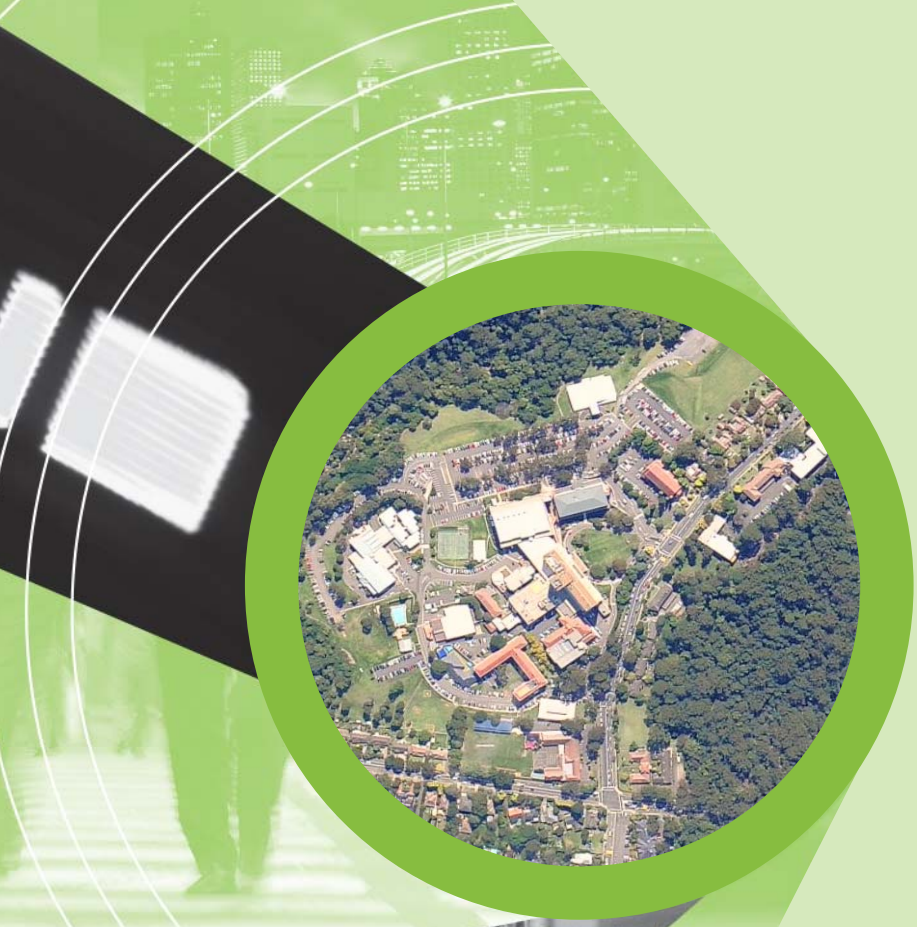


Sydney Adventist Hospital
Wahroonga
Sustainable Transport Initiative

GTAconsultants

Sydney Adventist Hospital Wahroonga

Sustainable Transport Initiative

Client: Site Image
Reference: IS12490
GTA Consultants Office: Sydney

Quality Record

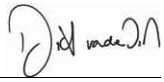
Issue	Date	Description	Prepared By	Checked By	Approved By
A	14/07/10	Final	Rhys Hazell	Dick van den Dool	

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Table of Contents

Tables

1. Introduction

1.1 Background

The following sustainable transport initiative has been prepared subsequent to the Director-General's Environmental Assessment requirements for the Sydney Adventist Hospital – Staged Alterations and Additions at 185 Fox Valley Road, Wahroonga. The Roads and Traffic Authority (RTA) also recommends that the transport and traffic impact assessment include the potential for a sustainable transport initiative.

This sustainable transport initiative identifies ways in which Sydney Adventist Hospital would be able to better manage the transport needs of visitors and staff by targeting a reduction in the environmental impact of travel in association with the site. This is achieved by compiling a list of strategies aimed at encouraging walking, cycling, public transport and car sharing for travel to and from the site and a shift away from the reliance on single occupant vehicle travel.

1.2 Purpose of This Report

The overall aim of sustainable transport initiatives is to limit the number of single-occupancy vehicle journeys for travel to and from the Sydney Adventist Hospital.

The following principle objectives have been identified to achieve the overall aim:

i To limit the overall number of staff vehicle trips.
ii To manage the demand for on-site car parking.
iii To limit the level of car travel to the site by visitors.
iv To encourage the use of public transport, walking and cycling by staff travelling to work.
v To encourage the use of internal shared pathways by staff, visitors and patients alike.

This report identifies current opportunities for sustainable transport and sets out the recommended initiatives that have the potential to be developed and implemented to achieve these objectives.

1.3 Referenced Documents

In preparing this report, reference has been drawn from a number of background sources, including:

- NSW State Plan 2010
- Metropolitan Transport Plan – Connecting the City of Cities
- NSW Planning Guidelines for Walking and Cycling
- Integrated Land Use and Transport policy package
- NSW Bike Plan – May 2010
- Wahroonga Estate Environmental Assessment
- an inspection of the site and its surrounds.

2. Existing Conditions

2.1 Subject Site

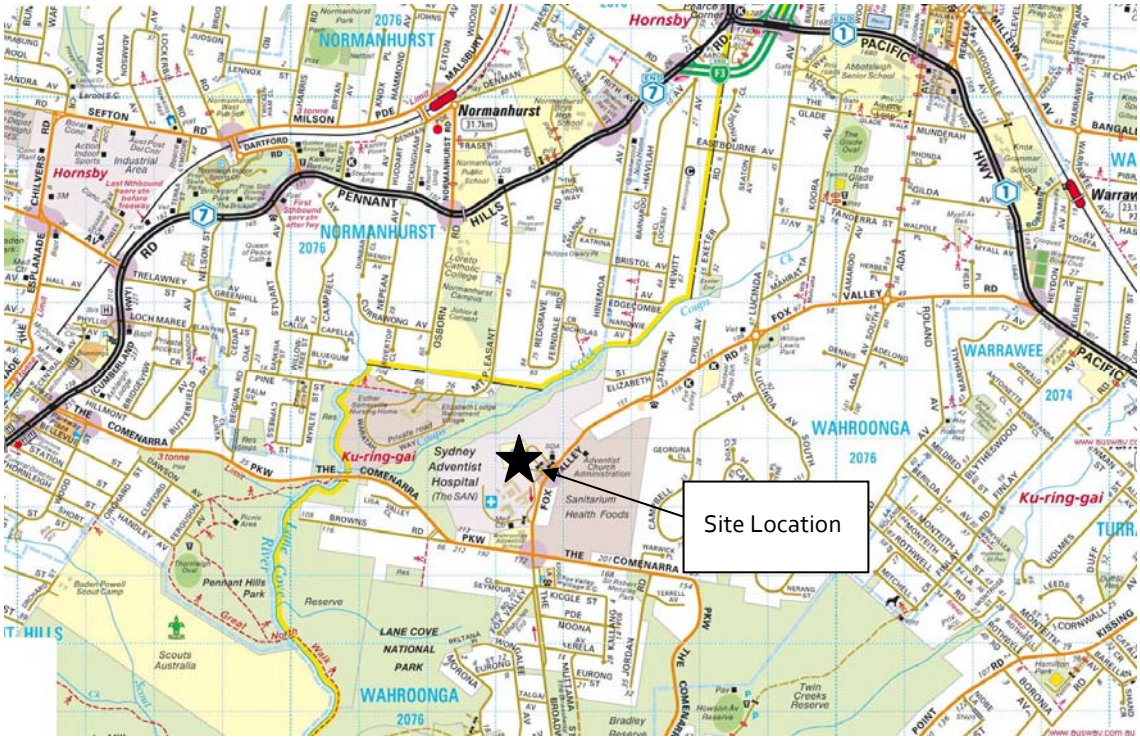
The Sydney Adventist Hospital is located at 185 Fox Valley Road, Wahroonga. The site is predominantly surrounded by residential development to the east and south with native vegetation bounding the site to the north and west. Other land uses in the vicinity of the site include Fox Valley Village Shopping Centre south of the site on the corner of Fox Valley Road and The Comenarra Parkway with Loreto Normanhurst located north of the site on Pennant Hills Road. The site is located in Ku-Ring-Gai Council within the Special Uses 1A zone.

