



Figure 18: Recommended logos for use on cycle network facilities and services signage. See Figure 18 for examples of use. Logos are white on a dark blue (standard services colour) background. Logos shown are relevant to signing cycle routes. For additional logos refer to MUTCD and Australian Standard AS1742.

An important part of the long term development of any tourist or recreational route is the formulation of a signage strategy to guide the design and installation of facilities and services signage as well as the essential route directional signage. This signage strategy will also document procedures for introducing new signage along the route as public and privately operated services and facilities become available.

The determination of facilities and services signage will be determined by the route's management on an ongoing basis. When new public facilities become available, direction

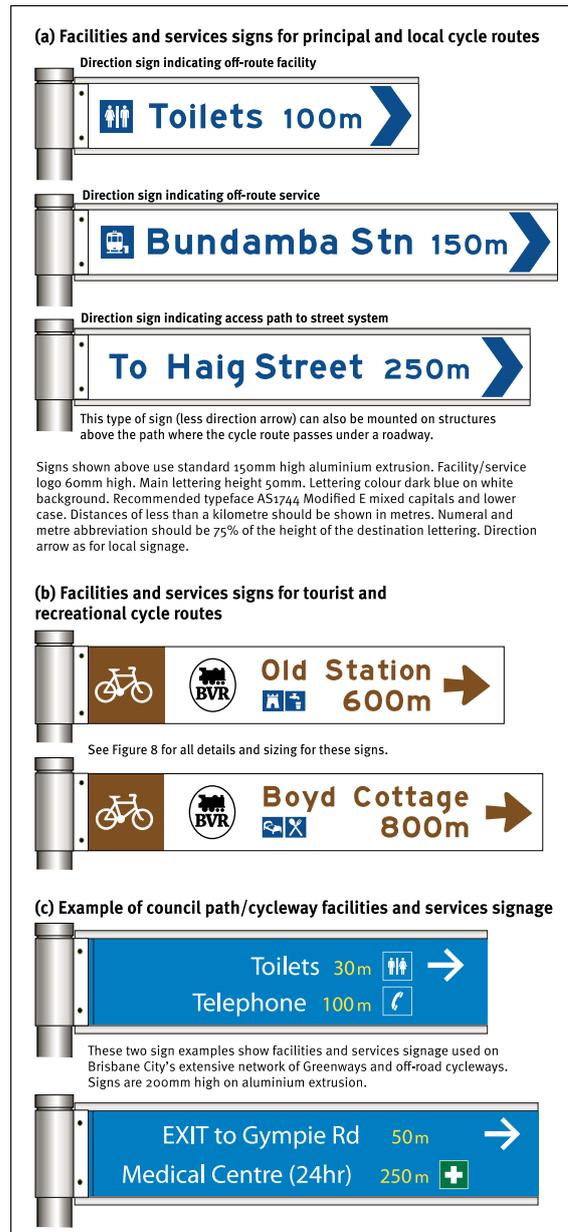


Figure 19: Facilities and services signage examples. This type of signage greatly increases the usefulness of a cycle route. Facilities and services signage can also be used to mark entry/exit paths which connect off-road cycle routes to the local street system. This further improves navigation and reduces the perceived isolation of paths.

signage will be added as part of regular route maintenance programs. When privately owned and operated facilities servicing a tourist or recreational route become available, the owners/managers of these facilities will be required to apply for approval to the route management authority before any new signage is erected.

In determining approvals for new route facilities and services signage route managers will be guided by TRUM 1.12 Service and Tourist Signing Guide - with additional consideration made for the different patronage levels and visitation rates expected for the cycle route.

3 Cycle route signing schedules

Once the decision has been taken to sign a cycle 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.

3.1 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 cycle 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. Figure 20 shows a sample route signing summary for intersection 'c' (see Figure 11) of the Ipswich City to Swanbank Principal Cycle Route. This intersection, which has three principal routes passing through it, is also shown in Figure 14: Example of Cycle Network Level of Signing C2.

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, Figure 20, lists information for a single sign. A complete signing summary would include all intersections for the route being signed. For the Ipswich City to Swanbank Route this would involve intersections 'a' through to 'f' as shown on the Figure 10 Focal Point Signing Map plus the additional intersections between intersection 'a' and Swanbank (not notated).



Photo 13: A signing schedule provides the detailed specification for the sign maker and installation crew or contractor to accurately install cycle route signage on streets, roads and paths. M7 Community Path, Western Sydney.

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.

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.

