Parking
Chapter aims

- Emphasise the importance of providing sufficient good-quality cycle parking in all new residential developments to meet the needs of residents and visitors.

- Explain how the parking of vehicles is a key function of most streets in residential areas and that it needs to be properly considered in the design process.

- Confirm that, having regard to the policy in Planning Policy Statement 3: Housing (PPS3), designers need to consider carefully how to accommodate the number of cars that are likely to be owned by residents (Wales: refer to TAN 18: Transport).^1^  

- Describe how providing a level of car parking below normal demand levels can be appropriate in some situations.

- Explain the efficiency benefits of unallocated car parking and the need to meet at least some of the normal demand on the street.

- Offer guidance on footway parking.

- Give guidance on the size of parking spaces for cycles, cars and motorcycles.

8.1 Introduction

8.1.1 Accommodating parked vehicles is a key function of most streets, particularly in residential areas. While the greatest demand is for parking cars, there is also a need to consider the parking of cycles, motorcycles and, in some circumstances, service vehicles. Where there is a need to regulate parking, this should be done by making appropriate traffic regulation orders (TROs) and signing and marking in accordance with the Traffic Signs Regulations and General Directions 2002 (TSRGD).^2^ Guidance is also provided in the Traffic Signs Manual.^3^

8.1.2 The level of parking provision and its location has a key influence on the form and quality of a development, and the choices people make in how they travel. The way cars are parked is a key factor for many issues, such as visual quality, street activity, interaction between residents, and safety.

8.1.3 A failure to properly consider this issue is likely to lead to inappropriate parking behaviour, resulting in poor and unsafe conditions for pedestrians.

8.1.4 Parking can be provided on or off the street. Off-street parking includes parking within a curtilage (on-plot) or in off-street parking areas (off-plot).

8.2 Cycle parking

8.2.1 Providing enough convenient and secure cycle parking at people’s homes and other locations for both residents and visitors is critical to increasing the use of cycles. In residential developments, designers should aim to make access to cycle storage at least as convenient as access to car parking.

8.2.2 The need for convenient, safe and secure cycle parking in new developments is recognised in Policy Planning Guidance Note 13: Transport (PPG13)£ (Wales: TAN 18), which recommends that provision should be increased to promote cycle use but should at least be at levels consistent with the local authority’s cycle target strategy in its Local Transport Plan.

Determining the amount of cycle parking

8.2.3 Shared cycle parking is normally more efficient than providing sufficient space within each dwelling for the maximum possible number of cycles. Shared cycle parking facilities should be secure and convenient to use.

8.2.4 The amount of cycle parking in a shared facility will depend on the overall number of cycles anticipated across the scheme, based on average cycle-ownership levels. This number can vary considerably depending on circumstances.

8.2.5 Houses tend to have higher levels of cycle ownership than flats. Research carried out for CABE/Oxfordshire County Council by WSP

---

Table 8.1 Average cycle ownership levels in Oxfordshire, 2006

<table>
<thead>
<tr>
<th></th>
<th>Average cycles/dwelling</th>
<th>Average cycles/resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houses, Oxford City</td>
<td>2.65</td>
<td>0.73</td>
</tr>
<tr>
<td>Houses, rest of Oxfordshire</td>
<td>1.51</td>
<td>0.52</td>
</tr>
<tr>
<td>Flats, Oxford City</td>
<td>0.97</td>
<td>0.48</td>
</tr>
<tr>
<td>Flats, rest of Oxfordshire</td>
<td>0.44</td>
<td>0.23</td>
</tr>
</tbody>
</table>

and Phil Jones Associates in 2006 found the average cycle ownership levels shown in Table 8.1.

8.2.6 The amount of provision will also vary depending on the type of development. Cycle use can be expected to be relatively high in places such as student accommodation. In sheltered housing or housing for older people, lower provision is likely to be more appropriate.

8.2.7 When assessing the effect of location, census data on the proportion of trips to work made by cycle provides a useful proxy for assessing the likely level of cycle ownership.

8.2.8 Cycle parking is often likely to be within, or allocated to, individual dwellings, particularly for houses. In such cases, it will be necessary to consider the potential for one cycle to be owned by each resident.

 Visitors and mixed-use areas

8.2.9 Providing cycle parking for visitors is important when planning new developments and modifying existing streets. In residential areas, the amount and location of visitor parking can be informed by the amount of cycle parking available to residents and the targeted modal share of visitor trips.

8.2.10 In some cases, visitors may be able to use spare space within residential cycle-parking facilities, whether shared or individual. Some provision in the public realm may also be appropriate, particularly where residents’ provision is not easily accessed by visitors.

8.2.11 In mixed-use areas and where there are commercial or communal facilities in a residential neighbourhood, well-located and convenient public cycle-parking will normally be necessary.

 Design solutions for residential cycle-parking

8.2.12 Cycles are often kept in garages, and this can be convenient and secure if located near the front of the property. However, garages are not normally designed for cycle storage, and the proportion of housing schemes with individual garages is declining.

8.2.13 Greater consideration therefore needs to be given to the provision of bespoke cycle storage. Cycles are not suited to overnight storage outdoors as they are vulnerable to theft and adverse weather. At the very least, any outdoor cycle parking needs to be covered, and preferably lockable (Fig. 8.1).

8.2.14 If no cycle parking is provided, this may affect the way garages are used. This aspect, among others, will inform decisions on whether garages count fully towards car-parking provision (see paragraph 8.3.4 below).

8.2.15 Where separate cycle-parking is provided within the building, it needs to be conveniently located, close to the main point of access. Where cycle parking is to be provided within a separate building, such as a detached garage or other outbuildings, it will need to be secure, with doors designed for easy access.

8.2.16 In flats, cycle parking has often been inadequate, leading to cycles being stored in hallways or balconies. For new developments, the storage of cycles is an important consideration.

Figure 8.1 Secure cycle storage.
8.2.17 For ground-floor flats, or where adequately-sized lifts are provided, storage within the accommodation may be an option, but it will need to be expressly considered in the design and it will be important to ensure that cycles can be brought into the building easily and quickly.

8.2.18 Cycle parking for flats can also be located in communal areas, such as in hallways or under stairs, but, if so, it needs to be properly designed in order to prevent parked cycles becoming a nuisance for residents. If parking is to be located on upper floors, adequately-sized lifts need to be considered.

8.2.19 Another option is to provide communal cycle-parking in secure facilities, such as in underground car parks, in purpose-designed buildings or in extensions to buildings.

8.2.20 Visitor cycle-parking in the public realm is best provided in well-overlooked areas, which may often be the street itself (Fig. 8.2). Although there is a wide variety of design options, simple and unobtrusive solutions, such as Sheffield stands (Fig. 8.3), are preferred. Some bespoke designs are not so convenient, for example they may not allow both wheels to be easily locked to the stand (Fig. 8.4).

8.2.21 Cycle stands need to be located clear of pedestrian desire lines, and generally closer to the carriageway than to buildings. They should be detectable by blind or partially sighted people. A ground level tapping rail at either end of a run of stands should be provided.

8.2.22 The preferred spacing of these stands is about 1 m, so that two cycles can be stored per metre run. Where space is limited, an absolute minimum spacing of 800 mm may be used, although this will make it more difficult for cycles with baskets and panniers to be stored. The outermost stands should be no closer than 550 mm to a parallel wall. In addition, there should be at least 550 mm clear space between the ends of individual stands and any wall.
8.2.23 Where cycle parking is provided internally, the indicative dimensions shown in Figs 8.5 and 8.6 are appropriate.

8.2.24 Overall space requirements can be reduced where cycles are stored on-end or in two layers using rack systems, but such storage is often not as easy to use by everyone, and is a less desirable option than parking on the ground.

8.3 Car parking

Introduction and policy background

8.3.1 The availability of car parking is a major determinant of travel mode. The Government’s general planning policy for car parking is set out in PPG13: Transport. The Government’s policy on residential car-parking provision is set out in PPS3: Housing, which is particularly relevant for MfS (Wales: policy on parking is set out in Planning Policy Wales, supplemented by TAN 18).

8.3.2 PPS3 makes it clear that, when assessing the design quality of a proposed new development, it is important to consider a design-led approach to the provision of car-parking space that is well-integrated with a high-quality public realm. PPS3 (paragraph 51) advises that:

‘Local Planning Authorities should, with stakeholders and communities, develop residential parking policies for their areas, taking account of expected levels of car ownership, the importance of promoting good design and the need to use land efficiently.’

8.3.3 The context of a new residential development needs to be carefully considered when determining the appropriate amount of parking (Fig. 8.7). This will be informed by the Transport Assessment, together with any accompanying Travel Plan and the local authority’s residential parking policies set out in its Local Development Framework.

8.3.4 Although the ability of residents to reach important destinations by other modes is one factor affecting car ownership, research has shown that dwelling size, type and tenure are also important.

Figure 8.5 Plan of store for two cycles using wall fixings.

Figure 8.6 Plan of store for four cycles using Sheffield stands.

Figure 8.7 Residential car parking.
8.3.5 Local planning authorities will need to consider carefully what is an appropriate level of car parking provision. In particular, under-provision may be unattractive to some potential occupiers and could, over time, result in the conversion of front gardens to parking areas (see box). This can cause significant loss of visual quality and increase rainwater run-off, which works against the need to combat climate change. It is important to be aware that many disabled people are reliant on the use of the private car for personal mobility. Ideally, therefore, layouts should be able to accommodate parking provision for Blue Badge holders.

Car parking provision for new homes

CABE research\(^8\) found that car parking remains a significant issue for residents and house buyers. Many people feel that the design for a new residential development should accommodate typical levels of car ownership and that the level of parking in new developments is often inadequate for residents’ and visitors’ demands. There was a general feeling among buyers of new homes that apparent attempts to restrict parking in order to curb car ownership were unrealistic and had little or no impact on the number of cars a household would require and acquire.

8.3.6 Provision below demand can work successfully when adequate on-street parking controls are present and where it is possible for residents to reach day-to-day destinations, such as jobs, schools and shops, without the use of a car. This will normally be in town and city centres where there will be good public transport and places that can be accessed easily on foot and by cycle. For residents who choose not to own a car, living in such an area may be an attractive proposition.

8.3.7 One way of encouraging reduced car ownership is to provide a car club. Car clubs provide neighbourhood-based short-term car hire to members for periods of as little as one hour, and have been shown to reduce car ownership and use. To function effectively, car club vehicles need to be made available close to members’ homes.

8.3.8 More information on car clubs is available at www.carplus.org.uk and in the Department for Transport document Making Car Sharing and Car Clubs Work\(^9\) (see box).

Car clubs

Making Car Sharing and Car Clubs Work advises that:
‘The importance of on-street spaces cannot be underestimated both for open and closed schemes; not least because they provide a very visible image of the presence of a car club, and demonstrate direct benefits for potential users. The provision of dedicated parking spaces is a major incentive for the uptake of community car clubs, particularly in urban areas.’

8.3.9 Highway authorities are able to make TROs, limiting the use of on-street parking spaces to car club vehicles. Authorities that have done this include Bristol, Ealing, Edinburgh, and Kensington and Chelsea. The supporting traffic signs and markings may need to be authorised by the Department for Transport in England or the Welsh Assembly Government (see Fig. 8.8).

