 - 16:45	0	0	9	0	0	0	9	
16:45 - 17:00	0	11	0	0	0	1	12	
17:00 - 17:15	0	2	3	0	0	0	5	
17:15 - 17:30	0	2	2	0	0	0	4	
17:30 - 17:45	0	7	0	0	0	0	7	
17:45 - 18:00	0	1	3	0	0	0	4	
Period Ending	0	24	33	0	0	4	61	

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total
16:00 - 17:00	0	12	25	0	0	4	41
16:15 - 17:15	0	13	19	0	0	3	35
16:30 - 17:30	0	15	14	0	0	1	30
16:45 - 17:45	0	22	5	0	0	1	28
17:00 - 18:00	0	12	8	0	0	0	20

Joray Enterprises Pty Ltd

ABN 80 061 513 933

Telephone and Fax : (02) 9624 5472

1 Ajax Place, Blacktown, NSW 2148

Count Number J11-87

Client URAP

Count Date Wednesday 30 March 2011

Location DARLING ST / HOSPITAL ENTRANCE

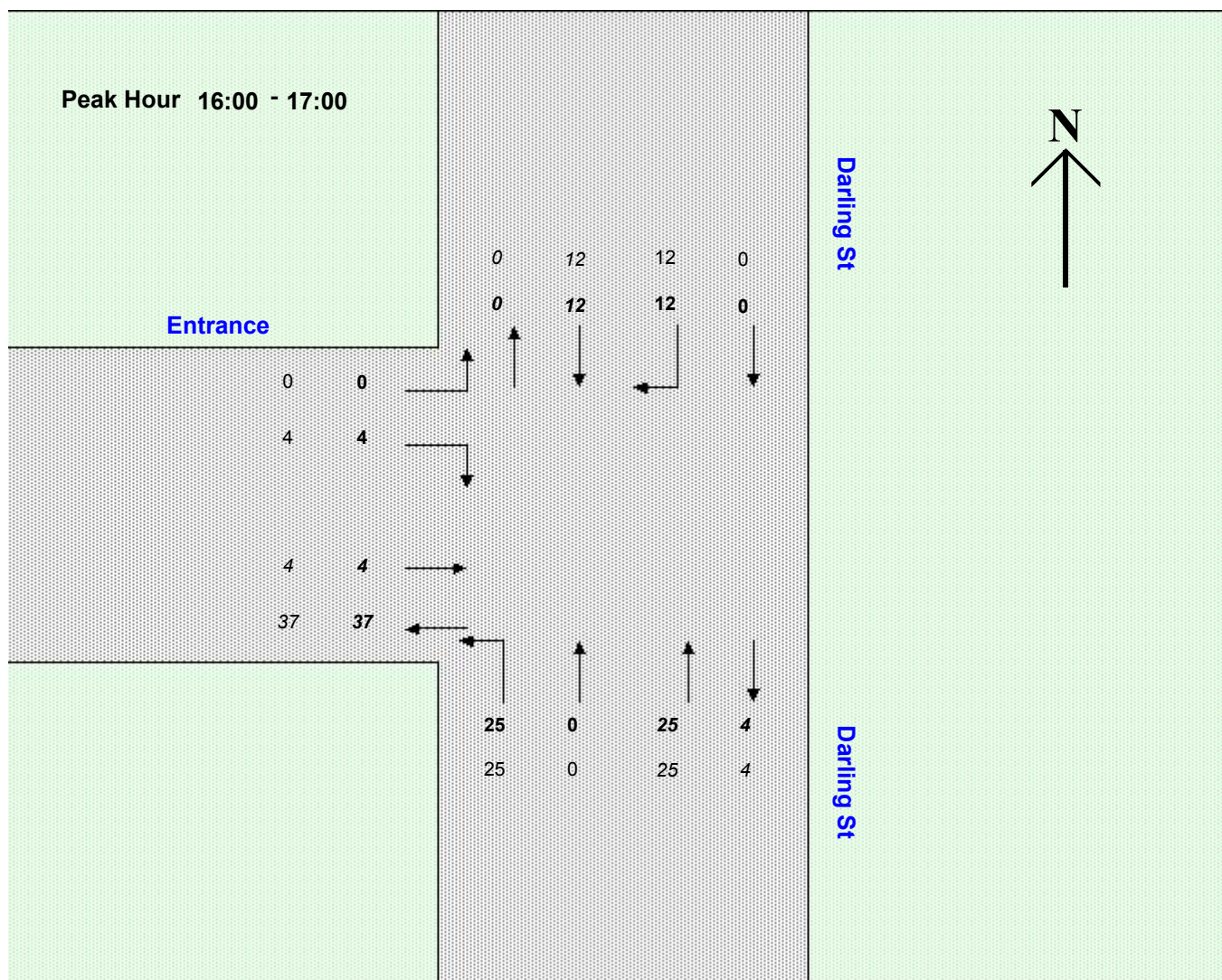
Suburb WOLLONGONG

Weather Fine

Job Number

Comments

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
VEHICLES	T	R	L	T	L	R	Total
All Vehicles	0	12	25	0	0	4	41
Total	0	12	25	0	0	4	41



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Count Number J11-87

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Count Date Wednesday 30 March 2011

Location DARLING ST / HOSPITAL ENTRANCE

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Vehicle Movements

All Vehicles

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total
7:00 - 7:15	0	3	2	0	0	0	5
7:15 - 7:30	0	2	0	0	0	0	2
7:30 - 7:45	0	4	3	0	0	0	7
7:45 - 8:00	0	2	3	0	0	0	5
8:00 - 8:15	0	3	4	0	0	0	7
8:15 - 8:30	0	2	1	0	0	0	3
8:30 - 8:45	0	4	5	0	0	0	9
8:45 - 9:00	0	2	7	0	0	0	9
Period Ending	0	22	25	0	0	0	47

