Passenger Transport

A guide to signing cycle networks

Showing the way to more cycle trips

Moving Queensland forward

Queensland Government

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Photo 1: Cycle network signage is part of a world-wide trend towards encouraging greater community use of more sustainable modes of transport. Urban cycle network signage in Amsterdam, The Netherlands.

Introduction – using this guide

Signage is a critical component used to legitimise and assist the many and varied trips which cyclists make daily within Queensland cities and towns. Cycle network signage can indicate the legal status of a facility (bike lane signs, shared path signs), regulate safe use (Stop, Give Way and parking signs), warn of potential hazards (steep descent, slippery when wet, road ahead signs), and guide cyclists to their destinations (cycle route direction signs).

The primary focus of this Guide is the directional signing of bicycle routes. The aim is to give bicycle network providers (state government agencies and local governments) a systematic approach to signing routes for guidance and wayfinding. This will help the growing number of Queenslanders to use their bicycles more extensively and more often. For more detailed guidance on regulatory, warning and guidance signage refer to Manual of Uniform Traffic Control Devices – Part 9, Bicycle Facilities.

Signing routes is very important for cyclists in complex urban street networks. Signage can inform bicycle riders of routes which are often more direct and less heavily trafficked. Cycle network signage can help the community to become aware of the many route possibilities other than the prominently-signed main road network.

Directional and wayfinding signage is a critical element of any transport system. Every transport system needs these signs to help the users find their way around the network and to make full use of the system's infrastructure. We are all so used to the signage systems which are integrated into airports and railway stations along with the familiar large green highway signs, that we often forget how dysfunctional these transport systems would become without their accompanying signage.

Though the bicycle has been in use in our cities and towns since the end of the 19th Century, providing an urban system for bicycle travel is only a fairly recent development. This began in Australia with the development of state and local bicycle plans and strategies and was a response to growing community interest and use of bicycles for transport, fitness, recreation and tourism.

The bikeplan approach sought to create a cycling transport system based on the long term development of urban cycle networks supported by encouragement, education and enforcement programs.

The first chapter of this guide covers this cycle planning process and the principles that underpin effective signage systems. This chapter illustrates how cycle network signage supports State and local cycle strategies by making networks easier and safer to use and by encouraging the wider community use their bikes on a daily basis.

The three following chapters provide detailed technical advice on signing bicycle networks and their component parts. These chapters provide information and resources on current signage practice and guidelines, route signing methodology, sign installation, mounting and maintenance.

Photo 2: Cycle network signage is an essential factor in making cycling more assessible by making a network more cohesive. This signpost marks a turning point on the Ammer-Amper Radweg (rural cycle route) south east of Munich, Germany. The blue 'Y' plate denotes its status as a designated route in the extensive Bavarian tourist and recreational cycle network.

1 Signing principles and cycle network

The purpose of cycle network signage is to provide guidance which will enable safe and efficient travel by bicycle for a diverse range of trips around cities, towns and areas of tourist interest. This chapter begins with a look at the important principles underpinning signage, how it communicates and how it can be most effectively used.

Most cycle networks are developed from a local or regional cycle strategy or bikeplan. This process incorporates inputs from road agencies, local government officers, technical experts, bicycle users and the wider community. Typically a cycle network plan, once adopted, is programmed to be implemented over a period of time. This upgrading work is usually carried out by making selected engineering improvements to each route in the network. These improvements may involve a number of measures from major construction where off-road paths are needed along heavily trafficked road corridors to linemarking and signing where the road environment is less dominated by heavy traffic.

Each approach is valid but if we only adopt a heavy infrastructure approach, we run the risk of long delays before the community have something that they can make use of on a daily basis.

Photo 3: Cycle network guidance signage provides clear directions for riders to trip destinations and alternative routes. These RTA cycle network signs are at a major route junction on the 42km M7 Westlink Shared Path in Western Sydney.

1.1 Sign language – the principles of signage

Human cultures have used signs for centuries to visually convey information from a fixed point. In road-based transport, government authorities put up signs to warn road users of hazards, to regulate usage and behaviour, and indicate the way to destinations, facilities and points of interest.