It is proposed to redevelop components of the Sydney Adventist Hospital by means of alterations and additions to the current structure. Additional floor space and formal car parking with associated set-down and pick-up operations and pedestrian facilities are part of the proposal.

The location of the site and the surrounding environs is shown in Figure 2.1.

A site visit was conducted on 22 June 2010 to identify site constraints and opportunities. Photos are included in Appendix C.

Figure 2.1: Subject Site and its Environs



2.2 Public Transport

2.2.1 Bus

The Sydney Adventist Hospital is serviced moderately well by existing bus services. Local bus services are provided by Shorelink Bus Services and generally connect the site with train services in Turramurra, Thornleigh and Hornsby. Bus routes and their proximity to the site are shown in Figure 2.2 with a summary of these bus services and typical peak frequencies provided in Table 2.1.

Travel by bus is more desirable when origins and destinations are located within 400m walking distance of a bus stop, which equates to a five minute walk. Existing bus service route 573 travels directly past the site with a bus shelter and additional seating located adjacent to the site access and a bus stop opposite the site on the east side of Fox Valley Road. Pedestrian crossings are provided on all approaches to the signalised intersection of Fox Valley Road and the site access.

In addition to the above, *Sanlink* route 589 provides a bus service that enters the hospital grounds circulating via the main porte cochere and exiting to Fox Valley Road.

Shorelink Bus Services has recently reviewed their network services concluding that the above bus services are well utilised with no variation in frequency required.

Figure 2.2: Existing Bus Services

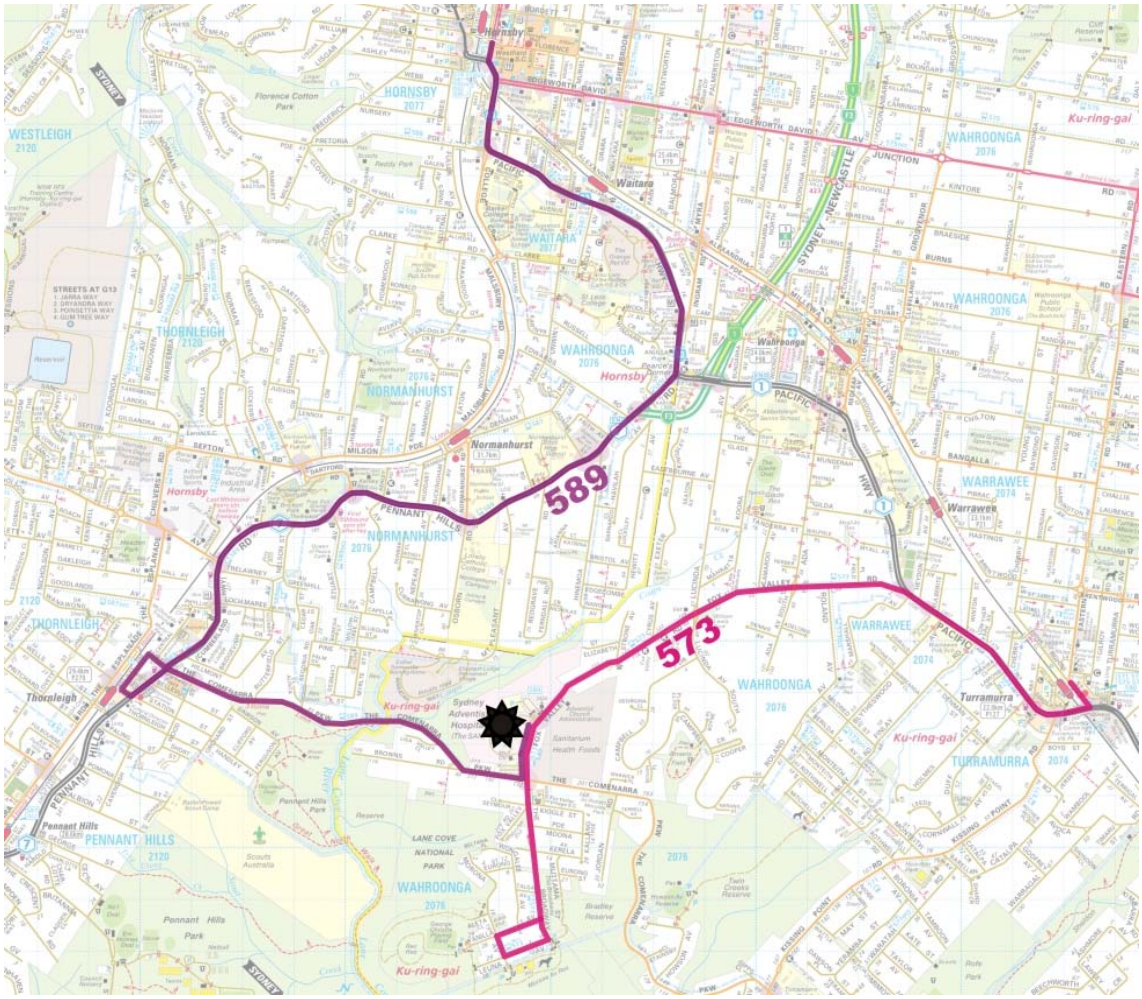


Table 2.1: Bus Route Details and Peak Frequencies as at June 2010

Route No.	Route Details	Time of Operation	Peak Period Frequency (mins)
573	Turramurra to South Turramurra via Fox Valley Road (Shorelink Bus Services)	Mon-Fri: 6:15am – 8:30pm Sat: 9:02am – 6:02pm Sun: 10:02am – 6:02pm	15-25 mins
	South Turramurra to Turramurra via Fox Valley Road (Shorelink Bus Services)	Mon-Fri: 6:08am – 8:23pm Sat: 8:56am – 5:56pm Sun: 9:56am – 5:56pm	15-25 mins
589	Hornsby to Sydney Adventist Hospital via Normanhurst and Thornleigh (Sanlink)	Mon-Fri: 6:55am – 5:42pm	60 mins
	Sydney Adventist Hospital to Hornsby via Thornleigh and Normanhurst (Sanlink)	Mon-Fri: 6:55am – 5:45pm	60 mins

