

Bicycle Network Directional Signage Design Guidelines

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*This guide was developed
and produced for*

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Photos overleaf on page 4 - Photos 1 to 8 (clockwise from the top right): Good bicycle network signage is part of a world-wide trend towards encouraging greater community use of more sustainable modes of transport. 1 & 2. Freiburg, Germany. Branded routes have markers affixed to the bottom of the signs. 3. RTA regional route signage, M7 Community Path, Western Sydney. 4. Directional signage in an urban setting. Karl Marx Alee, Berlin. 5. RTA regional bicycle route signage, Gore Hill Motorway Cycleway. 6. Bicycle route signage in Newtown mounted with street sign. 7 & 8. Dutch bicycle network signage outside Breda, The Netherlands



I Principles and planning

The purpose of bicycle network directional signage is to provide guidance which will enable safe and efficient travel by bicycle for a diverse range of trips around the city and surrounding regions.

The City of Sydney Bicycle Network is being developed across the local government area (LGA) in line with the City of Sydney Cycle Strategy and Action Plan 2007-2017 (CoS 2007) and the Inner Sydney Regional Bike Plan (CoS 2010). Because of the City's location and function at the hub of multiple regional transport systems, the City of Sydney Bicycle Network is being developed to serve both regional and local needs. The planned Sydney Cycling Network will be implemented progressively across the LGA by making engineering improvements to selected routes in the network. These improvements may involve a number of measures from major construction where separated bicycle paths are needed along busy road corridors to linemarking and signing where the road environment is less dominated by heavy traffic.

Bicycle directional and wayfinding signage is an important element in the development of the Sydney Bicycle Network both to encourage the community to use the bicycle route facilities and to provide the necessary system cohesion and connectivity.

Signing principles

Signs are compact pieces of information placed in a road/cycleway environment which have to transmit their messages very quickly to the people who are using the transport facility. They are most effective due to the brevity of their messages. This is very important in the road environment when people are travelling at speed and riders only have a limited time to take in the message and to respond to it in a practical way.

As useful as signs may be, the act of placing them in the road environment doesn't guarantee that they will communicate the intended message or have the required effect on road users. Human beings are limited by their physiology. The way our brain operates, we can not process large amounts of new information quickly. There is growing evidence that too many signs competing for our attention can either distract us from the act of riding or driving or cause us to miss vital messages entirely (see box right).

Signs primarily communicate through graphics and symbolism. Though much of the content of our road signs contains words, the letters which make up these words are in themselves complex graphical symbols. Unless the content of the lettering is immediately recognised and understood, it takes more time for the human brain to process a combination of letters than to recognise and react to shapes of whole words as the human eye usually sees words as graphical shapes rather than combinations of separate letters.

The most effective way signs communicate information is through their shape and colour. The universal Stop and Give Way signs are instantly recognisable (and from a far greater approach distance) because of their distinctive shapes and colours. A diamond shaped sign with a yellow background is used for warning signs, and the circular shape is generally used to denote crossings. The Australian road sign system only permits these shapes to be used for these types of signs.



Photo 9: Intersection, Ghent, Belgium

Communication without clutter

In all aspects of sign layout, design, placement, mounting and maintenance it is important to consider human factors. The tendency to 'solve' a traffic management or road safety problem by placing a new sign in the road/street environment can often be counter productive.

The human brain operates in two ways – conscious information processing and automatic information processing.

Conscious processing is: flexible, slow, easy to change, suited to new situations, requires energy, attention and conscious thought, and is error prone.

Automatic information processing is: rigid, fast, needs less attention, unsuited for new situations, dominated by expectations, hard to change, not consciously thought about, and is less error prone.

In learning to ride or drive we consciously learn many skills that with time become automatic. We don't need to consider the Stop sign in the distance. We automatically respond to it and begin to slow down on approach and look for other vehicles or pedestrians in or near the intersection.

On the other hand, an intersection fingerboard which lists two destinations requires an additional level of concentration and mental processing. Too much information in the road environment tends to overload our conscious information processing capacity which can in turn affect the ability of our automatic information processing to respond quickly.

Sign clutter, poor placement, insufficient colour contrast (particularly in low light situations) and complicated or wordy messages are all factors which can decrease the effectiveness of signage. Badly designed signage can add complexity to the road environment and can increase the possibility of operating errors by drivers and riders.

Every signage location or intersection is subtly different with its own set of problems to resolve. It is therefore essential when implementing any signing project to have a clear understanding of the key principles of good signage as most retro-fitting work will involve a wide range of challenges and unique signing situations.

A driver travelling at 50km/h sees in excess of 1200 pieces of information every minute. A slower travelling cyclist can take in more but, as discussed above, humans are limited by their capacity to filter and process new information. If a sign cannot be easily read, its message will go unheeded. The clarity and brevity of sign messages are essential components of legibility.

Signage guidelines are formulated to ensure good legibility. Consequently, important factors such as typeface (font), size, sign and lettering colours and sign layout are specified to ensure a consistently high legibility of signage.

Good signage brings cohesion to a bicycle network. Even if the provision of facilities is in its early development phase, a well-signed network of routes can provide people with the ability to more easily find their way around their city or town by bike. Consistent signage helps to build user-confidence in the bicycle network and cycling as a practical mode of transport.

Table I provides a comprehensive overview of the four principles of signing and their component elements.

Table I: Key issues relating to bicycle network signage

Principle	Elements	Discussion
Conspicuity	Siting	Signs should be sited so that cyclists have a clear view on approach and have time to respond. They should be mounted in locations which are consistent throughout the route. Adequate side clearance should be provided on sign supports.
	Mounting height	Signage should be kept clear of pedestrian and cyclist travel paths and mounted at a consistent height so as to be easily seen by all users. Signs should not be sited where they could be hit by vehicles or interfere with services (power, phone etc).
	Clutter-reduction	Visual clutter and sign proliferation should be avoided by grouping similar signage on the same support or combining information onto a single sign. Care should be taken when siting signs in situations where other signage systems may overwhelm or obscure bicycle route signage.
	Safe operation	Signage should be sited so as not to create a hazard to bicycle route users, pedestrians or other road users.
	Sightlines	Signs should be sited with clear sightlines for bicycle route users.
Legibility	Clarity	Signs must be easily read by all users of the system.
	Typeface	Choice of typeface should be based on legibility. Using a mixture of upper and lower case letters increases legibility particularly in low light conditions.
	Symbols	A limited, easily recognisable and consistent palette of symbols and pictograms should be used throughout.
	Colour	Sign background and lettering colours should avoid combinations which are hard to read.
	Contrast	Maximum contrast between sign background colour and legend is desirable.
	Lettering size	A consistent lettering size for route signage should be used so that signs can be easily read by users travelling at the design speed of the route and in all lighting conditions.
	Brevity	Destinations should be designated by concise, easily understandable and unabbreviated terms. Words over 20 characters should be avoided. Use pictograms to indicate services and facilities.
	Lighting	Night time and low light operation of the route should always be considered in the design and siting of signage.
	Alignment	Route turnings and branching routes should always be accurately indicated by fingerboard type signs. Fingerboards should be fixed to prevent accidental or intentional rotation.
Coherence	Route hierarchy	Signage should reflect the type of route (ie its designation in the network route hierarchy – State, Principal or Local).
	Destinations	All listed destinations should be identified (in the Bicycle Network Focal Point Map) and used consistently throughout the network. Closest destinations should be listed to the top. A branch destination, if shown, should be shown towards the bottom of the sign and separated from the main route destinations by a horizontal line.
	Distances	Distances are important to the users as a means of judging journey length, progress and arrival.
	Consistent information	Once a destination is stated it should be listed on each succeeding sign until it is reached (Rule of Continuity).
	Sign type	Sign type should indicate the importance of the route. Sign shape and type should relate to the location, ie board type signs for advance warning and reassurance and fingerboard types for intersections.
	Image/branding	Route signs should be consistently designed to reflect a consistent image or branding for the route relating to either network hierarchy, municipal style, or specific route design/designation.
	Relationship to other signs	Bicycle network signage should take account of other signage systems (eg route markers could be added to existing street signs to avoid unnecessary sign clutter).
Function	Relationship to other networks	Bicycle network signage should take account of other transport network signage systems and avoid ambiguity and unnecessary sign clutter.
	Decision points	All turnings of the route should be clearly signed. Advance direction signage should also be provided for difficult or inconspicuous turns. Reassurance and advance direction signs also contribute to effective system redundancy.
	Consistency	Signage has to be sited consistently and in the most obvious and logical of places to meet user expectations.
	Wayfinding complexity	A signage system should operate consistently across the bicycle network to service a complexity of wayfinding needs.
	Orientation	Signage should reflect the particular orientation of the traveller. For example, map boards located beside a path or road running south should always show the locality map with south towards the top of the panel.
	Human cognitive limitations	Human beings have limitations to the amount of information they can take in from the bicycle route environment in order to safely respond.
	Unambiguity	Only one route to a destination should be displayed on a sign. Alternate or parallel routes must not be shown.
	Redundancy	A sign system should be designed to permit safe and effective use even if individual signs are removed.
	Construction and installation	Signage should be durable, non-fading, and easy to erect and maintain. Simplified mounting systems compatible with existing systems will offer ease of maintenance and replacement to the sign system owner/provider. Construction/fabrication methods to minimise damage from vandalism and extreme weather should be considered.
	Route signage plans	A well prepared signage plan should cater for all the above elements for the installation and ongoing maintenance of the route signage system.

Signing bicycle networks

A bicycle network is a system of interconnected bicycle routes which enable people to satisfy their daily travel needs within their city or town and the surrounding region by bicycle.

Unlike the urban road network, which is predominately defined by its infrastructure (the main roads, regional roads and local roads which have been developed over time and interconnect our communities), a bicycle network is comprised of marked routes which overlay the existing urban road/street network.

It is the special system of bicycle signage, markings and engineering improvements we apply to our urban streets and roads which make bicycle routes and enable them to function collectively as a network.

There are three types of bicycle routes in use in NSW each with its own network function as shown in Table 2.

Regional bicycle routes

These routes are the spine of the network from which local bicycle routes radiate. They provide connections between areas of high population density and major activity centres, such as public transport nodes, universities, schools, shopping or commercial centres, industrial areas and regional recreational facilities. Regional routes are usually high-quality, high-priority routes providing quick unhindered travel between the major centres offering the most direct access with minimal delays.

Local bicycle routes

These routes provide high quality connectivity to residential streets and local trip-generating facilities such as schools, bus and train interchanges, pools, libraries and shops. Local routes provide for necessary circulation within the city and suburbs.

Tourism and recreational bicycle routes

These are designated routes which provide recreational and tourist bicycle access within the city or across regions. Examples of this type of route are rail trails (built along disused rail corridors), harbourside pathways and historical trails.

Table 2: Bicycle routes and their network function

Parameter	Regional Routes	Local Routes	Tourist and Recreational Routes
Basic characteristics	High-quality, high-priority routes permitting quick unhindered travel between major urban centres and to key centres within the surrounding region	High quality routes connecting residential streets and trip generating locations to regional bicycle routes and providing circulation within the urban area.	Providing attractive and easy access to places of high tourist interest and recreational areas in a 'low stress' environment
Transport function	Movement primary, access secondary	Movement and access equal	Movement and access equal
Priority	High	Medium	Medium to low
Place connections	Regional centres and major transport nodes	Urban centres, employment, schools, entertainment, cultural, transport	Tourist attractions, points of cultural and scenic interest
Spacing of facilities	500 – 800m	300 – 500m	Route specific
Choice of route	Choice of two routes.	Choice of two routes	Route specific
Continuity of movement	High	Medium	Medium to low
Service linkage to major transport nodes	High priority. Primary linkage may be via connecting local route	High priority	High priority. Primary linkage may be via connecting local route
Operation	30 km/h or more. Dual on-road and off-road travel paths through intersections	20-30 km/h	Less than 25 km/h
Target trip length	> 3km	0 – 3km	>5km but can vary according to the attractions
User skill required	Low to high	Low to high	Low
Maintenance	Pavement maintenance similar to regional road standard	Pavement maintenance similar to local road standard	Periodic. Depends on location and traffic load

Signage guidelines

There are a number of guidelines designed specifically to assist designers, engineers and transport planners to provide high quality, professional and consistent signage for cycling networks across NSW cities and towns. These guidelines cover all aspects of signing bicycle networks from the regulation of facilities to hazard warning and wayfinding.

NSW Bicycle Guidelines (NSWBG). This manual provides advice on the design and marking of bicycle facilities in NSW, particularly in relation to urban street/road environments. It should be used in conjunction with the *Austrroads Guide to Road Design* (AGtRD). The NSWBG provides technical guidance on regional bicycle network directional signage.

City of Sydney Bicycle Network Directional Signage Guidelines (CoSBND SG) – this manual. These guidelines provide advice and information on the planning, design, installation and maintenance of directional signage for bicycle networks within the City of Sydney LGA, including directional sign designs for local bicycle routes and tourism/recreational routes. The NSWBG provide details for regional bicycle route signage.

Austrroads Guide to Road Design (AGtRD) is the national road transport design guidelines. It covers a wide range of design issues including bicycle facilities on- and off-road and provision at road works and provides guidance on aspects of regulatory and warning signage for bicycle routes.

City of Sydney Park Regulation Signage Guidelines. The City of Sydney is implementing a number of wayfinding signage systems to assist people to navigate footpaths, parks, activity centres, shared paths and urban greenway networks. Paths through city parks are regulated by a system of signs described in the *City of Sydney Park Regulation Signage Guidelines*. Other City guidelines provide advice for wayfinding signage systems for public transport access and general pedestrian access within the Sydney CBD.

Where existing signed paths form part of a regional route, bicycle network directional signs will take precedence for route navigation over any local signs, but their use should be restricted to these locations:

- Where the regional route joins the path;
- Any branching intersections of other regional routes along the path; and,
- Where the regional route exits the path.

Care should be taken to harmonise the use of regional bicycle network signage with existing path signage systems through careful sign location and mounting.

Off-road paths and path junctions to other named destinations should be signed the same as on-road routes. Where no path signage system is in place, normal bicycle network signage should be applied throughout the path.

On bicycle routes through parklands and reserves, consideration should be given to the installation of additional signage indicating facilities such as water points, toilets, information centres and points of interest if none exist. These facilities are important particularly to recreational bicycle riders and tourists and should be included in any signage plan associated with the development of tourist and recreational routes.

