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Manual for Streets

Llywodraeth Cynulliad Cymru
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Manual for Streets

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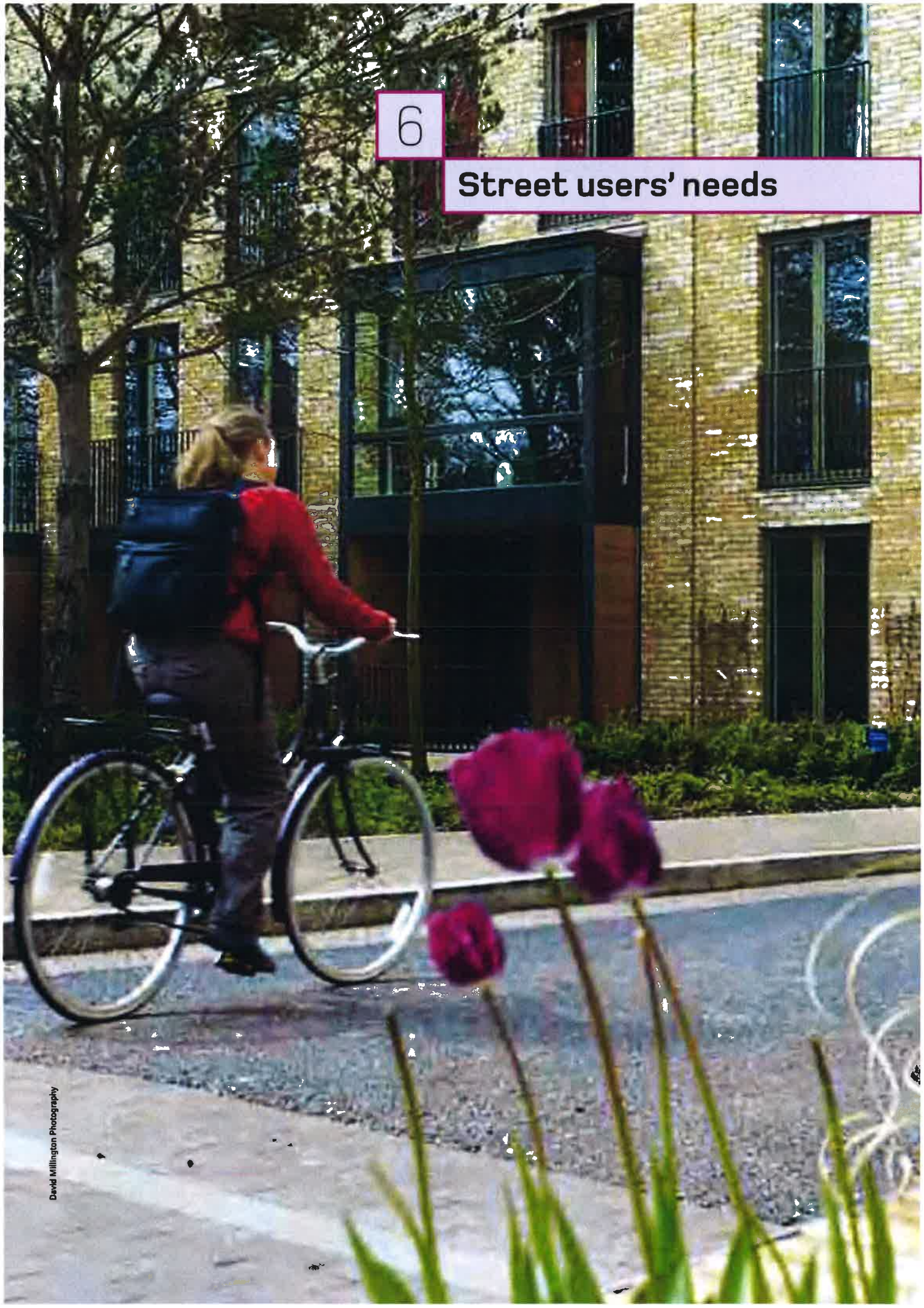
6 Street users' needs



David Millington Photography

Chapter aims

- Promote inclusive design.
- Set out the various requirements of street users.
- Summarise the requirements for various types of motor vehicle.

6.1 Introduction

6.1.1 Street design should be inclusive. Inclusive design means providing for all people regardless of age or ability. There is a general duty for public authorities to promote equality under the Disability Discrimination Act 2005.[1] There is also a specific obligation for those who design, manage and maintain buildings and public spaces to ensure that disabled people play a full part in benefiting from, and shaping, an inclusive built environment.

