
Subject UNSW Bicycle Masterplan: External Bicycle Network

Date 11 December 2013

Job No/Ref 233486

1 Background

The following document provides an overview of the existing bicycle network in the areas surrounding UNSW, and proposes augmentation of this network to support the provision of a high quality regional transport network.

The University of New South Wales (UNSW) is a major destination point within the Randwick LGA. Major land uses nearby include Randwick Racecourse, Prince of Wales Hospital and the Randwick, Kensington and Kingsford town centres. These areas generate a significant number of trips on a daily basis, and therefore should be served by a high quality transport network that considers all modes of travel.

It is noted that in the order of 5% of all journeys to UNSW every day are made via bicycle – equivalent to approximately 2,000 daily trips. Additionally, trends from the annual travel survey undertaken by the University indicates that cycling as a mode of transport is growing in popularity, with a 13% increase on average recorded each year since 2007.

2 Principles of Bicycle Planning

2.1 Key Design Principles

The needs of bicycle users and their requirements for an efficient and useable bicycle network can be summarised by the five design principles below:

1. **Safety:** A good quality route enhances the safety of all users, including cyclists, pedestrians and motorists. Streets and intersections along key bicycle routes should be designed to a standard which incorporates cyclist movements.
2. **Coherence:** The bicycle network should link popular destinations with local residential streets via a mix of both local and regional routes. The network should be continuous and easily identifiable to both novice and experienced cyclists.
3. **Directness:** Bicycle routes should be as direct as possible, having consideration for major barriers such as road intersections and steep topography. The rider should ideally be able to maintain a safe and comfortable consistent riding speed throughout their journey.
4. **Attractiveness:** The bicycle network must be designed so that complements and enhances its environment in such a way that cycling is attractive. Clear and strategically placed wayfinding information should indicate distances and times to major destinations.
5. **Comfort:** Bicycle routes must be comfortable and easy to use for all cyclists. Depending on the road environment and topography, some level of separation (e.g. clearly marked bicycle lanes, painted green) may be required.

2.2 Network Hierarchy

It is important to consider the road network hierarchy when planning a system of good quality bicycle routes. This hierarchy entails both local and regional routes to facilitate safe, connected and efficient bicycle movements.

Regional bicycle routes provide the most direct means of travelling between key centres, with riders generally travelling at higher speeds and less likely to deviate off the nominated route. Regional routes generally carry the majority of through cycling movements, and should therefore avoid interactions with other modes of transport such as cars, bus and light rail.

Local bicycle routes provide connections from regional routes to key destination points, with riders travelling at lower speeds in a more mixed traffic environment (e.g. shared space with either pedestrians or vehicles).

2.3 Appropriate Bicycle Facilities

When determining the most appropriate cycling treatment on a bicycle route, consideration must be given to the traffic speed and traffic volume. The NSW Bicycle Guidelines provide direction relating to the most suitable cycling treatment for different roads, as reproduced in Figure 1.

