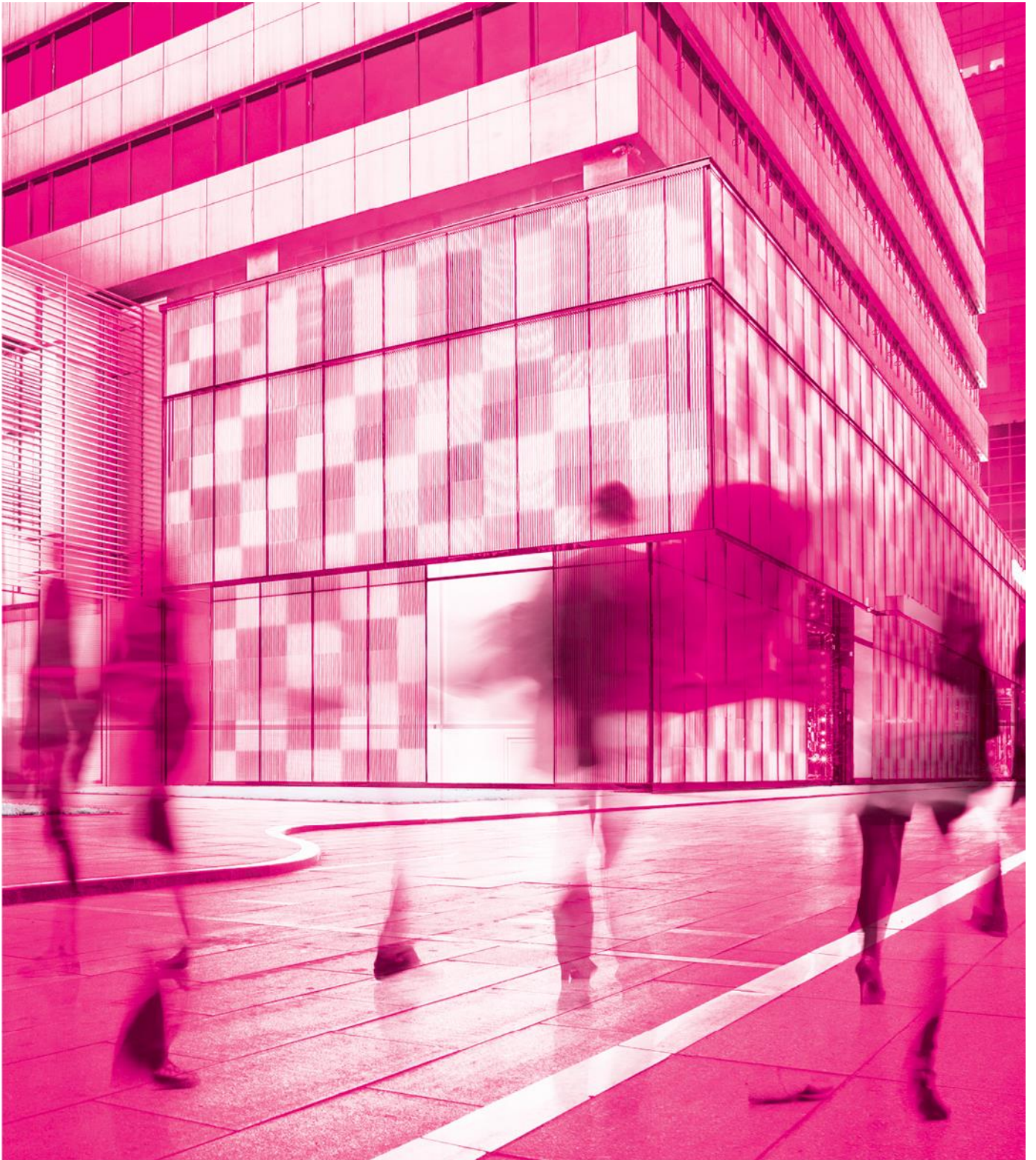




green travel plan;

**Integrated Nepean Hospital and
Community Based Services (Penrith)**

For NSW Health Infrastructure
09 August 2018

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1. Introduction

1.1 Background and Purpose of Report

ptc. has been engaged by Health Infrastructure NSW (HI) to prepare a Green Travel Plan (GTP) relating to the Nepean Hospital redevelopment, located in Kingswood, at the base of Blue Mountains.

