

## CYCLING AND PLANNING

The design of urban traffic systems focuses predominantly on car-users and is often 'unfriendly' to cyclists. Non-motorised transport such as cycling has often been marginalised within transport planning and where it is provided for, is often done so on a retrospective basis, adding to existing infrastructure whilst trying to cause minimum disruption to vehicle traffic (World Bank, 2002). Efforts should be made to make the road network more 'cycle-friendly' and to include cyclists in transport policy and planning as equal road users rather than as 'left-overs' in infrastructure (Eltis, 2003).

Planning has been considered in this briefing in two contexts:

1. The provision of physical infrastructure and appropriate, 'cycle-friendly' highway design and transport engineering. This is concerned with improving transport infrastructure and providing the necessary facilities so as to allow safe, convenient access for cyclists.

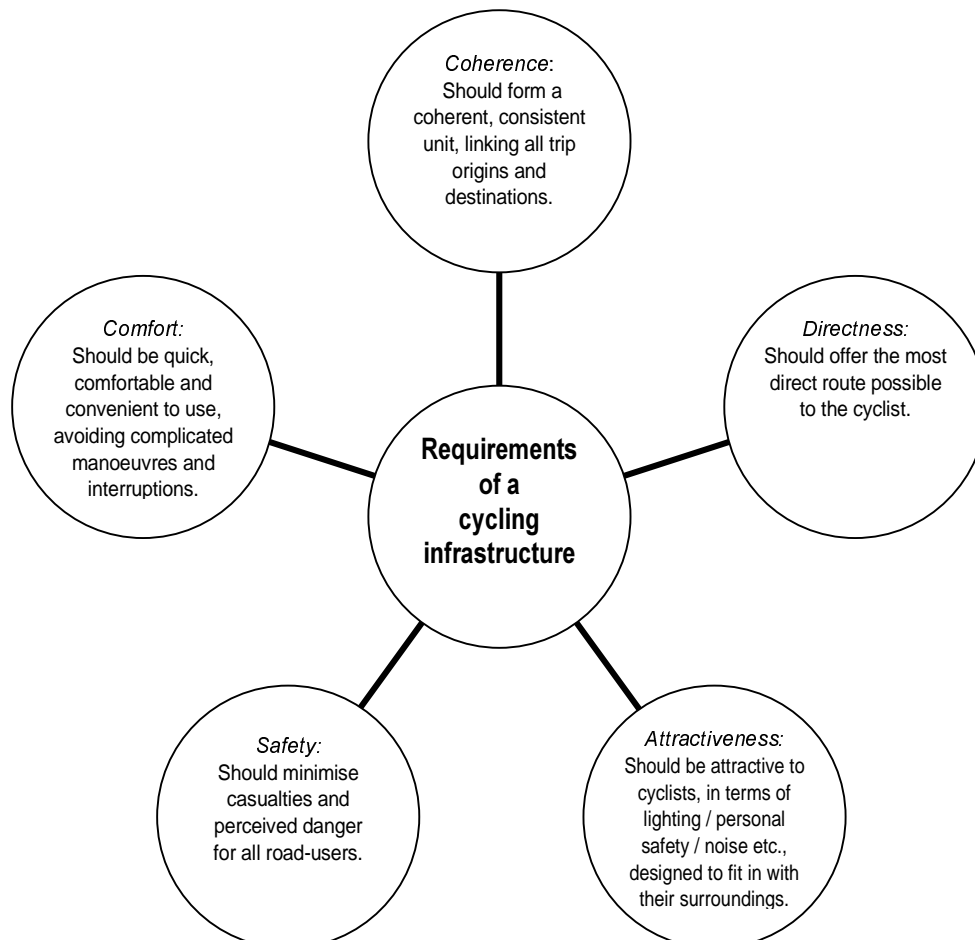
Key cycle infrastructure includes:

- cycle routes and networks;
- cycle parking and storage facilities;
- cycle priority measures;
- complementary traffic calming and speed reduction measures.