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total
7:00 - 8:00	0	11	8	0	0	0	19
7:15 - 8:15	0	11	10	0	0	0	21
7:30 - 8:30	0	11	11	0	0	0	22
7:45 - 8:45	0	11	13	0	0	0	24
8:00 - 9:00	0	11	17	0	0	0	28

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Count Number J11-87

Client URAP

Count Date Wednesday 30 March 2011

Location DARLING ST / HOSPITAL ENTRANCE

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Combined

		NORTH		SOUTH		WEST		
		Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total	
7:00 - 7:15	0	3	2	0	0	0	5	
7:15 - 7:30	0	2	0	0	0	0	2	
7:30 - 7:45	0	4	3	0	0	0	7	
7:45 - 8:00	0	2	3	0	0	0	5	
8:00 - 8:15	0	3	4	0	0	0	7	
8:15 - 8:30	0	2	1	0	0	0	3	
8:30 - 8:45	0	4	5	0	0	0	9	
8:45 - 9:00	0	2	7	0	0	0	9	
Period Ending	0	22	25	0	0	0	47	

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
Time Period	T	R	L	T	L	R	Total
7:00 - 8:00	0	11	8	0	0	0	19
7:15 - 8:15	0	11	10	0	0	0	21
7:30 - 8:30	0	11	11	0	0	0	22
7:45 - 8:45	0	11	13	0	0	0	24
8:00 - 9:00	0	11	17	0	0	0	28

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Count Number J11-87

Client URAP

Count Date Wednesday 30 March 2011

Location DARLING ST / HOSPITAL ENTRANCE

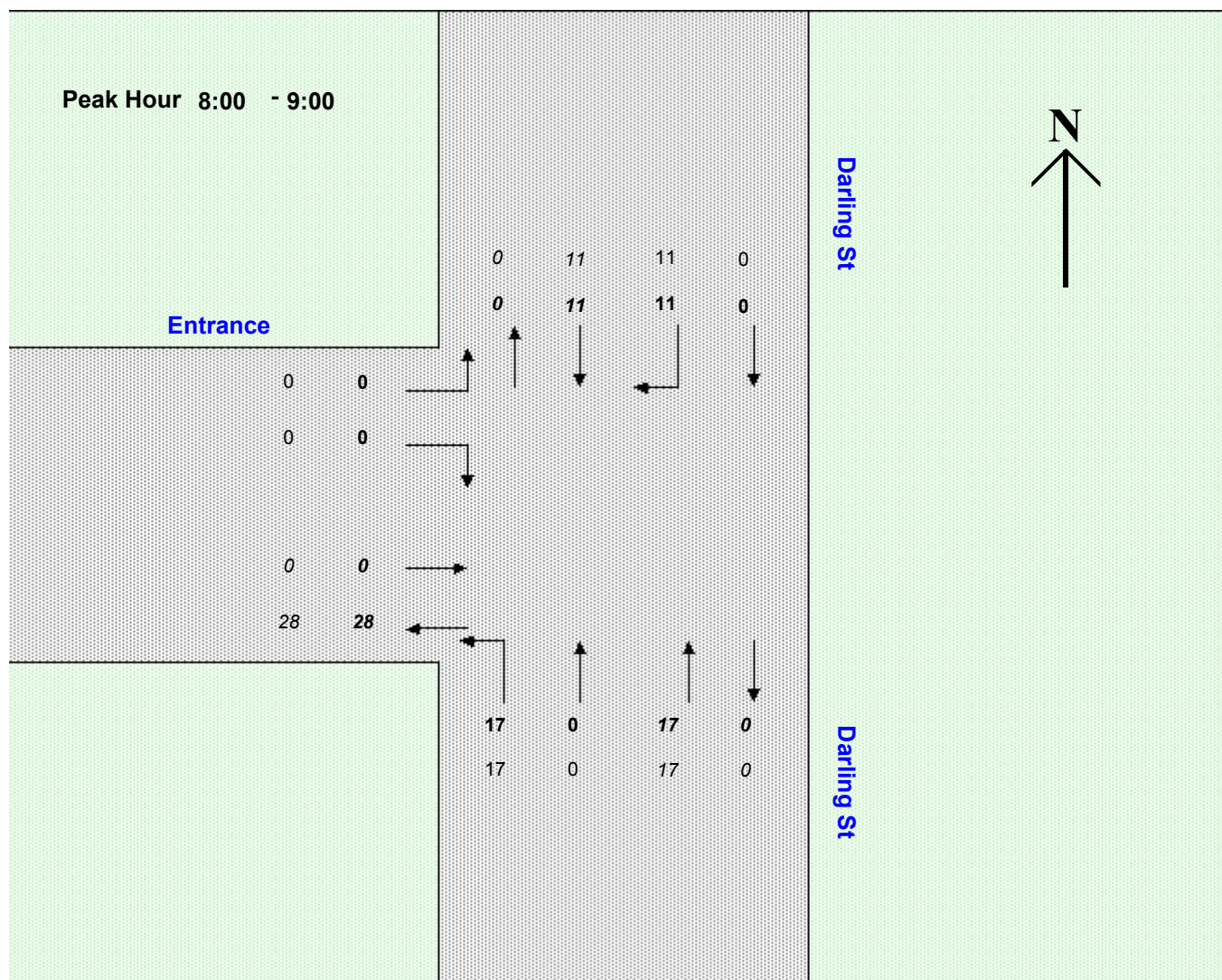
Suburb WOLLONGONG

Weather Fine

Job Number

Comments

	NORTH		SOUTH		WEST		
	Darling St		Darling St		Entrance		
VEHICLES	T	R	L	T	L	R	Total
All Vehicles	0	11	17	0	0	0	28
Total	0	11	17	0	0	0	28