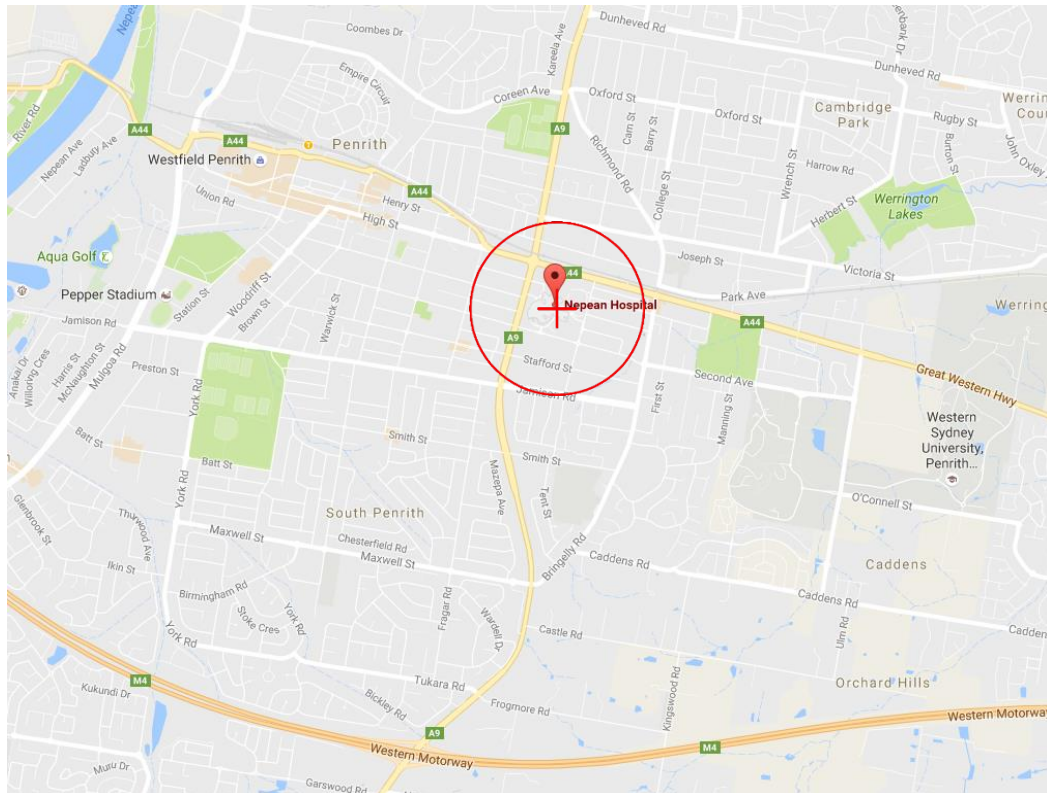


Figure 1 – Hospital Location

1.2 Aim of the Green Travel Plan

The purpose of a GTP is to reduce the impact of vehicular traffic to and from a particular land-use/facility. This is achieved through the review of existing policies and identifying programmes to encourage staff, visitors and patients to adopt more active and sustainable forms of transport.

This document presents the following:

- Review of existing public transport infrastructure and future transport options;
- Assessment of existing transport mode share within the area and the Hospital (based on intercept surveys);
- A modal share target for the Hospital;
- A framework to identify and respond to travel demand from the Hospital;
- Strategies to implement following the completion of the Hospital expansion; and
- The monitoring strategy to track performance of the Green Travel Plan.

2. Background

2.1 Nepean Hospital

Nepean Hospital is part of the Nepean Blue Mountains Local Health District, providing public health services to the Western Sydney region. The area is served by a number of hospitals including Hawkesbury Hospital, Springwood Hospital, Blue Mountains Hospital and Lithgow Hospital.

The Hospital is the principal referral hospital and regional trauma centre for Western Sydney and provides a diverse range of services including emergency, intensive care, cancer care, Cardiology, community health, Drug & Alcohol, medical imaging, mental health, sexual health, rehabilitation, pharma & Allied health, and Surgical (including dental, neurosurgery, orthopaedic, plastic & reconstructive, thoracic, breast & endocrine, ENT, urology and vascular).

The Hospital is also a teaching hospital of the University of Sydney. Medical, nursing and allied health students are placed at the hospital for practical terms.

2.2 Location and Context

Penrith is located approximately 60km west of the Sydney CBD. Nepean Hospital is located approximately 3km to the east of the Penrith Civic Centre and south-east of Penrith Railway Station, as shown in Figure 2.

The City Centre hosts a population of approximately 198,000 within the Penrith Local Government Area (LGA), which has experienced growth of approximately 11.9% between 2006 and 2015 according to ABS Census Data.

The context of the Hospital in relation to surrounding land-uses is shown in Figure 2.



