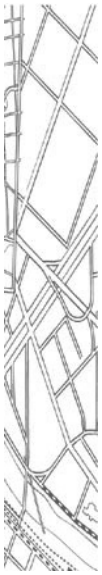

TMAP Report

Wahroonga Estate Transport Management and Accessibility Plan (TMAP)

13 February 2009

Prepared for

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Contents

1. Introduction

This report has been prepared on behalf of Johnson Property Group to address the Department of Planning's Director General's Key Assessment Requirement 6 Part 2 (dated 9 April 2008) in relation to the proposed redevelopment of the Wahroonga Estate, incorporating the Sydney Adventist Hospital (SAH) at Wahroonga.

These requirements stated:

> 'Transport Management and Accessibility Plan (TMAP) for the entire site, in accordance with the Ministry of Transport's Interim TMAP Guidelines, also including:
> - Staging/ Sequencing Plan;
> - Construction Management Plan; and
> - Voluntary Planning Agreement addressing MoT's requirements.'

This report develops a TMAP for the proposed development of the site. The TMAP is in addition to:

- Key Assessment Requirement 6 Part 1 – Traffic Study (refer to 'Wahroonga Estate – Traffic and Transport Review Paper' (Masson Wilson Twiney, November, 2008))
- Key Assessment Requirement 6 Part 3 – Parking Study (refer to report by Parking Consultants International)

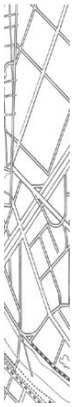
This TMAP was prepared in conformance with the objects of the *Interim TMAP Guidelines* (2001).

The site is described in this report as the Wahroonga Estate. The Sydney Adventist Hospital within the development site is commonly referred to as the SAN and is used where applicable (i.e., where the bus timetable uses the term).

The structure of this report is:

- Current onsite activities and transport patterns are described in Chapter 2, which sets out to identify the salient features of the site which affect transport.
- Chapter 3 describes the strategic context in which the site sits, with reference to evolving plans of the State Government and ongoing themes of population growth within the broader Sydney region.

- The proposed development of the site is described in Chapter 4, along with its resultant transport demand.
- Chapter 5 draws together the foregoing description and analysis to outline the implications of the proposed development for transport services.
- Conclusions and recommendations are presented in Chapter 6.



2. Background Situation

An appreciation of the background traffic conditions can be gained by examining the road network, traffic volumes, the operation of intersections, public transport availability, the traffic generated by the existing activity on the site as well as planned and proposed changes. These aspects are discussed in this section.

2.1 Site Location

The Wahroonga Estate, which includes the Sydney Adventist Hospital, is divided into two precincts by Coups Creek. West of Coups Creek, known as the Mt Pleasant Precinct, includes a small number of low density dwellings and residential aged care facilities.

On the eastern side of Coups Creek, the Sydney Adventist Hospital is located on the western side of Fox Valley Road, to the North of The Comenarra Parkway. The main vehicular access to and from the hospital is via a signalised intersection on Fox Valley Road. A secondary unsignalised access is located farther to the south, and is used by ambulances to access the emergency department and by a small number of staff.

Development fronting each side of Fox Valley Road includes hospital administration offices and professional consulting rooms, the SDA administration offices, school, hostel and residential accommodation, many of which have individual vehicular accesses to and from Fox Valley Road. There are also several dwellings fronting Comenarra Parkway east of the intersection with Fox Valley Road. This precinct is known as the Coups Creek East Precinct.

The area that is the subject of the concept plan is shown in **Figure 1**.

Pennant Hills Road[1] – is the main north-south arterial road through the area connecting the F3 Freeway and Hornsby LGA in north to the M2 Motorway in the south. It generally consists of divided carriageway with three traffic lanes in both directions. Intersections which allow right turn movements are controlled by traffic signals. The road carries large volumes of traffic and is also the main freight route through the area.

Comenarra Parkway – is a sub-arterial road providing a toll free parallel route to the M2 Motorway connecting Pennant Hills Road in the west with Lane Cove Road in the east. The alignment and topography of the road varies markedly along its length and in some locations this could act as a barrier to its use by buses. Whilst a prime purpose of this road is to serve adjacent properties (primarily residential) and surrounding residential areas, it carries a reasonable proportion of 'through' traffic. It generally consists of a single traffic lane in each direction with unrestricted parallel parking permitted along the majority of its length.

Fox Valley Road links the Comenarra Parkway (sub arterial) in the south to the Pacific Highway (arterial) in the north. It also provides direct access to the Sydney Adventist Hospital, a major employment centre in the area. Therefore it performs a sub arterial role in the area. It generally provides of a single traffic lane in each direction plus unrestricted parallel parking permitted along the majority of its length. Peak period parking restrictions are imposed across the hospital site frontage. It is noted that Ku Ring Gai Council classifies Fox Valley Road as a regional road[2].

Mt Pleasant Avenue – is a local street providing access for adjacent residential properties to Pennant Hills Road. Right turn movements are permitted into and out of Mt Pleasant Avenue at Pennant Hills Road. However, this intersection is not signalised. Mt Pleasant Avenue provides access to Elizabeth Lodge Hotel and Esther Somerville Nursing Home which provide accommodation for the aged and are located on the part of the Wahroonga Estate north of Coups Creek.

2.2 Existing uses on Site and General Description of Site Activities

The land encompassed by the Wahroonga Estate is divided into a western and eastern precinct by Coups Creek. To the west, the Mt Pleasant Avenue precinct consists of a number of detached dwellings which are occupied by hospital staff. This precinct also includes a large aged care facility which provides independent living units and higher care hostel facilities.

[1] Also known as the Cumberland Highway
[2] Ku Ring Gai Traffic Committee – KU Fox Valley Road Pre School Traffic Report, Ku Ring Gai Council 24 May 2007

East of Coups Creek on either side of Fax Valley Road, the land holdings consist of the following:

- The hospital;
- Professional consulting rooms;
- Seventh Day Adventist Church;
- Seventh Day Adventist Church Regional Administration Centre;
- Seventh Day Adventist Primary School (450 students);
- Detached and attached housing;
- Hostel for visiting doctors and church missionaries; and
- A 258 bed hostel room accommodation for student and staff accommodation.

The spatial relationships between current major on-site uses are shown in **Figure 2**.

The hospital and church administration operations currently employ between 2,500 and 3,000 staff. The Hospital / Church land on Mt Pleasant Avenue incorporates existing dwellings, retirement living and undeveloped land.

As a major health services complex, the SAN provides a broad range of sophisticated clinical care (including emergency medicine), teaching and support services. The 2008 Master Plan Review and Update provides an outline of the numerous related activities currently conducted on site, including:

- Clinical activities including dental care
- Inpatient beds – 345 beds
- Intensive care unit (ICU) – 12 beds
- Coronary care unit (CCU) – 11 beds
- Day beds – 96 beds
- Renal dialysis chairs – 14
- Birthing – 8 suites
- Cardiac catheter laboratory – 3
- Endoscopy theatres – 2
- Operating theatres – 12
- Faculty of Nursing including an auditorium, conference space and library
- Australasian Research Unit
- Nurses' Residence
- Child Care Centre
- Church
- Staff cafeteria
- Swimming pool

A notable feature of a major health care complex, which distinguishes it from many other land uses, is the extent of shift work. At SAH, the majority of nursing staff work a rotating shift system with three shifts operating during a 24 period. These shifts broadly follow the following hours:

- Morning shift 7:00am – 3:00pm
- Afternoon shift 3:00pm – 11:00pm
- Evening shift 11:00pm – 7:00am

Car parking is provided on-site, for which charges are levied for visitors and outpatients[3].

Additional information has been supplied to MWT by the client that characterises the types, scale and variability of activity on the site. This is summarised in the following paragraphs.

Numbers of Attending Medical Officers

An estimate of the average number of doctors (including Anaesthetists) attending in theatres, endoscopy and CCL per week day:

- Theatres 48.95
- Endoscopy 3.78
- CCL 4.90
- Total 57.63

This does not include:

- SAH Consultant Medical Officers (CMOs);
- Attending Medical Officers (AMOs) attending SAH for rounds/visiting patients; or
- AMOs attending their rooms in SAH Clinic (approximately 100 AMOs).

There are more than 650 AMOs at SAH, of which 120 contribute 85% of total SAH admissions. It would be reasonable to assume that these would be attending SAH on a regular basis, either for operating lists, patient visits, or San Clinic rooms.[4]

The average numbers of inpatient admissions and discharges by day of week are shown in **Chart 1** below.

[3] Refer to http://www.sah.org.au/patient.service.asp?sku=955761524

[4] The information in this section is sourced from SAH Patient AMO Data – TMAP XL workbook information from an accounting period in 2007-2008

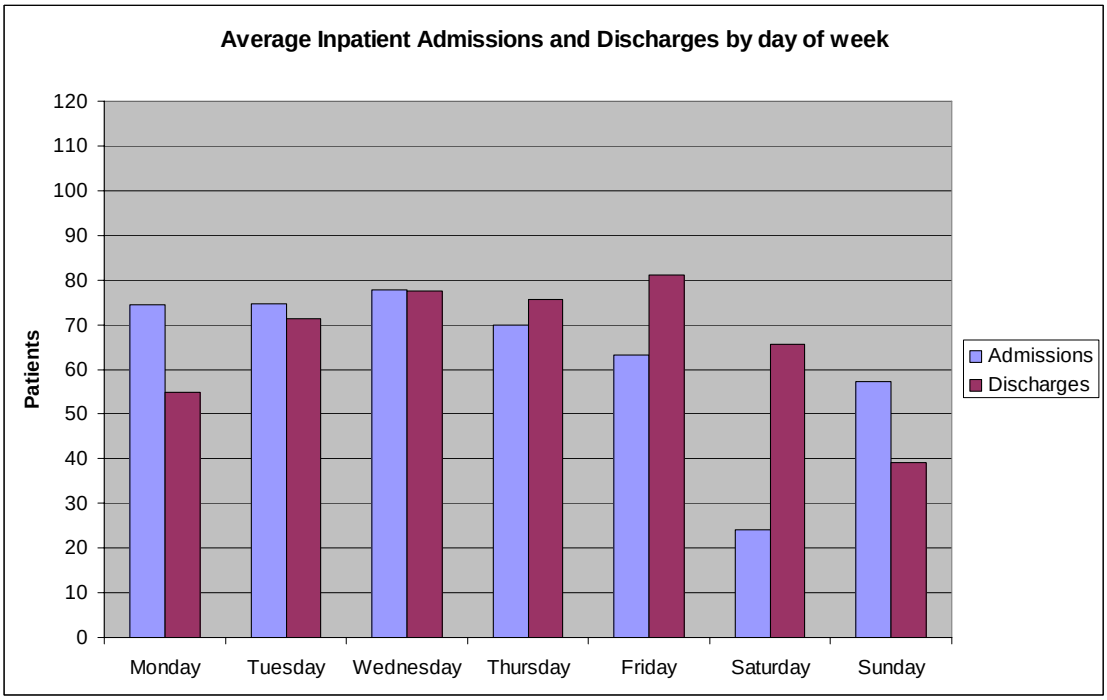


Chart 1 – Average inpatient admissions and discharges by day of week

Salient features of this pattern of activity are:

- Admissions and discharges occur throughout the week, even on the weekend
- Weekday volumes are relatively constant through the week, with Monday being a quieter day (probably partly reflecting a number of public holiday Mondays during the year)

The profile of admission times for inpatients are summarised in **Chart 2** below.

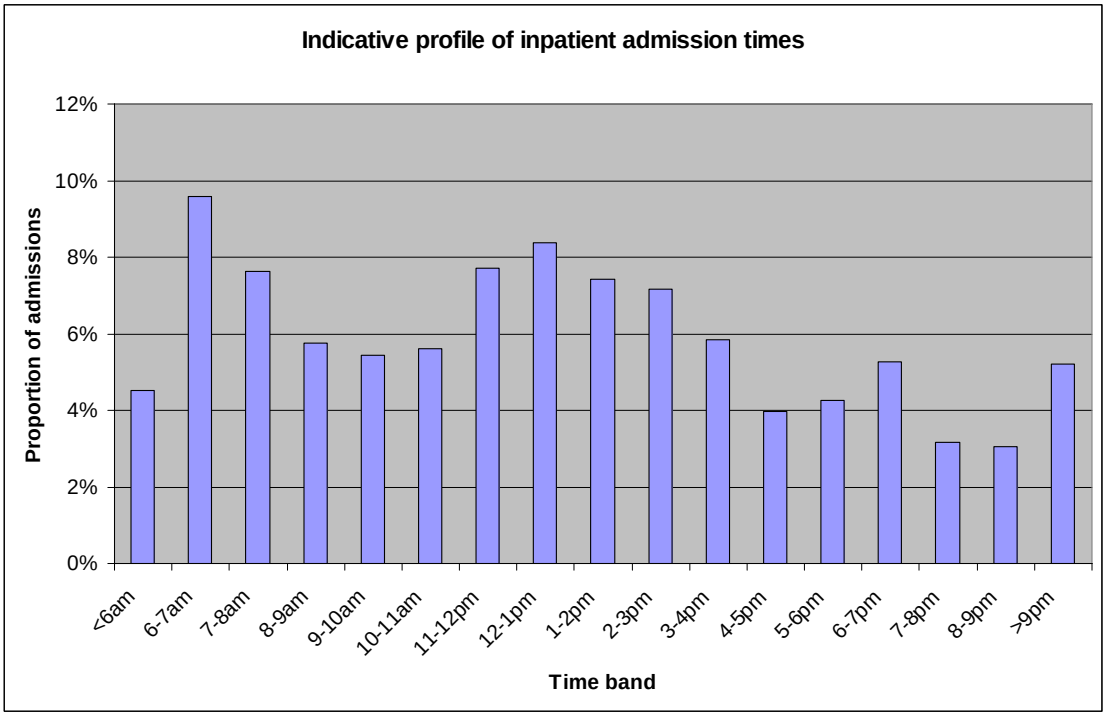


Chart 2 – Indicative profile of inpatient admission times

The peak time of admissions is in the hour 6am to 7am, which is prior to the main road system peak[5]. It is evident from the chart that inpatient admissions occur through the day, spreading access demands through hours when road system demands are lower.

The profile of inpatient discharge times are summarised in **Chart 3**.

