



LTN 1/04 - Policy, Planning and Design for Walking and Cycling

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1. Introduction

1.1 Context

1.1.1 The Government's policy for integrated transport has introduced a substantial change in the approach to transport schemes. In promoting an integrated transport system, the Government recognises the necessity for improving conditions for pedestrians and cyclists, with particular emphasis on the needs of disabled people. Promotion of walking and cycling is important in helping to support other major Government objectives such as improved public health, better air quality, and sustainable land-use planning.

1.1.2 This Local Transport Note (LTN) applies to rights of way under the control of local highway authorities. Two other LTNs accompany it. LTN 2/04 *Adjacent and Shared Use Facilities for Pedestrians and Cyclists* provides updated guidance on the application and design of off-carriageway facilities for cyclists and pedestrians (supersedes LTN 2/86). LTN 3/04, *Signs and Markings for Cycle Routes* provides guidance to designers of cycling facilities on the use of *Traffic Signs Regulations and General Directions, 2002* and it includes some common layouts (supersedes LTN 2/87).

1.1.3 All three LTNs refer to parts of the Design Manual for Roads and Bridges (DMRB). However, while the DMRB is a useful source of standards and advice for trunk roads, it is often not appropriate in the context of local roads. Local authorities should therefore consider how it is applied with care. Ultimately, local authorities are the arbiters of what happens on local roads. Guidance for accommodating non-motorised users along and across trunk roads is available from the Highways Agency.

1.1.4 Developments and innovations for walking and cycling are reported in Traffic Advisory Leaflets (TALs) available from the Department for Transport (DfT).

1.1.5 This document sets out the policy context that supports the promotion of pedestrian and cycling facilities (Chapter 2). It also describes common design principles for pedestrian and cycle provision (Chapter 3). These include:

- an overarching principle that any new measures proposed for pedestrians and cyclists should represent a real improvement over the existing situation, particularly in terms of accessibility, and, where practical and appropriate, offer users a positive advantage over motor traffic;
- the role of land use planning in enabling users to undertake more journeys on foot or by cycling;
- a hierarchy of users, which can assist in prioritising the needs of different transport modes where there are conflicting demands on carriageway space, or there is incompatibility in the highway layouts suiting different modes;
- hierarchies of provision, which provide a systematic approach to determining the best engineering solution for pedestrians and cyclists at a particular site;
- minimum requirements which should be met if the infrastructure is to be Convenient, Accessible, Safe, Comfortable and Attractive for pedestrians and cyclists;
- the various needs of different "design cyclists" and "design pedestrians" which should be considered when planning appropriate infrastructure; and
- the need for monitoring and evaluation to ensure that measures are fulfilling their intended purpose.

1.1.6 The decision-making framework for selecting and designing pedestrian and cycle infrastructure covers network planning, cycle/pedestrian review, scheme selection, scheme design and audit, and scheme implementation. The selection process uses the hierarchies of provision, and guides the designer to consider traffic reduction and speed reduction as the first options, followed by various on-carriageway solutions for cyclists. Where routes follow existing roads, the designer should only consider new off-carriageway options for cyclists or new alignments/grade-separated facilities for pedestrians if all on-carriageway solutions (including traffic and speed reduction) have been rejected as insufficient or inappropriate. However, this does not necessarily apply where the intention is to improve an existing off-carriageway route or where there is a specific need for a new route away from the road. LTN 2/04 gives guidance on the introduction of off-carriageway routes for cyclists.

1.1.7 Chapter 4 of this LTN outlines in more detail the infrastructure techniques available to cater for walking and cycling, and provides references for further guidance on these techniques. Examples are provided of how the policy and principles of the design process might be applied to promote walking and cycling.

2. Policy

2.1 Walking, cycling and integrated transport

2.1.1 The need to provide for pedestrians and cyclists is emphasised in the Government's *Guidance on Full Local Transport Plans* and in *Transport 2010 - The 10 Year Plan* in which the delivery mechanisms for the Transport White Paper are outlined. These documents emphasise the key role of walking and cycling as the main modes used for short trips (especially to local facilities such as shops, schools, etc) and in providing access to public transport for longer journeys.

2.1.2 The role of walking and cycling in helping to create liveable towns and cities and to promote health improvement and social inclusion has not always been recognised in the past. Around 25% of all journeys, and 80% of journeys of less than one mile are made on foot. Almost all other journeys include an element of walking. Three in ten households in the UK do not have access to a car, and in many one car households the majority of trips are made by non-car modes. Ensuring that there is safe and convenient access to jobs, education, health care, other services, and local facilities for non-motorised road users is an essential part of promoting social inclusion. Walking and cycling are low-cost travel modes available to almost all ages and have an important role to play.

2.1.3 The need to take the whole journey into account is important when considering public transport. Safe pedestrian and cycle access, and secure appropriate cycle parking (short and long term) at interchange facilities can help to stimulate greater use of these modes in conjunction with public transport. Improved cycling facilities can significantly increase the catchment of public transport stops, helping to boost patronage on the services. Improved access to public transport is an important element in reducing social exclusion.

2.1.4 High quality design of townscapes and rural transport infrastructure can help to encourage walking and cycling and assist with tackling social exclusion in many ways (see *Towards an Urban Renaissance*, DETR 1999, and *Making the Connections - Transport and Social Exclusion*, Social Exclusion Unit, ODPM 2003). Improvements to the walking and cycling environment are an inherent part of improving public spaces in towns and cities, and of providing access to work, education and healthcare in urban and rural areas. The emphasis on mixed use in new developments should help to bring about an increase in the number of shorter journeys undertaken on foot or by bike, and create attractive environments for pedestrians and cyclists.

2.1.5 Promoting walking and cycling is an important part of the Government's drive to raise the quality of life through the creation of sustainable communities. These are well designed, liveable places that are safe, visually attractive, and function well - places where people want to live and work. In order to realise high quality sustainable communities, the Government has placed good design at the heart of its planning policy. Policy Planning Guidance notes PPG1 and PPG3 make it clear that design is a material consideration of the planning system. PPG13 (Transport), promotes development patterns that encourage walking and cycling. PPG6 (Town Centres) places a strong emphasis on attractive pedestrian environments, keeping locations of the various activities and uses within walking distance of each other.

2.2 Walking, cycling, health and the environment

2.2.1 Walking and cycling for utility trips provide the opportunity to undertake daily exercise without the need for specialist equipment. Britain has a higher rate of coronary heart disease (CHD) and associated illnesses than most European countries. A modest amount of regular moderate intensity exercise such as walking or cycling can help to protect against developing such illnesses as CHD, stroke, non-insulin-dependent diabetes, osteoporosis and, by improving strength and co-ordination, it can also protect against falls, fractures and injuries (Davis, A, *Active Transport*, HEA 1999). Non-exercisers cycling approximately 30km per week can make significant gains in fitness, sufficient to considerably reduce any propensity to develop CHD (TAL 12/99, *Cycling for Better Health*).

2.2.2 Encouraging walking and cycling is included in the policy document *Our Healthier Nation*, DoH 1999. Air pollution can be attributed as a contributory cause to many respiratory diseases. Walking and cycling for short trips can help to reduce emissions to meet the objectives of the Government's Air Quality Strategy, DETR 2000.

2.2.3 The Government published the UK's Climate Change Programme in 2000. The programme sets out how the UK plans to meet its Kyoto target to cut greenhouse emissions to 12.5% below 1990 levels by 2008-2012, and move towards its domestic goal to cut carbon dioxide emissions to 20% below 1990 levels by 2010.

2.3 Walking, cycling and road safety

2.3.1 The Government has set the following casualty reduction targets for 2010 ¹ in its policy document *Tomorrow's Roads: Safer for Everyone*, DETR 2000:

- a 40% reduction in the number of people killed or seriously injured in road accidents;
- a 50% reduction in the number of children killed or seriously injured in road accidents; and
- a 10% reduction in the slight casualty rate, expressed as the number of people slightly injured per 100 million vehicle kilometres.

2.3.2 Child casualty reduction is a special focus of the 2010 Road Safety Strategy, which acknowledges the need to improve Britain's record, aligning it with the levels achieved in some other European countries.

2.3.3 Government also wishes to encourage more walking and cycling to improve public health and the environment, and to reduce congestion. Encouraging more children to walk and cycle to school is a key aim of the Government. This is demonstrated by its support, through the LTP process, for Safer routes to Schools and School Travel Plans.

2.3.4 Delivering increases in walking and cycling while reducing casualty numbers for these modes will require significant action by highway authorities, the police and others with responsibility for rights of way. Chapter 4 of this LTN provides examples of appropriate infrastructure measures that will create environments where it is safer to walk and cycle. It should be noted that walking and/or cycling journeys may take place along routes away from the highway network on footpaths, bridleways, canal towing paths and other rights of way. It is important that user safety is fully considered in the design of such routes.

2.3.5 Excessive and inappropriate speed is by far the biggest single contributor to recorded casualties in Britain. It can also be a significant deterrent to walking and cycling by creating a perception of danger. *New Directions in Speed Management, a Review of Policy*, DETR 2000, recommends reviewing the function of roads, and specifically their importance for walking and cycling journeys, to assist in setting speed limits.

2.4 Strategies for encouraging walking and cycling

2.4.1 During the last two decades, the number of walking journeys per person has fallen by 10% and the average distance walked by 24% (see *Providing for Journeys on Foot*, IHT 2000. The quality of the walking environment has deteriorated in many places as a result of increased motor traffic, worsened

perceptions of crime and assault, and a reduction in environmental quality. Although some areas have witnessed increases in cycle use since 1996, in many parts of the UK, cycling has remained at the base level of around 2% of all trips.

2.4.2 Local walking and cycling strategies set out how highway and planning authorities aim to encourage and facilitate the use of these modes. The inclusion of local walking and cycling strategies is a requirement in the guidance on preparing full Local Transport Plans. Successful strategies are often linked to employer and school travel plans or to health promotion initiatives. Sources of guidance on developing local walking and cycling strategies are listed in the bibliography.

