



TaylorThomsonWhitting

TRAFFIC and PARKING REPORT Campbelltown Hospital Redevelopment – Stage 1 Acute Hospital Services Building

for Health Infrastructure

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FACT SHEET

Stage1 - Acute Hospital Services Building

Table FS1 Summary of Hospital Population – Stage 1

Category	Year 2010	Stage 1	Increase
Total No of Staff	1150*	1300	150
Outpatients annually	248,213	310,000	61,787
Per day	1000	1250	250
No of Beds	406	496	90

*per 2008 yellow book

Table FS2 Parking Supply within the Study Area

CAR PARKING AREAS	No of Spaces
Total Street Parking Parkside Crescent	105
Total Hospital Campus Parking	1080
TOTAL EXISTING PARKING SUPPLY IN STUDY AREA	1185

Table FS3: Parking Requirements for Stage 1 Redevelopment

	STAFF (no. of spaces)	PUBLIC /SERVICE (no. of spaces)	TOTAL PARKING
Existing Hospital Campus	760	310	1070
Additional Demand–Stage 1	90	60	150
Total Stage 1 Parking Demand	850	370	1220

Access: the current access arrangement will be adequate for the Stage 1 redevelopment program (i.e. Acute Hospital building). Utilisation of Parkside Crescent with a minor access to the Hospital site would be a substitute for the existing western internal road, opposite the Cancer Centre. This also provides an improved access and connectivity to the campus.

Parking: provision of some **150** additional parking spaces would be required as part of the Stage 1 redevelopment program. As part of the parking management plan, appropriate measures will be introduced to improve parking usage by consideration to short and long term parking demands (i.e. visitors and staff). The parking demand for the Hospital redevelopment would be in order of **1220** parking spaces.

RESPONSE TO DIRECTOR'S GENERAL REQUIREMENTS

No	DGR Key Issues - Transport	Comments
1	<i>Details of proposed access and parking arrangements, whilst giving consideration to any associated investigations undertaken by Campbelltown City Council. Details surrounding proposed amendments to the internal hospital road network are also to be included.</i>	Appendix A (Part 1) provides a detailed plan of access and parking arrangement (including internal road network). Section 4.2 assesses the access requirements while Section 3 provides a full assessment of parking requirements.
2	<i>Detail access arrangements at all stages of construction and measures to mitigate any associated traffic impacts. All construction traffic shall enter and leave the site via Therry Road. No construction traffic access is to be provided from Parkside Crescent.</i>	A comprehensive Construction Management Plan will be prepared prior to the commencement of works. Construction access points have been discussed with Council and RMS in order to meet their requirements. All vehicular movements to and from the site will be in forward direction. See Section 4.2.2 under Construction Access.
3	<i>Demonstrate how users of the development will be able to make travel choices that support the achievement of State Plan targets.</i>	Section 4.4 demonstrates the 'Accessibility' to the (Figures 4.1 & 4.2 show the accessibility to Bus Routes and Train Station) while Appendix A, Part 2 includes cycleways and Transport Access Guide for the site. Section 5 sets out a Transport Management Strategy for the Hospital to promote a sustainable transport in support of State Plan initiatives.
4	<i>Detail 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.</i>	Please see comments above (No 3). Section 4.3 and Appendix A – Part 2 demonstrate pedestrian and cycle access
5	<i>Describe the measures to be implemented to promote sustainable means of transport including public transport usage and pedestrian and bicycle linkages in addition to addressing the potential for implementing a location specific sustainable travel plan .</i>	Please see comments above No 3 and 4 while noting that Section 5 of the report provides a Transport Strategy to address these issues. Bicycle parking spaces will be provided throughout the campus in addition to the above measures.
6	<i>Details of service vehicle movements, including vehicle type and likely arrival and departure times.</i>	Section 4.2 under Access Requirements discusses the movements associated with service vehicles. Appendix D demonstrates vehicular movements for loading areas.
7	<i>Demonstrate the provision of sufficient on-site car parking.</i>	Section 3 is devoted to evaluate parking supply and demand for the Hospital site (in order to provide appropriate level of parking for the users of site).
8	Provide accurate details of daily vehicle movements and assess the impacts of this traffic on the local road network (Parkside Crescent and Therry Road), including intersection capacity and the need/associated funding for upgrading or road works (if required), having regard to local planning controls. The following key intersections are to be examined/modelled: o Narellan Road/Hurley Street o Kellicar Road/Tindail Street o Gilchrist Drive/Kellicar Road o Appin Road/Therry Road o Woodhouse Drive/Therry Road o Any other intersections that may be affected by the proposed development.	Sections 4.1 and 4.2 provide full assessment of road network and intersections performances. Section 4.2.1 particularly addresses the requirements of item 8. This also outlines that a revised Director General's Requirements was issued on 21 February, indicating for this lower number of intersection analysis. <u>General Note:</u> Relevant documents such as Guide to Traffic Generating Developments, Planning Guidelines for Walking and Cycling, Metropolitan Transport Plan, NSW State Plan, South West Subregion Draft Subregional Strategy, Campbelltown DCP and Structure Plan all have been utilised, where relevant, as part of this study.

1.0 INTRODUCTION

1.1 Development Proposal

In June 2009, the Sydney South West Area Health Service released the draft Macarthur Clinical Services Plan (**CSP**). The key issues arising from the CSP include the:

- need to provide a basis for planning for a substantially expanded Campbelltown Hospital to meet exploding demand from a projected population that will grow 53% between 2006 and 2021,
- establishment of Campbelltown Hospital as a Principal Referral Hospital, and
- development of Campbelltown Hospital as a principal campus of the University of Western Sydney Clinical School.

The above demand translates to the need for significantly increased built infrastructure at **Campbelltown Hospital**, which may also affect the service split with Camden Hospital.

1.2 Study Approach

The purpose of this report is to provide information in terms of access, traffic and parking for Campbelltown Hospital Stage 1 redevelopment proposal (indicatively by Year 2015). An overall plan for the proposal is shown as part of the architectural drawings.

The study has been carried out on the basis of relevant guidelines and standards such as the RTA's Guide to Traffic Generating Developments, AUSTRROADS and state, regional and Campbelltown Council's planning documents including State Plan 2021, Metropolitan Plan for Sydney 2036 (Transport), South West Subregional Draft Strategy, Campbelltown DCP and Campbelltown/McArthur Structure Plan.

Further, documents from reports related to the study area and similar studies (based on our previous assessment of some 20 Hospitals in NSW and ACT) have also been utilised.

The following traffic and parking related surveys have been carried out as part of the study process:

- Parking Surveys of on street car parking occupancies
- Car parking occupancy survey of the Hospital carparks
- Intersection traffic counts
- Traffic Volume and speed data along streets near the Hospital

2.0 SITE CHARACTERISTICS

2.1 Hospital Campus

The Study Area includes Campbelltown Hospital Campus and its environs. The Hospital is located on northern side of Therry Road and western side of Appin Road (at north-western section of Appin and Therry Roads intersection) within the Campbelltown Local Government Area, NSW. The location of the Hospital site is shown in **Figure 1.1**.



Figure 1.1 Site Location

The document A Clinical Service Plan for Macarthur to 2021 by South West Area Health Services provides the following information with respect to the existing and future activities of Campbelltown Hospital and other health services within the area.

- The document indicates that future activities of the health services within the area will increase substantially by the year 2021 due to an increase in population and its socio-demographic demand. On this basis it is estimated that the current number of outpatients (NAPOOS) will be increased from 547,777 (2007/08) to over 1,328,208 in 2021 (for Macarthur area). The number of NAPOOS for Community Health at Macarthur facilities are recorded at 97,590.
- The document also indicates a total of **248,213** outpatients for the current (2007/08) activities of Campbelltown Hospital with some **1150** staff.

- The total number of beds at current Campbelltown Hospital is **406**. It is expected that a demand of **875** beds will be experienced by the year 2021 (i.e. **794** for Campbelltown Hospital and 81 for Camden Hospital).

The **Stage 1** development program (Year 2015) will provide clinical services with estimated some 250 additional outpatients per day and some 150 staff. **Table 2.1** provides a summary of the Hospital characteristics.

Table 2.1 Summary of Hospital Population – Stage 1

Category	Year 2010	Year 2015	Increase
Total No of Staff	1150*	1300^	150
Outpatients annually	248,213	310,000^	61,787
Per day	1000	1250	250
No of Beds	406	496	90

*per 2008 yellow book

2.2 Travel Mode

The Regional Transport Indicators for Sydney reports that about 79% of trips within western and south-western part of Sydney take place by car drivers (based on info from Transport Data Centre and South West Subregional Draft Strategy). Therefore, on the basis of the above and considering the location of the Hospital, a similar rate of 79% car use for the Hospital redevelopment is proposed.

However, the future (i.e. 2021) vehicular traffic generation and parking demand for the Hospital could be estimated by using 75% (or lower) instead of 79% car use among staff and outpatients reflecting a higher public transport use as part of the state and national sustainable transport programs (considering State Plan's targets and implementation of measures as described in Chapter 5 in this report). As mentioned above a rate of 79% car use has been employed for this study.

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), Hornsby Hospital (URaP-TTW, 2006), Concord Hospital (URaP-TTW, 2008) and Nepean Hospital Parking Demand Study (URaP-TTW, 2011) all showed overall car use of about 76 to 85% among staff and visitors (with 100% among VMO's and doctors).

Table 2.2 Comparison of Car Use (%) for various Hospital

Category	Hornsby	Nepean	Concord
Medical	100%	100%	100%
Staff*	74%	76%-90%*	86%
Outpatients/Visitors	90%	76%	80%

*staff includes admin, nursing, domestic and technical

Accordingly, appropriate assumption has been utilised for the Campbelltown Hospital's travel mode among its users with consideration to its community profile and journey to work data.

3.0 PARKING DEMAND AND SUPPLY

3.1 Existing Parking Demand

The existing parking provision at the Hospital has been recorded at **1080** spaces. The current observation of the site indicates an overall parking occupancy of **93%** reaches at about 11 AM and continues till 1.00PM. However, if we exclude reserved parking areas, in fact only about some 40 vacant parking spaces was observed, mainly in the main eastern parking area with some informal parking within the temporary site opposite the Cancer Centre. It should be noted that a high level of on street parking along Parkside Crescent was also observed at about **88%** of its capacity.