Figure 8.8 (a) and (b) A successful car club scheme is operating in Bath, with spaces provided on-street.

---

Allocated and unallocated parking

8.3.10 Not all parking spaces need to be allocated to individual properties. Unallocated parking provides a common resource for a neighbourhood or a specific development.

8.3.11 A combination of both types of parking can often be the most appropriate solution. There are several advantages to providing a certain amount of unallocated communal parking, and it is recommended that there should be a presumption in favour of including some in most residential layouts. Key considerations for communal parking are that it:

- only needs to provide for average levels of car ownership;
- allows for changes in car ownership between individual dwellings over time;
- provides for both residents’ and visitors’ needs; and
- can cater for parking demand from non-residential uses in mixed-use areas, which will tend to peak during the daytime when residential demands are lowest.

On-street parking

8.3.12 An arrangement of discrete parking bays adjacent to the running lanes is often the preferred way of providing on-street parking. It has little effect on passing traffic and minimises obstructions to the view of pedestrians crossing the street.

8.3.13 It is recommended that, in most circumstances, at least some parking demand in residential and mixed-use areas is met with well-designed on-street parking (Fig. 8.9).

8.3.14 Breaking up the visual impact can be achieved by limiting on-street parking to small groups of, say, about five spaces. These groups can be separated by kerb build-outs, street furniture or planting.

8.3.15 In planning for expected levels of car ownership it is not always necessary to provide parking on site (i.e. within curtilage or in off-street parking areas). In some cases it may be appropriate to cater for all of the anticipated

Figure 8.9 An example of on-street parking in the centre of the street that helps to separate the car from other users and provides strong surveillance of the cars.
demand on-street. This could be the case, for example, with a small infill development where adjacent streets are able to easily accommodate the increase in parking, or where a low car-ownership development is proposed. Crown Street, Glasgow, is an example of a large scheme that has accommodated all parking on-street (Fig. 8.10).

8.3.16 Where regulated on-street parking is provided, it is important to note that it cannot be allocated to individual dwellings, although such spaces can be reserved for particular types of user, such as disabled people.

8.3.17 In deciding how much on-street parking is appropriate, it is recommended that the positive and negative effects listed in the ‘On-street parking box’ are considered.

On-street parking – positive and negative effects

Positive effects

- A common resource, catering for residents’, visitors’ and service vehicles in an efficient manner.
- Able to cater for peak demands from various users at different times of the day, for example people at work or residents.
- Adds activity to the street.
- Typically well overlooked, providing improved security.
- Popular and likely to be well-used.
- Can provide a useful buffer between pedestrians and traffic.
- Potentially allows the creation of areas within perimeter blocks that are free of cars.

Negative effects

- Can introduce a road safety problem, particularly if traffic speeds are above 20 mph and there are few places for pedestrians to cross with adequate visibility.
- Can be visually dominant within a street scene and can undermine the established character (Fig. 8.11).
- May lead to footway parking unless the street is properly designed to accommodate parked vehicles.
- Vehicles parked indiscriminately can block vehicular accesses to dwellings.
- Cars parked on-street can be more vulnerable to opportunist crime than off-street spaces.
8.3.18 Generally the most appropriate solution will be to design for a level of on-street parking that takes account of the following factors:

- the overall level of car ownership in the immediate area;
- the amount of off-street parking provided;
- the amount of allocated parking provided;
- the speed and volume of traffic using the street; and
- the width and geometry of the street and its junctions.

8.3.19 Indicating on-street car-parking spaces clearly through the use of road markings or changes of surfacing material can help to encourage good parking behaviour.

8.3.20 Where on-street spaces are provided in bays adjacent to running lanes, having them drain towards the street will make cleaning easier.

Visitor parking

8.3.21 It is recommended that visitor parking is generally served by unallocated parking, including on-street provision.

8.3.22 Research\(^\text{11}\) indicates that no additional provision needs to be made for visitor parking when a significant proportion of the total parking stock for an area is unallocated.

8.3.23 In town centres and other locations with good accessibility by non-car modes, and where on-street parking is controlled, it is often appropriate to omit visitor car-parking spaces.

Car parking provision for disabled people (Blue Badge holders)

8.3.24 Spaces for disabled people\(^\text{12}\) need to be properly marked and meet the minimum space requirements (see paragraph 8.3.58 below).

8.3.25 It is preferable to provide these spaces in unallocated areas, including on-street, as it is not normally possible to identify which properties will be occupied by or visited by disabled people. It is recommended that spaces for disabled people are generally located as close as possible to building entrances.

8.3.26 In the absence of any specific local policies, it is recommended that 5% of residential car-parking spaces are designated for use by disabled people. A higher percentage is likely to be necessary where there are proportionally more older residents. Local authorities should provide spaces on the basis of demand.

8.3.27 Where local authorities mark out disabled bays on streets in residential areas, the traffic signs and road markings should comply with TSRGD and be supported by a TRO.

Parking for service vehicles

8.3.28 In most situations, it will not be necessary to provide parking spaces specifically for service vehicles, such as delivery vans, which are normally stationary for a relatively short time. If such parking bays are considered necessary, other vehicles may need to be prevented from using the spaces by regulation and enforcement.

Design and location of car-parking spaces

8.3.29 Guidance on the design and location of car-parking spaces can be found in a number of recent documents.

8.3.30 Better Places to Live\(^\text{13}\) echoes many of the principles already set out above, including opportunities to use a combination of allocated and unallocated parking and the scope for on-street parking, provided that it is designed so that it is interrupted at regular intervals.

---


Better Places to Live notes that 8.3.31
courtyard parking can be a useful addition
to spaces in front of dwellings, and that 8.3.32
courtyards which work well exhibit three main
characteristics:

• they are not car parks, but places which
  have parking in them;
• they are overlooked by adjoining houses, or
  by buildings entered from the parking area
  (Figs 8.12 and 8.13); and
• they normally include, at most, 10 parking
  spaces – if there are more spaces, the
  courtyard layout should be broken up.

Better Places to Live also acknowledges
8.3.33
the success of developments which depend on
basement or undercroft parking, without which
they would not be viable. The advantage of
putting cars underground is that it preserves the
street frontage, uses land more efficiently and
may be more convenient for drivers accessing the
building, particularly in adverse weather. However,
as with courtyard parking, much depends on
the location and design of the entrance.

Car Parking: What Works Where advises that
8.3.34
vehicles should not be allowed
to dominate spaces, or to inconvenience
pedestrians and cyclists; and that a careful
balance has to be struck between the desire of
car owners to park as near to their dwellings as
possible and the need to maintain the character
of the overall setting. Parking within the front
curtailage should generally be avoided as it
breaks up the frontage and restricts informal
surveillance. Where cars are parked in courts or
squares, the design should ensure that they are
overlooked by adjoining buildings.

• parking in structures such as multi-storey
  and underground car parks;
• parking in front and rear courts;
• on-street parking in central reservations,
  along kerbs and at different angles, and in
  parking squares; and
• parking on driveways, in garages and car
  ports, and in individual rear courts.
8.3.35 The guidance includes detailed case studies that illustrate the application of these parking solutions for different locations and types of housing.

8.3.36 When drawing up parking policies or designing for new car-parking arrangements, it is recommended that local authorities and applicants seeking planning permission have regard to the good practice set out in the above guidance (and also see box). Consideration should also be given to the Safer Parking Scheme initiative of the Association of Chief Police Officers (ACPO),\(^\text{17}\) aimed at reducing crime and the fear of crime in parking areas.

### Car parking arrangements: good practice

It is recommended that the following key principles (based on *Car Parking: What Works Where*) should be followed when considering the design and location of car parking:

- the design quality of the street is paramount;
- there is no single best solution to providing car parking – a combination of on-plot, off-plot and on-street will often be appropriate;
- the street can provide a very good car park – on-street parking is efficient, understandable and can increase vitality and safety;
- parking within a block is recommended only after parking at the front and on-street has been fully considered – rear courtyards should support on-street parking, not replace it;
- car parking needs to be designed with security in mind – advice on this issue is contained in Safer Places. See also the Safer Parking Scheme initiative of ACPO; and
- consideration needs to be given to parking for visitors and disabled people.

### Efficiency of parking provision

8.3.37 A key objective of PPS3 is to ensure that land is used efficiently, and to this end the total space taken up by parking needs to be minimised (*Wales*: refer to TAN 18). The more flexible the use of parking spaces, the more efficient the use of space.

#### Table 8.2 Efficiency of different types of parking

<table>
<thead>
<tr>
<th>Level of efficiency/flexibility</th>
<th>Type of parking</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>On-street</td>
<td>Most efficient, as parking spaces are shared and the street provides the means of access</td>
</tr>
<tr>
<td>Off-street communal</td>
<td>Requires additional access and circulation space</td>
<td></td>
</tr>
<tr>
<td>Off-street allocated spaces but grouped</td>
<td>Although less flexible in operation, this arrangement allows for future changes in allocation</td>
<td></td>
</tr>
<tr>
<td>Off-street allocated garages away from dwellings</td>
<td>Inflexible, and largely precludes sharing spaces. Also security concerns</td>
<td></td>
</tr>
<tr>
<td>Within individual dwelling curtilage</td>
<td>Requires more space due to the need for driveways, but more secure</td>
<td></td>
</tr>
</tbody>
</table>

8.3.38 Each type of solution has different levels of efficiency and flexibility (see Table 8.2).

\(^{17}\) See [www.britishparking.co.uk](http://www.britishparking.co.uk).
Garages

8.3.39 Garages are not always used for car parking, and this can create additional demand for on-street parking.

8.3.40 Research shows that, in some developments, less than half the garages are used for parking cars, and that many are used primarily as storage or have been converted to living accommodation (see box).

Use of garages for parking
Recent surveys found the following proportions of garages were used for parking:
- 44% at various sites in England\textsuperscript{18}
- 36% at Waterside Park, Kent;\textsuperscript{19} and
- 45% at various sites in Oxfordshire.\textsuperscript{20,21}

8.3.41 In determining what counts as parking and what does not, it is recommended that the following is taken into account:
- car ports are unlikely to be used for storage and should therefore count towards parking provision, and
- whether garages count fully will need to be decided on a scheme-by-scheme basis. This will depend on factors such as:
  - the availability of other spaces, including on-street parking – where this is limited, residents are more likely to park in their garages;
  - the availability of separate cycle parking and general storage capacity – garages are often used for storing bicycles and other household items; and
  - the size of the garage – larger garages can be used for both storage and car parking, and many authorities now recommend a minimum size of 6 m by 3 m.

Footway parking

8.3.42 Footway parking (also called pavement parking) causes hazards and inconvenience to pedestrians. It creates particular difficulties for blind or partially-sighted people, disabled people and older people, or those with prams or pushchairs (Fig. 8.14). It is therefore recommended that footway parking be prevented through the design of the street.

8.3.43 Footway parking may also cause damage to the kerb, the footway and the services underneath. Repairing such damage can be costly and local authorities may face claims for compensation for injuries received resulting from damaged or defective footways.

8.3.44 In London footway parking is prohibited, unless expressly permitted by an order. Outside London footway parking is not generally prohibited, but local authorities can prohibit footway parking through a TRO. Any such order would, however, need to be enforced, which may be costly without an awareness-raising campaign. Local authorities should therefore aim to encourage drivers to regard the footway as reserved for pedestrians, and public information and education programmes can help to influence attitudes in line with this objective.