Figure 2 - Nepean Hospital Local Context

The following land uses are located within a 500 metre catchment of the Hospital:

- North-east of the Hospital lies Kingswood Railway station and several automotive outlets along the Great Western Highway;
- East and west of the hospital is characterised by low density housing;
- On the southern border of the hospital precinct is the Sydney Medical School, associated with the University of Sydney.

2.3 The Hospital Campus

The existing Hospital Campus is bordered by Great Western Highway on the northern boundary, Parker Street on the western boundary, Derby Street on the south and Somerset Street on the east. Access to the Hospital is possible from Parker Street (two entrances), Derby Street (one entry) and Somerset Street (two entrances). The hospital is divided into four blocks, identified as the North, South, East and West blocks.

The Hospital Campus map is presented below:

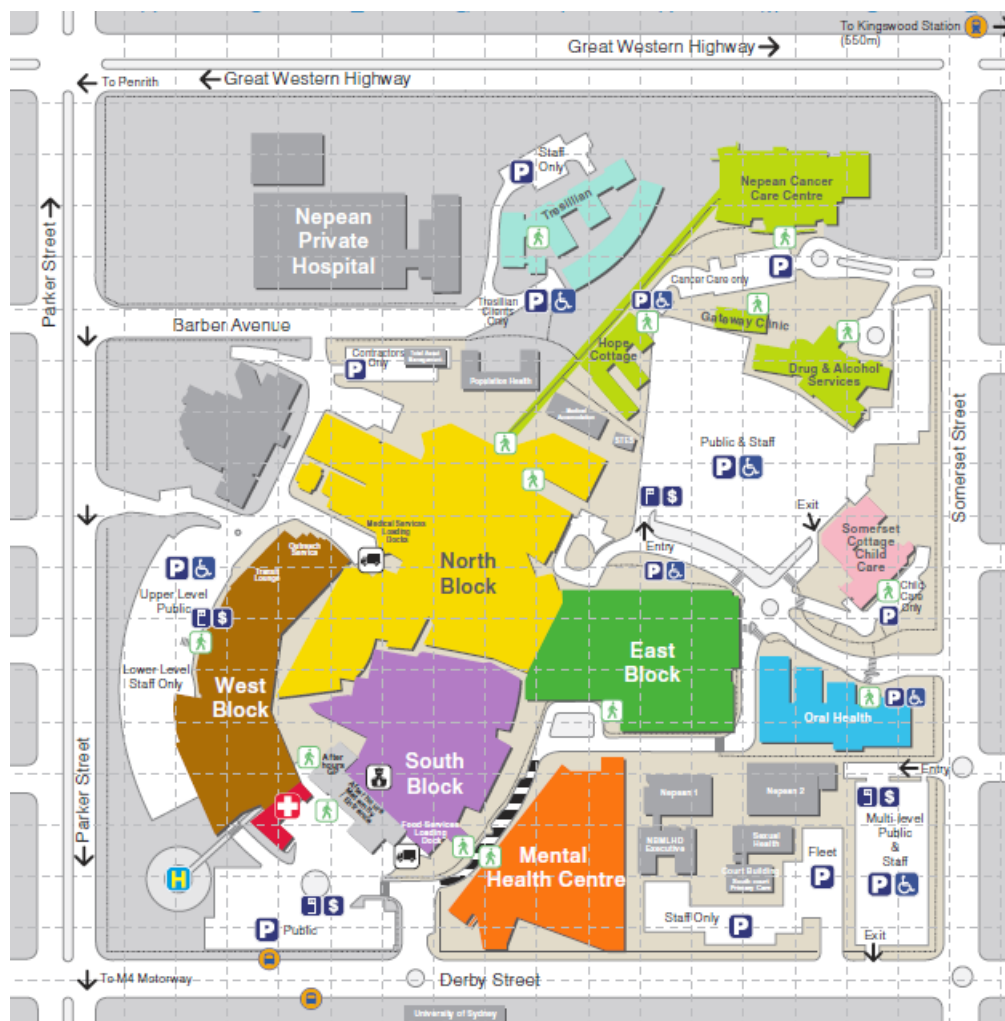


Figure 3 - Hospital Campus Map (Source: NSW Health)

3. Existing Transport Infrastructure

3.1 Existing Road Network

The Hospital is served by a regional and local road network, which provides ready access to the City Centre and the surrounding region, while the Great Western Highway and Parker Street provide the primary connection to Sydney and Orchid Hills. The road network in this area is also comprised of State and Regional roads, as well as local roads providing access to the surrounding land-uses.