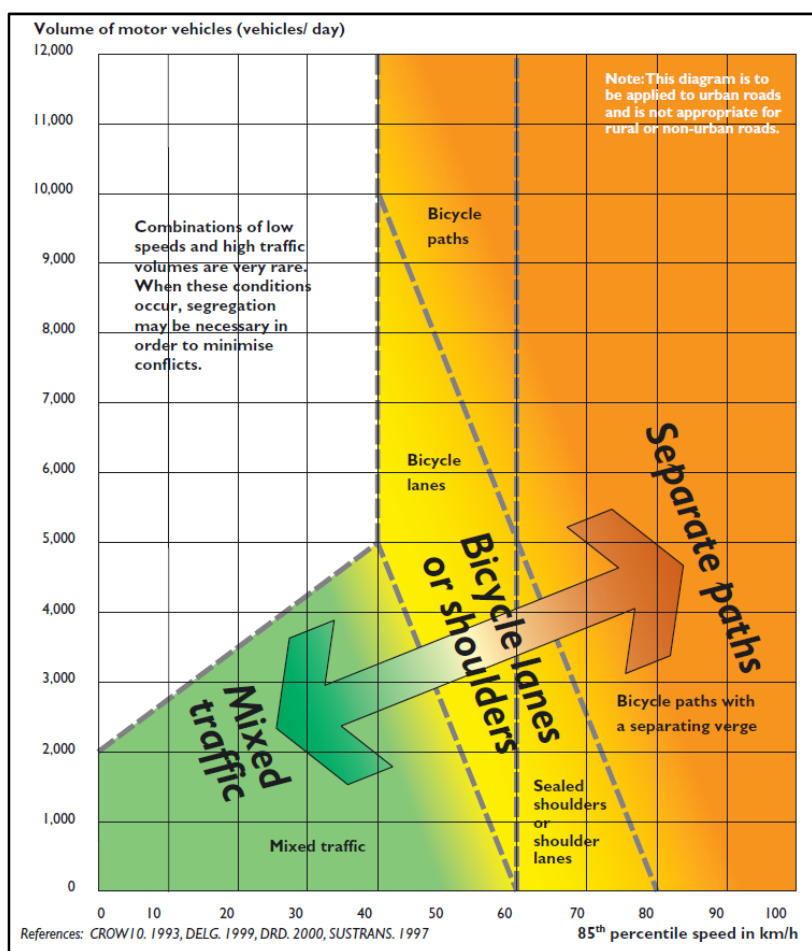


Figure 1 Separation of Bicycles and Motor Vehicles According to Traffic Speed and Volume

Source: NSW Bicycle Guidelines, Figure 3.2

3 **Existing Bicycle Network**

The existing bicycle network in the area surrounding UNSW and environs is generally fragmented and incomplete, with a number of missing links present. Doncaster Avenue provides a north-south route which connects links Kingsford and Kensington to the Anzac Parade cycleway at Centennial Park, continuing on to the Sydney CBD. A shared path exists on Alison Road and Wansey Road which provides a connection between the UNSW, Randwick Racecourse and Centennial Park.

Existing deficiencies and missing links in the bicycle network include:

- the conclusion of the Wansey Road shared path at the Wansey Road / High Street intersection, with no linkages towards Coogee, Randwick or lower campus available;
- absence of a dedicated east-west bicycle facility linking Randwick town centre and Anzac Parade, requiring many less confident cyclists to travel through UNSW;
- no connection from the bicycle facility on Doncaster Avenue / Houston Road across Anzac Parade into UNSW;
- no formal bicycle connection into Prince of Wales Hospital along High Street;
- incomplete bicycle route on Todman Avenue, between Kensington Road and Doncaster Avenue; and
- no connection along Cottenham Avenue between the bicycle routes on Day Avenue and Tresidder Avenue

The growth in cycling activity recorded at UNSW in recent years is significant given the absence of a high quality bicycle network surrounding the campus.