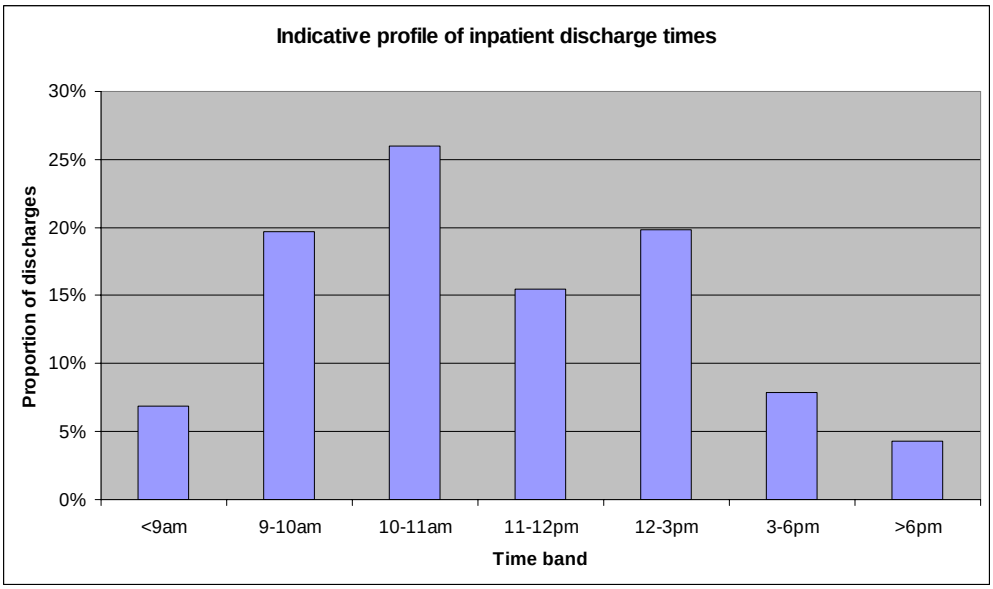


Chart 3 – Indicative profile of inpatient discharge time

The bulk of discharges (61%) occur between mid-morning (10am) and mid-afternoon (3pm).

Chart 4 below presents approximately nine months of weekly admissions data, from July 2007 to March 2008, and provides an indication of the effect of seasonal influences on demand.

[5] Admission and discharge temporal profiles are likely to be influential variables in explaining profiles of access transport demand for the SAH. Conceivably some patterns of activity could reduce the direct correspondence between these temporal profiles and site access temporal profiles, such as where a patient is admitted as a day patient, and as a consequence of the findings of a day procedure, may be admitted on the same day as an inpatient.

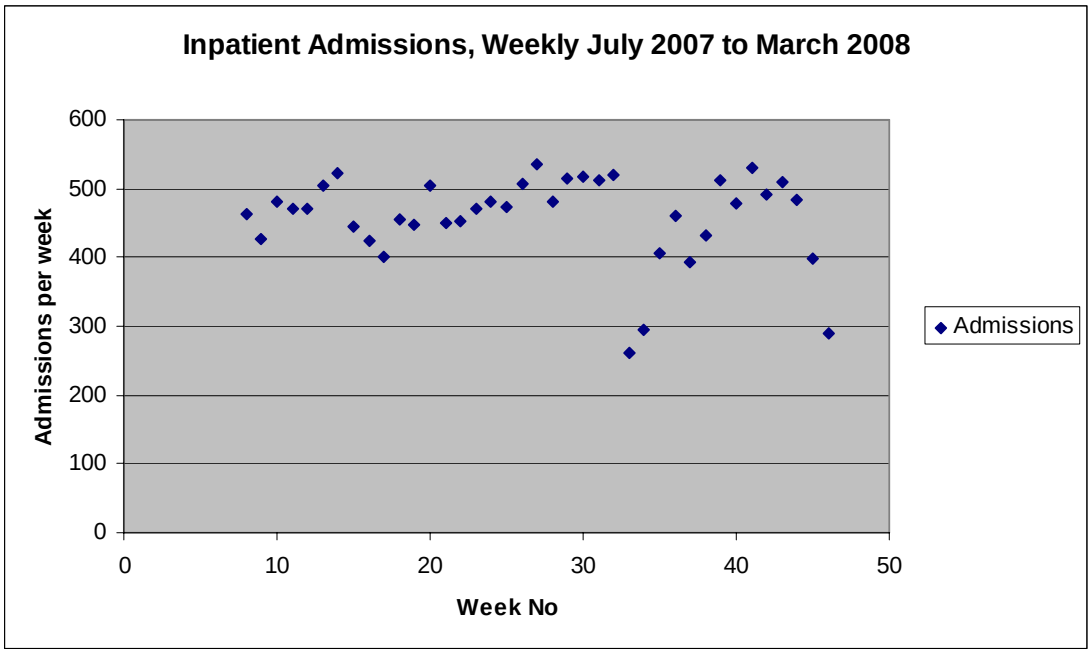


Chart 4 – Inpatient admission, weekly from July 2007 to March 2008

The first dip in the series is associated with the Christmas/January holiday period and the second dip (at the right hand end) is associated with Easter. For the rest of the year, there is some week to week variation, although the underlying series indicates a broad spread of activity across the year.

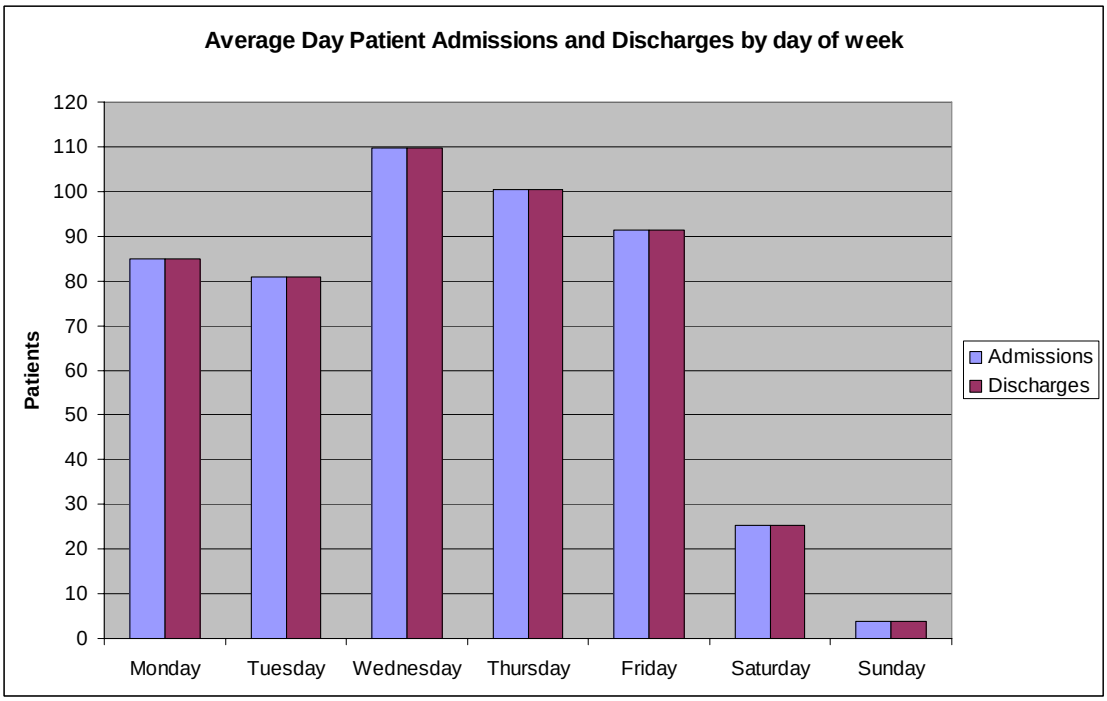


Chart 5 – Average day patient admissions and discharges by day of week

Chart 5 above shows a more varied profile than for inpatient admissions (compare with Chart 1); this indicates that day patient activity is spread through the week, with

an elevated level of activity on Wednesday and Thursday. Of note is that limited day patient activity does occur on Saturday, and to a lesser extent, on Sunday.

The profile of day patient admission times is shown in **Chart 6** below.

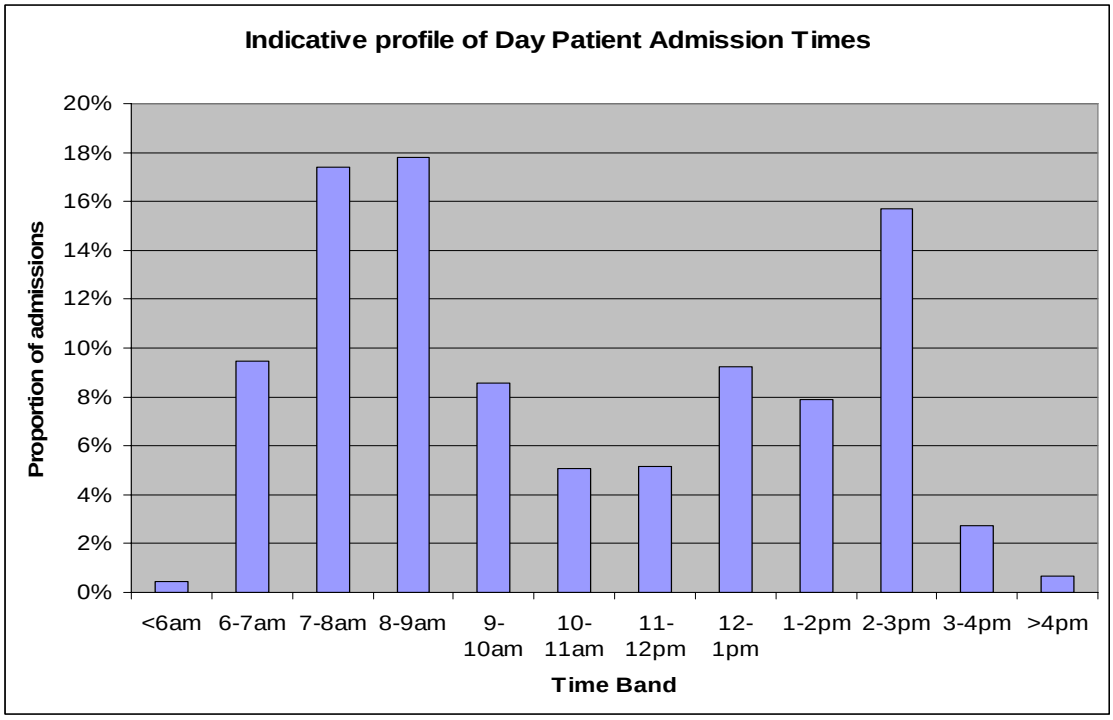


Chart 6 – Indicative profile of day patient admission times

The peak admission time in the morning coincides with the road system peak period. In the afternoon, the admissions during the road system peak (later than 4 pm) are almost zero. Activity associated with admissions is spread through the day with around two-thirds outside the road system peaks.

A profile of day patient discharge times are summarised in **Chart 7** below.

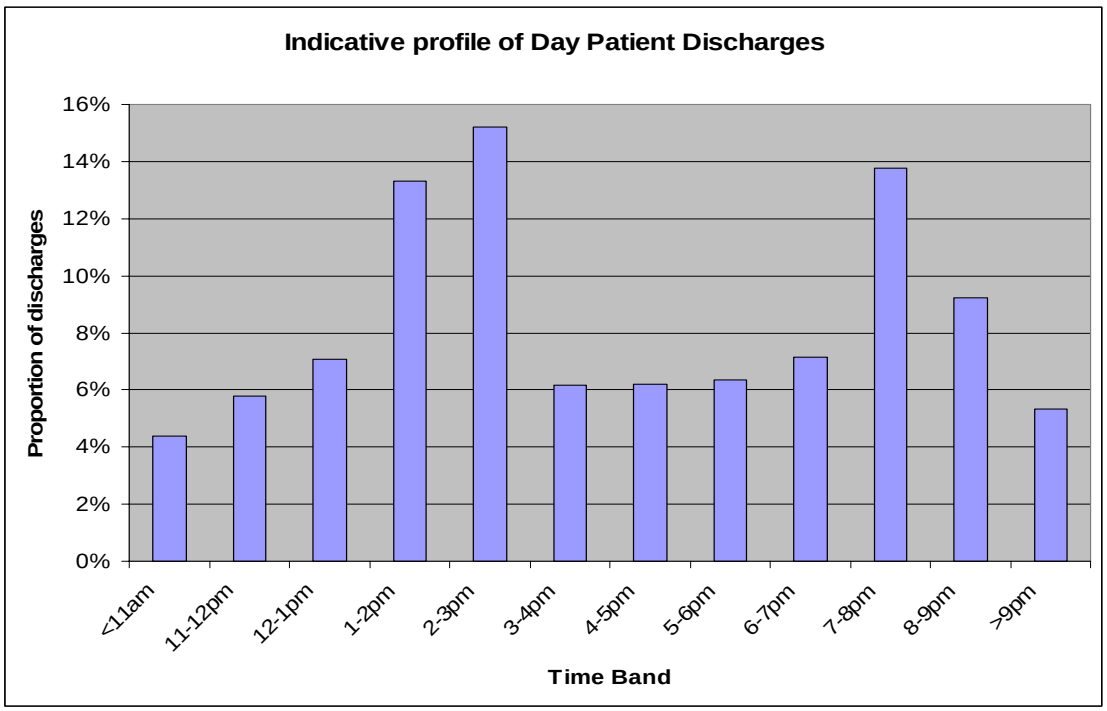


Chart 7 – Indicative profile of day patient discharges

The main discharge time is around lunch and early afternoon (around a third of daily discharges). Not surprisingly there are very few in the morning peak. The second peak occurs in the early evening (after the road system peak), with a quarter of daily discharges occurring between 7pm and 9pm.

Seasonal patterns of day patient admissions for nine months are summarised below.