8.3.45 It is also possible to deter footway parking through physical measures, such as by installing bollards, raised planters or other street furniture, and by clearly indicating where people should park.
8.3.46 Further guidance on deterring footway parking is contained in Traffic Advisory Leaflet 04/93. The Department for Transport has also drawn together examples of authorities that have tackled footway parking (also see ‘Derby City Council case study box’).

8.3.47 Where there is a shared surface (Fig. 8.16), conventional footways are dispensed with, so, technically, footway parking does not arise. However, inconsiderate parking can still be a problem (Fig. 8.17). Parking spaces within shared surface areas which are clearly indicated – for example by a change in materials – will let people know where they should park. Street furniture and planting, including trees, can also be used to constrain or direct parking.

**Dimensions for car-parking spaces and manoeuvring areas**

8.3.48 For parking parallel to the street, each vehicle will typically need an area of about 2 m wide and 6 m long.

8.3.49 For echelon or perpendicular parking, individual bays will need to be indicated or marked. Bays will need to enclose a rectangular area about 2.4 m wide and a minimum of 4.2 m long. Echelon bays should be arranged so that drivers are encouraged to reverse into them. This is safer than reversing out, when visibility might be restricted by adjacent parked vehicles.

---


---

**Case study**

**Derby City Council – tackling pavement parking**

In a number of pavement parking hot-spots in Derby, the Council placed Parking on Pavements leaflets on vehicles parked on the pavement (Fig. 8.15). These leaflets give a clear message as to the negative effects of pavement parking, along with an indication of the penalties that pavement parkers could incur. Since 2002, over 300 Parking on Pavements leaflets have been placed on vehicles in hot spots, and the effect on pavement parking has been positive.

Figure 8.15 DCC’s Parking on Pavements leaflets.

---

Figure 8.16 Clearly indicated parking spaces on a shared surface in Morice Town Home Zone, Plymouth.

---

Figure 8.17 Untidy and inconsiderate parking.
8.3.50 Figures 8.18 and 8.19 show some suggested arrangements.

8.3.51 The width ($W$ in Fig. 8.18) needed to access echelon or perpendicular spaces conveniently, depends on the width of the bay and the angle of approach. For a 2.4 m wide bay, these values are typically:
- at 90 degrees, $W = 6.0$ m;
- at 60 degrees, $W = 4.2$ m; and
- at 45 degrees, $W = 3.6$ m.

8.3.52 These width requirements can be reduced if the spaces are made wider. Swept-path analysis can be used to assess the effect of oversized spaces on reducing the need for manoeuvring space (Fig 8.20).

8.3.53 Where space is limited it may not be possible to provide for vehicles to get into the spaces in one movement. Some back and fore manoeuvring may be required. This is likely to be acceptable where traffic volumes and speeds are low.

8.3.54 The dimensions given above for parking spaces and manoeuvring areas can also be applied to the design of underground and multi-storey car parks. For detailed guidance on the design of these types of parking, reference can be made to guidelines prepared by the Institution of Structural Engineers (IStructE).23

---

Parking spaces for disabled people

8.3.55 Detailed design specifications for parking spaces for disabled people are set out in Traffic Advisory Leaflet 05/95 and in Inclusive Mobility. Further advice is available in BS 8300: 2001. However, it is important to note that the diagrams on page 58 of Inclusive Mobility do not show the correct way to mark nor do they show the full range of dimensions for on-street bays for disabled people. The diagrams also show some of the kerb-mounted sign posts poorly positioned for people wishing to access their cars. Traffic signs and road markings for on-street bays reserved for disabled badge holders should comply with TSRGD and further guidance is provided in Traffic Signs Manual Chapter 3 and Traffic Signs Manual Chapter 5.

8.3.56 It is recommended that parking bays for disabled people are designed so that drivers and passengers, either of whom may be disabled, can get in and out of the car easily. They should allow wheelchair users to gain access from the side and the rear. The bays should be large enough to protect people from moving traffic when they cannot get in or out of their car on the footway side.

8.3.57 Inclusive Mobility recommends that dropped kerbs with tactile paving are provided adjacent to car-parking spaces to ensure that wheelchair users can access footways from the carriageway. (Wales: Further guidance on car parking standards and design for inclusive mobility will be produced in association with Welsh guidance on Design and Access Statements during 2007.)

8.3.58 The recommended dimensions of off-street parking bays are that they are laid out as a rectangle at least 4.8 m long by 2.4 m wide for the vehicle, along with additional space as set out in Inclusive Mobility.

8.4 Motorcycle parking

8.4.1 In 2003 there were 1.52 million motorcycles in use – representing around 5% of all motor vehicles. The need for parking provision for motorcycles is recognised in PPG13, which advises that, in developing and implementing policies on parking, local authorities should consider appropriate provision for motorcycle parking.

8.4.2 Guidance on motorcycle parking is contained in Traffic Advisory Leaflet 02/02. General advice on designing highways to meet the need of motorcycles is given in the Institute of Highway Engineers (IHIE) Guidelines for Motorcycling, published in 2005. Some of the guidance contained in that document has been repeated here for ease of reference.

8.4.3 The IHIE guidelines provide considerable detail on the provision of public motorcycle parking at locations such as educational establishments and workplaces, at shopping/entertainment areas and within residential areas lacking private parking opportunities.

8.4.4 Motorcyclists prefer to park close to their destination, in places where they can secure their machine. Designated motorcycle parking facilities that fail to meet these requirements will probably be overlooked in favour of informal spaces that are considered more suitable by owners.

8.4.5 Motorcycles are prone to theft, as they can be readily lifted into another vehicle. Security should therefore be a key consideration for those providing parking facilities for motorcycles.
8.4.6 In planning for private residential parking, in most situations motorcycles will be able to use car parking spaces, but in some situations it will be appropriate to provide designated motorcycle parking areas, particularly:

- where there is a high density of development and where car parking is likely to be intensively used; and
- where demand for motorcycle parking is expected to be significant.

8.4.7 Where designated parking is provided, covered spaces will provide protection from the elements.

8.4.8 Physical security need not be difficult or expensive to provide. Fixed features, such as rails, hoops or posts designed to provide a simple locking point to secure a motorcycle should be considered. Where motorcycles are parked in bays with one wheel against the kerb, a simple continuous steel rail satisfies most situations (Fig. 8.21). The rail should be set at around 600 mm high to accommodate the range of wheel sizes in use. The addition of guard railing prevents the locking rail from becoming a tripping hazard.

8.4.3 To estimate the space required for parking motorcycles, it is recommended that a 2.0 m by 0.8 m footprint is allowed per motorcycle. It is not necessary or desirable to mark individual bays. For regulated on-street parking, supported by a TRO, diagram 1028.4 of TSRGD should be used.
Traffic signs and markings
Chapter aims

- Discuss the influence of signs on making streets successful.
- Raise awareness of the visual impact of excessive signing.
- Direct practitioners to detailed guidance.
- Examine the flexibility allowed by the Traffic Signs Regulations and General Directions 2002 and the Traffic Signs Manual to ensure that signing is appropriate to the street and its intended uses.
- Encourage designers to optimise signing.

9.1 Traffic signs

9.1.1 The Traffic Signs Regulations and General Directions 2002 (TSRGD) is a regulatory document which details every traffic sign prescribed for use in the UK. It includes all of the prescribed road markings, as a road marking is legally a sign. TSRGD also stipulates the conditions under which each sign may be used.

9.1.2 Further advice on the use of signs is contained in the Traffic Signs Manual, which gives advice on the application of traffic signs in common situations. Chapters likely to be of particular relevance to street design include:

- Chapter 1 – Introduction sets out the background to, and principles of, signing;
- Chapter 3 – Regulatory Signs gives advice on the use of signs which give effect to traffic regulation orders (TROs);
- Chapter 4 – Warning Signs gives advice on signs used to warn of potential hazards;
- Chapter 5 – Road Markings gives advice on the use of road markings in common situations.

9.1.3 It is important that designers refer to the Traffic Signs Manual before embarking on the design of signing.

9.1.4 Supplementary advice is also published by the Department for Transport in Local Transport Notes (the LTN series) and Traffic Advisory Leaflets (the TAL series). The publications relevant to signing include LTN 1/94 The Design and Use of Directional Informatory Signs and TAL 06/05 Traditional Direction Signs.

9.1.5 Designers need to understand the status of these documents. Compliance with TSRGD is mandatory. The Traffic Signs Manual, the LTNs and the TALs are guidance.

9.1.6 On occasion designers may find that there is no prescribed sign which suits their purpose. If so, they can apply to the Department for Transport or the Welsh Assembly Government, as appropriate, for authorisation to use a non-prescribed sign. However, they should check carefully beforehand to make sure that the situation they wish to address is not already covered by TSRGD – some applications for non-prescribed signs turn out to be unnecessary for this reason.

9.1.7 Some streets feature few, or no, signs or markings. This may be appropriate in lightly-trafficked environments. It reduces sign clutter and the relative lack of signing may encourage lower vehicle speeds. However, it is worth monitoring such arrangements to confirm that the level of signing is correct.

9.1.8 In residential areas, minimal signing can work well if traffic volume and speed are low. Some designers have experimented with this approach on more heavily-trafficked streets, but there is insufficient evidence to date to be able to offer firm guidance here.

9.1.9 When planning how to sign a street, designers should note the following:

- the size of a sign should suit the speed of the traffic regardless of its purpose. It is not appropriate to use smaller signs simply because the sign is informative rather than a warning or regulatory sign. If the sign is necessary, motorists need to be able to read it;
- signs are most effective when not used to excess. Designers should ensure that each sign is necessary – they should use the flexibility within the TSRGD and associated guidance documents to ensure that signs are provided as required, but do not dominate the visual appearance of streets;
9.2 Designing signs

9.2.1 No signs are fundamentally required by TSRGD per se. Signs are only needed to warn or inform, or to give effect to TROs, and TSRGD simply sets out how signs must be used once it has been decided that they are necessary.

9.2.2 Designers should start from a position of having no signs, and introduce them only where they serve a clear function:

“Signs are used to control and guide traffic and to promote road safety. They should only be used where they can usefully serve these functions.”

9.2.3 Street layouts, geometries and networks should aim to make the environment self-explanatory to all users. Features such as public art, planting and architectural style can assist navigation while possibly reducing the need for signs.

9.2.4 The location and design of signs and signposts should be planned to permit effective maintenance (including access for cleaning equipment) and to minimise clutter.

9.2.5 Providing additional signs may not solve a particular problem. If signs have proved ineffective, it may be more appropriate to remove them and apply other measures rather than providing additional signs. If motorists already have all the information they need, additional signing will simply clutter the environment:

‘Appropriate warning signs can greatly assist road safety. To be most effective, however, they should be used sparingly.’

9.2.6 The TSRGD provide significant flexibility in the application of statutory signs, including the use of smaller signs in appropriate conditions. Designers need to be familiar with the Regulations and with the published guidance, determine what conditions they are designing for and specify appropriate signs. Working drawings for most prescribed signs are available free of charge on the Department for Transport website. Designers should always start from these when adapting a prescribed sign for special authorisation.

