

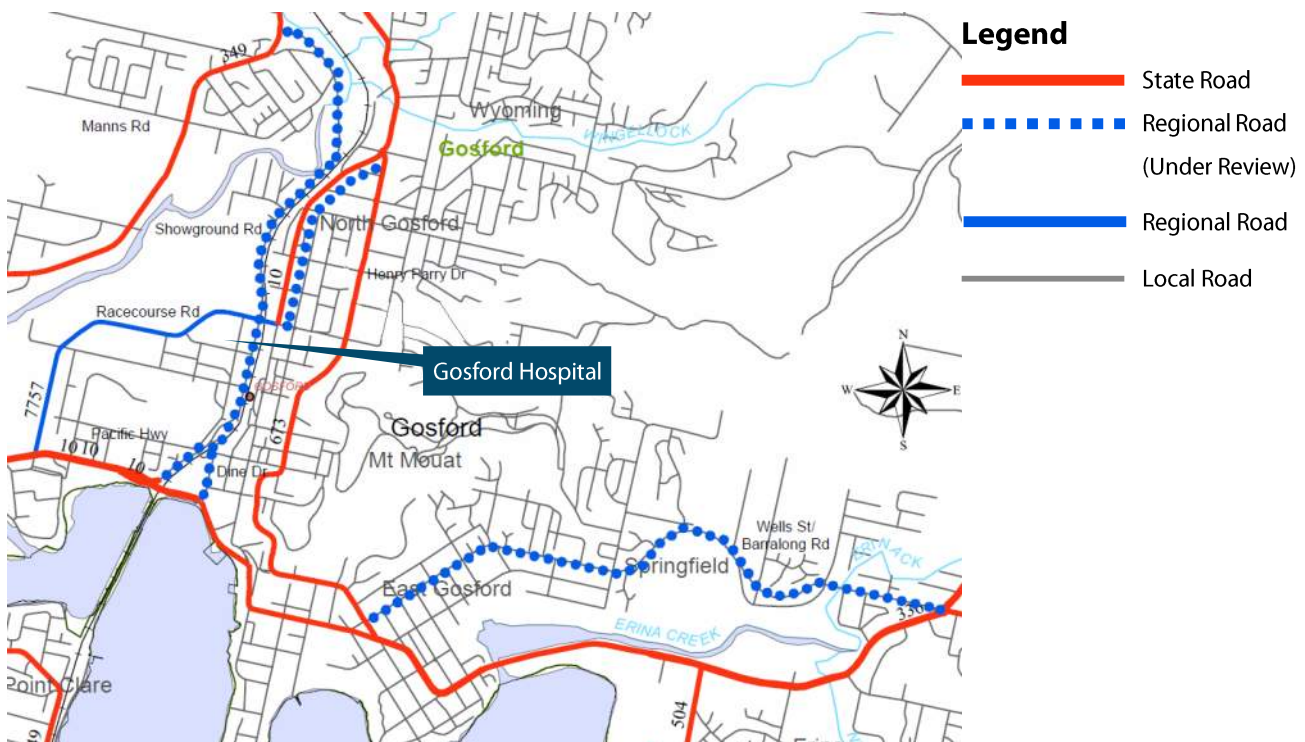


Figure 7 - Road Hierarchy (Source: RMS Road Hierarchy Review)

The NSW administrative road hierarchy comprises the following road classifications, which align with the functional road hierarchy as follows:

- State Roads - Freeways and Primary Arterials (Administered by RMS)
- Regional Roads - Secondary or sub arterials (Administered by Council through delegated Authority from RMS, Part funded by the State)
- Local Roads - Collector and local access roads (Administered by Council through delegated Authority from RMS)

The local road network directly serving the Hospital includes:

Racecourse Road is classified as a Regional Road. It provides an east-west connection along the northern border of the Hospital. The road bisects Hospital Road, Showground Road and Holden Street to provide access from the north into the Hospital. Within the vicinity of the Hospital, the carriageway generally carries one lane of traffic in each direction and has a posted speed limit of 50km/hr.