2.5 Monitoring and re-evaluation

2.5.1 Local authorities should monitor progress towards the targets set in their walking and cycling strategies, and they should periodically re-evaluate these strategies to ensure that they are using the most effective means to achieve the targets. Cycling strategies would usually be expected to contain targets for modal shift, since in most areas, the level of cycling is extremely low. Such an indicator may be less relevant to walking, particularly in inner-urban areas where a high proportion of journeys is already undertaken on foot. TAL 2/00, *Framework for a Local Walking Strategy*, suggests key objectives, measures, outcomes and performance indicators, and gives advice on how to measure these. Many practical examples are included in *Walking: Making it Happen*, London Walking Forum 2000. The Annual Progress Report of the Local Transport Plan should include an assessment of progress towards the targets that a local authority hopes to achieve within the life of the plan.

2.5.2 Planning, monitoring and evaluation should involve studies of usage and demand to gain an understanding of which routes people use and why they use them. This will inform the development and improvement process, and help in establishing the necessary maintenance procedures.

¹ The baseline values for the 2010 casualty reduction targets are the average casualty rates for 1994-1998

3. Planning and Design principles

3.1 Introduction

3.1.1 Integrated transport plays an important part in realising the Government's aims of creating well designed sustainable communities. This issue is less constrained by finance than it was in the past and should lead to a greater range of infrastructure solutions to accommodate the conflicting demands of different modes in any given situation. Particular attention is drawn to the role of walking and cycling in supporting these aims.

3.1.2 This chapter describes the key concepts used in designing for pedestrians and cyclists. These include minimum pedestrian and cyclist requirements, the design pedestrian and design cyclist, and the hierarchies of provision. Recommended processes for selecting appropriate infrastructure for pedestrians and cyclists are presented at Annex A in Figures 1 and 2 respectively.

3.1.3 With careful design and traffic management, it is sometimes possible to cater for the needs of pedestrians and cyclists without providing obvious measures such as cycle lanes and sub-ways etc. This concept is often referred to as "invisible infrastructure" and its importance should not be underestimated.

3.2 Design requirements

3.2.1 Planning and designing high quality infrastructure involves developing very localised solutions in close consultation with local people, but there are some basic requirements that need to be satisfied, and these are summarised below. The underlying principle is that measures for pedestrians and cyclists should offer positive provision that reduces delay, diversion and danger. The design requirements should be considered in conjunction with the hierarchy of users (Section 3.3), hierarchies of provision (Section 3.6) and take into account the achievable traffic conditions (Section 3.7) to determine the most appropriate design solution.

3.2.2 Five core principles have been established common to both pedestrians and cyclists. They have been derived from the requirements for pedestrians included in *Guidelines for providing for journeys on foot*, IHT 2000 (Connectivity, Conspicuity, Convenience, Comfort, and Conviviality) and the requirements for cyclists included in *Cycle Friendly Infrastructure*, IHT 1996 (Coherence, Directness, Comfort, Safety, and Attractiveness). They are:

3.2.3 *Convenient*: Networks should allow people to go where they want, and new facilities should usually offer an advantage in terms of directness and/or reduced delay compared with existing provision. Routes and key destinations should be properly signed and street names should be clearly visible. On-street route maps can be particularly helpful in certain locations. Published route maps should also be made available. Ideally, routes should be unimpeded by street furniture, pavement parking and other obstructions which can be particularly hazardous to visually impaired pedestrians. There should be the minimum practicable delay for pedestrians and/or cyclists waiting at signalled crossings, and they should not face long detours along their route. Trip-end facilities should be clearly marked, conveniently located, and appropriate for the likely length of stay. Designers should consider the future ease of maintenance, including access to vehicles for sweeping, trimming grass verges and making surface and lighting repairs along off-road routes.

3.2.4 *Accessible*: Pedestrian and cycling routes should form a network linking trip origins and key destinations including public transport access points. The routes should be continuous and as direct as possible in terms of distance and journey time (type and colour of surfacing can be used to stress route continuity as appropriate). There should be proper provision for crossing busy roads and other barriers in urban and rural areas, and in some areas there should be a positive advantage over private motorised traffic. As far as is practicable, all parts of each route (including crossing points) should be situated on desire lines. Routes should be provided into and through areas normally inaccessible to motor vehicles such as parks and shopping centres, as this may help to encourage modal shift. Safe access for pedestrians and cyclists should be maintained at all times during road works. The needs of people with various types and degrees of disability should be taken into account at the design stage by consulting local groups representing them.

3.2.5 *Safe*: Not only must infrastructure be safe, but for the well being of users, it must be perceived to be safe. Traffic volumes and speeds should be reduced where possible in order to create the desired conditions. Reducing the impact of motor traffic also facilitates the implementation of other measures

beneficial to pedestrians and cyclists which might not otherwise be viable. Opportunities for redistributing space within the highway should be fully explored including moving kerblines and street furniture, providing right-turn refuges for cyclists or separating conflicting movements by using traffic signals. The potential for conflict between pedestrians and cyclists should be minimised. Maintenance plays an important part with regard to safe operation, and surface defects should not be allowed to develop to the extent that they become a hazard. Similarly, vegetation should be regularly cut back to preserve available width and sight lines. The latter is particularly relevant with regard to crime and the fear of crime. Apart from long sight lines, the risk of crime can be reduced through the removal of hiding places along the route, provision of lighting, and the presence of passive surveillance from neighbouring premises or other users. Waiting rooms, cycle parking etc, should be sited where people using the facilities can feel safe. In rural areas, the needs of pedestrians, cyclists and equestrians should be considered where their routes cross busy roads, and where a satellite village or district is separated from a town or city by a major ring road or bypass.

3.2.6 Comfortable: Infrastructure should meet design standards for width, gradient, and surface quality etc, and cater for all types of user, including children and disabled people as appropriate. Pedestrians and cyclists benefit from even, well-maintained and regularly swept surfaces with gentle gradients. Dropped kerbs are particularly beneficial to users of wheelchairs, pushchairs and cycles, and tactile paving needs to be provided to assist visually impaired people. Dropped kerbs should be properly flush with the road surface. Even a very small step can be uncomfortable and irritating for some users, especially if there are several to be negotiated along a route. Seating at regular intervals is desirable to enable people to stop and rest. Comfort is enhanced when users are free from the fear of crime.

3.2.7 Attractive: Aesthetics, noise reduction and integration with surrounding areas are important. The walking and cycling environment should be attractive, interesting and free from litter, dog mess and broken glass. If possible, routes should cater for users wishing to stop, chat and rest. The ability for people to window shop, walk or cycle two abreast, converse or stop to look at a view makes for a more pleasant environment. Public spaces need to be well-designed, finished in attractive materials, and be such that people want to stop in them to spend some time there. The surfaces, landscaping and street furniture must be well-maintained and regularly cleaned, and in keeping with the surrounding area. Issues of light pollution should be considered in addition to personal security in rural and semi-rural routes.

3.3 Hierarchy of users

3.3.1 The concept of a hierarchy of users has been established for use in the planning and design processes for new developments and proposed traffic management schemes. This places pedestrians at the top, followed by cyclists then public transport, with unaccompanied private car-users last. The objective of such a hierarchy is to ensure that the needs of the most vulnerable road users are fully considered in all highway schemes, but not necessarily to give priority to pedestrians and cyclists in every location.

3.3.2 Adoption of a hierarchy of users is recommended as one of the elements of good practice in Local Transport Plans, and is one of the recommendations in the *Government's Response to the Select Committee on Walking in Towns and Cities*, DTLR 2001.

3.4 The design pedestrian and design cyclist

3.4.1 This is a useful concept to distinguish between the differing priorities assigned to various aspects of a route (for example, safety versus directness) for users with different requirements due to their journey purpose, level of experience or physical ability. The design of the most appropriate infrastructure needs to take account of the anticipated type of user.

3.4.2 The design pedestrian types are:

- Commuter - prefers a fast direct route between home and work or when accessing public transport, regardless of quality of environment;
- Shopper/leisure walker - looks for ease of access, attractive retail environments, and attractive routes;
- Disabled person - requires level, clearly defined easy access and careful attention in the design and placement of street furniture, including resting points. Satisfying these requirements will also satisfy the needs of all other users, especially older people, people with heavy shopping/young children, and people with temporary impairments or low levels of fitness; and
- Child - requires a high level of segregation from motorised traffic and/or other measures to reduce the dominance of motor vehicles, such as speed reduction, together with good passive surveillance from other users. These are important factors where children and young people make independent journeys, especially journeys to school.

3.4.3 The design cyclist types are;

- Fast commuter - confident in most on-road situations, and will use a route with significant traffic volumes if it is more direct than a quieter route;
- Other utility cyclist - may seek some segregation at busy junctions and on links carrying high-speed traffic;
- Inexperienced utility, commuter and leisure cyclist - may be willing to sacrifice directness in terms of both distance and time, for a route with less traffic and more places to stop and rest. May travel more slowly than regular cyclists;
- Child - may require segregated, direct routes from residential areas to schools, even where an on-road solution is available. Design needs to take account of personal security issues. Child cyclists should be anticipated in all residential areas and on most leisure cycling routes;
- Users of specialised equipment - includes disabled people using hand-cranked machines and users of trailers, trailer-cycles, tandems and tricycles. This group requires wide facilities free of sharp bends and an absence of pinch-points or any other features which force cyclists to dismount. Cycle tracks and lanes where adult cyclists frequently accompany young children should be sufficiently wide to allow for cycling two abreast. This enables the adult to ride on the offside of the child when necessary.

3.4.4 All types of pedestrian and cyclist will use high quality well maintained traffic-free routes away from the carriageway if they are more direct than the equivalent on-road alternative and there are no personal security issues.

3.5 Route function and journey purpose

3.5.1 For most journeys, convenience (in terms of journey time and distance) and an acceptable degree of traffic safety and personal security are the most important design requirements for pedestrians and cyclists. This is particularly the case for access to public transport interchanges or other time critical journeys. These should be the main factors to take into consideration when planning networks of routes.

3.5.2 The journey purpose is important in defining the value attached to attractiveness. There are situations where walking or cycling for pleasure may be the only reason for the journey. These include rural leisure routes, parks, urban squares and tourist destinations. There are also multi-function environments such as shopping arcades, market places and public transport interchanges where people may wish to meet, relax or trade, but which may also serve as through-routes for pedestrians and cyclists.