Clutter

9.1.10 Signs can clutter the street if used to excess (Fig. 9.1). Clutter is unattractive and can introduce hazards for street users.

9.1.11 Cluttering tends to take place over time by the incremental addition of signs to serve a particular purpose without regard having been given to the overall appearance of the street. It is recommended that street signs are periodically audited with a view to identifying and removing unnecessary signs.

9.1.12 In the case of new developments, some highway authorities seek to guard against having to install additional signs at their own expense later, by requiring all manner of signs to be provided by the developer at the outset. This can lead to clutter and is not recommended. The preferred way of addressing such concerns is to issue a bond to cover an agreed period, so that additional signs can be installed later at the developer’s expense if required.
### Table 9.1 Prompts for deciding on the appropriate level of signing

<table>
<thead>
<tr>
<th>Prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Users</strong></td>
</tr>
<tr>
<td>- What signs are necessary to assist users, including non-motorised users?</td>
</tr>
<tr>
<td>- Are directional signs needed for vehicular traffic, including pedal cyclists?</td>
</tr>
<tr>
<td>- Is information provided in the necessary formats to be accessible to all?</td>
</tr>
<tr>
<td>- Can navigation be assisted by means other than signs? For example, landmarks or other visual cues, etc.</td>
</tr>
<tr>
<td>- Can road markings be dispensed with in some places?</td>
</tr>
<tr>
<td><strong>Place</strong></td>
</tr>
<tr>
<td>- How can necessary information be integrated into the place without dominating it?</td>
</tr>
<tr>
<td>- Can some pedestrian direction signs be designed to contribute to the sense of place by using a locally distinctive format?</td>
</tr>
<tr>
<td>- Are traditional direction signs(\text{\textsuperscript{12}}) appropriate for the setting?</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
</tr>
<tr>
<td>- Are there any hazards that require signs?</td>
</tr>
<tr>
<td>- Can significant locations, such as school entrances, health centres, local shops, etc., be indicated by a measure such as surface variation to reduce the need for signs?</td>
</tr>
<tr>
<td><strong>Regulation</strong></td>
</tr>
<tr>
<td>- What signing is necessary to give effect to TROs?</td>
</tr>
<tr>
<td>- Is it necessary to regulate traffic or parking?</td>
</tr>
<tr>
<td>- Can behaviour be influenced by means other than signing? For example, can parking be managed by the physical layout of the street?</td>
</tr>
<tr>
<td><strong>Speed</strong></td>
</tr>
<tr>
<td>- Are signs specified at the minimum size required for the design speed of traffic (new build) or 85th percentile speed (existing streets)?</td>
</tr>
<tr>
<td>- Can traffic speeds be controlled by measures (such as planting to break-up forward visibility) to reduce the need for signs?</td>
</tr>
</tbody>
</table>

#### 9.2.7 When designing for minimal signing, care should be taken that safety hazards are not left unsigned.

#### 9.2.8 The Department for Transport may be prepared to authorise departures from TSRGD to reduce signs and road markings in environmentally sensitive streets.

#### 9.2.9 The Traffic Signs Manual states that ‘it is desirable to limit the number of posts in footways. Where possible signs should be attached to adjacent walls, so that they are not more than 2 metres from the edge of the carriageway, or be grouped on posts’\(\text{\textsuperscript{11}}\). Lighting equipment may also be mounted on walls (see Chapter 10).

#### 9.2.10 In existing neighbourhoods, there can be legal difficulties associated with attaching signs (or lighting) to private property – this is less of a problem with new build.

#### 9.2.11 Existing streets should be subject to a signs audit to ensure that they are not over-signed and, in particular, that old, redundant signs, such as ‘New road layout ahead’ have been removed.

#### 9.2.12 The prompts in Table 9.1 will help when deciding on the appropriate level of signing for a street.

#### 9.3 Common situations

##### Centre lines

#### 9.3.1 The use of centre lines is not an absolute requirement. The Traffic Signs Manual Chapter 5\(\text{\textsuperscript{13}}\) gives advice on the correct use of road markings.

#### 9.3.2 Centre lines are often introduced to reduce risk but, on residential roads, there is little evidence to suggest that they offer any safety benefits.

#### 9.3.3 There is some evidence that, in appropriate circumstances, the absence of white lines can encourage drivers to use lower speeds:

- research undertaken in Wiltshire found that the removal of the centre line led to a wider margin being maintained between opposing flows. There was no indication that drivers were encouraged to adopt inappropriate speeds. At 12 test sites, it resulted in slower speeds and reduced accidents, although the council had concerns regarding liability;\(\text{\textsuperscript{14}}\) and

---

research carried out in 20 residential areas during the preparation of MFS found no relationship between white centre lines and recorded casualties (see ‘Starston case study box’ and Fig. 9.3).

**Parking**

9.3.4 In residential locations, high levels of kerbside parking and inconsiderate behaviour can create problems with access, convenience and safety. It may be necessary to manage kerbside parking through the use of restrictions indicated by signs and road markings (also see Chapter 8).

9.3.5 For designated parking spaces, markings indicating the ends of bays may be omitted if physical delineation is used, e.g. build-outs (see *Traffic Signs Manual* Chapter 5).

9.3.6 The new edition of Chapter 3 of the *Traffic Signs Manual*, which the Department for Transport expects to consult on in summer 2007, will give more guidance on footway parking and shared parking spaces.

---

**Case study**

**Starston, Norfolk: effects of road markings and signs on traffic speed**

Figure 9.2 Starston, Norfolk.

Starston is a village on the B1134 in Norfolk (Fig. 9.2) which was experiencing problems with excessive traffic speed. It would have required a significant number of new signs to implement a 30 mph limit. Instead, road markings were removed, signing was rationalised and natural coloured road-surfacing was used. Over half of the signs were removed and many of the remainder were replaced with smaller ones. New, locally-designed place-name signs were also installed which helped reinforce the sense of place of the village. These measures led to mean speeds being reduced by up to 7 mph.\(^{15}\)

Following a Road Safety Audit, Norfolk County Council reinstalled the white lines and noted that, six months after the initial scheme opening and three months after the centre line markings were put back, there was some erosion of the earlier reduction achieved on the western approach, although they were sustained on the shorter eastern approach.\(^{16}\)

The erosion of speed reduction may have been a consequence of reinstalling the white lines but drivers were also responding to other factors.

---


9.3.7 Parking restrictions are often ignored where enforcement is limited. The use of planting and placing of street furniture may be a more attractive and effective way of managing parking (Fig. 9.4).

Junction priority

9.3.8 Most unsignalised junctions are designed assuming a dominant flow, with priority indicated by give-way signs and markings. There is, however, no statutory requirement for junction priority to be specified.

9.3.9 Some schemes, primarily on lower volume roads, feature unmarked junctions that require drivers to ‘negotiate’ their way through, with the aim of controlling speeds (Fig. 9.5). At UK residential sites studied in the preparation of MFS, unmarked junctions performed well in terms of casualties. There was, however, evidence of higher vehicle approach speeds compared with marked junctions. This may indicate an intention by drivers to slow down only when another vehicle is present. For unmarked junctions, it is recommended that the geometry on junction approaches encourages appropriate speeds.

9.3.10 Where there is a need to specify junction priority, it can be signed in three ways:
- a diagram 1003 ‘Give Way’ marking;
- a diagram 1003 ‘Give Way’ marking and a diagram 1023 triangle; and
- both these markings and a diagram 602 ‘Give Way’ sign.

9.3.11 It may be appropriate to begin with the simplest option, and introduce further signing only if deemed necessary in the light of experience.

Figure 9.5 Four-way junction with no marked priority.

Figure 9.6 Clear and legible street name sign attached to a building.

Informatory signs

9.3.12 LTN 1/94 The Design and Use of Directional Informatory Signs gives guidance on directional signs for drivers. The size of lettering (defined by the x-height) should be appropriate for the traffic speed. Guidance on relating the size of signs to traffic speed is given in Appendix A of the LTN.

9.3.13 Streets need to be easy to identify. This is particularly important for people looking for a street on foot. A good system of street name plates may also make direction signs to certain sites, such as schools, churches, shopping areas, etc., unnecessary. Name plates should be provided at each junction. They should be legible with a strong tonal contrast, for example black lettering on a white background. Attaching the name plates to structures can help reduce clutter (Fig. 9.6).

9.3.14 Non-statutory signs can also contribute to the sense of place of a street. This may include examples such as village signs, as well as the permitted use of a lower panel on statutory 20 mph zone signs, which allow for scheme specific artwork and messages (Fig. 9.7).

Figure 9.7 Design contributes to sense of place and reduces clutter by incorporating several direction signs on one post.
Street furniture and street lighting
Chapter aims

- Describe how street furniture that offers amenity to pedestrians is to be encouraged, but clutter avoided.
- Comment on street furniture and lighting design relating to context.
- Explain that lighting should be planned as an integral part of the street layout.
- Recommend that where lighting is provided it should conform to European standards.

10.1 Introduction

10.1.1 Street furniture and lighting equipment have a major impact on the appearance of a street and should be planned as part of the overall design concept. Street furniture should be integrated into the overall appearance of a street. Street audits can help determine what existing street furniture and lighting is in place, and can help designers respond to the context.

10.1.2 It is especially important that, in historic towns and conservation areas, particular attention is paid to the aesthetic quality of street furniture and lighting. Care should be taken to avoid light pollution and intrusion, particularly in rural areas. In some cases it may not be appropriate to provide lighting, for example in a new development in an unlit village.

10.1.3 Street furniture that encourages human activity can also contribute to a sense of place. The most obvious example of this is seating, or features that can act as secondary seating. In addition, street features such as play equipment may be appropriate in some locations, particularly in designated Home Zones, in order to anchor activity.

10.1.4 Where street furniture or lighting is taken out of service, it should be removed.

10.2 Street furniture

10.2.1 Excessive street furniture, including equipment owned by utilities and third parties, should be avoided.

10.2.2 Street furniture of direct benefit to street users, particularly seating, is encouraged but should be sympathetic to the design of the street and respect pedestrian desire lines (Fig. 10.1).

10.2.3 Seating is necessary to provide rest points for pedestrians, particularly those with mobility or visual impairments, and extra seating should be considered where people congregate, such as squares, local shops and schools. Guidance is given in Inclusive Mobility¹ and BS 8300². Seating can sometimes attract anti-social behaviour and therefore should be located where there is good lighting and natural surveillance.

10.2.4 Although much street furniture is provided for the benefit of motorised users, it is generally located on the footway and can contribute to clutter. In some circumstances, it may be possible to reduce footway clutter by placing some of these items on build-outs.

10.2.5 Street furniture, including lighting columns and fittings, needs to be resistant to vandalism and be placed in positions that minimise risk of damage by vehicles.

10.2.6 Street furniture and lighting should be located within the limits of the adoptable highway. Street furniture should be aligned on footways, preferably at the rear edge in order to reduce clutter. Care should be taken that street furniture at the rear edge of the footway does not make adjoining properties less secure by providing climbable access to windows.

---

10.2.7 All street furniture should be placed to allow access for street cleaning.

10.2.8 Guard railing is generally installed to restrict the movement of vulnerable road users (Fig. 10.2). In some cases guard railing has been introduced in specific response to accidents.