Design objectives

Consistent, accurate and unambiguous bicycle network signage uses a methodology based on the established practice of highway network signage which embodies the following key signage and wayfinding objectives:

- 1. Ensure consistency of signage layout and quality across the networks.** A consistent standard, location and quality of signage across bicycle networks will assist people to identify bicycle routes, minimise the risk of confusion and build community confidence in the system.
- 2. Identify important departure/ destination locations and decision points.** These are the only places which are to be named on signage for a particular bicycle network. These locations are to be plotted onto a Network Focal Point Signage Map. This map provides the framework for directional signage on the bicycle network and is an important tool in its ongoing development.
- 3. Maintain rigid consistency in naming locations.** Absolute consistency in naming locations must be maintained throughout the system. Once a destination has been named it must appear on all subsequent signs until that destination has been reached.
- 4. In the event of alternate routes, sign the most direct route.** If more than one route is possible from a departure point the most direct route should be the

only one indicated on the signs. This may be varied if the alternative offers major advantages over the shorter route.

- 5. Major centres such as the Sydney CBD will be signed: 'City'.** Routes from the edge of a built-up area to the centre should be regarded as continuous even though they may pass through other regional centres. The destination wording (City) should be continued right into the city centre.
- 6. Indicate distances in kilometres.** Distances to destinations provide essential wayfinding and orientation information and should be indicated on all fingerboard and reassurance signage. Where indicated distances are less than 10km, 100m increments should also be shown (eg 9.4, 4.2 etc). For greater legibility the numerals indicating 100m increments should be 75% of the height of the whole kilometre numerals.
- 7. Brand the important routes (optional).** Route branding should be limited to a small number of high-speed, limited-access, regional bicycle routes between regional centres within the Sydney Metro Region.
- 8. Use map boards at key entry points.** Network map boards provide additional navigational assistance to bicycle riders and can often indicate multiple route options and wayfinding possibilities.
- 9. Ensure street name signs are in place at all network intersections.** Street name signs provide the fine grained information to enable riders to know precisely where they are and to efficiently find their way to their destinations.

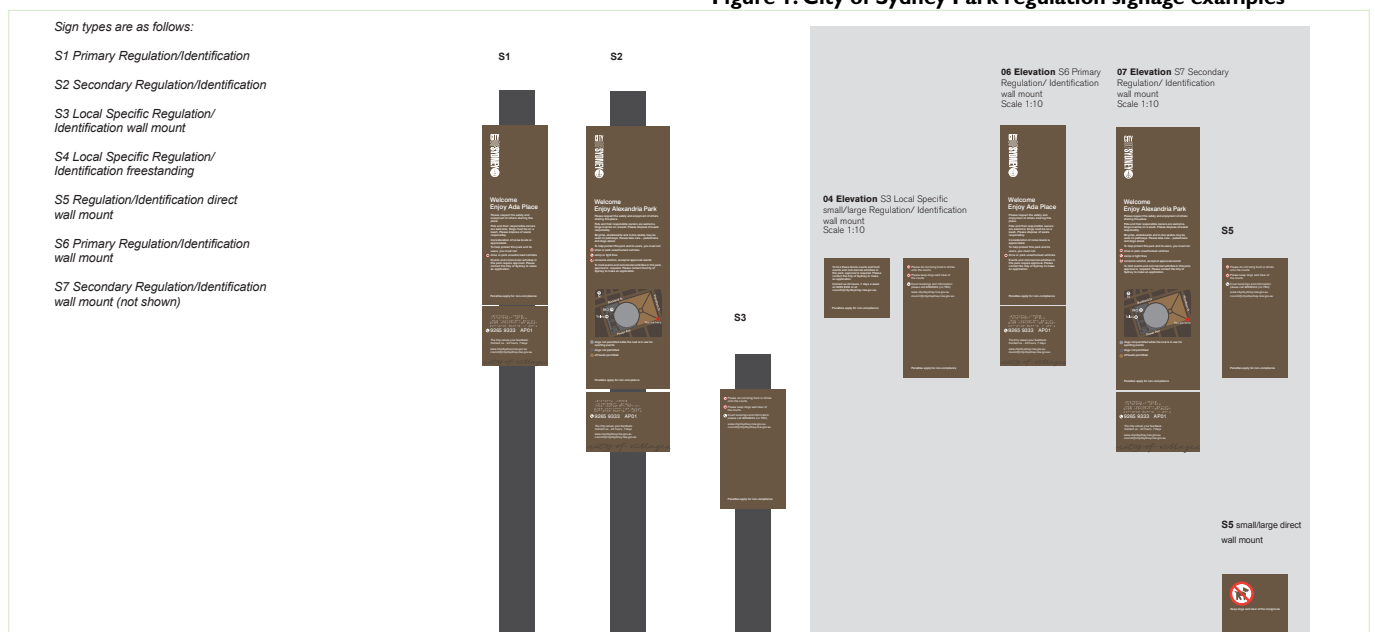
Route signing methodology

Signing a network is a five stage process:

1. Prepare the bicycle network focal point map which identifies all destination points and key decision points for each route;
2. Assess the current physical condition of the route via a pre-signage and risk assessment survey;
3. Determine the level of signing, the route numbering or branding required for each route to be signed;
4. Prepare a signing schedule specifying all signs, their locations and mounting; and,
5. Install the signs and inspect after installation to correct any errors and omissions.

This process is described in detail in the following sections.

Figure 1: City of Sydney Park regulation signage examples



2 Sign types and their use

This section provides details on the various types of signs and their use within the bicycle network. There are four basic types of bicycle network signs:

- **Regulatory signs** define facilities such as bicycle lanes, bicycle paths and shared paths. They have to be obeyed by all road users. Stop and Give Way signs are also regulatory signs used in conjunction with bicycle facilities. The combination of regulatory signage and linemarking usually defines a bicycle facility. The NSWBG and AGtRD provides detailed guidance on the use of this type of signage to define and regulate the use of on-and off-road bicycle facilities.
- **Warning signs** are the familiar yellow diamond shaped signs which warn of hazards in the road or path environment. This type of sign is used to alert other road users of intersecting or merging bicycle movements. The NSWBG Section 9 and the RTA's Road Sign Register provides detailed guidance on this type of signage.
- **Guidance signs** have two broad purposes. They are used to guide road/path users through complicated or potentially hazardous locations or to provide simple behavioural messages and instructions. The other purpose is to provide directional and wayfinding guidance throughout the bicycle network. Detailed advice on the types and use of directional guidance signs for the City of Sydney bicycle network is provided in these guidelines.
- **Information signs** have multiple purposes, such as area-wide maps, information on construction projects, and interpretation panels for sites of interest. Information suitable for use in the City of Sydney bicycle network is detailed in these guidelines.

Directional guidance signs

The main purpose of this type of signage is to provide directional and wayfinding guidance to people using the bicycle network. Directional signing reinforces system connectivity and coherence and gives high visibility and recognition to the routes which make up any network.

In the general traffic environment there are many directional signs provided for road users. This main road and highway signage is usually attuned to motorised traffic and does not adequately serve the bicycle rider, when a separate or parallel bicycle network is in existence. Add-on systems for directional signage can create ambiguity and conflict for both motorised road users and bicycle riders alike, so in line with best practice in Australia and overseas, a completely independent system of signing is used to mark bicycle routes.

There are three categories of directional signage recommended for use on the City of Sydney bicycle network: regional route signage; local route signage; and, tourism and recreational route signage. All bicycle network directional signage should comply with the requirements and individual sign details described in the following pages of these guidelines.

Regional bicycle route signs

There are three types of direction signs used on regional bicycle routes (see Figure 2):

1. **Intersection fingerboards** are the primary means of indicating route direction at network decision points or intersections. The focal point destination and one

sub destination are shown on this type of sign. Where routes overlap separate finger boards should be used for each route with the sign for the joining route mounted below the joined route(s) sign(s). Destinations used on fingerboards should be identical to those used on all other signs along the route. Distance indication is shown for all destinations on intersection fingerboards.

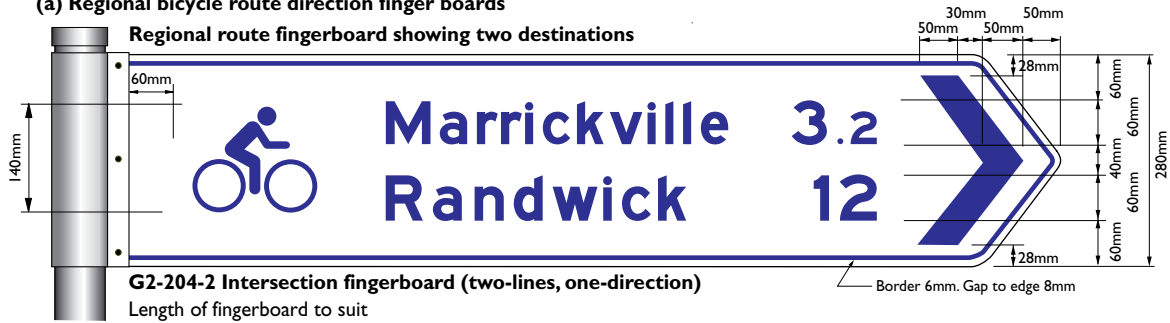
2. **Advance Direction Boards** are placed before an intersection to indicate the route(s) being followed and route choices available at the approaching intersection. Advance Direction Boards display the destination and sub destination for the route(s) being followed. Where other routes are indicated, only the focal point destinations should be shown. Distances are never shown on advance direction boards.
3. **Reassurance Direction Boards** are used beyond intersections that have been signposted with fingerboards to reassure bicycle riders that they are travelling towards their intended destination and to indicate the distances to those destinations. Focal point destinations and subdestinations with their distances should be shown as a list with the closest destination to the top and the list sorted by distance. Where routes overlap, destinations and subdestinations for all routes are listed, including any route Destination Points (ends of routes).

Local bicycle route signs

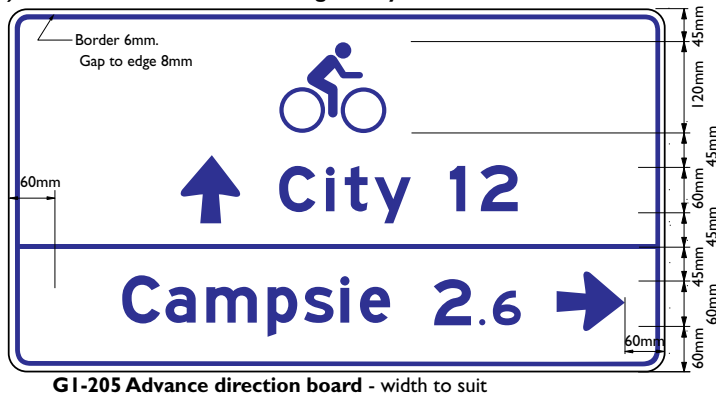
There are three types of direction signs used on local bicycle routes (see Figure 3):

1. **Intersection fingerboards** are erected at local bicycle route turnings as a wayfinding aid to important local destinations. These signs indicate distances similar to regional route fingerboards. As this type of bicycle network signage is closely related to local street name signage, it may be necessary when signing local routes to install missing street signage to ensure completeness and easy navigation within the locality. Where a local route is short (maximum of three turnings from the regional route), the preferred method of marking destinations is to mount a local bicycle route intersection fingerboard below the existing street name sign at each route turning. On longer routes with many turnings, it may be preferable to mark most route turnings with local bicycle route markers affixed directly to street name signs or separately mounted beneath. When marked this way, Local Bicycle Route Fingerboards (with destination and distance) should be used as the first and last sign in the sequence. Advance direction and reassurance signs are not used when marking local bicycle routes.
2. **Route markers** are used to supplement local bicycle route fingerboards and are affixed to existing street name signs (or mounted separately beneath) to indicate a route turning.
3. **Facilities/services indicators** are used to supplement the use of both regional and local bicycle route fingerboards. These signs as fingerboards can be erected at the side of a route to indicate the path to nearby facilities or local attractions (toilets, shops, services) and local street exits from paths located in parklands. As plate type signs they can be erected on the sides of

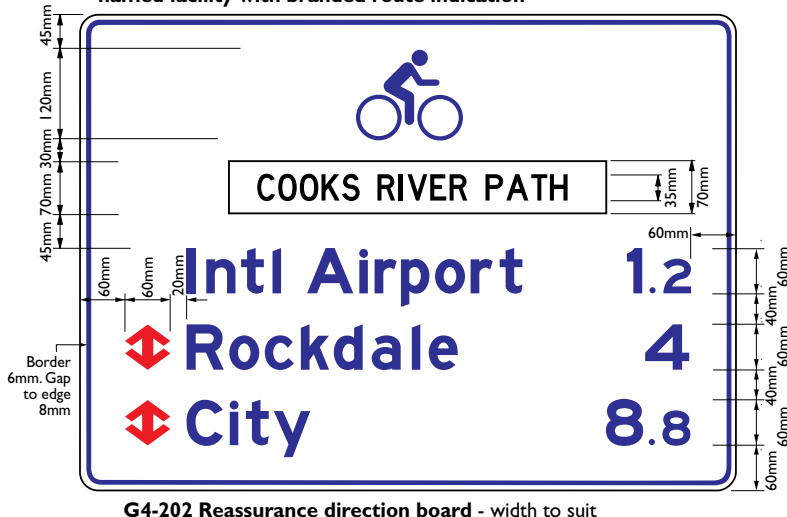
(a) Regional bicycle route direction finger boards



(b) Advance direction board for regional cycle route intersection



(c) Reassurance direction board for regional cycle route on named facility with branded route indication



Notes

1. This drawing is to be read in conjunction with the NSW *Bicycle Guidelines*.
2. See separate diagram for typical intersection sign layout and mounting methodology.
3. Direction signs use AS2700 Royal Blue lettering, logos and arrows on white retro-reflectoris background. Letter sizes as shown.
4. Typeface used for destinations/distances is AS1744 Modified E mixed capitals and lower case. Where distances are less than 10km these should be indicated to the nearest 100 metres expressed in standard decimal form with the sub kilometre numeral 75% of the height of the whole kilometre numerals.
5. On fingerboards, distance numerals are located adjacent to the direction arrow. On reassurance direction boards they are located to the right of listed destinations.
6. Typeface used for named routes is AS1744 Series D Medium capital letters. Route name plates use black lettering with white background.
7. Fingerboards are double sided from thick aluminium or steel plate or extrusion (height as above) and cut to length. Fingerboard signs are mounted on poles using standard pipe clamps. Clamps should be pinned to prevent accidental movement due to wind or vandalism.
8. Fingerboard sign plates can be square-ended provided that the sign border and main directional arrow are reproduced to dimensions given.
9. Direction arrows on advance and reassurance direction boards are AS1743 - short arrow.
10. On fingerboards, the bicycle symbol points in the direction of travel. On reassurance and advance direction boards the bicycle symbol faces towards the right as shown.