3.5.3 Careful urban design can ensure that these areas are attractive and functional - it is important to get the balance right. Guidance on how to deliver a high quality environment is set out in *By Design*, DETR 2000. Advice on how to accommodate the conflicting requirements of multi-function urban roads and town centres is contained in *Transport and the Urban Environment* IHT 1998. The design of good quality urban pedestrian space is covered in *Going to Town - Improving Town Centre Access - a companion guide to PPG6*, DfT 2002, *Designing Streets for People*, ICE 2000, and *Guidelines on Pedestrianised High Streets* IHT 2001. *Inclusive Mobility - A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*, DfT 2002 sets out guidance on providing for access by disabled people to footways, footpaths, pedestrian areas, public transport and car parks. Guidelines and principles for good quality design of residential areas are included in *Places, Streets and Movement: A Companion Guide to Design Bulletin 32, Residential Roads and Footpaths*, DETR 1998, and *Better Places to Live*, DTLR 2001.

3.5.4 In order to accommodate the differing and sometimes conflicting needs of various user types and functions, it may be necessary to combine measures or to create dual networks offering different levels of provision, with one network offering greater segregation from motor traffic at the expense of directness and/or priority. Such dual networks may be considered analogous to a busy main road carrying through-traffic and a service road catering for access to homes and shops at lower speeds.

3.6 Hierarchies of provision

3.6.1 The majority of pedestrian or cycle routes use the *existing* road network. The first step in planning pedestrian or cycle infrastructure measures is to assess if any change is needed to existing provision. If so, selecting the appropriate measures should generally follow a preferred hierarchy for each mode (See Table 3.6). The hierarchy does not necessarily apply to schemes where it is intended to construct totally new cycle tracks/footpaths to a high standard which offer a more advantageous route than the equivalent route for motorised traffic. For pedestrians on narrow rural roads where speeds can be difficult to control and sightlines are often restricted, a new footway is often the preferred option.

Table 3.6: Hierarchies of provision

	Pedestrians	Cyclists
Consider first	Traffic reduction	Traffic reduction
	Speed reduction	Speed reduction
	Reallocation of road space to pedestrians	Junction treatment, hazard site treatment, traffic management
	Provision of direct at-grade crossings	Redistribution of the carriageway (bus lanes, widened nearside lanes etc)
	Improved pedestrian routes on existing desire lines	Cycle lanes, segregated cycle tracks constructed by reallocation of carriageway space, cycle tracks away from roads
Consider last	New pedestrian alignment or grade separation	Conversion of footways/footpaths to unsegregated shared-use cycle tracks alongside the carriageway

3.6.2 Both hierarchies include traffic reduction and speed reduction as the first and second options because these treatments are likely to offer wider community benefits in terms of road safety, streetscape, community severance and noise reduction, and make effective use of existing road space. Increased walking and cycling and improvements in streetscape, local environment and community safety are entirely compatible and mutually reinforcing.

3.6.3 The options at the bottom of each table should normally be considered last (unless they offer greater overall advantage - see 3.6.1) because they do not address the safety issues that preclude pedestrians or cyclists from using existing highway infrastructure. In some cases, new or grade-separated pedestrian alignments and cycle tracks may be less direct or may be problematic in terms of personal security. Designers must take these issues into account to ensure that a facility is useable. The measures in the hierarchy are not mutually exclusive - for example, reducing traffic speeds or volumes may be a pre-requisite for enabling an at-grade pedestrian crossing, cycle lane or a cycle track to be installed. For cyclists, the design also needs to take account of the traffic conditions discussed in section 3.7.

3.6.4 It is important that each option is considered thoroughly before resorting to any measure further down the hierarchy. Motor traffic reduction may appear quite difficult to achieve because of initial public resistance or resistance from traders or other interest groups, but it should not simply be discarded in favour of what seem to be less onerous measures further down the table. Sometimes it may be appropriate to introduce a trial scheme to gain public acceptance. Full consideration must be given to motor traffic reduction before it is dismissed as it may deliver benefits in terms of pedestrian safety, improved retail environments, and is usually the optimum solution for encouraging cycling. In the event that none of the options brings about any improvement, doing nothing may well be the best course of action. The introduction of sub-standard measures should be discouraged, and authorities should seek opportunities to upgrade existing measures where these have proven to be inadequate. Provision for walking and cycling should always be of good quality, to both attract and retain users.

3.6.5 Unsegregated shared-use by pedestrians and cyclists should normally be at the bottom of the hierarchy. The decision to adopt this option by taking space from pedestrians must not be taken lightly - see LTN 2/04.

3.7 Cycling infrastructure for different traffic speeds and volumes

3.7.1 In most situations cyclists have to be accommodated within the existing highway boundary. The decision to integrate cyclists with motor traffic, or physically separate them from it will depend on the speed and volume of that traffic. Where possible, speed and volume of traffic should be reduced to enable cyclists to use the carriageway in safety, but on roads where this is not possible, some form of segregation is desirable. Sustrans uses a form of the diagram below for the UK National Cycle Network (values have been omitted here because the diagram is only meant to demonstrate the principles involved). Clearly site-specific factors such as visibility and available lane widths need to be considered, but the diagram is a good starting point in design. It is important to consider the effect on pedestrians of any decision to create an off-road route, and this is discussed in LTN 2/04.

Link speed/flow diagram - selection of cycle route type



(Based on Sustrans' National Cycle Network Guidelines and Practical Details 1997 and CROW Sign Up for the Bike 1993)

3.8 Infrastructure planning

3.8.1 When designing infrastructure for pedestrians and cyclists, it is important to ensure that it is not simply being provided because an opportunity exists to do so. The demand for walking and cycling routes is influenced by the need to provide permeable development that does not result in long detours to gain access or to cross busy roads, nor undermine personal safety. Good safe links to public transport for multi-modal journeys, and trip-end facilities at destinations are important. Development planning and detailed design should assume that short journeys will be undertaken on foot or by bike through the availability of suitable and direct access routes. Poor planning or design can result in an unattractive scheme which may be technically correct but does not address the needs of users. Conversely, high quality public space can lead to drivers, pedestrians and cyclists modifying their behaviour and as a result, bring about a reduction in the dominance of motorised traffic without the need for special facilities. Some key issues are summarised in Table 3.8 below.

3.8.2 The decision-making process needs to take into account existing and potential users, levels of use, route function and the main journey purpose of users. Early consultation with likely users through transport fora, local user groups (particularly those representing disabled people), Local Authority Access Officers, and residents likely to be affected is important in defining the scope of the scheme. Later consultation is valuable for refining the design. Facilities should also be revisited following a settling down period after implementation to ensure that they are working as intended and to identify the need for any further modification.

Table 3.8: Key planning issues for walking and cycling

Permeable Infrastructure	Transport Connections	Positive Planning
<ul style="list-style-type: none"> ● Residential, retail and industrial development permeable to the passage of pedestrians and cyclists ● Exemption from traffic management measures ● Accessible, barrier-free environment ● Providing priority calls for pedestrians and cyclists at signals and crossings, and giving them priority at side road crossings ● Area wide traffic calming ● Home Zones and 20mph zones ● Safe Routes to School ● Clear signing and mapping 	<ul style="list-style-type: none"> ● Pedestrian- and cyclist-friendly links to public transport and interchanges ● Trip-end facilities tuned to user needs (e.g. seating, waiting rooms, cycle parking etc) ● Safe, direct, and convenient routes to town centres, shopping streets, schools, supermarkets, parks, libraries etc. 	<ul style="list-style-type: none"> ● Co-ordinated land-use and transport planning ● Positive development control for pedestrians and cyclists ● Rights of Way Improvement Plans ● Travel plans for school, work, shopping and leisure facilities, including where appropriate, personal travel plans ● User audits ● Promotion of walking and cycling

3.8.3 The flowcharts in Annex A summarise the pedestrian and cyclist infrastructure design processes, commencing with identification of demand (existing or potential), followed by a review of existing conditions and problem identification. This is followed by scheme selection adopting the hierarchies of provision, and finally by pedestrian/cycle audit to identify any deficiencies in the scheme. This is a simplistic overview of the process, and it may well be that a combination of measures is the most appropriate solution for any one location or route section. The flow charts do not include cycle parking, seating or other trip end facilities for pedestrians and cyclists, the need for which should be considered as a matter of course when planning for walking and cycling.

3.9 Audit and review

3.9.1 An audit is a check on the design of a scheme to ensure that it does not unduly affect people who are not part of the group the scheme is mainly aimed at. For example, if a scheme is designed to improve conditions for cyclists, a pedestrian audit will help ensure that the improvements do not cause difficulties for people on foot. A cycle audit on a cycling scheme should be unnecessary because the design process itself should make such an audit redundant. A review is a process which entails examining the existing infrastructure to explore ways of improving conditions for people who the proposed scheme is meant to serve. A cycle review should therefore precede the design of a scheme of cycling improvements.

3.9.2 Pedestrian audits, cycle audits, vulnerable road user audits together with their equivalent review processes can help to identify opportunities to improve conditions for pedestrians and cyclists. There will inevitably be times when the needs of different users conflict and planners have to make a professional judgement as to what the most appropriate course of action is. In some cases, it may be desirable to

involve the local community or user groups in audit and review procedures as part of the consultation process. Events such as 'Planning for Real' and 'Community Street Audits' can yield detailed local information to feed into the design process to ensure an integrated approach that deals with wider local issues.

3.9.3 Audit procedures should be applied to all new transport schemes (including land use developments) to ensure that opportunities to improve conditions for walking and cycling are properly considered and to ensure that, at the very least, conditions are not inadvertently made worse for these modes.

3.9.4 Audits should be applied to all schemes on urban roads. In rural areas the conditions require a different approach. If there is a general desire to facilitate cycling, such as may be the case where a primarily rural route links two villages within, say, 8km of each other, or where routes are likely to be promoted for recreational cycling, a cycle audit should be carried out. Pedestrian audits in rural areas are useful where gaps in the right of way network currently result in people walking along the highway, or where there is a significant or potentially significant amount of walking between residential areas and village schools or other services. On rural roads where cycling and walking is less likely to be significant, established safety audit procedures should pick up any features likely to introduce hazards for non-motorised users.