2. Land-use planning.

### CYCLING AND INFRASTRUCTURE PLANNING: Meeting Cyclists' Needs:

Dutch research (CROW, 1993) identifies the cyclist's five main requirements of cycling





- Provision for cyclists goes beyond the design and construction of specific measures to assist them – consideration of cyclists’ needs should also be integrated into the design and management of all traffic management road improvement schemes, with the aim of connecting relevant origins and destinations and making cities and the road system fit for cycling. The use of cycle audits and reviews might promote efforts to ensure that the road network becomes more cycle-friendly (NCF, 1998; Department of Transport *et al.*, 1996; IHT *et al.*, 1998).
- The National Cycling Forum (1998) suggests several key action points for planning well for cyclists:
  - “Include cycling as a key element in an integrated transport policy;
  - Adopt a road user hierarchy favouring more sustainable transport modes;
  - Develop a local cycling strategy;
  - Integrate cyclists’ needs into mainstream design through a system of cycle audits and reviews;
  - Cover cyclists’ needs in road safety programmes and safety audits;
  - Adopt a hierarchy of solutions;
  - Ensure users are consulted;
  - Ensure safe and convenient access for cyclists into and through town centres;
  - Provide well designed and conveniently located cycle parking;
  - Make full use of engineering measures to assist cycling” (NCF, 1998).
- In order for cycling to be successfully encouraged the bicycle must be able to compete, in terms of time, comfort and safety, with alternative modes of transport, particularly over short distances. If this is to be achieved, a safe, comfortable, direct infrastructure must be provided (C.R.O.W., 1993). Existing infrastructure must also be adapted to make it safe and comfortable for cycling.
- C.R.O.W. (1993) outlines a number of further key design principles paramount in planning for cycling:
  - *Cycle-cyclist system* – a cycle friendly infrastructure should be familiar with the technical possibilities and limitations of the cyclist and cycle.
  - *Profile of clear space* – cyclists need a certain amount of space on the road with traffic.
  - *Resistance* – cycling is muscle-powered and requires physical exertion to create resistance, or speed is lost. Cycle friendly road designs should aim to minimise speed-loss.
  - *Stress* – cycling requires physical and mental effort; some cyclists are more vulnerable/inexperienced than others.
  - *Integral traffic and transport system* – a well-designed bicycle-friendly infrastructure should consider integral thinking at both network, connecting and facility level, considering planning scale and level of function of a cycle route.



### Design considerations:

- Department of Transport *et al.* (1996) recommend the use of a hierarchy of solutions/measures to guide planning and design programmes with the idea that strategies that stress the importance of traffic restraint, speed reduction and the promotion of alternative modes will encourage and benefit cyclists:
  1. *Traffic reduction* – reduce traffic flows/volumes, e.g. through restrictions/diversions;
  2. *Traffic calming* – reduce traffic speeds;
  3. *Junction treatment and traffic management* – introduce cycle priority schemes and improvement of junctions to assist cyclists;
  4. *Redistribution of the carriageway* – reallocate road space and time to cyclists;
  5. *Cycle lanes and cycle tracks* – provide off-carriageway cycle facilities.
- Key design considerations of when planning and introducing bicycle facilities should be:
  - Characteristics and abilities of the bicycle and the cyclist;
  - Quality requirements
  - Trading off different requirements and interests, weighing up costs and benefits and setting priorities.
  - (Godefrooij and Pettinga, 1993).

### 'Cycle-Friendly' Infrastructure:

- In order to promote cycling and walking, there is a need to ensure the provision of suitable urban conditions, that is, a cycle-friendly environment, to ensure that they can respond to and permit an increase in cycling. It is not merely a question of adding facilities, but about proofing the context into which these facilities are placed. For example, rather than campaigning solely for the installation of cycle lanes, efforts should also focus on campaigning for the rights of non-motorised users to share the road. Until this is possible, cyclists will be confined to cycle lanes or exposed on the road.
- The main objective of planning must be to ensure both that potential cyclists are not discouraged and also that existing cyclists are not driven away.

The European Federation for Transport and the Environment recommends several technical measures to support cycling:

- Cyclist exemption from one-way streets;
- Provision of through cycle routes in pedestrian areas;
- Cycle/pedestrian underpasses and bridges;
- Introduction of cycle-friendly traffic calming;
- Ensuring continuity of cycle routes.

It also recommends several measures to promote safety:

- 30kph speed limits;
- Appropriate junction design;
- Provision of advanced stop lines;



- Stopping cyclists using interrupted segregated cycle paths;
- Provision of a coherent cycle network.
- (CTC, 1995).
  
- Providing cycle facilities should not be seen as an objective in itself. Cyclists do not want cycle facilities per se, but rather integrated facilities that form safe, convenient, comfortable and attractive cycling routes and facilitate everyday cycling, allowing the bicycle to compete with other modes of transport, particularly in relation to the car (Department of Transport *et al.*, 1996; Pettinga, 1993).
  
- Cycling should be considered a vital component of an integrated transport policy (National Cycling Forum, 1998). Cycle planning should not be viewed as 'stand-alone' facilities, but rather as part of a group of complementary measures and an integrated transport plan (Eltis, 2003).
  