Figure 20: Sample signing summary for Intersection 'c' (See Figure 11) of the Ipswich City to Swanbank Principal Cycle Route

| Ref no. | Km from start | Sign type | Reference No. | Direction* | Focal points & Sub-destinations etc | Level of signing | Remarks and requirements |
|---------|---------------|-------------------|---------------|------------|---|------------------|---|
| 4a | 3.2 | Advance direction | G1-205 | O | ↑ Springfield ← Booval Swanbank → | C2 | Site assessment to determine precise location |
| 4b | | Fingerboard | G2-204-2 | O | Swanbank 6.2 | C2 | Site assessment to determine precise location |
| 4c | | Fingerboard | G2-204-2 | I | Ipswich City 3.2 | C2 | Site assessment to determine precise location |
| 4d | | Fingerboard | G2-204-2 | S | Redbank Plains 9.4 Springfield 15 | C2 | Site assessment to determine precise location |
| 4e | | Fingerboard | G2-204-2 | B | Booval 800m Booval Stn 1.4 | C2 | Site assessment to determine precise location |
| 4f | | Advance direction | G1-205 | I | ↑ Booval Ipswich City Springfield → | C2 | Site assessment to determine precise location |
| 4g | | Advance direction | G1-205 | I | ↑ Ipswich City ← Swanbank Booval → | C2 | Site assessment to determine precise location |
| 4h | | Advance direction | G1-205 | O | ↑ University ← Springfield Ipswich City → | C2 | Site assessment to determine precise location |

* Direction codes: I = Inbound – facing cyclists travelling in the direction of Ipswich City; O = Outbound – facing cyclists travelling in the direction of Swanbank; S = Springfield – facing cyclists travelling in the direction of Springfield; B = Booval – facing cyclists travelling in the direction of Booval.

3.2 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.

3.2.1 Sign location and placement

The placement of cycle network directional signage should adhere to the general principles of signage as detailed in *MUTCD – Part 5*, for local roads and residential type streets and *MUTCD – Part 2* in relation to major roads and State Controlled Roads. Specific considerations relating to the installation of directional signage for cyclists are detailed below.

Sign clearances

Figure 21 shows vertical and horizontal clearances applying to cycle 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 cycle route intersections/decision points, directional signage should be positioned so that cyclists 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 8 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 cycle stopping distances and sight distances on curves can be found in *Austrroads GTEP Part 14* Section 6. Intersection fingerboard signage should be mounted in a highly visible location so that it can be clearly read by cyclists at a minimum of 15 metres from the intersection.

Table 8: 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 principal route | 50-70 metres |
| C2 | 30km/h | Principal route | 35-50 metres |
| C3 | Below 30 km/h | Local route | 30 metres |
| C4 | Below 25 km/h | Tourism and recreational route | 30 metres |