The Hospital is served by the following State roads:

- North – Great Western Highway
- South – M4 Western Motorway
- West – Parker Street, Mulgoa Road

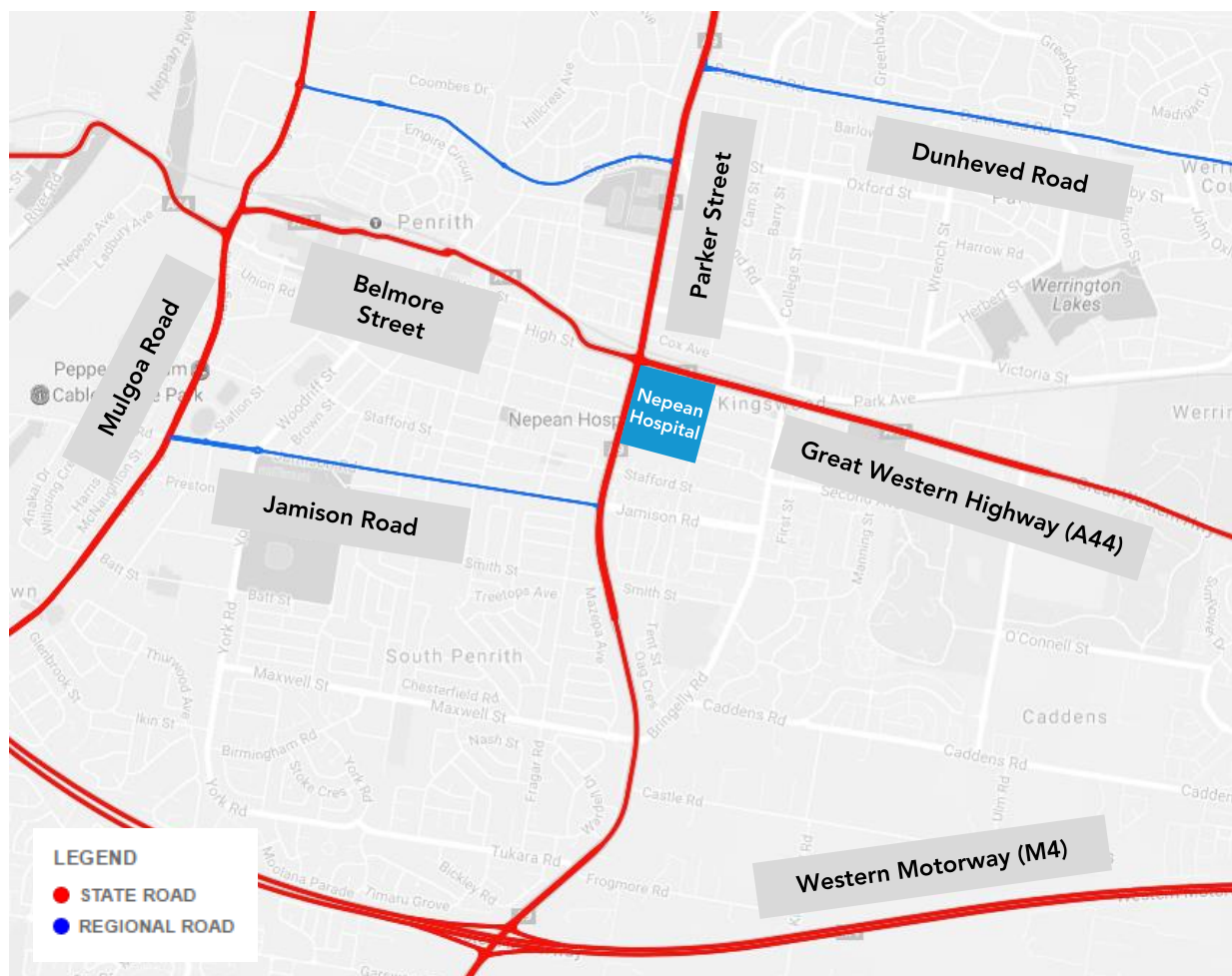


Figure 4 - Road Hierarchy (Source: RMS Road Hierarchy Review, 2017)

3.2 Public Transport

A number of public transport options are available in the vicinity of the Hospital in the form of buses and rail.

Kingswood Railway Station is located approximately 1km (walking distance) from the main Hospital entry whilst Bus Stops are located along Derby Street, in close proximity to the main Hospital entrance of the South Block. These are further discussed in the sub-sections below.

3.2.1 Bus (Private and Public)

The Hospital Precinct is serviced by the bus routes presented in Table 1. There are two bus stops located on the southern boundary of the Hospital Precinct, as indicated in Figure 5.