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1 Ajax Place Blacktown, NSW 2148

Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Vehicle Movements

All Vehicles

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 16:15	11	1	23	5	194	16	14	6	5	9	114	2	400
16:15 - 16:30	16	3	16	4	160	15	6	7	0	16	104	2	349
16:30 - 16:45	14	4	14	3	217	18	9	4	6	25	117	3	434
16:45 - 17:00	15	0	17	2	172	12	5	3	1	19	100	9	355
17:00 - 17:15	13	3	28	0	231	14	14	7	5	13	128	9	465
17:15 - 17:30	9	9	18	5	196	19	7	3	2	14	77	8	367
17:30 - 17:45	7	1	10	2	184	20	6	7	1	16	95	9	358
17:45 - 18:00	5	0	11	2	182	10	3	4	2	25	129	6	379
Period Ending	90	21	137	23	1536	124	64	41	22	137	864	48	3107

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 17:00	56	8	70	14	743	61	34	20	12	69	435	16	1538
16:15 - 17:15	58	10	75	9	780	59	34	21	12	73	449	23	1603
16:30 - 17:30	51	16	77	10	816	63	35	17	14	71	422	29	1621
16:45 - 17:45	44	13	73	9	783	65	32	20	9	62	400	35	1545
17:00 - 18:00	34	13	67	9	793	63	30	21	10	68	429	32	1569

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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Combined

Combined

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 16:15	11	1	23	5	194	16	14	6	5	9	114	2	400
16:15 - 16:30	16	3	16	4	160	15	6	7	0	16	104	2	349
16:30 - 16:45	14	4	14	3	217	18	9	4	6	25	117	3	434
16:45 - 17:00	15	0	17	2	172	12	5	3	1	19	100	9	355
17:00 - 17:15	13	3	28	0	231	14	14	7	5	13	128	9	465
17:15 - 17:30	9	9	18	5	196	19	7	3	2	14	77	8	367
17:30 - 17:45	7	1	10	2	184	20	6	7	1	16	95	9	358
17:45 - 18:00	5	0	11	2	182	10	3	4	2	25	129	6	379
Period Ending	90	21	137	23	1536	124	64	41	22	137	864	48	3107

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 17:00	56	8	70	14	743	61	34	20	12	69	435	16	1538
16:15 - 17:15	58	10	75	9	780	59	34	21	12	73	449	23	1603
16:30 - 17:30	51	16	77	10	816	63	35	17	14	71	422	29	1621
16:45 - 17:45	44	13	73	9	783	65	32	20	9	62	400	35	1545
17:00 - 18:00	34	13	67	9	793	63	30	21	10	68	429	32	1569

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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Pedestrian Movements

All Pedestrians

	NORTH	EAST	SOUTH	WEST	
Time Period	Darling St	Crown St	Osborne St	Crown St	Total
16:00 - 16:15	14	19	16	13	62
16:15 - 16:30	10	7	7	10	34
16:30 - 16:45	26	27	11	21	85
16:45 - 17:00	21	19	9	3	52
17:00 - 17:15	42	36	21	11	110
17:15 - 17:30	24	25	10	11	70
17:30 - 17:45	22	21	9	6	58
17:45 - 18:00	6	4	18	3	31
Period Ending	165	158	101	78	502

	NORTH	EAST	SOUTH	WEST	
Time Period	Darling St	Crown St	Osborne St	Crown St	Total
16:00 - 17:00	71	72	43	47	233
16:15 - 17:15	99	89	48	45	281
16:30 - 17:30	113	107	51	46	317
16:45 - 17:45	109	101	49	31	290
17:00 - 18:00	94	86	58	31	269

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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Combined

	NORTH	EAST	SOUTH	WEST	
Time Period	Darling St	Crown St	Osborne St	Crown St	Total
16:00 - 16:15	14	19	16	13	62
16:15 - 16:30	10	7	7	10	34
16:30 - 16:45	26	27	11	21	85
16:45 - 17:00	21	19	9	3	52
17:00 - 17:15	42	36	21	11	110
17:15 - 17:30	24	25	10	11	70
17:30 - 17:45	22	21	9	6	58
17:45 - 18:00	6	4	18	3	31
Period Ending	165	158	78	78	502

	NORTH	EAST	WEST	WEST	
Time Period	Darling St	Crown St	Crown St	Crown St	Total
16:00 - 17:00	71	72	47	47	190
16:15 - 17:15	99	89	45	45	233
16:30 - 17:30	113	107	46	46	266
16:45 - 17:45	109	101	31	31	241
17:00 - 18:00	94	86	31	31	211

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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