As useful as signs may be, placing them in the road environment doesn't necessarily communicate the intended message or have the required effect on road users. People are limited by their physiology. The way our brain operates we can't 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 we can miss vital messages entirely.

The discussion below sets out the principles underpinning good signage and the way signs operate within the road environment.

1.1.1 How signs communicate

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 vehicles are travelling at speed and drivers/riders only have a limited time to take in the message and to respond to it in a practical way.

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 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 symbols and shapes. The human eye usually sees words as 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 on 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.

In all aspects of sign layout, design, placement, mounting and maintenance it is important to consider the 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 and 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.

Table 1: 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 cycle route signage.
	Safe operation	Signage should be sited so as not to create a hazard to cycle route users, pedestrians or other road users.
	Sightlines	Signs should be sited with clear sightlines for cycle 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 Cycle 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	Cycle network signage should take account of other signage systems (eg route markers could be added to existing street signs to avoid unnecessary sign clutter).
	Relationship to other networks	Cycle network signage should take account of other transport network signage systems and avoid ambiguity and unnecessary sign clutter.
Function	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 cycle 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.

1.1.2 Four signing principles

As every signage location or intersection is subtly different, it is essential when undertaking any signage project to have a clear understanding of the key principles of good signage and be guided by these principles when applying your signing skills to non-generalised signing situations (see Figure 1).

Conspicuity

A fundamental of good signage is that signs can be easily seen from a sufficient distance so that the traveller approaching the sign can take in its message and react to it in a timely way. A sign has to be clear and unambiguous in its message otherwise it will be missed or overlooked particularly in highly distracting urban environments. Conspicuity encompasses the siting of signs, their mounting height, clutter-reduction, safe operation, sightlines.

Legibility

It has been estimated that 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.

Signs sometimes use symbols in the form of pictograms (often indicating facilities) and logos (sometimes referring to a branded route). It is important that these graphical symbols can be easily understood by cyclists and the use of non-standard pictograms is not recommended. See Figure 19 for standard pictograms to be used for cycle network signage.

Coherence

Good signage brings cohesion to a cycle network. Even if the provision of facilities is in its early development phase, a well-signed network of routes can provide cyclists 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 cycle network and cycling as a practical mode of transport.

Cohesion is further provided by the use of different sign types to indicate the function of routes within the network: principal, local or tourist/recreational routes. Popular destinations with distances will be listed on successive direction signs until that destination is reached.

A cycle network signage system should also seamlessly interface with other signage systems (main roads and pedestrian pathway systems) and clearly indicate the cycle route without adding ambiguity.

Function

Signs should work safely and efficiently in their environment. They should be carefully and consistently installed at or near all decision points along a bicycle route and work together as a system. A functional directional signage system also includes design redundancy – placement of signs at, or before or following an intersection to ensure that if one sign is accidentally or intentionally removed, sufficient signage will remain to enable the cyclist to find their destination.

Photo 4: Cycle network signage is part of a much wider system of road transport signage. Main roads and cycle network signage share common principles. This advance direction sign is near the Gold Coast.

Figure 1: Illustrated examples of signage principles.

Conspicuity

Signs need to be conspicuous. In an already cluttered urban environment they need to be distinctive, easily recognisable and easily seen on approach. The photo on the left shows sign clutter. One sign has been rotated on its mountings and is no longer fully visible. Other signs are partially hidden and not visible on approach.

The photo to the right shows signs with good conspicuity but poor legibility. The bicycle symbol is clear but the important destination lettering is too small to be read from a distance.