3.9.5 In rural areas and at the edge of urban areas there is often significant equestrian use of roads and other rights of way and this should be considered as part of the design process.

3.9.6 Audits may be undertaken at up to four stages of the design process:

- Preparation of a design brief.
- Preliminary design.
- Detailed design.
- Substantial completion.

3.9.7 Pedestrian Review and Cycle Review are systematic procedures for looking at existing transport routes or networks to identify shortcomings and potential enhancements. The review procedures are valuable in assisting with identifying a pedestrian or cycle priority network on which the bulk of funds and efforts to improve conditions will be targeted. Pedestrian/Cycle Review can be applied to part or all of a local transport network in order to identify priorities for action. Alternatively, it can be used reactively in response to a programmed land use development or highway scheme (bus priority for example) to identify aspects of the network that should be improved as part of the larger scheme.

3.9.8 The document *Guidelines for Cycle Audit and Cycle Review* was published by IHT in 1998, and is summarised in TAL 7/98, *Cycle Audit and Review*. An outline Pedestrian (Mobility) Audit Checklist and a Pedestrian Review Form are included at Appendices C and B respectively in *Guidelines for Providing for Journeys on Foot*, IHT 2000. Audit and review procedures are evolving as practitioners gain more experience. The Traffic Advisory Leaflet Bibliographies for cycling and walking are a useful source of information.

3.10 Land use planning

3.10.1 The principles of mixed-use planning and high-density urban form are outlined in *Planning Policy Guidance 13: Transport*, DETR 2001. PPG13 states that: "Land use planning has a key role in delivering the Government's integrated transport strategy. By shaping the pattern of development and influencing the location, scale, density, design and mix of land uses, planning can help to reduce the need to travel, reduce the length of journeys and make it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking and cycling."

3.10.2 The importance of high-density, permeable, mixed-use planning to walking and cycling is that it helps to meet the requirements of convenience and accessibility. Because such developments can be easily served by non-car modes (and are consequently much less car dependent), it is generally easier to provide high levels of accessibility and safety. By creating human-scale developments where there is a variety of urban forms and functions within a short distance of each other, comfort and attractiveness can also be addressed.

3.10.3 There are limits to the distances generally considered acceptable for utility walking and cycling. The mean average length for walking journeys is approximately 1 km (0.6 miles) and for cycling, it is 4 km (2.4 miles), although journeys of up to three times these distances are not uncommon for regular commuters. The distances people are prepared to walk or cycle depend on their fitness and physical ability, journey purpose, settlement size, and walking/cycling conditions. Useful guidance on desirable, acceptable and preferred maximum walking distances for different purposes is included in Tables 3.2 and 3.3 of *Providing for Journeys on Foot*, IHT 2000.

3.10.4 Since most journeys start or end at home, the location of new housing and how it connects to the existing movement framework is particularly important. *Planning Policy Guidance Note 3: (Housing)*, DETR 2000 calls for more sustainable patterns of development and better use of previously developed land. To achieve this, local planning authorities are required to:

- place the needs of people before ease of traffic movement when designing the layout of residential development;
- avoid inflexible planning standards, reduce road widths and traffic speeds, and promote a safer environment for pedestrians;
- seek to reduce car dependence by facilitating more walking and cycling through improved links with public transport between housing, jobs, local services and amenities, and by planning for mixed use; and
- promote good design in new housing development in order to create an attractive high-quality and sustainable living environment where people will choose to live, work and spend their leisure time.

3.10.5 Further sources of guidance on the subject of designing pedestrian and cycle routes through residential areas are Circular 2/93, *Public Rights of Way*, DoE 1993 and Circular 5/94, *Planning out Crime*, DoE 1994.

3.11 Consultation and publicity

3.11.1 Planning for pedestrians and cyclists requires a high level of carefully detailed design. Early consultation with local residents, businesses and user groups can save time in the design process and ensure that plans meet the needs of the intended users. It is recommended that organisations representing disabled people are contacted at local and national level, and that consultation materials are available in forms that are accessible to disabled users, including spoken word, Braille and electronic formats. Consultation events should be held at venues accessible to disabled users, and at times when people are likely to be able to attend. In areas where a significant proportion of the population does not usually speak English, it may be appropriate to prepare materials in more than one language and have staff with appropriate language skills available at events.

3.11.2 It is important to publicise the consultation as widely as possible using written media, as well as others such as local radio. Similarly, it can be important to publicise completed schemes to make it clear how they are intended to operate, especially where innovative or unusual infrastructure has been introduced. Other education and training initiatives can be used to publicise new road safety measures and to encourage compliance with speed limits, parking restrictions and advanced stop lines, etc.

3.11.3 When a local authority chooses to reject the outcomes of public consultation, or implements development or design that does not comply with national and local policies or design guidance, it should be able to demonstrate the rationale for such a decision to the groups and individuals who are adversely affected.

4. Applying The Design Options

4.1 Introduction

4.1.1 This chapter outlines the main engineering techniques used in providing for pedestrians and cyclists, and lists references for further information. It is arranged in the order in which the designer should consider design options, as defined by the hierarchies of provision (Section 3.6). Traffic reduction and speed reduction (approaches common to the hierarchies for both pedestrian and cyclist provision) are described first (4.2 to 4.3), followed by the remainder of the hierarchy for pedestrian provision (4.4 to 4.7) and that for cycling provision (4.8 to 4.13).

4.1.2 The engineering techniques are based on the assumption that existing highways infrastructure is in place. However, there is no reason why some of the techniques cannot be incorporated into new-build schemes. Advice on providing for pedestrians and cyclists in new development, and where new highways are required, may be found in documents such as *Better Places to Live*, ODPM 2001 and *Going to Town*, ODPM, National Retail Planning Forum 2002. The core principles set out in 3.2.3 to 3.2.7 apply equally to new and existing pedestrian and cycling networks.

Cycle Parking



Providing attractive accessible space for pedestrians and cyclists helps to improve the urban environment and can contribute to urban regeneration. (Photo: Adrian Lord)

4.2 Traffic reduction

4.2.1 Reducing the overall volume of traffic or restricting selected types of vehicle helps improve road safety and the quality of the local environment. Such moves can assist pedestrians and cyclists by increasing the footway and carriageway space available to them and may give them a time advantage over motor traffic.

4.2.2 Consideration needs to be given to:

- the potential impact of traffic diverting to other routes;
- signing that facilitates route-finding; and
- ensuring that speeds do not increase.

Vehicle restricted areas

4.2.3 TAL 9/93, *Cycling in Pedestrian Areas*, concludes that there are no real factors to justify excluding cyclists from pedestrianised areas, which suggests that cycling could be more widely permitted than it currently is without detriment to pedestrians. Accidents between pedestrians and cyclists in pedestrianised areas are very rare. When pedestrian density increases cyclists behave accordingly by slowing down, dismounting, or taking avoiding action as required. Where there are appreciable flows of pedestrians or cyclists, a defined route for cyclists through the area aids orientation and assists effective movement. At lower flows users mingle readily. When considering the safety aspects of allowing cyclists into a pedestrianised area, the risk to cyclists forced to use alternative on-road routes should be taken into account. This is particularly important if the alternatives are not safe or direct and cannot be made so (LTN 1/87, *Getting the Right Balance - Guidance on Vehicle Restriction in Pedestrian Zones*).

Road signs and parking stands



Bus Lanes and High Occupancy Vehicle Lanes provide road space that can also be used by cyclists, while road user charging can help to reduce traffic volumes. Off-carriageway space created by installing a delivery bay has been used for cycle parking stands and road signs, leaving the main footway (which is off to the left of the picture behind a wall) unobstructed. (Photo: Adrian Lord)

4.2.5 Chapter 9 of *Cycle Friendly Infrastructure*, IHT 1996 outlines the regulatory and design solutions to integrate cycling within pedestrianised areas. These include:

- pedestrian-only areas
- restrictions on selected vehicle types; and
- time- or date-based restrictions.

4.2.5 The following examples illustrate some of the techniques available.

Pedestrianised area - New Street, Birmingham



New Street, Birmingham (closed to vehicles except for access, deliveries and cyclists). The use of coloured block paving emphasises the fact that this is predominantly a space for pedestrians and cyclists. The road surface in the background is delineated by a half-height kerb. There is no formal cycle route demarcated. Seats and cycle parking stands are provided at regular intervals. (Photo: Adrian Lord)

4.2.6 LTN 1/87, *Getting the Right Balance - Guidance on Vehicle Restriction in Pedestrian Zones* provides more detail on the required Traffic Regulation Orders and signing requirements. In York and some other city centres, certain streets are open to pedestrians, cyclists and delivery vehicles before 10:00 and after 16:30 but to pedestrians only, between these times. (TAL 9/93 *Cycling in Pedestrian Areas*). This constructive approach enables the streets to be used by cycle commuters at times when they are not busy with shoppers.

Enclosed cycle lane



London Road, Kingston, a vehicle restricted area with a defined cycle track with a difference in level, colour and texture, leading to a signalised crossing. (Photo: Adrian Lord)

Traffic cells, point closures, bus gates, turning restrictions and one-way orders

4.2.7 Traffic cells can be created in existing town centres or residential areas by allowing private motorised traffic to enter and exit by a limited number of routes while allowing pedestrians, cyclists and public transport more numerous (and direct) access points into and between cells. This treatment offers significant local environment and safety benefits by reducing through traffic and providing a time advantage for sustainable modes.

4.2.8 Cyclists should be exempted from point closures, turning restrictions and one-way orders and permitted to use bus gates unless there are overriding safety considerations that cannot be resolved. Further guidance on bus priority and traffic management techniques is available in publications from DfT and IHT. LTN 3/04, *Signs and Markings for Cycle Routes* describes layouts and signing requirements for exempting cyclists from one-way orders.