Table 3.1 Campus Parking Occupancy - Number of Empty Spaces

SITE	CAPACITY	10 -11 AM	1.30 – 2.30 PM	4 - 5 PM
West Block A	212	0 (+6)	0 (+1)	17
VMO, near West	38	7	12	10
South West, E of Round't	145	3	20	53
South (CP 5)	120	0(+1)	0	50
East (along the highway)	253	40	65	152
Over Flow (Temporary)	162	18	22	100
Birunji	20	0	0	18
Youth Mental Health	35	8	10	14
Waratah	22	0	1	3
Cancer Care	28	8	10	12
Education Centre	10	0	1	0
Total	1045	77	141	429

Survey Dates: 28.10.2010: and 25.03.11

Table 3.2 On Street Parking Occupancy - Number of Empty Spaces

SITE	CAPACITY	10 -11 AM	1.30 – 2.30 PM	4 - 5 PM
Parkside Cres <i>South of Private Hospital</i>	76	12	24	31
Parkside Cres <i>Bet. Private Hosp. to Hyde Pde</i>	16*	0	1	5
Parkside Cres <i>Bet. Hyde Pde and Centennial</i>	13	0	1	6
Total	105	12	26	42

*includes 9 spaces with 3P time limit

Table 3.3 Parking Supply within the Study Area

CAR PARKING AREAS	No of Spaces
Total Street Parking - Parkside Crescent	105
Total Hospital Campus Parking (including temporary spaces)	1080
TOTAL EXISTING PARKING SUPPLY IN STUDY AREA	1185

Existing Parking Demand

The overall peak parking demand for the Hospital is about **1070** spaces based on the following assumption:

Staff: 760 spaces (based on 79% car use for 1150 staff and considering shift works among staff about 80-85% present at hospital: $1150 \times 0.83 \times 0.79 = 760$).

Outpatients: 200 spaces (based on 80% car use and with average stay of less than 120 minutes over an 8 hour period for 1000 outpatients per day: $(1000 \times 0.80) / 4 = 200$)

Visitors: 80 spaces during peak parking demand (based on 2 separate visitors per bed during a day for 406 beds with average stage of 1 hour at about 10% of total visitors: $406 \times 2 = 816 / 10 = 81.6$ say 80).

Fleet/service vehicles: 30 spaces

Total Parking Demand for the existing situation: **1070** spaces

The above parking demand is also supported by level of parking occupancy within the hospital campus which reflects a similar demand.

Note: Travel modes are based per Section 2.2 of this report.

3.2 Future Parking Demand

The additional parking demand for the **Stage 1** (of the Hospital Redevelopment without the new mental health expansion) would be in order of some **150** spaces. This includes:

Staff: 85 spaces (for 150 staff, based on 79% car use and taking into account a higher % of shift works for nursing staff due to activities of the proposal and including holidays, sick/seminar leave etc.).

Outpatients: 30 spaces (based on 250 outpatients per day and 80% car use and staying about 90 minutes over an 8 hour period: $250 \times 0.80 = 200 / 6 = 33$ say 30). Note: new outpatients' visits will be shorter so 90min instead of 120min is used.

Visitors: 18 spaces during peak parking demand (based on 2 separate visitors per bed during a day for 90 beds with average stay of 1 hour at about 10% of total visitors – during the day time only).

Fleet/service vehicles: 10 spaces

Total additional parking demand for Stage 1 proposal: 143 spaces

Recommended additional parking supply: 150 spaces.

Therefore a total parking supply of some **1220** spaces would be required to accommodate various uses of the Hospital campus – **Stage 1 redevelopment**.

Accordingly, the above parking supply is included as part of the Hospital's REF works (REF: Review of Environmental Factors).

Table 3.4 Summary of Parking Demand – Stage 1 Hospital Redevelopment

CATEGORY	YEAR 2010*	YEAR 2015*
Staff	760	850
Outpatients/Visitors	280	325
Fleet/service vehicles	30	45
Total Parking Demand	1070	1220

*based on 79-80% car use and average stay of 2 hours for outpatients and visitors.

3.3 Parking Requirements

The parking requirements for the Campbelltown Hospital Campus have been assessed based on its current and future activities. It should be noted that the Campbelltown Council Development Control Plan does not provide specific requirements for these types of developments i.e. health related facilities. The RTA's Guide to Traffic Generating Developments also does not have any specific requirements or traffic generation rate for Public Hospitals. The Guide suggests use of similar sites for assessment of such facilities. Accordingly, an evaluation of parking demand has been made on this basis and detailed in Sections 3.1 and 3.2 of this report.

Table 3.5 summaries the parking requirements for the existing Hospital Campus and its Stage 1 redevelopment (i.e. Acute Hospital Building).

The parking demand for the Stage 1 - Hospital redevelopment is estimated at about **1220** parking spaces. As part of the Hospital's redevelopment program and REF works, a car parking capacity of some **1240** spaces within the campus has been achieved.

It is envisaged that parking demand would be contained by introduction of appropriate strategies that will promote less car dependency (as a mode of travel) particularly among staff.

Table 3.5: Parking Requirements for Stage 1 Redevelopment

DEVELOPMENT SITE	STAFF (no. of spaces)	PUBLIC /SERVICE (no. of spaces)	TOTAL PARKING
Existing Hospital Campus	760	310	1070
Additional Demand–Stage 1	90	60	150
Total Stage 1 Parking Demand	850	370	1220

Note: Public = visitors/outpatients Service: fleet and service vehicles

A total of some 35 accessible car parking spaces also would also be provided as part of the master plan parking provision which accounts for 2.7% of total parking spaces. Provision of bicycle parking (say about 35 spaces over 20% of additional staff) throughout the campus at appropriate locations are also included as part of the proposal for the site.



4.0 ACCESS AND ROAD NETWORK

4.1 Road System

The current access point to the Campus is mainly via the intersections of Central Road with Therry Road and Parkside Crescent. These intersections are controlled by roundabouts and rely on Central Road as an access point to the Hospital. Alternative approach route to the Hospital is also available via Parkside Crescent.

Intersection counts at these locations have been carried out and the results are shown in **Appendix B**.

Therry Road experiences peak hourly traffic volumes of about **1230** vph and **1500** vph (two way movements) during an AM and PM peak periods, respectively (max. one way at 738vph). The peak hourly traffic volumes for Parkside Crescent are recorded at 388 and 555vph during morning and afternoon peak periods (with max. one way flow of 338). Parkside Crescent currently is being used by parkers and activities associated with Private Hospital and clinics/surgeries.

Therry Road provides two vehicular travelling lanes in each direction while Parkside Crescent has one travelling lane and one parking lane in each direction.

The major approach routes to the area are provided via major regional roads such as Appin and Narellan Roads.

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

In addition to the above intersection vehicular counts, traffic volumes and speed surveys were also carried out along Central Road, Parkside Crescent and Centennial Drive for a period of one week during May 4 to May 11, 2011.

The results of the surveys are summarised in the following Table while all data are shown in the Appendix.

Table 4.2 Vehicular Volume and Speed Survey (Existing)

Street	ADT (5 Day)	ADT (7 Day)	85% Speed
Central Road			
Bet. Therry Rd – Hospital	8306 vpd	7728 vpd	48km/hr
Parkside Crescent			
Bet. Central Rd-Private Hosp	6347 vpd	5967 vpd	49 km/hr
Centennial Drive			
Bet. Parkside Cr– Kellicar Rd	6124 vpd	5858 vpd	48 km/hr

Table 4.3 Highest Peak Hourly Traffic Volumes (Existing Situation)

Street	NB/EB	SB/WB	Both Direction
Central Road			
Bet. Therry Rd – Hospital	307 vph	393 vph	700 vph
Parkside Crescent			
Bet. Central Rd-Private Hosp	346 vph	180 vph	526 vph
Centennial Drive			
Bet. Parkside Cr– Kellicar Rd	183 vph	372 vph	555 vph

NB/EB: Northbound/Eastbound

The above results indicate that the street system operates at a good level of service with ample capacity based on traffic engineering terms/guidelines (see Table 4.1).

4.2 Traffic Impact

As stated earlier, the Stage 1 proposal involves 90 more beds with an addition of some 150 staff and increase of some 250 outpatients per day in comparison to the existing situation. Therefore, an additional peak hour traffic generation of some **203** veh/hr has been estimated for the Stage 1 redevelopment of the Hospital on the following basis.

- Staff arrival and departure vehicular trip (considering that not all arrive in one hour period): 150 staff X say 0.79 car use X 0.70 arrive or depart i.e. start or finish work = 83 vph
- Visitors and outpatients vehicular trips: 20 visitors + 30 outpatients arrive and depart in one hour period (worst case) X 0.80 car use = 80 vph
- Service vehicular trips = 20 vehicles in and out = 40 vph

Accordingly, an additional vehicular traffic generation of **203 vph** has been projected for the Hospital campus as the result of future Stage 1 redevelopment of the Hospital and Mental Health expansion. Considering, that not all traffic movements will be in one direction, the impact of such vehicular traffic on the road system would be minimal. This is based on 70% arrival or departure during a peak hour which results in an additional traffic volume of some 140 vph in one direction. Considering the ample road capacity along streets surrounding the Hospital (see Table 4.1 and 4.3), this level of vehicular traffic is well within the capacity of the road system.

4.2.1 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 4.4**.

Table 4.4 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

The assessments of intersections operation at the entry to the Hospital (roundabouts at intersections of Therry Road with Woodhouse Drive and Parkside Crescent) have been carried out and the results are shown in **Table 4.5**.

**Table 4.5 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)
Therry Rd & Woodhouse Dr Roundabout					
AM Peak Hour	Existing	0.45	A	15.0 (WR)	8.7
PM Peak Hour	Existing	0.40	A	14.6 (ER)	8.8
AM Peak Hour	Future	0.58	A	17.4 (WR)	9.9
PM Peak Hour	Future	0.57	A	18.4 (ER)	10.6
Central Rd & Parkside Crs Roundabout					
AM Peak Hour	Existing	0.31	A	13.4 (ER)	8.3
PM Peak Hour	Existing	0.28	A	15.8 (ER)	9.4
AM Peak Hour	Future	0.38	A	13.7 (ER)	8.5
PM Peak Hour	Future	0.36	A	17.4 (ER)	9.9

Note: The assessment has used worst case scenarios including the future expansion of Mental Health.

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 after the completion of Stage 1 redevelopment program (the assessment has included Acute Hospital and Mental Health combined for a worst case scenario). It should be noted that an assessment of intersections operation for potential future expansion of the Hospital has also been carried out and the results indicate a good/satisfactory level of service for intersections' operation. Consequently, the operation of intersections and road system for Stage 1 redevelopment proposal will continue at level of service "A" as shown in Table 4.5.

Operation of Surrounding Intersections

In addition to the main access points to the Hospital (as shown above), a number of major intersections have also been analysed in order to provide an overview of network operation. The assessment has been based on strategic purposes to see whether any additional vehicular trips from the redevelopment of the Hospital would have any impact on operation of these intersections. The comparative assessments (using SIDRA software) as shown in **Table 4.6** show that such impact is insignificant.

It should also be noted that these major signalised intersections are along arterial routes and are subject to daily control by the RMS particularly during a peak hour period. Therefore, routine modifications to timing and phasing of the intersections take place to provide a better level of service (while our assessments are representative of overall operation with fixed parameters).