2.2.2 Rail

Warrawee Railway Station is located approximately 2.5km walking distance east of the site via Fox Valley Road, Pacific Highway and Heydon Avenue. Thornleigh Railway Station is located approximately 2.5km walking distance west of the site via The Comenarra Parkway and Railway Parade. Normanhurst Railway Station is located approximately 1.9km walking distance north of the site via a dedicated pathway, Mount Pleasant Avenue and Normanhurst Road.

Typically, travel by train is maximised when origins and destinations are located within 800m walking distance of a station, which equates to a ten minute walk. However, the bus services outlined earlier combine to provide adequate access to rail services on the North Shore Line and the Northern Line. A summary of the rail services provided are included in Table 2.2.

Table 2.2: Rail Services as at June 2010

Rail Line	Station	Peak	Services Details	Peak Period Frequency (mins)
North Shore Line	Turramurra	AM	Turramurra to Hornsby	5-15 mins
			Turramurra to Parramatta via City	5-15 mins
		PM	Turramurra to Hornsby	5-15 mins
			Turramurra to Parramatta via City	5-15 mins
Northern Line	Thornleigh, Normanhurst	AM	Thornleigh & Normanhurst to Hornsby	15-20 mins
			Thornleigh & Normanhurst to City via Macquarie Park	15 mins
		PM	Thornleigh & Normanhurst to Hornsby	15 mins
			Thornleigh & Normanhurst to City via Macquarie Park	15-20 mins

2.3 Pedestrians and Cyclists

Sealed pedestrian footpaths are available within the grounds and within the vicinity of the Sydney Adventist Hospital. The pedestrian network includes both sides of Fox Valley Road, the southern side of The Comenarra Parkway and the eastern side of Lucinda Avenue. A dedicated sealed footpath also leads north through the valley linking the site with Elizabeth Lodge Retirement Village and Mt Pleasant Avenue sealed footpath.

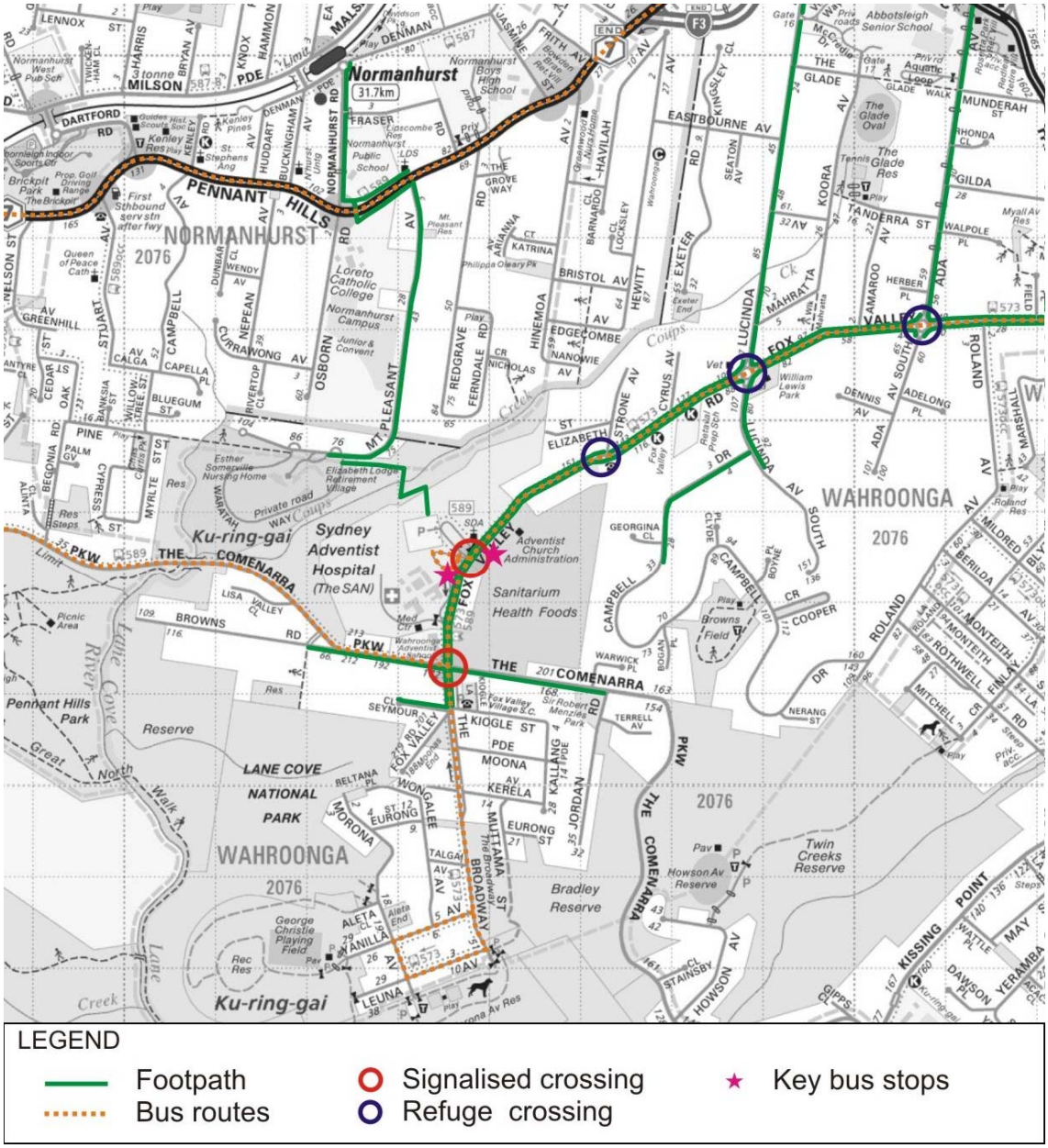
Pedestrian crossings are provided at the signalised intersections of Fox Valley Road with the site access and The Comenarra Parkway, linking the site with Fox Valley Village Shopping Centre. A marked pedestrian crossing with refuge is provided at the intersection of Fox Valley Road and Strone Avenue with refuge crossings and/or kerb ramps provided at the roundabout intersections of Fox Valley Road with Lucinda

Avenue and Ada Avenue. A pedestrian bridge over Pennant Hills Road north of the site also provides safe and convenient access to Normanhurst Railway Station.