- Promotion of cycling is unlikely to be successful without adequate planning. High-quality planning creates higher road safety standards for all road users, including cyclists.
  
- Many UK local authorities incorporate ranked road user hierarchies into their local transport plans with the aim of guiding design, planning and funding priorities and ensuring that all users' needs are considered in scheme development. Although the hierarchies do vary slightly, they are very similar: The City of York Transport Strategy 1998/1999 (Harrison, 2002) identifies an order of priority used to guide design, planning and funding priorities:
  1. "Pedestrians (including those with mobility difficulties);
  2. People with mobility problems;
  3. Cyclists;
  4. Public transport users (including bus, rail, water, coach);
  5. Powered two wheelers;
  6. Commercial/business users (includes deliveries/HGVs);
  7. Car-borne shoppers and visitors;
  8. Car-borne commuters" (Harrison, 2002).
  
- Studies by the municipality of Amsterdam have shown that 'push' policies, such as discouraging car-use, are more effective than 'pull' policies, such as improving bicycle facilities, in increasing bicycle use (Buis, 2001). Legislative measures such as reduced motorised vehicle speed limits or redesigning residential areas to 30 mph zones have also been shown to have a positive effect (ECF, 1995).
  
- The introduction of cycle facilities and infrastructure alone will not alter people's modal choice on its own. Instead, a combination of both 'soft' and 'hard' policies and measures geared towards cycling is needed.



'Soft measures' such as enhancing the overall image of cycling or creating a bicycle climate, can effectively work alongside 'hard', physical measures such as the provision of bicycle infrastructure and facilities (Harrison, 2002; Eltis, 2003).

#### **Considering Specific Needs in Planning:**

- There is a need for clear benchmarks of good practice and comprehensive and consistent cycling policies, whilst simultaneously allowing for differences in emphasis according to local context and differing economic, social, environmental, cultural, geographical and political circumstances.
  
- According to Eltis (2003), depending upon the cycling context for which it is aimed, planning for cyclists will have varying approaches:
  - In a city with medium or high levels of cycling, the aim should be to sustain the current cycling levels, e.g. through measures such as providing workplace bicycles and free city-bicycles, and installing cycle racks and cycle theft prevention measures.
  - In a city with low levels of cycling, efforts should focus on providing key a road infrastructure which affords cyclists more priority and encouraging cycling as a clean, convenient mode of transport.
  - In cities with virtually no cycling, the first step is to make people more familiar with cycling, e.g. by creating opportunities and facilities for leisure trips which might promote utility cycling.
  - Alongside these strategies, car use should be simultaneously discouraged (Eltis, 2003).
  
- In some cultural contexts, planning is more likely to be approved and implemented if it is seen to have wider benefit beyond cyclists. For example, strategies that benefit the whole community by restraining motorised traffic, reducing vehicle speed and promoting environmentally-friendly modes, rather than being cycling-specific, are likely to be favoured (Department of Transport *et al.*, 1996). In countries with high levels of cycling, implementation of specific bicycle provision is unlikely to be a problem. In general, specific bicycle provision will be more difficult to justify so long as levels of cycling are relatively low and in that sense, it is necessary to consider wider benefits.

#### **Cycle Parking:**

- Prominently located cycle parking and storage facilities can provide reassurance for cyclists with regards to safety, reduce theft and have the potential to encourage cycling (National Cycling Strategy, 2001).
  
- Different parking facilities might be appropriate for short-term parking and long-term parking needs. Successful facilities must be secure, safe and well-located, sited close to trip destinations, leisure facilities, public establishments, public transport interchanges and all major trip generators, and must be adequate both in terms of quantity and quality.



- Monitoring of cycle use can help determine level of demand. This can then be matched by supply (National Cycling Strategy, 2001).

Cycle parking could be located near CCTV so as to ensure an enhanced level of security.

#### **Cycle Theft and Security:**

- Fear of theft is a key concern of both existing and potential cyclists and can provoke people into using other transport modes where they might otherwise have use the bicycle. Bicycles are mobile and often poorly secured, making them vulnerable to theft.
- Cycling can be encouraged by providing secure, safe cycle parking and storage facilities at destinations and origins (DTLR, 2001).
- Schemes aiming to improve cycle security should encourage secure behaviour of users: ensuring that security products such as locks are used, insurance for the bicycle is obtained, security marking and registration. Home and workplace/school security should be encouraged (National Cycling Strategy, 2001).
- Security measures can include:
  - 'Natural surveillance';
  - CCTV;
  - Lighting;
  - Lockers, cages and sheds;
  - (National Cycling Strategy, 2001).