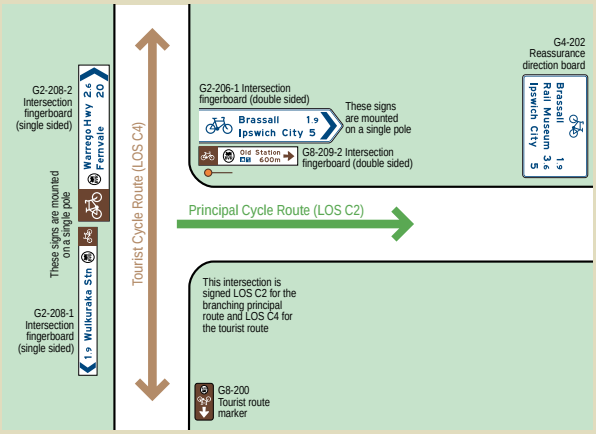
Sign legibility is critical if the information on the sign is to be quickly and accurately read by passing cyclists. Here's a simple example of legibility and lettering - the words shown below have been partially covered. The mixed capitals and lower case type is more easily read than all capitals.

Legibility

LEGIBILITY

Legibility

Coherence

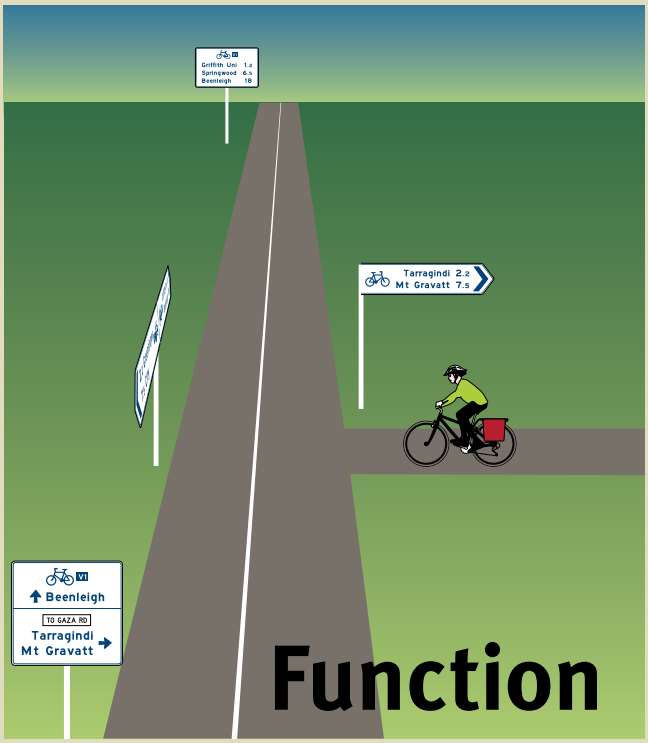


Individual letters may combine to form words but the human brain identifies the shape of the word rather than scanning each individual letter. Mixed upper and lower case words have a more distinctive shape and are more quickly recognised than words made of all capitals.

Cycle network direction signage uses the same typeface as highway direction signs around Australia. This typeface has been developed for its high legibility.

Cycle network direction signs are intended to mark different types of cycle routes which work together as a system. A well-designed system of signage gives cyclists confidence that the cycle network can work to their benefit and offer them a wide range of popular destinations. Signs are the glue which bind together all the component parts of an urban cycle network.

Signs need to work together in a functional, logical and efficient way. Signs along a route are like links in a chain. If one link snaps the system breaks down. This is why signage systems build in redundancy. In the example shown below, the numbered principal route has signs on approach, at the intersection, and on departure. If a sign is removed there are still enough signs left to provide directions.



1.2 What is a cycle network?

A cycle network is a system of interconnected cycle routes which enable people to satisfy their daily travel needs within their city or town and the surrounding region by bicycle. A cycle route is a recommended path-of-travel by which cyclists can travel efficiently from one part of town to another.

The main aims of cycle network design are to:

- Provide safe cycle transport from A to B;
- Provide links and access to important destinations;
- Reduce conflicts with crossing traffic;
- Provide defined operating space (physical, visual and mixed traffic);
- Reduce speeds at points of conflict; and,
- Provide a clear, unambiguous and easily identifiable facilities recognisable by all road users (CROW 2007).

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 cycle network is comprised of marked routes which overlay the existing urban road/street network. It is the special system of cycle signage, markings and engineering improvements we apply to our urban streets and roads which make cycle routes and enable them to function collectively as a network.