Showground Road is currently classified as a local road and functions as a collector road, although according to the RMS Road Hierarchy Review, Showground Road is being considered for an upgrade to a regional road. It provides a north-south connection along the eastern edge of the Hospital Precinct. Within the vicinity of the Hospital, the carriageway generally carries one lane of traffic in each direction and has a posted speed limit of 50km/hr. Showground Road is currently proposed by RMS to be classified as a Regional Road.

Beane Street West, is a local access road providing an east-west connection between Showground Road and Holden Street. To the east of Holden Street the alignment continues, comprising the existing access to the Hospital public drop-off area. The carriageway follows a steep grade rising approximately 7 metres from Showground Road to Holden Street over a length of 90 metres. The carriageway accommodates one lane of traffic in each direction and has a posted speed limit of 50km/hr.

Holden Street is a two-lane, two way local road providing north-south movements along the east border of the Hospital Precinct between Racecourse Road (to the north) and Faunce Street West (to the south). Within the vicinity of the Hospital, the road has a posted speed limit of 50km/hr.

Ward Street is classified as a local road providing two-way access in an east-west direction along the southern boundary of the Hospital. Within the vicinity of the Hospital, the carriageway carries one lane of traffic in each direction with a posted speed limit of 50km/hr.

Hospital Road is classified as a local private road providing access through the north-eastern corner of the Hospital Precinct. Between Racecourse Road and the driveway into the existing multi-storey car park the road is two-way, however south of this driveway it provides one way access towards Beane Street West. Hospital Road has a sign posted speed limit of 40/km/hr.

3.7 Vehicle Access

The key inbound vehicle routes and originating suburbs to the Hospital are as follows, and are graphically represented in Figure 8:

- **Route 1: East** – Inbound vehicles travel along the Central Coast Highway, then onto Racecourse Road to access the Hospital (typically travelling from Erina, Terrigal, Avoca). 37% of Hospital arrivals originate from this direction.
- **Route 2: North** – Inbound vehicles travel south along the Pacific Highway and Showground Road (typically originating from suburbs such as Wyong, Tuggerah, Wyoming, etc.); 15% of Hospital arrivals originate from this direction.
- **Route 3: West** – Inbound vehicles travel east along the Central Coast Highway and Racecourse Road (typically originating from Kariong and the F3 Freeway); 36% of Hospital arrivals originate from this direction.
- **Route 4: South** – Inbound vehicles travel east along Brisbane Water Drive, the Central Coast Highway and turn right onto Showground Road (typically originating from suburbs such as West Gosford, Woy Woy) 12% of Hospital arrivals originate from this direction.



Figure 8 - Origin of Drivers Accessing the Hospital

Vehicle access to the Hospital Campus is provided in a number of locations in order to serve the various car parks, loading areas and the Emergency Vehicle areas. The existing vehicle access locates are indicated in the following figure:



Figure 9 - Existing Vehicle Access Locations

3.8 Existing Traffic Volumes

The SEARs (Item 5. Transport and Accessibility) require details of daily and peak hour trips generated by the project. Daily traffic volumes are not presented in this Assessment as the road network has been assessed on the basis of the peak traffic activity. In this regard, the modelling and projected traffic activity has been established to include the key morning and afternoon periods, which represents the peak loads and therefore worst case scenarios. This approach has been confirmed as acceptable by RMS.

To identify the existing traffic conditions, video survey counts were undertaken in proximity to the Hospital at the following locations:

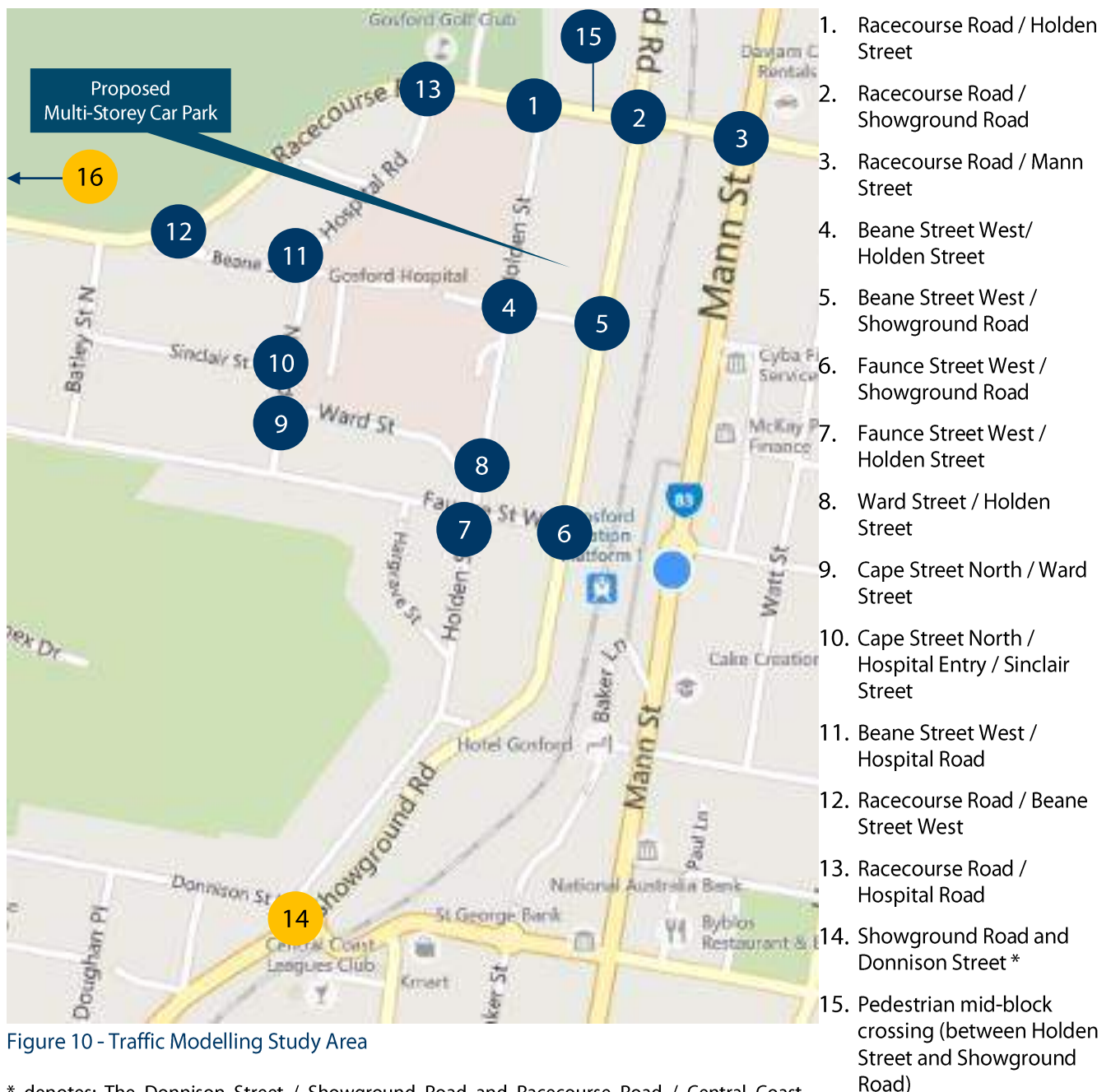


Figure 10 - Traffic Modelling Study Area

* denotes: The Donnison Street / Showground Road and Racecourse Road / Central Coast Highway intersections have been modelled as isolated intersections using SIDRA due to the distance from the modelling area and the lack of influence through queuing etc.

An initial set of intersection surveys were undertaken across two separate periods, the first set was undertaken on 21st October 2014 and the second on 16th December 2014. These were performed at the following times to record the AM and PM peak activity surrounding the Hospital:

- 7:30am – 9:30am, and
- 2:30pm – 5:30pm.

The traffic survey results indicate that the network peaks occurred at:

- 7:45am – 8:45am, and
- 3:00pm – 4:00pm.

Based on surveys, the Hospital peak access periods occur at:

- 7:30am – 8:30am, and
- 3:00pm – 4:00pm.

Therefore, these hours have been adopted as the peak periods for the purpose of assessing the impacts of increased traffic resulting from the proposed Hospital development.