Weight and height limits

4.2.9 A disproportionately high number of serious and fatal injuries to cyclists involves large goods vehicles. These accidents occur almost exclusively in urban areas and most commonly at junctions. The introduction of weight restrictions along cycle routes or the provision of cycle routes along roads with existing weight limits can improve cyclists' safety and comfort. TAL 5/97, *Cycles and Lorries* sets out a

range of other engineering measures that can be introduced to minimise cycle/lorry conflicts.

Techniques to discourage use of selected routes by motorists

4.2.10 Signal staging can be set to discourage particular manoeuvres by minimising the green time available to them. This can reduce rat-running along inappropriate routes while enabling access by residents and other essential users. The provision of advanced stop lines at traffic signals combined with extended or more frequent pedestrian signal phases should help limit delay for cyclists and pedestrians.

4.2.11 Similarly traffic calming, in addition to reducing speeds, encourages motorists to use other, more appropriate routes. Traffic calming techniques are covered more fully in 4.3.

Right turn lane and cycle gap



Right turn lane and cycle gap at residential road closure (Photo: DfT)

Signing strategies

4.2.12 In rural, suburban, and larger urban centres, direction signs can be used (often in conjunction with traffic calming on the minor road route) to direct most traffic along major roads, while retaining quieter through routes along minor roads for cyclists, pedestrians and local access. Signing must be consistent and well-maintained, but no more than is required. The deliberate omission of destinations from certain road signs may reduce the volume of motor traffic on minor roads, but this strategy needs to be applied with care, especially in rural areas where cyclists may be unfamiliar with the local area. It can also lead to cyclists being led onto major roads when a more suitable minor road is available.

Car parking management

4.2.13 One of the most effective ways of reducing urban traffic is through robust parking policies. Reducing the amount of long stay parking in city centres can help deter commuter traffic, while residents' parking schemes can help to control long stay parking at edge-of-town sites and near commuter stations. Removing on-street parking can help to release road space for pedestrian and cycle facilities and can lead to improved safety although the needs of disabled persons' parking card (the Blue Badge) holders must be taken into account when restricting vehicular access. Controlling the capacity of available parking by introducing features to prevent verge side parking is a technique often employed in rural areas with high levels of tourism.

Road user charging and workplace parking levies

4.2.14 Lower levels of motor traffic help stimulate walking and cycling. The Transport Act 2000 enables local authorities to introduce road user and workplace parking charges. Cycle use in central London increased significantly following the introduction of congestion charging. Some Travel Plan schemes offer employees the opportunity to trade in a valuable parking space in exchange for a cash reward, which can be used to purchase a bicycle or travel pass. Other schemes introduce a direct payment in exchange

for a parking place.

Bypasses

4.2.15 Towns in the Bypass Demonstration Project were given additional funding to introduce traffic calming and environmental improvements. The reduction in traffic levels allowed speed limits to be reduced and former through-roads to be re-engineered to reflect their change in status. This has created improved conditions for pedestrians and cyclists. Care in the design of the bypass itself can avoid the severance effect of such roads for pedestrians and cyclists.

Safer Routes to Schools

4.2.16 Safer Routes to Schools schemes offer the opportunity to introduce measures to facilitate walking and cycling throughout the catchment area of a school or group of schools. Measures should always take into account the needs of the wider local community, and should consider personal safety implications in addition to road safety issues.

Children crossing a road with roadworks



It is important to provide crossings and a higher level of segregation on routes to schools. At such sites, the level of pedestrian activity may be insufficient to warrant a crossing using the traditional numeric approach, but there is clearly a need for additional facilities. LTN 1/95 offers a more flexible approach to pedestrian crossing assessment. (Photo: Jon Toy)

Park and Ride

4.2.17 Bus-based park and ride sites are often linked to the city centre by bus priority measures, which may also benefit cyclists. Cycle parking at the park and ride site enables users to cycle to the site and then use the bus for the busier part of the route, or to drive the longer rural part of a journey and cycle the final urban section.

Cycle Stands



Cycle stands and lockers at a park and ride site near York. (Photo: DfT)

4.3 Speed reduction

4.3.1 At the heart of the integrated transport policy *A New Deal for Transport - better for everyone*, DETR 1998 is the encouragement of public transport, cycling and walking, and discouragement of using the car for inappropriate journeys. Traffic calming has a significant role to play in achieving these objectives by improving the safety and environment of vulnerable road users. A forthcoming LTN, *Traffic Calming*

Measures, will provide comprehensive guidance on the use of traffic calming measures. It covers relevant legislation and the design, effectiveness and installation (including signing and lighting) of traffic calming, and incorporates design features to assist cycling and walking.

4.3.2 Walking has a major role in transport and the Government wants walking to be easier, more pleasant and safer than it is now. Advice to local authorities is given in TAL 2/00, *Framework for a Local Walking Strategy*, and reiterated in *On the Move: By Foot*, DfT 2003 a discussion paper reflecting the issues raised in a series of seminars during 2002. The most important problem is inappropriate vehicle speed. Reducing speeds, particularly in residential areas and along busy pedestrian routes, would reduce accidents significantly and make injuries much less severe.

4.3.3 By reducing the speed, dominance and, at times, the volume of motor vehicles, traffic calming can benefit cyclists. In older towns and cities where space is at a premium, traffic calming would be an appropriate means of facilitating cycling, as lower speeds and flows can lessen the need to separate cyclists from motor traffic, IHT 1996.

4.3.4 From the outset, local authorities should view traffic calming schemes as an opportunity to improve conditions for cyclists, and scheme designs should be cycle-friendly. The Institution of Highways and Transportation publication *Guidelines for Planning and Design of Cycle-Friendly Infrastructure*, IHT 1996, includes advice on cyclists and traffic calming.

4.3.5 Other sources of detailed design advice include the *National Cycle Network: Guidelines and Practical Details Issue 2*, Sustrans 1997, and the *CSS Traffic Calming guide* CSS et al 1994. Particular care needs to be exercised in rural areas to ensure that engineering measures do not introduce inappropriate 'urban' features. *Rural Routes and Networks*, Countryside Agency/Institution of Civil Engineers 2002, gives appropriate examples. A regularly updated Traffic Calming Bibliography is available from DfT, giving many references that may be useful when considering a scheme.

20 mph zones

4.3.6 A TRL review of 20 mph zones with traffic calming found that speeds were reduced by about 9 mph and traffic flows reduced by 27%. This led to a 60% reduction in overall accident frequency.

4.3.7 Reductions in pedestrian and cyclist accidents of 63% and 29% respectively have been measured where 20 mph zones were introduced in the UK. Child pedestrian and child cyclist accidents were reduced by 70% and 48% respectively after the introduction of 20 mph zones.

4.3.8 Since 1999, it has been permissible under certain conditions to apply 20 mph speed limits without any accompanying traffic calming.

Home zones

4.3.9 These are intended to improve the quality of life of residents. Hard landscaping is often used to create an environment where vehicle speeds are reduced to very low figures. Pedestrians, motor traffic and cyclists often share a common surface. The power to designate a home zone is contained in Section 268 of the Transport Act 2000.

Home zone road sign



In home zones, pedestrians, cyclists and vehicles mix at low speeds (Photo Wayne Dueden)

Speed limit reduction in villages and on rural links

4.3.10 A range of measures such as village gateways, rumble strips etc can often benefit pedestrians, cyclists and equestrians by reducing speeds. 'Quiet Lanes' are minor rural roads (or networks of roads) that are appropriate for shared use by walkers, cyclists, horse riders and motorised users. These roads carry small amounts of motor traffic travelling at low speeds. The DfT's expectation is that 30 mph speed limits will apply on all roads that pass through villages. Further information on the design of roads in rural areas is available from the DfT and the Countryside Agency (*Roads in the Countryside*, Countryside Agency 1995, *Design Issues for Rural Traffic Management*, Countryside Agency 2000 and *Rural Routes and Networks*, ICE/Countryside Agency 2002).

Traffic calming

4.3.11 Vertical measures include full width humps, speed cushions, speed tables and rumble strips. Round and flat topped humps with steep ramps can be uncomfortable for cyclists and some disabled people. Sinusoidal profile humps are usually more comfortable, but require careful design and construction (TAL 9/98). Pre-cast sinusoidal humps are available from some manufacturers. Cyclists are normally able to ride through the gap between speed cushions but side ramp faces should not be steeper than 1:4 and on/off ramps not steeper than 1:8 as sometimes it is impossible to avoid riding over the cushions. Full width flat topped speed humps sometimes become informal crossing points for pedestrians, and can be beneficial to wheelchair users and people with pushchairs. Rumble strips and corrugated surfacing (with cycle gaps) can be used, although care needs to be taken to ensure that there is no noise disturbance to nearby properties.

4.3.12 Horizontal measures include build-outs, chicanes, and central refuges. Motorists will not usually attempt to overtake cyclists where the available width is 3.0m or less (TAL 9/94 *Horizontal Deflections*, and TAL 1/97 *Cyclists at Road Narrowings*). Widths between 3.1m and 3.9m should be avoided as it is in this range that motorists will often attempt to overtake cyclists where there is insufficient room to pass safely. Cycle bypasses should be provided where possible, but careful design detailing is needed to avoid problems with drainage, sweeping and to prevent obstruction by parked vehicles. A bypass should not require cyclists to travel additional distance, or require them to give way before rejoining the main carriageway. Central refuges are helpful to pedestrians, and can encourage people to cross the carriageway at places where there is good visibility. For a central refuge to safely accommodate cyclists, wheelchair users and pedestrians with pushchairs, it needs to be at least 2.0m wide

4.4 Reallocation of road space to pedestrians

Footway widening

4.4.1 *Inclusive Mobility*, DfT 2002, recommends a footway width of 2.0m as the minimum under normal circumstances, with an acceptable minimum of 1.5m. At restrictions or obstacles, an absolute minimum useable width of 1.0m is acceptable for short distances (maximum length 6.0m). Footways less than 1.2m wide can be inconvenient and sometimes unpleasant to use, and it is often necessary for pedestrians to step into the carriageway to pass each other. At bus stops, a minimum footway width of 2.0m should be provided where pedestrian flows are low, increasing to a minimum of 3.0m where they are high. Widths of 3.5m to 4.5m are recommended outside shops. Carriageway space to widen footways can often be released as a result of introducing traffic management schemes or parking restrictions. Scheme designers should take care that the carriageway width is not reduced to such an extent that cyclists' safety is compromised. It may be necessary to introduce speed reduction methods to maintain the safety of cyclists on the carriageway.