1.2.1 Cycle routes

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

Principal Cycle Routes

These routes are the spine from which the local cycle 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. Principal routes are high-quality, high-priority routes providing quick unhindered travel between the major centres within a city and to key centres within the surrounding region. These routes should offer the most direct route alignments and minimal delays.

Local Cycle Routes

These routes provide high quality connectivity to residential streets and localised trip-generating facilities such as schools, bus and train interchanges, pools, libraries and shops. Local routes provide for necessary circulation within a city, town or suburb. They are often shared paths constructed along linear parkways such as creek valleys or suburban foreshores.

Tourism and Recreational Cycle Routes

These are specially identified and designated routes which provide recreational and tourist cycle access within a city or town or across regions. Examples of such routes are rail trails (built along disused rail corridors), coastal trails and historical trails. Tourism and recreational routes should be developed in conjunction with Tourism Queensland and/or Regional Tourism Organisations.

1.2.2 Putting it all together

Cycle networks are usually planned as the key component of a regional or council cycle strategy. A cycle strategy provides government with a framework for coordinating the installation of cycle network infrastructure with allied promotional measures such as cycle network maps, education, new rider training, bicycle events and other practical encouragement activities.

The major aim in developing cycle networks is to satisfy the cycle network design aims as listed in Table 2 by successively introducing facilities along identified routes usually in the form of engineering treatments and signage. For cyclists these measures will improve through-access, operating safety and the general attractiveness of these routes.

Though cycle network directional signage is usually considered when cycle route infrastructure (cycle lanes, off-road paths etc) is constructed, it is often not installed or delayed until much later in the physical development of the cycle network. This approach usually results in a poor take-up on the usage of new facilities. As the cycle network is almost always applied to complex existing urban street environments, it is difficult for the community to comprehend the network and therefore make full use of it when it lacks direction signage.

Table 2: Bicycle routes and their network function

Parameter	Principal 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 principal 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

1.3 Signing the cycle network

Signage provides great cohesion for the cycle network by regulating the use of roads, streets and paths, warning of hazards and difficulties, and indicating destinations where individual trips may start and end. This section looks broadly at the processes for signing cycle networks and recommends methodologies for signing both before and after the installation of cycle route infrastructure.

1.3.1 Why sign networks?

Cycle network signage, particularly direction signage is a crucial aid to navigation and the safe operation of the system. Providing cycle route direction signage benefits the community because it:

- Expands the usage of the cycle network;
- Increases the visibility of routes both for cyclists and the wider community; and,
- Guides local people and those from further afield to destinations along the cycle network.

Without direction signage cyclists cannot easily work out where routes lead or even if the route exists as a functional entity. Engineering treatments and street linemarking on their own may not be valued by cyclists or seen only as ad hoc measures if these improvements are not seen in the broader context of cycle routes designed to help riders complete their journeys.

This process of cycle network development may take a number of years depending on the extent of the necessary route improvements and the resources of councils and government agencies. For this reason it is important to consider the installation of direction signage on a route by route basis as a first stage in developing the network as a whole.

1.3.2 Signing and infrastructure provision

It is important to consider the signing of routes as an undertaking that is critical to the network. Signage is of great benefit to the community even when done independently of major infrastructure provision. For over twenty years Australian councils have been signing cycle routes before major infrastructure can be provided. This type of signed route often utilises the residential street network, paths and local short cuts.

There are major advantages in signing cycle routes before any engineering works are installed. Direction signage can provide the necessary information to enable cyclists to more easily find their way to trip destinations. To ensure that cycle routes are suitable for signing, regardless of the level of infrastructure existing or newly installed, it is advisable to undertake a simple risk analysis route assessment before commencing the signing planning process.

Recommended signing processes are detailed in Section 2 of this Guide. Table 3 details the main issues relating to signing cycle routes according to the level of existing infrastructure.

Photo 5 -Directional signage is an essential component of any effective bicycle transport system. Network signage on the Leach Highway path south east of Perth CBD.