10.2.9 Guard railing should not be provided unless a clear need for it has been identified (Fig. 10.2). Introducing measures to reduce traffic flows and speeds may be helpful in removing the need for guard railing. In most cases, on residential streets within the scope of MfS, it is unlikely that guard railing will be required.

10.2.10 A Local Transport Note giving further guidance on guard railing is currently in preparation.

10.2.11 It may sometimes be necessary to introduce barriers to pedestrian movement. Where they are required, consideration should first be given to the use of features such as surface textures, bench seating and planting that can guide pedestrian movement whilst also contributing to the amenity of the street.

10.3 Lighting

10.3.1 Lighting can contribute to:
- reducing risks of night-time accidents;
- assisting in the protection of property;
- discouraging crime and vandalism;
- making residents and street users feel secure; and
- enhancing the appearance of the area after dark.

10.3.2 Lighting may not be appropriate in all locations or contexts. However, if it is to be provided it should be of high quality. Lighting should generally be in accordance with BS EN 13201-2, BS EN 13201-3 and BS EN 13201-4. Guidance on lighting design is given in BS 5489-1, Code of Practice for the Design of Road Lighting, to comply with the requirements of BS EN 13201.

10.3.3 Where streets are to be lit, lighting should be planned as an integral part of the design of the street layout, and in conjunction with the location and anticipated growth of planting. This may require coordination between authorities to ensure that similar standards of lighting are provided for the adopted highway and un-adopted areas, such as car parking. The potential for planting to shade out lighting through growth should be considered when deciding what to plant.
10.3.4 Lighting columns should be placed so that they do not impinge on available widths of footways in the interests of wheelchair users and people pushing prams, or pose a hazard for blind or partially-sighted people. Consideration should be given to incorporating colour contrast bands on lighting columns (see also paragraph 9.1.9).

10.3.5 Lighting should illuminate both the carriageway and the footway, including any traffic-calming features, to enable road users to see potential obstacles and each other after dark. The lighting design should ensure that shadows are avoided in streets where pedestrians may be vulnerable. Adequate lighting helps reduce crime and the fear of crime, and can encourage increased pedestrian activity.

10.3.6 While lighting fulfils a number of important purposes in residential areas, care should be taken not to over-light, which can contribute unnecessarily to light pollution, neighbourhood nuisance and energy consumption.

10.3.7 Lighting arrangements may be used to identify the functions of different streets. For example, a change of light source to provide whiter lighting can distinguish a residential or urban street from the high-pressure sodium (honey coloured) and the low-pressure sodium (orange coloured) lighting traditionally used on traffic routes. This contrast may be reduced over time if white-light sources become more commonly used in road-lighting schemes.

**Lighting equipment on buildings**

10.3.8 Consideration should be given to attaching lighting units to buildings to reduce street clutter (Fig. 10.3). While maintenance and access issues can arise from the installation of such features on private property, some authorities have successfully addressed these. There are likely to be fewer challenges arising from the placement of lighting on buildings in new-build streets. Where lighting units are to be attached to a building, an agreement will be required between the freeholder of the property, any existing tenants and the highway/lighting authority.

10.3.9 In attaching lighting to buildings, it should be noted that it may become subject to the Clean Neighbourhoods and Environment Act 2005. It is possible that lighting could then be subject to control by Environmental Health officers if it is deemed to constitute a nuisance. It is therefore important that wall-mounted lighting is carefully designed to reduce stray light.

10.3.10 Key issues in the provision of lighting in residential areas are:
- context;
- lighting intensity;
- scale; and
- colour.

Figure 10.3 Street light mounted on a building.
Context

10.3.11 Lighting should be appropriate to the context. In some locations, such as rural villages, lighting may not have been provided elsewhere in the settlement and therefore it would be inappropriate in a new development. Often, lighting suits highway illumination requirements but is not in keeping with the street environment or the range of uses of that street. A street audit can be helpful in determining both the level of lighting and the type of equipment used in the area.

10.3.12 Over-lighting should be avoided. More detailed information is given in the Guidance Notes for the Reduction of Obtrusive Light.\(^8\) This provides advice on techniques to minimise obtrusive light and recommends that planning authorities specify four environmental zones for lighting in ascending order of brightness, from National Parks and Areas of Outstanding Natural Beauty to city centres. This is helpful in determining limits of light obtrusion appropriate to the local area.

Lighting intensity

10.3.13 Guidance on the appropriate level of lighting in an area is contained in BS 5489-1 Annex B.\(^9\) This advice provides a systematic approach to the choice of lighting class based on:

- type of road or area;
- pedestrian and cycle flow;
- presence of conflict areas;
- presence of traffic-calming features;
- crime risk; and
- ambient luminance levels.

10.3.14 BS EN 13201-2, Road Lighting – Performance Requirements,\(^10\) gives details of the necessary minimum and average levels of lighting to be achieved at each of the lighting classes. For streets within the scope of the MFS, it is likely that Class ME (primarily vehicular) lighting will be inappropriate and that Classes S (for subsidiary routes) or CE (for conflict areas) should be specified.

10.3.15 Lighting levels do not have to be constant during the hours of darkness. Increasingly equipment is available which will allow street lighting to be varied or switched off based on timing or ambient light levels. This offers opportunities to design variable lighting to maximise the benefits while reducing negative impacts at times when lower lighting levels may be adequate.

10.3.16 Continuity of lighting levels is important to pedestrians. Sudden changes in lighting level can be particularly problematic for partially-sighted people.

Scale

10.3.17 As much street lighting is actually provided for highway purposes, it is often located at a height inappropriate to the cross section of the street and out of scale with pedestrian users.

10.3.18 In street design, consideration should be given to the purpose of lighting, the scale of lighting relative to human users of the street, the width of the street and the height of surrounding buildings. For example, a traffic-calming scheme in Latton in Wiltshire reduced the height of lighting columns by around 40% to make the appearance less urban. In a survey of residents, 58% thought it was a good idea, and only 3% opposed. This arrangement resulted in less intrusion of light into bedroom windows.\(^11\)

10.3.19 Where highway and pedestrian area lighting are both required, some highway authorities installed lamp columns featuring a secondary footway light mounted at a lower height. This can assist in illuminating pedestrian areas well, particularly where footways are wide or shaded by trees. Careful design is essential to ensure that such secondary luminaries do not have a detrimental effect on the uniformity of the scheme or increase light pollution.

10.3.20 While reducing the height of lighting can make the scale more human and intimate, it will also reduce the amount of coverage from any given luminaire. It is therefore a balance between shortening columns and increasing their number.

---

10.3.21 Generally in a residential area, columns of 5–6 m, i.e. eaves height, are most appropriate. It should be noted that, if lighting is less than 4 m in height, it may no longer be considered highway lighting and therefore the maintenance responsibility will rest with the lighting authority rather than the highway authority.

Other lighting considerations

10.3.24 In some contexts, lighting can contribute to the sense of place of a street, with both active and passive (reflective) lighting features blurring the boundary between function and aesthetic contribution to the streetscape.

10.3.25 As with other forms of street furniture, there are longer-term maintenance issues associated with the choice and location of lighting equipment. It is recommended that this be addressed in the planning process and that equipment which is both sympathetic to the local vernacular and for which adequate replacement and maintenance stock is available be specified.

10.3.26 In developing lighting schemes, it should be recognised that there will be an interaction between light shed and light reflected from pavement surfaces, etc. Lighting should therefore be developed in coordination with decisions about materials and other street furniture.

Colour

10.3.22 The colour of lighting is another important consideration. This relates both to people’s ability to discern colour under artificial light and the colour ‘temperature’ of the light. Light colour temperature is a consequence of the composition of the light, ranging simply from blue (cold) to red (warm).

10.3.23 In terms of discerning colour, ‘colour rendering’ is measured on a Colour Rendering Index of Ra0–Ra100,\(^\text{12}\) from no colour differentiation to perfect differentiation. Generally pedestrians prefer whiter lighting. It provides better colour perception which makes it easier to discern street features, information and facial expressions. The latter can be important in allaying personal security concerns. For the lighting of residential and urban streets, an Ra of 50 is desirable – and at least Ra60 is preferable for locations of high pedestrian activity.

Materials, adoption and maintenance
11.1 Introduction

11.1.1 The quality of the environment created by new development needs to be sustained long after the last property has been occupied. This requires good design and high-quality construction, followed by good management and maintenance.

11.1.2 The latter tasks are commonly the responsibility of the local highway authority, although other public and private-sector bodies can also be involved. It is therefore important that the highway engineers responsible for adoption should be included in all key decisions from the pre-planning stage through to detailed design.

11.2 Materials and construction

11.2.1 Developers and local authorities are encouraged to consider the innovative use of materials, processes or techniques. This could be supported by local authorities adopting a wide palette of local and natural materials, bearing whole-life costs in mind.

11.2.2 The inflexible application of standard construction details and materials may not be appropriate in new housing layouts. Local authorities should be prepared to allow the use of alternative materials, landscaping treatment and features (Fig. 11.1). However, it is recommended that all materials meet the following requirements:

- easy to maintain;
- safe for purpose;
- durable;
- sustainable (including the manufacturing process and energy use); and
- appropriate to the local character.

Figure 11.1 The use of good-quality materials achieves a sense of place without leading to excessive maintenance costs.
11.3 Planting

11.3.1 Planting should be integrated into street designs wherever possible. Planting, particularly street trees, helps to soften the street scene while creating visual interest, improving microclimate and providing valuable habitats for wildlife (Fig. 11.2). Care needs to be taken to preserve existing trees, particularly when changes to a street are planned (Fig. 11.3).

11.3.2 Where trees are to be used, careful consideration needs to be given to their location and how they are planted. Trench planting, irrigation pipes and urban tree soils will increase the chance of trees establishing themselves successfully, thereby minimising maintenance and replacement costs.

11.3.3 Consideration should also be given to the potential impact of planting on adjacent buildings, footway construction and buried services. Concerns have been expressed by highway authorities regarding the impact that tree roots can have on highway drainage – this can be reduced with tree pits (see Fig. 11.4). Detailed advice on this issue is contained in Tree Roots in the Built Environment.  

11.3.4 Trees and shrubs should not obstruct pedestrian sightlines. In general, driver sightlines also need to be maintained, although vegetation can be used to limit excessive forward visibility to limit traffic speeds. Slow growing species with narrow trunks and canopies above 2 m should be considered. Vegetation should not encroach onto the carriageways or footways.

11.3.5 Maintenance arrangements for all planted areas need to be established at an early stage, as they affect the design, including the choice of species and their locations.

11.3.6 Generally, any planting intended for adoption by a public body should match standards set locally and be capable of regeneration or easy renewal if vandalised. Planting needs to be designed for minimal maintenance. Evidence that buildings and walls have been built with foundations to allow for tree growth may be required.
11.3.7 The planting of less robust species which require specialist skilled maintenance, or more frequent maintenance visits than usual, are unlikely to be accepted for adoption by the local or highway authority and should be avoided.

11.3.8 Alternatives to formal adoption may require innovative arrangements to secure long-term landscape management. These may include the careful design of ownership boundaries, the use of covenants, and annual service charges on new properties.