6.1.2 Poor design can exacerbate the problems of disabled people – good design can minimise them. Consultation with representatives of various user-groups, in particular disabled people, is important for informing the design of streets. Local access officers can also assist here.

6.1.3 Designers should refer to *Inclusive Mobility*,[2] *The Principles of Inclusive Design*[3] *and Guidance on the Use of Tactile Paving Surfaces* (1999)[4] in order to ensure that their designs are inclusive.

6.1.4 If any aspect of a street unavoidably prevents its use by particular user groups, it is important that a suitable alternative is provided. For example, a safe cycling route to school may be inappropriate for experienced cyclist commuters, while a cycle route for commuters in the same transport corridor may be unsafe for use by children. Providing one as an alternative to the other overcomes these problems and ensures that the overall design is inclusive.

6.1.5 This approach is useful as it allows for the provision of a specialised facility where there is considerable demand for it without disadvantaging user groups unable to benefit from it.

1 Disability Discrimination Act 2005. London: TSO.
2 Department for Transport (2002) *Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*. London: Department for Transport.
3 CABE (2006) *The Principles of Inclusive Design (They include you)*. London: CABE.
4 DETR (1999) *Guidance on the Use of Tactile Paving Surfaces*. London: TSO.

6.2 Requirements for pedestrians and cyclists

6.2.1 When designing for pedestrians or cyclists, some requirements are common to both:

- routes should form a coherent network linking trip origins and key destinations, and they should be at a scale appropriate to the users;
- in general, networks should allow people to go where they want, unimpeded by street furniture, footway parking and other obstructions or barriers;
- infrastructure must not only be safe but also be perceived to be safe – this applies to both traffic safety and crime; and
- aesthetics, noise reduction and integration with surrounding areas are important – the environment should be attractive, interesting and free from graffiti and litter, etc.

6.3 Pedestrians

6.3.1 The propensity to walk is influenced not only by distance, but also by the quality of the walking experience. A 20-minute walk alongside a busy highway can seem endless, yet in a rich and stimulating street, such as in a town centre, it can pass without noticing. Residential areas can offer a pleasant walking experience if good quality landscaping, gardens or interesting architecture are present. Sightlines and visibility towards destinations or intermediate points are important for pedestrian way-finding and personal security, and they can help people with cognitive impairment.

6.3.2 Pedestrians may be walking with purpose or engaging in other activities such as play, socialising, shopping or just sitting. For the purposes of this manual, pedestrians include wheelchair users and people pushing wheeled equipment such as prams.

6.3.3 As pedestrians include people of all ages, sizes and abilities, the design of streets needs to satisfy a wide range of requirements. A street design which accommodates the needs of children and disabled people is likely to suit most, if not all, user types.

6.3.4 Not all disability relates to difficulties with mobility. People with sensory or cognitive impairment are often less obviously disabled,

Figure 6.1 West End of London 1884 – the block dimensions are of a scale that encourages walking.

so it is important to ensure that their needs are not overlooked. Legible design, i.e. design which makes it easier for people to work out where they are and where they are going, is especially helpful to disabled people. Not only does it minimise the length of journeys by avoiding wrong turns, for some it may make journeys possible to accomplish in the first place.

6.3.5 The layout of our towns and cities has historically suited pedestrian movement (Fig. 6.1).

6.3.6 Walkable neighbourhoods should be on an appropriate scale, as advised in Chapter 4. Pedestrian routes need to be direct and match desire lines as closely as possible. Permeable networks help minimise walking distances.

6.3.7 Pedestrian networks need to connect with one another. Where these networks are separated by heavily-trafficked roads, appropriate surface level crossings should be provided where practicable. Footbridges and subways should be avoided unless local topography or other conditions make them necessary. The level changes and increased distances involved are inconvenient, and they can be difficult for disabled people to use. Subways, in particular, can also raise concerns over personal security – if they are unavoidable, designers should aim to make them as short as possible, wide and well lit.