Ku-Ring-Gai Council Cycleway Network 2006 shows that existing cycling facilities in the vicinity of the site are limited. However, Fox Valley Road generally provides a wide carriageway with one traffic lane and one parking lane in each direction in the vicinity of the site allowing cyclists the ability to use Fox Valley Road in a comparatively safe and convenient manner. The Comenarra Parkway also provides a partly sufficient verge varying in width between 1.5m to 2.5m to the west of the site.

Details of the site and proximity to public transport services and pedestrian facilities are shown in Figure 2.3.

Figure 2.3: Public Transport and Pedestrian Facilities



3. Broader Context

3.1 State Government

The NSW State Plan 2010 aims to improve the liveability of cities and considers transport a key component in achieving desired outcomes. The objectives of the plan for the Sydney Metropolitan Region include aiming towards increasing proportional total journey to work by public transport means to 28% by 2016, increasing bicycle trip mode share to 5% by 2016 and reducing overall journey to work times by public transport.

3.2 Council

Ku-Ring-Gai Council released its Sustainability Vision Report to address 25 years of planning to 2033. Significant community consultation contributed to a range of social, environmental and economic concerns that are consistent with State Government policies.

The cycleway network map was released in September 2006 and details existing and proposed cycle routes. Council is currently working towards expanding the cycleway network and incorporating it into a broader sustainable transport framework with no indication as yet of route planning. However it is council's general opinion that the scale of the Wahroonga Estate Redevelopment will ensure consideration in providing an appropriate cycleway serving Fox Valley Road catering for staff and residents alike.

3.3 The Wahroonga Estate Redevelopment

The Wahroonga Estate includes the Sydney Adventist Hospital precinct incorporating educational, medical and community facilities, churches, a primary school, retirement village and staff housing. A concept plan and Environmental Assessment has been prepared by Urbis Pty Ltd and involves the complete redevelopment of the estate. The key aspects of the redevelopment include:

- Strengthening its reputation as a sustainable living and working community
- Providing cost effective housing for staff and students
- An innovative car sharing scheme to lessen the environmental impact
- Reinforce its reputation as an employment hub in north west Sydney.

The aims and objectives of the broader Wahroonga Estate Redevelopment remain of importance when considering sustainable transport initiatives for the Sydney Adventist Hospital.

3.4 Green Star

Green Star is a comprehensive voluntary environmental rating system that has been developed by the Green Building Council of Australia to evaluate sustainable planning, building design and construction. In June 2009 the Green Star – Healthcare V1 tool was released and has since contributed to cost savings, improved design standards, patient health outcomes and staff working conditions. Formal certification and recognition for green leadership requires a 4 star rating or above.

The Green Star Healthcare V1 ratings tool has eight categories for assessment. These include management, indoor environment quality (IEQ), energy, transport, water, materials, land use and ecology, and emissions. Energy has the highest weighting with 24 percent of points available, followed by IEQ with 20 percent and then water 12 to 15 percent depending in State the facility is located[1].

[1] Lynne Blundell, 28 June 2010. Healthcare – the job of turning around the massive energy ship begins. www.thefifthestate.com.au/archives/13569

In terms of the transport component, the Green Star Healthcare V1 Tool includes the following requirements:

- Developments that limit car parking facilities
- Development that facilitates the use of fuel efficient vehicles
- Building design that promotes bicycle use
- Developments that facilitate the use of mass transport
- Site design that promotes low environmental impact transport modes.

In addition, experience with the Green Star program has identified that hospital design must increasingly take into account the reduction of travel distances for staff within the buildings, which is vital for staff wellbeing and productivity.

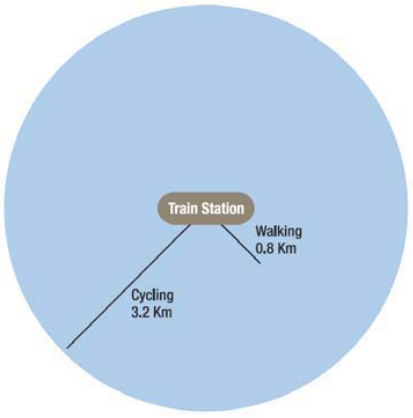
3.5 General Principles

Sustainable transport initiatives clearly offer a number of benefits to the individual and wider community. These may include but are not limited to:

- Health improvements
- Improved workplace productivity
- Reduced fuel expenses associated with private car use
- Environmental benefits
- Reduced parking costs for employers
- An interactive living/working community.

Cycling for example can offer a viable alternative to private car use even for journeys over substantial distances. When combined with public transport through promoting railway station access by cycling, each railway station is able to increase its catchment area as demonstrated in Figure 3.1 and highlighted over the broad Sydney context in Figure 3.2.

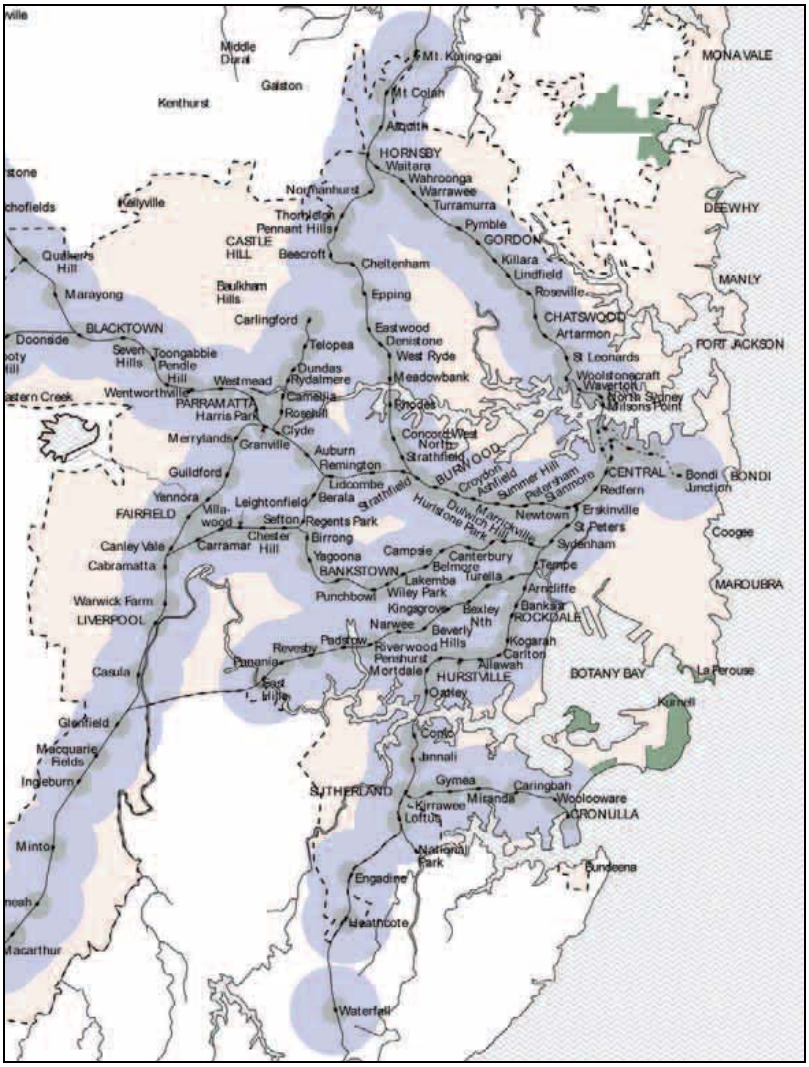
Figure 3.1: Potential Catchment Increase from Cycling