It is important to appreciate the level of the proposed redevelopment and the additional traffic generation by this project which encompasses a major hospital and health facility for the region and should not be combined with the overall community use of the arterial road system. This is supported by the following:

- The additional peak hour traffic generation for Stage 1 of the Hospital Redevelopment is in order of 200vph - since this would be during a peak period it would be 70% in one direction (arrival or departure). Therefore, the resultant 140vph is not significant and would not have an adverse impact on the performance of the concerned intersections particularly when they are distributed from various directions (i.e. less traffic). This would be equivalent to say about 2 additional cars per minute during a peak period. A much higher fluctuation of traffic flows is generally experienced during daily traffic volumes along arterial route systems.
- The assessment of major intersections along major arterial routes is more related to the strategic assessment of the route network on an area wide basis rather just taking the Hospital's impact into account. The concerns are that once we go beyond the immediate access points associated with the site, we are taking into account wider strategic traffic generation and their issues which do not directly relate to this proposal. For example Campbelltown/Macarthur Structure Plan (2009) states that *"Narellan Road is almost continually congested and intersections at Gilchrist Drive and Kellicar Road/Hurley Street operate well below acceptable standards"*.
- The above points have been conveyed to NSW Planning & Infrastructure via a letter from Health Infrastructure. Accordingly, a revised Director General's Requirements has been issued (dated February 21, 2012).

As indicated earlier, the results of analyses show no significant change/impact on operation of these intersections from additional vehicular trips associated with the Hospital redevelopment. Appendix C provides the results of SIDRA analyses.

Table 4.6 Performance of Intersections (Existing and Future: with redevelopment)

AM and PM Commuter Peak Hour Traffic on a Weekday

Intersection	Control	LoS AM	AD AM	LoS PM	AD PM
Therry/Appin Existing Future	Signal	B B	21.7 21.6	B B	22.3 22.7
Kellicar/Tindall Existing Future	Signal	C C	38.1 38.7	D D	53.1 53.0
Kellicar/Narellan/Hurley Existing Future	Signal	D D	47.0 47.8	E E	59.6 60.2
Kellicar/Gilchrist Existing Future	Signal	D D	48.0 48.7	E E	68.6 69.4
Centennial/Parkside Cres. Existing Future	Sign	— —	— —	A A	12.5 13.1

Key: LoS=Level of Service; AD=Average Delay (veh/sec)

4.2.2 Access Requirements

The proposed internal road network within the Hospital campus is shown in Appendix A. The introduction of a new loop road along the eastern boundary of the campus and improving the existing driveway off Parkside Crescent has been included as part of the REF Works. This will improve better accessibility to the Hospital while addressing a need for a minor access to the Hospital campus. It is envisaged that this location will mainly serve the hospital staff who wish to gain access to the north side car parking area which would be used primarily by staff and professionals.

As discussed earlier and demonstrated in Table 4.5, at this stage of the redevelopment program, the proposed access points to the Hospital campus are appropriate and meet the required vehicular traffic demand.

Parkside Crescent: Currently, Parkside Crescent provides two travelling lanes and two parking lanes (on each side) along most of its length. The results of traffic counts show that Parkside Crescent carries about 400 to 500 vehicles/hour (vph) during one hour peak period with 85 percentile speed of 49km/hr (Table 4.2). This indicates that appropriate level of capacity exists to further utilise Parkside Crescent and if it would be required (as a long term measure) some on street parking along its length could be restricted. However, this measure will not be required as part of the Hospital redevelopment program. It is understood that currently Council is undertaking a review for traffic management along Parkside Crescent which would improve its environment and amenity for its users.

The access off Parkside Crescent will provide opportunity for a direct access to the site from its western side. The implementation of such measure would substitute the current use of western internal loop road, opposite the Cancer Centre. This measure has been discussed with Council and is in accordance with Council's traffic management plan along Parkside Crescent.

An assessment of the access off Parkside Crescent including future traffic volumes has been carried out using traffic modelling software. The analysis of the results indicates that it will operate at a good level of service with one car space queue length for turning movements. The results of the analysis are shown in **Table 4.7** indicating that all possible intersection controls would provide appropriate treatment for the site.

Table 4.7 Assessment of Parkside Cres Access

Control	Signals		Signs		Roundabout	
Criteria	AM	PM	AM	PM	AM	PM
DS	0.30	0.36	0.07	0.13	0.20	0.22
LoS	A	A	A	A	A	A
AD (sec/veh)	11.0	10.4	4.4	5.8	3.0	3.0
HD (secs)	19.5	23.4	6.2	8.0	5.6	7.2
Max. Queue	6m	6m	6m	6m	6m	6m

Service Vehicles: all service vehicles including trucks will enter and exit the site in forward direction. All vehicular turning paths to and from the loading areas are shown in Appendix D. Access to the site will be maintained per existing situation with relevant modifications to facilitate better and safer vehicular movements. The architectural drawings for the site demonstrate the loading areas and associated improvements. A total of some 30 truck movements occur within a day (about 20 during the morning period and 10 in the afternoon). Approximately 15 to 20 other deliveries also occur throughout the day using vans, smaller trucks for couriers and other services.

Construction Access: A possible access off Appin Road on the east side of the proposed Mental Health facilities also is considered as part of the REF Works for the site. This would provide an alternative construction access to Therry and Central Roads intersection. Considering that no construction access will take place via Parkside Crescent. The provision of access off Appin Road has been discussed with the RMS and Council.

A construction management plan (CMP) will be prepared as a separate document as part of the Development Application. The detailed CMP will be prepared prior to the commencement of works.

4.3 Pedestrian and Cyclist Access

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.

Accordingly, pedestrian facilities and links will be provided as part of the Hospital redevelopment plan. Pedestrian desire lines for the existing and the proposed redevelopment have been identified and are shown in Appendix A. The plan clearly identifies a pedestrian network for the campus (Stage 1 Redevelopment).

Introduction of bicycle parking at various locations within the Hospital Campus will also provide additional amenities for the users of the Hospital and would promote active transport particularly among the Hospital's staff. A total of 35 spaces (at various locations) are proposed for bicycle parking as part of the Stage 1 Development.

Bicycle routes based on Campbelltown Council's Bike Plan for the study area are shown in Appendix A. This provides a transport nexus for the existing Hospital Campus and the proposed Acute Hospital Building. It also promotes more choice of travel modes for users of the Hospital.

4.4 Accessibility

Transport Access Guide (TAG) for the Campbelltown Hospital provides comprehensive information on accessibility and options on travel modes to/from the Hospital (see Appendix A).

Campbelltown Hospital is a 20 to 25 minute walk from Macarthur Station and a 30 to 35 minute walk from Campbelltown Station. It is a short walk uphill from the bus stop on Therry Road. The return walk from the hospital to Macarthur Station involves a significant hill. For less mobile people, an alternative walking route is identified on the map (TAG).

Busabout 871, 872 and 873 operate between Liverpool Rail Interchange and Campbelltown Hospital. Buses operate every 15 minutes from Monday to Saturday and every 30 minutes on Sundays.

Busways provide bus services to the Hospital along: Campbelltown Rail Interchange, Macarthur Square and St Helens Park, via the bus stop on Therry Road, outside the hospital. Buses operate every 15 minutes from Monday to Saturday and every 30 minutes on Sundays (Route 888). Busways 887 operates a limited daily service between Campbelltown, Appin and Wollongong. Most buses stop on Therry Road outside the hospital (and a limited service stops inside the hospital).

Wheelchair accessible buses operate on all bus routes at selected times.

South West 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. A total of 35 bicycle parking (i.e. 23% of additional staff) will be provided as part of the Stage 1 Redevelopment program as shown in architectural drawings.

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.

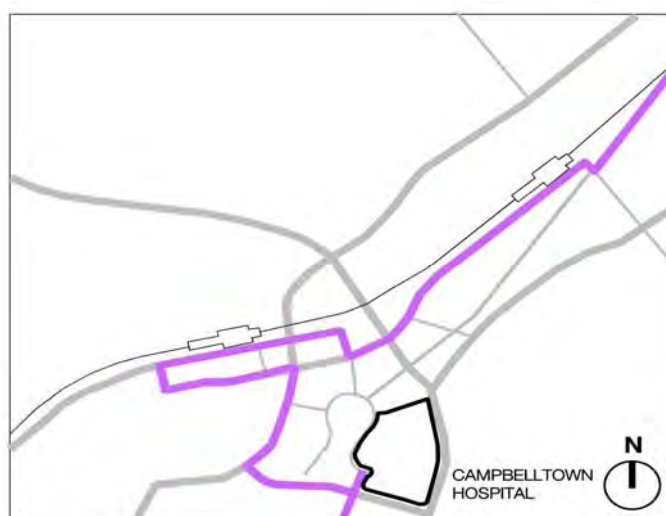


Figure 4.1

Existing Bus Routes



Figure 4.2 Train Stations Accessibility

5.0 TRANSPORT MANAGEMENT STRATEGY

As part of the transport strategy for the Campbelltown 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.

As stated earlier (Section 1.2) a number of planning documents provide guidelines and strategies for future development of the region in order to achieve their targets. Some of their related key objectives include:

- *Providing upgrade and expanded health services (NSW State Plan)*
- *Increasing the patronage of the transport services (NSW State Plan)*
- *Increasing Use of Public Transport, Walking and Cycling in Existing Urban areas (South West Subregion Draft Strategy)*
- *Planning for Employment and Services Growth in the South West Subregion (South West Subregion Draft Strategy)*
- *Increase the mode share of bicycle trips made in the Greater Sydney region, at a local and district level, to 5% by 2016 (NSW State Plan)*
- *Increased targets for public transport mode share for all journey to work trips across the metropolitan area (from 25% to 28%). Importantly and for the first time, it also includes targets for peak time work journeys to the regional cities of Parramatta (50%), Penrith (25%), and Liverpool (20%) (NSW State Plan)*
- *Achieving environmental and health benefits (Sydney Metropolitan Strategy, Transport Plan).*

The above mentioned documents (i.e. NSW State Plan and South West Subregion Draft Subregional Strategy) also state related factors such as “land use changes should be planned to take advantage of new and existing public transport infrastructure, not to reduce car use, but to increase the viability of the public transport services” and “it is also important to enhance the public transport experience by providing awnings and shelters at bus stops, appropriate lighting levels to ensure safety, a high standard of information delivery, and access for all levels of mobility.”

Accordingly, in line with such objectives a number of strategies are included as part of the project and/or recommended in order to achieve such goals to improve the liveability, quality of life and sustainable transport for the region and its community.

For example, 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 the Hospital's staff, will reduce the need for construction of carparks and their associated costs. This means freeing funds for other activities and needs.

Therefore, following measures are put forward for consideration and implementation in order to achieve the desired goals and targets as outlined above and detailed in relevant planning documents:

- provision of incentive schemes among staff e.g. subsidised bus tickets.
- negotiation with bus agencies for provision of frequent bus services with faster and more direct destinations e.g. shuttle bus between city centre/shopping areas and the Hospital.
- provision of shuttle bus between train station and the Hospital or possible a car parking area (say in town centre) where a carpool could occur.
- 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.
- Introduction of 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 bicycle parking within the campus.
- provision of safer and higher quality bus shelters or waiting areas.



6.0 MAJOR ISSUES AND FINDINGS

The future parking demand for the site including Stage 1 Acute Hospital Services Building is **1220** spaces. The proposed redevelopment plan for the site provides this level of car parking (1240 spaces).

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 Stage 1 - redevelopment of the Hospital is completed. The improved driveway off Parkside Crescent (near to existing Private Hospital) will provide an improved accessibility (particularly for staff parking) to the Hospital Campus with minimal impact on operation of the road system.

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.

