Figure 6: This active-travel map uses the Brisway commercial street directory as its base. The street system is printed in a grey tone to make the public transport, cycling and walking information stand out. This map shows major commercial/community facilities and public places which are the destinations of many transport trips. Because this map aims to serve three transport user groups, it sacrifices some clarity and readability to present more information. As cycle routes overlap both walking routes and bus routes, a transparent style 'highlighter' line is used to show cycle routes. Reproduced from the map, *Active Travel Map 6 Brisbane South*, Brisbane City Council, 2006. Base map copyright Brisway Publishing Pty Ltd. Used with permission.

2. Hierarchy with harmony

Maps can contain many different sets of information with each displaying its own hierarchy. Striking a balance between the depiction of these different hierarchies and the overall legibility of the map is one of the map designer's biggest challenges.

One way the normal road hierarchy is depicted on street maps and directories is by line thickness. For example, major roads with heavy traffic are shown as thick lines, while secondary roads, residential streets and lanes are thinner lines, with colour often used to reinforce line thickness. On a map for cyclists, the most important information is the network of cycle routes (principal, local and tourist/recreational). Colour is recommended to indicate these cycle routes, with the base road network depicted in a neutral grey to differentiate it from the coloured cycle routes (see Figures 6 and 9).

Recommendation: *Important things must look important on the map. Information of lesser importance still needs to be readable, but only on closer inspection.*

3. Simplicity from sacrifice

The best way to avoid 'map clutter' and difficult to read maps is by limiting the range of route or facility types depicted. Usually there are three basic types of cycle routes: main or principal routes, local routes, and tourism and recreational routes. These three types can be simply shown using different line colours. Figure 7 shows many possible ways of showing route information using a combination of line colour and type. This level of complexity makes a map difficult to read. Figure 9 on the other hand, shows a cycle network map where only two types of routes are shown: principal routes shown in blue and local routes shown in green. This map has avoided complexity by limiting the depiction of cycle facilities to two line types: on-road (solid lines) and off-road facilities (broken lines). By sacrificing some level of detail the map becomes easier to read.

Using multiple colours and line shapes requires a careful application of contrasting colour and shape. When selecting line colours, avoid combinations which are hard to distinguish from each other. If cycle route conditions/facilities are to be shown, use a limited palette of line shapes to intuitively represent the facility. Whatever method is used to indicate information, it should be simple and easy to follow.

Recommendation: *Less is more. Good design tends*

Figure 7: Though it is possible to show route hierarchy, surface condition, type of facility etc using colour and line type, it is not advisable to show this level of detail. Limiting the number of symbols the user has to decode will make a map much easier to read.

Designation	Surface	Separation	Flow direction
Principal	Sealed	Physical (off-road path)	One-way off-road pairs
	Mixed (shared street)		
Local	Cobbled	Visual (bicycle lanes)	Two-way off-road one side
Tourist/recreational	Gravel	Mixed (shared path)	Contra-flow on-road
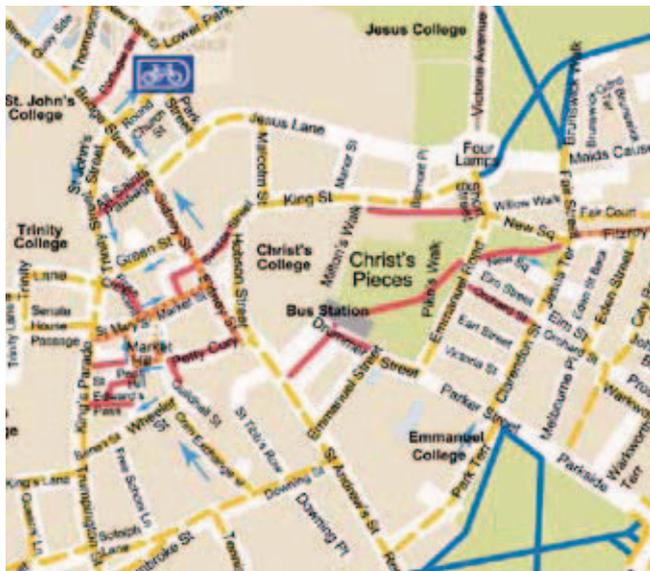
Figure 8: This cycle network map of Cambridge in the UK uses a mixture of colour and line shape to indicate routes and facilities. Solid yellow lines indicate the presence of cycle facilities and dashed yellow lines show routes without facilities (shared space). Blue lines indicate routes off-road and red lines indicate roads prohibited to cycling. Brown lines indicate shared bus lanes.

towards simplicity. The best, most useable maps are often distinguished by what they do not show rather than what they do show.