11.3.9 Funding for initial set-up costs and an endowment to generate income for maintenance (e.g. executive staff, gardening staff, site offices, equipment, machinery, stores, compost/leaf litter-bins), and community and resident facilities capable of generating regular income, may be appropriate.

11.3.10 Guidance on planting in street environments includes:

- Roots and Routes: Guidelines on Highways Works and Trees – consultation paper; and
- Tree Roots in the Built Environment.

11.3.11 Further advice on planting considerations is set out in Chapter 5.

---

2 See www.dft.gov.uk
5 NJUG 10 is under review at the time of writing. Please visit www.njug.co.uk/publications.htm for more details.
11.4 Drainage

Introduction

11.4.1 One of the functions of a street is to provide a route for foul water and surface water drainage (Fig. 11.5).

Foul water drainage

11.4.2 The majority of streets are designed to accommodate the disposal of foul water from buildings. This will normally take the form of drains around the curtilage of buildings which come under Part H of the Building Regulations (2000),6 and sewers located in the street, where the relevant guidance is found within Sewers for Adoption.7

11.4.3 The adoption process for sewers is set by section 104 of the Water Industry Act 1991.8 Sewers for Adoption acts as a guide to facilitate the procurement, design, maintenance and adoption of sewers, and is accompanied by a Model Agreement used by sewerage undertakers and developers.

11.4.4 An important consideration when designing sewers is their siting within the street and the impact they may have on detailed design issues. Advice on these matters is given in Sewers for Adoption.

Surface water drainage

11.4.5 The street provides a conduit for the storage or disposal of rainwater and, by its nature and its impact on the environment, the management of surface water runoff is a more complex matter than dealing with foul water. The Government’s strategy in this area is set out in Making Space for Water9, with the emphasis on the sustainable management of surface water.

11.4.6 When considering the management of surface water, designers, developers and authorities need to take account of the

---

Figure 11.5 Sustainable drainage systems can form an integral and attractive part of the street.

---

7 Water UK (2006) Sewers for Adoption, 6th edn. Swindon: WRc plc
8 Water Industry Act 1991 London HMSO.
14 Available from www.njug.co.uk

11.4.7 The planning and management of surface water discharge from buildings and highways requires a co-ordinated approach to evaluating flood risk and developing an integrated urban drainage strategy.

11.4.8 A Flood Risk Assessment (FRA) will demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed now and taking climate change into account. FRA is required for planning applications where flood risk is an issue, depending on their location and size, as set out in Annex D of PPS25.

11.4.9 The responsibility for undertaking an FRA rests with the developer. However, PPS25 advocates a partnership approach, consulting with the relevant stakeholders to compile the FRA. This will involve the planning authority, the Environment Agency and sewerage undertakers. (Wales: refer to TAN 15.)

11.4.10 A Practice Guide has been published as a ‘Living Draft’ to accompany PPS25. It contains guidance in the management of surface water and FRAs. The Practice Guide also covers other areas of flood risk which may be worth considering in the way streets can be used to accommodate or eliminate flood risk.

Sustainable drainage systems

11.4.11 The term Sustainable Drainage Systems (SUDS) covers the whole range of sustainable approaches to surface water drainage management. SUDS aim to mimic natural drainage processes and remove pollutants from urban run-off at source. SUDS comprise a wide range of techniques, including green roofs, permeable paving, rainwater harvesting, swales, detention basins, ponds and wetlands. To realise the greatest improvement in water quality and flood risk management, these components should be used in combination, sometimes referred to as the SUDS Management Train.

11.4.12 SUDS are more sustainable than conventional drainage methods because they:
- manage runoff flow rates, using infiltration and the retention of storm water;
- protect or enhance the water quality;
- are sympathetic to the environmental setting and the needs of the local community;
- provide a habitat for wildlife in urban watercourses; and
- encourage natural groundwater recharge (where appropriate).

They do this by:
- dealing with runoff close to where the rain falls;
- managing potential pollution at its source; and
- protecting water resources from pollution created by accidental spills or other sources.

11.4.13 The use of SUDS is seen as a primary objective by the Government and should be applied wherever practical and technically feasible.

11.4.14 Detailed guidance on SUDS is contained in the Interim Code of Practice for Sustainable Urban Drainage Systems, Part H of the Building Regulations and Sewers for Adoption. All stakeholders need to be aware of the importance of the application of SUDS as part of an integrated urban drainage strategy for a development.

11.5 Utilities

11.5.1 Most residential streets provide routes for statutory undertakers and other services. Detailed advice on providing for utilities in new developments can be found in NJUG Guidance.

11.5.2 It is best to liaise with the utility companies when the layouts of the buildings and streets are being designed. In nearly all cases this should be prior to making the planning application. Where streets are to be adopted, it will be necessary to ensure that all legal documentation required by the utility companies is completed as soon as is possible.
11.5.3 Similar principles apply to streets that are to remain private. It is important that the rights of access to the development by utility companies are set out in the management company’s obligations. Residents will need to be made aware of these rights.

11.5.4 The availability and location of existing services should be identified at the outset. The requirements for new apparatus should be taken into account in the layout and design of the streets, and a balance should be struck between the requirements of the utility companies and other objectives. The locations of any existing trees or shrubs, and proposals for new planting, will require special consideration.

11.5.5 Where possible, all utility apparatus should be laid in ‘corridors’ throughout the site. This will facilitate the installation of the services and any future connections as the development proceeds. Consideration should be given to the use of trenches and ducts to facilitate this.

11.5.6 In designing for utilities, there are advantages in developing streets along reasonably straight lines rather than introducing gratuitous bends and curves (but see Section 7.4 regarding the control of traffic speeds). This practice will assist in simplifying utility runs, with a corresponding improvement in the efficient use of land and a reduced need for inspection chambers.

11.5.7 It may be possible to install utilities’ apparatus in adopted service strips in privately-maintained land adjacent to the carriageway, provided early discussions are held with service providers and the highway authority, and that adequate safeguards are provided. Conveyance documents must incorporate perpetual rights for service providers within the service strip. Such service strips should be clearly marked and residents should be made aware of restrictions that apply to the use of these areas.

11.5.8 There have been problems with service strips where residents have not been aware of them. In addition, service strips can be unsightly and limit opportunities for planting. As an alternative, placing apparatus in the highway may be acceptable on well-connected networks, as traffic can be routed around a point closure if it is necessary to excavate the carriageway for maintenance.

11.5.9 In shared surface areas, such as in some Home Zones, the routing of services will require careful consultation between designers, utility companies and the highway authority. This consultation should take place at an early stage in the planning and design process. It may be necessary to route services in the vehicle track in some places, but as noted above this may not be a significant problem on well-connected networks.

11.6 Arrangements for future maintenance

11.6.1 It is important that the future maintenance arrangements of the streets and public spaces in a development are decided early in the design process. If the streets are to be adopted by the local highway authority, the layout and material choices need to be acceptable to the authority.

11.6.2 It is possible for streets to remain private but a properly-constituted body with defined legal responsibilities will need to be established to maintain the streets to the common benefit of residents. Further guidance on management companies is given in Section 11.9.

11.6.3 A highway authority will require legal certainty that the streets are going to be properly maintained in perpetuity by these private arrangements. In the absence of this, the Advance Payments Code contained in the Highways Act 1980\(^\text{15}\) enables highway authorities to secure funding to meet any costs of bringing new roads up to an adoptable standard.

\(^{15}\) Highways Act 1980. London: HMSO.
11.6.4 A highway authority may be unwilling to adopt items such as planting and street furniture (e.g. play equipment and public art) which are not considered to relate to the highway functions of the street. If there is no private management company, arrangements can be made for such features to be maintained by another public body, such as a district or town/parish council (e.g. by designating areas of public open space).

11.6.5 In these circumstances the developer must ensure that there is agreement between the county, district and town/parish councils as to:

- which authority is best able in practice to take day-to-day responsibility for each element of planting and/or non-highway-related furniture;
- the future maintenance responsibilities, obligations and liabilities arising from such planting, street furniture etc.; and
- the apportionment of these contributions among the authorities concerned in the light of the apportioned responsibilities/ liabilities.

11.7 Highway adoption – legal framework

**Section 38 Agreements**

11.7.1 Section 38 of the Highways Act 1980 gives highway authorities the power to adopt new highways by agreement and this is the usual way of creating new highways that are maintainable at the public expense. The Act places a duty on highway authorities to maintain adopted highways at public expense under section 41.

11.7.2 Under a Section 38 Agreement, the developer is obliged to construct the streets to an agreed standard, having first secured technical approval of the designs from the highway authority. A fee is normally payable by the developer to the highway authority to cover its reasonable costs in checking the design and supervising the construction of the works.

11.7.3 The Section 38 Agreement sets out the obligations of the developer to construct the streets and to maintain them for a set period – normally 12 months. Following the satisfactory discharge of these obligations, the new streets are automatically dedicated as public highway and are maintainable at the public expense.

**Advance Payments Code**

11.7.4 The Advance Payments Code (section 219 to section 225 of the Highways Act 1980) provides for payments to be made to a highway authority to cover future maintenance liabilities in the absence of a Section 38 Agreement.

11.7.5 The Advance Payments Code provides a compulsory process which involves cash deposits being made by the developer to the highway authority before building works can commence. It is an offence to undertake any house building until these payments have been deposited with the highway authority. The money securing the road charges liability is used to offset the cost of the works in instances where the highway authority carries out a Private Street Works Scheme to make up streets to an acceptable standard.

11.7.6 Thus, before any construction begins, the developer will normally be required either:

- to secure the payment of the estimated cost of the highway works under the Advance Payments Code provisions as set out in section 219 of the Act; or
- to make an agreement with the highway authority under section 38 of the Act and provide a Bond of Surety.

**Private streets**

11.7.7 Where a developer wishes the streets to remain private, some highway authorities have entered into planning obligations with the developer under section 106 of the Town and Country Planning Act 1990,16 which requires the developer to construct the new streets to the authority’s standards and to maintain them in good condition at all times.
11.7.8 Such a planning obligation enables the developer to avoid making payments under the Advance Payments Code, as the highway authority can then be satisfied that the streets will not fall into such a condition that a Private Streets Work Scheme will be needed. The planning obligation thus provides exemption to the developer from making advance payments under section 219(4)(e) of the Highways Act 1980.

What is adoptable?

11.7.9 The highway authority has considerable discretion in exercising its powers to adopt through a Section 38 Agreement under the Highways Act 1980, but there are other mechanisms contained in the Act which help to define the legal tests for adoption.

11.7.10 Although seldom used, section 37 of the Act does provide an appeal mechanism in the event of a highway authority refusing to enter into a Section 38 Agreement. Under section 37(1), a developer can give notice to the authority that he/she intends to dedicate a street as a public highway.

11.7.11 If the authority considers that the highway ‘will not be of sufficient utility to the public to justify its being maintained at the public expense’, then it will need to apply to a magistrates’ court for an order to that effect.

11.7.12 A further possibility is that the authority accepts that the new highway is of sufficient utility but considers that it has not been properly constructed or maintained, or has not been used as a highway by the public during the 12-month maintenance period. On these grounds it can refuse to accept the new road. In this case the developer can appeal to a magistrates’ court against the refusal, and the court may grant an order requiring the authority to adopt the road.