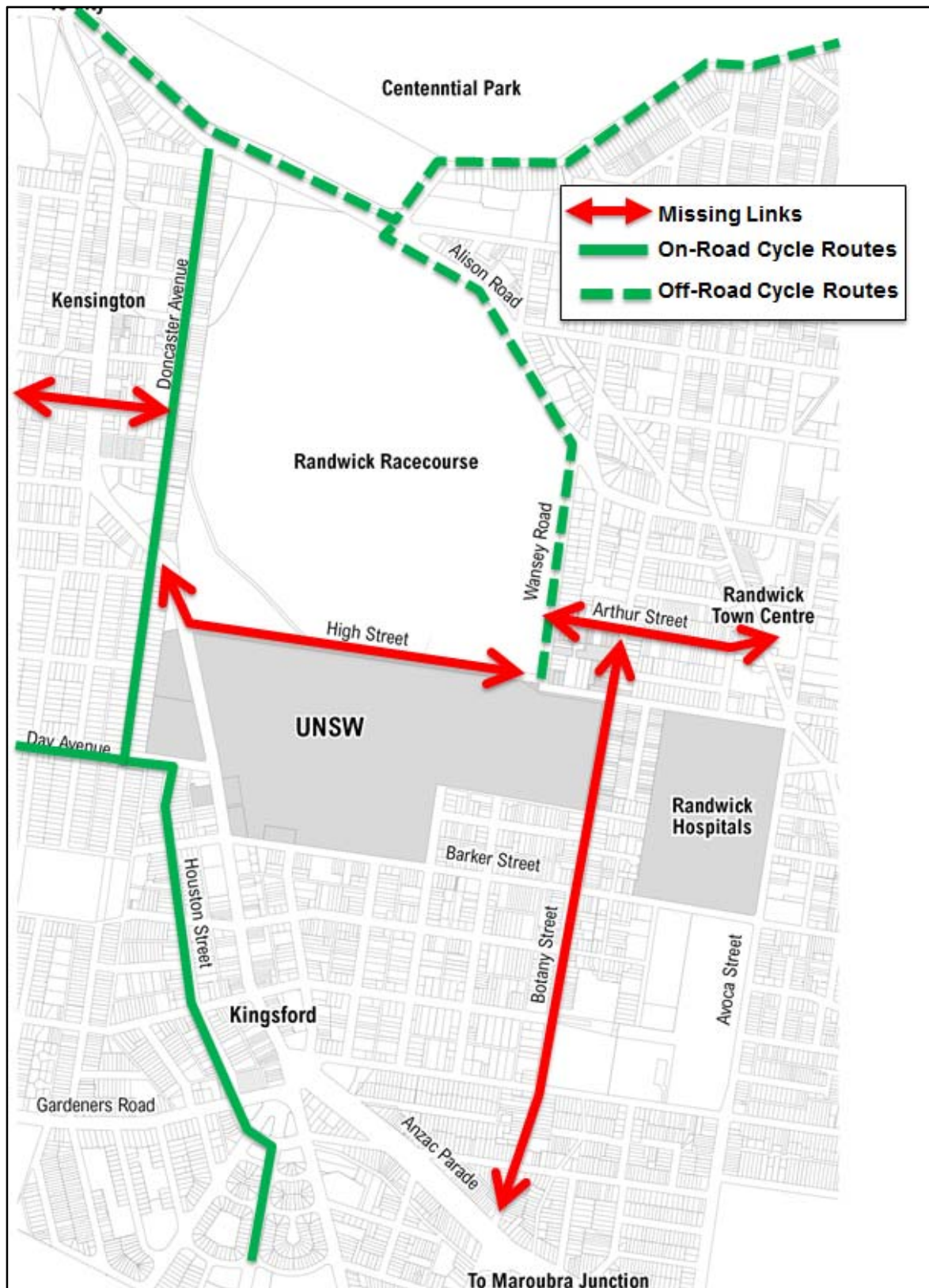


Figure 2 Existing Cycle Network

4 Proposed Bicycle Network

The proposed regional bicycle network aims to deliver a good quality series of routes by considering the five key principles of bicycle planning. The regional routes have been selected to avoid major arterial or collector roads carrying large amounts of vehicular traffic. They build on the existing regional bicycle network by addressing existing missing links and providing local connections to major destinations in the precinct. The network provides integration with future development associated with the Randwick UAP and the CBD and South East Light Rail project. This supports bicycle access to key destinations in the precinct including UNSW, Prince of Wales Hospital and other major developments.

Key features of the proposed network are described below:

4.1 Doncaster Avenue / Houston Street

Doncaster Avenue / Houston Street to the west of UNSW is a key component the regional bicycle network serving major centres including the Sydney CBD, Surry Hills and Kingsford. It is proposed to retain this route as the principal north-south bicycle facility. Local connections from this bicycle route will be provided to key destinations including UNSW and Kingsford shops.

The existing facility consists of white line-markings indicating on-road cycle lane. Many cyclists unfamiliar with the area travel down the busy Anzac Parade as they are unaware of the extent of this route, particularly at the Doncaster Avenue / Anzac Parade intersection.

To emphasise the importance of this regional bike route, it is recommended green paint be installed along the length of the route. This will provide a visual indication for cyclists that they may continue along their path of travel, enhanced continuity and improved level of safety as it would signify to motorists that this is a cyclist only area.



Figure 3 Existing Doncaster Avenue On-Road Bicycle Lane



Figure 4 Example of On-Road Cycleway with Green Paint

Source: Google Street View (2013)

4.2 **Barker Street**

Barker Street is proposed to provide local access for cyclists travelling from the Doncaster Avenue / Houston Street route into UNSW. Traffic signals at the Anzac Parade / Barker Street intersection will provide controlled access for cyclists riding between the campus and Houston Street.