A Transport Management Strategy for the Hospital could be developed to promote active and public transport particularly among staff which would result in reduction of car use and car parking provision.

A construction traffic management plan will be prepared prior to the commencement of works at the Hospital.



APPENDIX A

PART 1



Site Access

The diagram above illustrates the major access points to and from the Hospital Campus, both vehicular and pedestrian.

There is currently one vehicular entry point to the campus located at the south west corner of the site.

The north west corner of the campus is used as an informal pedestrian entry to the site. Used predominantly by staff, the north west corner of the site links the Hospital campus with Macarthur Railway Station, Macarthur Square and the immediately adjacent food and retail precinct around the Campbelltown Private Hospital.



On-site Vehicular Circulation

The diagram above shows the vehicular circulation around the campus.

On site, there are two main circulation routes around the campus to the east and west. The eastern route provides access to the hospital's Day Surgery entry, the loading docks, mental health facilities and various carparks. The western route provides access to the main hospital entry, emergency and ambulance entries, the cancer therapy clinic, mental health facilities and the main public carpark.



Carparking

The current capacity for on-site carparking is 1080 car spaces and distributed across the site.



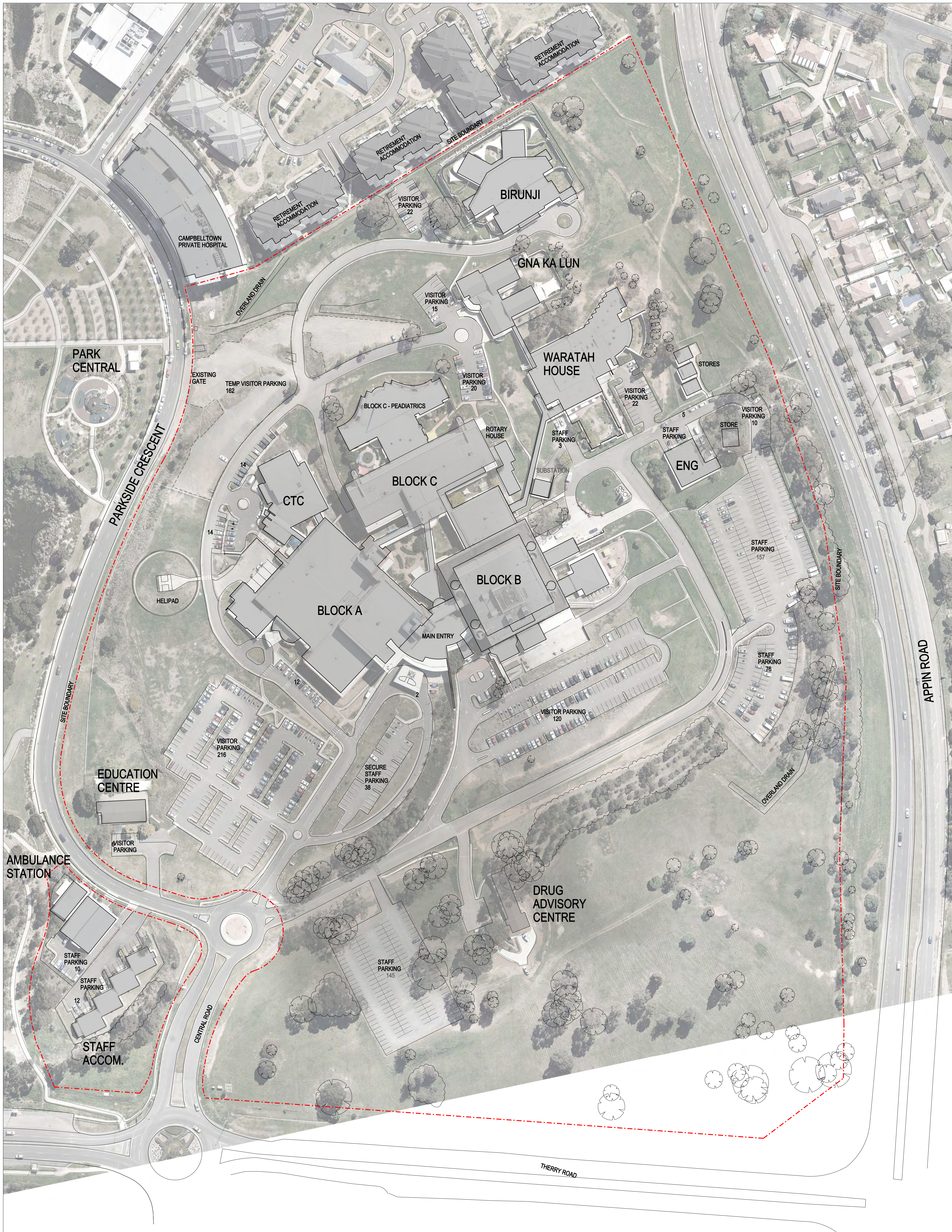
Hospital Entry Points

Entries to the main hospital are concentrated on its southern and western edges with the exception of the loading dock, located at the 'rear' of the main hospital and approached from the east.

The main public entry is located to the south of the hospital complex and can be approached from two levels, at RL+82.70 and RL+87.71, in response to the change in topography at this part of the site.

Separate entrances are provided to each of the existing mental health buildings.

- PEDESTRIAN SITE ACCESS
- PRIMARY ROADS
- SECONDARY ROADS
- PRIMARY CAR PARKING AREAS
- SECONDARY CAR PARKING AREAS



CAPARKING	
TOTAL EXISTING CARSPACES	1070

KEY:



EXISTING BUILDING



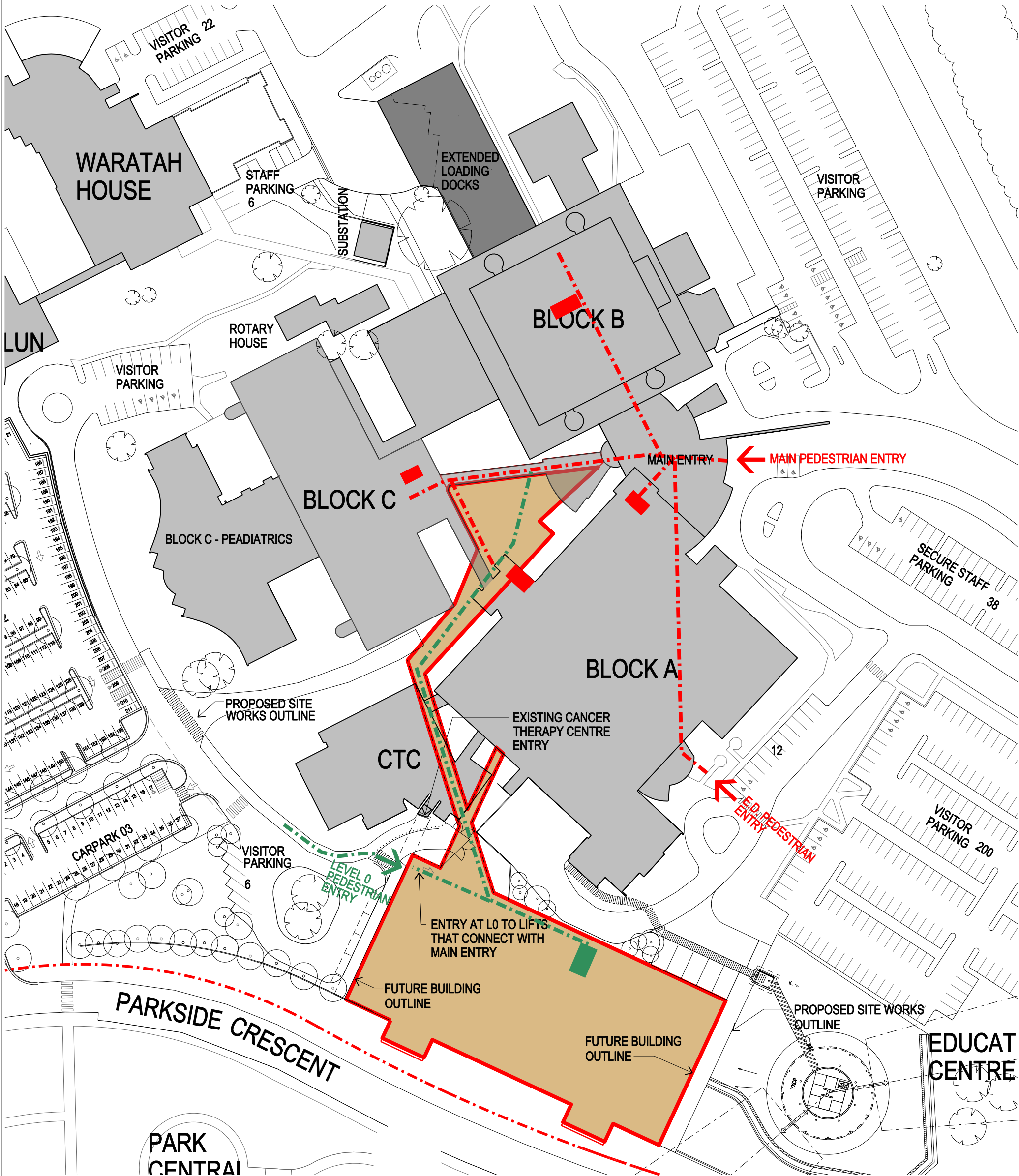
EXISTING BUILDING
PEDESTRIAN TRAFFIC



NEW BUILDING FOOTPRINT



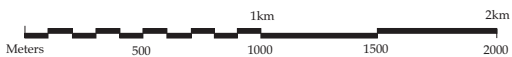
PROPOSED BUILDING
PEDESTRIAN TRAFFIC



PART 2

CYCLEWAY LEGEND

- | | | | |
|---|-------------------|---|-------------------|
|  | EXISTING ON ROAD |  | EXISTING OFF ROAD |
|  | PROPOSED ON ROAD |  | PROPOSED OFF ROAD |
|  | RESIDENTIAL AREAS |  | RURAL ROADS |
|  | COMMERCIAL AREAS |  | MAIN ROADS |
|  | INDUSTRIAL AREAS | | |