Figure 2: NSW Regional Bicycle Route Direction Signage

Standard City of Sydney street name fingerboard
Mounting shown for smart poles. Length of fingerboard to suit



G2-206-2 Local intersection fingerboard (right pointing, 2 lines)

Length of fingerboard to suit



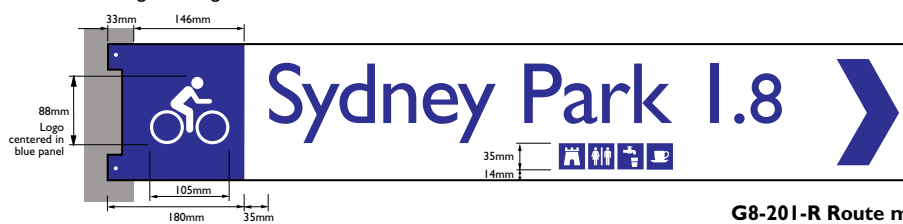
G2-206-2 Local intersection fingerboard (left pointing, 2 lines)

Length of fingerboard to suit



G2-206-1 Destination point fingerboard with facilities symbols (right pointing, 1 line)

Length of fingerboard to suit

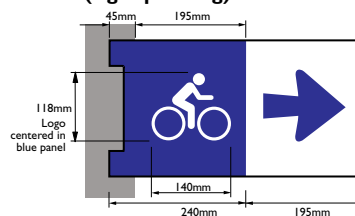


G2-207-1 Street location plate above road underpass

Reduced version shown. Actual size as above



G8-201-R Route marker (right pointing)



Straight ahead



Turn left



Turn right



Veer left



Reduced version.
Actual size as per
dimensions (left).

Notes

1. This drawing is to be read in conjunction with the City of Sydney Street Name Sign Standard Drawing.
2. See separate diagram for typical intersection sign layout and mounting methodology.
3. Direction signs use AS2700 Royal Blue lettering, logos and arrows on white retro- reflectorised background. Letter sizes as shown.
4. Typeface used is Gill Sans mixed capitals and lower case. Where distances are less than 10km these should be indicated to the nearest 100 metres expressed in standard decimal form with the sub kilometre numeral 75% of the height of the kilometre numerals.
5. Distance numerals are located adjacent to the direction arrow.
6. Signs are manufactured from 6mm aluminium plate sanded then acid washed, followed by a two-pack etch primer and a two-pack polyurethane coating to the required background colour. Sign height as above and cut to length.
7. Sign lettering and graphics are then applied and finished with a coating of two-pack anti-graffiti paint.
8. Fingerboard signs are mounted on poles using standard pipe clamps. Clamps should be pinned to prevent accidental movement due to wind or vandalism.
9. Direction arrows for markers are ASI 743 - short arrow.

overbridges to indicate the name of cross streets. Figure 3 shows a sign example utilising the relevant services logos. Figure 6 shows the facility logos commonly used on bicycle routes.

Tourist and recreational bicycle route signs

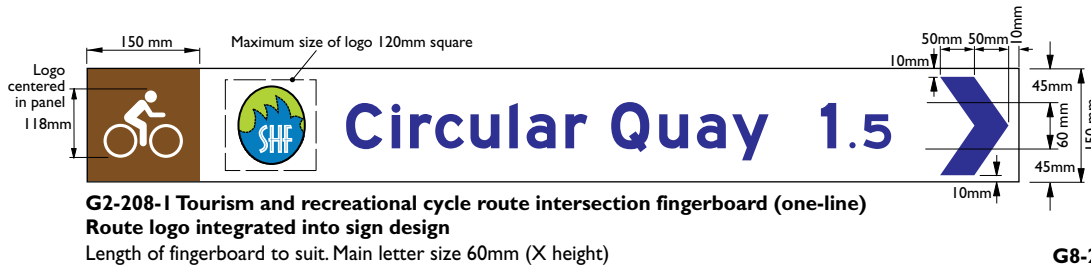
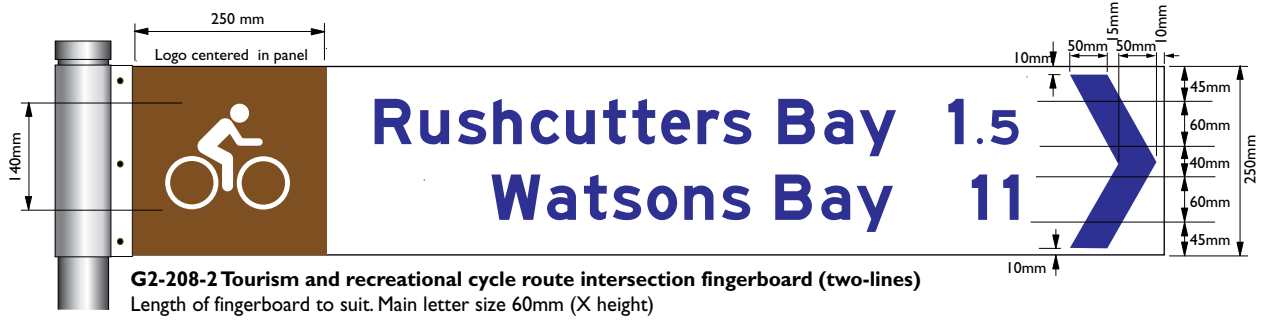
Tourist signs are intended to mark recreational and tourist

Figure 3: City of Sydney Local Bicycle Route Direction Signage

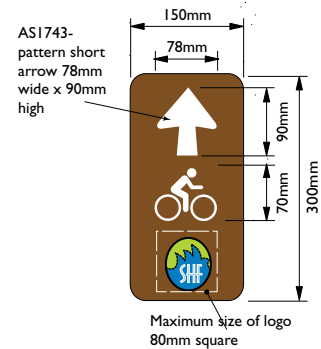
routes which are usually (but not entirely) off-road and sometimes in remote locations. Tourist and recreational signs differ from normal network signage in that they use the standard brown tourist sign colour in their design. There are three types of direction signs used on tourism and recreational bicycle routes (see Figure 4):

1. **Intersection fingerboards** are the major means of indicating tourism and recreational bicycle route

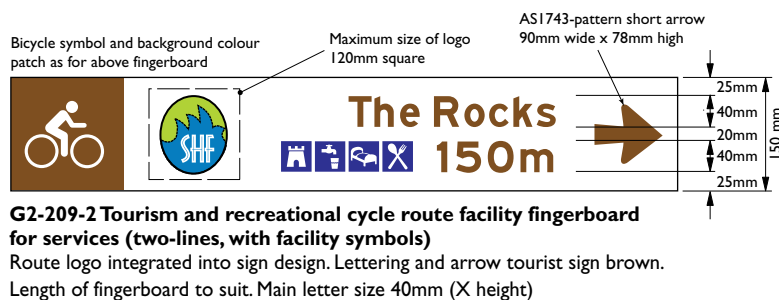
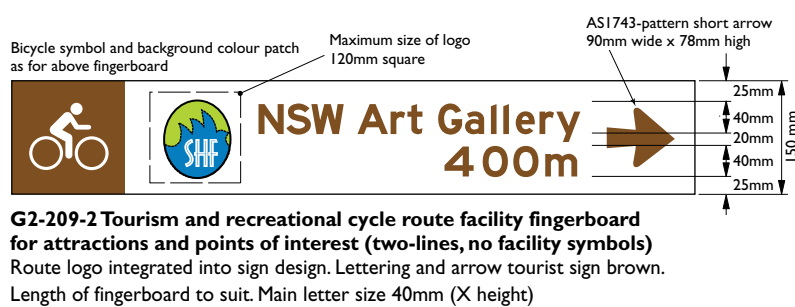
(a) Wayfinding direction signs



G8-200-U Tourism and recreational cycle route marker



(b) Facilities direction signs

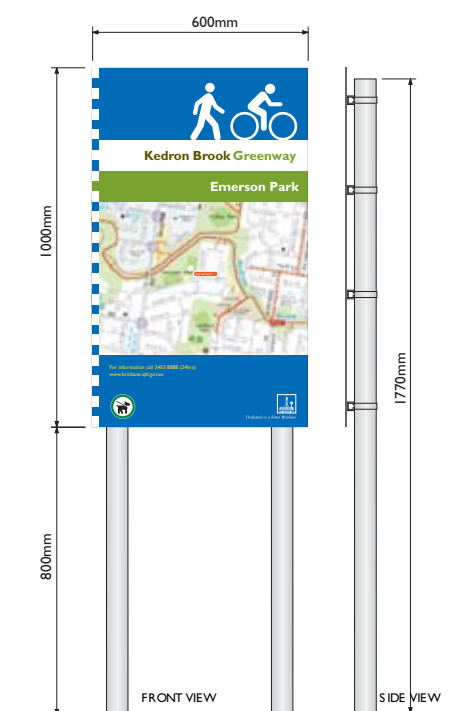


Notes

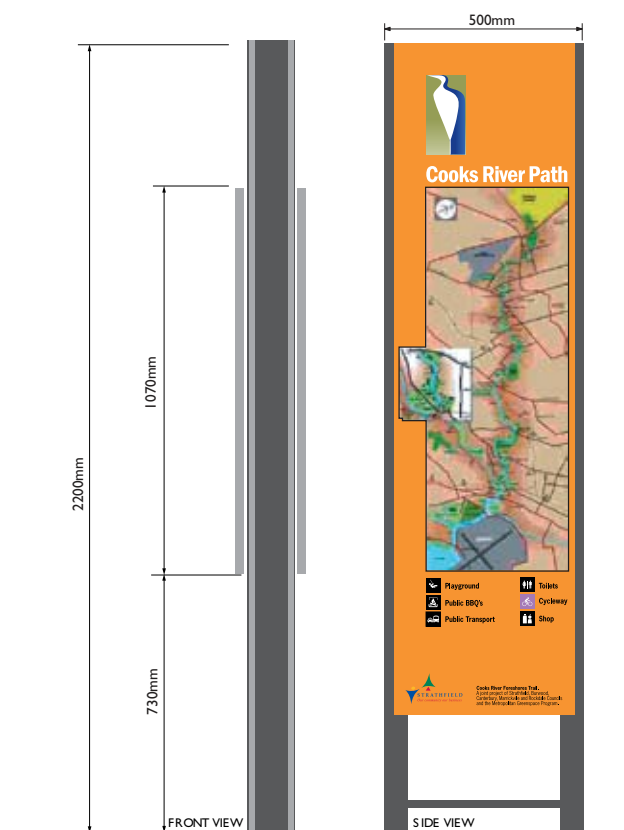
1. This drawing is to be read in conjunction with the *New South Wales Bicycle Guidelines* Section 9
2. Tourism and recreational signs are AS2700 Royal Blue lettering on white retro-reflectorised background with a white bicycle symbol on a square brown background at the mounting end of each sign. Brown colour is AS2700 Brown. Letter sizes as shown.
3. Typeface used for destinations and distances is AS1744 Modified E mixed capitals and lower case. Where distances are less than 10km these should be indicated to the nearest 100 metres and expressed in standard decimal form with the sub kilometre numeral 75% of the height of the whole kilometre numerals.
4. Fingerboards are double sided from thick aluminium or steel plate or extrusion and cut to length. Fingerboard signs are mounted on poles using standard pipe clamps. Clamps should be pinned to prevent accidental movement due to wind or vandalism.
5. Fingerboard signs are square ended. The main directional arrows should be reproduced to dimensions given.
6. On fingerboards, the bicycle symbol points in the direction of travel.

Figure 4: City of Sydney Tourism and Recreational Bicycle Route Direction Signage

Map display board examples



Example 1: (Top left) Brisbane City, Kedron Brook Greenway area map oriented to North.



Example 2: (Top right) Cooks River Path, Sydney. Linear park trail map oriented to direction of travel.

direction at decision points or intersections. Focal point destinations for the route, plus any subdestinations, are shown on intersection fingerboards along with distances. If advance or reassurance direction signage is required near an intersection on tourism and recreational bicycle routes to ensure adequate route wayfinding (due to complicated intersection alignments etc), tourist bicycle route markers should be used.

2. **Facilities/services indicators** pointing to facilities and attractions relevant to the route are used at intersections or access roads adjoining the route. The name of the facility/attraction is shown on the fingerboard along with distances to these destinations. Where distances are less than 1 kilometre these shall be shown in metres. These signs are subject to approval by the route management authority. Facilities signs may include one or more facilities logos (see Figure 6) to indicate the availability of facilities/services such as toilets, water, rest stops, accommodation and attractions such as points of local interest and historic sites.
3. **Route Markers** are an additional aid to cyclist navigation and are used to supplement direction signing on routes that have significance as through-routes. Markers, when used away from intersections, are placed at 5km intervals. Markers can also be used on trails as advance direction and reassurance signs to supplement intersection fingerboards.

Information signs

Map boards

Street maps and bicycle network maps can be very useful aids to navigation especially when placed at key entry and exit

Figure 5: Map boards. While signs generally only indicate one or two routes, maps boards can show multiple routes and thus show more options for bicycle travel.

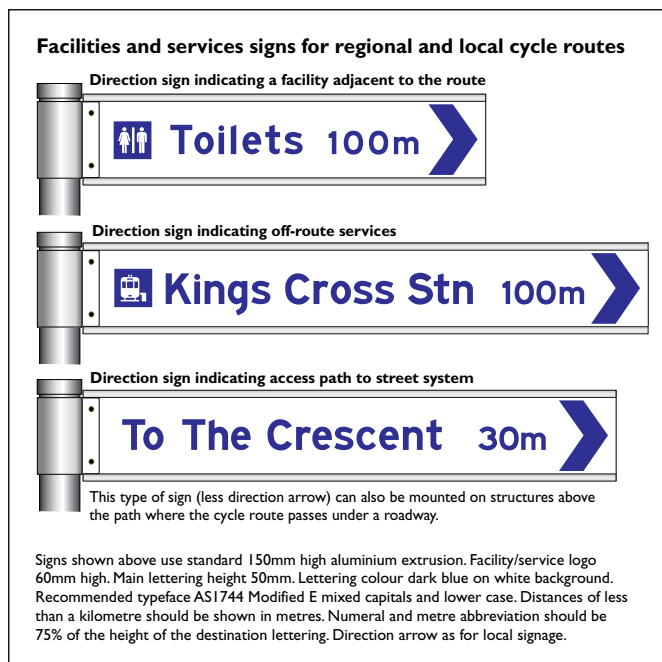
points to a town or built-up area, at the ends or entrances to linear pathways and at mid-points along bikeways/shared paths. Examples of path map boards are shown in Figure 5. Map boards should be easily accessible from the bicycle route. If maps are located on a side path, or rest area not visible from the path, they should be indicated with additional signs.