4.3 **Botany Street**

Botany Street currently acts as a missing north-south link in the existing cycle network surrounding the campus. It is listed as a priority 2 route in Randwick City Council's current bike plan. Providing a formal bicycle facility at this location (on-road cycleway with green pavement) would deliver a connection between Centennial Park / Randwick Racecourse (via the Wansey Road cycleway) and Maroubra Junction (via the future Anzac Parade shared path).

4.4 **Arthur Street**

Arthur Street is proposed to provide a connection from the Wansey Road regional bicycle route into the Randwick Town Centre, providing local connections to Prince of Wales Hospital and UNSW. Arthur Street is a quiet, residential street suitable to accommodate bicycle movements, and would provide linkages to adjacent routes including the Wansey Road shared path and the proposed cycleway along Botany Street.

This route avoids interaction with the light rail and bus stops on High Street, and minimises potential conflicts with other modes of transport. Given the low traffic speeds and volumes on Arthur Street, a mixed traffic environment would be appropriate where bicycle logos would be painted near the centre of the road to indicate the space is to be shared between motorists and cyclists. This is a similar arrangement to many streets across Sydney (see Figure 5).



Figure 5 Examples of Mixed Traffic Streets (North Sydney LGA)

4.5 Anzac Parade

Randwick City Council is currently investigating the introduction of an off-road bicycle path along Anzac Parade (south of 9-ways roundabout). This facility would be located within the existing median. It will be important for Council to ensure that safe and convenient connections are provided from the end of the shared path to adjacent cycle routes – particularly along Houston Street.

Due to the high pedestrian volumes on Anzac Parade following the introduction of light rail, it is not recommended the Anzac Parade shared pathway be extended to run between 9-ways roundabout and High Street. Houston Road / Doncaster Avenue should be retained as the primary north-south regional bicycle route serving cyclists travelling longer distances at higher speeds.

4.6 Wansey Road

Wansey Road acts as an important regional bicycle route in the precinct, providing a connection between Centennial Park, Randwick Racecourse and UNSW.

The Environmental Impact Statement (EIS) of the light rail project indicates the shared bike path on the western side of Wansey Road is to be retained following the completion of the light rail. A significant number of pedestrians are forecast to utilise the light rail stop on Wansey Road during the morning and afternoon peak periods. Retention of the shared path, particularly given the topography of the area, increases the potential for conflicts between pedestrians and cyclists.

It is recommended that as the design of the light rail on Wansey Road progresses, consideration be given to a good quality separated, on-road bicycle facility. The ability to provide this facility will be dependent on the available road reserve, given the constrained width to allow for the light rail tracks.

4.7 High Street

A major deficiency in the existing bicycle network is the lack of a good quality east-west bicycle route connecting the local town centres of Kensington, Kingsford and Randwick.. The topography of the area makes cycling between these areas challenging for many riders, and therefore it is important a good quality facility be provided. A series of local connections across High Street can strengthen local connections to both UNSW and the future development at the southern end of Randwick Racecourse.

It is proposed that this be achieved by utilising the existing road reserve to provide an on-road bicycle lane for cyclists travelling east (uphill), with cyclists travelling west (downhill) to ride in the middle of the road.

The proposed solution could be implemented in the short term prior to the development of the Racecourse site. This option considers the slow operating speeds of cyclists travelling uphill and relatively high speeds when descending. When riding at higher speeds comparable to motor vehicles (due to steep topography), cyclists feel safer and more comfortable towards the middle of the road, reducing the risk of being hit by someone opening their car door. A parking separation line, 2.2m from the kerb, can be installed to maximise the usable road space. An example of this treatment is shown in Figure 6.

Travelling uphill cyclists require a greater degree of separation from vehicles and therefore a dedicated bicycle lane is appropriate. This arrangement is similar to that installed in Mount Street, Coogee (Figure 7), where a bicycle lane is provided in uphill sections only. A potential road cross-section for High Street is illustrated in Figure 8.

There may be future opportunities to improve this bicycle route in association with outcomes that may arise as part of the Randwick UAP.