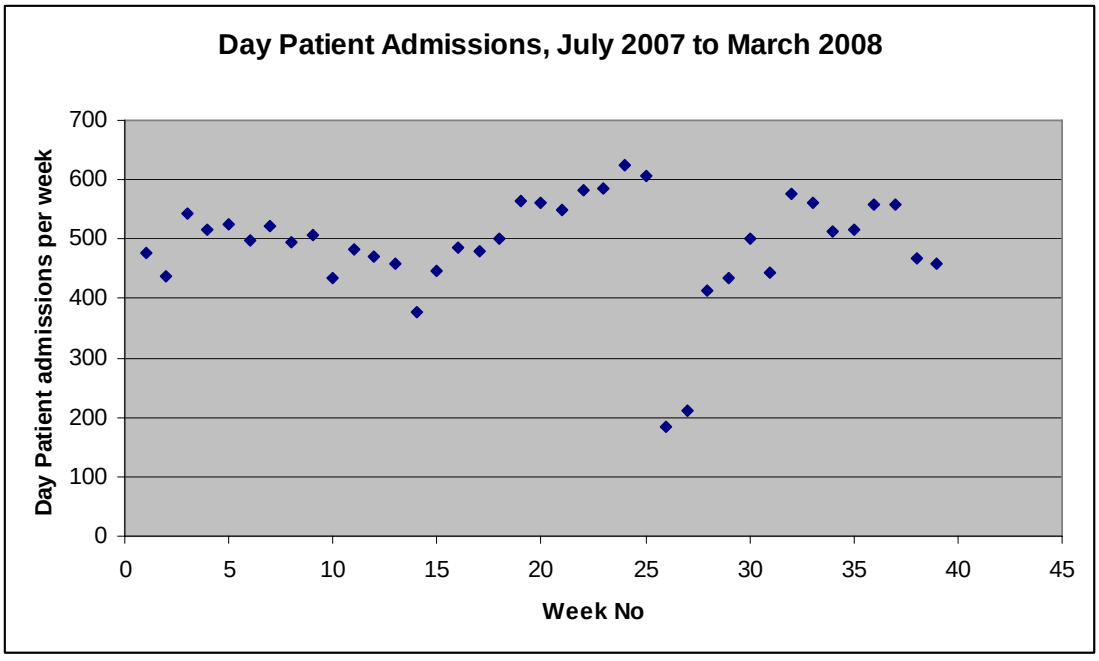


Chart 8 – Day patient admissions, July 2007 to March 2008

As with inpatient admissions there is a drop off in activity around Christmas, but the series returns to more normal levels more rapidly than inpatient admissions. Again, activity is spread through the year.

Typical weekly admissions and discharges for inpatient and day patient services are:

	Admissions	**Discharges**[6]
Inpatient	410	465
Day Patient	496	496
Total	***906***	***961***

The main implication for transport of a large scale integrated clustering of activity is that large economies of scale lead to substantial amounts of avoided travel on public movement networks. In other words, by having a full suite of clinical services plus related ancillary and support services on the one site, patients do not need to travel between widely dispersed services via the public road network. There are probably also economies derived in terms of the number of staff required relative to activity levels. An indication of how this scale and diversity of activity influences travel is investigated in the next section which explores the site's direct trip generation.

2.3 Existing Site Trip Generation

An extensive set of counts was undertaken in June 2008, including:

- Vehicle movements at all access points to the site, including the recording of vehicle occupancy;
- Pedestrian movement into and out of the site, as well as pedestrian movement at key locations within the site including access doorways to the hospital;
- Bus boardings and alightings at the nearest bus stops to the site in Fox Valley Road; and
- Car park occupancy surveys.

These observations were made over the period from 5.00am to 10.00pm.

The following series of charts summarise the results of these observations, with the next two charts showing pedestrian movements into and out of the site.

[6] Imbalance of discharges over admissions for inpatients is assumed by MWT to be due to midwifery services.

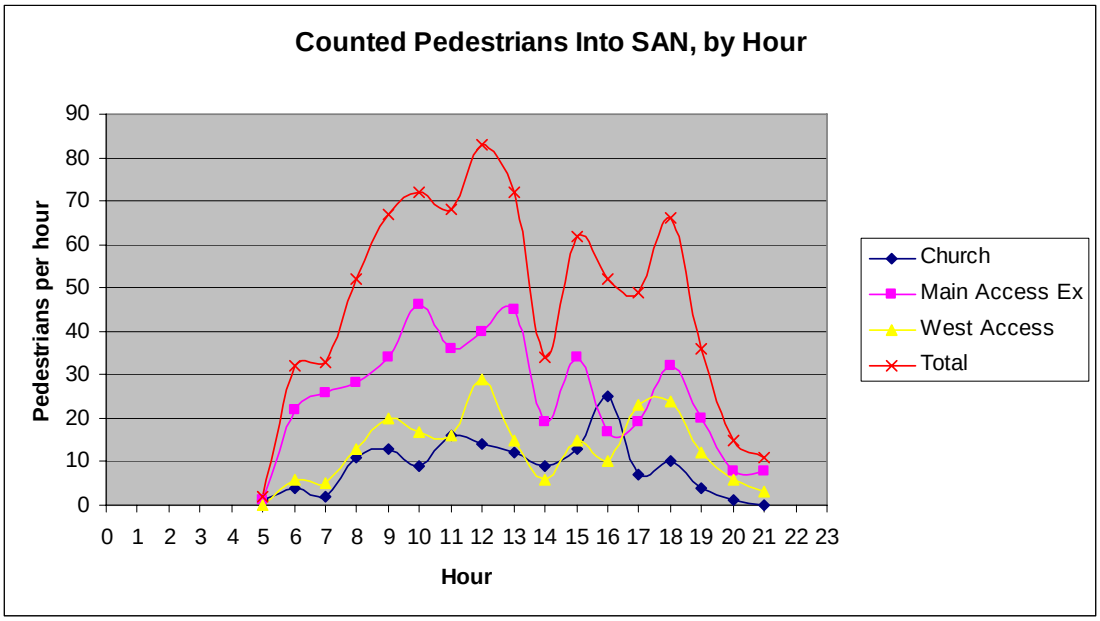


Chart 9 – Counted pedestrians moving into the SAH by hour

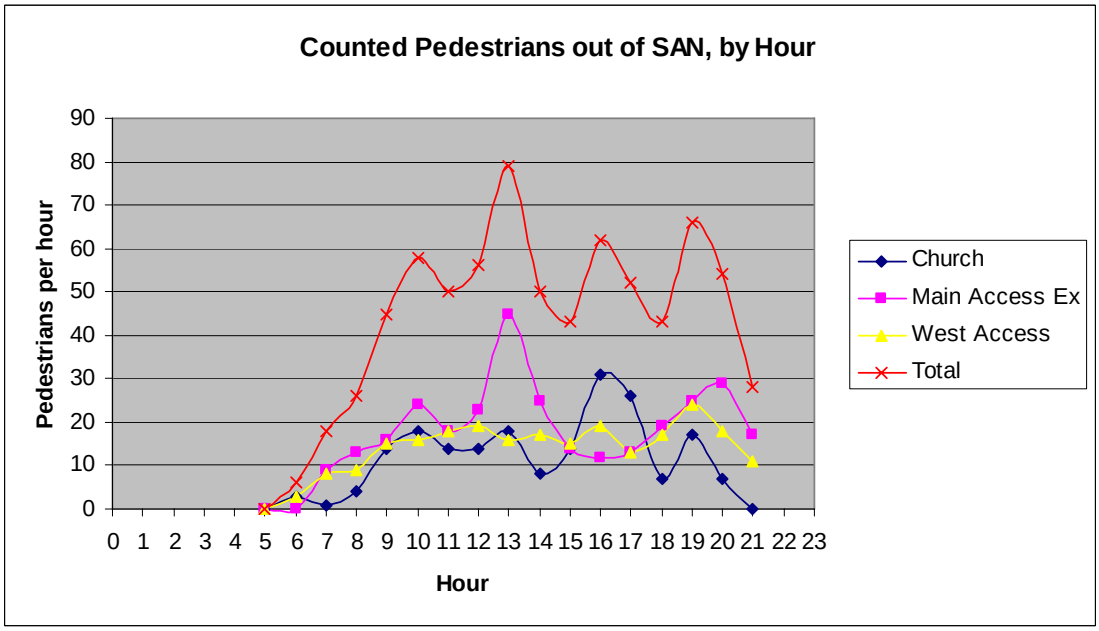


Chart 10 – Counted pedestrians moving out of the SAH by hour

Generally the Main Access is the prime access for pedestrians into the site; whereas for movements out of the site, the three access points have a generally similar level of foot traffic (apart from a spike at the Main Access for the hour from 1pm to 2pm). The level of foot traffic generated by the site is variable, but it does indicate useful levels of movement.

The following chart summarises vehicle generation of the site over the course of the day for all access points, by direction.

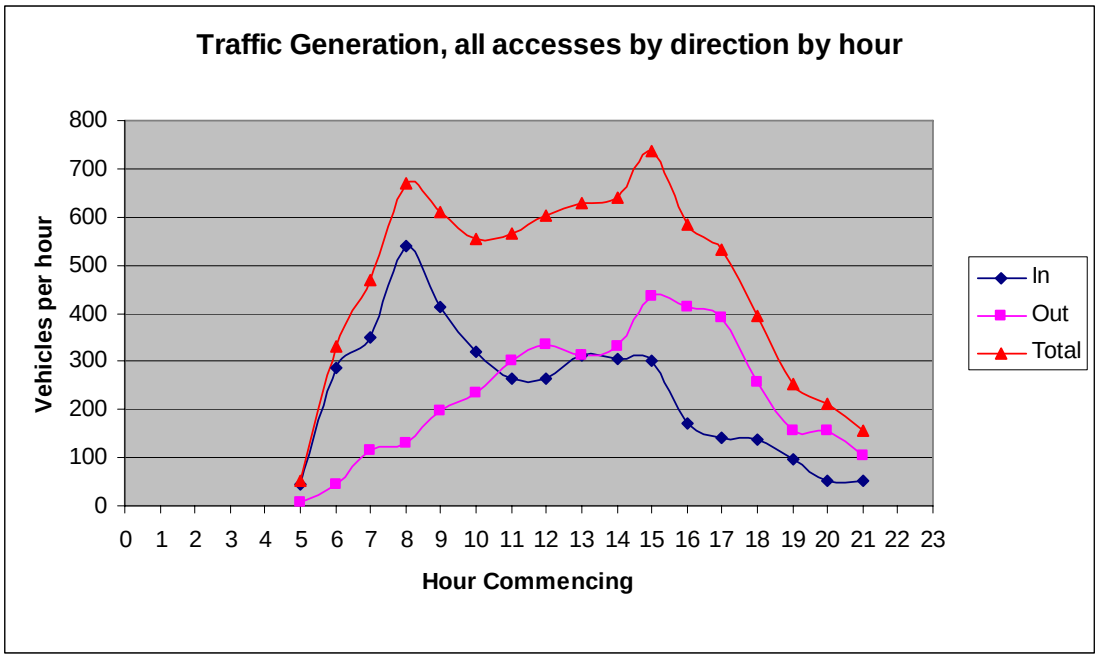


Chart 11 – Traffic generation, all accesses by direction by hour

The site's peak traffic generation on the day of the survey occurred in the hour commencing 3 pm, well before the road system peak. During the afternoon road system peak, site traffic generation is around 200 vehicles per hour less than the site peak; this is approximately 27% less than the peak. The morning site traffic generation peak coincides with the road system peak. Traffic generation by the site maintains a relatively (when compared with the peaks) elevated level through the day.

This spread of activity through the day and the early afternoon peak is considered consistent with the patterns of activity of the site. With a high proportion of shift workers, as well as different types of clinical services and other activities, all have different temporal profiles of demand.

The following chart shows average vehicle occupancy by hour and direction for the three accesses combined.

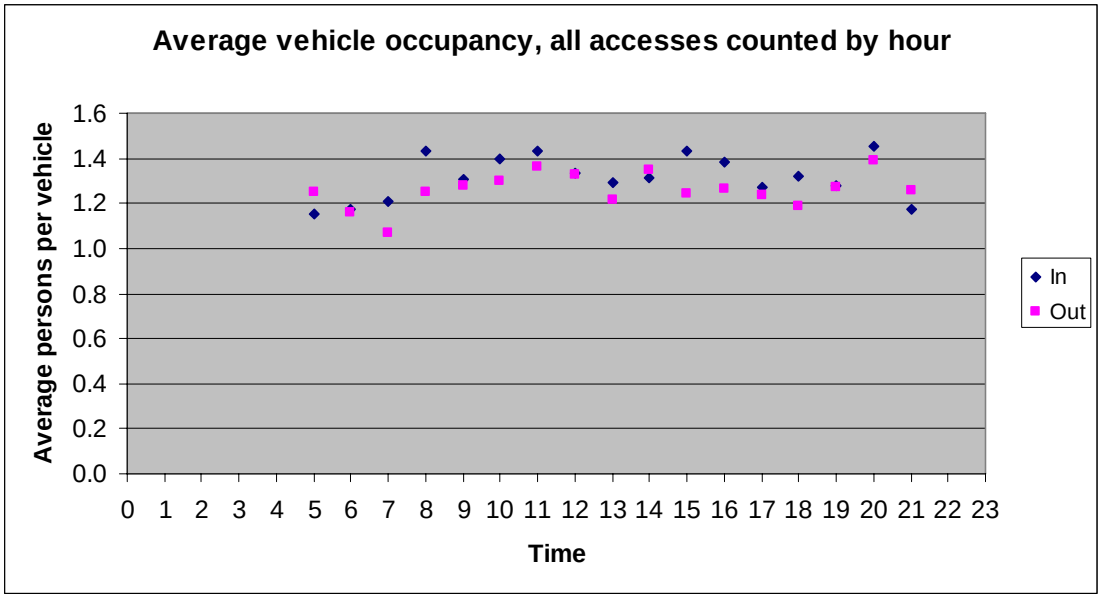


Chart 12 – Average vehicle occupancy, all accesses by hour

Average vehicle occupancy for the site for selected periods is compared below with road system averages reported by the NSW RTA[7]:

Period	SAH	Road system average
AM peak (8am-9am):	1.40	1.21
Off peak (10am-3pm):	1.33	1.32
PM peak (5pm-6pm):	1.25	1.25

This comparison indicates that the average vehicle occupancy for SAH is higher than the road system average during the AM peak, and similar to the road system average at other times of day (for which road system averages were available).