Though it is an established mapping convention to use street maps oriented towards north, care should be taken when presenting this information to the user. Map boards should be located so as to assist orientation, with the user facing up the page and generally in a northerly direction. Alternatively, a north point located on the ground nearby and/or on the map board may assist the viewer to orient the map.

When mounting map boards and other information boards, such as tourist information, care should also be taken to provide sufficient space and clearance from the path to ensure adequate space to inspect the map without interfering with the passage of other path users (see Section 3 for clearance recommendations). Map boards should be mounted flush with their support posts and finished so that they do not present sharp edges to users or protrude into the operational space of the adjacent cycleway or pathway.

Information and infrastructure signs

Information signs can be erected to provide technical details of bicycle facilities and important network infrastructure. These signs can also be used to heighten awareness of major bicycle facilities such as welcome and naming signage at major route gateways and trail heads.



Shared path pavement markings

A pavement marking system to encourage bicycle riders and pedestrians to behave in a predictable and co-operative manner has been developed for use on shared paths within the City of Sydney. Guidance pavement markings to communicate key behavioural messages to path users have been developed for use singly or in groups to suit each shared path situation (See Figure 8).

To improve management of shared paths through the promotion of key behavioural messages, a tiered implementation framework is recommended and is detailed in the City of Sydney *Shared Pathways Pavement Markings Guidelines* manual. Choosing the appropriate level of path marking requires a site-specific analysis of the types of path user and the operational conditions relating to each location.



Figure 6 (above left): Facilities and services signs for use on regional and local routes. Facilities and services signs for tourist and recreational signs are shown on Figure 4.

Figure 7 (above right): Recommended logos for use on bicycle network facilities and service signage. Logos are white on a dark blue background (standard services colour). Logos shown are relevant for signing bicycle routes. For additional services logos refer to ASI742.

Figure 8: (left and below): City of Sydney Shared path pavement markings. See separate design guidelines for full details.



TIL01



SHARED PATH



3 Bicycle network signing process

Bicycle route signing is a five stage process:

1. Refer to the regional and local bicycle network focal point maps which identify all destination points and key decision points for the network;
2. Assess the current physical condition of the route via a pre-signage and risk assessment survey;
3. Determine the level of signing, the route numbering or branding required for each route to be signed;
4. Prepare a signing schedule specifying all signs, their locations and mounting; and,
5. Install the signs and inspect after installation to correct any errors and omissions.

A bicycle network is usually signed route by route. However, before commencing any route directional signing project, it is essential to determine the location and context of the route within the regional bicycle network so that interconnecting routes and the destinations they serve can be identified. The regional bicycle network plan also determines the types of routes from which the level of signing is determined.

A regional bicycle network plan for the Inner Sydney region was undertaken in 2009-10 in conjunction with 14 neighbouring councils. This regional plan and the underpinning local council bicycle network plans have been combined to produce a bicycle network showing all planned regional bicycle routes for the City of Sydney and surrounding LGAs. This plan provides the basis for the City of Sydney Bicycle Network Focal Point Map which provides a consistent framework for all future route directional signage projects.

Selecting destinations

When undertaking directional signage projects for the City of Sydney Bicycle Network, council officers and their advisors should consult this bicycle network focal point map to ensure a consistent, logical and region-wide set of destinations are selected for use. This is particularly important when signing regional routes which extend beyond council boundaries.

Focal point mapping

A bicycle network focal point map is a planning document, used and maintained by the bicycle network's manager to establish the destinations which will appear on directional signage for the network. A key aim of a bicycle network focal point map is to achieve rigid consistency in the use of named locations so that a coherent system of signage can be developed which will enable direct and unambiguous navigation around the bicycle network. Only those locations appearing on the focal point map will be used on bicycle network signage.

The focal point map for the Sydney Bicycle Network is maintained by City of Sydney bicycle planning staff working in consultation with RTA Sydney Region and neighbouring LGAs. As bicycle networks are locally- or regionally-based and are more fine-grained and urban-oriented than the main road network, they will often use different focal points to RTA road-based focal point maps within the same area or region.

Figure 9 shows the Sydney Regional Bicycle Network Focal Point Signing Map. This shows regional bicycle routes identified in the *Inner Sydney Regional Bicycle Network Plan* and the *City of Sydney Cycle Strategy*. Refer to the City of Sydney Bicycle Network manager for the current version of this map.

Table 3 defines the terminology used in focal point bicycle network mapping. The following guidelines apply to focal point mapping methodology for bicycle networks:

- Focal points are significant localities commonly recognised within the region where routes start, finish, join or cross. They are indicated in the focal point map by a solid disc symbol. Arrow heads on the routes indicate the travel direction. At intersections and parts of the network where routes overlap or cross, small red arrows are provided to indicate the paths for each route.
- Accepted practice with focal point bicycle network mapping is to show only one focal point per intersection fingerboard. Where routes overlap or branch to access separate focal points, it may be necessary to list two focal points. This is done by using separate fingerboards for each route.
- Sub-destinations are important local centres along a route. To keep signage uncluttered and compact, only one of these should be listed with the route's focal point until the sub-destination is reached. Sub destinations should only be used on fingerboards relating to that route or on reassurance boards where routes overlap. For brevity advance warning boards should only show subdestinations for route(s) being followed.
- On all network signage, named localities should be listed with the closest at the top of each list and the most distant at the bottom.
- On local routes where a destination (or community facility) is not immediately apparent, the designer should consult with local stakeholders (local councils, bicycle user groups, regional tourist associations etc) to determine the destination names to be included on local route direction signs.
- City and town centres are always important destinations. Regional routes leading in from the edge of a built-up area to the centre should be regarded as continuous even though they may pass through other important regional centres. The destination wording (City, CBD, Town Centre etc) should be continued right into the town/city centre.

Bicycle network focal point mapping practice example

The letters a to h, indicate signed intersections on Figures 9 and 10 which illustrate the principles of focal point mapping. A signing system is first organised by determining the main routes which comprise the bicycle network. In complex urban environments network routes may often overlap for short distances and shorter connecting routes which branch from the longer routes may be used to provide more direct access to focal points. There are five longer-distance regional routes shown in this example (two north-south and three east-west) and a connecting route. Figure 11 shows a detailed signage plan for intersections c and d.

Newtown to Bondi Junction Regional Route (blue dashed line). Travelling eastwards this route passes through intersections a, b, c and d. At all these intersections the focal point for the route is Bondi Junction and the sub destination is Centennial Park. From intersection c through to d, the City South to Coogee route shares the same path. At intersection c, fingerboards for each route are mounted together with the City South to Coogee route fingerboard mounted on top. Intersection d is the last listing of the

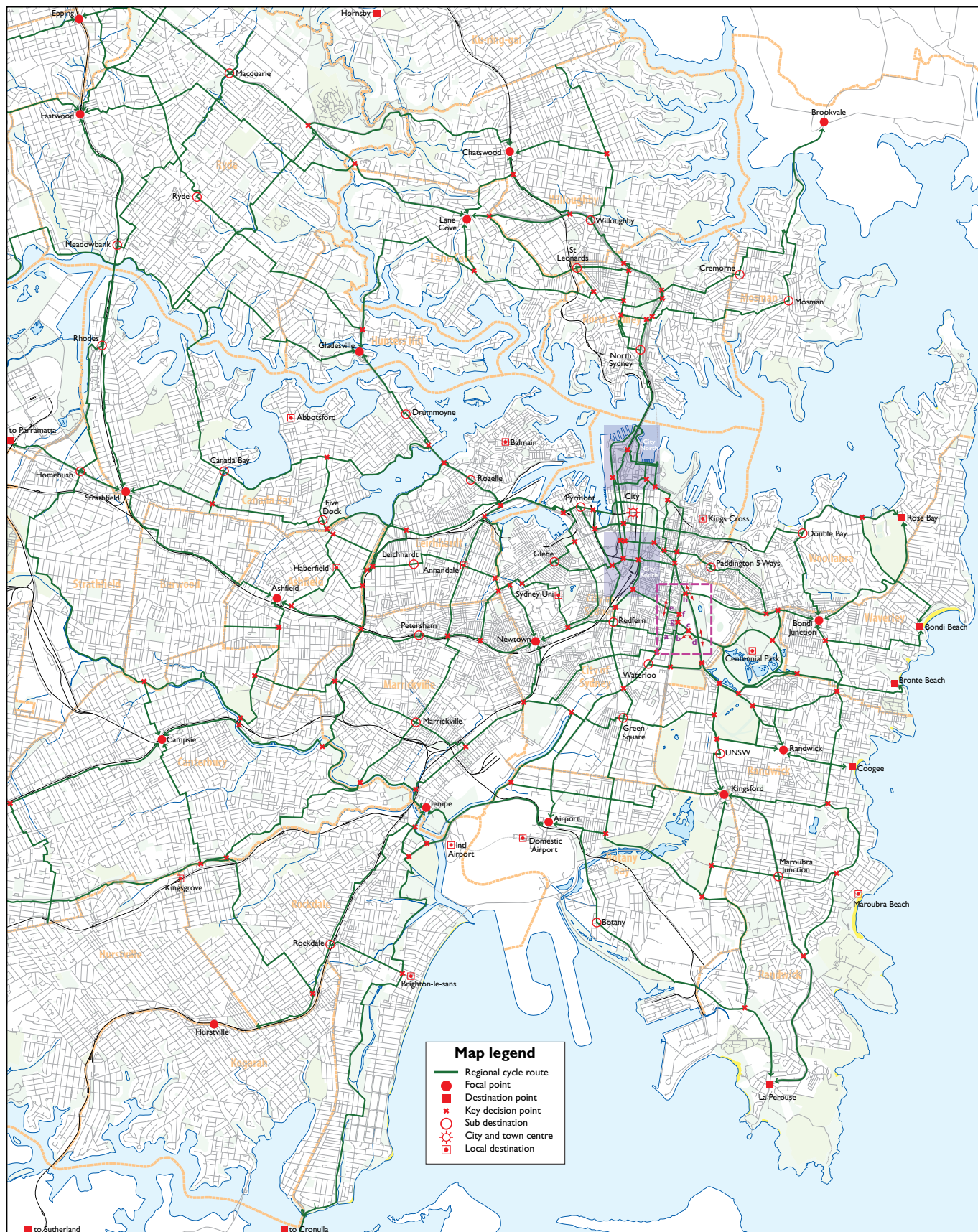


Figure 9: City of Sydney Bicycle Network Focal Point Signing Map (Example only - refer to CoS bicycle planning staff for latest version).

Centennial Park subdestination because this is reached at the next intersection east of d. From that point onwards only the focal point need be listed. Intersection a is an offset 'dog leg' type crossing of the City North to Airport route. These types of turnings/crossings often require the use of diagram-type advance direction signs to indicate the correct path through a complex intersection. Travelling westbound, the fingerboards at intersection d should list both Newtown and City South

focal points. At intersection c, separate fingerboards will list each focal point, and for this route, the Redfern subdestination. At intersection b, the route crosses the Moore Park North-South Connector Route.

City South to Coogee Regional Bicycle Route (orange dashed line). This route travels eastwards through intersection e, f, g, c and d. At e it crosses the City North to

Table 3: Destination definitions for focal point bicycle network mapping

Location type	Symbol*	Definition
Focal points	●	Major cities, towns, regional centres and key localities located at the start/finish of a regional bicycle route or where they join. Where a focal point occurs outside a locality, the route junction (or nearest landmark) may be separately named.
Destination points	■	Cities, towns, city/town centres, regional centres, and major localities which are located at the ends of regional bicycle routes but are not at a junction with other regional routes.
City and town centres	☼	The business centre of cities and towns. This area may be represented by multiple focal points depending on the size of the "CBD" or "City" precinct and the density of the bicycle route network.
Key decision points	×	Bicycle network junctions which are intersections only (not focal points). These points are rarely named on bicycle network signage.
Sub-destination	○	An important intermediate locality listed on the sign which will be reached in advance of the route's next focal point.
Local destinations	◼	Important local trip generators located at the termination of local routes (sporting/recreational and entertainment venues, community facilities, key local attractions and points of interest etc).

* Symbol used in Figure 7 to denote location types.

Airport route via an offset intersection. Diagram type signs will be needed for both approaches to this intersection as for a above (see Figure 12 example). Between f and g the route shares the path with the Moore Park North-South Connector route and between c and d it shares the path with the Newtown to Bondi Junction Route. The focal point on all signs along this route is Randwick. Westbound the focal point listed on all signs will be City South. At intersection d individual fingerboards will show focal points and subdestinations. An advance direction board on the approach to c, will show the City South focal point and for the other route both the focal point and subdestination.