4. Maximum information at minimum cost

A good map is one which packs in a large amount of information, but at the same time is very easy to use. It is essential to carefully select the map content and symbols to avoid conflicting information, such as lines, lettering and colours. A good base map is essential, but if the base map is too strong in appearance the cycling information will be lost and the map will appear cluttered and confused.

When the background street network is shown in neutral grey (see Figures 6 and 9), coloured cycle routes and important buildings and services appear more prominent and can be more easily read on the map.

Recommendation: *Always try Include as much useful information on a map as is possible without making the map difficult to read and use.*

5. Engage emotion to improve understanding

A well-designed map needs to connect with users. For designers this means developing an emotional connection and empathy with the map users. Effective map design engages the map users' emotions and in this way are they receptive to the map's message. Although it is not its primary purpose, a good map which is loved by its users can be a work of art.

Recommendation: *Always aim to 'connect' with end user of the map and cater to their particular needs.*

The map making process

Developing a map is an excellent way of encouraging the community to ride more often. A cycling map can make people aware of new possibilities for travel in their local area. The following checklist outlines the important issues in the map making process.

Formulate the map concept

Maps can show many things from single routes to whole networks. Cycle maps can show people ways to get to a train or bus station or ferry wharf. They can also show local routes centred on universities, schools, TAFEs, large work places, shopping centres and other large trip attractors. Cycle network maps can show only routes within the network or, in the case of the map shown in Figure 3, cycling conditions on every street and road within an area. Maps can be used to show long distance tourism and recreational routes, or feature a single trunk route in an urban area to specifically promote this route to the local community.

The map concept will include a range of technical issues which, when settled, will feed directly into a brief for the map designer. Among these issues are:

- **Area covered by the map.** This also relates to the scale of the map. If the map is to cover a large area it may be necessary to break the map into pages or sections or even reduce the scale. Printed maps using large sheets of paper can be very difficult to use particularly over longer trips where the map has to be continually refolded. One of the reasons that street directories are popular is that they are reasonably compact and easier to use than a map printed on large sheets of paper.

- **Scale of the map.** Most street directories print maps in a scale of 1:20,000, with more detailed maps of the city centres at 1:10,000 and even 1:5,000. The smaller the number, the larger the scale – a 1:10,000 map of the same physical area will need a larger piece of paper to print on than a map in a scale of 1:20,000. Larger scale maps can fit in more information, but take up more space. Most people are familiar with the 1:20,000 street directory standard and it provides a good level of detail for urban environments. At 1:20,000, an A4 page will cover an area of 4.2 x 5.9 km. Increasing the scale increases the coverage, but to make the map readable some detail may have to be omitted.

- **Cycling information and how to show it.** There are many ways of showing cycling wayfinding information. A map can show a complete bicycle network of principal, local and recreational routes. It can also show recommended cycling routes using existing streets regardless of any specific cycling infrastructure provided. Cycling maps can show the facilities along designated routes or more broadly indicate the cycling conditions on all streets and roads within an urban area. Whichever approach is adopted, the map should clearly state in its legend box the way cycling information is represented on the map.

- **Good level of detail to show trip attractors.** This issue is related to the scale of the map. Cyclists are ordinary people who want to use their bikes in cities and towns for many different trip purposes. It is important that all the important community facilities (educational campuses, shopping areas/centres, commercial/business centres, government buildings and community facilities) are shown.

- **Delivery formats and mechanisms.** The way a map will be delivered to potential cyclists is an important part of the map making process. Traditional printed paper maps can be made in many shapes and