11.7.13 Section 37 effectively sets the statutory requirements for a new street to become a highway maintainable at the public expense. The key tests are:

- it must be of sufficient utility to the public;
- and
- it must be constructed (made up) in a satisfactory manner.

In addition:

- it must be kept in repair for a period of 12 months; and
- it must be used as a highway during that period.

11.7.14 There is little case law on the application of these tests, however.

11.7.15 Highway authorities have also tended to only adopt streets that serve more than a particular number of individual dwellings or more than one commercial premises. Five dwellings is often set as the lower limit, but some authorities have set figures above or below this.

11.7.16 There is no statutory basis for the lower limit on the number of dwellings justifying adoption. The use of five dwellings as a criterion may have come from the notional capacity of private service supplies (gas, water, etc.) but it is now more commonplace for utilities to lay mains in private streets.

11.7.17 It is not desirable for this number to be set too high, as this would deny residents of small infill developments the benefit of being served by an adopted street.

11.7.18 It is recommended that highway authorities set a clear local policy on this issue.

Adoption of streets on private land

11.7.19 Under some circumstances the developer may not be able to dedicate a certain area of land as highway because he does not own it. If so, the road (or footway, etc.) can be adopted using the procedures under section 228 of the Highways Act 1980.
11.7.20 On completion of the works to the satisfaction of the highway authority, and following any agreed maintenance period, notices are posted on site. These state that unless objections are received from the owner of the land, the highway in question will become maintainable at public expense one month after the date of the notice. An inspection fee is payable in the same way as for Section 38 Agreements.

Section 278 Agreements

11.7.21 A Section 278 Agreement, under the Highways Act 1980, enables improvements to be made to an adopted highway that convey special benefit to a private body – for example, the formation of a new access to a development site, or improvements to permeability and connectivity that help strengthen integration with an existing community.

11.7.22 Before entering into such an agreement, a highway authority will need to be satisfied that the agreement is of benefit to the general public. The developer will normally bear the full cost of the works, and a bond and inspection fee is also payable, as with Section 38 Agreements.

11.8 Design standards for adoption

11.8.1 The highway authority has considerable discretion in setting technical and other requirements for a new highway. Concerns have been raised over the rigid adherence to these requirements, leading to refusal to adopt new streets. This issue was explored in Better Streets, Better Places.\(^\text{17}\)

11.8.2 Highway authorities are nowadays encouraged to take a more flexible approach to highway adoption in order to allow greater scope for designs that respond to their surroundings and create a sense of place. It is recognised, however, that highway authorities will need to ensure that any future maintenance liability is kept within acceptable limits.

11.8.3 One way of enabling designers to achieve local distinctiveness without causing excessive maintenance costs will be for highway authorities to develop a limited palette of special materials and street furniture. Such materials and components, and their typical application, could, for example, be set out in local design guidance and be adopted as a Supplementary Planning Document.

11.8.4 Developers should produce well-reasoned design arguments, and articulate these in a Design and Access Statement (where required), particularly if they seek the adoption of designs that differ substantially from those envisaged in a local authority’s design guide or MFS. However, provided it can be demonstrated that the design will enhance the environment and the living experience of the residents, and that it will not lead to an undue increase in maintenance costs, then highway authorities should consider responding favourably.

11.8.5 Drawings should indicate which parts of the layout the developer expects to be adopted and how the adoption limits are to be differentiated on the ground. Widths and other key carriageway dimensions, and the location and dimensions of parking spaces, should also be shown, together with full details of all planting.

11.8.6 Highway authorities would be expected to adopt street layouts complying with their Design Guide which have been constructed in accordance with the highway authority’s specification of works. They would normally be expected to adopt:
- residential streets, combined footways and cycle tracks;
- footways adjacent to carriageways and main footpaths serving residential areas;
- Home Zones and shared–surface streets;
- land within visibility splays at junctions and on bends;
- trees, shrubs and other features that are an integral part of vehicle speed restraints;
- any verges and planted areas adjacent to the carriageway;
- Structures, i.e. retaining walls and embankments, which support the highway or any other adoptable area;

---

• street lighting;
• gullies, gully connections and highway drains, and other highway drainage features;
• on-street parking spaces adjacent to carriageways; and
• service strips adjacent to shared surface streets.

11.9 Private management companies

11.9.1 Any unadopted communal areas will need to be managed and maintained through private arrangements. Typical areas maintained in this way include communal gardens, shared off-street car parking, shared cycle storage, communal refuse storage and composting facilities, and sustainable energy infrastructure.

11.9.2 Where a private management company is established, it is desirable for residents to have a strong input into its organisation and running in order to foster community involvement in the upkeep of the local environment.
Index
Access See Pedestrian access; Vehicle access
Adoption of streets
design standards 11.8
drainage systems 11.4.3
landscaping 11.3.6–7, 11.6.4
legal framework 11.7
street furniture 11.6.4
Advance Payments Code 11.6.3, 11.7.4–6
Advertising boards 6.3.26
Alignment of street 4.5.5, 6.5.5, 7.2.6–7
Alleyways 4.5.1, 4.6.3
Allocated parking 8.3.10–11
Audits
quality 3.7
road safety 3.7.5–13
Backs of houses 4.6.3, 5.6
Barriers, pedestrian 10.2.11
Blind people See Visual impairment
Block paving 7.2.15
Block structures 4.5.2, 4.5.4, 7.3.17–18
Blue Badge parking 8.3.24–27
Building frontages
oversailing of footways 6.3.24
in relation to street 2.3.8, 5.5–6, 5.9, 7.3.5
vehicle access 7.9
Building height, in relation to street width 5.4.3–4
Bus dimensions 6.5.2
Bus lay-by 6.5.10
Bus routes 6.5.1–8
Bus stops 6.5.9–15
Car clubs 8.3.7–9
Car-free developments 6.6.3
Car parking 8.3
allocated and unallocated parking 8.3.10–11
crime prevention 4.6.3
design and location of spaces 8.3.29–36
dimensions for spaces and manoeuvring 8.3.48–54, 8.3.58
for disabled people 8.3.24–27, 8.3.55–57
effect on emergency vehicle access 6.7.3
efficient use of space 8.3.37–38
footway parking 8.3.42–47
front gardens 5.9.2
garages 8.3.39–41
government policy 8.3.1–2
level of provision 8.3.3–6, 8.3.18
off-street 6.3.28, 6.6.3, 8.1.4
on-street 7.8.6, 8.3.12–20
visitors’ 8.3.21–23
Car use (See also Motor vehicles) 4.2.1, 4.3.2–3, 4.4.1
Carriageway alignment See Alignment of street
Carriageway widths See Width, street
Centre lines 9.3.1–3
Characterisation of streets 2.4.9–14, 4.7.1, 7.2.4
Claims against highway authorities 2.6.4–8
Classification of streets See Street types
Closed-off streets 6.3.11, 6.4.2
Clutter 5.10, 9.1.10–12, 10.2.4
Collaborative design 1.3.1–3, 3.2, 3.6.32
Commercial vehicles 6.6.1
Communal parking 4.6.3, 8.3.11
Communal space 4.5.2, 5.7, 10.2.3
management and maintenance 11.9.1
Community function (See also Social interaction) 2.2.5, 5.7
Connectivity (See also Permeable street layouts)
crime prevention 4.6.2–3
cycle links 4.2.4, 6.4.2
external connections 4.2.5–9
pedestrian links 4.2.4, 6.3.11
Conservation areas 3.6.17, 3.8.6
street furniture and lighting 10.1.2
Context appraisal 3.6.1–7
Continental-style roundabouts 7.3.16
Corner radii 6.3.12–14, 6.4.6, 6.5.8
at bus stops 6.5.10, 6.5.13
parking on 8.3.42–47
width 6.3.22–23
Forward visibility 7.8
Foul water drainage 11.4.2
Front gardens 5.6.1, 5.9.2
parking use 8.3.5
Fronts of buildings See Building frontages
Functions of streets 2.3
Future-proofing 3.6.19, 5.13
Garages 8.3.39–41
doors oversailing footway 6.3.24
Geometric choices 4.5.5–7, 6.6.1
Government policy and guidance 2.5.2, 2.5.4
Gradients
- cycling 6.4.11
- pedestrians 6.3.20, 6.3.27
- waste collection vehicles 6.8.9
Granite sets 6.4.12
Guard railing 10.2.8–10
Headroom, cycling 6.4.11
Height of buildings, in relation to street width 5.4.3–4
High streets 2.4.10
Highway authorities 1.4.1–2
- adoption of streets 11.7–8
- joint working 3.2.1–2
- responsibilities 2.4.7
- categorisation of street/road types 2.7.1
- disability equality 2.7.1
- maintenance 2.6.4–5, 2.6.8, 11.1.2
- road safety 2.6.6, 3.7.6
Historic towns, street furniture and lighting
(See also Conservation areas) 10.1.2
Historical perspective 2.2.3
Home Zones 2.4.10, 7.2.16–22
- routing of services 11.5.9
- street furniture 10.1.3
Housing densities 4.4.3
Improvement schemes 3.1.3, 3.6.4
Inclusive design 1.1.4–5, 1.6.1, 6.1
Informal crossings 6.3.9
Informatory signs 9.3.12–14
Integrated street design See Collaborative design
Joint working See Collaborative design
Junction design 5.5, 7.3
- corner radii 6.3.12–14, 6.4.6, 6.5.8
- cyclists’ needs 6.4.6
- junction priority 7.3.7, 7.4.4, 9.3.8–11
- pedestrian needs 6.3.12
- spacing of junctions 7.3.17–18, 7.4.4
- visibility splays 7.7
Kerb build-outs 6.3.9
Kerb line 7.2.7
Kerbing
- dropped kerbs 6.3.9, 6.3.12, 8.3.57
Landscape Character Appraisals 3.6.2
Landscaping 5.7.1–2, 5.12, 11.3
- adoption of streets 11.3.6–7, 11.6.4
- parking areas 9.3.7
- shading of lighting 10.3.3
Large-scale developments 3.6.19
Lay-by, bus 6.5.10
Layouts
- context appraisal 3.6.2–4
- conventional approach 2.2.3–4, 4.5.3
- crime prevention 4.6
- detailed plans 3.6.25–28
- factors influencing 5.8
- movement framework 4.2
- outline plans 3.6.15–19
- spacing of junctions 7.3.17–18, 7.4.4
- structures and geometry 4.5
- sustainable communities 4.3
- walkable neighbourhoods 4.4
Legal context 2.5, 3.6.33
Legible design 6.3.4, 9.2.3
Length of streets 6.3.7, 7.3.17–18, 7.4.4
Level changes (See also Gradients; Surface level crossings) 6.3.7, 6.3.15
vehicle crossovers 6.3.28
Liability and risk See Risk and liability
Life cycle of a scheme 3.1.1–2
Lighting columns (See also Street lighting) 10.2.5, 10.3.4
  effect on visibility 7.8.7
height 10.3.18–21
Local amenities 4.3.2, 4.3.4, 4.4.1
Local authorities (See also Highway authorities) design codes 3.6.33
  joint working 1.3.3, 3.2.1–2
  responsibilities 2.3.2
disability equality 2.7.1–2
  standards and guidance 1.4.5, 2.5.5, 3.4.2, 3.5.6
Local Development Frameworks 3.4.2, 5.7.2
Local distinctiveness 3.5.1–4, 5.11, 11.8.3
Local materials 11.2
Local policies, standards and guidance (See also Design codes) 1.4.5, 2.5.2, 2.5.5, 3.4.2, 3.5.6
Local Transport Plan 3.4.2
Maintenance 5.13.1, 11.6
  highway adoption 11.7–8
  landscaping 11.3.5–9
  private management companies 11.9
  responsibilities 2.6.4–5, 2.6.8, 11.1.2
street furniture and lighting 10.2.7, 10.3.21, 10.3.25, 11.6.4–5
Management companies 11.9
Masterplan detailed 3.6.25–28
  outline 3.6.15–19
Materials (See also Surface materials) 11.2, 11.8.3
Mini-roundabouts 7.3.15
Mobility impairment car parking 8.3.5
design for 6.3.20, 6.3.28
public transport use 6.5.1
Monitoring 3.7.13, 3.10
Motor vehicles (See also Bus routes, Car use; Emergency vehicles; Service vehicles) 6.6
  priorities of different road users 2.3.6, 2.4.2–8, 3.6.8–9
Motorcycle parking 8.4
Movement 2.3.6
  analysis of existing patterns 3.6.8–12
  proposed movement framework 3.6.13–14, 4.2
  status in relation to place 2.4
Multi-functional streets 2.2.4
Name plates for streets 9.3.13
Networks See Street networks
Objective setting 3.5
Obstructions (See also Closed-off streets; Visibility) 6.3.10, 6.3.26
  overhanging trees and shrubs 6.3.26
  oversailing of footways 6.3.24
Off-street parking 6.3.28, 6.6.3, 8.1.4
On-street parking 8.3.12–20
  signs and road markings 9.3.4–7
  in visibility splays 7.8.6
One-way streets 4.2.8
Open space (See also Communal space) 5.7.1–2
Open Space Strategy 3.4.2
Outline scheme layouts 3.6.15–19
Overhanging trees and shrubs 6.3.26
Overrun areas 7.11
Oversailing of footways 6.3.24
Parking (See also Car parking; Cycle parking; Motorcycle parking) 8.3.48–54, 8.3.56, 9.3.5
  ing signage 9.3.4–7
Parking bays 8.3.48–54
  motorcycles 8.4.9
  in relation to junctions 7.8.6
Partially-sighted people See Visual impairment
Pavement parking 8.3.42–47
Pavements See Footways
Paving materials (See also tactile paving) 6.3.9, 6.4.12, 7.2.15
Pedestrian access to buildings and public spaces 2.3.7–8
Pedestrian barriers 10.2.11
Pedestrian crossing points 6.3.7–9, 6.3.30
Pedestrian desire lines 6.3.12
Pedestrian links 4.2.4, 6.3.11
Pedestrian networks 6.3.7
Pedestrian refuges 6.3.9
Pedestrians
  design requirements 6.2.1, 6.3
  inclusive design 4.2.4
  priorities of different road users 2.4.6, 3.6.8–9
  seating 6.3.33, 10.2.2–3
Pelican crossings 6.3.9
Perimeter blocks 4.5.2, 4.5.4, 7.3.17–18
Permeable street layouts 2.2.5, 4.2.3–8
crime prevention 4.6.2–3
junction design 7.3.9
spacing of junctions 7.3.17–18
Perpendicular parking 8.3.49–52
Personal security 2.2.5, 6.3.18–19
cyclists 6.4.10
inclusive design 4.2.4
layout considerations 4.5.1
subways 6.3.7
Pinch-points 6.3.9
Place
  characterisation 2.4.9–14, 4.7.1, 7.2.4
  context appraisal 3.6.5–7
design quality 5.3
local distinctiveness 3.6.1–4, 5.11, 11.8.3
sense of 1.1.7, 2.3.2–5
status in relation to movement 2.4
Place/movement matrix 2.4.9–14, 7.2.4
Planning approval 3.8
Planning framework 2.5
Planning policies 3.4.1, 4.4.3,
Planning Policy Statement 13: Transport (PPS13) 4.4.1
Planning process 3.1–3
Planting See Landscaping
Policy review 3.4
Priorities of different road users (See also User hierarchy) 2.3.6, 2.4.2, 2.4.6–7, 3.6.8–9
  buses 6.5.6
Private streets 11.7.7–8
Project life cycle 3.1.1–2
Project planning 3.3.1
Public consultation 2.4.11, 3.3.2, 3.6.16
Public Realm Strategy 3.4.2
Public space See Communal space
Public transport 6.5
  bus routes 6.5.2–8
  bus stops 6.5.9–15
  priorities of different road users 3.6.8–9
  use of 4.2.2, 4.3.3, 4.4.3
Puffin crossings 6.3.9
Quality auditing 3.7
Quality of design 5.2
Quality places 2.2.5, 5.2
Rear access to houses 5.6.1
Recycling provision 6.8.14–18
Residential sprinkler systems 6.7.3
Reversing distances 6.7.2, 6.8.8
Risk and liability (See also: Road safety) 2.6
balanced approach 3.7.11–12
Road closure 7.3.11
Road markings 9.1.2, 9.3.1–3
  centre lines 9.3.1–3
  for parking 9.3.4–7
Road safety (See also: Risk and liability; Speed reduction) 2.2.5, 6.3.19
  centre lines 9.3.2–3
  cycling 6.4.4–6
  guard railing 10.2.8–9
  highway authority’s responsibility 2.6.6, 3.7.6
  visibility splays at junctions 7.7.9
Road safety audits (RSAs) 3.7.5–13
Road types 2.2.3, 2.4.7, 2.4.10, 4.7.1
Roads compared with streets 2.2, 2.4.4
Roundabouts 7.3.12–16
RSAs (Road safety audits) 3.7.5–13
Rural areas 2.3.5