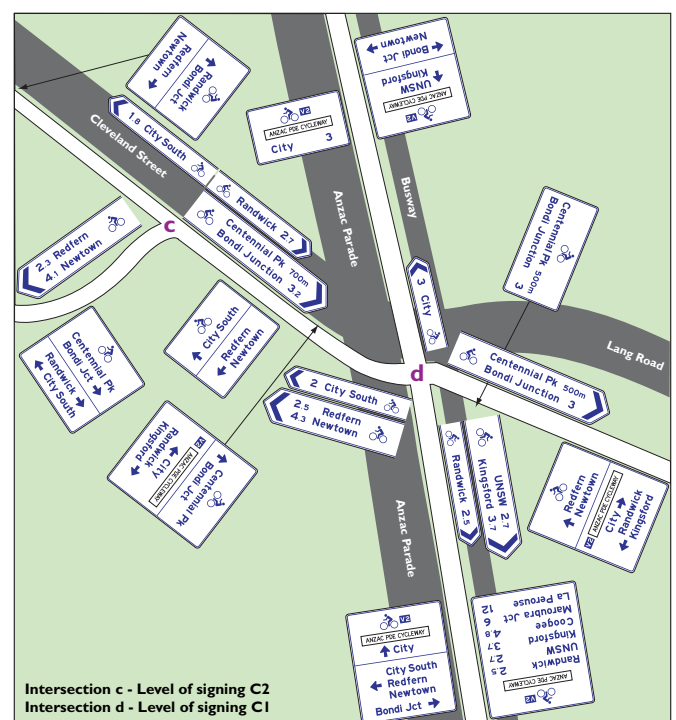
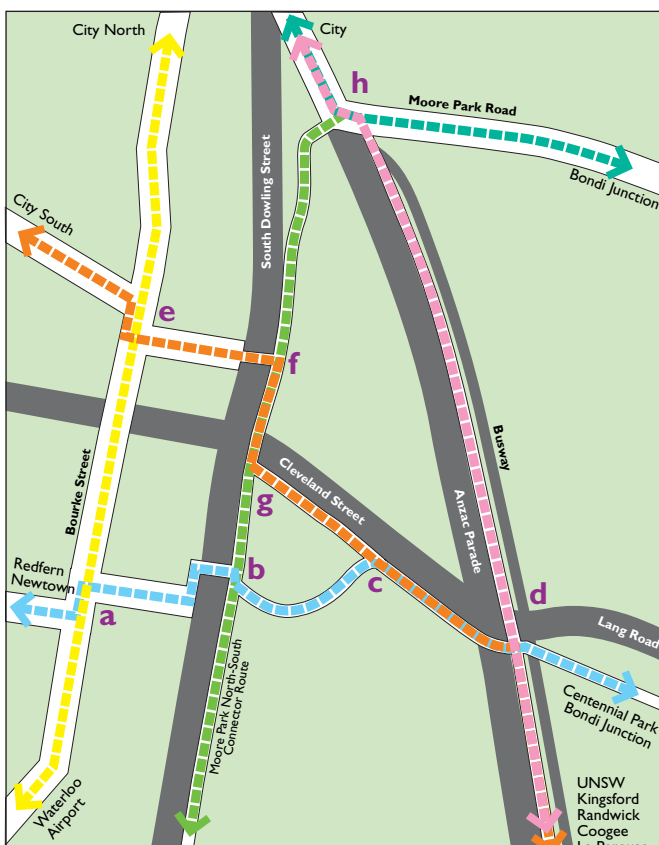
City to La Perouse Regional Bicycle Route (pink dashed line). This route travels south through intersections h and d. At intersection d the path south is shared with the City South to Coogee route. Fingerboard signage for each route will be erected at this intersection. On the northern approach to intersection d, an advance direction sign will list the focal points for the crossing of the Newtown to Bondi Junction Route and the joining by the City South to Coogee route. For travel in the opposite direction, a similar procedure will be adopted at intersection h to indicate the crossing/turning routes at that intersection.

City North to Airport Regional Bicycle Route (yellow dashed line). Travelling south this route passes through intersections e and a. At these intersections the route is crossed by east-west routes and fingerboards and advance direction signs would indicate the focal points for these routes. The southbound focal point for this route is Airport (subdestination Waterloo) and northbound it is City North.

City to Bondi Junction Regional Bicycle Route (dark green dashed line). This route shares its path from the City to intersection h with the route to La Perouse (focal point Kingsford). Advance direction boards will indicate cross routes prior to this intersection.

Moore Park North-South Connector Regional Bicycle Route (light green dashed line). This route connects other regional routes in the area and enables more direct connections to be made to destinations. Southbound at intersections h, f, g and b its focal point would be listed as Airport, while in a northbound direction its focal point will be listed as City.

Figure 10 (left): Detail bicycle route intersection layout showing area covered by the signing example shown in Figure 9 and described in the text. **Figure 11 (below):** Detail of intersections c and d showing sign layout examples for each intersection as per the explanatory text. These routes utilise off-road paths located adjacent to roads. Careful attention should be taken on the siting of these signs to ensure good sign legibility from the bicycle routes. Refer to the following pages for further advice on sign siting.



Pre-signing assessment

Before signing a bicycle route it is recommended that a risk assessment be made so that any physical deficiencies can be corrected either immediately prior to signing, as part of regular infrastructure maintenance or as part of planned route upgrading. It is also advisable to undertake a similar assessment prior to the installation of bicycle network infrastructure such as linemarking and engineering treatments.

The process outlined below is designed primarily for use by Council but could be used by any government agency or private/community organisation with a management/ownership role of a bicycle route.

Section 1 of this manual provides information on the established processes for identifying and planning bicycle networks and their component bicycle routes. Once a bicycle route has been identified for evaluation, the physical risk assessment should be planned, carried-out and documented as detailed below.

Physical assessment of the bicycle route

A route assessment aims to identify any physical deficiencies which may present serious risks to bicycle riders. General

issues on mid-block street-sections (between intersections or crossing points) to be assessed are:

- The availability of operating space for bicycle riders. This may be a wide kerbside lane or street conditions suitable for mixed traffic spacious profile or existing marked bicycle facilities;
- Potential squeeze points where traffic islands or kerb extensions may restrict bicycle operating space for short distances;
- Potential conflict points with pedestrians;
- Smooth, paved surfaces for the bicycle path of travel, with bicycle-safe drainage grates;
- Desirable sight distances (measured from expected bicycle path of travel); and,
- Consistent treatment (path of travel, warning/guidance signing, safety measures, etc.) throughout the proposed route corridor.

Specific intersection and crossing issues to be assessed are:

- Manageable crossing opportunities at all intersection route turnings or crossings of low to moderate traffic-volume roads. Crossings of high traffic-volume major roads, highways and State Roads should preferably be at controlled or grade separated crossing points;
- Potential conflict points with pedestrians at crossing points; and,

Table 4: Pre-signing bicycle route assessment analysis

Issue	Description	References	Short-term remedial actions	Longer-term remedial actions
Roads/paths general	Is there adequate operating space on the road or path to accommodate cyclists?	NSWBG Sections 3, 4, 5, 6, 7 & 8 and AGtRD, Parts 3, 4, 4A, 4B & 6A	Signing and marking narrowings	Road realignment and engineering treatments to remove narrowings
Provision for wide range of users	Does the route provide alternative off-road routing (parallel route) on road-based bicycle routes where vehicle speeds and volumes are high (> 5,000 vpd, >60 km/h)?	NSWBG Sections 3, 4, 5, 6, 7 & 8 and AGtRD, Parts 3, 4, 4A, 4B & 6A	Signing both on-road and off-road alternatives. Creating a continuous shared path along off-road alternative sections	Locating entire route off-road by constructing a separated cycleway
Sealed shoulders	Is there adequate operating space in the shoulder? Is the shoulder surface free of obstructions?	NSWBG Sections 3, 4 & 5 and AGtRD, Part 3	Repair surface imperfections and serious hazards	Reseal shoulder with smooth grade asphalt
Major roads >5,000 vpd	Is there adequate operating space on the road shoulder or wide kerbside lane to adequately accommodate cyclists?	NSWBG Sections 3, 4 & 5 and AGtRD, Parts 3 & 6A	Signing and marking. Repair road imperfections and serious hazards	Develop on-and off-road routes as a parallel system
Minor roads <5,000 vpd	Is there adequate operating space on the road or path to accommodate cyclists?	NSWBG Sections 3, 4 & 5 and AGtRD, Parts 3 & 6A	Repair road imperfections and serious hazards	Install intersection treatments where needed
Physical hazards in the road or path environment	Are there physical deficiencies or hazards on the road or path (drainage grates, large cracks, blind driveways or hidden entrances, bollards and poles on paths etc)?	NSWBG and AGtRD, Parts 3 & 6A	Signing and marking of hazard	Complete removal of hazard
Sight lines and clearances	Are sight lines applicable to cyclists obscured by obstacles such as signs, trees, pedestrian fences and parked cars?	NSWBG Sections 3, 4 & 5 and AGtRD, Parts 3 & 6A	Signing and marking	Complete removal of hazard
Intersections, general	Is there adequate operating space in the intersection to accommodate cyclists needs?	NSWBG Section 7 and AGtRD, Parts 4, 4A, 4B & 6A	Signing and marking. Repair road imperfections and hazards	Develop on-and off-road routes as a parallel system
Intersections at route turning points	Can cyclists easily negotiate turns on-road? Is an off-road alternative available?	NSWBG Section 7 and AGtRD, Parts 4, 4A, 4B & 6A	Signing and marking. Repair road imperfections and serious hazards	Redesign and reconstruction of intersection to include provision for cyclists
Signalised intersections	Can cyclists comfortably negotiate the intersection? Is an off-road crossing possible for young, elderly and traffic-shy cyclists?	NSWBG Section 7 and AGtRD, Parts 4, 4A, 4B & 6A	Signing and marking. Repair road and path imperfections and serious hazards	Install bicycle lanes and holding boxes at intersection. Include cyclists needs in signal phasing
On-road to off-road transitions	Can cyclists comfortably negotiate transitions? Are sightlines preserved at transitions by signed parking restrictions?	NSWBG Section 5 and AGtRD, Parts 3 & 6A	Ensure correct parking set-backs are marked by regulatory signage	Install protected transition (see AGtRD Section 4.5.3)
Shared paths and footpaths	Is the design of the shared path adequate to accommodate the estimated volumes of cyclists and pedestrians? Are good sightlines maintained, and blind driveways and building entrances minimised?	NSWBG Sections 3, 4, 5 & 6 and AGtRD, Parts 3 & 6A	Signing and marking. Repair path imperfections and serious hazards. Signing or marking blind entrances or driveways.	Rebuild path along clearer alignment. Locate path away from property boundary. Relocate obstructions such as power poles, trees, signage.
Path crossings of roadways	Are provisions for car parking near the path satisfactory in relation to the operation and safety of path users, e.g. cars cannot encroach onto path?	NSWBG Section 7 and AGtRD, Part 6A	Ensure correct parking set-backs are marked by regulatory signage	Installation of refuge crossing or other engineering treatment (see AGtRD Section 6.7.2.3)



Figure 12: Diagram-type Advance Direction Signs are often needed to sign complicated intersections such as this offset crossing of two routes (see Figure 10, intersection e).

- Connection to existing or planned bicycle routes at either end of the route or at intermediate points.

Signing routes with and without bicycle infrastructure

Bicycles are legally defined as vehicles and can use public roads unless specifically prohibited for operational safety reasons. The lack of bicycle infrastructure along a route, such as bicycle lane markings, regulatory and warning signage and bicycle pavement symbols, does not necessarily mean that the route is unsuitable for cycling. Bicycle riders have differing levels of competency and sensitivity to traffic. Experienced bicycle riders often will prefer unmarked wide kerb-side traffic lanes to marked bicycle/car parking lanes due to the close proximity in the latter to opening car doors. Others (such as children and the elderly) may prefer to avoid trafficked roads altogether and ride off-road.

Fitting a route with a system of directional signage provides all bicycle riders with important wayfinding information which helps them to more effectively use their bicycles for a wide range of local and regional trips. Without this signage it is difficult for them to take full advantage of the road system and to use their bicycles as an efficient means of transport.

A pre-signing assessment of a route with or without bicycle infrastructure should aim to identify any specific road hazards

which would cause unacceptable operating risks for bicycle riders using these streets and roads. These may be road narrowings where bicycle riders are 'squeezed' into risky situations, hazardous drainage grates and difficult turns on busy multi-laned roads.

Table 4 shows recommended issues analysis for a bicycle route pre-signing assessment where various types of potential hazards have been identified and remedial action taken on a short- or long-term basis if potential hazards and deficiencies exist. Guidance is provided for optimal cycling operating conditions on streets and roads in AGtRD. In particular AGtRD contains technical details for the provision of cycling on all streets and roads such as recommended lane widths for safe sharing with motor vehicles.

The aim of the route assessment is to document road, street and path conditions and from that formulate a program of remedial actions with a defined time frame. High risk items will require immediate attention. Remedial actions may range from short-term signing and marking of hazards to longer-term engineering works to physically remove the hazard by major road works.

Level of signing, numbering and branding

Level of signing (LOS) for bicycle networks is a methodology for the signing of route intersections and decision points based on the importance of the route and its place in the bicycle network route hierarchy. Level of signing for bicycle routes is expressed in descending order of signing hierarchy (ie Level C1 is the highest level of signing). Different levels of signing may be required at each signed intersection along a route depending on intersecting bicycle route types. Table 5 lists the signing requirements for each level. Figures 13 to 16 on the following pages provide graphical examples of the methodology for the four levels of signing.

This level of signing allows for a degree of redundancy in the signage system. A signage system with only one sign at each change of direction risks a breakdown in the provision of important wayfinding information to the user. If one sign is removed the system fails. Only local routes pointing directly to destinations have one sign per intersection (see Table 5).

Route numbering

In densely populated cities where there are far more route options than in smaller centres, route numbering may make it considerably easier for users to navigate around the network. Route numbering may also be appropriate on longer distance (inter-city) routes and may reflect existing road system route numbering where appropriate.