6.3.8 The specific conditions in a street will determine what form of crossing is most relevant. All crossings should be provided with tactile paving. Further advice on the assessment and design of pedestrian crossings is contained in Local Transport Notes 1/95[5] and 2/95[6] and the *Puffin Good Practice Guide*.[7]

6.3.9 Surface level crossings can be of a number of types, as outlined below:

- Uncontrolled crossings – these can be created by dropping kerbs at intervals along a link. As with other types of crossing, these should be matched to the pedestrian desire lines. If the crossing pattern is fairly random and there is an appreciable amount of pedestrian activity, a minimum frequency of 100 m is recommended.[8] Dropped kerbs should

5 Department for Transport (1995) *The Assessment of Pedestrian Crossings*. Local Transport Note 1/95. London: TSO.

6 Department for Transport (1995) *The Design of Pedestrian Crossings*. Local Transport Note 2/95. London: TSO.

7 County Surveyors' Society/Department for Transport (2006) *Puffin Good Practice Guide* available to download from www.dft.gov.uk or www.cssnet.org.uk.

8 Department for Transport (2005) *Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*. London: Department for Transport.

be marked with appropriate tactile paving and aligned with those on the other side of the carriageway.

- Informal crossings – these can be created through careful use of paving materials and street furniture to indicate a crossing place which encourages slow-moving traffic to give way to pedestrians (Fig. 6.2).
- Pedestrian refuges and kerb build-outs – these can be used separately or in combination. They effectively narrow the carriageway and so reduce the crossing distance. However, they can create pinch-points for cyclists if the remaining gap is still wide enough for motor vehicles to squeeze past them.
- Zebra crossings – of the formal crossing types, these involve the minimum delay for pedestrians when used in the right situation.
- Signalised crossings – there are four types: Pelican, Puffin, Toucan and equestrian crossings. The Pelican crossing was the first to be introduced. Puffin crossings, which have nearside pedestrian signals and a variable crossing time, are replacing Pelican crossings. They use pedestrian detectors to match the length of the crossing period to the time pedestrians take to cross. Toucan and equestrian crossings operate in a similar manner to Puffin crossings except that cyclists can also use Toucan crossings, while equestrian crossings have a separate crossing for horse riders. Signalised crossings are preferred by blind or partially-sighted people.

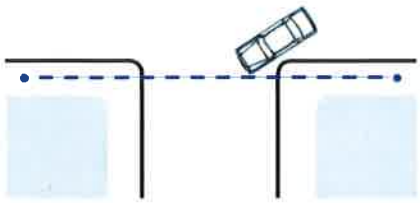
6.3.10 Obstructions on the footway should be minimised. Street furniture is typically sited on footways and can be a hazard for blind or partially-sighted people.

6.3.11 Where it is necessary to break a road link in order to discourage through traffic, it is recommended that connectivity for pedestrians is maintained through the break unless there are compelling reasons to prevent it.

Andrew Cameron, WSP

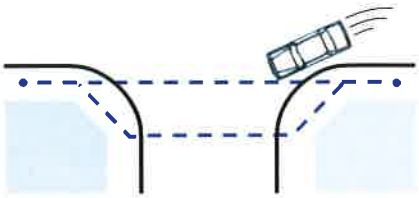
Figure 6.2 Informal crossing, Colchester – although the chains and a lack of tactile paving are hazardous to blind or partially-sighted people.

Small radius (eg. 1 metre)

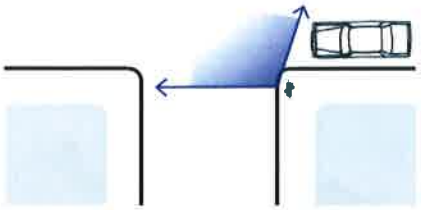


- **Pedestrian desire line (---) is maintained.**
- **Vehicles turn slowly (10 mph – 15 mph).**

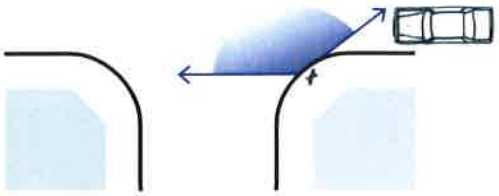
Large radius (eg. 7 metres)



- **Pedestrian desire line deflected.**
- **Detour required to minimise crossing distance.**
- **Vehicles turn faster (20 mph – 30 mph).**



- **Pedestrian does not have to look further behind to check for turning vehicles.**
- **Pedestrian can easily establish priority because vehicles turn slowly.**



- **Pedestrian must look further behind to check for fast turning vehicles.**
- **Pedestrian cannot normally establish priority against fast turning vehicles.**

Devon County Council

Figure 6.3 The effects of corner radii on pedestrians.