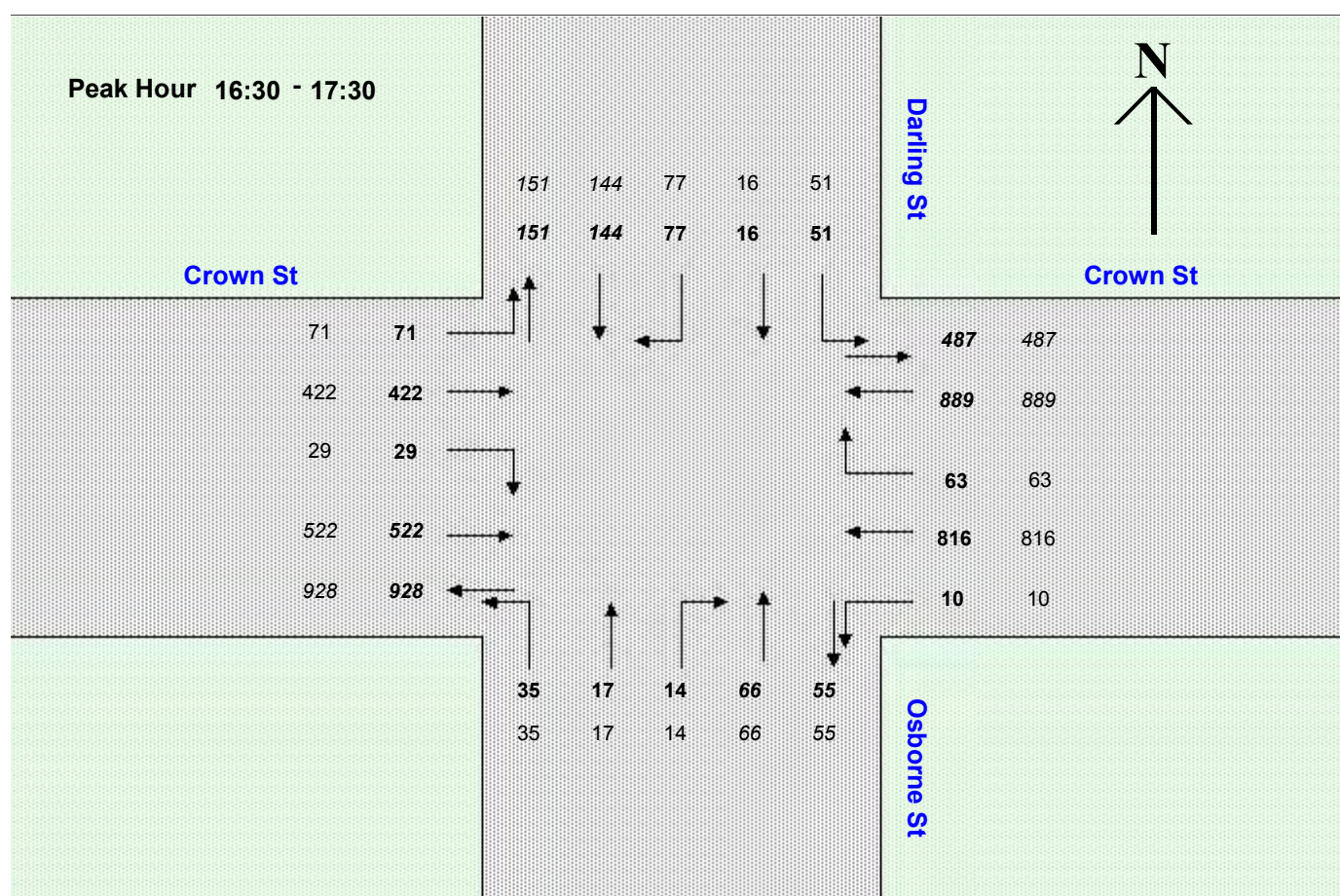
Weather Fine

Job Number

Comments

	Darling St			Crown St			Osborne St			Crown St			
Vehicle Class	L	T	R	L	T	R	L	T	R	L	T	R	Total
All Vehicles	51	16	77	10	816	63	35	17	14	71	422	29	1621
Total	51	16	77	10	816	63	35	17	14	71	422	29	1621

PEDESTRIAN	Darling St	Crown St	Osborne St	Crown St	
All Pedestrians	113	107	51	46	317
Total	113	107	51	46	317



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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Vehicle Movements

All Vehicles

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
	L	T	R	L	T	R	L	T	R	L	T	R	
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
7:00 - 7:15	2	0	3	1	79	7	6	1	0	4	67	3	173
7:15 - 7:30	6	2	9	2	47	6	4	1	1	10	127	5	220
7:30 - 7:45	2	0	18	2	67	8	5	2	1	22	110	1	238
7:45 - 8:00	9	9	8	3	65	5	2	3	1	31	185	10	331
8:00 - 8:15	4	0	4	1	73	4	13	2	1	13	172	8	295
8:15 - 8:30	5	4	14	2	74	11	7	6	2	8	167	5	305
8:30 - 8:45	10	1	15	3	88	4	1	4	1	12	184	4	327
8:45 - 9:00	11	3	10	5	131	11	9	6	5	11	217	12	431
Period Ending	49	19	81	19	624	56	47	25	12	111	1229	48	2320

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
7:00 - 8:00	19	11	38	8	258	26	17	7	3	67	489	19	962
7:15 - 8:15	21	11	39	8	252	23	24	8	4	76	594	24	1084
7:30 - 8:30	20	13	44	8	279	28	27	13	5	74	634	24	1169
7:45 - 8:45	28	14	41	9	300	24	23	15	5	64	708	27	1258
8:00 - 9:00	30	8	43	11	366	30	30	18	9	44	740	29	1358

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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Combined