Table 5: Level of signing for bicycle network routes

Level of signing	C1	C2	C3	C4
Type of route	High-speed, limited-access, regional routes usually paralleling State Roads or major regional roads	All other regional bicycle routes	Local routes	Off-road, shared path and tourist/recreational routes
Advance direction signs	Yes, before route junctions with other C1 or C2 routes	Yes, at junctions where the route changes direction	No	No
Fingerboards at intersection	Yes, at route junctions with other C1 or C2 routes	Yes	Yes, integrated with street signage	Yes
Reassurance signs with distances	Yes, after route junctions with other C1 or C2 routes	Only if advance direction signs are not used	No	Route markers only
Route markers	No	No	Yes	Yes
Route numbering	Yes	No	No	No
Branding logos	Yes	Yes	No	Yes
Street signs	Yes, if none exist	Yes, if none exist	Yes, if none exist	Yes, if none exist

Figure 13: Example of cycle network level of signing CI

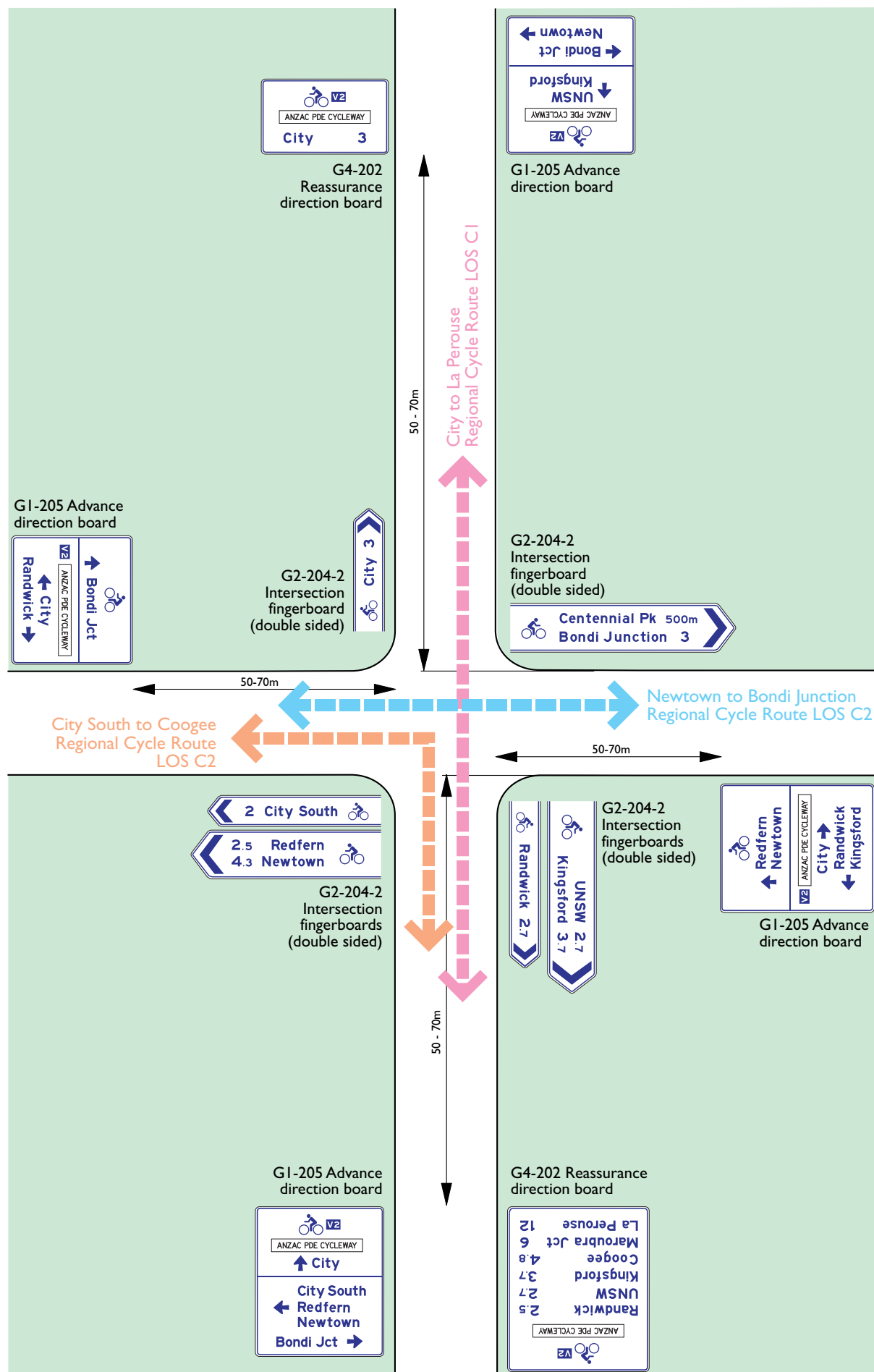


Figure 14: Example of cycle network level of signing C2

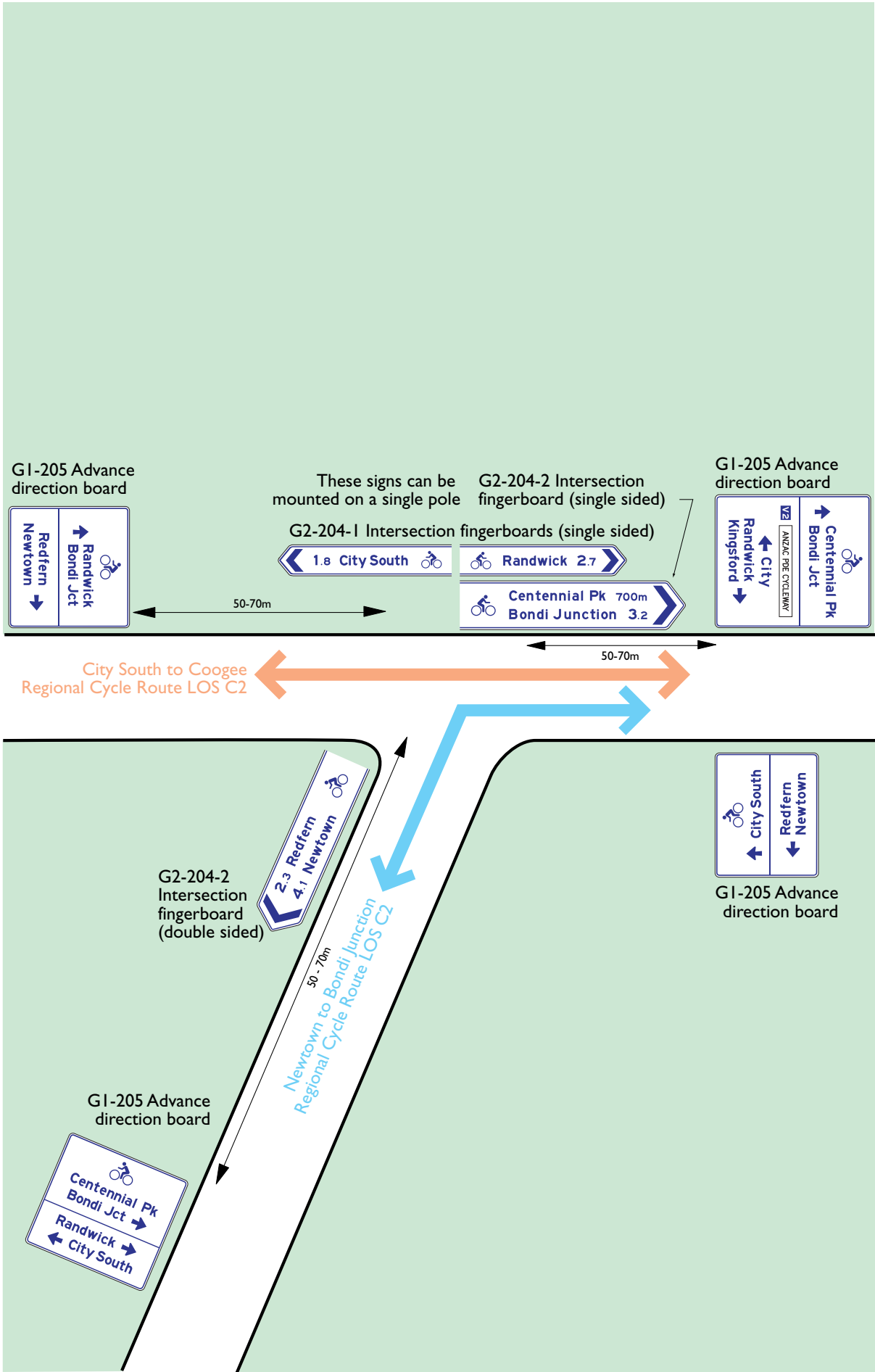


Figure 15: Example of cycle network level of signing C3

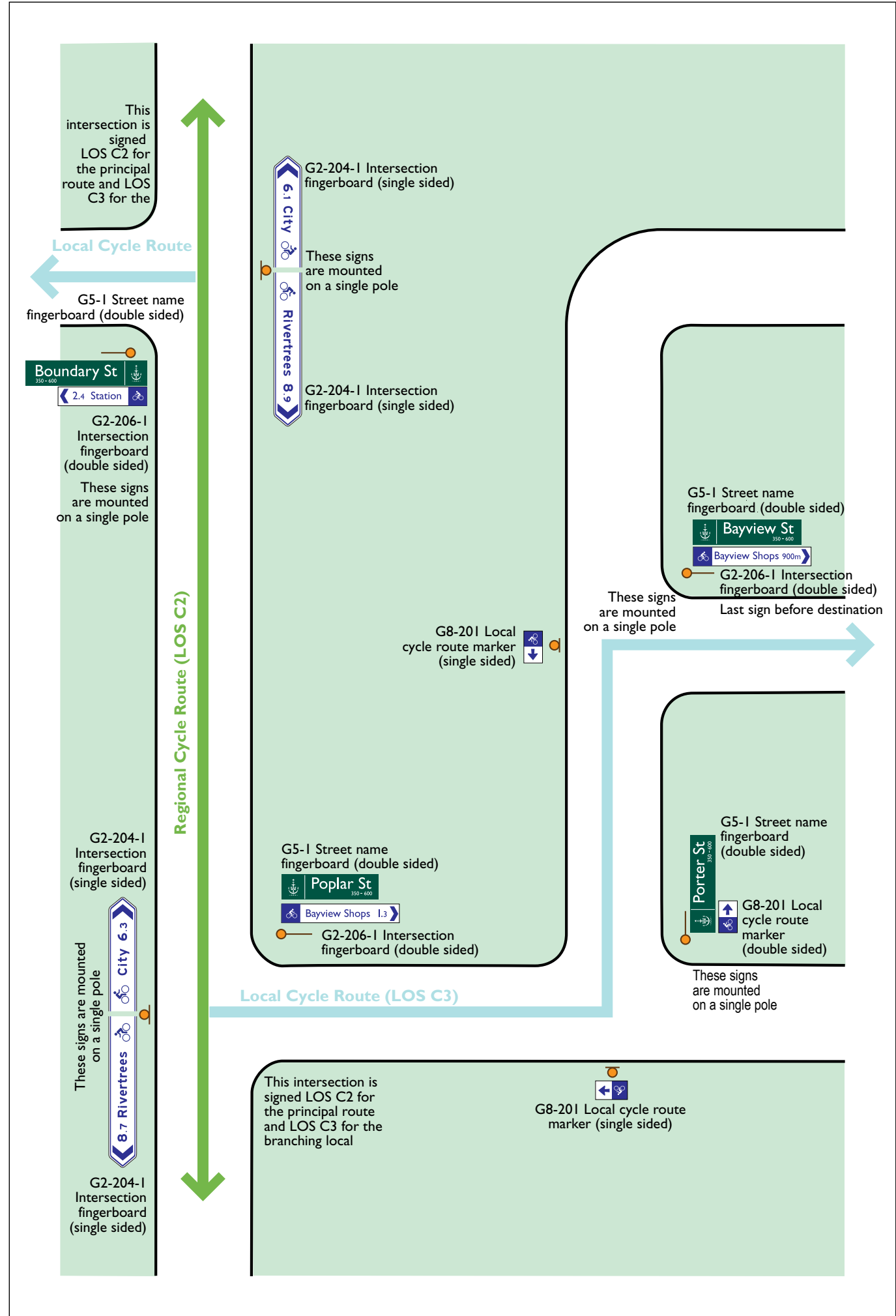


Figure 16: Example of cycle network level of signing C4

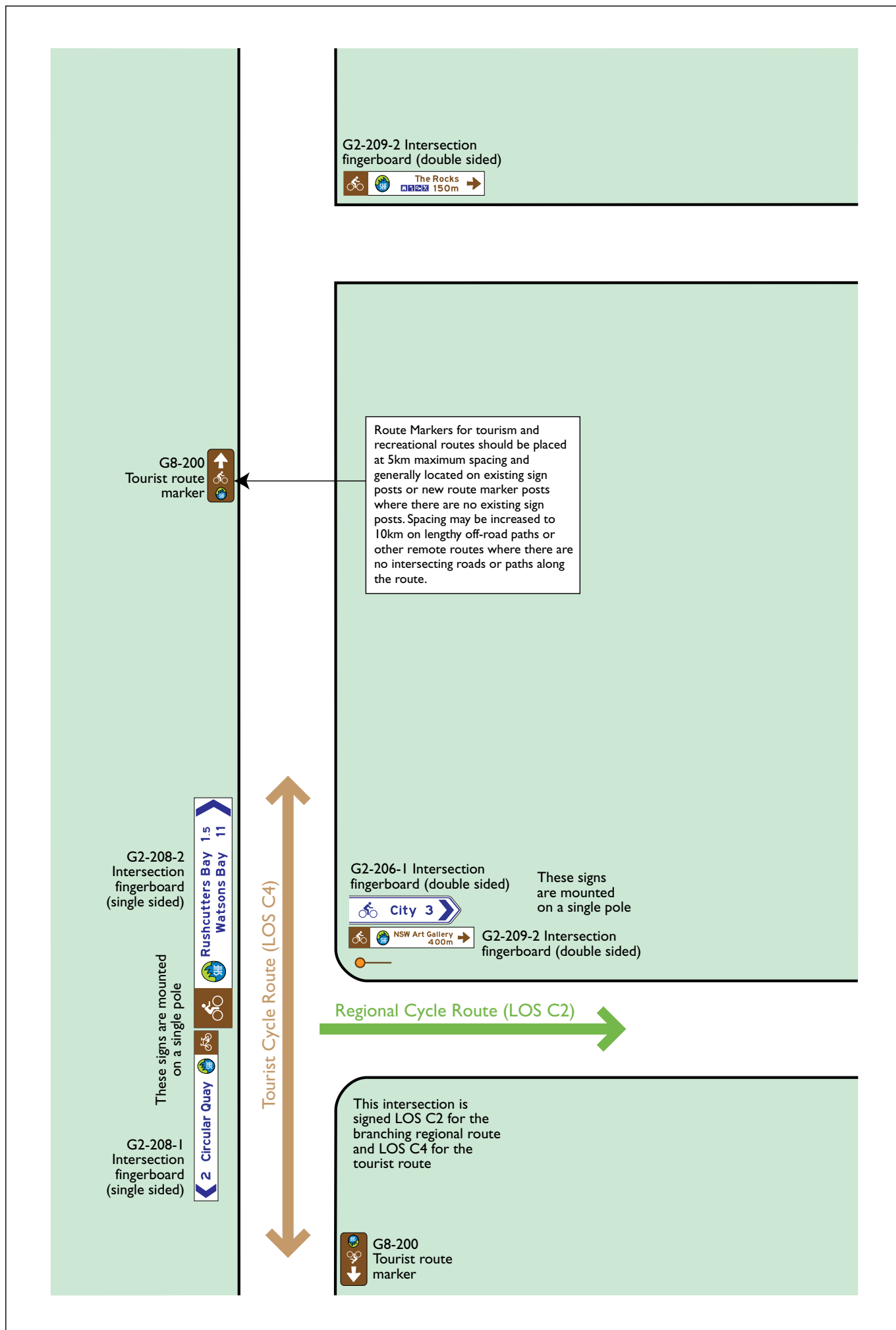




Photo 10: The lower sign in this example shows branded routes in Munich, Germany. The lower sign indicates a 200m connection to a riverside path which carries three branded routes - the Inner Ring Route and the River Isar Route which carries the national bicycle route D11 through the city. This route runs from Upper Bavaria to the Baltic Sea and is part of a twelve route, 11,700km national bicycle tourism network.