[7] Refer to www.austroads.com.au

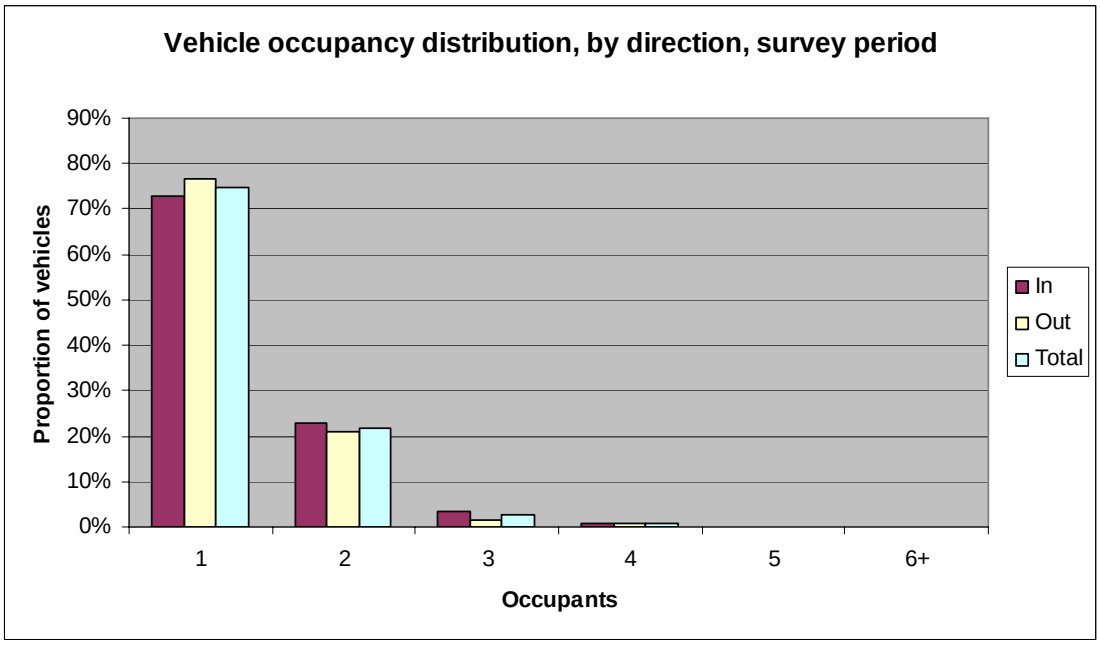


Chart 13 – Vehicle occupancy distribution by direction for entire survey period

Person trip generation by vehicle of the site was calculated based on direct observations of vehicle occupancy. These profiles of person trips are plotted on the chart below.

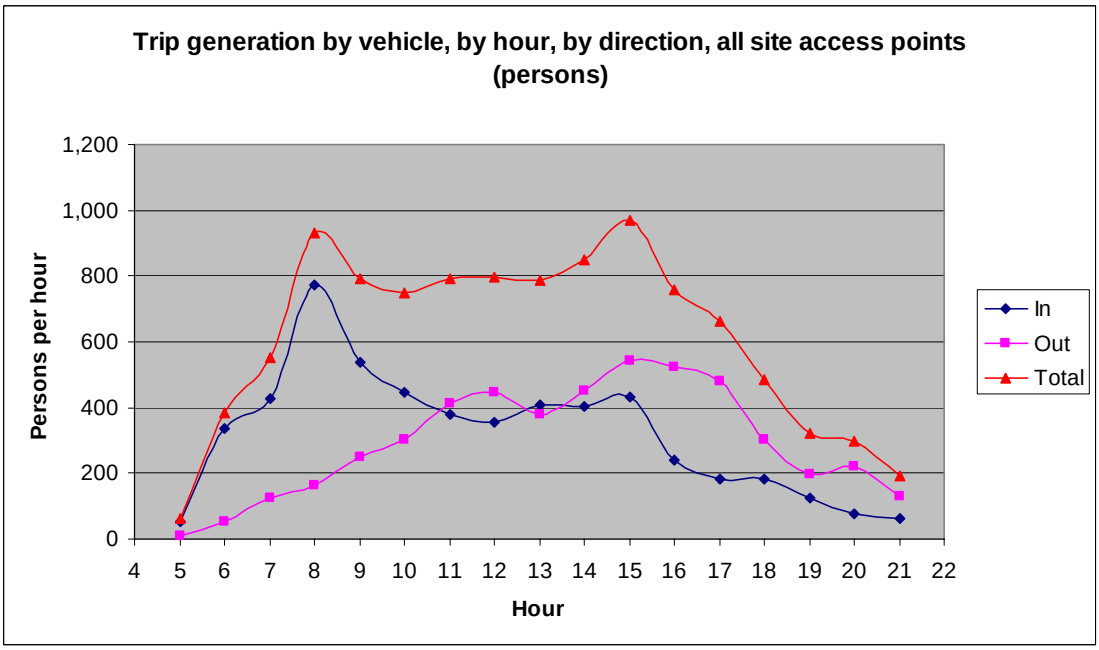


Chart 14 – Person trip generation by vehicle by hour by direction

Due to variations in vehicle occupancy, the person trip profile shows less variation by hour than the vehicle trip profile.

The following chart summarises a survey of total bus stop activity at the two bus stops closest to SAH.

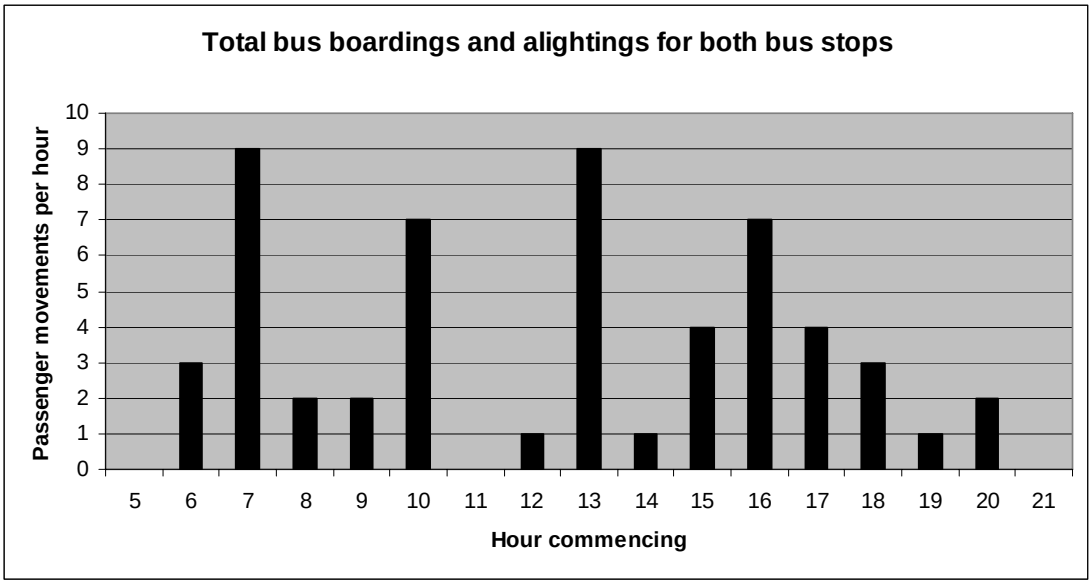


Chart 15 – Bus stop activity, total passengers boarding and alighting

It is clear from this that the use of these services in the vicinity of SAH is modest.

Further analysis of the site's traffic generation is contained in 'Wahroonga Estate – Traffic and Transport Review Paper' of November 2008, prepared by Masson Wilson Twiney.

2.4 Public Transport Services

The hospital is served by bus services and falls within the catchment of both the Main North and North Shore Rail Lines. The existing public transport services which operate past or in close proximity to the site are shown in **Figure 3**.

2.4.1 Existing Bus Services

The site is within Metropolitan Bus Service Contract Region 12 and Shorelink is the head operator of bus services in this region. Shorelink operates two bus services in the vicinity of the hospital. These services are:

- Route 589 – SAN Link – Hornsby to Sydney Adventist Hospital via Thornleigh Station and the Comenarra Parkway.
- Route 573 – Turramurra Station to South Turramurra via Fox Valley Road (Loop service).

The frequencies of the services are summarised in Table 2.1 and Table 2.2 below.

Table 2.1 – Number and Frequency of Route 573 Bus Services (Loop Service)

Day	AM Peak 6am to 10am	Inter Peak 10am – 4pm	PM Peak 4pm to 7pm	Evening after 7pm
From Turramurra Station				
Weekday	8 [6 to SAH] (2 to 3 per hour)	6 [all to SAH] (1 per hour)	6 [all to SAH] (2 per hour)	2 [1 to SAH] (1 per hour)
Saturday	One service per hour First service at 8.50am, last service at 5.50pm [10 trips]			
Sunday & Public Holidays	One service per two hours First service at 9.50am, last service at 5.50pm [5 trips]			
To Turramurra Station				
Weekday	7 [all from SAH] (1-3 per hour)	5 [all from SAH] (1 per hour)	6 [all from SAH] (2 per hour)	2 [all from SAH] (1 per hour)
Saturday	One service per hour First service at 9.02am, last service at 6.02pm [10 trips]			
Sunday & Public Holidays	One service per two hours First service at 10.02am, last service at 6.02pm [5 trips]			

Source: www.shorelink.com.au, accessed September 2008

Table 2.2 – Number and Frequency of Route 589 Bus Services

Day	Number of Services	Frequency
Hornsby to Sydney Adventist Hospital		
Weekday	6 morning services, only 3 to SAH	1 per hour between 6am and 9am
	6 afternoon services, all to SAH	1 or 2 per hour between 12 and 6pm
Saturday	No service to SAH	
	No service to SAH	
Sunday/Public Hols	No services	
Sydney Adventist Hospital to Hornsby		
Weekday	8 morning services, only 3 from SAH	1 per hour between 6am and 9am
	7 afternoon services, 6 from SAH	1 or 2 per hour between 12 and 6pm
Saturday	No service from SAH	
	No service from SAH	
Sunday	No services	

Source: www.shorelink.com.au

Table 2.3 summarises the available seating and standing capacity of the existing bus services to and from the hospital in the morning, afternoon staff changeover and evening peak periods.

Table 2.3 – Existing Seating and Standing Capacity of Bus Services

Description	AM Peak 7:00am – 9:00am_		Staff Changeover Peak 2:00pm-3:00pm		PM Peak 4:00pm – 6:00pm	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Route 573 Turramurra Stn – Fox Valley via The San	165 seats + 30 standing	110 seats + 20 standing	55 seats + 10 standing	55 seats + 10 standing	220 seats + 40 standing	220 seats + 40 standing
Route 589 Hornsby Stn - Thornleigh Stn via The San	110 seats + 20 standing	55 seats + 10 standing	55 seats + 10 standing	55 seats + 10 standing	10 seats + 20 standing	10 seats + 20 standing

The following chart summarises bus stop boardings and alightings at the bus stops closest to the SAH.

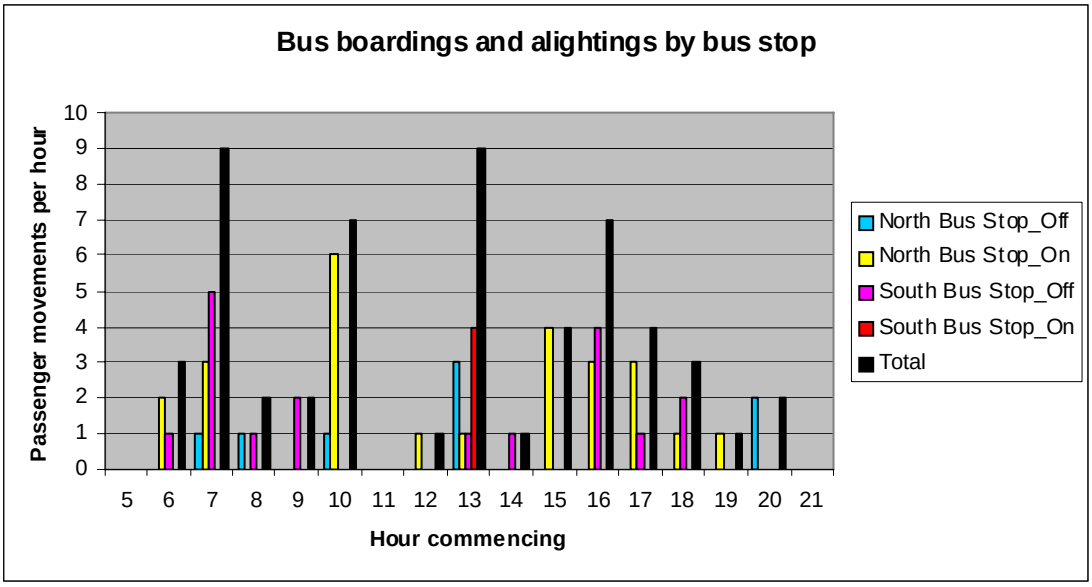


Chart 16 – Bus boardings and alightings by bus stop

This data indicates, in conjunction with the capacities reported in Table 2.3 that there is adequate existing bus capacity for current demands generated by SAH.

2.4.2 Existing Rail Services

The nearest train stations are Thornleigh, Wahroonga and Turramurra. Thornleigh Station is located approximately 2km west of the hospital and Wahroonga and Turramurra Stations are approximately 3km north east and east respectively of SAH.

As discussed above, bus services connect SAH to Thornleigh and Turramurra Stations. Table 2.4 summarises the number of rail services to Thornleigh and Turramurra Stations at different times of day on different days of the week.

Table 2.4 – Number of Rail Services to Thornleigh, Wahroonga and Turramurra Stations

Service	Day	Before 6.00am	6am to 10am	10am to 3pm	3pm to 7pm	After 7pm
Thornleigh (Northern Line)						
Hornsby to Nth Sydney	Weekday	4	15	11	14	11 1 is Fri only
	Weekend	3	8	10	8	10
Nth Sydney to Hornsby	Weekday	0	14	11	18	15 2 are Fri only
	Weekend	0	8	10	8	14 2 are Sat only
Wahroonga and Turramurra (North Shore Line)						
Hornsby towards Parramatta via North Sydney	Weekday	6/6	29/18	29/28	33/33	27/27 4 are Fri only
	Weekend	6/4	16/16	20/20	16/16	20/20 3 are Sat only
Parramatta towards Berowra via North Sydney	Weekday	2/2	30/21	25/24	26/21	33/33 3 are Fri only
	Weekend	1/1	16/16	20/20	16/16	24/24 2 are Sat only

Source: www.cityrail.com.au, accessed September 2008

2.5 Existing Commuter Travel Patterns

The SAH sits within Transport Data Centre (TDC) travel zone 2558. This zone follows the boundary between the local government areas of Ku-ring-gai and Hornsby, around the SAH site and down to the south, encompassing the largely residential area along The Broadway. Land use in the zone comprises:

- The SAH and associated activities
- Residential use along The Broadway
- The Lane Cove National Park's bush

The SAH is the major employment site within this zone.