On 5 - 6 May 2015, following an RMS request, a new survey was undertaken of all intersections within the network model area and included travel time surveys as a means of providing further validation of the base model. The result of the May survey were similar to the initial sets of data collected in the October and December surveys. The May data set has been used throughout the LINSIG model scenarios and also to test the intersection of Showground Road and Donnison Street using SIDRA.

3.9 Current Road Network Operation

The performance of the existing road network has been established through the preparation of a Road Network Model, which has been undertaken by Jacobs using LINSIG modelling software. The model incorporates the surveyed traffic volume data described in Section 3.8 and the existing situation (described as Scenario 1) represents the Base Model. The related future scenarios are described in Section 7.3 of this Assessment.

A full description of the modelling results is presented in Section 7 of the Traffic Modelling Report, prepared by Jacobs (See Attachment 2), while key findings are summarised in the following:

- the road network within the study area is generally operating within capacity,
- all of the priority controlled intersections within the study area are operating at Level of Service A,
- some delay is experienced at the traffic signal controlled intersections and although the delays are moderate these intersections are operating with a high degree of saturation. This means that small increases in demand or interruptions to vehicle flows causes a large increase in delays.

Detailed results including the degree of saturation, average delay and maximum queue lengths for each approach are presented in Appendix B of the Traffic Modelling Report, while a summary of the intersection results at the AM and PM peak are presented in the following tables:

Intersection	Level of Service	Average Delay	Degree of Saturation
Racecourse Road / Holden Street	A	5.5	0.426
Racecourse Road / Showground Road	B	18.4	0.826
Racecourse Road / Mann Street (Pacific Highway)	C	39.2	0.940
Beane Street West/ Holden Street	A	2.9	0.171
Beane Street West / Showground Road	A	3.0	0.186
Faunce Street West / Showground Road	A	2.8	0.332
Faunce Street West / Holden Street	A	3.3	0.145
Ward Street / Holden Street	A	1.8	0.158
Cape Street North / Ward Street	A	3.2	0.077
Cape Street North / Hospital Entry / Sinclair Street	A	3.3	0.062
Beane Street West / Hospital Road	A	3.5	0.197
Racecourse Road / Beane Street West	A	4.5	0.298
Racecourse Road / Hospital Road	A	1.7	0.366

Table 1 - Summary of Existing Traffic Conditions (AM Peak)

Intersection	Level of Service	Average Delay	Degree of Saturation
Racecourse Road / Holden Street	A	3.8	0.364
Racecourse Road / Showground Road	C	32.5	0.901
Racecourse Road / Mann Street (Pacific Highway)	C	38.1	0.822
Beane Street West/ Holden Street	A	2.9	0.129
Beane Street West / Showground Road	A	3.3	0.163
Faunce Street West / Showground Road	A	2.8	0.337
Faunce Street West / Holden Street	A	3.3	0.214
Ward Street / Holden Street	A	1.7	0.128
Cape Street North / Ward Street	A	2.9	0.091
Cape Street North / Hospital Entry / Sinclair Street	A	3.4	0.088
Beane Street West / Hospital Road	A	3.9	0.298
Racecourse Road / Beane Street West	A	4.3	0.245
Racecourse Road / Hospital Road	A	1.5	0.292

Table 2 - Summary of Existing Traffic Conditions (PM Peak)

The network model incorporates all intersections within the influence of the Hospital Precinct, while a further two interactions that are isolated from the Hospital have also been modelled within SIDRA as they are outside the influence of the network model.

- A SIDRA model of the roundabout intersection of Donnison Street and Showground Road has been undertaken by PTC and indicates that this intersection is currently operating at Level of Service B during the morning peak and Level of Service A during the afternoon peak. In terms of Level of Service the intersection exhibits a reasonable result, however it is apparent that queuing occurs on the northbound Highway approach during the morning peak and the westbound Highway approach during the afternoon peak. The degree of saturation is above 80% which means that any slight increases in the demand cause a dramatic increase in delays.
- A SIDRA model of the intersection of Racecourse Road and the Central Coast Highway has been prepared by NTPE in the context of upgrades proposed by RMS. The results indicate that current demand is in excess of the intersection capacity in that the performance is recorded as Level of Service C during the morning peak and Level of Service E during the evening peak, with a Degree of Saturation of 0.878 and

1,006 respectively. RMS has published plans of an upgrade to the intersection and according to the modelling this will improve the performance and reduce the critical queue lengths in the short-term, however a model of the 2% growth scenario in 2027 indicates that significant queue (1,002 metres on the western approach) will occur without the Hospital development.