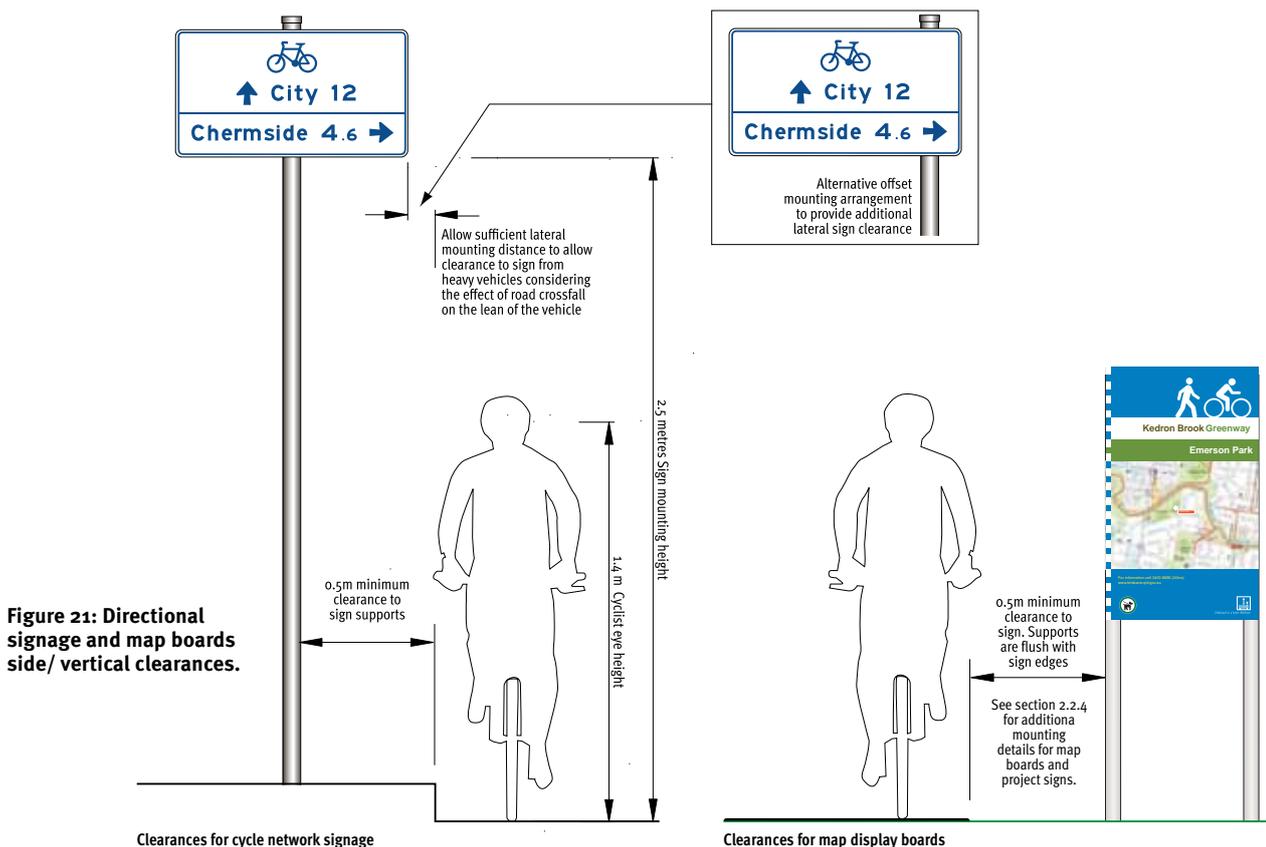


Figure 21: Directional signage and map boards side/vertical clearances.

Signs should be placed consistently as indicated in Figure 22. 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).

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.

3.2.2 Cycle network signs with other sign systems

The presence of cycle network signage should not detract from the effectiveness of other existing road or path signs. Cycle 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 cycle network signage is installed to improve the overall intersection sign layout.

Cycle route signage and road signage

Cycle network signage, like highway signage, is a discrete system designed to guide cyclists through often complex road environments. Combining cycle network signage by