The latest Journey to Work (JTW) data available (2006) was interrogated to identify the volume and mode shares of commuters residing in this zone and commuters working in this zone. Table 2.5 summarises the volume of commuter trips originating in this zone.

Table 2.5 – Commuter Travel Originating in Zone 2558

Mode	Train	Bus	Car Driver	Car Passenger	Other	Not Travelled on Census Day	Total
JTW Trips	117	0	328	15	31	100	591
Mode Share of Travel	24%	0%	67%	3%	6%	n/a	

Source: Table 07 JTW dataset, 2006

The transit mode share (train, ferry, light rail and bus combined) is above the Sydney-wide average of 22%, with the car mode share (car driver and car passenger), at 70%, below the Sydney-wide average of 72%. Given that the zone is located in the Middle Ring, the mode share comparison is more favourable than that with the Sydney-wide average. The average car mode share for the Middle Ring is 69.1% compared with 67% in this zone; other mode share for this zone is 6.3% compared with the average for the Middle Ring of 5.5%.

The top three destinations for commuters who reside in this zone and travelled to work on Census Day 2006 are:

- Ku-ring-gai – 113 (23%)
- Sydney – 98 (20%)
- Hornsby – 44 (9%)

These three destinations account for 51% of commuter trips originating in this zone. Of note is that over 64% of travel to the CBD uses transit.

For commuters working in the zone, the following summary is provided in Table 2.6.

Table 2.6 – Commuter Travel to Zone 2558

Mode	Train	Bus	Car Driver	Car Passenger	Other	Not Travelled on Census Day	Total
JTW Trips	29	18	1,271	131	161	424	2,034
Mode Share of Travel	2%	1%	79%	8%	10%	n/a	

Source: Table 07 JTW dataset, 2006

For an employment zone that is not within a major employment centre, this 'other' mode share is comparatively high at around twice the average for commuter trips with destinations in the Middle Ring.

The top three origins of commuters who work in this zone are:

- Hornsby – 692 (34%)
- Ku-ring-gai – 525 (26%)
- Baulkham Hills – 188 (9%)

These nearby local government areas account for about two-thirds of workers in TDC Zone 2558.

MWT were provided with a distribution of postcodes for commuters to the hospital. These were processed to statistical local areas (SLA) and compared with journey to work data[8]. The following chart compares the top 15 origins of commuter travel from each source.

[8] Some approximations in processing were inevitable due to some postcode areas overlapping two or more statistical local areas.

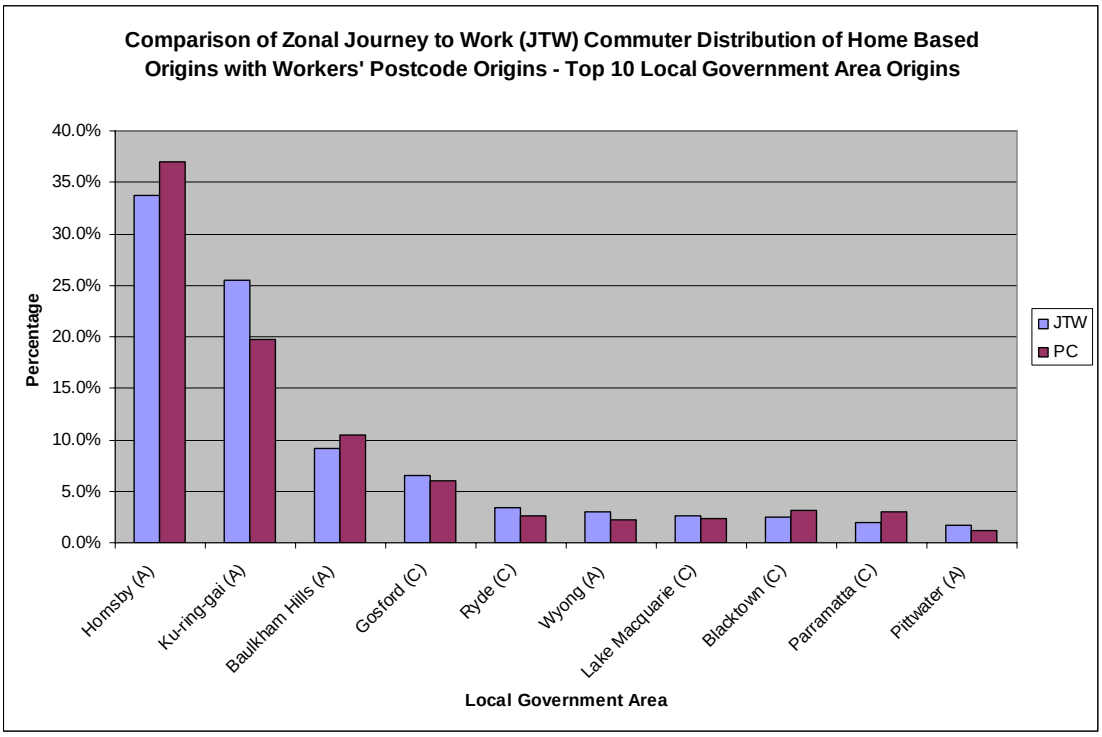


Chart 17 – Comparison of distribution of commuter origins, JTW and Postcode Data

This comparison indicates good agreement between the two datasets. The top three origin local government areas of Hornsby, Ku-ring-gai and Baulkham Hills accounted for 67.2% of staff commuter home-based origins. A feature of the chart is that the overwhelming bulk of origins (the top ten local government areas account for around 90% of staff residential locations) are within the northern part of Sydney, including the Central Coast and Lake Macquarie (in the Lower Hunter).

Table 2.7 summarises the travel patterns of commuters who live and work in this zone.

Table 2.7 – Commuter Travel Originating From and Travelling to Zone 2558

Mode	Train	Bus	Car Driver	Car Passenger	Other	Not Travelled on Census Day	Total
JTW Trips	3	0	35	3	12	45	98
Mode Share of Travel	6%	0%	66%	6%	23%	n/a	

Source: Table 07 JTW dataset, 2006

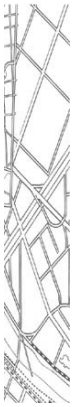
The level of zonal self-containment, at around 17% is relatively high, especially given the predominantly residential land use and specialised use (SAH), when compared with the Sydney-wide average of 7.6%, and places SAH's zone 69 out of 1,800 across Sydney. This additional information about worker home-based origins provides a useful broad order cross check on JTW information.

Of the self-contained commuters, just under 25% use 'Other Mode' (mainly walk, but also including bicycle). This is indicative of a favourable transport outcome that can be achieved through the co-location of designated residential accommodation and employment (i.e., health facilities at the SAH).

2.6 Existing Bicycle Facilities

Both Hornsby Shire Council and Ku-ring-gai Municipal Council have published Cycleway maps. These indicate existing and proposed bicycle facilities. The closest to the SAH on the Hornsby Council side is along the alignment of the west side of the Main North Rail Line, running past Thornleigh Station on the Esplanade and past Normanhurst Station on Malsbury Road.

On the Ku-ring-gai Council side the closest facility is from Turramurra Station down Kissing Point Road to its terminal at South Turramurra. At this point an off-road facility continues through the bush along the alignment of the Great North Walk. This cycleway is a combination of a shared facility and an on-road cycleway.



3. Strategic Context

3.1 Overview

From a top down perspective, several echelons of State Government pronouncements of the past three years set a broad and evolving framework for land use and transport policy and development. These are:

- Strategic land use and transport planning in Sydney is guided to some extent by the Metropolitan Strategy (released in December 2005) plus subsequent sub-regional strategies, of which the relevant one for SAH is the Draft North Sub-regional Strategy (released in November 2007).
- In addition, the Urban Transport Statement (November 2006) set out a series of projects, some of which were in the Metropolitan Strategy, to develop Sydney's transport network further. This statement was broadly in accordance with the State Plan, although it did accelerate some previously announced projects.
- More recently, the previous government announced plans for a Metro system within Sydney (March 2008) with the North West Metro to proceed to a compressed timetable. However, the Mini-Budget (November 2008) confirmed that the North West Metro was not to proceed in the foreseeable future.

Abstracting from these documents, and looking at what is actually occurring, the main strategic planning themes to be considered are:

- Continued strong growth in Sydney of both population and employment.
- Major reform of the bus system over the past four and a half years.
- On-going major capital investment to stabilise and improve the current heavy rail system, through Clearways and the nearly-completed Epping to Chatswood Rail Line.
- Prospective strategic-level road network improvements within the sites' broad sub-region.

The next section summarises the main formal strategic planning documents, whilst the subsequent section discusses the implications of the more immediate proposals.

Based on recent statements by the new State Government, in particular the NSW's Mini-Budget[9] on 11 November 2008, it is expected that the strategic planning outlook will be adjusted further over the next six to 12 months. To some extent it is likely to be framed by the willingness of the Commonwealth Government to financially support (at least partially) a number of major initiatives.

3.2 Strategic Plans - Transport

3.2.1 Metropolitan Strategy (December 2005)

This Strategy set the long term direction for Sydney's land use and economic development when it was released. However, it now appears to be dated and has lost its primacy in setting the long term direction for planning, especially for transport.

One of the few changes to statutory plans affecting transport that accompanied the Metropolitan Strategy was the withdrawal of Draft SEPP 66 (Land Use and Transport), but the continuance of the Integrated Land Use and Transport Policy Package that had accompanied the Draft SEPP. This continuance was given effect through Section 117 directions issued by the Planning Minister in September 2005[10].

The release of the Urban Transport Statement and Sydlink (see separate sections below for each) has reinforced some of the concepts in the Metropolitan Strategy, such as strategic bus corridors and rail clearways. These documents have changed priorities of projects and supplanted other concepts.

3.2.2 Draft North Sub-region Strategy (November 2007)

This Strategy document covers the local government areas of Hornsby and Ku-ring-gai. It provides a description of the current situation and likely future of the area, covering themes of:

- Economy and employment
- Centres and corridors
- Housing
- Transport
- Environment, heritage and resources
- Parks, public places and culture
- Implementation and governance

Despite an exhaustive listing of activity locations within the sub-region, no reference to SAH can be found in the sub-regional strategy.

[9] Refer to http://www.treasury.nsw.gov.au/?a=12713 for a link to the Mini Budget and the NSW Treasurer's speech; these include changes to planning responsibilities for some lands

[10] The September 2005 Section 117 direction was superceded by July 2007 Section 117 direction #3.4

Key transport directions are:

- Implement the Strategic Bus Corridors to provide better links to Major Centres and employment opportunities
- Improve rail access and services
- Improve efficiency of freight movements and through traffic
  (page 58, Sub-regional Strategy)

Specific measures to improve transport include:

- Widen F3 Freeway between Mt Colah and Cowan to three lanes each direction
- Commence development of a new largely tunnelled motorway-standard National Network link between the F3 Freeway at Wahroonga and the M2 Motorway at Pennant Hills
- Address critical pinch-points in the road network, including the Pacific Highway from Chatswood to Pymble and the F3 Freeway and Pacific Highway at Wahroonga.
- Northwest Rail Link as a heavy rail project.

As noted previously, the Metropolitan Strategy seems to have lost its primacy as the over-arching strategy for Sydney's future development. Therefore, it is not clear whether a final sub-regional strategy will be produced for the North Sub-region.

3.2.3 *Urban Transport Statement (November 2006)*

This document provides a comprehensive outline of the transport improvement projects planned for Sydney, with a year-by-year schedule of rail system upgrades.

The Urban Transport Statement provides a concise summary of travel patterns in Sydney's major corridors, including:

- Central Coast to Chatswood (H)
- Parramatta to Hornsby (N)

The Comenarra Parkway links these two corridors along the northern side of the Lane Cove River National Park.

Scheduled works under existing approved programs for each of the corridors are listed in the Urban Transport Statement as:

Central Coast to Chatswood

- Epping to Chatswood Rail Line
- Chatswood Transport Interchange
- Rail Clearways – Hornsby Station platform 5 turnback and stabling[11]
- Rail Clearways Program – Berowra Station platform 3
- North Sydney Station capacity upgrade

[11] According to http://www.cityrail.info/news/clearways.jsp this is under construction

- Easy access – Turramurra
- Extra trains to provide additional services
- Air conditioning on all trains
- F3 Freeway widening from Mt Colah to Cowan
- F3 to M2 link (Wahroonga to Carlingford)
- Pacific Highway, Chatswood to Pymble network improvements
- F3 and Pacific Highway, Wahroonga network improvements
- Bus priority on Strategic Bus Corridor 8[12]

Parramatta to Hornsby

- North West Rail Link
- Rail Clearways Program – Carlingford Line Passing Loop
- Easy Access Eastwood Station and Meadowbank Stations
- Air conditioning on all trains
- F3 to M2 link (Wahroonga to Carlingford)
- Potential F3 to M7 link
- Potential Parramatta-Epping Corridor
- F3 and Pennant Hills Road Wahroonga 'pinch point' network improvements
- Bus priority on Strategic Bus Corridor 41[13]

3.2.4 Sydlink – North West Metro

This proposal was announced in March 2008 to build the North West Rail Link (from Epping to Rouse Hill) as a Metro Line, with a separate connection to the CBD from Epping via the Victoria Road corridor. This was proposed to open sometime around 2016 or 2017. It would have provided a mass transit link between Sydney's growing North West and the CBD, as well as connecting a number of medium scale demand generators along the way.

3.2.5 Mini-budget 11 November 2008

Main transport-related measures of relevance:

- Indefinite deferment of the North West Metro.
- Acceleration of the delivery of 300 additional buses, including 100 for north west Sydney.
- Whilst the M2-F3 link is mentioned specifically, it is difficult to precisely define its likely timing. It appears to depend on the re-ordering of a number of major projects, in consultation with the Commonwealth Government and Infrastructure Australia.
- Development of lower cost capacity increases and improvements to service levels on CityRail's network.