Combined

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
7:00 - 7:15	2	0	3	1	79	7	6	1	0	4	67	3	173
7:15 - 7:30	6	2	9	2	47	6	4	1	1	10	127	5	220
7:30 - 7:45	2	0	18	2	67	8	5	2	1	22	110	1	238
7:45 - 8:00	9	9	8	3	65	5	2	3	1	31	185	10	331
8:00 - 8:15	4	0	4	1	73	4	13	2	1	13	172	8	295
8:15 - 8:30	5	4	14	2	74	11	7	6	2	8	167	5	305
8:30 - 8:45	10	1	15	3	88	4	1	4	1	12	184	4	327
8:45 - 9:00	11	3	10	5	131	11	9	6	5	11	217	12	431
Period Ending	49	19	81	19	624	56	47	25	12	111	1229	48	2320

	NORTH			EAST			SOUTH			WEST			
	Darling St			Crown St			Osborne St			Crown St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
7:00 - 8:00	19	11	38	8	258	26	17	7	3	67	489	19	962
7:15 - 8:15	21	11	39	8	252	23	24	8	4	76	594	24	1084
7:30 - 8:30	20	13	44	8	279	28	27	13	5	74	634	24	1169
7:45 - 8:45	28	14	41	9	300	24	23	15	5	64	708	27	1258
8:00 - 9:00	30	8	43	11	366	30	30	18	9	44	740	29	1358

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Count Number	J11-86	Client	URAP	Count Date	Wednesday 30 March 2011
Location	CROWN ST / DARLING St / OSBORNE ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments

Pedestrian Movements

All Pedestrians

	NORTH	EAST	SOUTH	WEST	
Time Period	Darling St	Crown St	Osborne St	Crown St	Total
7:00 - 7:15	7	3	8	3	21
7:15 - 7:30	5	10	12	0	27
7:30 - 7:45	4	21	18	0	43
7:45 - 8:00	22	22	23	7	74
8:00 - 8:15	16	17	23	3	59
8:15 - 8:30	19	7	23	3	52
8:30 - 8:45	24	9	27	4	64
8:45 - 9:00	27	10	32	13	82
Period Ending	124	99	166	33	422

	NORTH	EAST	SOUTH	WEST	
Time Period	Darling St	Crown St	Osborne St	Crown St	Total
7:00 - 8:00	38	56	61	10	165
7:15 - 8:15	47	70	76	10	203
7:30 - 8:30	61	67	87	13	228
7:45 - 8:45	81	55	96	17	249
8:00 - 9:00	86	43	105	23	257

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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments

Combined

	NORTH	EAST	SOUTH	WEST	
Time Period	Darling St	Crown St	Osborne St	Crown St	Total
7:00 - 7:15	7	3	8	3	21
7:15 - 7:30	5	10	12	0	27
7:30 - 7:45	4	21	18	0	43
7:45 - 8:00	22	22	23	7	74
8:00 - 8:15	16	17	23	3	59
8:15 - 8:30	19	7	23	3	52
8:30 - 8:45	24	9	27	4	64
8:45 - 9:00	27	10	32	13	82
Period Ending	124	99	33	33	422

	NORTH	EAST	WEST	WEST	
Time Period	Darling St	Crown St	Crown St	Crown St	Total
7:00 - 8:00	38	56	10	10	104
7:15 - 8:15	47	70	10	10	127
7:30 - 8:30	61	67	13	13	141
7:45 - 8:45	81	55	17	17	153
8:00 - 9:00	86	43	23	23	152