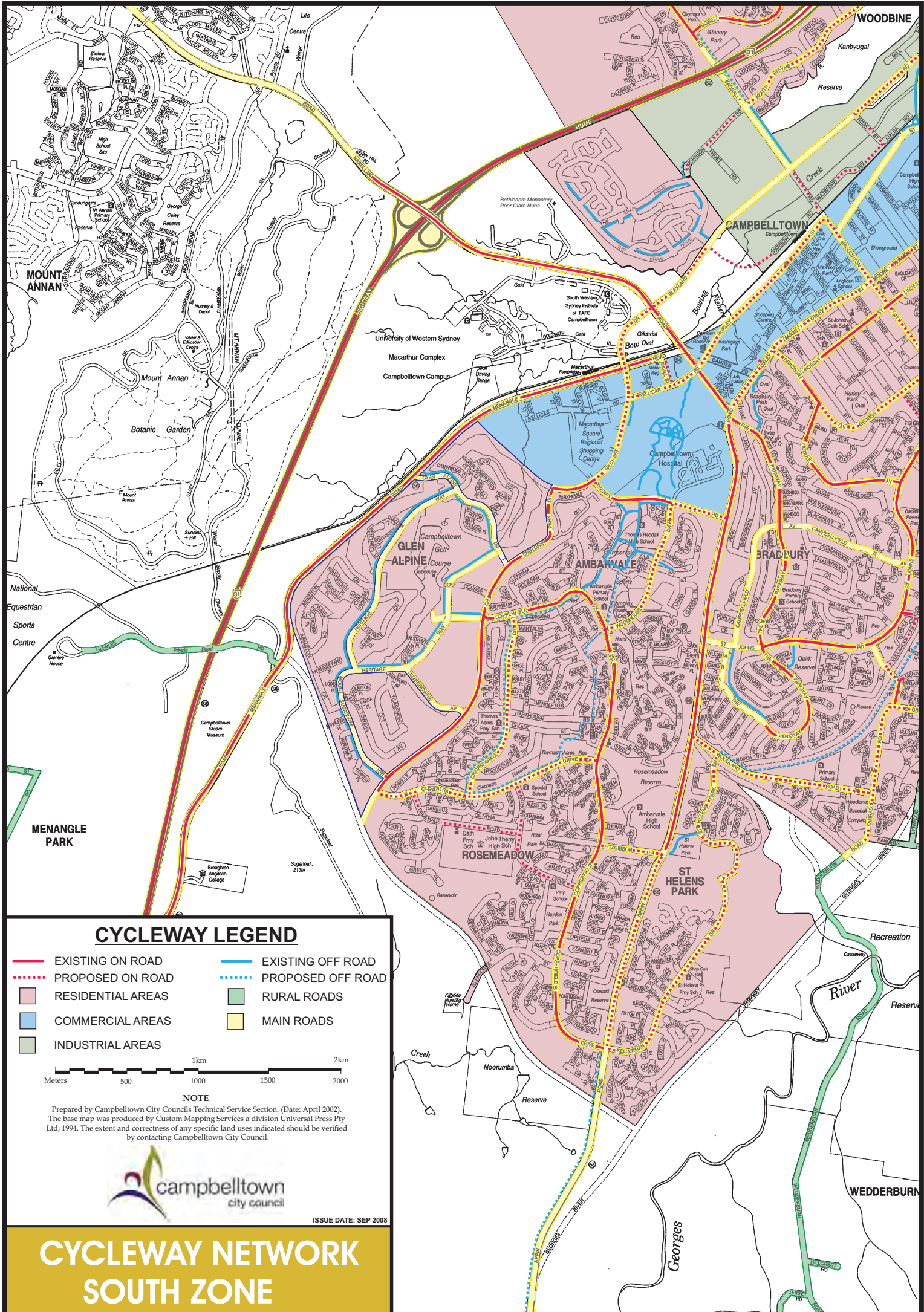
NOTE

Prepared by Campbelltown City Councils Technical Service Section. (Date: April 2002).
The base map was produced by Custom Mapping Services a division Universal Press Pty Ltd, 1994. The extent and correctness of any specific land uses indicated should be verified by contacting Campbelltown City Council.



ISSUE DATE: SEP 2008

CYCLEWAY NETWORK SOUTH ZONE





View the map overhead for details of where services operate.



Campbelltown Hospital

Accessing our facilities



Campbelltown Hospital is a 20 to 25 minute walk from Macarthur Station and a 30 to 35 minute walk from Campbelltown Station. It is a short walk uphill from the bus stop on Therry Road. The return walk from the hospital to Macarthur Station involves a significant hill. For less mobile people, an alternative walking route is identified on the map.



CityRail stations with connecting buses to Campbelltown Hospital:

Macarthur Station on the Airport and East Hills line and Southern Highlands line. Catch a connecting bus to the hospital: Busways 888 or 887 at rank 4 on Kellicar Road, or Interline/Busabout 870, 871 or 872 at the car park off Gilchrist Drive.

Campbelltown Station on the South, Cumberland, Airport and East Hills, and Inner West lines. Catch a connecting bus to the hospital: Busways 888 or 887 at rank B.



Cycling access to the hospital, generally, is on wide shoulders on major roads. These options are for confident cyclists. For more information see the Campbelltown Council bike plan at www.campbelltown.nsw.gov.au



Bicycle parking is available in front of the Emergency Department. Shower and locker facilities are available for staff. Ask your manager for details.



Interline or Busabout 870, 871 and 872 operate between Liverpool Rail Interchange and Campbelltown Hospital. Buses operate every 15 minutes from Monday to Saturday and every 30 minutes on Sundays.

Busways 888 operates between Campbelltown Rail Interchange, Macarthur Square and St Helens Park via the bus stop on Therry Road, outside the hospital. Buses operate every 15 minutes from Monday to Saturday and every 30 minutes on Sundays.

Busways 887 operates a limited daily service between Campbelltown, Appin and Wollongong. Most buses stop on Therry Road outside the hospital (and a limited service stops inside the hospital).

South West Community Transport Inc. transport frail aged people, younger people with a disability and their carers. Phone 4629 6888 for more details.



Wheelchair accessible buses operate on all bus routes at selected times. Contact Interline on 9605 1811 or Busways on 4625 8922 during office hours to check times.



Limited mobility parking is available at the Hospital for people displaying their current Mobility Parking Scheme Card.



To plan your trip, call the Transport Infoline on 131500 or visit www.131500.com.au

Produced: December 2008

Campbelltown Hospital

Transport Access Guide



Did you know you can get to Campbelltown Hospital by walking, cycling and public transport?

30 minutes of moderate physical activity (brisk walking) on most days of the week can maintain good health.

SSWAHS is a smoke free area. Smoking is not permitted anywhere on the grounds of the health service.

Campbelltown Hospital
Therry Road
Campbelltown
Phone: 4634 3000



NSW HEALTH
SYDNEY SOUTH WEST
AREA HEALTH SERVICE



Getting to Campbelltown Hospital

Campbelltown Hospital

Transport Access Guide



Bus Routes

- 870 Liverpool to Campbelltown Hospital
- 871 Liverpool to Campbelltown Hospital
- 872 Glenfield to Campbelltown Hospital
- 887 Wollongong to Campbelltown
- 888 St Helens Park to Campbelltown



KEY

- Bus route
- Bus stop and route numbers
- Train line and train station
- Bicycle access
- Walking path and time (minutes)
- Play area
- Walking path for less-abled
- Mobility parking
- Bicycle parking

For timetables, fares
and to plan your trip:

**Transport
Infoline**
131500
Bus Train Ferry
mobile.131500.info
www.131500.info

APPENDIX B

Count Number

7562

Ref : URAP

Lat/Long : S34 04 26.6 / E150 48 13.9

UBD 346 G-8

Street

CENTENNIAL DRIVE, CAMPBELLTOWN : Between PARKSIDE CRESCENT & KELLICAR ROAD (bidirectional) :

Location

Bidirectional Count 7241 and 7466 north of Parkside Crescent, at Balboa Street, ELP 285017

Carriageway

TOTAL COUNT MATRIX

Start Date
Start Time
Duration
Interval

04-MAY-11
100
7 DAYS
1 HOUR

Weekly 50th Percentile Speed
Weekly 85th Percentile Speed
Five Day AADT
Seven Day AADT

41
48
6124
5858

	MON 9TH	TUE 10TH	WED 4TH	THU 5TH	FRI 6TH	SAT 7TH	SUN 8TH	5 Day		7 Day	
								Total	Average	Total	Average
Midnight - 1am	21	30	28	39	40	68	51	158	32	277	40
1am - 2am	7	14	16	19	23	36	26	79	16	141	20
2am - 3am	12	7	6	11	11	19	17	47	9	83	12
3am - 4am	2	6	6	9	11	11	16	34	7	61	9
4am - 5am	10	20	14	11	11	13	6	66	13	85	12
5am - 6am	40	47	33	54	44	31	22	218	44	271	39
6am - 7am	167	158	131	172	169	68	62	797	159	927	132
7am - 8am	266	271	243	290	231	93	94	1301	260	1488	213
8am - 9am	421	422	380	386	410	199	145	2019	404	2363	338
9am - 10am	372	368	266	384	405	274	271	1795	359	2340	334
10am - 11am	378	393	266	423	379	372	333	1839	368	2544	363
11am - Midday	418	424	264	428	453	432	454	1987	397	2873	410
Midday - 1pm	410	431	281	479	463	433	493	2064	413	2990	427
1pm - 2pm	440	462	274	440	455	423	443	2071	414	2937	420
2pm - 3pm	439	441	428	485	490	358	411	2283	457	3052	436
3pm - 4pm	436	462	433	457	447	381	375	2235	447	2991	427
4pm - 5pm	498	473	525	495	541	391	427	2532	506	3350	479
5pm - 6pm	503	501	493	505	555	390	365	2557	511	3312	473
6pm - 7pm	391	443	441	482	500	425	363	2257	451	3045	435
7pm - 8pm	280	292	307	323	353	312	244	1555	311	2111	302
8pm - 9pm	184	187	209	238	237	202	181	1055	211	1438	205
9pm - 10pm	123	143	149	195	143	140	137	753	151	1030	147
10pm - 11pm	103	102	103	126	163	141	97	597	119	835	119
11pm - Midnight	40	47	62	56	116	105	39	321	64	465	66
Total	5961	6144	5358	6507	6650	5317	5072	30620	6124	41009	5858

Count Number 7562

Lat/Long : S34 04 26.6 / E150 48 13.9

UBD 346 G-8

Street

CENTENNIAL DRIVE, CAMPBELLTOWN : Between PARKSIDE CRESCENT & KELLCAR ROAD (bidirecti

Location

Bidirectional Count 7241 and 7466 north of Parkside Crescent, at Balboa Street, ELP 285017