Widened footway - Broad Street, Birmingham



In Broad Street, Birmingham, the widened footway has enabled street cafes and bars to thrive in what has become the entertainment quarter of the city centre. Some of the advantage of the widened footway has been lost through businesses placing A-frame advertisements on it, which can be hazardous for blind people. (Photo: Adrian Lord)

Central median

4.4.2 On some wider streets and boulevards the central median can become an attractive feature for pedestrians, but it is important to provide sufficient numbers of crossing points, carefully situated so as not to compromise the character of the streetscape.

Central median



The footways were widened and a central median provided as part of work to improve The Strand, London (Photo: Adrian Lord)

4.5 Provision of at-grade crossings for pedestrians

At-grade crossings

4.5.1 These can be introduced at junctions and along link sections of the highway where there is a pedestrian crossing demand. In addition to the installation of crossings in response to an accident problem, there may be a need to re-assess facilities in the light of increased or altered traffic flows following a new development or change of use, or where a new pedestrian desire line has been identified. LTN 1/95

recommends a methodology for local authorities to assess where pedestrian crossings are needed and to decide what type of crossing is best for a particular site. LTN 2/95 gives advice on the design of pedestrian crossings. This LTN is supplemented by Traffic Advisory Leaflets 1/01 and 1/02 about puffin crossings, and they need to be read together.

Example of a zebra crossing



Zebra Crossing, Westminster (Photo: DfT)

4.5.2 In all cases, local authorities should aim to develop the most pedestrian-friendly environment that can be achieved, consistent with meeting the local casualty reduction target and with properly serving the interests of other road users. This may be a matter of a simple change; for example replacing a staggered pelican crossing by a straight-across puffin crossing. Or, it may need changes much further back in the planning process to achieve other aspects of the hierarchy of provision such as, for example, reducing traffic speeds and flows at particular locations to levels where guard rails are not required. In some cases it may mean putting crossings on all arms of a junction at the expense of capacity for motor traffic.

4.5.3 In urban areas, at-grade crossings are usually preferable to grade separated crossings such as subways and footbridges which can raise fears about personal security and are sometimes inaccessible to disabled people. However, grade-separated solutions may be the only safe option on high-speed suburban and inter-urban roads. Controlled and uncontrolled at-grade crossing points should normally be marked with tactile paving and have dropped kerbs installed **fully** flush with the road surface. It is not acceptable to allow water to pond at a dropped kerb. Good workmanship is essential here to ensure that drainage is properly provided. *Inclusive Mobility*, DfT 2002, gives the current recommendations for visually impaired people and wheelchair users. *Guidance on the Use of Tactile Paving Surfaces*, DETR 1998, gives advice on the installation of these surfaces. Crossing points should not be installed on a kerb radius.

Stop lines

4.5.4 Increasing the distance between the stop line and the crossing studs from 2m to 3m has been proven to improve safety and comfort for pedestrians by positioning waiting motor vehicles further from the crossing point. Advanced stop lines for cyclists can also have this effect.

4.6 Improved pedestrian routes on existing desire lines

Improved pedestrian alignments

4.6.1 There is often evidence of a desire line for pedestrians across planted or grassy areas, or where a guard rail or fence has been broken or removed. It is important to create direct pedestrian routes to and within areas such as car-parks, bus stops, bus and rail stations and other journey attractors. In new developments, the movement of pedestrians into and through an area is often ill-considered and routes can become tortuous and unpleasant to use, particularly where there are long cul de sacs.

4.6.2 The improvement of existing pedestrian routes often requires a series of minor changes such as rationalising street furniture to create a clear unobstructed route. This could involve moving signs and lighting columns to the edges of the pedestrian path, improving the paving, and creating at-grade crossings of side roads by using flat topped speed humps possibly in conjunction with localised road narrowing. It can also include re-timing traffic signals to reduce delay to pedestrians and cyclists at signal controlled crossings, or introducing additional crossings at junctions.

4.7 New pedestrian-only alignment or grade separation

New alignment

4.7.1 New pedestrian alignments are particularly valuable where they create a short-cut compared with an existing route. Alongside major roads, especially in suburban and rural areas, it may be appropriate to move an existing footway from being immediately adjacent to the carriageway for safety or environmental reasons, so that there is some physical separation such as a verge or hedge. Alternatively, a new alignment may be completely away from the highway. In such circumstances, there may be an opportunity to introduce a new cycle track at the same time if this is desirable and appropriate.

Grade-separated crossings

4.7.2 Where a pedestrian route crosses a major road or a railway line, the most desirable solution may be grade separation. Both ramps and steps should be provided where practicable. Parapet height should be a minimum of 1.4m if cyclists are expected to use a bridge (legally or otherwise), or 1.8m if equestrian use is also expected. See *BD 52/93, Design of Highway Bridge Parapets, Design Manual for Roads and Bridges*, Highways Agency 1993. Widths for different circumstances are specified in *Inclusive Mobility*, DfT 2002, and other references (see 4.7.3).

Example of a grade-separation crossing - Paradise Circus Queensway, Birmingham



If possible, the design of the scheme should ensure that pedestrians have a minimal change of level by, for example, putting the road in a cutting such as here at Paradise Circus Queensway, Birmingham. This scheme enabled expansion of the city centre into an area that was previously cut off by the inner ring road. (Photo: Adrian Lord)

4.7.3 Key references are *Inclusive Mobility*, DfT 2002, and *Design Manual for Roads and Bridges TD36/93 Subways for Pedestrians and Pedal Cyclists: Layout and Dimensions*, Highways Agency 1993. Acceptable pedestrian ramp gradients range from less than 5%, up to 10% in exceptional circumstances. Cycle ramp gradients should preferably be less than 3% and should not normally exceed 5%. If space is very restricted, a gradient of up to 7% may be used. Ramps may need to include landings as resting points for wheelchair users. Guidance on distances between landings is given in *Inclusive Mobility*.

4.8 Complementary and trip-end facilities for pedestrians

Signing, Route Maps and Information

4.8.1 Signing is essential for visitors to an area, and signing of key destinations from railway/bus stations and other points of arrival is important. Where non-highway standard direction signing is used for pedestrians and cyclists, it must be clear and legible with good colour contrast between letters and backgrounds. Signs and tactile maps for visually impaired people should be designed in accordance with *Inclusive Mobility*, DfT, 2002.

4.8.2 Street maps can be installed at strategic locations throughout the town centre, and should also be available from information points at transport interchanges. Route maps offer opportunities for the promotion of walking for health and leisure through themed walks, such as fitness walks or historic walks.

Example of a Street Map



Good on-street information with local maps and public transport timetables. (Photo: Adrian Lord)

Seating

4.8.3 Seating can be used to positively enhance the quality of an urban area and is greatly valued by less mobile pedestrians. Care needs to be taken to ensure that seats are not placed in a position where they impede heavy flows of pedestrians or pose a hazard to visually impaired people. Research suggests that the maximum walking distance without a rest for many mobility impaired people is around 100 metres and, in heavily used pedestrian areas and interchanges, seats should be provided at 50 metre intervals. Advice on the design and positioning of seating facilities is given in *Inclusive Mobility*, DfT 2002.

Means of access to public transport interchanges

4.8.4 Providing wheelchair access to public transport interchanges can also assist cyclists, people with pushchairs, and other less mobile travellers. Anticipating the use of facilities by a variety of different user groups can help in designing out potential conflict and ensure that dimensions are adequate. Accessible entrances should always be clearly sign posted.

4.9 Junction treatment, hazard site treatment and traffic management for cyclists

Advanced Stop Lines

4.9.1 ASLs enable cyclists to position themselves ahead of other traffic during the red phase at signalised junctions. Cyclists at ASLs are more visible to other traffic and are therefore better placed to execute manoeuvres that might otherwise conflict with the movement of motor vehicles. Cyclists also benefit from being able to queue away from harmful exhaust emissions. ASLs allow cyclists who want to go straight ahead to get in front of motor vehicles intending to turn left. They are also useful to cyclists who need to make a right turn. (TAL 5/96 and TAL 8/93). ASLs can also benefit pedestrians, as motor vehicles are required to wait further from the crossing area and are therefore less intimidating.

Example of an Advanced Stop Line (ASL)



ASL with mandatory feeder lane (Photo: Adrian Lord)

Cycle route priority crossing

4.9.2 Off-carriageway cycle tracks parallel to a main route may have to cross a number of side roads. These crossings are normally configured so that the side road has priority over the cycle track. Where appropriate, the priority may be reversed by placing the cycle track on a flat topped speed hump and putting give-way markings on the side road. This may be reinforced by other traffic calming measures.

Cycle Track



Cycle track with priority over side road. (Photo: Tony Russell)

4.9.3 Mandatory cycle lanes within the carriageway cannot be continued across the mouth of a side road. In these circumstances, the mandatory lane is terminated each side of the junction and the lane continues past the side road as an advisory one (often with coloured surfacing to reinforce visibility).

Toucan crossing

4.9.4 A Toucan crossing is an unsegregated signal controlled crossing for cyclists and pedestrians. Cyclists may use the crossing without dismounting. It is important that there is enough width on the approaches and on the crossing itself to minimise the potential for conflict between users. Cyclists and pedestrians on the approaches may be segregated, and this can continue right up to the kerb line but segregation is usually terminated before the waiting areas (see TALs 10/93 and 4/98).

4.9.5 Toucan crossings work best when the flow of either group of users wishing to cross is not too great. As flows increase, these crossings may experience operational difficulties. If so, pedestrian and cycle flows may be better served by parallel crossings, or entirely separate ones.

Parallel Crossing

4.9.6 A segregated pedestrian/cycle crossing is called a parallel crossing. Parallel crossings may be used in high pedestrian/cycle flow locations where the movements of pedestrians and cyclists are likely to conflict with each other.

4.9.7 If a dedicated cycle crossing totally separated from pedestrians is installed, there will be a cycle-only stage in the signal sequence. The cycle phase may be called by push buttons, loop detectors, microwave detectors, or a combination of these.