3.10 Traffic Accidents

The Hunter region crash data centre, within the Roads and Maritime Services (RMS), has provided historical crash data for the past 5 years in respect to crashes within a 500 metre radius of the Hospital, as shown in Figure 11. A review of the data indicates that crashes in the vicinity of the Hospital have occurred at the following intersections:

- Racecourse Road and Showground Road,
- Racecourse Road and Holden Street,
- Racecourse Road/ Beane Street West,
- Faunce Street / Holden Street,
- Faunce Street / Showground Road, and
- Beane Street West / Showground Road.

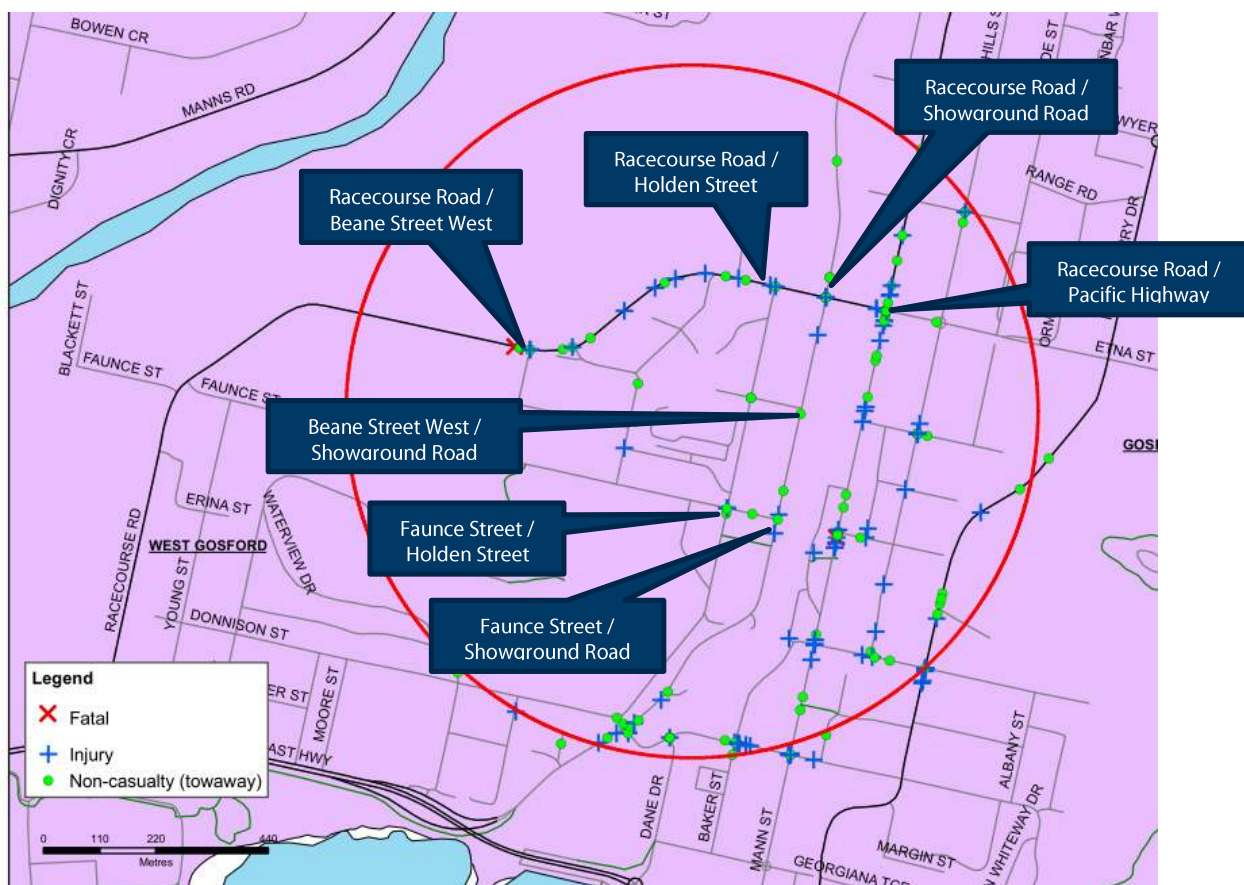


Figure 11 - Crash data within a 500m radius from Gosford Hospital over a 5 year period (RMS, 2015)