	Average Speed	Distance Covered	Catchment Area
Walking	5 Km/h	0.8 Km	2 Km^2
Cycling	20 Km/h	3.2 Km	32 Km^2

Source: Cycling Promotion Fund, 2007

Figure 3.2: Walking and Cycling Catchments around Sydney Railway Stations



Source: NSW Planning Guidelines for Walking and Cycling, 2004

When planning sustainable transport options careful consideration needs to be given to factors that may affect the level of use. For example, the implicit provision for walkers and cyclists include:

- Security and Safety
- Visibility
- Shelter
- Convenience
- Signage.

When allowing for bicycle parking and storage solutions many factors require consideration, specifically matters surrounding security, visibility and convenience. Ease of use with the ability to safely store helmets and equipment has regularly been cited as key considerations. Bicycle parking also provides an opportunity to add not just a functional, but also a sculptural element in any design process.

Examples of bicycle parking shelters and storage solutions are shown in Figures 3.3 to 3.8. Bicycle parking is around 10 times more space efficient than parking and minimising the provision of car parking can act as an important travel demand management tool, encouraging the uptake of sustainable forms of transport to and from railway stations and the workplace.

Figure 3.3: Bike Arc, Bicycle Parking Design

Source: greenlaunches.com

Figure 3.4: Bike Arc, Bicycle Parking Design

Figure 3.5: Secure Bicycle Parking, Perth

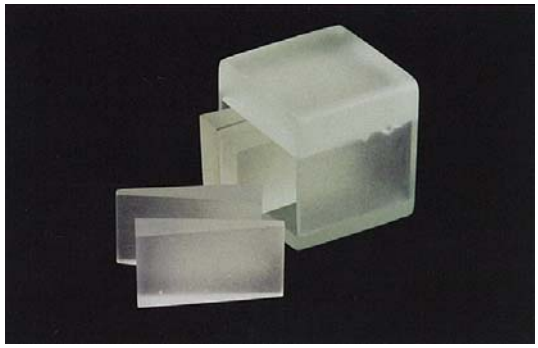
Photo: Jim Krynen (PTA WA)

Figure 3.6: Secure Bicycle Parking, Perth

Figure 3.7: The Wedge Bike Rack

Source: Cesar Cueva and Lisa-Maree Carrigan, Design a Bike Rack

Figure 3.8: The Cube Bike Storage



In addition to the above, the Penny Farthings company provide creative solutions to environmental and social issues through innovative design. One particular innovative bike storage facility that can be integrated into indoor and outdoor use is The Green Pod. Figures 3.9 and 3.10 display its potential.

The Green Pod is the size of a car park and comes in two configurations:

- 1 Shower, 1 Change Room, 10 Bicycles, 10 Lockers
- 2 Showers, 2 Change Rooms, 28 Lockers, 28 bicycles.

The Green Pod has been designed to be powered by solar panels and includes a solar hot water system, electronic locking system, LED lighting activated by motion sensors, a grey water treatment unit, timed showers and a self cleaning mechanism. It is of a high quality sustainable construction with low establishment and operational costs that encourage sustainable lifestyles.

In addition to The Green Pod, Figures 3.11 and 3.12 are further examples of bicycle parking facilities and the potential for practical bike parking solutions through innovative design.