Toucan crossing



Toucan crossings can benefit pedestrians and cyclists in terms of both journey time and safety at busy junctions where a cycle track crosses a road. (Photo: Adrian Lord)

Urban Traffic Management and Control (UTMC)

4.9.8 UTMC is used to control the flow of traffic within urban areas. It can assist in area safety schemes, and deter drivers from using certain routes by altering the signal timings at junctions. In some cases this may be beneficial to cyclists by giving priority to a cycle route (in conjunction with bus priority for example) or by controlling traffic volumes along links. It may be possible in some circumstances to set up the 'green wave' in a UTMC system for a low design speed to assist pedestrian safety and cyclist progression.

4.10 Redistribution of the carriageway for cyclists

Bus lanes

4.10.1 Cyclists should normally be allowed access to with-flow and contraflow bus lanes and bus-only streets (LTN 1/97, *Keeping Buses Moving*, DETR 1997). The preferred lane width where there is combined use with cyclists is 4.5 m. Where the width is less than 4.0m, a narrow bus layby (1.5m wide) may be necessary to enable cyclists to pass at bus stops. Where with-flow bus lanes are of minimum width, cyclists are still usually safer in the bus lane than in the general traffic lane unless there is a high volume of bus traffic.

4.10.2 Where cyclists use contraflow bus lanes, conflict with other traffic occurs mainly at the beginning and end of the lane. Between junctions, the accident risk tends to be low. If safe junctions are provided for cyclists at the entry and exit points, it may be safer to allow them to use these bus lanes even where they are of minimum width. In assessing the safety issues, it is important to recognise that if a contraflow bus lane is not made available to cyclists, they may have to use a more hazardous alternative route which will almost certainly be less direct.

Widened nearside lanes

4.10.3 These can be beneficial in creating additional space in an all-purpose lane used by cyclists, without some of the disadvantages associated with advisory cycle lanes. The extra space can be introduced at minimal cost as part of routine carriageway re-marking, and is useful where there are relatively high flows of HGVs and buses. An example is the A38 Bristol Road in Birmingham, which has a 4.25m nearside lane and a 3.0m offside lane.

Reduction in number of all-purpose traffic lanes

4.10.4 To ensure cycle facilities are adequate it may be worth considering removal of a general traffic lane. Safety may improve through a reduction in overtaking accidents, and the space released could, for example, make the introduction of pedestrian refuges and right-turning cycle lanes possible.

4.11 Cycle lanes

With-flow cycle lanes

4.11.1 These can be mandatory or advisory (details of the signing and marking are included in LTN 3/04). Mandatory cycle lanes are delineated by a solid white line. Motor vehicles are not permitted in a mandatory cycle lane during its hours of operation, but cyclists are entitled to ride outside the lane. Mandatory lanes require a traffic regulation order to prohibit use of the lane by motor vehicles and to impose parking or waiting restrictions. Cycle lanes should normally be carried across junction mouths, and where the lane is mandatory, a short section of advisory cycle lane is required here to enable motor vehicles to cross it.

Advisory Cycle Lane



Advisory cycle lane and left turn ban with exemption for buses and cycles. (Photo: Adrian Lord)

4.11.2 Advisory cycle lanes are marked with a broken white line and do not require a traffic regulation order. Advisory lanes may be used when a mandatory one would be impractical. They should not be favoured over mandatory lanes simply because they are easier to instal. All cycle lanes should preferably be a minimum of 1.5m wide to ensure that motor vehicles pass cyclists at a safe distance. If an advanced stop line (ASL) is provided at a junction where width is limited, an advisory cycle feeder lane may be used instead of a mandatory one. This permits motor vehicle encroachment into the cycle lane and thus allows an ASL to be provided where the available room would otherwise preclude it.

4.11.3 A cycle lane may be intermittent as a result of the carriageway being too narrow in places. If so, and to help preserve route continuity, each break in the lane can be marked as an advisory cycle route using signs and cycle logos only. 4.11.4 Coloured surfacing may be used in mandatory and advisory lanes and can help to prevent encroachment into the lane by motor vehicles.

Contraflow cycle lanes

4.11.5 Contraflow lanes permit cyclists to travel against the flow of motor traffic in one-way roads and thus avoid circuitous one-way systems. They can be used to similar effect in false one-way roads (i.e. two-way roads which have no-entry signs at one end).

4.11.6 If a street is to be converted to one-way, consideration should always be given to providing a contraflow facility for cyclists at the same time. In addition, it is strongly recommended that existing one-way streets are studied with a view to modifying them to accommodate contraflow cycling where practicable. As with contraflow bus lanes, in assessing the safety issues it is important to recognise that if a one-way street is not made available to cyclists in contraflow, they may have to use a more hazardous alternative which will almost certainly be a less direct route.

Segregated contraflow lane



Segregated contraflow lane (Photo: Adrian Lord)

4.11.7 Contraflow lanes can be physically segregated from the general traffic lanes and are safer than unsegregated ones but they require more space. Otherwise, the lanes may be mandatory or advisory, or the contraflow facility may not even exist as a cycle lane at all. Layouts and signing are included in LTN 3/04. Contra-flows using an advisory cycle lane or no lane at all require special authorisation from the Department for Transport, and the authorisation procedure is included in LTN 3/04 and TAL 6/98.

Other cycle lanes

4.11.8 One example is Torrington Place in Camden. This is an experimental scheme where a physically segregated bi-directional cycle lane has been provided on one side of the carriageway. The lane has priority over side road entrances and is segregated from the rest of the carriageway along link sections by a raised kerb.

4.12 Cycle tracks

4.12.1 Cycle tracks can be beneficial to children and other inexperienced users by separating them from fast moving traffic. They benefit all types of cyclists where there is little scope for safe provision within the carriageway, such as at large multi-lane junctions and roundabouts. They can be designed for cycle use only (although they are often used by pedestrians) or they may be combined with pedestrian footways or footpaths (see LTN 2/04). Where cycle tracks are installed, the trip length should preferably be shorter, and never more than 10% longer than the equivalent on-road route. Cycle tracks intended for utility journeys away from the carriageway (for example through a park or across a common) should normally be lit but if not, an alternative on-road route should be provided for use during darkness. The design of cycle tracks in rural areas should reflect the character of the location and not lead to a sense of urbanisation.

Cycle-only tracks

4.12.2 There may be sufficient room within the highway boundary to provide cycle tracks parallel to the carriageway but such tracks require careful thought because of the problems associated with their crossing side roads and footways. In urban areas a cycle track is normally required to give way at side roads, and for this reason, many experienced cycle commuters will not use the facility. If the cycle track is to have priority over side roads, it must be raised relative to the carriageway surface through the use of a flat-topped road crossing (absolute maximum height 100mm, recommended maximum 75mm) and signed using the appropriate road markings (see LTN 3/04). Care needs to be taken to ensure that these layouts are properly designed so that motor vehicles turning into the side road have adequate opportunity to see cyclists crossing and stop for them. Where cyclists are required to give way, dropped kerbs should be installed fully flush with the road surface.

Cycle tracks adjacent to or shared with a pedestrian route

4.12.3 There may be some circumstances where adjacent or shared use with pedestrians is the most desirable design option available. (Adjacent use means there is some form of segregation between pedestrians and cyclists; shared use is otherwise.) Examples include cycle routes to primary schools, cycle access to vehicle-restricted areas and linear routes designed primarily for leisure walking and cycling. Care needs to be taken to minimise the potential for conflict, particularly at bus stops and where a route is likely to be used by older and/or disabled people. Such routes may be adjacent use or shared use, but especially on utility routes, there should be a presumption in favour of physical segregation unless conditions dictate otherwise. Some forms of tactile paving are available for this application (see *Guidance on the Use of Tactile Paving Surfaces*, DfT 1998). The decision not to segregate cyclists from pedestrians will depend on the volume of flow of either group, and the total width available for the route. In some circumstances, for example where forward visibility is restricted, it may be appropriate to segregate by direction of flow rather than by mode. LTN 2/04 deals with adjacent and shared use, and explains the legal basis for the creation and use of different types of cycle track.

Integrated cycle track within footway



The cycle track and adjacent footway are separated by a level difference. The scheme was created by taking out a service road. (Photo: Adrian Lord)

4.13 Complementary and trip-end facilities for cyclists

Cycle parking

4.13.1 Appropriate long or short stay cycle parking should be sited as close as possible to the final destination (TAL 7/97, *Supply and Demand for Cycle Parking*, DETR 1997). TAL 6/99, *Cycle Parking - Examples of Good Practice* and NCN leaflet *Cycle Parking*, include a variety of good practice solutions for different situations. Cycle lockers are increasingly being used to provide secure long-stay parking at businesses and public transport interchanges. Local authorities should ensure that cycle parking is provided in new developments by including cycle parking standards in planning guidance.

Cycle Locker



Cycle lockers can be used to provide secure long stay parking at stations (Photo DfT)

4.13.2 Poorly sited cycle parking or lack of formal parking can create hazards for blind or partially sighted people. Some parking stands now incorporate tapping rails and these are preferred (tapping rails not only assist blind people using sticks but they help prevent guide dogs walking through the stands). The facilities should not interfere with visibility splays and should avoid pedestrian desire lines. Good locations for cycle parking are build-outs created by removing car parking spaces, and these can sometimes be combined with informal pedestrian crossing points. Good examples include Kensington High St where cycle parking is provided on the central reserve (see below), and Notting Hill Gate and Brompton Road (see 4.2), which have cycle parking stands on build-outs next to car parking bays.

Cycle parking in central reserve



Cycle parking in central reserve, High Street, Kensington. (Photo: DfT)

14.3.3 Cycle parking in rural and historic areas may be constructed from cast iron or other suitable materials, using designs that fit in with the surrounding street furniture. Designs should be convenient and secure without being visually obtrusive or over-engineered.