6.3.12 Pedestrian desire lines should be kept as straight as possible at side-road junctions unless site-specific reasons preclude it. Small corner radii minimise the need for pedestrians to deviate from their desire line (Fig. 6.3). Dropped kerbs with the appropriate tactile paving should be provided at all side-road junctions where the carriageway and footway are at different levels. They should not be placed on curved sections of kerbing because this makes it difficult for blind or partially-sighted people to orientate themselves before crossing.

6.3.13 With small corner radii, large vehicles may need to use the full carriageway width to turn. Swept-path analysis can be used to determine the minimum dimensions required. The footway may need to be strengthened locally in order to allow for larger vehicles occasionally overrunning the corner.

6.3.14 Larger radii can be used without interrupting the pedestrian desire line if the footway is built out at the corners. If larger radii encourage drivers to make the turn more quickly, speeds will need to be controlled in some way, such as through using a speed table at the junction.

6.3.15 The kerbed separation of footway and carriageway can offer protection to pedestrians, channel surface water, and assist blind or partially-sighted people in finding their way around, but kerbs can also present barriers to some pedestrians. Kerbs also tend to confer an implicit priority to vehicles on the carriageway. At junctions and other locations, such as school or community building entrances, there are benefits in considering bringing the carriageway up flush with the footway to allow people to cross on one level (Fig. 6.4). This can be achieved by:

- raising the carriageway to footway level across the mouths of side roads; and
- providing a full raised speed-table at 'T' junctions and crossroads.

Andrew Cameron, WSP

Figure 6.4 Raised crossover, but located away from the desire line for pedestrians and therefore ignored – the crossover should be nearer the junction with, in this case, a steeper ramp for vehicles entering the side street.

Stuart Reid, TRL

Figure 6.6 Uninviting pedestrian link – narrow, not well overlooked, unlit and deserted.

Tim Pharoah, Llewelyn Davies Yeang

Figure 6.5 Inviting pedestrian link.

Andrew Cameron, WSP

Figure 6.7 Overlooked shared route for pedestrians and vehicles, Poundbury, Dorset.

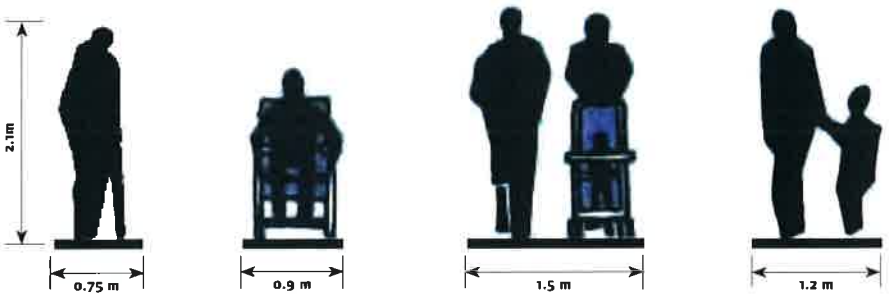
6.3.16 The carriageway is usually raised using short ramps which can have a speed-reducing effect, but if the street is on a bus route, for example, a more gradual change in height may be more appropriate (Fig. 6.4). It is important that any such shared surface arrangements are designed for blind or partially-sighted people because conventional kerbs are commonly used to aid their navigation. Tactile paving is required at crossing points regardless of whether kerbs are dropped or the carriageway is raised to footway level. Other tactile information may be required to compensate for kerb removal elsewhere.

6.3.17 Pedestrians can be intimidated by traffic and can be particularly vulnerable to the fear of crime or anti-social behaviour. In order to encourage and facilitate walking, pedestrians need to feel safe (Figs 6.5 and 6.6).

6.3.18 Pedestrians generally feel safe from crime where:

- their routes are overlooked by buildings with habitable rooms (Fig. 6.7);
- other people are using the street;
- there is no evidence of anti-social activity (e.g. litter, graffiti, vandalised street furniture);
- they cannot be surprised (e.g. at blind corners);
- they cannot be trapped (e.g. people can feel nervous in places with few entry and exit points, such as subway networks); and
- there is good lighting.

6.3.19 Streets with high traffic speeds can make pedestrians feel unsafe. Designers should seek to control vehicle speeds to below 20 mph in residential areas so that pedestrians activity is not displaced. Methods of vehicle speed control are discussed in Chapter 7.