Table 1 - Bus routes servicing the Hospital

Route No.	From	To	Frequency (approx)	Services Operate Approx (Weekdays)	Services Operate Approx (Weekends)
774	Mount Druitt	Penrith	Mon-Fri every 30 mins, Sat-Sun every 60 mins	6:25am - 11:36pm	7:33am - 10:20pm
775	Mount Druitt	Penrith	Mon-Fri every 30 mins, Sat-Sun every 60 mins	5:21am - 10:56pm	7:54am - 10:43pm
776	Mount Druitt	Penrith	Mon-Fri every 30 mins, Sat-Sun every 60 mins	5:36am - 10:20pm	8:14am - 11:03pm
789	Luddenham	Penrith	Mon-Fri only two services, No weekend services	7:54am & 4:30pm	No weekend services

The Hospital is relatively well serviced by bus, with a number of routes and regular services (every 30 mins on weekdays) and therefore provide a reasonably attractive transport option for some Hospital-related users, subject to the availability of convenient bus stops close to their home location.

This appears to be confirmed by our surveys¹, which show 4% of outpatients and 4% of visitors utilising bus services to travel to the hospital. However, only 1% of staff utilised buses.

¹ Car Parking Demand Study – March 2017



Figure 5 - Location of Nearby Bus Stops (Source: NS W Health)

3.2.2 Rail

Kingswood railway station is located approximately 1km from the Hospital, which is within reasonable walking distance for staff and, potentially, visitors to inpatients. It is recognised that Hospital attendees with walking difficulties may find this a less attractive transport mode share, although taxi connections are available from the Station to the Hospital.

The Station is on the Western Line, from Emu Plains and Richmond to the City. Services operate every 5 – 15 minutes during peak hours, with services operating from 3.12am to 11.23pm.

The distance from the Hospital and relative frequency of services could make heavy rail a reasonably attractive mode share option for some Hospital-related users, subject to the availability of a convenient railway station close to their home location.

This appears to be confirmed by our surveys, which show 2% of outpatients and 4% of visitors utilising heavy rail mode share to travel to the hospital. However, only 1% of staff utilised heavy rail (or a combination of heavy rail and bus) as their mode share option.

It is noted that the pedestrian access to the Station is located at the eastern end of the platform. Whereas the desire line when walking to the Hospital would be to enter/exit the Station at the western end of Platform 2 (the southern platform). Access to the Station could be improved through a new access at the western end of Platform 2 and an improved crossing across the Highway in the vicinity of the Hospital. This

would be similar to the arrangement at Redfern Station, where access is provided to the Australian Technology Park, at the far end of Platform 1.

3.3 Cycling

It is noted the cycling infrastructure in the Penrith region is relatively underdeveloped, with no dedicated bicycle paths in the vicinity of the Hospital. However, the surrounding road network makes cycling and motorcycle viable methods of travel.

Despite the relatively level topography surrounding the site, cycling is only likely to be an attractive mode share for daytime staff, and even then only for those that live within a relatively close distance.

Our surveys show that only 1.5% of staff cycle/motorcycle to work, although when asked if they would cycle if end of trip facilities were provided, 17% of staff surveyed said that they would be interested.

3.4 Walking

The topography of the area is relatively flat; however, as with cycling, walking is only likely to be an attractive option for people who live relatively close to the Hospital.

The campus is surrounded by a reasonable volume of low-density (mostly single storey) residential development, apart from the area to the north of the Great Western Highway which is predominantly light industrial and bulky goods.

New apartment blocks also appear to be under construction along Parker Street and Derby Street, which would provide convenient access to the Hospital for, for example, staff.

Having said all of the above, staff on early morning or late evening/night shifts would be unlikely to walk, for safety reasons, unless (for example) renting a property in close proximity to the campus.

For these reasons, we expect that walking would only be an attractive mode share for people living locally. This appears to be supported by our surveys which show only 2% of staff walking to work. 4% of outpatients and 3% of visitors walked to the Hospital.

4. Opportunities and Targets

4.1 Current Modal Split

Multiple transport modes are available to Hospital attendees (staff, outpatients and visitors), including road, bus, rail and active transport.

Kingswood Railway Station is located approximately 500 metres from the Hospital Campus. However, the convenience of rail as a mode share will also depend on the connections at the other end of the person's journey e.g. the proximity of stations to the person's residence, provision of parking at those stations (i.e. commuter style, long stay parking), and/or bus routes linking their residence to the railway stations.