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Count Number J11-86

Client URAP

Count Date Wednesday 30 March 2011

Location CROWN ST / DARLING St / OSBORNE ST

Suburb WOLLONGONG

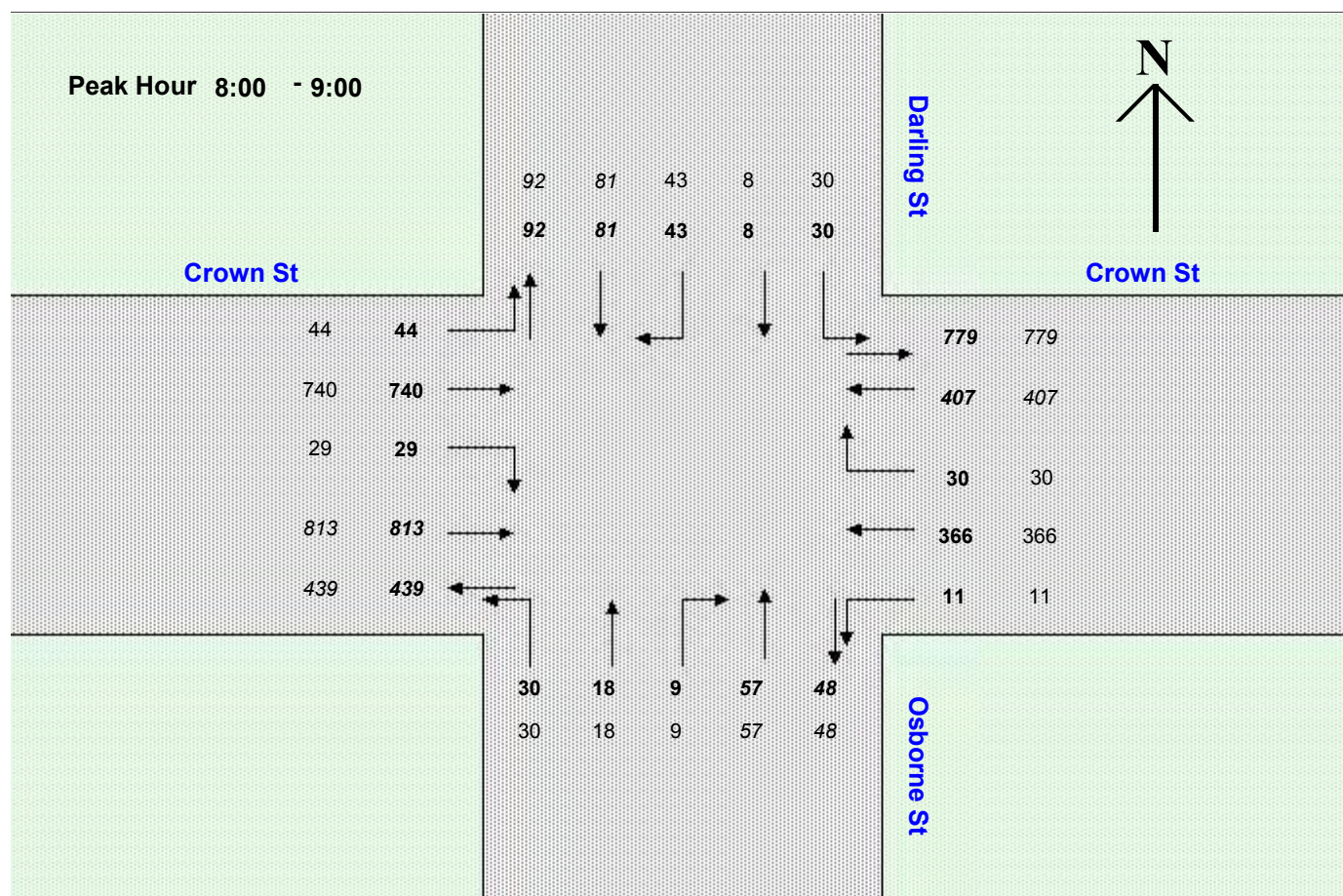
Weather Fine

Job Number

Comments

	Darling St			Crown St			Osborne St			Crown St			
Vehicle Class	L	T	R	L	T	R	L	T	R	L	T	R	Total
All Vehicles	30	8	43	11	366	30	30	18	9	44	740	29	1358
Total	30	8	43	11	366	30	30	18	9	44	740	29	1358

PEDESTRIAN	Darling St		Crown St		Osborne St		Crown St		
All Pedestrians	86		43		105		23		257
Total	86		43		105		23		257



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Count Number J11-85 Client URAP
Location CROWN ST / NEW DAPTO RD
Weather Fine

Count Date Wednesday 30 March 2011
Suburb WOLLONGONG
Job Number

Comments

Vehicle Movements

All Vehicles

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
16:00 - 16:15	14	126	177	42	42	98	499
16:15 - 16:30	27	108	156	29	69	122	511
16:30 - 16:45	25	131	178	38	64	130	566
16:45 - 17:00	21	119	143	24	66	104	477
17:00 - 17:15	16	110	172	41	70	120	529
17:15 - 17:30	15	147	207	37	60	112	578
17:30 - 17:45	14	125	146	23	59	92	459
17:45 - 18:00	21	113	163	32	79	164	572
Period Ending	153	979	1342	266	509	942	4191

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
16:00 - 17:00	87	484	654	133	241	454	2053
16:15 - 17:15	89	468	649	132	269	476	2083
16:30 - 17:30	77	507	700	140	260	466	2150
16:45 - 17:45	66	501	668	125	255	428	2043
17:00 - 18:00	66	495	688	133	268	488	2138

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ABN 80 061 513 933

Telephone and Fax (02) 9624 5472

1 Ajax Place Blacktown, NSW 2148

Count Number J11-85 Client URAP
Location CROWN ST / NEW DAPTO RD
Weather Fine

Count Date Wednesday 30 March 2011
Suburb WOLLONGONG
Job Number

Comments

Combined

ned

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
16:00 - 16:15	14	126	177	42	42	98	499
16:15 - 16:30	27	108	156	29	69	122	511
16:30 - 16:45	25	131	178	38	64	130	566
16:45 - 17:00	21	119	143	24	66	104	477
17:00 - 17:15	16	110	172	41	70	120	529
17:15 - 17:30	15	147	207	37	60	112	578
17:30 - 17:45	14	125	146	23	59	92	459
17:45 - 18:00	21	113	163	32	79	164	572
Period Ending	153	979	1342	266	509	942	4191

	NORTH		EAST		WEST		
	New Dapto Rd		Crown St		Crown St		
Time Period	L	R	T	R	L	T	Total
16:00 - 17:00	87	484	654	133	241	454	2053
16:15 - 17:15	89	468	649	132	269	476	2083
16:30 - 17:30	77	507	700	140	260	466	2150
16:45 - 17:45	66	501	668	125	255	428	2043
17:00 - 18:00	66	495	688	133	268	488	2138

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Location CROWN ST / NEW DAPTO RD
Weather Fine

Count Date Wednesday 30 March 2011
Suburb WOLLONGONG
Job Number

Comments

Pedestrian Movements

All Pedestrians

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
16:00 - 16:15	10	6	0	16
16:15 - 16:30	18	15	0	33
16:30 - 16:45	27	3	0	30
16:45 - 17:00	10	1	0	11
17:00 - 17:15	20	1	0	21
17:15 - 17:30	13	4	0	17
17:30 - 17:45	12	2	0	14
17:45 - 18:00	17	1	0	18
Period Ending	127	33	0	160

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
16:00 - 17:00	65	25	0	90
16:15 - 17:15	75	20	0	95
16:30 - 17:30	70	9	0	79
16:45 - 17:45	55	8	0	63
17:00 - 18:00	62	8	0	70