Over that period there have been no fatal incidents within the Hospital Precinct (although two fatalities are recorded within the 500 metre radius) and 14 incidents involving an injury, although the extent of injury is not known.

3.11 Public Transport

A number of public transport options are available in the vicinity of the site in the form of buses and rail. The closest station, Gosford Railway Station, is located 500 metres (walking distance) from the main Hospital entry whilst bus stops are located within the Hospital Precinct. These are further discussed in the sub-sections below.

3.11.1 Bus (Private and Public)

The Hospital Precinct is serviced by the bus routes presented in Table 3:

Bus Route	From	To	Daytime Frequency (approx)
70	Ettalong Beach	Gosford Hospital	Every hour (Mon - Fri) 8.09am – 4.42pm (additional services 9.42am and 4.12pm), every hour (Sat) 10.06am – 4.06pm, every 2 hours (Sun & PH) 11.32am – 3.32pm
Free Shuttle Bus Route 41	Gosford Station/Gosford Transport Interchange	Gosford Hospital	Every 20 mins (Mon - Fri) 8.45am-2.45pm (additional services 6.43am, 4.05 and 4.55pm), every 20 minutes (Sat) 9.05am-4.05pm, every 3 hours (Sun) 9.05am – 3.05pm
32	Gosford	Spencer	Irregular (Mon – Fri,) 2 services (Sat)
34	Gosford	Kariong	Every 30min (Mon- Fri), every hour (Sat, Sun & PH)

Table 3 - Bus Services accessing the Hospital Precinct (Source: TfNSW, 2014)

There are two free shuttle buses providing transport from the Railway Station to the Hospital. One is operated by Busways, while the other is operated by the Hospital. The latter operates approximately every 15 minutes, between the hours of 8am – 11.15am, 12pm – 4pm, Monday – Friday (excluding Public Holidays).

In addition to the above specific routes servicing the Hospital, a major transport interchange is located on the east side of Gosford Railway Station (Figure 13), which is located approximately 500 metres from the Hospital. The majority of buses servicing the Gosford area link to this location, from which passengers are able to walk to the west side of the railway station (via the link bridge) and catch a free shuttle bus or walk to the Hospital, albeit via a relatively steep incline.

There are four bus stops located within the Hospital Precinct, as indicated in Figure 12 overleaf.