The survey performed by PTC as part of the Parking Demand Study captured 1,581 respondents consisting of:

- 65% (658 respondents) Hospital Staff
- 35% (346 respondents) Public, in the following groups:
 - 40% (137 respondents) were outpatients
 - 60% (209 respondents) were visitors

The split in the number of users accessing the Hospital by different transport modes is summarised in Table 2. The data indicates that the car is by far the most popular form of access to the Hospital by all users.

Table 2 - Mode of transport access to the Hospital (%) by user group

Mode of Transport	Staff	Outpatients	Visitors
Car	94.7%	85.4%	83.7%
Public Transport – bus, train	1.8%	6.6%	7.6%
Taxi	0%	2.2%	4.8%
Walk	2.0%	1.4%	0.5%
Bicycle	1.5%	4.4%	3.4%

The 2011 journey to work (JTW) data for the area surrounding the Hospital has been used to quantify the trips by modes used by workers travelling to the area surrounding the Hospital.

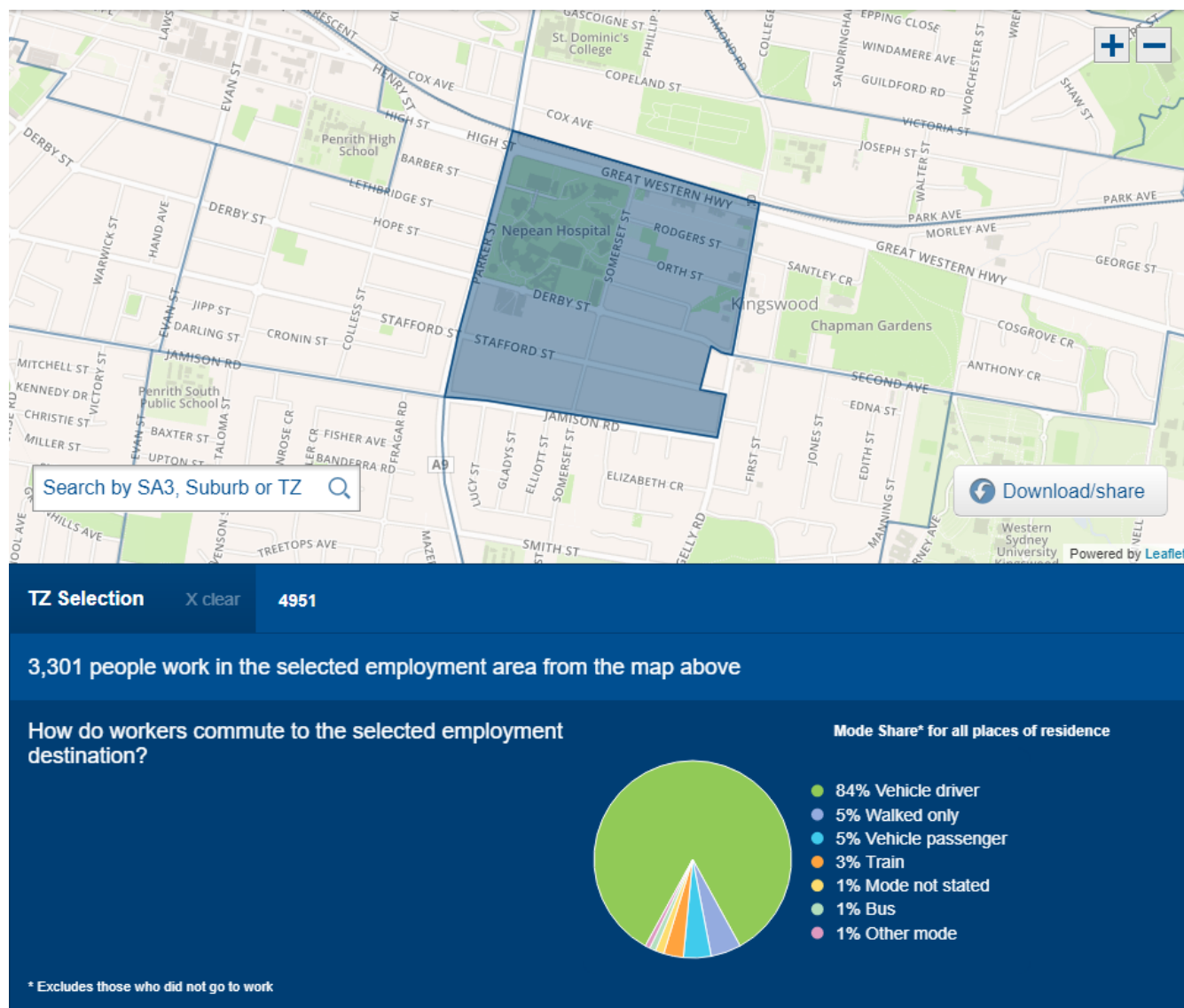


Figure 6 - JTW Data for the Nepean Health Precinct (BTS Zone 4951)

The data indicates that the Hospital mode share is more reliant on car usage, which is typical for large Hospitals that involve unusual staff arrival and departure times when public transport is less available.