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Count Number J11-85 Client URAP
Location CROWN ST / NEW DAPTO RD
Weather Fine

Count Date Wednesday 30 March 2011
Suburb WOLLONGONG
Job Number

Comments

Combined

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
16:00 - 16:15	10	6	0	16
16:15 - 16:30	18	15	0	33
16:30 - 16:45	27	3	0	30
16:45 - 17:00	10	1	0	11
17:00 - 17:15	20	1	0	21
17:15 - 17:30	13	4	0	17
17:30 - 17:45	12	2	0	14
17:45 - 18:00	17	1	0	18
Period Ending	127	33	0	160

	NORTH	EAST	WEST	
Time Period	New Dapto Rd	Crown St	Crown St	Total
16:00 - 17:00	65	25	0	90
16:15 - 17:15	75	20	0	95
16:30 - 17:30	70	9	0	79
16:45 - 17:45	55	8	0	63
17:00 - 18:00	62	8	0	70

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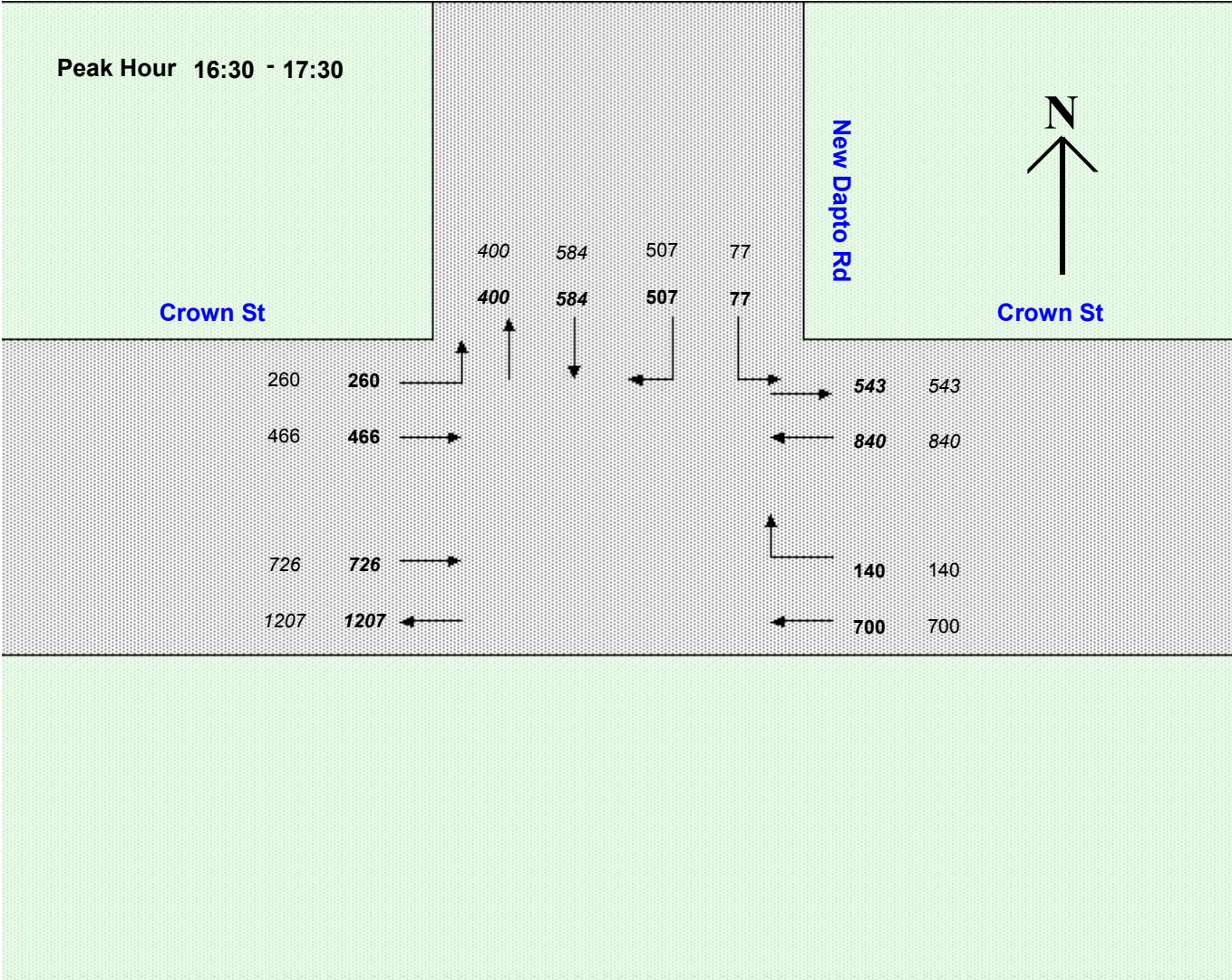
1 Ajax Place Blacktown, NSW 2148

Count Number	J11-85	Client	URAP	Count Date	Wednesday 30 March 2011
Location	CROWN ST / NEW DAPTO RD			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments

VEHICLES	New Dapto Rd		Crown St		Crown St		Total
	L	R	T	R	L	T	
All Vehicles	77	507	700	140	260	466	2150
Total	77	507	700	140	260	466	2150

PEDESTRIAN	New Dapto Rd	Crown St	Crown St	Total
All Pedestrians	70	9	0	79
Total	70	9	0	79



Joray Enterprises Pty Ltd

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Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Vehicle Movements