Table 3: Cycle route development process and signing

Infrastructure provision	Description	Suitability of use	Signage provision	Recommendations
Undeveloped	No cycle infrastructure provided	Experienced adult riders, commuters, training riders, local use	Can be signed for local use and principal route connectivity	Pre-signing route assessment. Particular attention paid to road cross sections and intersections
Mixed-traffic facilities	On-road on mostly residential streets. Crossings facilities of major roads provided	Experienced adult and teen riders, commuters, local use	Can be signed for local use and principal route connectivity	Pre-signing route assessment. Particular attention paid to intersections
Visually-separated facilities	Routes primarily on-road using linemarking. Major road crossing facilities provided	Experienced adult and teen riders, commuters, local use	Can be signed for principal and local routes	Post linemarking installation assessment. Particular attention paid to facility connectivity
Mixed visually- and physically-separated facilities	Mixture of on-road routes with linemarking and off-road paths shared with pedestrians	Experienced adult and teen riders, commuters, local use	Can be signed for principal and local routes	Post construction assessment. Particular attention paid to facility connectivity
Physically separated routes shared with pedestrians	Off-road paths shared with pedestrians. Mostly controlled or grade separated major road crossings	General adult riders, teens, supervised children, commuters, local and recreational use	Can be signed for principal, local and tourist/recreational routes	Post construction assessment. Particular attention paid to facility connectivity
Cycles-only routes physically separated	Off-road exclusive-use cycleways. Controlled or grade-separated major road crossings	Off-road exclusive-use cycleways. Controlled or grade-separated major road crossings	Post construction assessment. Particular attention paid to facility connectivity	Post construction assessment. Particular attention paid to facility connectivity