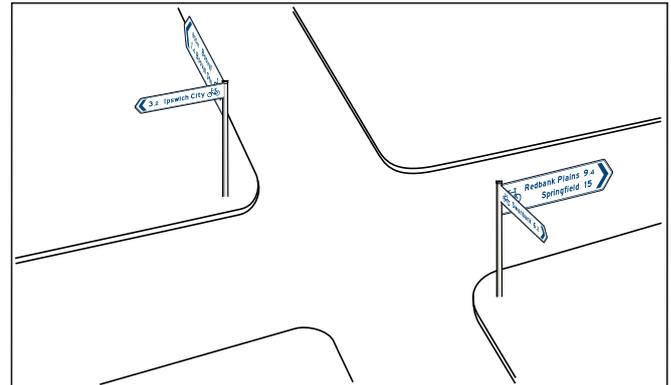


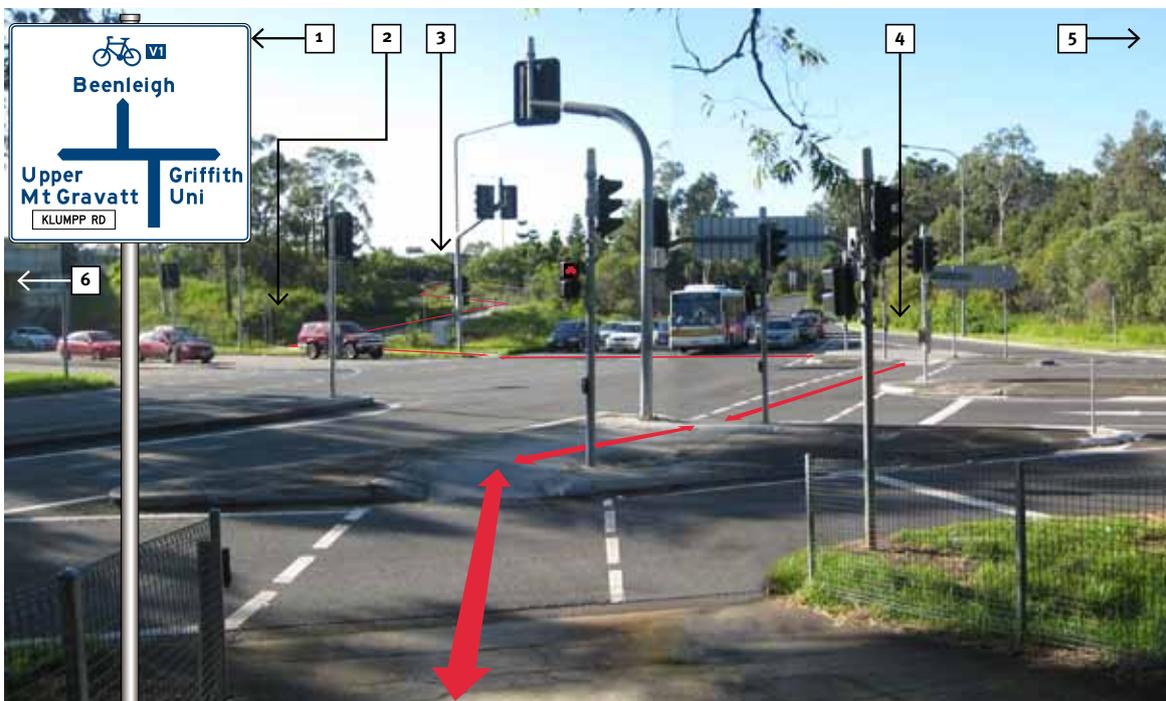
Figure 22: Typical layout for four way intersection with cycle routes on each leg. The example is for intersection 'c' shown on Figure 10.

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 cyclists 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 principal cycle 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 7) with existing or upgraded street name signage.

Photo 14 (below left): Signage example for off-road cycleway travelling through a complex intersection. Some signs are not shown in this photomontage but indicated in the text. Cyclist path is shown in red. (1) Due to the complexity of the intersection it is advisable to use a simplified intersection diagram type sign for all advance direction signs. (2) At this off-road path junction three fingerboards (on same pole) will indicate route turnings. (3) In advance of this intersection, a diagram-type advance direction board, similar to 1, will face cyclists travelling from the opposite direction. (4) At this route junction three fingerboards (on traffic island) will indicate the route turnings. (5) In advance of this intersection, a diagram-type advance direction board, similar to 1, will face cyclists travelling from Griffith University. (6) A diagram-type advance direction board, similar to 1, will face cyclists approaching the intersection from Upper Mt Gravatt.



MR regions and councils will need to assess the fitting of new cycle network signage adjacent to street name signs and the repositioning or reinstatement of street names signs on a case by case basis. Where placing a cycle 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 *MUTCD, Part 5*.

Cycle route signage and path signage

TRUM 1.36 recommends that on local paths cycle network signage should take into account any current local government path signing policy. Where local path signs have been installed, the principal cycle route signage should be installed only where the principal route enters and exits the path or at any other path junction with a principal 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 cycle route being signed. If no local path signing policy is in place cycle 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 cycle 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.

3.3 Preparing the signing schedule

The information collected from the site assessment will be added to new columns in the route signing summary table (see Figure 20). This table, when completed, will become the cycle 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.

Photo 15 (below right): Signage example for on-road cycle route travelling through a complex intersection. Cyclist path is shown in red. Bicycle lanes are fitted to Wynnum Road, a divided roadway with a large centre median. Cyclists approach the signals at the intersection in a bicycle lane. Junction Road exits to the left. Cyclists turning into Junction Road share the road space with other vehicles until the bicycle lane resumes further on. (7) The cycle route advance direction sign for this intersection needs to be positioned just before the side street (partly visible in the foreground) to provide sufficient warning for cyclists to position themselves for the intersection ahead. (8) Direction board type sign on this traffic island fitted in place of the usual fingerboards. (9) Reassurance direction board (optional) on departure side of intersection. (10) Similar signage scheme for travel in opposite direction for both Wynnum and Junction Roads.



4 Sign installation and maintenance

The previous sections of this guide have detailed the processes for planning cycle 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. Some councils prefer to undertake signage projects using in-house staff. 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.

4.1 Sign manufacture

The signs described in this guide and their usage should be manufactured in accordance with *TRUM 1.36* and the relevant sections of the *MUTCD*. A sign manufacturer with in-house design capability will be able to accurately design and fabricate cycle route signage to *TRUM 1.36* specifications. Main Roads sign software *TraSiCAD* is commonly used by council design staff and can be used to design and specify cycle network signs for manufacture. Design wizards for cycle network signage are available as software updates.