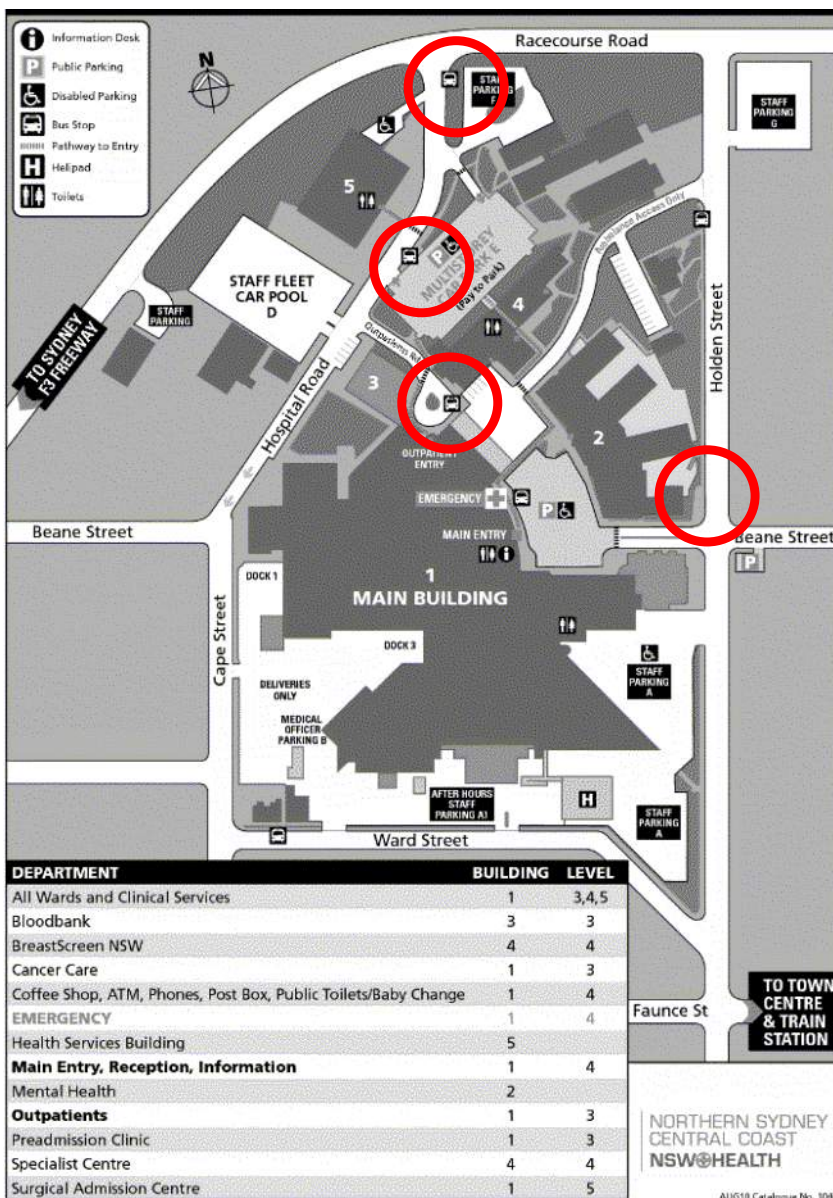


Figure 12 - Location of Bus Stops within Hospital Precinct (Source: NSW Health, 2014)



Figure 13 - Bus routes adjacent to the Hospital (Source: Busways Pty Ltd, 2015)

According to the travel surveys undertaken as part of this Assessment, the use of buses by the various user groups is as follows:

- Staff = 2%
- Outpatients = 10%
- Visitors = 8%

3.11.2 Rail

The Hospital is readily accessible from Gosford Railway Station (heavy rail), which is located approximately 500 metres south of the Hospital. Those accessing the Hospital entrance using rail would need to walk up a steep incline, making it unattractive for hospital users (particularly for elderly outpatients and visitors). In light of this, the Hospital's free shuttle buses provides a direct link from the Station to the Hospital, as discussed in the previous section. The primary rail services servicing the Hospital are presented in Table 4.

Rail Route	From	To	Frequency (approx.)
Newcastle and Central Coast Line	Sydney Central	Gosford Station	2-5 services per hour, every day
North Shore Line	Sydney Central	Gosford Station	5 services per day, every day

Table 4 - Train Services accessing Gosford Station

According to the travel surveys undertaken as part of this Assessment, the use of trains by the various user groups is as follows:

- Staff = 3%
- Outpatients = 5%
- Visitors = 4%

3.12 Cycling

The Hospital is reasonably accessible by bicycle from all directions, due to the good road network, although cyclists are required to share the road with motor vehicles. However, the hilly topography of the area, particularly to the east and south of the Hospital, make cycling an unattractive mode share option.

According to the travel surveys undertaken as part of this study, the use of bicycles by all user groups is very low with less than 1% of persons surveyed travelling by bicycle.

3.13 Pedestrian Network

3.13.1 Major Pedestrian Routes

As with cycling, walking is only likely to be an attractive option for people who live relatively close to the Hospital. A limited amount of low/medium-density residential development is located in relatively close proximity to the Hospital e.g. Sinclair Street, Batley Street North, Ward Street, Showground Road, Faunce Street West, and Holden Street (south of Faunce Street West).

Walkers might include staff, outpatients and visitors; however the questionnaire surveys undertaken as part of the this study indicate that staff on early morning or late evening/night shifts are less likely to walk, for safety reasons, unless living in very close proximity to the Hospital.