#### **Links with Public Transport:**

- Planning for cycling should ensure integration with all public transport (bus/train/light rail/ferry). Measures could include ensuring accessibility of interchanges, provision of parking and storage facilities at interchanges, integration of service charges/transport prices and permitting bicycles to be carried on trains.
- In the Netherlands, 35% of all train-users come to the railway station by bicycle (ECF, 1995).
- In Switzerland, linkages with public transport have helped capture cyclist patronage. Here measures such as 'Bike and Ride schemes', bicycle hire at stations, running of special leisure trains, ferry services for cyclists and the on-train/bus carriage of bicycles has provided integration allowing for multi-modal journeys (CTC, 1995).
- Cycle parking can be provided at 'Park and Ride' sites. There is also potential for 'Park and Cycle' Schemes where drivers take a bicycle into town, rather than using a bus (CTC, 1995).



- Cycling has the potential to not only be an alternative mode of travel to the car but also, when combined with public transport, to form part of longer journeys (DTLR, 2001).

## **TRANSPORT, CYCLING AND LAND USE PLANNING:**

### **Integrating Transport with Land Use:**

- Accessibility is vital to a city's economic and social functioning.
- Planning should aim to improve accessibility whilst also reducing the need to travel (National Cycling Forum, 1998). This might be achieved through the integration of transport and land-use planning policy at all levels – national, regional, strategic and local (DTLR, 2001).
- There is a need for consistency between planning and other policies, e.g. so that the benefits of good quality provision are not undermined by other measures such as wider roads or junction capacity that make local cycling conditions more dangerous on balance and not safer.
- Cycling can be encouraged through shaping urban development design, for example, parking restrictions (DTLR, 2001). Of paramount significance is the need to develop compact settlement patterns and layouts that are more conducive to encouraging the use of bicycles for short trips, with cumulative effects increasing over time and with new development and redevelopment.
- There is a need for complementary integrated urban and traffic design and planning. Effective urban and traffic planning based on all city users and not just motorists might improve spatial and functional quality and encourage people to use more sustainable transport more often and to take the car less (Novem, 2002).
- Transport mode choice should dictate location and spatial siting, not the opposite way round as is usually the case. The locations of functions (work, services, home), the use of space and the way people travel are inextricably intertwined and hence travel behaviour can be modified accordingly by according patterns of development and siting (Novem, 2002).
- By paying attention to location, scale, density, design, functional mix and spatial separation of key land uses, planning can reduce the need to travel, reduce journey times/length/distance and improve accessibility to facilities and services by alternative modes of transport – public transport, walking and cycling etc. (DTLR, 2001).
- Transport flows can be reduced by combining different functions (work, leisure, living, shopping) in concentrated areas (EEA, 2002). The emphasis is on a 'compact city' approach, in which development is focused on areas easy to reach by cycling.



- 'Car-free areas' and other areas designed for non-motorised priority have been shown to operate successfully in Bremen and Houten, the latter of which has a 30% modal share of cycling.
- The European project ECOCITY aims to develop sustainable settlement patterns and environmentally-compatible transport system (Novem, 2002).
- The aim is not to reduce mobility but to introduce transport measures and shape the pattern of urban growth so that it is favourable to, and can encourage, a modal shift from car use to sustainable modes in general. Spatial structure has a major impact upon modal choice. Over short distances, especially journeys less than 5km, cycling and walking can compete with, and act as major alternatives to, the car, but only if this is reinforced by planning (Novem, 2002; Department of Transport, Local Government and the Regions, 2001).
- It is important to make sure that key facilities and services can be accessed by all forms of transport. This is also important for those who did not have regular use of a car and can play a role in promoting social inclusion (DTLR, 2001).

#### **Parking Policies:**

- The European Federation for Transport and the Environment suggests that reductions in car parking supply can be an effective tool in demand management and act as a key factor in modal shift (CTC, 1995).
- A reduction in car parking spaces and parking prohibitions can restrict car use and improve accessibility by non-motorised modes. If car parks are located away from destinations at least as far as the nearest cycle parking facility or public transport stop, users might be provoked into using alternatives.
- Experience in York and Oxford, England indicates that there are key links between a reduction in car parking and higher levels of cycle use (CTC, 1995).

#### **Other Relevant Briefings:**

- Cycling and Promotion
- Cycling and Urban Efficiency
- Cycling and Accessibility and Mobility

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