All Vehicles

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 16:15	7	42	10	17	21	8	46	35	14	2	22	49	273
16:15 - 16:30	10	33	8	18	18	9	38	40	10	2	23	49	258
16:30 - 16:45	8	44	8	11	19	18	51	35	17	9	19	49	288
16:45 - 17:00	1	39	8	10	14	2	58	33	17	7	31	45	265
17:00 - 17:15	7	64	14	25	20	3	60	41	28	8	34	45	349
17:15 - 17:30	2	34	10	7	23	3	47	33	22	1	20	47	249
17:30 - 17:45	7	44	6	12	17	6	44	32	12	7	19	60	266
17:45 - 18:00	2	37	8	20	18	5	43	38	17	6	18	61	273
Period Ending	44	337	72	120	150	54	387	287	137	42	186	405	2221

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 17:00	26	158	34	56	72	37	193	143	58	20	95	192	1084
16:15 - 17:15	26	180	38	64	71	32	207	149	72	26	107	188	1160
16:30 - 17:30	18	181	40	53	76	26	216	142	84	25	104	186	1151
16:45 - 17:45	17	181	38	54	74	14	209	139	79	23	104	197	1129
17:00 - 18:00	18	179	38	64	78	17	194	144	79	22	91	213	1137

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Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Combined

Combined

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 16:15	7	42	10	17	21	8	46	35	14	2	22	49	273
16:15 - 16:30	10	33	8	18	18	9	38	40	10	2	23	49	258
16:30 - 16:45	8	44	8	11	19	18	51	35	17	9	19	49	288
16:45 - 17:00	1	39	8	10	14	2	58	33	17	7	31	45	265
17:00 - 17:15	7	64	14	25	20	3	60	41	28	8	34	45	349
17:15 - 17:30	2	34	10	7	23	3	47	33	22	1	20	47	249
17:30 - 17:45	7	44	6	12	17	6	44	32	12	7	19	60	266
17:45 - 18:00	2	37	8	20	18	5	43	38	17	6	18	61	273
Period Ending	44	337	72	120	150	54	387	287	137	42	186	405	2221

	NORTH			EAST			SOUTH			WEST			
	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Time Period	L	T	R	L	T	R	L	T	R	L	T	R	Total
16:00 - 17:00	26	158	34	56	72	37	193	143	58	20	95	192	1084
16:15 - 17:15	26	180	38	64	71	32	207	149	72	26	107	188	1160
16:30 - 17:30	18	181	40	53	76	26	216	142	84	25	104	186	1151
16:45 - 17:45	17	181	38	54	74	14	209	139	79	23	104	197	1129
17:00 - 18:00	18	179	38	64	78	17	194	144	79	22	91	213	1137

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Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Pedestrian Movements

All Pedestrians

	NORTH	EAST	SOUTH	WEST	
Time Period	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	Total
16:00 - 16:15	3	5	16	0	24
16:15 - 16:30	7	7	12	1	27
16:30 - 16:45	14	11	15	1	41
16:45 - 17:00	14	14	8	0	36
17:00 - 17:15	17	19	18	0	54
17:15 - 17:30	5	2	6	0	13
17:30 - 17:45	8	9	10	0	27
17:45 - 18:00	4	4	8	0	16
Period Ending	72	71	93	2	238

	NORTH	EAST	SOUTH	WEST	
Time Period	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	Total
16:00 - 17:00	38	37	51	2	128
16:15 - 17:15	52	51	53	2	158
16:30 - 17:30	50	46	47	1	144
16:45 - 17:45	44	44	42	0	130
17:00 - 18:00	34	34	42	0	110

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Count Number	J11-84	Client	URAP	Count Date	Wednesday 30 March 2011
Location	LOFTUS ST / NEW DAPTO RD / MERCURY ST			Suburb	WOLLONGONG
Weather	Fine			Job Number	

Comments U TURNS W-W / S-S not included

Combined

	NORTH	EAST	SOUTH	WEST	
Time Period	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	Total
16:00 - 16:15	3	5	16	0	24
16:15 - 16:30	7	7	12	1	27
16:30 - 16:45	14	11	15	1	41
16:45 - 17:00	14	14	8	0	36
17:00 - 17:15	17	19	18	0	54
17:15 - 17:30	5	2	6	0	13
17:30 - 17:45	8	9	10	0	27
17:45 - 18:00	4	4	8	0	16
Period Ending	72	71	2	2	238

	NORTH	EAST	WEST	WEST	
Time Period	New Dapto Rd	Loftus St	Mercury St	Mercury St	Total
16:00 - 17:00	38	37	2	2	77
16:15 - 17:15	52	51	2	2	105
16:30 - 17:30	50	46	1	1	97
16:45 - 17:45	44	44	0	0	88
17:00 - 18:00	34	34	0	0	68

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Count Number J11-84

Client URAP

Count Date Wednesday 30 March 2011

Location LOFTUS ST / NEW DAPTO RD / MERCURY ST

Suburb WOLLONGONG

Weather Fine

Job Number

Comments U TURNS W-W / S-S not included

	New Dapto Rd			Loftus St			New Dapto Rd			Mercury St			
Vehicle Class	L	T	R	L	T	R	L	T	R	L	T	R	Total
All Vehicles	26	180	38	64	71	32	207	149	72	26	107	188	1160
Total	26	180	38	64	71	32	207	149	72	26	107	188	1160

PEDESTRIAN	New Dapto Rd	Loftus St	New Dapto Rd	Mercury St	
All Pedestrians	52	51	53	2	158
Total	52	51	53	2	158