Figure 3.9: The Green Pod

Figure 3.10: The Green Pod

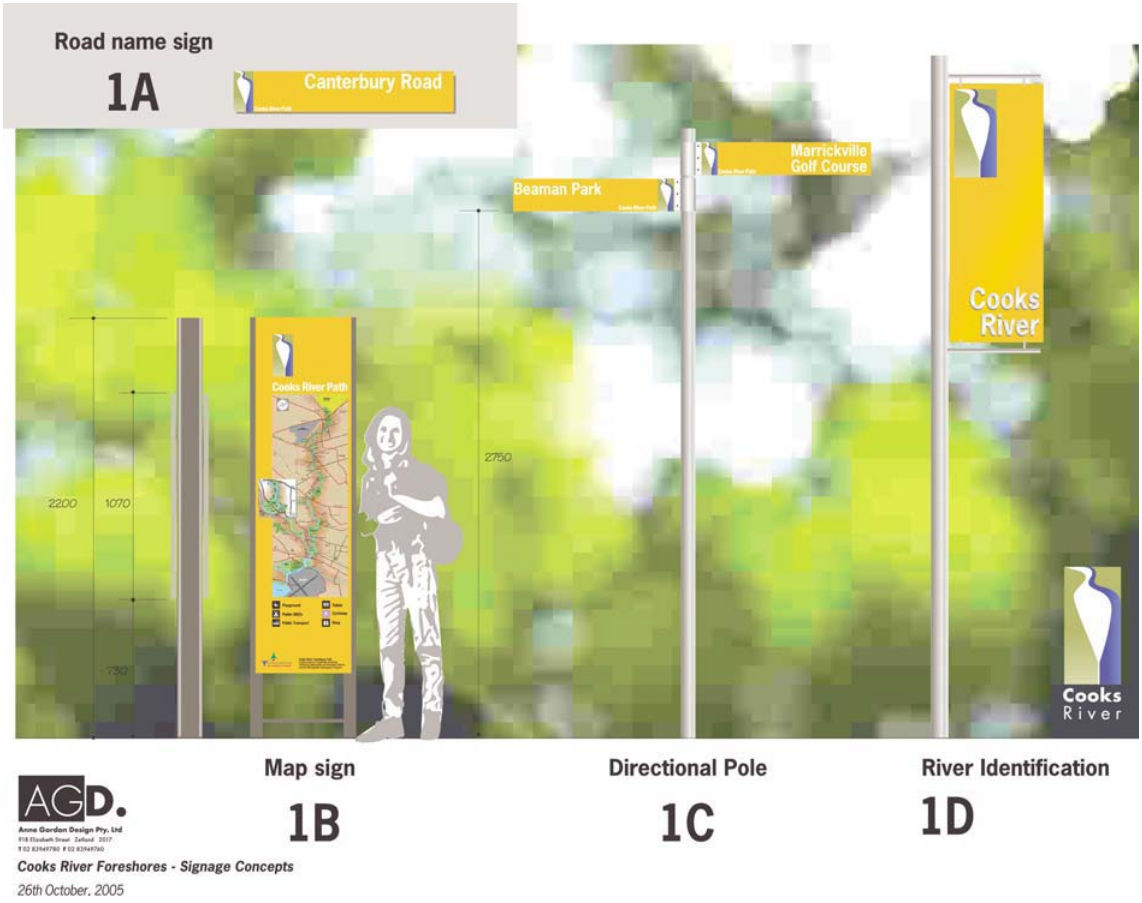
Figure 3.11: The Pushbike Tree

Figure 3.12: Penny Farthing Bike Rack

Source: pushbikeparking.com

Appropriate signage is also important when designing walking/bicycle paths and allows the user to interact further with their surroundings. An example is included in Figure 3.13 below.

Figure 3.13: Signage Design



Source: Anne Gordon Design Pty Ltd

4. Opportunities

4.1 Matters Affecting Mode Choice

People's behaviour will always be influenced by individual circumstances and preferences. Offering alternatives to driving ideally requires equal provision for all sustainable modes (walk, cycle, bus, train, ride share, etc). This can be problematic given the number of agencies with responsibility for the network and the characteristics of each mode. Hospitals can also prove challenging as they operate outside of peak times of the week which requires support from public transport authorities to provide additional services during off-peak hours.

Staff car use varies with factors such as income, age and travel distance. In locations such as town centres, where services are readily accessible by walking and cycling, public transport tends to provide relatively good levels of service with the need for a car tending to be lowest. As noted earlier the Sydney Adventist Hospital, while located within walking catchment for bus and subsequent rail facilities, would present challenges in terms of encouraging appropriate sustainable mode choices. Also a constraint is security for staff walking to public transport facilities at night after finishing a shift.

Although sustainable transport initiatives typically target staff, there is scope to encourage visitors to also use alternative forms of transport. However this needs to overcome individual preference for the comfort and convenience of cars.

In order to encourage a modal shift various initiatives are required. The Sydney Adventist Hospital would need to address both the issues and initiatives in order to deliver sustainable options which successfully encourage the take up and long term use of alternatives to single occupant driving by staff and by visitors. It is noted that implementing sustainable transport initiatives with related marketing may be successful in convincing people to trial sustainable modes. However, without continued support and review people will revert to driving as a result of specific personal circumstances.

4.2 Sustainable Transport Options

Typically transport targets are set in order to determine the effect of initiatives in reducing private car usage. Targets are generally set in the context of an existing workforce whose demographics and travel characteristics are already known. An access plan would need to be developed to firstly understand the travel habits of staff and visitors. This enables any access plan to provide appropriate services in areas where they are needed most. It is also important to have realistic objectives. A feasible aim for the site may be to achieve a 10% reduction in vehicle trips to the site over a 3 year period.

The responsibility for co-ordination and implementation of an access plan would be internal to the Sydney Adventist Hospital. Duties would include administration of the before and after travel surveys, collating suggestions from staff and visitors, managing staff car pooling and parking areas, co-ordination with Council, RTA and public transport authorities and maintenance of facilities (e.g. showers, change rooms, bicycle parking, etc).

In order to understand existing facilities and future opportunities, concept plans have been included in the Appendix attached to this report. Appendix A illustrates the existing internal pedestrian links and the on-street facilities within the vicinity of the site.

The concept plan included as Appendix B shows the potential to build on the existing pedestrian network and establish a bicycle network by providing a perimeter shared pathway for staff, visitor and patient use. This shared pathway may include cover in limited areas for weather protection, lighting, seating and exercise

equipment with appropriate width and grades to allow for practical regular use and wheelchair access. Potential links to the road network have also been identified with particular opportunities for bike access via The Comenarra Parkway south-west of the site. The concept plan includes potential locations for shared car spaces and bike parking and facilities such as The Green Pod as discussed earlier in this report. Convenience and accessibility are primary considerations when implementing sustainable transport options and can have a profound impact on user take up. The broader initiatives highlighted by the Wahroonga Estate Redevelopment have been considered when devising this concept plan.

A number of broad sustainable transport initiatives that would have merit in relation to the Sydney Adventist Hospital have been considered and are discussed below.

4.2.1 Public Transport

As discussed earlier, the Sydney Adventist Hospital is currently served moderately well by bus services provided by Shorelink Bus Services. The proposed alterations and additions to the hospital and the broader Wahroonga Estate redevelopment together with further initiatives encouraging public transport use could see positive consultation with the provider to expand these services. For example, services timed to coincide with staff shift times outside of peak day periods is one option that would encourage staff to use the services.

Further initiatives include:

- Include public transport information during employee inception, including maps, timetables and links to online services.
- Promote the environmental benefits of public transport use.
- Targets for public transport use would need to be established and may be in the order of 20-25%. This equates to some 500-550 daily trips by public transport assuming 60% staff attendance.
- Promote both full and partial public transport use. For example, a staff member who uses public transport one day a week reduces private car use by 20%.

4.2.2 Pedestrians and Cyclists

An established network of internal and external pedestrian links provides access to Fox Valley Road and the surrounding residential precinct and Fox Valley Village Shopping Centre. Some deficiencies exist in footpath location with evidence of informal walkways as shown in Appendix C (photo 6).

Some considerations to expand on the network include:

- Provide a 4 metre wide perimeter shared path that promotes use throughout the day.
- Perimeter shared path would include facilities such as exercise equipment, signage, water, lighting, seating and tree planting for shade protection.
- Promote the use of the perimeter shared path for staff, visitors and patients to aid recovery.
- Initial targets for bike use may be 2-3% which would see a requirement of some 50-60 on-site bicycle parking spaces. Long term targets would be assessed as required.
- Investigate possibility of external links with The Comenarra Parkway to the south-west and through bushland north of the site.
- Ability to expand the Shared Zone facilities within the hospital grounds.
- Consider how the site interacts with the initiatives incorporated in the Wahroonga Estate Redevelopment.
- Provide bicycle parking and internal facilities in convenient and safe locations within the hospital grounds. Given the diverse nature and location of the buildings, these would need to be appropriately located throughout the site.