Start Date 04-MAY-11

Start Time 100

Duration 7 DAYS

Interval 1 HOUR

Speed Limit 50

NORTH

SOUTH

COMBINED

Weekly 50th Percentile Speed

40

41

41

Weekly 85th Percentile Speed

48

49

48

Five Day AADT

1879

4245

6124

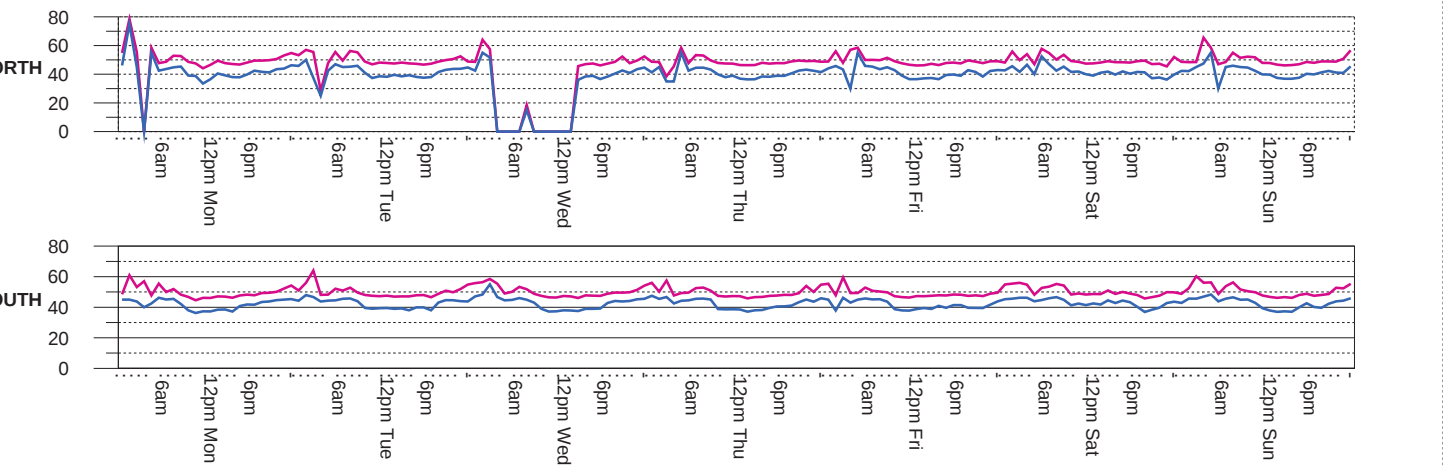
Seven Day AADT

1858

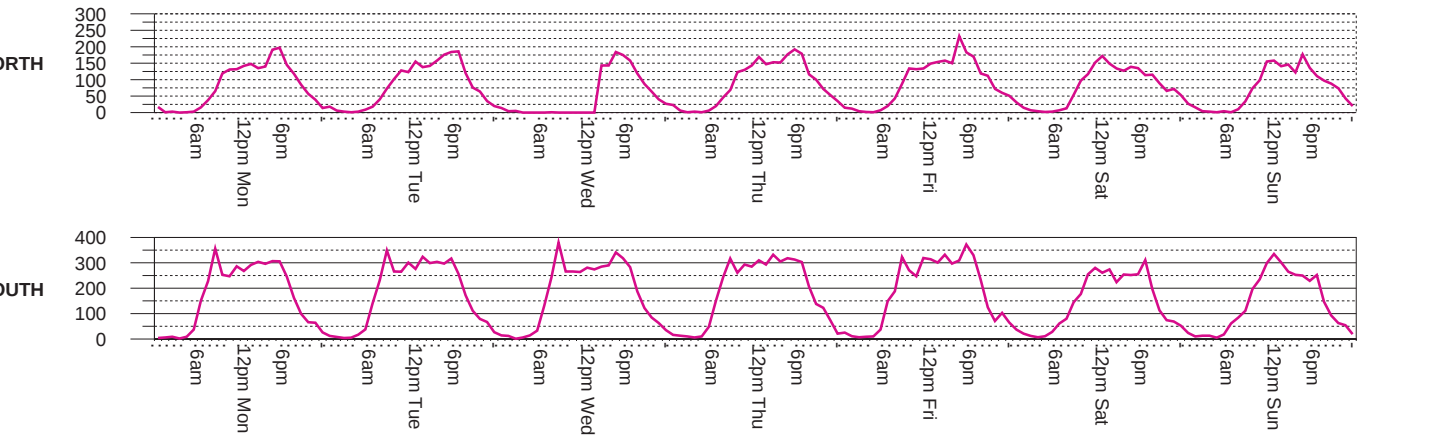
4001

5858

	MON 09-MAY-11			TUE 10-MAY-11			WED 04-MAY-11			THU 05-MAY-11			FRI 06-MAY-11			SAT 07-MAY-11			SUN 08-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	48.6	48.1	48.2	48.5	48.4	48.5	47.9	48.5	48.4	48.0	48.4	48.3	48.2	48.2	48.2	48.5	49.1	48.9	48.4	48.6	48.5	48.3	48.5	48.4
50%ile	39.9	40.7	40.5	40.0	41.2	40.9	39.0	40.9	40.5	39.3	41.1	40.5	39.7	40.8	40.5	40.8	42.5	42.0	40.0	40.8	40.6	39.8	41.2	40.8
> 60 k	11	19	30	12	22	34	7	13	20	13	23	36	14	17	31	11	23	34	9	19	28	11	19.43	30.43
%age	.6	.5	.5	.6	.5	.6	.6	.3	.4	.6	.5	.6	.6	.4	.5	.6	.7	.6	.5	.6	.6	.5	.5	.5
> 70 k	2	2	4	1	2	3	2	2	4	0	2	2	3	1	4	0	3	3	2	0	2	1.429	1.714	3.143
%age	.1	.0	.1	.1	.0	.0	.2	.0	.1	.0	.0	.0	.1	.0	.1	.0	.1	.1	.0	.0	.1	.0	.1	.1



Short %	94.3	93.5	93.8	94.3	93.5	93.8	93.8	93.2	93.3	94.0	93.8	93.8	94.3	93.5	93.8	94.8	95.1	95.0	96.3	94.8	95.3	94.6	93.9	94.1
Med %	2.0	2.8	2.5	2.1	2.8	2.6	1.9	2.6	2.5	2.5	2.7	2.6	2.0	2.7	2.5	1.6	2.0	1.8	1.2	1.9	1.7	1.9	2.5	2.3
Long %	3.7	3.7	3.7	3.5	3.7	3.7	4.3	4.2	4.2	3.5	3.6	3.6	3.7	3.7	3.7	3.6	2.9	3.2	2.5	3.3	3.1	3.5	3.6	3.6
AM Pk Vo	132	356	421	128	349	424	14	380	380	143	317	428	134	323	453	152	280	432	155	299	454	123	329	427
PM Pk Vo	197	307	503	186	324	501	184	341	525	192	332	505	232	372	555	172	311	433	177	335	493	191	332	502
7-7pm	1583	3389	4972	1605	3486	5091	804	3490	4294	1680	3574	5254	1726	3603	5329	1403	2768	4171	1362	2812	4174	1452	3303	4755
24Hr Tot	1937	4024	5961	1978	4166	6144	1164	4194	5358	2116	4391	6507	2201	4449	6650	1867	3450	5317	1740	3332	5072	1858	4001	5858
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	1814	3746	5560	1858	3884	5742	1083	3896	4979	1974	4099	6073	2060	4147	6207	1765	3269	5034	1666	3149	4815	1746	3741	5487
Class 2	13	17	30	8	11	19	9	13	22	15	18	33	16	15	31	5	12	17	9	18	11	14	24	24
Class 3	28	102	130	33	107	140	16	102	118	39	109	148	38	113	151	19	67	86	18	62	80	27	95	122
Class 4	6	8	14	6	6	13	4	6	10	8	6	14	1	5	6	6	1	7	2	0	5	5	9	9
Class 5	5	3	8	2	2	4	2	2	4	5	2	7	4	3	7	4	0	4	1	1	2	3	2	5
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	12	9	21	10	11	21	5	9	14	12	11	23	8	10	18	6	6	14	2	2	4	8	8	16
Class 8	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Class 9	6	17	23	5	12	17	6	18	24	7	15	22	15	19	34	8	7	15	6	17	23	8	15	23
Class 10	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Class 11	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Class 12	3	3	6	4	2	6	1	6	7	1	1	2	1	6	7	2	3	3	1	1	2	3	5	5
Class 13	50	118	168	51	130	181	36	141	177	54	129	183	58	131	189	49	85	134	35	91	126	48	118	165



Count Number7561Ref : URAPUBD 346 G-10

StreetCENTRAL ROAD, CAMPBELLTOWN : Between TERRY ROAD & CAMPBELLTOWN HOSPITAL COMPLEX (bidirectional) :

LocationBidirectional Count 7240 and 7467 north of Terry RoadCarriageway

Weekly 50th Percentile Speed41

Weekly 85th Percentile Speed48

Five Day AADT8306

Seven Day AADT7728

Start Date05-MAY-11

Start Time100

Duration7 DAYS

Interval1 HOUR

TOTAL COUNT MATRIX

	MON 9TH	TUE 10TH	WED 11TH	THU 5TH	FRI 6TH	SAT 7TH	SUN 8TH	5 Day		7 Day	
								Total	Average	Total	Average
Midnight - 1am	23	47	37	31	57	64	54	195	39	313	45
1am - 2am	12	20	31	23	33	36	34	119	24	189	27
2am - 3am	11	12	11	9	28	30	31	71	14	132	19
3am - 4am	13	23	18	18	22	19	21	94	19	134	19
4am - 5am	32	31	43	29	25	27	21	160	32	208	30
5am - 6am	122	132	123	117	134	71	45	628	126	744	106
6am - 7am	276	278	276	299	275	171	137	1404	281	1712	245
7am - 8am	513	516	526	479	439	220	187	2473	495	2880	411
8am - 9am	572	586	551	570	559	278	210	2838	568	3326	475
9am - 10am	538	537	510	549	480	357	331	2614	523	3302	472
10am - 11am	525	530	526	582	527	464	442	2690	538	3596	514
11am - MIDDAY	570	561	508	586	541	485	513	2766	553	3764	538
MIDDAY - 1pm	521	534	543	621	575	485	517	2794	559	3796	542
1pm - 2pm	520	581	522	588	630	524	467	2841	568	3832	547
2pm - 3pm	617	659	635	610	700	565	507	3221	644	4293	613
3pm - 4pm	621	647	631	630	653	542	486	3182	636	4210	601
4pm - 5pm	583	633	629	619	556	471	455	3020	604	3946	564
5pm - 6pm	530	553	607	588	561	424	395	2839	568	3658	523
6pm - 7pm	446	446	512	486	490	402	363	2380	476	3145	449
7pm - 8pm	310	354	334	395	393	279	267	1786	357	2332	333
8pm - 9pm	260	206	271	280	241	220	190	1258	252	1668	238
9pm - 10pm	154	170	197	213	188	144	117	922	184	1183	169
10pm - 11pm	141	149	160	181	217	177	149	848	170	1174	168
11pm - Midnight	72	70	70	66	111	99	71	389	78	559	80
Total	7982	8275	8271	8569	8435	6554	6010	41532	8306	54096	7728