[12] Pg 41 Urban Travel Statement
[13] Pg 47 Urban Travel Statement

This last proposal seems to pick up on some of the proposals outlined in the Urban Transport Statement, for example, relating to substitution of eight-car trains for six-car trains. However, it does go further, suggesting that investigations into the gradual conversion of network operations to higher-frequency single-deck rolling stock (refer to pg5-3).

3.3 Forward Plans and Trends

3.3.1 Population growth

The most recent projections of population growth by the state at SLA level were published in 2007 (designated the 2005 Release), whereas the most recent regional level forecasts were published in 2008. A summary of existing and projected future population is in the following table.

Table 3.1 – Comparison of projections of population, from 2006 to 2021

Level of Service	Population - 2006	Population - 2021	Difference
2005 Projections			
Ku-ring-gai (SLA)	106,744	111,525	+ 4,781 (4.5%)
Hornsby (SLA)	157,243	165,534	+ 8,291 (5.3%)
Sydney (SD)	4,310,099	4,922,646	+ 612,547 (14.2%)
2008 Projections			
Sydney SD	4,282,000	5,104,100	+ 822,100 (19.2%)

Note – 2005 SLA projections use the 2005 Australian Standard Geographical Classification (ASGC 2005).
Source: New South Wales Statistical Local Area Population Projections 2001-2031, 2005 Release, NSW Government Department of Planning, 2007 and New South Wales State and Regional Population Projections, 2006-2036, 2008 Release, NSW Government Department of Planning, 2008

The 2005 projections indicate a modest level of growth over the 15 year period to 2021 for both Ku-ring-gai and Hornsby – their increase is projected to be around a third of the Sydney-wide increase. The 2008 Sydney-wide projection is substantially above the 2005 Release. These projections tend to be volatile from release to release as they are generally based (at Sydney SD level) on some continuation of past trends, and elements of these trends have been varying in recent years.

3.3.2 Ongoing bus system reforms[14]

SAH is currently within Contract Region 12, which extends from the Hawkesbury River in the north to Chatswood in the south east and Macquarie Centre in the south. As of January 2012, the 15 Metropolitan Bus Service Contract Regions in Sydney will be reduced to 10 and the site will be within proposed Contract Region 8.

A Strategic Bus Corridor is identified as running along The Comenarra Parkway; Corridor #7, Hornsby to Macquarie Centre.

[14] These reforms were initiated through the NSW State Government's response to the Unsworth Report (March 2004)

An integrated network plan for Contract Region 12 was exhibited earlier in 2008. Advice from the Ministry of Transport indicates that it is likely to be implemented in the first half of 2009, probably at the time of the introduction of the new rail timetable to accommodate the opening of the Epping to Chatswood Rail Link (see below).

This integrated network plan leaves services to the SAH (Rts 573 and 589) unamended with frequencies of:

Frequency (headway mins)	**Rt 573**	**Rt 589**
Peak	20	60
Off Peak	60	limited
Nights	nil	nil
Saturday	60	120
Sundays	120	0

The plan was prepared in accordance with the Bus Service Planning Guidelines[15], making a number of amendments to bring the network structure closer to the concepts in the Unsworth Report.

The most ambitious amendment is the introduction of the route 575, which will connect Hornsby with Turramurra Station and then onto Macquarie University. This route has the following key features:

- It serves two major sub-regional centres (Hornsby and Macquarie Centre), making a link from north of the Lane Cove River into Macquarie for the first time.
- It serves a major University Campus.
- It serves Hornsby and Ku-ring-gai Hospital.
- It serves a small-scale centre at Turramurra.
- It connects with the rail network at three locations (Hornsby, Turramurra and Macquarie University, when that station opens in the near future).
- It is relatively long, thereby increasing the chance of serving more of the existing travel market.

This amendment provides the broad transport function envisaged by Strategic Bus Corridor #7, by connecting Hornsby with Macquarie Centre (however, it follows a substantially different alignment to the Strategic Bus Corridor, as it runs primarily north of the North Shore Line).

While not directly serving SAH, the success of this route could have implications for:

- Further network amendments which seek to apply similar principles elsewhere in the Contract Region, possibly providing a more direct benefit for the SAH
- Has the potential to attract some additional patronage, possibly from car, thereby making a modest contribution to higher transit mode shares in the general area.

[15] Bus Service Planning Guidelines, Sydney Contract Regions, NSW Ministry of Transport, June 2006

3.3.3 Clearways including Epping to Chatswood Rail Line

The Epping to Chatswood Rail Line is expected to open in the first half of 2009. When it is opened, it is expected that there will be a substantial modification of CityRail's existing timetable.

For the sub-region around SAH, the Epping to Chatswood Rail Line will have the following primary benefits:

- It will put the Macquarie sub-regional centre on the rail network. This is a major employment area, including Macquarie University and a major retail destination. As such it would be expected to capture some the existing transit access market as well as serve a broad range of trips from elsewhere on the CityRail network.
- The line is also expected to draw some demand from car to rail.
- It will provide improved access between areas served by the Main North Line (north of Epping) and employment centres on the Lower North Shore, in particular from Chatswood to North Sydney.
- The line is expected to result in additional rail capacity into the CBD via the Harbour Bridge and from Sydney's west (through relieved capacity between Strathfield and the City).

3.3.4 Road Network Improvements

F3 widening – this project is underway between Mt Colah and Cowan. This is expected to improve the reliability of the F3 and reduce extensive delays at bottlenecks, especially northbound. This has the potential to reduce the volume of cross-traffic trading between the Pacific Highway and Pennant Hills Road, potentially reducing traffic volumes on The Comenarra Parkway.

M2-F3 Link – this large-scale proposal has been subject to several investigations and reviews. This may be one of the projects that proceeds, possibly as a result of funding from the Commonwealth Government. Previous work by SKM (F3 to Sydney Orbital Link Study, 2004) indicated that this link would provide major traffic relief to Pennant Hills Road.
This is a key link in the nationally important Sydney Brisbane Corridor and would fill a perceived 'gap' in Sydney's higher order road network, connecting the Sydney Orbital and the F3. At present, its counterpart corridor in the southwest (the Sydney Melbourne Corridor, the F5) connects directly to the Sydney Orbital).

M7-F3 Link – this is considered a long term potential link. If it were to proceed, previous investigations[16] indicated only a small market and, therefore, only modest relief would be provided to Pennant Hills Road.

[16] See, for example, http://www.infrastructure.gov.au/roads/F3toM7Review/pdf/F3toM7_final.pdf

M2 Upgrade – it is understood from public statements by Transurban, effectively the owner of the M2, that negotiations are underway for the upgrade of the M2[17]. The form of Transurban's upgrade concept, which is yet to be agreed with the RTA, for the M2[18] is:

- Eastbound widen from two to three lanes between Windsor Road and Pennant Hills Road and Beecroft Road and Christie Road
- Widen westbound from two to three lanes between Beecroft Road and Pennant Hills Road
- A new 'Park and Ride' bus interchange at Herring Road
- A new eastbound bus lane between Herring Road and Delhi Road
- New access to Norwest Business Park with new west-facing on and off-ramps at Windsor Road
- New access to Macquarie University and Macquarie Park with new east-facing on and off ramps at Herring Road
- Reinstate the cycleway between Lane Cove Road and Pennant Hills Road to bypass Norfolk Road Tunnel
- Conversion to cashless tolling (there is already efficient e-tolling available)

The timing of this upgrade is unclear: if the concept were to be agreed with Government by the end of 2008, then it might be two to four years before completion of the upgraded works.

The implications of additional capacity along the M2 corridor for Pennant Hills Road and the SAH might be:

- Better east-west access for traffic travelling between the North West Sector and employment centres to the east. This may assist to reduce traffic volumes on The Comenarra Parkway.
- Conflicts between this east-west traffic and north-south traffic using Pennant Hills Road and the Pacific Highway may be reduced.

3.4 Summary

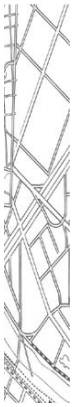
The NSW Department of Planning's most recent population projections envisage that Sydney will continue to grow, and that this growth will occur at a faster rate than had been anticipated by previous population projections. The projections indicate that the proportion of the population over 65 years of age will continue to increase.

[17] Refer to page 23 of http://www.transurban.com.au/transurban_online/tu_nav_black.nsf/PageLayouts/TU2005~subframe?OpenDocument&showurl=/transurban_online/tu_nav_black.nsf/v/581279AF7143A151CA2574B10079C924/%24file/080827%20TCL%20Market%20PresFINAL.pdf

[18] http://www.transurban.com.au/transurban_online/tu_nav_black.nsf/PageLayouts/TU2005~subframe?OpenDocument&showurl=/transurban_online/tu_nav_black.nsf/v/452F923D98BDBD1ACA2574820020F858/%24file/M2%20Upgrade%20Questions%20and%20Answers.pdf

Over the life of SAH's Concept Plan there is likely to be:

- Transport benefits from the opening of the Epping to Chatswood Rail Line
- Improvements to the rail system's reliability and capacity
- A link constructed between the F3 and M2
- An upgrade of the M2
- Improvements to the bus system serving the sub-region through the implementation of better networks, additional capacity and additional bus priority measures



4. The Proposed Development

4.1 Development Proposal

The concept plan provides for the following development:

Mt Pleasant Precinct

- Increased aged care facilities including self care units and hostel expansion
- Medium density development for private and staff ownership

Coups Creek East Precinct

- Single lot and medium density housing
- Improved staff housing
- Expanded hospital services
- Increased number of professional consulting rooms
- Seniors' Living accommodation
- Kindergarten to Year 12 school
- Community centre
- Small retail shops to service the surrounding neighbourhood.

At this stage of planning the number of dwellings which would be occupied by staff of the Hospital and those which would not cannot be determined. Given a number of staff already live in close proximity to the Hospital and Church, it is likely this trend would continue into the future and they would occupy a reasonable proportion of the new housing.

The existing primary school would be relocated to the north of the estate and expanded to a K-Year 12 school. That is, an additional 570 students would be catered for equating to a total student population of 800 students.

Some of the existing 258 bed hostel which provides accommodation for staff would be demolished and replaced with apartments designed to suit student accommodation. Table 4.1 summarises a comparison of existing number of residential dwellings and the total number of dwellings proposed.

Table 4.1 – Proposed Residential Dwellings

Dwelling Type	Existing Number	Future Number	Difference
Mt Pleasant Precinct			
House / town house	30	34	+ 4
Studio / one bedroom units*	-	17	+ 17
Two / Three bedroom units	-	52	+ 52
Retirement / nursing home**	146	195	+ 49
Coups Creek East Precinct			
House / town house	48	42	- 6
Studio / one bedroom units*	258	446	+ 188
Two / Three bedroom units	-	386	+ 386
Retirement / nursing home**	30	30	0
Total	**512**	**1,202**	**690**

*Assumes hostel room is comparable with a studio unit

**Includes self care units and hostel rooms

A plan of the proposed masterplan is provided in **Figure 4**.

4.2 Vehicular Access

Mt Pleasant Precinct

A road connection is proposed from Mt Pleasant Avenue to Osborne Road to provide access to the traffic signals at Pennant Hills Road. Access to these traffic lights will enable safe right turn movements to and from Pennant Hills Road.

The existing break in the centre island of Pennant Hills Road at Mt Pleasant Avenue which allows right turn movements to and from Pennant Hills Road could be closed once the Osborne Road connection was made if deemed necessary by the RTA. However the intersection would still operate as a left in / left out arrangement so all Mt Pleasant Avenue traffic was not transferred to Osborne Road.

Coups Creek East Precinct

Development of lands on either side of Fox Valley Road would include a new internal road system. This would loop around the hospital and Church on the western side with connections to Fox Valley Road at each end. On the eastern side a new spine road would connect to Fox Valley Road at its northern end and to Comenarra Parkway at its southern end. This new internal road network would spread the increased traffic loads, alleviating pressure on site access points and at the intersection of Fox Valley Road with Comenarra Parkway. It would also provide improved bushfire protection for existing and proposed development.

A new dual lane roundabout would be provided on Fox Valley Road-Coups Creek Way intersection, providing access to the new access road at the northern end of the estate.

A new priority controlled intersection would be also provided on Comenarra Parkway-Ku-Ring-Gai Way intersection at the southern end of the spine road.

Fox Valley Road, between the Comenarra Parkway and the northern boundary of the site would be widened to accommodate two travel lanes in each direction. North of the estate, Fox Valley Road would include two lanes southbound up to the Pacific Highway.

On-street parking in Fox Valley Road along the frontage of the estate would be removed to provide two travel lanes in each direction. The removal may take the form of either peak hour parking restrictions or permanent restrictions and would be subject to negotiations with the RTA and Ku-ring-gai Council.

The existing secondary Hospital entrance would be converted to left in and left out only, given its close proximity to the intersection of Fox Valley Road and The Comenarra Parkway.

4.3 Car Sharing Proposal

The Church proposes to build on its already high car pooling practice and introduce an innovative car pooling system for staff, students and residents who will reside in the new residential community on the Estate. Cars would be booked in advance, in a similar manner to a number of schemes which currently operate within the Sydney metropolitan area (e.g. www.charterdrive.com.au).

A variety of car types will be provided to cater for different needs of new residents ranging from small cars, where only one person is using the car, up to people movers where residents can travel together in large groups, for example, for recreational trips.

The car pooling proposal would have the potential to reduce car usage by staff and hospital staff. As nurses and hospital staff work at different times throughout a 24 hour period depending on their shift, they have the opportunity to share vehicles, using them at different times of the day.

The proposal includes a condition of occupation / ownership that all residencies (excluding aged care) would pay a levy to support the car share scheme and provide capital for its operation[19]. Management fees and hire costs would be imposed on vehicle usage similar to existing schemes which operate in the Sydney metropolitan area.

The development proposes a car pooling provision of one vehicle per 6 dwellings with this subject to revision up or down once the scheme was operating and actual usage was established. This scheme will reduce the need for occupants to own individual cars and hence will allow reduced provision of parking spaces.