- Provide appropriate directional signage from the external network and from within the site to the bicycle parking and facilities to ensure they are easy to find.
- Ensure internal facilities are well maintained as part of the regular building maintenance.
- Investigate the provision of equipment such as hats, water bottles, pedometers, umbrellas, etc. to encourage staff to walk to work.
- Participate in events such as NSW Bike Week, Ride to Work Day and Walk to Work Day.
- Include walking and cycling information in the employee welcome packs.

4.2.3 Car Sharing

- Investigate the further development of the car-pooling system using the software available through the TravelSmart program. This software is available for businesses to allow staff registrations and to assist in matching suitable car-poolers. Alternatively, a system may be established which includes details such as home suburb and postcode, phone number, car sharing preference (driver or passenger or either), work hours and days of employment. These details can then be assessed internally to establish additional car pools. This system should be promoted to ensure that all staff are aware that car pooling may be a viable travel alternative.
- Allocate car parking spaces in a convenient location within the on-site car parking to car-pool users.
- Provide a guaranteed ride home (e.g. as a taxi voucher) to car-poolers in the event of an emergency.
- Promote the use of hybrid/electric cars by providing spaces close to buildings and near car park access points.

Sydney Adventist Hospital staff currently park on-site for free. Consideration may be given to implementing a small charge for this privilege though this would only be a viable future consideration if the above measures are successfully put in place and after further review and staff/visitor feedback. The process of altering travel choice centres on providing sustainable alternatives to sole occupancy vehicle travel. Pay parking initiatives remain site specific concerns and should be independently investigated.

5. Conclusion

The proposed Sydney Adventist Hospital – Staged Alterations and Additions has been assessed in terms of the potential for a sustainable transport initiative, specifically accessibility by means other than the private car.

Based on the analysis and discussions presented within this report, the following conclusions are made:

i The site is moderately serviced by existing public transport services.
ii Existing bus services run directly past the site and within the hospital grounds. They link the site with rail services east and west of the site.
iii Pedestrian facilities within and in the vicinity of the site are adequate in places and link the site to the surrounding area.
iv A well designed perimeter shared pathway would encourage use by staff and visitors and aid patient recovery.
v Diverse opportunities exist for providing innovative bicycle parking and storage facilities.
vi Development of an access plan would assist in providing services and facilities where they are needed most.
vii Further development of a car sharing scheme would prove beneficial.
viii Education and promotion of sustainable transport initiatives is central to successful implementation.
ix Monitoring and reviewing of any implemented initiatives is required to ensure effectiveness is maintained.

Appendix A

Existing Facilities

Legend

External Network

Internal Network

Signalised Pedestrian crossing

Zebra Crossing

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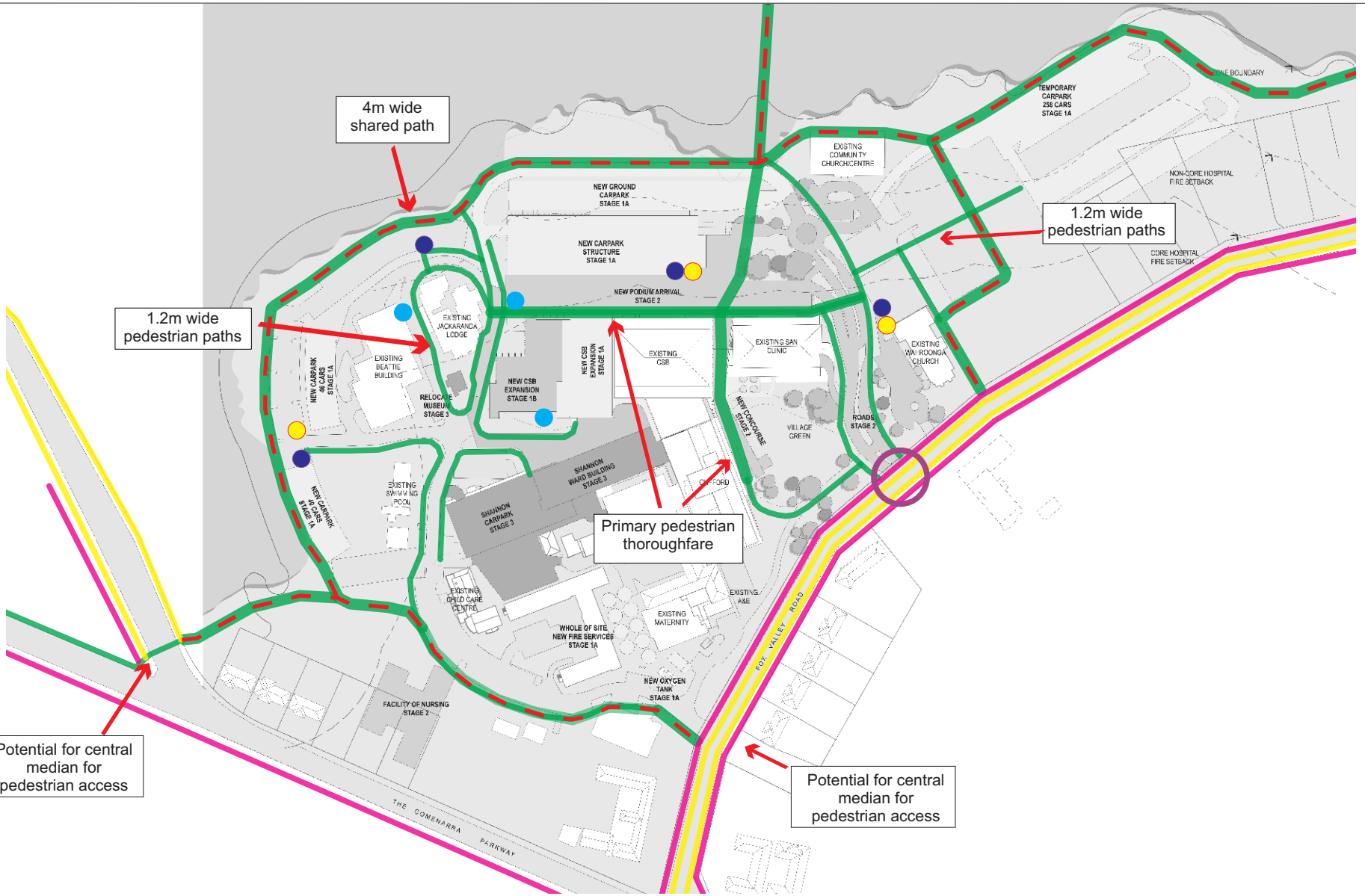
Existing Pedestrian Facilities

Sydney Adventist Hospital
Sustainable Transport Initiatives
Job No: Is12490

Appendix B

Site Opportunities



Legend

- Shared Pathways/Recreational Trails
- Pedestrian Paths (4m main access route/1.2m pedestrian links)
- Existing On-Street Pedestrian Paths
- Pedestrian Crossing
- On-Street Bike Lane
- Bike Parking
- Bike Storage
- Car Share Space