Count Number7561

StreetCENTRAL ROAD, CAMPBELLTOWN : Between TERRY ROAD & CAMPBELLTOWN HOSPITAL COMPLI

LocationBidirectional Count 7240 and 7467 north of Therry Road

Start Date05-MAY-11

Start Time100

Duration7 DAYS

Interval1 HOUR

Speed Limit50

Weekly 50th Percentile Speed44

Weekly 85th Percentile Speed49

Five Day AADT4273

Seven Day AADT3947

NORTH

SOUTH

COMBINED

35

46

8306

41

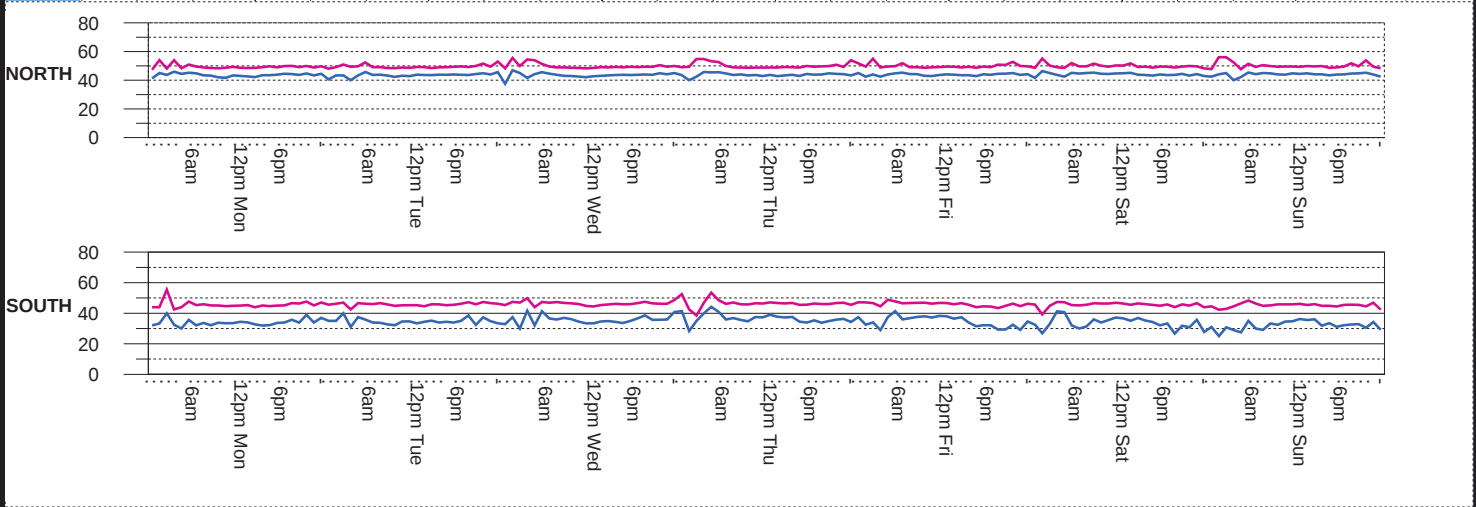
48

4034

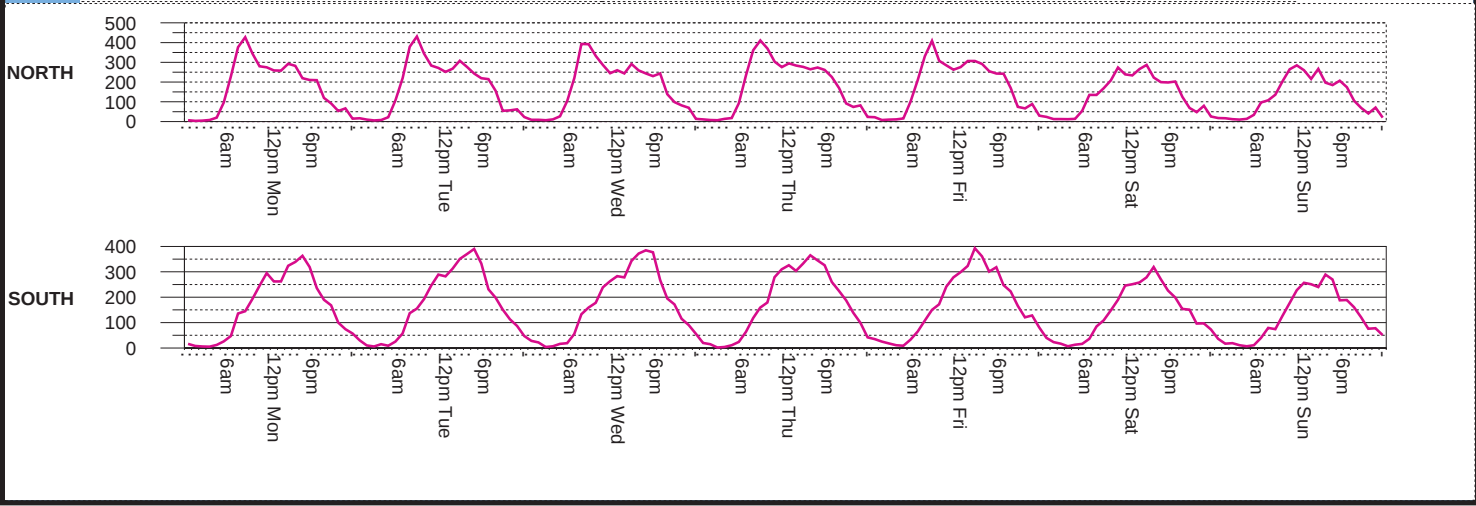
3781

7728

	MON 09-MAY-11			TUE 10-MAY-11			WED 11-MAY-11			THU 05-MAY-11			FRI 06-MAY-11			SAT 07-MAY-11			SUN 08-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	49.0	45.3	47.9	49.0	45.8	48.0	49.1	46.2	48.1	49.2	46.4	48.2	49.3	45.9	48.2	49.7	45.9	48.4	49.6	45.5	48.3	49.3	45.9	48.2
50%ile	43.4	33.6	40.3	43.6	34.4	40.7	43.5	35.1	40.8	43.8	36.5	41.3	43.9	35.2	41.1	44.3	34.5	41.2	44.3	33.7	41.0	43.8	34.7	40.9
> 60 k	12	6	18	14	11	25	13	14	27	12	8	20	17	5	22	18	5	23	12	4	16	14	7.571	21.57
%age	.3	.2	.2	.3	.3	.3	.3	.3	.3	.3	.2	.2	.4	.1	.3	.6	.2	.4	.4	.1	.3	.4	.2	.3
> 70 k	2	4	6	2	6	8	2	7	9	2	3	5	1	2	3	3	1	4	0	3	3	1.714	3.714	5.429
%age	.0	.1	.1	.0	.1	.1	.0	.2	.1	.0	.1	.1	.0	.0	.0	.1	.0	.1	.0	.1	.0	.1	.1	.1



Short %	92.0	80.4	86.4	92.9	80.5	86.9	92.6	79.9	86.4	93.1	78.9	86.3	93.0	78.7	86.0	94.4	81.8	88.0	94.6	85.1	89.8	93.1	80.6	87.0
Med %	5.2	9.6	7.3	4.7	9.2	6.9	4.7	9.9	7.3	4.2	11.8	7.9	4.2	11.0	7.5	4.0	9.3	6.7	3.3	5.2	4.4	9.8	7.0	7.0
Long %	2.8	10.1	6.3	2.4	10.3	6.2	2.7	10.2	6.4	2.7	9.3	5.9	2.8	10.3	6.5	1.6	8.9	5.3	2.1	7.9	5.0	2.5	9.6	6.0
AM Pk Vo	427	295	572	431	289	586	393	263	551	411	310	586	409	278	559	274	246	485	285	228	513	376	273	550
PM Pk Vo	293	363	621	308	390	658	292	385	635	295	365	630	307	393	700	287	319	565	267	289	517	293	358	618
7-7pm	3437	3119	6556	3493	3290	6783	3422	3278	6700	3604	3304	6908	3518	3193	6711	2637	2580	5217	2504	2369	4873	3231	3019	6250
24Hr Tot	4154	3828	7982	4237	4038	8275	4214	4057	8271	4432	4137	8569	4327	4108	8435	3251	3303	6554	3013	2997	6010	3947	3781	7728
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	3812	3052	6864	3931	3232	7163	3892	3221	7113	4117	3243	7360	4008	3208	7216	3063	2687	5750	2841	2525	5366	3666	3024	6690
Class 2	11	25	36	7	19	26	10	21	31	8	23	31	15	25	40	5	15	20	9	24	33	9	22	31
Class 3	206	78	284	192	94	286	194	78	272	183	105	288	177	92	269	125	41	166	99	30	129	168	74	242
Class 4	5	198	203	4	207	211	4	245	249	4	273	277	3	275	278	2	209	211	0	138	138	3	221	224
Class 5	3	90	93	3	72	75	2	77	79	0	109	109	1	84	85	3	56	59	1	43	44	2	76	78
Class 6	2	1	3	0	1	1	4	2	6	1	3	4	0	2	2	0	0	0	0	0	0	1	1	2
Class 7	6	5	11	4	6	10	8	7	15	10	5	15	11	5	16	2	1	3	3	1	4	6	4	11
Class 8	1	7	8	0	2	2	0	5	1	10	11	0	3	3	0	1	1	1	1	1	1	4	4	4
Class 9	4	3	7	7	14	21	10	10	20	8	11	19	11	12	23	4	6	10	4	5	9	7	9	16
Class 10	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Class 11	0	2	2	0	0	0	0	1	1	1	1	2	0	0	4	0	0	0	0	0	0	1	1	1
Class 12	2	1	3	2	1	3	2	1	3	1	2	3	1	1	2	0	1	1	1	2	3	1	1	3
Class 13	102	366	468	87	390	477	88	387	475	98	352	450	100	397	497	47	286	333	55	227	282	82	344	426



Count Number7239

StreetPARKSIDE CRESCENT, CAMPBELLTOWN : Between CENTRAL ROAD & CENTENNIAL DRIVE (bidirectional) :

LocationBetween Central Road and Private Hospital (west of Central Rd midblock), opposite Ambulance Station

Ref : URAP

Lat/Long : S34 04 43.4 / E150 48 12.8

UBD 346 G-10

TOTAL COUNT MATRIX

Start Date
Start Time
Duration
Interval

04-MAY-11
1500
7 DAYS
1 HOUR

Weekly 50th Percentile Speed
Weekly 85th Percentile Speed
Five Day AADT
Seven Day AADT

42
49
6347
5967

	MON 9TH	TUE 10TH	WED 11TH / 4TH	THU 5TH	FRI 6TH	SAT 7TH	SUN 8TH	5 Day		7 Day	
								Total	Average	Total	Average
Midnight - 1am	12	23	20	37	47	58	39	139	28	236	34
1am - 2am	11	16	21	21	19	32	20	88	18	140	20
2am - 3am	9	9	4	18	17	20	25	57	11	102	15
3am - 4am	5	12	15	11	18	11	14	61	12	86	12
4am - 5am	20	32	33	32	23	26	14	140	28	180	26
5am - 6am	81	84	90	86	89	46	22	430	86	498	71
6am - 7am	188	184	186	213	214	90	64	985	197	1139	163
7am - 8am	319	331	299	333	286	158	114	1568	314	1840	263
8am - 9am	413	394	401	405	378	211	167	1991	398	2369	338
9am - 10am	347	408	367	349	365	275	301	1836	367	2412	345
10am - 11am	369	404	433	435	399	408	368	2040	408	2816	402
11am - Midday	446	484	434	479	466	409	437	2309	462	3155	451
Midday - 1pm	432	413	441	503	478	392	471	2267	453	3130	447
1pm - 2pm	425	432	411	452	441	404	438	2161	432	3003	429
2pm - 3pm	428	472	448	518	479	397	399	2345	469	3141	449
3pm - 4pm	488	486	463	497	522	393	440	2456	491	3289	470
4pm - 5pm	496	487	525	512	497	393	345	2517	503	3255	465
5pm - 6pm	452	511	520	476	526	342	307	2485	497	3134	448
6pm - 7pm	355	375	414	395	412	326	294	1951	390	2571	367
7pm - 8pm	219	235	269	308	290	254	206	1321	264	1781	254
8pm - 9pm	165	176	193	212	180	153	151	926	185	1230	176
9pm - 10pm	107	127	153	164	133	128	102	684	137	914	131
10pm - 11pm	93	114	119	122	163	123	103	611	122	837	120
11pm - Midnight	56	57	84	65	104	89	54	366	73	509	73
Total	5936	6266	6343	6643	6546	5138	4895	31734	6346	41767	5966