Route numbering, used for CI routes only, should be based on an alphanumeric code comprising the letter 'V' (for veloway) followed by the route number in the series. The use of route numbering should be limited to a small number of high-speed, limited-access, regional bicycle routes usually paralleling State Roads or major regional roads within a city or between cities and within a densely populated metropolitan region.

Maintenance of the system of bicycle route numbering within a city or region is the additional responsibility of the organisation which maintains the Focal Point Signing Map for bicycle network signage within that city/region.

Route branding for regional, tourism and recreational bicycle routes

The regional bicycle route signage system makes provision for the naming of bicycle routes where these already exist (see Figure 2). Naming routes is, however, cumbersome. Naming routes does not necessarily improve wayfinding and can place heavy demands on available sign space and can consequently increase the size of signs.

Lengthy route names should be avoided. Where the length of a route name exceeds the available sign length (usually determined by the length of the longest listed destination) an abbreviated form or a smaller letter size may need to be used. When used, named route indication should be limited to signs at the start and finish of the named route and to important junctions where other major routes enter.

Longer recreational and tourist routes are being developed throughout NSW (eg NSW Coastline Cycleway) for a variety of purposes ranging from local recreational paths to long distance trails. These routes often pass through a number of local government areas. To give the route its own identity, local governments need to cooperate and give the route a distinctive branding and a promotional identity which encompasses design elements such as path logo, specialist wayfinding and facilities signage designs.

The preferred way to identify tourism and recreational routes, along with more easily identifiable urban routes, is by branding – using an easily recognisable logo or symbol to mark the route. Humans respond quicker to symbols and graphical shapes and can read them from far greater distances than lettering or words. Logos are very compact and so require very little precious sign space.

Where a bicycle route uses part or all of a route with a branded identity, the logo for this route may be integrated into the sign design (for new tourism and recreational bicycle route signage installations) or affixed to existing signage as shown in Figure 4. Regional bicycle route signage branding should be integrated into the sign design as shown in Figure 2. Local routes do not use branding logos.

Route branding logos can be used to indicate different routes by locating them on the same line as the relevant destination (see German example in Photo 10). Where route identity branding logos are used for individual destinations, they should be located on the same line as the related destination name and placed at the opposite end of the text line to the distance indication numerals. Where branding logos are primarily associated with the route (ie all listed destinations), they should be located at the top of the sign adjacent to the bicycle symbol as for numbered routes (see Figure 2). Logos, when used in conjunction with individual destinations should always match the height of the associated destination lettering.

Table 6: Sample signing summary for Intersection d for the City to La Perouse Regional Bicycle Route (see Figures 9-11)

Ref no.	Km	Sign type	Reference No.	Direction*	Focal points & Sub-destinations etc	Level of signing	Remarks and requirements
7a	3.0 less 50m	Advance direction	G1-205	O	ANZAC PDE CYCLEWAY V2 ↑ UNSW Kingsford ← Bondi Jct Newtown →	C1	Site assessment to determine precise location
7b	3.0 less 50m	Reassurance direction	G4-202	I	ANZAC PDE CYCLEWAY V2 City 3	C1	Site assessment to determine precise location
7c	3	Fingerboard double sided	G2-204-2	I	ANZAC PDE CYCLEWAY V2 City 3	C1	Site assessment to determine precise location
7d	3	Fingerboard double sided	G2-204-2	O	ANZAC PDE CYCLEWAY V2 UNSW 2.7 → Kingsford 3.7	C1	Site assessment to determine precise location
7e#	3	Fingerboard double sided	G2-204-1	O	Randwick 2.7 →	C2	Site assessment to determine precise location
7f#	3	Fingerboard double sided	G2-204-1	N	← 2 City South	C1	Site assessment to determine precise location
7g#	3	Fingerboard double sided	G2-204-1	N	← 2.5 Redfern 4.3 Newtown	C1	Site assessment to determine precise location
7h#	3	Fingerboard double sided	G2-204-1	B	Centennial Pk 500m → Bondi Junction 3	C1	Site assessment to determine precise location
7i	3 + 50m	Reassurance direction	G4-202	O	Randwick 2.5 UNSW 2.7 Kingsford 3.7 Maroubra Jct 6 La Perouse 12	C1	Destination points for both routes listed. Significant distant focal point (MJ) listed. Site assessment to determine precise location
7j	3 + 50m	Advance direction	G1-205	I	↑ City ← City South Redfern Newtown Bondi Jct →	C1	Site assessment to determine precise location

* Direction codes: I = Inbound – facing cyclists travelling in the direction of City; O = Outbound – facing cyclists travelling in the direction of La Perouse;

W = facing westbound cyclists travelling in the direction of Newtown; E = facing eastbound cyclists travelling in the direction of Bondi Junction.

Signs associated with other routes. Provide mountings ready for installation when route signage is implemented

Bicycle route signing schedules

Once the decision has been taken to sign a bicycle route following a positive pre-signing risk assessment, the next task is to prepare the signing schedules which will provide detailed information for the sign maker and installation crew or contractor.

Route signing summary

The first stage in the formulation of a signing schedule is to prepare a signing summary for the route. The signing summary is a preliminary list of signs based on the bicycle network focal point map and level of signing required for the signed route and any interconnecting routes. The signing summary provides the necessary documentation to take into the field to assist the collection of additional information needed to complete the signing schedule.

The signing summary lists the directional signs needed along the route, their general siting and focal points, destination points and sub-destinations to be used on signage at each route decision point. Table 6 shows a sample route signing summary for intersection 'c' (see Figure 11) for the City to La Perouse Regional Bicycle Route. This intersection, which has three regional routes passing through it, is also shown in Figure 13: Example of Bicycle Network Level of Signing C1.

It is important when signing each intersection along a route to include other routes which may cross or overlap the route being signed. This will make the future task of signing these other routes easier and avoid the costly need to redo signage to add additional destinations.

Each row of the sample signing summary lists information for a single sign. A complete signing summary would include all intersections for the route being signed.

When determining the focal points, destination points and sub-destinations to be listed on directional signage, it is important to note that a directional signage system should be closed. Once a destination has been used on a sign, it should appear on all subsequent signs, until that particular destination has been reached. Destinations mentioned on previous signs are therefore given priority and should appear in strict order with the closest appearing at the top of any sequence listing.

As a rule, the next focal point and subdestination are listed on intersection fingerboards. On advance direction boards focal points are listed for all relevant routes but sub destinations are only listed for the route being followed and any overlapping route for the duration of the overlap. On reassurance boards focal points, subdestinations are listed in descending distance order. If space permits (to a maximum of 6 listed destinations), destination locations (end of route(s) and significant distant focal points can be included on reassurance boards. See example for two overlapping routes in Figure 13.

All listed distances should be calculated in advance (from mapping or GIS systems) and checked via accurate field measurement either during site assessment or separately.

Site assessment and operational issues

As part of the preparation of the signing schedule, a site inspection should be carried out to research and assess the precise locations for route signage. An important part of this process is to physically assess the safety issues relating to sign placement and to compensate for sites with poor safety.

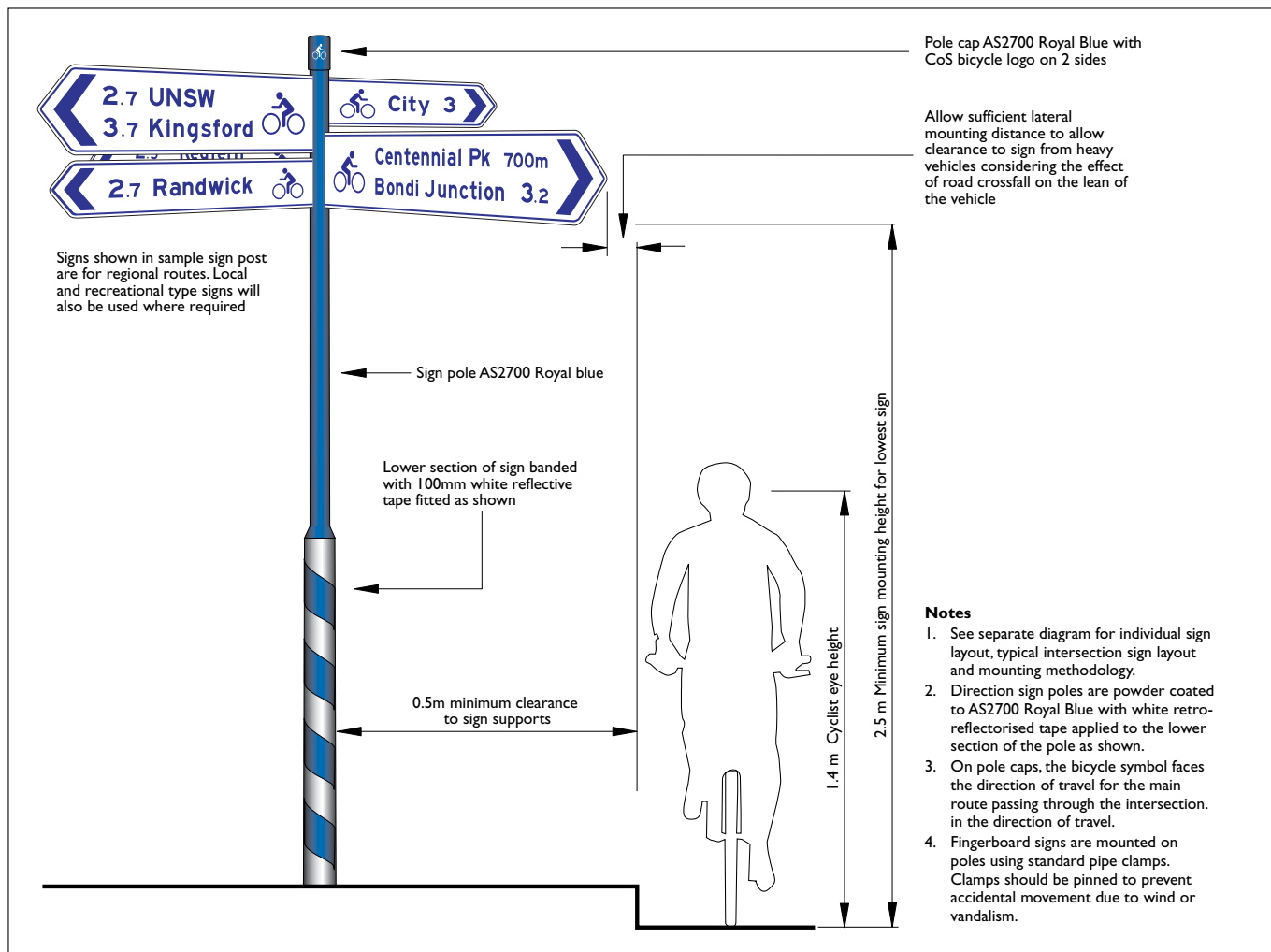


Figure 17: Standard intersection fingerboard sign pole design

Sign location and placement

The placement of bicycle network directional signage should adhere to the general principles of signage as detailed in Australian Standard AS1742.5 *Street Name and Community Facility Name Signs*, for local roads and residential type streets and AGtRD in relation to major roads and State Roads. Specific considerations relating to the installation of directional signage for bicycle riders are detailed below.

Sign clearances

Figures 17 and 18 show vertical and horizontal clearances applying to bicycle network signage. It is important to assess correct clearances, taking into account the actual site conditions. For example, a roadway with an excessive crossfall may require signs to be mounted further back to avoid damage from turning heavy vehicles.

Pedestrian desire lines should be taken into account. Sign placement at intersections should be clear of existing pedestrian paths and kerb ramps.

Sight distances and sign visibility

At bicycle route intersections/decision points, directional signage should be positioned so that bicycle riders can safely and comfortably follow their chosen route. Stopping distance and the sight distance to the intersection are also of importance.

When placing advance direction signage it is essential to take into account all local variables such as slope and sight distances so that signs are located to provide adequate warning of a change of direction. Table 7 lists recommended mounting

distances for advance directional signage. The greater distance should be applied where there is a downhill grade towards the intersection or where the approach visibility is restricted. For grades steeper than 8% it is recommended that additional warning signage be used in advance of the intersection.

Further advice on bicycle stopping distances and sight distances on curves can be found in AGtRD. Intersection fingerboard signage should be mounted in a highly visible location so that it can be clearly read by bicycle riders at a minimum of 15 metres from the intersection.

Signs should be placed consistently as indicated in Figures 17 and 18. If site conditions prevent two signs indicating separate directions from being mounted on the same pole on one corner of the intersection, consideration should be given to separately mounting these signs. Consideration should also be given to mounting signage on existing sign poles or power poles (where an agreement exists between the road/street/path owning authority and the power supply company) provided that such mounting offers superior sight lines and visibility for the sign(s).