Figure 6 Parking Separation Line, Darlinghurst



Figure 7 Mount Street, Coogee

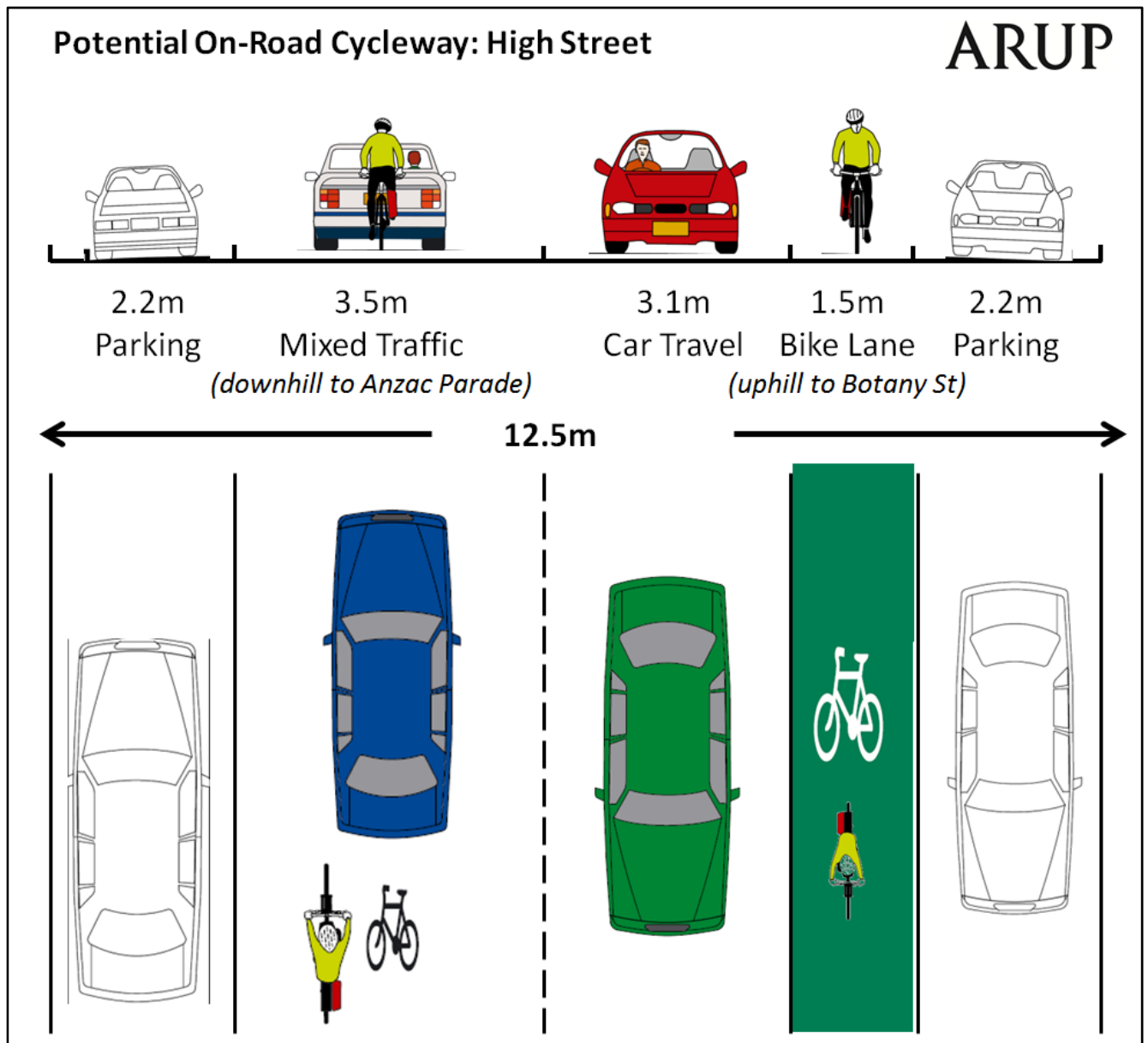


Figure 8 Potential High Street Cross Section

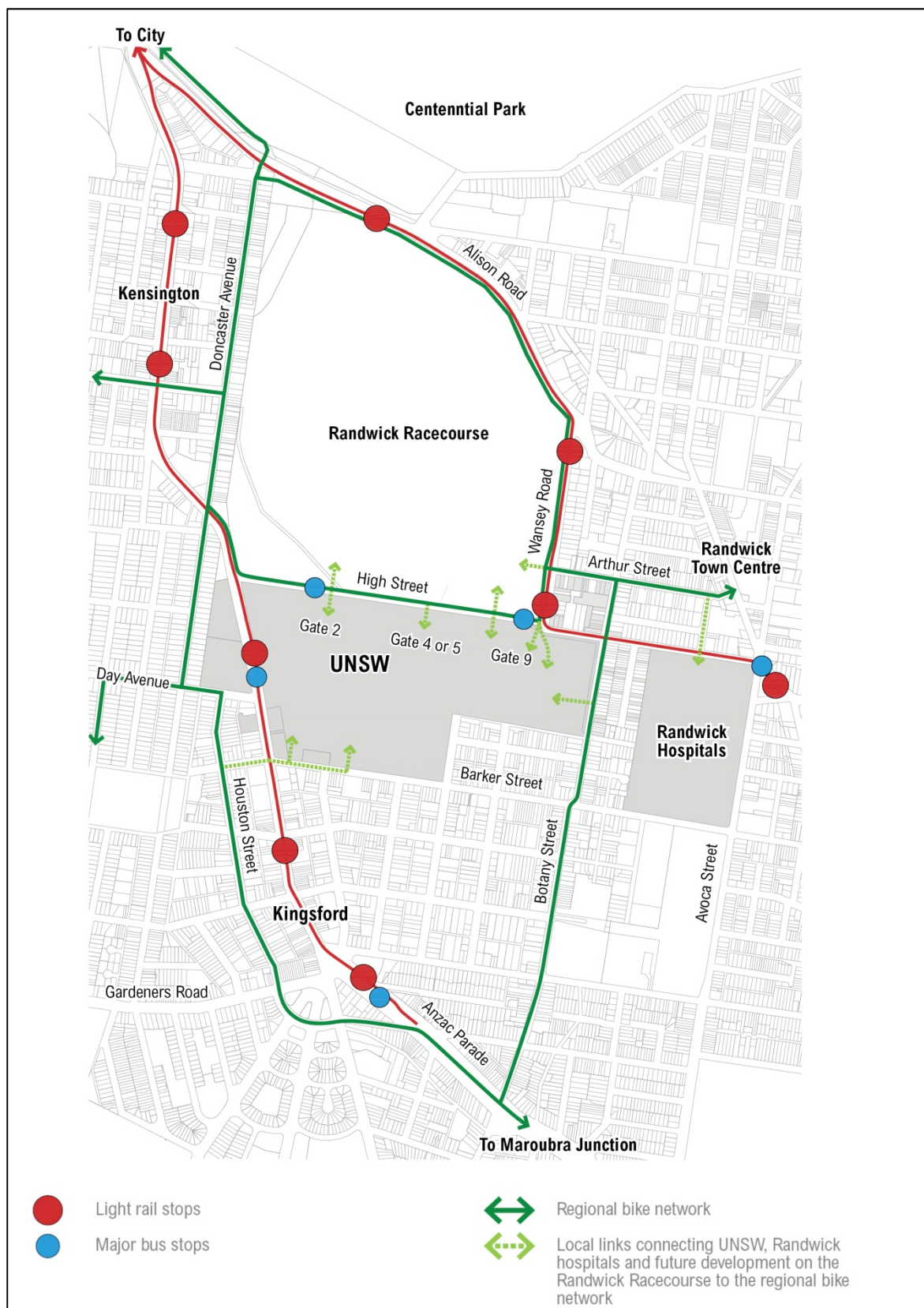


Figure 9 Proposed Bicycle Network

5 Wayfinding & Signage

Directional signage provides critical information to cyclists who are unfamiliar with the local bicycle network. Strategically positioned directional signage reinforces the connectivity and coherence of the bicycle network and directs cyclists to travel on the recommended bicycle routes.

Many cyclists often select an unsafe or undesirable route when a good quality bicycle facility exists nearby, potentially discouraging them from cycling in the future. For example many cyclists are currently unaware of the on-road bicycle route that exists on Doncaster Avenue parallel to Anzac Parade, and instead choose to cycle in the bus lane along Anzac Parade.

The directional signage would contain key information such as the name of the bicycle route, and directions (including distance and/or time) to major destinations in the area, e.g. UNSW, Prince of Wales Hospital, Randwick Town Centre, Randwick Racecourse.



Figure 10 Directional Signage Examples – City of Sydney