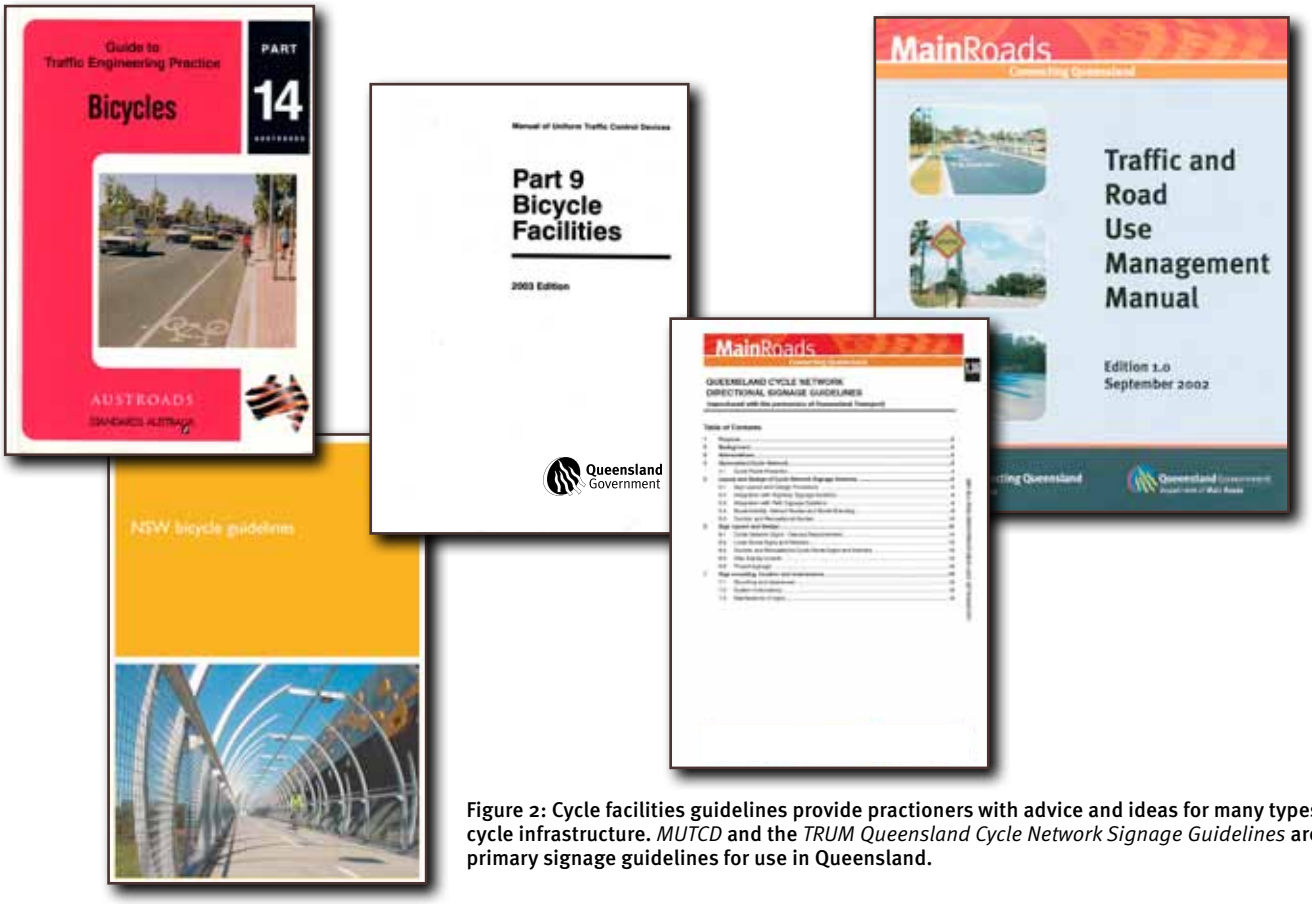


Figure 2: Cycle facilities guidelines provide practioners with advice and ideas for many types of cycle infrastructure. *MUTCD* **and the** *TRUM Queensland Cycle Network Signage Guidelines* **are the primary signage guidelines for use in Queensland.**

1.3.3 Cycle network signing guidelines

There are a number of guidelines designed specifically to assist road designers, engineers and transport planners to provide high quality, professional and consistent signage for cycling networks across Queensland cities and towns. These guidelines are listed in order of importance.

Traffic and Road Use Management Manual Section 1.36: Queensland Cycle Network Directional Signage Guidelines, (TRUM 1.36) outlines procedures for the design and layout of directional signage systems for bicycle networks in Queensland. It deals only with wayfinding or directional signage for cycle routes (both on- and off-road) within a cycle network. It does not cover the many other aspects of cycle network facilities signage and marking, such as regulatory and warning signage, linemarking, pavement symbols and advisory signage covered in guidelines listed below.

Manual of Uniform Traffic Control Devices – Part 9, Bicycle Facilities (MUTCD Part 9) sets out the traffic control devices (signs and markings) used to designate bicycle facilities in Queensland. *MUTCD Part 9* covers regulatory, warning, and guidance and direction signs for cycle facilities. *TRUM 1.36* is the preferred Queensland guideline for cycle network direction signage.

Austroads Guide to Traffic Engineering Practice, Part 14 – Bicycles (Austroads GETP 14) is the national bicycle facilities design guidelines. It covers a wide range of design issues including bicycle facilities on- and off-road, bicycle parking and provision at road works. The preferred Queensland guidelines for bicycle related regulatory, warning and guidance signage is *MUTCD Parts 2* and *9*, and for direction signage *TRUM 1.36*.

Manual of Uniform Traffic Control Devices – Part 2, Traffic Control Devices for General Use (MUTCD Part 2) is the primary reference for regulatory, warning and guidance signs for general road use in Queensland.

Guide to Pavement Markings (Main Roads Queensland) is the primary reference for linemarking for road-based transport.

NSW Bicycle Guidelines (NSWBG). This manual is approved for use in Queensland and provides additional advice on facilities design to *Austroads GETP 14*, particularly in relation to urban street/road environments. It should be read and applied in conjunction with the guidelines listed above.

Local path signing standards

Local governments are implementing wayfinding signage systems to assist people to navigate shared paths and urban greenway networks. These paths have often been developed with unique signage, distance marker systems and identity branding.