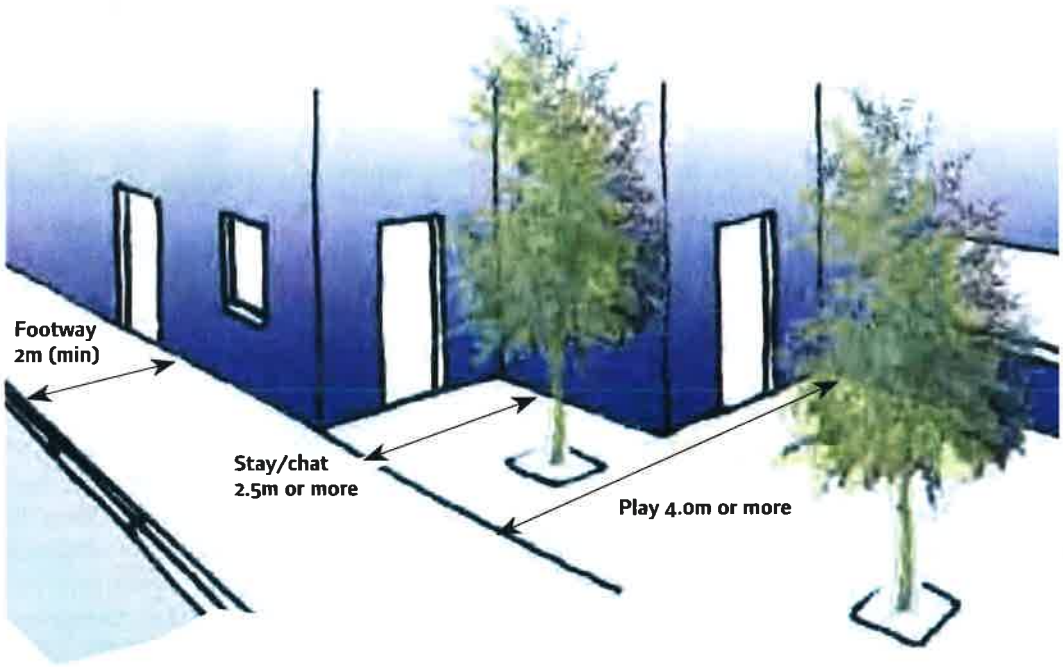


Figure 6.8 The footway and pedestrian areas provide for a range of functions which can include browsing, pausing, socialising and play.

6.3.20 *Inclusive Mobility* gives guidance on design measures for use where there are steep slopes or drops at the rear of footways.

6.3.21 Places for pedestrians may need to serve a variety of purposes, including movement in groups, children's play and other activities (Fig. 6.8).

6.3.22 There is no maximum width for footways. In lightly used streets (such as those with a purely residential function), the minimum unobstructed width for pedestrians should generally be 2 m. Additional width should be considered between the footway and a heavily used carriageway, or adjacent to gathering places, such as schools and shops. Further guidance on minimum footway widths is given in *Inclusive Mobility*.

6.3.23 Footway widths can be varied between different streets to take account of pedestrian volumes and composition. Streets where people walk in groups or near schools or shops, for example, need wider footways. In areas of high pedestrian flow, the quality of the walking experience can deteriorate unless sufficient width is provided. The quality of service goes down as pedestrian flow density increases. Pedestrian congestion through insufficient capacity should be avoided. It is inconvenient and may encourage people to step into the carriageway (Fig. 6.9).

6.3.24 Porch roofs, awnings, garage doors, bay windows, balconies or other building elements should not oversail footways at a height of less than 2.6 m.

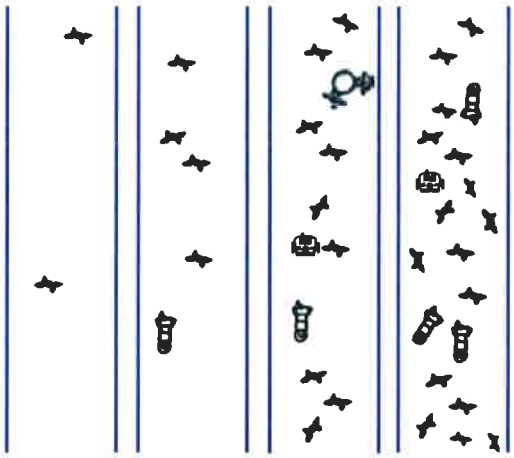


Figure 6.9 Diagram showing different densities of use in terms of pedestrians per square metre. Derived from *Vorrang für Fussgänger*[9].