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Pedestrian and Cycling Opportunities

Sydney Adventist Hospital
Sustainable Transport Initiatives
Job No: Is12490

Appendix C

Photo References

Photo 1: Northern designated footpath link through bushland to Mt Pleasant Avenue

Photo 2: Mt Pleasant Avenue designated footpath link

Photo 3: Southern pedestrian/cyclist opportunities

Photo 4: Southern pedestrian/cyclist opportunities

Photo 5: Fox Valley Road pedestrian facilities

Photo 6: Informal pedestrian route at site access

Photo 7: Fox Valley Road pedestrian facilities

Photo 8: Fox Valley Road pedestrian facilities

Photo 9: Fox Valley Road bus shelter at site access

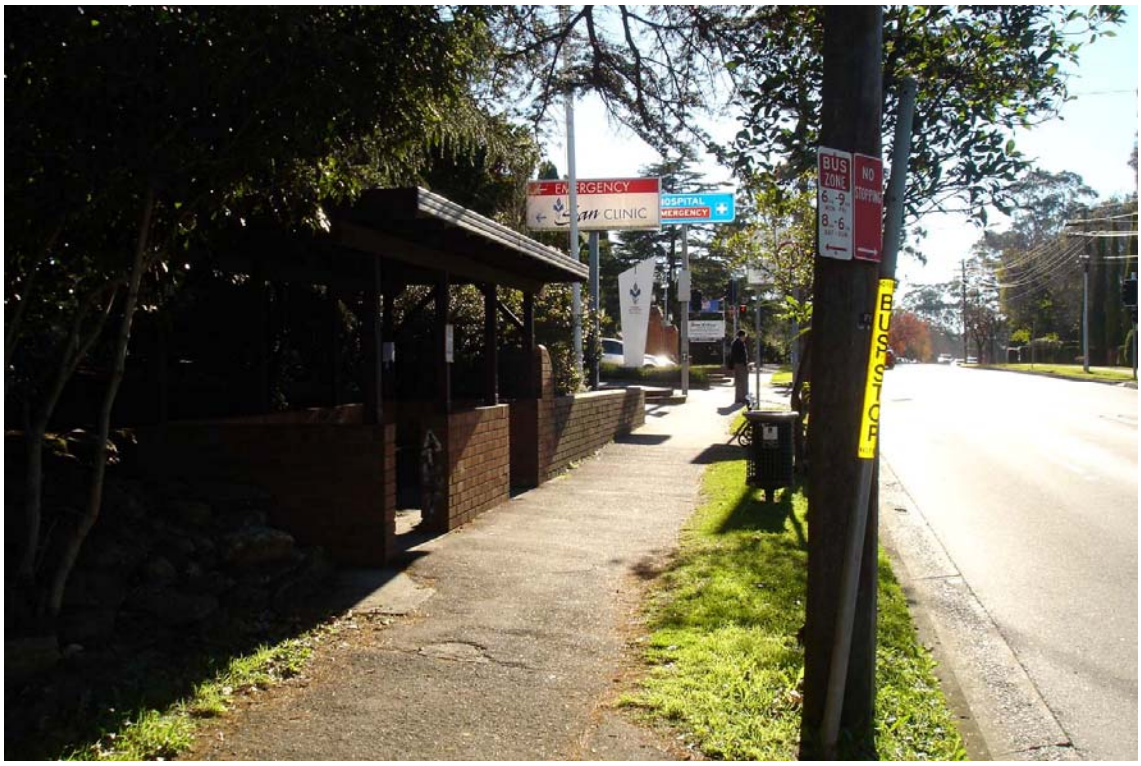

Photo 10: Fox Valley Road pedestrian facilities

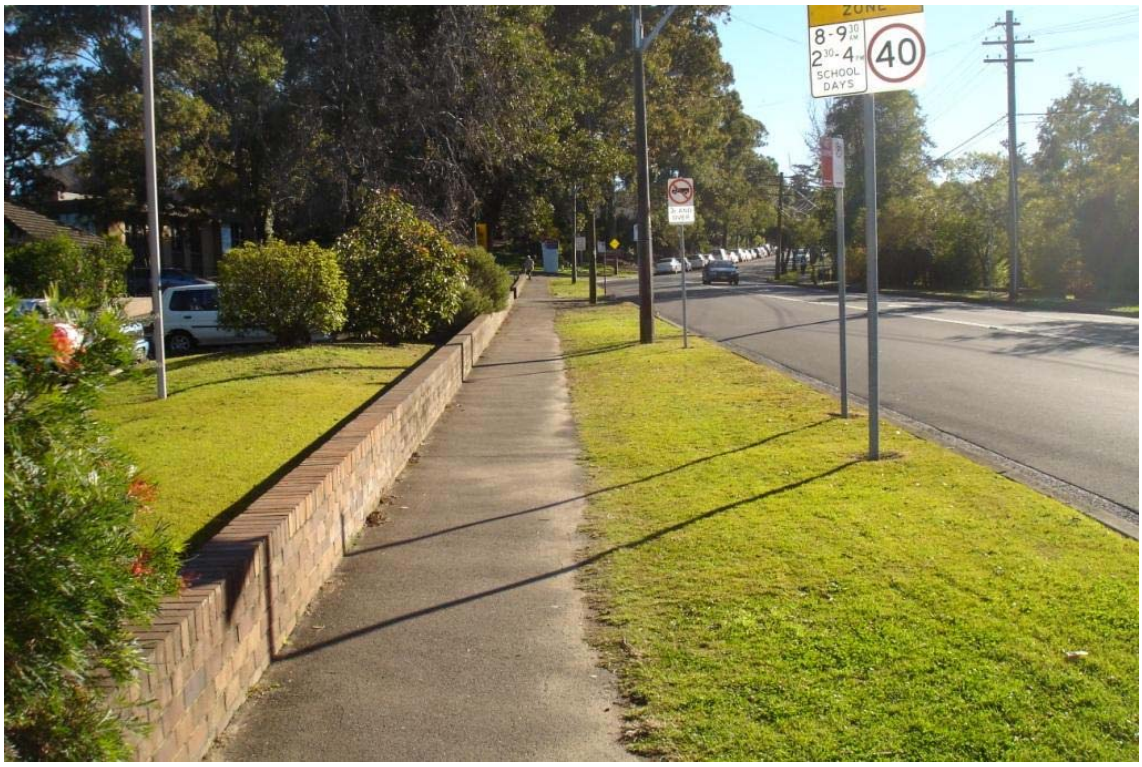

Photo 11: The Comenarra Parkway west of the site

Photo 12: The Comenarra Parkway west of the site

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