Cycle Parking contained within build outs



Cycle parking bay protected by build outs. (Photo: Alex Sully, English Regions Cycling Development Team)

Signing

4.13.4 Care should be taken to ensure that route signing is easy to follow and legally correct, and that key destinations are included especially where the route of the cycle track and/or pedestrian footpath differs from the route used by motor traffic. Signing needs particular emphasis where shared-use ends and pedestrian-only routes begin. Signing may be supplemented by road marking such as the cycle symbol on advisory routes (see LTN 3/04).

Sign posts



This traditional style sign, in a semi-rural environment, includes information about its location to help with route finding and features a slotted pole design to prevent the signs from being turned by vandals. (Photo: Steve Essex, Manchester City Council)

Route maps and information

4.13.5 In addition to signing, pedestrians and cyclists can benefit from the provision of on-street plans and information, not just at public transport interchanges, public buildings, and key destinations, but also at intersections with main routes. In rural areas, interpretation boards can be used to illustrate routes, connections to public transport and features of interest. Copies of the maps should also be available from information centres and downloadable from the Council's website. Some authorities have incorporated information panels for route maps etc into the design of clusters of cycle parking stands.

Bike Guide Publication - Southampton County Council



Photo: Southampton CC

4.13.6 The provision of information can often be tied in to health promotion, school and workplace travel plan initiatives. Information about routes, local cycle shops, local cycling groups and contact details for relevant organisations are usually included. Mapping should be of sufficient quality such that a person unfamiliar with the area would be able to follow routes without reference to additional maps.

4.14 Temporary measures for pedestrians and cyclists

Cyclists and pedestrians at road works

4.14.1 It is important to ensure that the safety and convenience of pedestrians and cyclists is not compromised by road works. This topic is covered more fully for pedestrians in *Guidelines for Providing for Journeys on Foot*, IHT 2000 and for cyclists in TAL 15/99, *Cyclists at Road Works*, DETR 1999. Where road works limit the carriageway to a single lane, a minimum lane width of 4.0m is desirable to enable cars to pass cyclists safely, and a minimum width of 4.25m is necessary for HGVs to pass safely. Advice about street works on footpaths is given in *Inclusive Mobility*, DfT 2002.

5. Key References and Useful Addresses

5.1 General

5.1.1 Some of the key texts giving advice on good practice, and preferred design solutions and dimensions are listed below. Many can be accessed from DfT website (www.dft.gov.uk) or from the National Cycling Strategy website (www.nationalcyclingstrategy.org.uk). A national website for walking is to be developed in the near future. Regularly updated cycling, walking and traffic calming bibliographies are available from the DfT, which detail publications by the DfT and many other organisations.

5.2 Walking

5.2.1 *On the Move by Foot: a Discussion Paper*, DfT 2003. Sets out ideas for encouraging more walking through planning, design and encouragement measures.

5.2.2 *Guidelines for Providing for Journeys on Foot*, IHT 2000. Main principles and references for good practice in catering for pedestrians.

5.2.3 *Walking: Making it Happen*, London Walking Forum 2000. Contains many examples of good practice in applying policies, plans and programmes to promote and facilitate walking.

5.2.4 *Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*, DfT 2002. Also available from the DfT web site ²

5.2.5 *Guidance on the Use of Tactile Paving Surfaces*, DETR 1998. Also available from the DfT web site ³

5.2.6 *DIY Community Street Audits*, Living Streets 2002. A self-help guide for communities to identify opportunities for improving local conditions for people on foot.

5.2.7 *The Assessment of Pedestrian Crossings*, LTN 1/95, DoT 1995 and *LTN 2/95 The Design of Pedestrian Crossings*, DoT 1995.

5.3 Cycling

5.3.1 LTN 3/04, *Signs and Markings for Cycle Routes* includes the range of prescribed signs available and their correct usage.

5.3.2 *Cycle Friendly Infrastructure*, IHT 1996. Main principles and references for all aspects of providing for journeys by bike, including trip-end facilities.

5.3.3 *London Cycle Network Design Manual*, LCN 1998. Contains guidance on how to implement routes for cyclists in typical urban situations where optimal conditions are difficult to achieve.

5.3.4 *National Cycle Network: Guidelines for Planning and Design*, Sustrans 1997. Design guidance intended to cater for novice, child and less-experienced cyclists requiring higher levels of separation from motor traffic.

5.4 Walking and cycling

5.4.1 LTN 2/04, *Adjacent and Shared Use Facilities for Pedestrians and Cyclists*, DfT 2004. Sets out the design criteria for implementing a shared-use scheme.

5.4.2 TAL 1/87, *Measures to Control Traffic for the Benefit of Residents, Pedestrians and Cyclists* is a brief review of traffic calming techniques.

5.4.3 Forthcoming LTN, *Traffic Calming*, DfT. This document will contain the latest guidance on traffic calming principles and techniques, including the application of traffic calming measures along main roads.

5.4.4 *By Design - Urban design in the planning system: towards better practice*, DETR 2000. This guide by the Commission for Architecture and the Built Environment (CABE) aims to promote higher standards in urban design and acts as a companion to PPG1 *General Policy and Principles*, which sets the policy for urban design.

5.4.5 *Design Bulletin 32* and companion volume *Places, Streets and Movement*, DETR 1998. The primary design guidance for residential areas although now in need of revision. Includes footway and cycle track widths, kerb radii and sightlines as well as more general guidance about layout and design.

5.4.6 *Better Places to Live*, ODPM 2001. This guide is a companion to PPG3 (*Housing*), DETR 2000. It aims to improve the quality of design in residential areas and provides advice on how to create a good movement framework for residential areas. *Better streets, Better places: Delivering Sustainable Residential Environments*, DfT 2003, examines progress towards meeting the requirements of PPG3.

5.4.7 *Going to Town - Improving Town Centre Access*, ODPM/National Retail Planning Forum 2002, is a companion guide to PPG6: *Town Centres and Retail Developments*, DETR 1996, and sets out good practice for design of town centres.

5.4.8 *Best Practice to Promote Walking and Cycling*, (ADONIS Project Report 3). Report for EU from Danish Roads Directorate 1998. Includes examples of innovative solutions from a number of European countries.

5.4.9 *Transport in the Urban Environment*, IHT 1997. Wide-ranging document providing an overview of the main traffic management techniques applicable to urban transport, including catering for pedestrians and cyclists. Useful as an initial source of information about issues such as parking management, vehicle restrictions and other measures that may indirectly improve conditions for pedestrians and cyclists.

5.4.10 *Cycling: the way ahead for towns and cities*, European Commission, DG XI 1999. Includes several successful examples of how cycling provision and promotional strategies have been undertaken in European towns and cities, and comparisons of cycle ownership and use.

5.4.11 *Roads in the Countryside*, Countryside Agency 1995, looks at the general design of roads within rural areas.

5.4.12 *Quiet Roads: Taming Country Lanes*, Countryside Agency, 1998 looks specifically at the issue of providing rural roads that are attractive and safe for pedestrians, cyclists and equestrians as well as for motor traffic.

5.4.13 *Public Rights of Way*, Circular 2/93, DoE 1993, gives detailed advice about the topic. Further detail on the latest developments is available from the DEFRA and Countryside Agency web sites.

5.5 Transport, health and environment

5.5.1 *Cycling Towards Health and Safety*, British Medical Association 1992. Identifies the much greater health benefits of cycling compared with the risks posed by traffic danger.

5.5.2 *Active Transport*, Health Education Authority 1999. Gives an overview of issues and case studies of initiatives to promote walking and cycling.

5.5.3 *Making T.H.E. Links*, Health Education Authority 1999. A guide for local authorities and healthcare providers on integrating sustainable transport, health and environmental policies.

5.5.4 *Our Healthier Nation*, Department of Health 1999. Government policy statement on health.

5.5.5 *National Air Quality Strategy*, DETR 2000. Government Strategy to reduce air pollution from transport and other sources.

5.5.6 *Making Travel Plans Work: Lessons from UK Case Studies*, DfT 2003. Case studies of successful workplace strategies to reduce car use and encourage walking, cycling and other modes.

5.5.7 *Planning out Crime*, Circular 5/94, DoE 1994. Gives advice on crime reduction aspects of designing roads, footpaths and open public space.

5.5.8 *Making the Connections - Transport and Social Exclusion*, Social Exclusion Unit, ODPM 2003. Looks at the crucial role of transport in providing access to education, employment, health care and other services.

5.6 Road safety

5.6.1 *Tomorrow's Roads: Safer for Everyone*, DETR 2000 sets out the Government Policy on road safety and targets for reducing the number of casualties.

5.6.2 *New Directions in Speed Management: a Review of Policy*, DETR 2000 specifically deals with Government policy on motor vehicle speeds and their role in road safety and transport planning.

5.7 Useful addresses

5.7.1

DfT Free Literature
P O Box 236
Wetherby

West Yorkshire
LS23 7NB

Tel: 0870 1226 236
Minicom 0870 1226 405
Fax: 0870 1226 237
Email: dft@twoten.press.net

5.7.2

DfT Traffic Advisory Leaflets
Charging & Local Transport Division
Zone 3/19, Great Minster House
76 Marsham Street
London
SW1P 4DR

Tel 020 7944 2478

5.7.3

DfT Mobility and Inclusion Unit
(advice on accessible pedestrian environments and installation of tactile paving).

Zone 1/18, Great Minster House
76 Marsham Street
London
SW1P 4DR

Tel 020 7944 6100
Minicom 020 7944 3277
Email: miu@dft.gov.uk

5.7.4

Highways Agency Publications Officer
Heron House
49/53 Goldington Road
Bedford
MK40 3LL

5.7.5

Countryside Agency
John Dower House
Crescent Place
Cheltenham,
Gloucestershire
GL50 3RA

Email: transport@countryside.gov.uk

5.7.6

Sustrans Head Office
35 King Street
Bristol BS1 4DZ

Tel: 0117 926 8893

Fax: 0117 929 4173

² *Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure:*
<http://www.dft.gov.uk/transportforyou/access/tipws/inclusivemobility>

³ *Guidance on the Use of Tactile Paving Surfaces:*
<http://www.dft.gov.uk/transportforyou/access/tipws/guidanceontheuseoftactilepav6167>

Annex A

Figure 1: Walking Infrastructure Design Process



Figure 2: Cycling Infrastructure Design Process