Compared with the JTW data for the Penrith / Kingswood area, there is only a slight variation in the proportion of workers who drive to work, being 84% in the health precinct and 81% for the Penrith/Kingswood area. This indicates that the mode share within the health precinct (which comprises Nepean Hospital and the surrounding private health services) is largely consistent with the broader area, with some opportunity for mode shift from cars to other modes, in the region of 3% as a minimum.

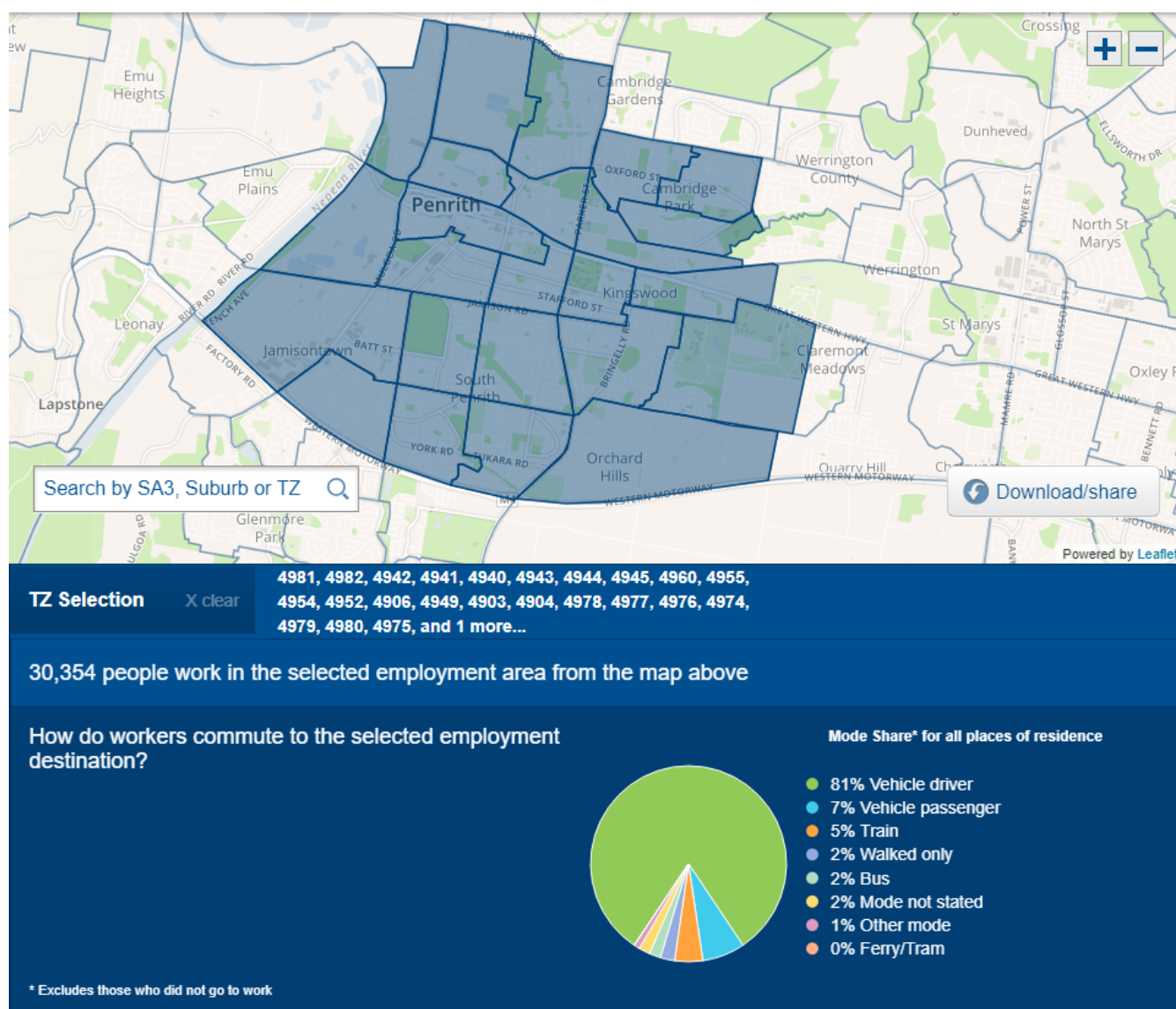


Figure 7 - JTW Data for Penrith / Kingswood

4.2 Current On-Site Initiatives

In order to facilitate other forms of transport, parking is provided throughout the campus for motorcycles and bicycles for use by staff, visitors and patients. Additionally, there are shower and change facilities within the hospital, including disabled toilets with showers on each floor.