[19] *Car Sharing: An Overview* (The Department of Environment and Heritage, 2004) suggests that higher ratios may be sustainable and the number of car share vehicles may be reduced if it is demonstrated that a 1:4 ratio is too low. Any residual parking will revert to private parking associated with existing residential development.

4.4 Residential Parking Provision

4.4.1 Ku Ring Gai Council DCP 43

The following subsections compare the proposed parking provision with the Ku Ring Gai Council requirements. The DCP recommends the following parking provision for normal residential situations:

Dwelling Houses

- 2 spaces for single occupancy.

Dual Occupancy

- minimum 1 space per dwelling under 125sqm.
- 2 spaces per dwelling (dwellings >125sqm)

Medium Density

- 1 bedroom unit:- 1 space per unit
- 2 bedroom unit:- minimum multiple of 1.25 spaces per unit.
- 3 bedroom unit:- minimum multiple 1.5 spaces per unit.
- Visitor parking: 1 space per 4 units.

4.4.2 Proposed Residential Parking Provision

To reduce the traffic impacts of the proposed and having regard to the existing low journey to work private vehicle usage by persons who currently live in close proximity to the Hospital, the Concept Plan proposes the following parking provision for residential (non aged care) dwellings within the estate.

• Studio:-	1 space per 4 units	(not listed in DCP)
• 1 bedroom:-	1 space per 2 units	(50% reduction in DCP rate)
• 2 bedroom:-	1 space per unit	(25% reduction in DCP rate)
• 3 bedroom:-	1 space per unit	(50% reduction in DCP rate)
• Houses / Townhouses	2 spaces per dwelling	(No reduction in DCP rate)

The on site parking provision would be complimented by access to the car sharing scheme.

A comparison the proposed on site parking provision for residential dwellings and the DCP requirements for this precinct is provided in Table 4.2.

Table 4.2 – Comparison of Proposed Residential Parking Provision versus DCP Parking Requirements

Dwelling Type	Future Number	DCP Rate	DCP Parking Required	Proposed Rate	Proposed Parking Provision
Mt Pleasant Precinct					
House / town house	34	2 spaces per dwelling	68	2 spaces per dwelling	68
Studio / one bedroom units [1]	17	1 space per dwelling [2]	17	1 space per 4 units or 1 space per 2 units [3]	6
Two / Three bedroom units	52	1.25 spaces per dwelling or 1.5 spaces per dwelling [4]	72	1 space per unit [4]	52
Sub Total	**103**	**Sub Total**	**157**		**126**
Coups Creek East Precinct					
House / town house	42	2 spaces per dwelling	84	2 spaces per dwelling	84
Studio / one bedroom units [1]	446	1 space per dwelling [2]	446	1 space per 4 units or 1 space per 2 units [3]	140
Two / Three bedroom units	386	1.25 spaces per dwelling or 1.5 spaces per dwelling [4]	531	1 space per unit [4]	386
Car Pool Parking		---	---	1 vehicle per 6 dwellings	146
Sub Total	**874**	**Sub Total**	**1,061**		**756**
		Grand Total	**1,218**		**882**

(1)Assumes hostel room is comparable with a studio unit
(2) 1 bedroom parking rate has been applied to studio apartments
(3) Assumed 75/25 split between studio and one bedroom dwellings
(4) Assumed 50/50 split between two bedroom and three bedroom dwellings

It is noted that the DCP rates are blanket rates applied throughout Ku-Ring-Gai and thus it would be reasonable to vary them when non standard situations were to apply.

In this case the proposed parking provision for private vehicles is considered appropriate as:

- student nurses and junior medical staff would be less likely than other residents of Ku-ring-gai to own cars;
- the fact that most persons living in the accommodation would also work in the area would reduce the need to own a car; and
- the availability of the car sharing scheme would reduce the need to own a car or have a second car.

4.4.3 Visitor Parking

At this stage of planning it is proposed that visitor parking would be provided in the form of on site parking provision within car parks complimented by the availability of on street parking on the estate's internal road network. The proposal is to provide an overall visitor parking provision of 1 space per four units in accordance with Council's DCP.

4.5 Hospital Expansion

As stated previously, the parking needs of the Hospital expansion are the subject of a separate report undertaken by Parking Consultants International.

It is proposed that the needs of each development element be determined and met once a concrete proposal for it was formulated.

4.6 Aged Care / Commercial / Retail / Education Uses

4.6.1 Aged Care

SEPP Seniors Living is the applicable control in relation to parking for aged care. In accordance with this, it is proposed to provide parking for this component as follows:

- independent living not subsidised – 1 space per two bedrooms in each dwelling.
- independent living subsidised – 1 space per five homes
- hostels and nursing homes – 1 space per ten homes plus one space per 2 staff.

4.6.2 Commercial

DCP43 requires 1 space per 33sqm gross floor area plus 1 space for a resident manager or caretaker.

In this case a large proportion of the commercial development will provide ancillary services to the hospital and church operations. Accordingly many visits to these will be made by persons living or working in the area who would either not require parking or would park elsewhere (e.g. in the hospital car park).

In general, a parking rate of 1 space per 100m^2 is proposed for new commercial floorspace. The parking provided for existing commercial buildings will be maintained. Parking needs for each future commercial building will be considered having regard to its particular needs.

4.6.3 Retail

Similar to commercial development, the retail development is proposed to provide a strictly local service function and therefore will have a high proportion of walk in trade. In view of this, a parking provision rate of 3 spaces per 100m^2 is proposed, this being about one half of the 1 space per 17m^2 required in the Ku-Ring-Gai DCP.

4.7 Transport Demand

Estimates of incremental traffic generation produced by the proposed development are described in detail in 'Wahroonga Estate – Traffic and Transport Review Paper' (Masson Wilson Twiney, November, 2008). That analysis considers the following sources of additional traffic:

- Residential Component
- Hospital Expansion

- School Component
- Faculty of Nursing
- Commercial
- Retail

It then undertakes a distribution and assignment of this generated traffic and conducts detailed intersection modelling to assess impacts on performance and required intersection capacity upgrades to mitigate traffic impacts.

A number of features of the current and future use of the site lead to modest peak hour generation when compared with the overall scale of site activity. These include:

- shift work by staff,
- on-site staff accommodation,
- innovative car pooling arrangements,
- a diversity of site activity which is associated with multiple purpose trips to the one destination (e.g., Faculty of Nursing activities interact with clinical activities)
- a spread of admission times across the day and week for both inpatients and day patients

4.8 Implications of Staging

As noted in the traffic report, the traffic growth estimates for the Wahroonga Estate considered above covers development of the hospital up to 2020. An over-riding consideration of the staging process will be to maintain the ongoing effective function of the hospital.

The staging of the Concept Plan will mean that a number of temporary works and internal re-locations of activities will be required, as replacement facilities are constructed and, in some places, where old facilities are to be demolished. This is likely to result in temporary amendments to the onsite movement network, prior to the construction of the ultimate movement networks.

Therefore, care will be required to develop a legible and easy to follow signage system to maintain efficient vehicular and pedestrian movement within the site. It would be expected that this would need to be supported through additional information provided in advance to regular users of the site.

In terms of capacity implications for the surrounding movement networks, it is likely that the overall transport demand of the site will increase incrementally, broadly in line with the underlying projected growth rate of 4% per annum as noted in the traffic report. However, due to the discrete nature of expansion projects, it is likely that activity and actual services may initially ramp-up at a slower rate than the 4% per annum estimate, and then 'catch-up' as facilities are largely completed.

There are likely to be temporary relocations of building access points.

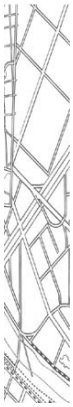
These matters and more detailed assessments of access, traffic network performance, transport system function, car parking arrangements and similar, will be required through the detailed planning and assessment process. These will need to be responsive to the requirements of the actual staging processes. They will also need to be co-ordinated with transport operators (e.g., with the bus operator and MoT, as well as Council, should works require the temporary relocation of bus stops) and road network authorities (Council and RTA).

Given the long term duration of the concept plan and the exact details of staging works will vary depending on medical technology, funding availability and decisions of changing management teams over time, it is not possible to undertake quantitative analysis of the transport effects of specific development stages.

4.9 Construction Management Plan

It is expected that a detailed construction management plan would be required to be prepared as a condition of development consent for each significant development project. This will need to take account of transport implications of:

- Construction traffic access requirements
- Temporary parking provision for construction contractors and staff
- Other related matters



5. Implications of Proposed Development for Transport Services: TMAP

5.1 Introduction

The overall transport outcome of the Masterplan will reflect how activities on the site develop over the course of the plan as well as the delivery of regional and sub-regional transport system outcomes by the State, as discussed in Chapter 3 above. This chapter outlines the likely future situation for each mode and measures that require consideration at this stage of the planning process.

5.2 Road network

Implications for the road network in terms of capacity, traffic management and parking are described in 'Wahroonga Estate – Traffic and Transport Review Paper' (Masson Wilson Twiney, November, 2008).

5.3 Train

Across the Sydney region, CityRail provides a vital transport function, especially during the commuter peak periods to dense rail-served centres, such as the CBD and those on the lower North Shore. The network is currently subject to major capital works that aim to stabilise the system and improve its reliability. In addition, the Epping to Chatswood Rail Link and elements of the Clearways Program will expand system capacity.

The NSW Government is considering a number of ways of expanding system capacity. These include network augmentation as well as potential re-introduction of single deck rolling stock. In addition, the development of a Metro System, whilst recently curtailed, is still an active and funded program, which could at some stage expand again.

The benefits of these rail system improvements will be felt progressively. They are expected to support the State Government's targeted increase in the share of travel undertaken by transit. As SAH falls within the catchment of both the Main North and North Shore Rail Lines, including the improved accessibility afforded by the Epping to Chatswood Rail Line, sub-regional traffic conditions would be expected to benefit from the improved operation of the rail system. There may also be some modest flow-through to increased bus patronage.

5.4 Bus

5.4.1 Regular passenger services

Bus services in SAH's sub-region, like those across the rest of Sydney, will progressively benefit from improved network design and institutional reforms which will reduce barriers to efficient service delivery. Additional bus capacity will be provided through the Government's commitment to acquire 300 extra buses.

Existing bus services to SAH remain as part of the recent integrated network review.

Demand for buses in the vicinity of SAH is currently modest, and there is sufficient capacity on current services to deal with likely increases. Such increases in demand will be modest, largely because they are off an already low base. It should be noted that the improvements to the rail system are likely to boost bus use, as the total door-to-door total travel cost[20] of transit journeys should decline.

At some future stage, should demand increase substantially, there are a number of incremental options to increase service to SAH:

- Extension of some short trips on existing services so that they serve the SAH
- Additional trips at times of peak demand, should demand warrant it

The current bus routes, by linking SAH to the rail system, do provide a meaningful contribution to the transit accessibility of the site. Rt 589 also links through to the sub-regional centre of Hornsby.

Longer term improvements, undertaken as part of ongoing bus network reviews as part of service contracts with the Ministry of Transport, could consider through routing rt 573 at Turramurra Station into the residential catchment on the eastern side of the North Shore Line. Such an extension might be achieved through connecting rt 573 to an existing route east of Turramurra Station or, potentially, extending the current rt 573 itself through to St Ives or Wahroonga (north). The feasibility of amendments to route structures such as this, is expected to be largely informed by the degree of success enjoyed by the introduction of the Integrated Network Plan in early 2009; especially rt 575.

[20] This is known as the perceived generalised cost of a trip.

Joining rt 573 to 589 is also a possible option for future consideration. However, the requirement to serve the residential 'peninsula' along The Broadway (currently by rt 573) would remain. Such a large-scale deviation (with substantial back-tracking) to a through route may compromise the overall attractiveness of such a service, and is unlikely to contemplated further.

Measures to improve the attractiveness of existing bus services to SAH include the provision of a bus shelter on Fox Valley Road for southbound services. This offers the benefits of:

- Providing weather protection for passengers alighting from southbound services and the small number of passengers waiting to board these services
- Raising general awareness of bus services in the area.

5.4.2 School services

The proposed school is estimated to generate additional demand for bus services. While this could be partly met by available capacity on existing services, it is most likely that additional capacity will be required. Providing school transport links between the school and the rail network is a cost-effective approach to serving this market, especially where existing route services can be used.

Additional trips to serve the school peaks are likely to be required as the school is developed. It is recommended that SAH monitor the ongoing network review process undertaken by the Ministry of Transport in conjunction with the Contract Region 12's Operator, and entered into specific discussions as the detailed planning of the school proceeds.

5.4.3 Strategic Bus Corridor

At this stage there is no publicly announced plan for services to run the full length of Strategic Bus Corridor #7 (Hornsby to Macquarie Centre)[21]. However, existing services and the proposed Integrated Network Plan do provide service along this road, with a 'gap' (underserved section) between The Broadway and Kissing Point Road.

5.5 Bicycle

Cycle facilities in the sub-region are progressively being implemented by both Ku-Ring-Gai and Hornsby Councils. There are limited opportunities to extend the current network past SAH.

Nonetheless, it is anticipated that some staff may choose to ride to SAH. In which case, the Masterplan should make provision for facilities within the site; specifically:

- Secure bicycle parking
- Appropriate change room facilities for staff members

[21] The concept of strategic bus corridor network was not necessarily to have routes running the full length of the designated corridors: rather they provide a strategic framework for the bus network, and tend to support services that converge on major centres, such as Hornsby and Macquarie Centre.

5.6 On-Site Movement Networks

The Masterplan makes provision for improved on-site movement networks, largely through rationalisation of movement generators and the development of a hierarchy of facilities. It also achieves improvement through the construction of grade separated pedestrian connections and development of private pedestrian connections which will separate different classes of network users.

Consideration should be given to the development of a legible, safe and attractive pedestrian connection between Fox Valley Road and the Main Entrance node adjacent to the green space. Such a connection would provide a link for pedestrians and bus users to the main address and then connect into the re-vamped on-site movement network.

5.7 Information and Co-ordination

There is a body of opinion that indicates that comprehensive and easy to use information about transport alternatives can lead to reduced use of cars. This is the impulse behind the TravelSmart[22] approach to travel behaviour change.

TravelSmart programs entail a number of measures, of which the provision of individualised travel information (e.g., through the provision of journey planners) forms one. While these approaches are controversial, there is no doubt that the better the information given to market participants is, the better the market will function, all else being equal.