4.2 Materials and mounting

Cycle network directional signage is made from sheet aluminium or aluminium/zinc coated steel. Sheet aluminium is the preferred material. Local route fingerboard signage and services and facilities signage may be manufactured from extruded aluminium to the sizes shown in the sign layout drawings (Figures 7 and 19). Sign specifications are detailed in *TRUM 1.36*. Materials are specified in Main Roads *Standard Specification for Roadside Furniture MRS11.14*.

Double sided fingerboards for principal and tourism and recreational routes should be made of thick aluminium sheet able to withstand bending by the elements. Fingerboards should be fixed to galvanised steel pipe supports by means of galvanised steel or aluminium clamps (see Main Roads *Standard Drawing 1295* for clamp details). 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 as shown in Photo 14.

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 as per Main Roads *Standard Drawing 1368*.

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 cycle 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.



Photo 16: Poor practice example of cycle network signage in an urban environment. This four-way intersection has cycle routes on three legs. The cycle route signage is poorly mounted with double, back to back signs for each cycle leg. These are centre mounted on a new steel pole. The street sign has its own timber pole. The badly faded and unreadable community sign and the blue cycle route sign above it are redundant and should be removed. The damage sustained by the blue marker, points to the eventual fate of this sign group. Bondi NSW.

4.3 Checking the installation

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

4.4 Maintenance

The maintenance of cycle 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 cycle 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 cycle route information. This system can either be integrated into existing fault-reporting systems or set up as a new service on council internet sites.

5 Resources

Australian Standard AS 1742.6, Manual of Uniform Traffic Control Devices – Part 6, Service and Tourist Signs for Motorists. Standards Australia. Sydney. 1990.

Australian Standard AS 1744, Standard Alphabets for Road Signs. Standards Australia. Sydney. 1995.

Bikeway and Greenway Signage Manual. Brisbane City Council. Brisbane. 2008.

Cycle Network and Route Planning Guide. Land Transport Safety Authority of New Zealand. Wellington, New Zealand. 2004.

Cycle Note Number 10 - Shared Path Behavioural Signs. Vicroads. Melbourne. 2001.

Design Manual for Bicycle Traffic. *CROW* Record 25. Centre for Research and Contract Standardisation in Civil and Traffic Engineering. The Netherlands. 2007.

Guide to Pavement Markings. Main Roads Department. Brisbane. 2001.

Guide to Traffic Engineering Practice, Part 14 – Bicycles. Austroads. Sydney. 1999.

Main Roads Asset Maintenance Guidelines, Part 6 Road Furniture Maintenance. Main Roads Department. Brisbane. 2002

Manual of Uniform Traffic Control Devices Part 2, Traffic Control Devices for General Use. Main Roads Department. Brisbane. 2003.

Manual of Uniform Traffic Control Devices Part 5, Street Name and Community Facility Name Signs. Main Roads Department. Brisbane. 2003.

Manual of Uniform Traffic Control Devices Part 9, Bicycle Facilities. Main Roads Department. Brisbane. 2003.

NSW Bicycle Guidelines. Roads and Traffic Authority of NSW. Sydney. 2003.

Queensland Parks and Wildlife Service Signage Manual. Queensland Parks and Wildlife Service. Brisbane. 2008.

Signage Planning Manual. Patrick Wenzel. www.signageplanning.com. 2004.

South East Queensland Principal Cycle Network Plan. Department of Transport and Main Roads. Brisbane. 2007.

Standard Specification for Roadside Furniture MRS11.14. Main Roads Department. Brisbane. 2007.

The Human Factors of Transport Signs. Candida Castro and Tim Horberry editors. CRC Press. Boca Raton, USA. 2004.

Traffic and Road Use Manual Section 1.12, Service and Tourist Signing Guide. Main Roads Department. Brisbane. 2007.

Traffic and Road Use Manual Section 1.21, Direction Signs – Legends and Layout. Main Roads Department. Brisbane. 2005.

Traffic and Road Use Manual Section 1.36, Queensland Cycle Network Directional Signage Guidelines. Main Roads Department. Brisbane. 2009.

Standard drawings

Main Roads *Standard Drawing 1295* for fingerboard mounting bracket assembly.

Main Roads *Standard Drawing 1368* for single pole mounting of board type signs.

Figure 23: Australian Standard AS1744 Modified E typeface used on cycle network direction signs

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

12345678

X-height

X height measurement is the height of the capital X letter