4.3 Future Transport Targets

To encourage and promote more active travel opportunities, the development should consider adopting targets identified for the Inner Sydney area. These targets would apply to all residents travelling to and from work on a daily basis. The benchmark targets are as follows based on the 2011 Inner Sydney City existing transport uses.

Table 3 - Mode of Transport Target (%) by user group

Mode of Transport	Staff	Outpatients	Visitors
Car	85%	80%	80%
Car as Passenger/carpool	5%	0%	0%
Public Transport – bus, train	5%	10%	10%
Taxi	0%	3.0%	3.0%
Walk	2.5%	2.0%	2.0%
Bicycle	2.5%	5.0%	5.0%

5. Strategies

There are a number of strategies which can be employed to encourage non-car modes of transport to and from the Hospital. The following table outlines potential strategies that can be adopted in achieving future transport targets.

Target	Strategy
Public Transport	
Increase journeys to work by Public Transport	Create a map identifying the location of bus stops and routes and make this available to all residents.
	Improve the promotion of Public Transport on the Hospital website. It currently refers to public transport (below the section describing the parking, and available parking concessions) and doesn't provide maps or links to transport websites.
	Discuss with stakeholders, the feasibility of providing entry to the western end of Platform 2 of Kingswood Station.
Cycling	
Increase journeys to site by cycling	Create maps and bike routes, which link to surrounding key amenities and available facilities
	Provide facilities on-site for staff and visitors to repair bikes. Ensure visitor bicycle racks are positioned in an accessible and sheltered location that provides good passive surveillance, and is easily recognisable to visitors.
Walking	
Encourage staff and visitors to walk to work as part of their journey	Work in partnership with Council and RMS to determine whether there are opportunities to improve the pedestrian connectivity to the Hospital. For example, ensure that pedestrians are considered within the proposed RMS road upgrades.
Car Pooling/Car Share	
Improve accessibility to car share	Work with carpooling networks (e.g. Western Sydney Carpool) to increase the ability for staff to carpool.
	Promote the existence of car share within the building and surrounding areas, via potential promotional campaigns on site.
	Engage with a car share provider to provide spaces/pods within the Hospital. This would provide staff with the ability to undertake short trips during their shift, without having to bring a vehicle to the campus.

5.1 Workplace Transport Plans

The core principle in reducing the demand for car parking spaces (specifically for Hospital Staff) is to introduce and promote "Healthy Transport Plans".

The availability of the rail, bus, cycle and pedestrian network near the Hospital Precinct combined with a proportion of staff living within relatively close proximity to the Precinct clearly highlights the possibility of introducing a robust and sustainable travel plan. Travel plans should aim to:

- Encourage staff, patients and visitors to use more sustainable travel options to get to Hospitals;

- Encourage staff to adopt healthy transport choices such as walking and cycling where this is a realistic option;
- Explore car parking needs with Public Transport providers, which may include consideration of park and ride schemes;
- Pursue opportunities for sharing vehicles or transport not only for staff but to explore innovative solutions to minimise journeys;
- Consider journey management and distance covered;
- Ensure that the Hospital's actions in respect to transport do not have an adverse impact upon the environment and consequently the health of the population which we serve. There is a requirement to balance the needs of patients, visitors and staff against ensuring protection of the environment for which we all have a responsibility; and,

Furthermore, there are other methods of shifting the number of staff accessing work by incentivising and increasing the use of carpooling, cycling, park and ride. However these forms of transport need to be supported by an incentivised system to make these forms of access more desirable than driving.

6. Monitoring and Evaluation

A Travel Plan Co-ordinator and Travel Plan Group should be established to monitor and review the sustainability targets. As a minimum, the Plan should be reviewed on a yearly basis incorporating consultation with residents and businesses at the completion of a regular travel survey.

The yearly review should result in an update to the Travel Plan which may include, where necessary:

- Modifications to the previously agreed targets as a result of data collected and analysed.
- Implementation of additional remedial actions if the Travel Plan is not meeting its objectives within the timescales specified which remedial actions may include but not be limited to, undertaking new or additional monitoring activities to those specified in the Travel Plan.