At present SAH provides useful travel information on its website for the use of visitors and patients. This describes its location and how to get there, with information about various modes, including links through to website of CityRail and Shorelink (the bus operator)[23].

Also, Shorelink has designated rt 589 as the 'SAN Link', providing useful information to potential bus users about the relevance of this service to a journey to SAH.

The following are potential opportunities for the provision of additional information about travel choices:

- Production of a standard sheet (e.g., in portable document format) of basic travel information that could be readily emailed to patients with their booking confirmation (as a matter of course). The sheet could also be provided to new and prospective employees, as part of their general information package.

[22] Refer to www.travelsmart.gov.au
[23] Refer to http://www.sah.org.au/about.find.asp

- Additional signage at Thornleigh and Turramurra Stations advising train passengers that this is the station to alight at for SAN. Similarly, signage measures to direct passengers to relevant bus stops for buses to the SAN. This will require discussion and agreement from the transport operators, local councils and respective bus shelter contractors (if applicable).

5.8 Car Parking

The hospital already charges visitors and patients to park in the hospital car park. This gives an important price signal which encourages these groups to consider other transport before electing to travel by car. Such consideration may also result in further car sharing to increase vehicle occupancy and reduce traffic generation.

5.9 Car Pooling and Car Sharing

Because of the commonality of interest between the Adventist Church and the hospital, the hospital has been successful in getting staff to car pool. This is particularly effective in relation to staff living on the Central Coast. The Hospital is committed to the continuation of its efforts to facilitate car pooling.

As mentioned above it is proposed to operate a resident funded car sharing scheme for persons living in hospital accommodation. This will reduce car ownership and give residents cause to think whether they really need to travel by car on a particular trip.

5.10 On Site Staff Accommodation

The final important factor which will minimise car usage is that as with existing dwellings surrounding the hospital, a number of the new dwellings are likely to be occupied by staff from within the Estate. It also proposes local shops and other services to serve these residents and staff in general. These will reduce the extent of motorised travel related to the hospital and staff.

5.11 Mode Spit Targets

5.11.1 Hospital Patients and School

The travel components that are most amenable to travel mode change are those related to resident and employee travel. In the case of a hospital it is difficult to influence patient travel because of the special circumstances and anxieties related to patient movement.

Similarly for the school, it is difficult to set specific travel mode targets because these will most be influenced by the number that live or whose parents work locally. The community of interest amongst the Seventh Day Adventist is such that inevitably a significant number will work and live locally. However it is not possible to quantity this effect without a degree of speculation.

5.11.2 Residents

In the case of new residents it is expected that a large number of these will work locally. Of the workforce living in the 568 new dwellings it is anticipated that at least 70% would work locally as follows:

- Studio/one bedroom (188) – 90%, mostly hospital workers (assume 188 are employed).
- Two/three bedroom (380) – 60%, some spouses and some occupants would not work at the hospital (assume 570 occupants are employed).
- Combined total working locally = 70%

As indicated above in Table 2.5, at present about 30% of persons commuting from the local area (Zone 2558) travel by public transport or non motorised ("other") means. 70% travel by car.

The change to at least 70% working locally and thus not travelling by car represents a very significant improvement in terms of travel management aspirations.

5.11.3 Employees

Table 2.6 above indicates that at present about 87% of commuters to the area travel by car. 10% travel by other modes (walk, cycle etc.) which is high by Sydney suburban standards.

Through the use of the following measures it is anticipated that car usage for employee commuting to the hospital would reduce from about 87% to 80%:

- Changing for on-site car parking;
- Car pooling initiatives;
- On-site staff accommodation; and
- Improvement to local bus service frequencies through increased passenger demand.

The achievement of an 8% reduction in car usage by employees represents a very good outcome when the needs of hospital shift workers to start or finish work at either 10:00 or 11:00pm or 5:00am is taken into account.

6. Conclusions and Recommendations

This report has described the unique features of the SAH's current operation and its transport situation. These features include:

- Trip containment within the site, through provision of on-site staff accommodation and the provision of diverse but related activities.
- A temporally dispersed profile of traffic generation, which results from a combination of shift work and a spread of activity through the day and week.
- A site that sits on existing transit networks.
- Car parking that is subject to a charging regime.

Analysis of the strategic context in which the SAH sits identifies several themes of direct relevance to this project, including:

- Likely benefit to the sub-region that is expected to accrue from the imminent opening of the Epping to Chatswood Rail Link. This is the largest rail network development to be implemented in around a decade.
- Implementation of an Integrated Network Plan for bus services in Contract Region 12, due to commence in 2009, probably to coincide with the opening of the Epping to Chatswood Rail Link.
- The potential for further transport benefits to accrue from improved overall CityRail capacity.
- Upgrades to the strategic road network through the development of a link between the M2 and F3; likely additional east-west capacity on the M2; and additional capacity on the F3.
- There is also projected to be on-going population growth in the sub-region.

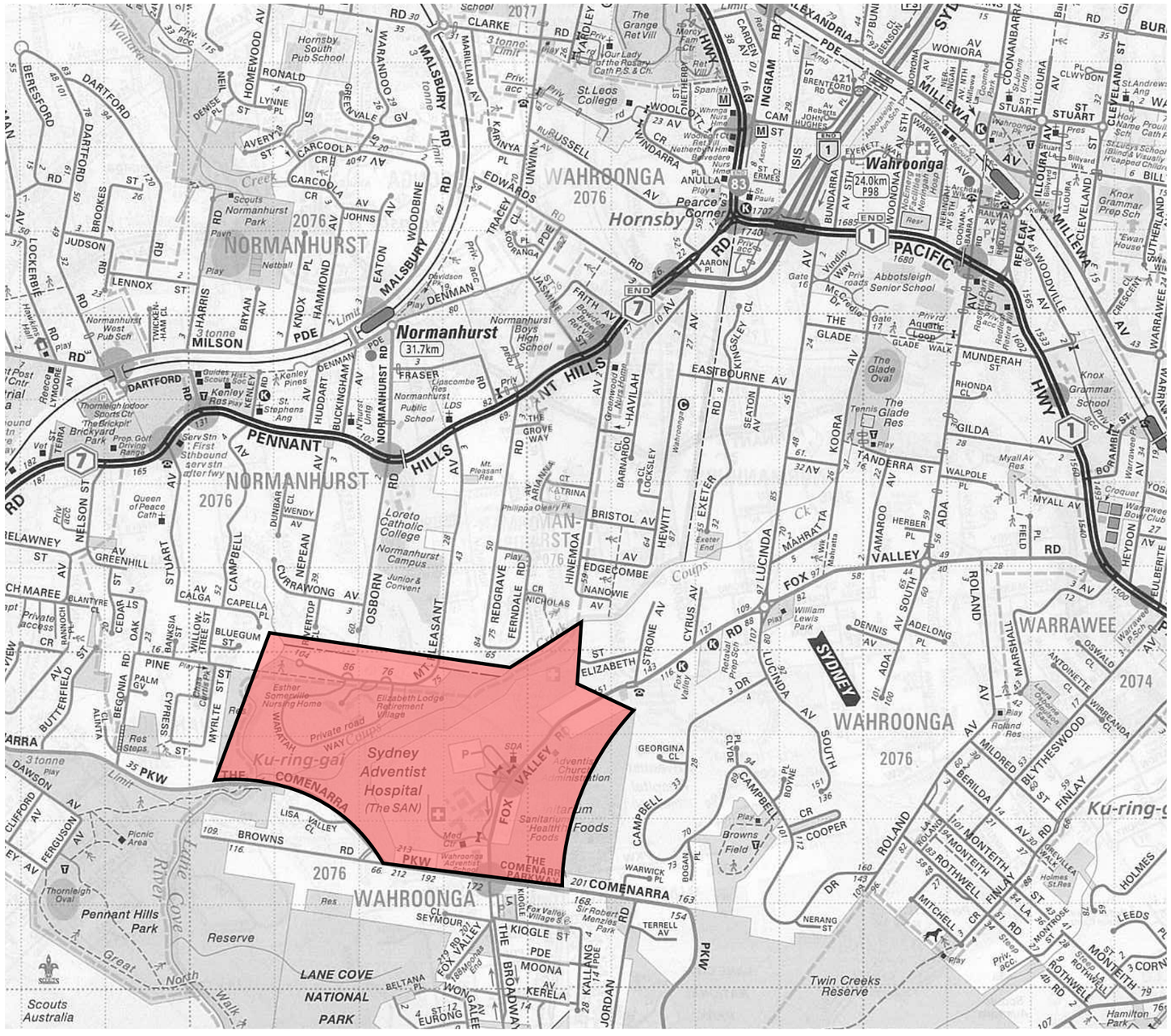
A number of measures are proposed that will facilitate site access by non-car modes. These include in particular an innovative car share scheme, significant on-site employee accommodation, car pooling initiatives and improved public transport access.

It is recommended that this TMAP be discussed and further developed with relevant transport agencies through the planning process.

SITE LOCATION

WAHROONGA ESTATE MASTERPLAN

North



Key

Site Location

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Figure 1

Filename: 073380di11.ai

Date: 22 May 2007

EXISTING ON-SITE USES

SYDNEY ADVENTIST HOSPITAL MASTERPLAN

KEY

1. Clinical Services Building
2. Tower Block : *Built 1973*
3. Maternity Building : *Original built 1933*
   Extension 1990
4. Services Building
5. Shannon Building : *Built 1920*
6. SAH Foundation Building
7. Merrit Kellog Museum : *Built 1915*
8. Maintenance and Engineering
9. Information Services / Bio-Medical Engineering
10. Child Care Centre
11. Nurse's Residence : *Original built 1952, Extension 1971*
12. Fox Valley Medical and Dental Centre : *Built 1971*
13. Staff Amenities
14. Linen Building
15. Jacaranda Lodge : *Built 1993*
16. SAN Clinic 1 : *Built 2002-04*
17. Fox Valley Community Centre : *Built 2002*
18. Seventh-day Adventist Church : *Built 1958*
19. Estate Houses
20. Adventist Administration Building: *Original built 1911*
21. Media Centre
22. Estate Residential
23. Estate Residential
24. Shopping Centre
25. Wahroonga Adventist School
26. Estate Houses

BVN

EXISTING PUBLIC TRANSPORT OPERATIONS

WAHROONGA ESTATE MASTERPLAN

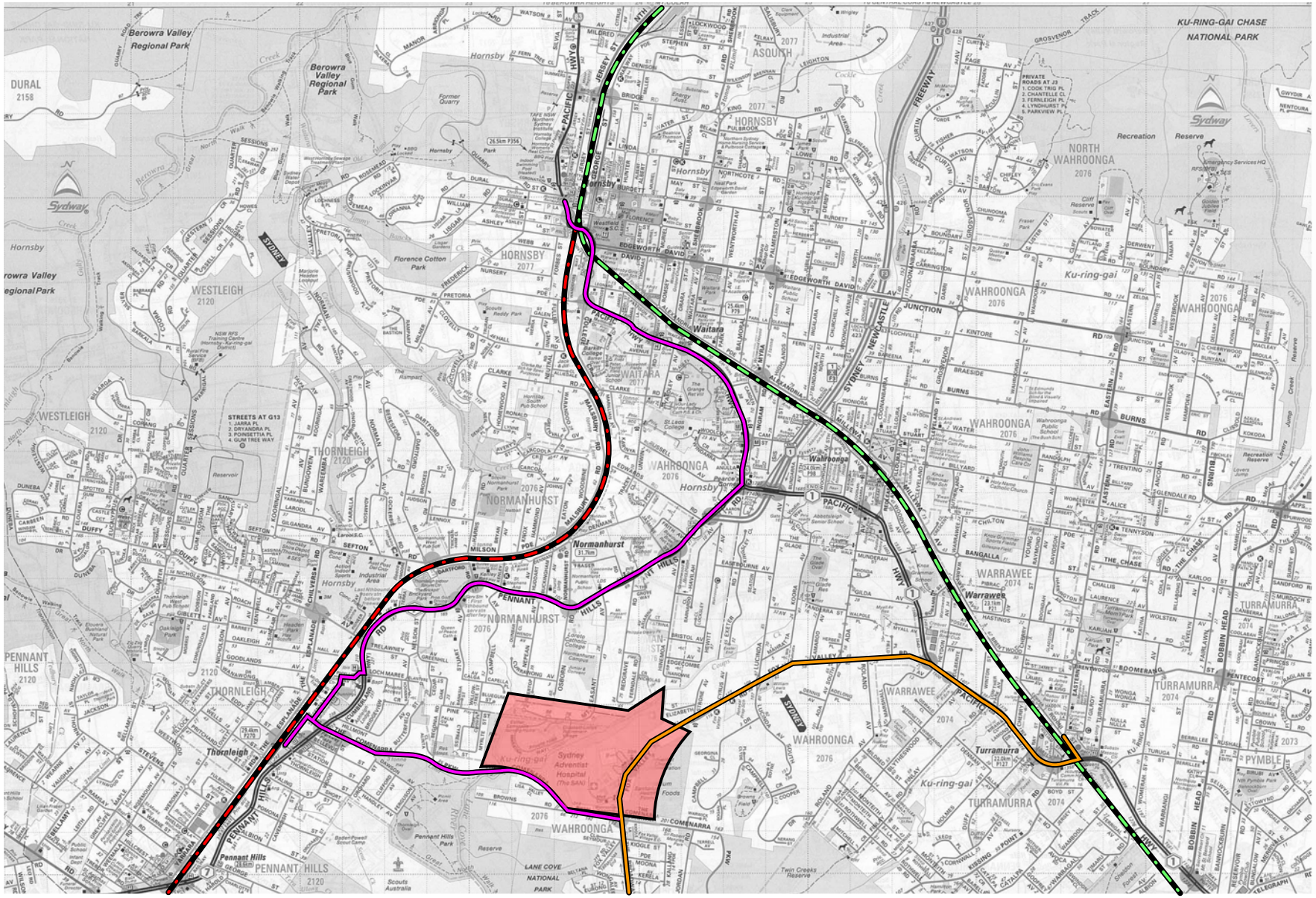

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Figure 3

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Date: 22 May 2007

PLAN OF PROPOSED DEVELOPMENT

WAHROONGA ESTATE MASTERPLAN

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Figure 4

Filename: 073380di19.ai

Date: 22 May 2007