Table 7: Advance direction sign mounting distances from intersections

Level of signing	Design speed	Route type	Recommended mounting distance from intersection
C1	Above 30 km/h	Numbered regional route	50-70 metres
C2	30km/h	Regional route	35-50 metres
C3	Below 30 km/h	Local route	30 metres
C4	Below 25 km/h	Tourism and recreational route	30 metres

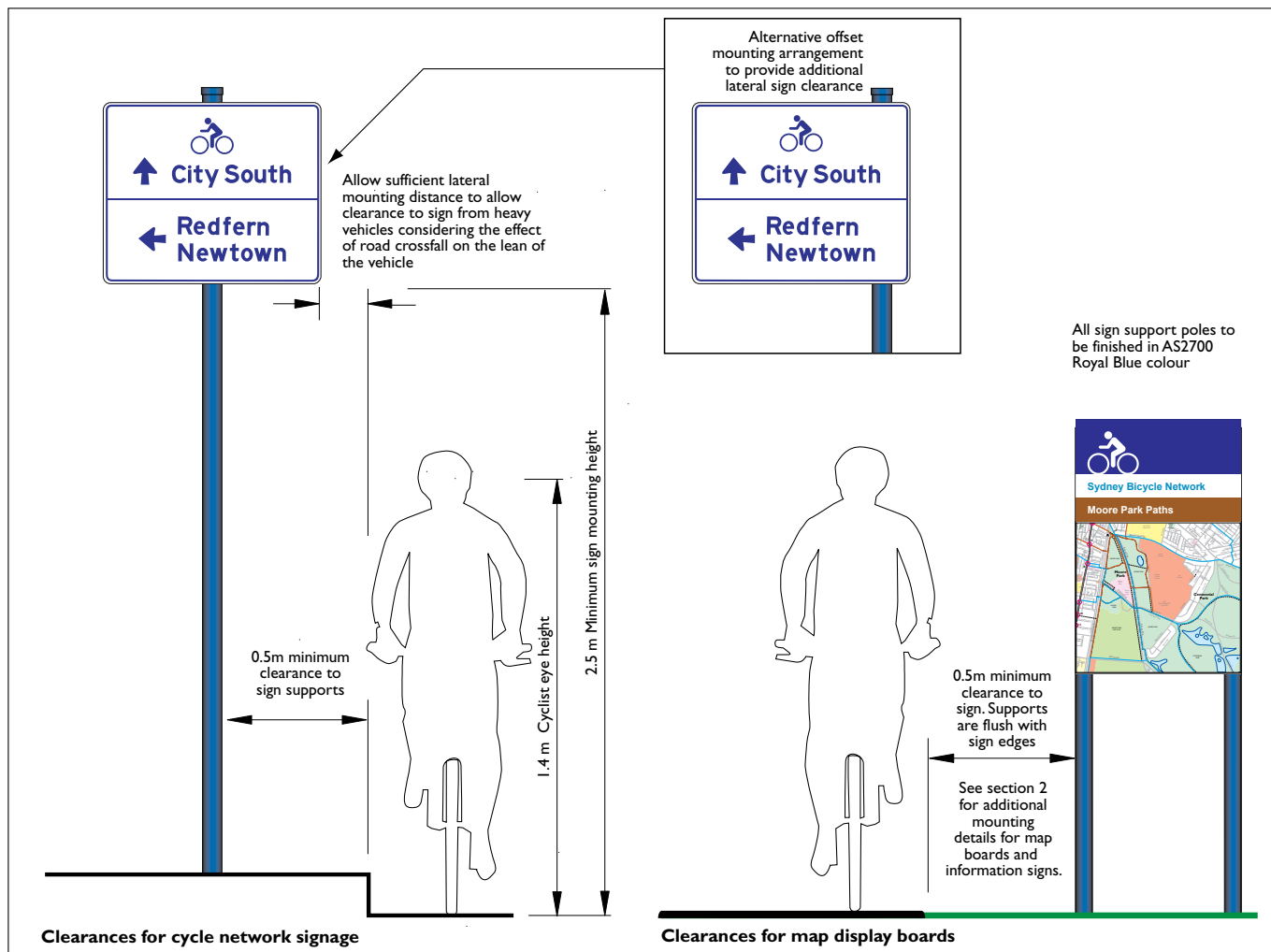


Figure 18: Signs and map boards side/vertical clearances.

Sign legibility and lighting

Direction signage should be easily readable in either day or night conditions. Signs located in a normal urban environment will usually have adequate ambient lighting. For this reason it is advisable to locate signage under, or adjacent to, overhead lighting where present.

Bicycle network signs with other sign systems

The presence of bicycle network signage should not detract from the effectiveness of other existing road or path signs. Bicycle route directional signs should be located so as to not conflict with existing road directional signage, or create ambiguity at critical turning points or crossings. New signage should not add to existing clutter. Existing signage may need to be relocated at the time bicycle network signage is installed to improve the overall intersection sign layout.

Bicycle route signage and road signage

Bicycle network signage, like highway signage, is a discrete system designed to guide bicycle riders through often complex road environments. Combining bicycle network signage by including bicycle destination information or routing details on normal road directional signage is to be avoided. Care should always be taken to place signs where they can be clearly seen by bicycle riders and in a location where their message will not be compromised or overwhelmed by proximity to other signage.

Though the indication of street names does not form part of the regional bicycle network signage system, it is vital for

riders that they can see clearly legible street signs on every route turning/intersection to enable them to reach their destination as quickly as possible.

Local routes typically terminate at destinations such as suburban centres, educational and community facilities and public transport interchanges. Signage for this type of route should be closely integrated with local street signage by using fingerboards or markers (see Figure 3) with existing or upgraded street name signage.

Council officers and contractors will need to assess the fitting of new bicycle network signage adjacent to street name signs and the repositioning or reinstallation of street names signs on a case by case basis. Where placing a bicycle route sign below a street name sign reduces clearance to less than 2.5m, alternative provision will have to be made. This may include re-installation of the existing street name sign on a new taller pole. Additional information on the layout design and mounting of this type of signage can be obtained in ASI 742.5.

Bicycle route signage and path signage

When signing local paths or routes through parklands with existing signage installed, bicycle network signage should take into account any current path signing policy. Where local path signs have been installed, the regional bicycle route signage should be installed only where the regional route enters and exits the path or at any other path junction with a regional route.

If no local path signage exists at the time of signing it should be installed along the section of the path used by the bicycle route being signed. If no local path signing policy is in place bicycle network signage should be used to sign the relevant path section.

Local path signage should provide the necessary advance, reassurance and fingerboard signs as well as directions to facilities and side destinations, intersecting and cross street names and map display boards. Care should be taken to harmonise the use of standard bicycle network signage with existing path signage systems through careful sign location and mounting. Off-road path junctions should be signed the same as on-road routes.

Preparing the signing schedule

The information collected from the site assessment will be added to new columns in the route signing summary table (see Table 6). This table, when completed, will become the bicycle route signing schedule and will be used to specify the manufacture of the signs by a sign maker and to provide precise details for the contractor or in-house crew to carry out the final site installation.

Additional details needed for each sign to complete the signing schedule are:

- Precise location of each sign (it is recommended that marked-up site photos be appended to the sign schedule to ensure an accurate communication of each sign's

intended siting;

- Mounting support (new pole, existing etc);
- Mounting fixing type;
- Additional path signs found necessary by the site assessment – services and facilities signs, signs indicating connecting paths to the street system and street name signs at intersecting streets; and,
- Additional work (installation where needed of new taller street sign poles to replace existing poles).

Costs for signs and installation can be added to the table at this stage to produce a budgetary estimate.

Installation and maintenance

The previous sections of this guide have detailed the processes for planning bicycle networks and designing a coherent signage system on a route by route basis. With the completion of the signing schedule and the allocation of sufficient funding to undertake a route signing project, the task now is to contract a sign designer/manufacture and sign installer. Regardless of who performs the actual tasks, the process detailed in this section still require a degree of supervisory skill and checking at all stages.

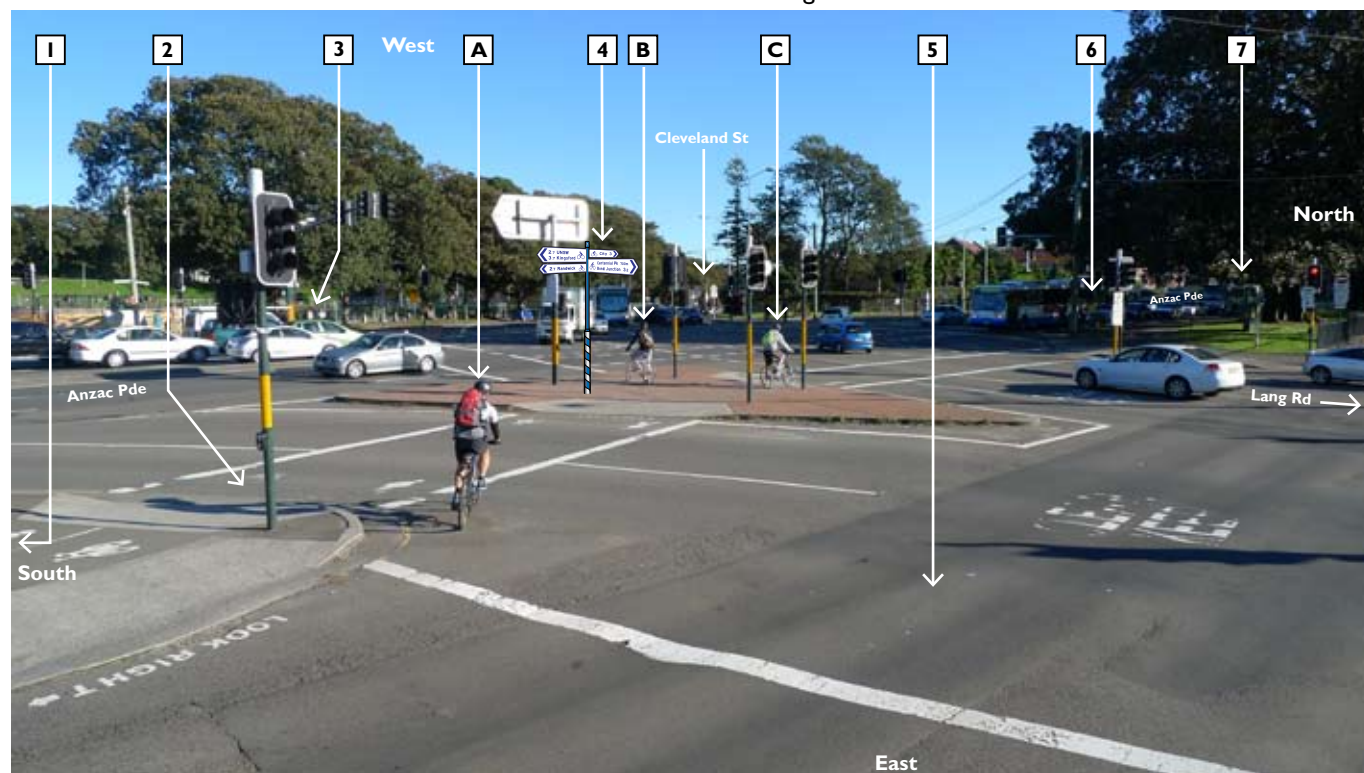


Photo 11: Signage example for an off-road cycleway travelling through a complex intersection (Intersection 'd' shown in Figures 10 and 11 looking westwards). Some signs are not shown in this photomontage but indicated in the text. The triangular traffic island marks the crossing point of three routes. (1) Two routes enter the intersection from the south (left of frame). These routes share the same path. Advance direction and reassurance signs are erected beside this path 30-50 metres south of this intersection. (2) These routes cross the slip lanes to the traffic island where they diverge. An east-west route also crosses at this point. (A) This cyclist has ridden across the bus road and is crossing the slip lanes to the traffic island. They are following the east-west route from Bondi Junction and Centennial Park. (B) On the island a cyclist waits for a crossing signal before continuing westwards. (3) On the western side of the intersection is another triangular traffic island with slip lane adjacent. (4) At the junction of the routes a four-way fingerboard has been erected. At this important path junction six fingerboards (on same pole) indicate the travel direction for each of the three routes. Intersection signing can be greatly simplified if, as in this example, the fingerboards

can be sited on one pole so that they can be clearly seen from all approaches. Due to the complexity of some intersections this is not always possible. Each intersection needs to be individually assessed and signs erected for maximum wayfinding clarity. (C) This cyclist waits for the signal before resuming travel towards the City on the numbered 'V2' route. (5) The complexity created by the additional crossing of this north-south busway will require a reassurance direction sign to be located closer to the intersection to provide visual guidance for cyclists travelling towards Bondi Junction. (6) The V2 route continues northwards towards the City. Multi-staged road crossings (due to slip lanes) require careful assessment to ensure that a clear route direction is indicated by all signs. (7) Advance direction and reassurance signs are erected beside this path 30-50 metres north of this intersection.

General Note: Due to the complexity of intersections it may often be advisable to use a simplified intersection diagram type sign for advance direction signs. In this photo example, the use of a four-way fingerboard signpost located at the route junction (clearly visible from all four approaches) greatly simplifies the sign layout.

Sign manufacture

The signs described in this guide and their usage should be manufactured in accordance with these guidelines and the relevant sections of AS1742. A sign manufacturer with in-house design capability will be able to accurately design and fabricate bicycle route signage to City of Sydney specifications. Road sign design software is commonly used by council design staff and contractors and can be used to design and specify bicycle network signs for manufacture.

Materials and mounting

Bicycle network directional signage is made from 6mm sheet aluminium able to withstand bending by the elements. Services/facilities fingerboard signage may be manufactured from extruded aluminium to the sizes shown in the sign layout drawings (Figure 6). Sign dimensions including letter height and colours are detailed in these guidelines.

Fingerboards should be fixed to galvanised steel pipe supports by means of galvanised steel or aluminium clamps. Fingerboard signs should be always attached to the mounting pole via the mounting clamp method and not secured to the pole in the centre of the sign. Anti-rotational fittings or fixing screws should be used on fingerboard clamps to prevent rotation by either wind or vandalism. This is particularly important on fingerboard signs which indicate travel direction at intersections.

Advance direction, reassurance direction and tourist and recreational markers are manufactured from aluminium sheet. These signs are single sided, stiffened as required and mounted on a single galvanised steel post.

In urban environments signs should be mounted sensitively to avoid sign clutter. Where intersections have existing signs in an untidy or cluttered state, it is wise to replan the layout and placement of all signage (including the new bicycle route signs) so that the legibility and general appearance of the total signage installation is improved. Any redundant signage should be removed during new sign installation.

Checking the installation

The accuracy of the signage installation and particularly the positioning of the signs and poles should be checked by the bicycle specialist who has prepared the signage schedule following installation. Installation errors should be remedied promptly and prior to any public promotion of the route.

Maintenance

The maintenance of bicycle route signage is usually the responsibility of the government agency, local government or private landowner which owns or operates the road, street or path. It is important that ongoing sign maintenance responsibilities be assigned and carried out, particularly where joint funding and partnership arrangements have been developed for the construction phase. Any ongoing maintenance of bicycle network infrastructure should include the maintenance of the sign system.

An on-going system for public reporting of signage faults and damage due to graffiti, storm or heavy vehicle damage is recommended as an additional aid to maintaining a high quality bicycle route information. This system can either be integrated into existing fault-reporting systems or set up as a new service on council internet sites.

4 References

- AS1742.6. *Australian Standard AS 1742.6, Manual of Uniform Traffic Control Devices – Part 6, Service and Tourist Signs for Motorists*. Standards Australia. Sydney. 1990.
- AS1744. *Australian Standard AS 1744, Standard Alphabets for Road Signs*. Standards Australia. Sydney. 1995.
- AgtRD 2010. *Austrroads Guide to Road Design, Parts as indicated*. Austrroads. Sydney. 2010.
- RTA 2003. *NSW Bicycle Guidelines*. Roads and Traffic Authority of NSW. Sydney, NSW.