Count Number 7239

Lat/Long : S34 04 43.4 / E150 48 12.8

UBD 346 G-10

Street PARKSIDE CRESCENT, CAMPBELLTOWN : Between CENTRAL ROAD & CENTENNIAL DRIVE (bidirectional)

Location Between Central Road and Private Hospital (west of Central Rd midblock), opposite Ambulance Station

Start Date 04-MAY-11

Start Time 1500

Duration 7 DAYS

Interval 1 HOUR

Speed Limit 50

Weekly 50th Percentile Speed 42

Weekly 85th Percentile Speed 49

Five Day AADT 2880

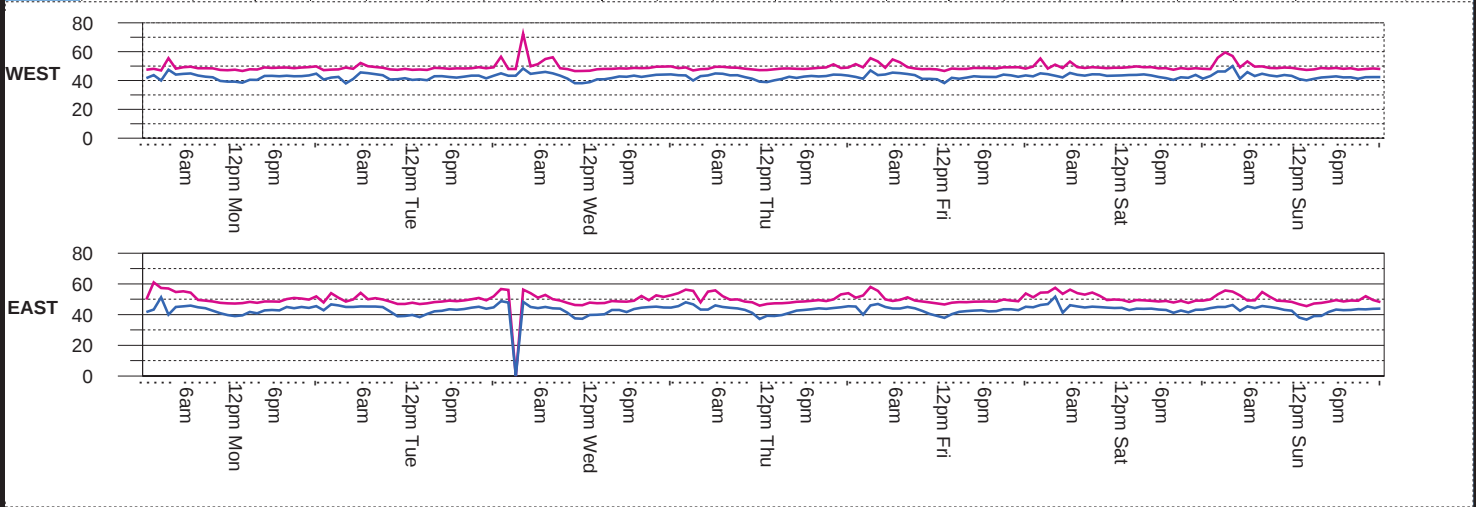
Seven Day AADT 2717

WEST

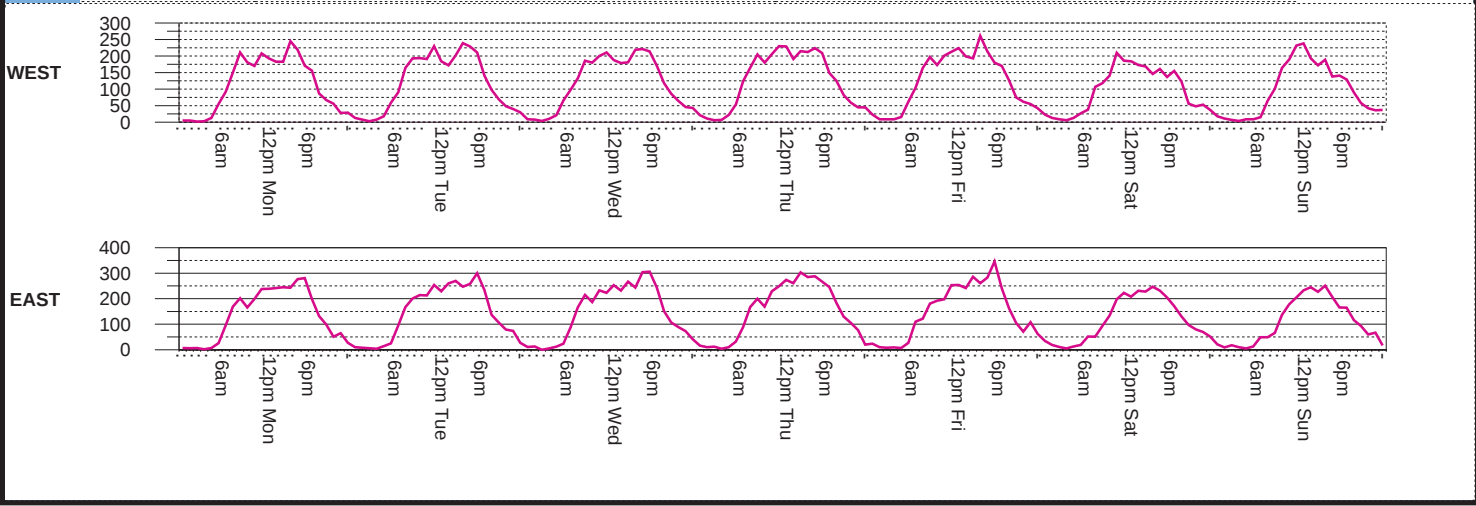
EAST

COMBINED

	MON 09-MAY-11			TUE 10-MAY-11			WED 04-MAY-11			THU 05-MAY-11			FRI 06-MAY-11			SAT 07-MAY-11			SUN 08-MAY-11			SEVENDAY AVERAGE		
	WEST	EAST	BiDir	WEST	EAST	BiDir	WEST	EAST	BiDir	WEST	EAST	BiDir	WEST	EAST	BiDir	WEST	EAST	BiDir	WEST	EAST	BiDir	WEST	EAST	BiDir
85thile	48.3	48.7	48.5	48.4	48.7	48.5	48.5	48.7	48.6	48.4	48.6	48.5	48.5	48.5	48.5	48.9	49.4	49.2	48.5	48.5	48.5	48.5	48.7	48.6
50thile	42.0	42.5	42.3	42.4	42.4	42.4	42.2	42.2	42.2	42.3	42.2	42.3	42.4	42.2	42.3	43.4	43.8	43.6	42.4	41.8	42.1	42.4	42.5	42.5
> 60 k	24	22	46	15	21	36	40	16	56	18	16	34	29	20	49	16	16	32	12	20	32	22	18.71	40.71
%age	.9	.7	.8	.5	.6	.6	1.4	.5	.9	.6	.4	.5	1.0	.6	.7	.7	.6	.6	.5	.8	.7	.8	.6	.7
> 70 k	16	12	28	11	4	15	18	6	24	8	6	14	14	8	22	10	5	15	7	7	14	12	6.857	18.86
%age	.6	.4	.5	.4	.1	.2	.6	.2	.4	.3	.2	.2	.5	.2	.3	.4	.2	.3	.3	.3	.4	.2	.2	.3



Short %	94.7	92.9	93.7	95.6	93.4	94.4	95.2	94.0	94.5	95.2	93.0	94.0	95.5	93.4	94.3	95.5	94.9	95.2	95.5	94.1	94.7	95.3	93.6	94.4
Med %	3.5	2.7	3.1	2.9	2.8	2.8	3.4	2.1	2.7	3.1	2.6	2.8	2.8	2.8	2.8	3.2	2.5	2.8	2.6	2.4	2.5	3.1	2.6	2.8
Long %	1.9	4.3	3.2	1.5	3.8	2.8	1.4	3.9	2.8	1.7	4.4	3.2	1.7	3.8	2.9	1.3	2.6	2.0	1.9	3.5	2.8	1.6	3.8	2.8
AM Pk Vo	211	238	446	230	254	484	211	233	434	230	249	479	213	253	466	210	223	409	232	205	437	220	236	451
PM Pk Vo	245	281	496	239	300	511	221	306	525	229	303	518	261	346	526	184	247	404	238	251	471	231	291	493
7-7pm	2270	2700	4970	2350	2847	5197	2282	2874	5156	2415	2939	5354	2389	2860	5249	1887	2221	4108	1952	2129	4081	2221	2653	4874
24Hr Tot	2712	3224	5936	2834	3432	6266	2855	3488	6343	3016	3627	6643	2982	3564	6546	2333	2805	5138	2288	2607	4895	2717	3250	5967
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	2550	2985	5535	2699	3190	5889	2704	3260	5964	2863	3352	6215	2835	3317	6152	2221	2652	4873	2176	2436	4612	11	2578	3027
Class 2	17	11	28	10	16	26	14	18	32	9	20	29	12	12	24	7	10	17	8	18	26	11	15	26
Class 3	75	78	153	68	83	151	84	65	149	72	89	161	74	80	154	60	64	124	48	60	108	69	74	143
Class 4	17	9	26	14	12	26	11	11	16	21	6	27	9	17	26	9	7	16	10	12	12	13	8	21
Class 5	2	1	3	0	1	1	1	1	3	0	0	0	1	2	3	0	0	1	2	0	2	1	1	3
Class 6	0	8	3	0	2	2	3	0	4	0	4	0	2	0	0	0	1	0	2	4	1	3	4	7
Class 7	5	4	9	2	3	5	3	6	4	5	5	4	5	5	3	3	2	4	1	0	4	1	1	1
Class 8	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 9	1	10	11	1	9	10	3	10	13	1	15	16	5	10	15	2	5	7	1	7	8	2	9	11
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	0	2	2	1	2	3	0	5	0	0	2	2	0	3	3	0	0	0	0	1	1	2	2	2
Class 13	45	116	161	39	113	152	32	112	144	44	132	176	40	118	158	26	64	90	37	78	115	38	105	142



Manual Count Data

TTM Reference: **80711**
Location: **Therry Rd / Woodhouse Dr**
Suburb: **Campbelltown**
Date: **Thursday 28-10-10**
Duration: **0700-0900 & 1500-1800**
Weather: **Early morning showers / Fine PM**
Notes:



Peak Hours

AM Peak Hour: **0800-0900**
PM Peak Hour: **1630-1730**

Links

Graphical Reports

- [AM Full Graphical Report](#)
- [AM Peak Hour Graphical Report](#)
- [PM Full Graphical Report](#)
- [PM Peak Hour Graphical Report](#)

Tabular Report

- [Tabulated Data](#)

Image



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