Tim Pharoah, Llewelyn Davies Yeang

Figure 6.10 Poorly maintained tree obstructing the footway.

6.3.25 Trees to be sited within or close to footways should be carefully selected so that their spread does not reduce pedestrian space below minimum dimensions for width and headroom (Fig. 6.10).

6.3.26 Low overhanging trees, overgrown shrubs and advertising boards can be particularly hazardous for blind or partially-sighted people. Tapering obstructions, where the clearance under a structure reduces because the structure slopes down (common under footbridge ramps), or the pedestrian surface ramps up, should be avoided or fenced off.

6.3.27 Designers should attempt to keep pedestrian (and cycle) routes as near to level as possible along their length and width, within the constraints of the site. Longitudinal gradients should ideally be no more than 5%, although topography or other circumstances may make this difficult to achieve (Fig. 6.11).

Andrew Cameron, WSP

Figure 6.11 In some instances it may be possible to keep footways level when the carriageway is on a gradient, although this example deflects pedestrians wanting to cross the side road significantly from their desire lines.

9 Wissenschaft & Verkehr (1993) *Vorrang für Fussgänger*. Verkehrsclub Österreich.

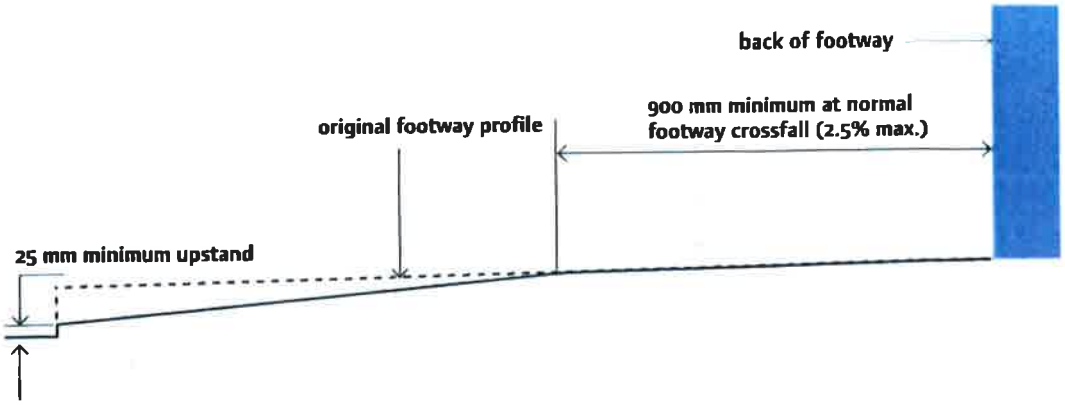


Figure 6.12 Typical vehicle crossover.

6.3.28 Off-street parking often requires motorists to cross footways. Crossovers to private driveways are commonly constructed by ramping up from the carriageway over the whole width of the footway, simply because this is easier to construct. This is poor practice and creates inconvenient cross-falls for pedestrians. Excessive cross-fall causes problems for people pushing prams and can be particularly difficult to negotiate for people with a mobility impairment, including wheelchair users.

6.3.29 Where it is necessary to provide vehicle crossovers, the normal footway cross-fall should be maintained as far as practicable from the back of the footway (900 mm minimum) (Fig. 6.12).

6.3.30 Vehicle crossovers are not suitable as pedestrian crossing points. Blind or partially-sighted people need to be able to distinguish between them and places where it is safe to cross. Vehicle crossovers should therefore have a minimum upstand of 25 mm at the carriageway edge. Where there is a need for a pedestrian crossing point, it should be constructed separately, with tactile paving and kerbs dropped flush with the carriageway.

6.3.31 Surfaces used by pedestrians need to be smooth and free from trip hazards. Irregular surfaces, such as cobbles, are a barrier to some pedestrians and are unlikely to be appropriate for residential areas.

6.3.32 Designs need to ensure that pedestrian areas are properly drained and are neither washed by runoff nor subject to standing water (Fig 6.13).

6.3.33 Seating on key pedestrian routes should be considered every 100 m to provide rest points and to encourage street activity. Seating should ideally be located where there is good natural surveillance.

Stuart Reid, TRL

Figure 6.13 Poor drainage at a pedestrian crossing place causes discomfort and inconvenience.

Andrew Cameron, WSP

Figure 6.14 On-street cycling in Ipswich.