design statements 5.11.2
street furniture and lighting 10.1.2, 10.3.11
Safety See Crime prevention; Personal security; Road safety
Seating 6.3.33, 10.2.2–3
Security See Crime prevention; Personal security
Segregation of road users 2.2.3, 3.7.9, 4.5.1, 7.4.1
non-segregation 4.6.3
Sense of place See Place
Service roads 7.9.4
Service strips 11.5.7–8
Service vehicles 6.8
parking provision 8.3.28
Services See Utilities
Setts, granite 6.4.12
Sewers 11.4.2–4
Shared-surface streets and squares 7.2.8–15, 11.5.9
Signing 9
informatory 9.3.12–14
junction priority 9.3.8–11
for parking 8.3.9, 8.3.27, 8.3.55, 9.3.4–7
override of 2.3.5, 5.10.1
Signalised crossings 6.3.9
Single lane working 7.2.3
Smaller developments 3.1.3, 3.6.3, 3.6.16, 3.6.19
planning approval 3.8.6
Social interaction 2.2.5, 2.4.12, 5.7
Speed limits 7.4.2, 7.4.5–8
Speed reduction (See also Traffic-calming) 6.3.19, 6.5.14, 7.4, 9.3.3
Speed tables 6.3.15–16, 7.3.11
SSD (Stopping sight distance) 7.5, 7.6.4
Stages of a scheme 3.1.1–2, 3.3.1
Staggered junctions 7.3.10
Standards and guidance See Design guidance; Design standards
Stopping sight distance (SSD) 7.5
Street character types 4.7

categorisation 3.6.20–23, 7.2.4–5
conventional approach 2.2.4
Street definition 1.1.7
Street dimensions See Dimensions of streets
Street furniture 2.3.5, 10.1–2
adoption of streets 11.6.4
reducing clutter 5.10.1–2, 9.1.10–12, 10.2.4
Street lighting 2.3.5, 10.1, 10.2.5–6, 10.3
attached to buildings 10.3.8–9
colour 10.3.7, 10.3.22–23
lighting levels 10.3.11–16
reducing clutter 5.10.1–2
scale 10.3.17–21
Street name plates 9.3.13
Street networks (See also Layouts) 3.6.24, 6.3.7, 6.8.2

categorisation 3.6.20–23, 7.2.4–5
conventional approach 2.2.4
2Subways See Underpasses
SUDS (Sustainable urban drainage systems) 11.4.11–14
Surface level crossings 6.3.7–9, 6.3.15–16
Surface materials (See also Paving materials) 2.3.5

cycling 6.4.12
pedestrians 6.3.31
relation to street lighting 10.3.26
shared-surface streets 7.2.15
Surface water drainage 11.4.5–14
Surveillance 4.5.1, 4.6.3, 6.3.18
Sustainable communities 2.2.6, 2.3.2, 4.3, 5.2.1
Sustainable urban drainage systems (SUDS) 11.4.11–14
Swept path analysis 7.2.6
Tactile paving 6.3.8, 6.3.12, 6.3.16, 8.3.57
Tall buildings 5.4.4
Tapering obstructions 6.3.26
Technical approval 3.9.2
Toucan crossings 6.3.9
Town Design Statements 5.11.2
Tracking models 7.2.7
Traffic See Motor vehicles; Movement
Traffic-calming

- junction design
- single lane working
- speed tables

Traffic signs

- 2.3.5, 7.4.5–9, 9.1–2

Traffic speeds

See Speed limits; Speed reduction

Transportation policies

- 3.4.1

Travel choices, influencing

- 4.2.1, 4.3.1–3

Trees (See also Landscaping)

- 5.12.4, 11.3.2–4
- effect on visibility
- pedestrian issues

- 6.3.25–26

Trunk roads

- 1.4.2–3

Types of streets

See Street types

Unallocated parking

- 8.3.10–11

Undercroft parking

- 8.3.32

Underground parking

- 8.3.32

Underground waste containers

- 6.8.16

Underpasses

- 4.5.1, 6.3.7

Unmarked junctions

- 9.3.9

Urban design principles

- 5.3

Urbanisation

- 2.3.5

User hierarchy (See also Priorities of different road users)

- conventional approach
- recommended

Utilities

- 2.3.10, 11.5

street furniture

- 10.2.1

Vehicle access to buildings and open spaces

- 7.9

Vehicle crossovers

- 6.3.28–30

Vehicles

See Motor vehicles; Movement

Visibility

- along the street edge
- effect on driving speeds
- forward visibility
- obstacles to
- requirements
- visibility splays at junctions

Visitors’ parking

- cars
- 8.3.21–23
- cycles
- 8.3.29–11, 8.2.20

Visual impairment

- design for
- shared-surface streets

Walkable neighbourhoods

- 4.4

Walking (See also Pedestrians)

- 2.3.6, 4.2.2

Waste collection

- 3.2.1, 6.8

Waste collection points

- 6.8.9–10

Waste collection vehicles

- routing
- 6.8.10

- 7.9.3

Waste containers

- 6.8.9, 6.8.11, 6.8.13, 6.8.16–18

Waste storage

- 5.10, 6.8.9, 6.8.12–18

Width

- footways
- 6.3.22–23
- parking bays
- 8.3.48–52
- public transport vehicles
- 6.5.2
- street
- 5.4.2, 7.2
- effect on driving speeds
- 7.4.4
- bus routes
- 6.5.7
- emergency vehicles
- 6.7.3
- waste collection vehicles
- 6.8.6–7

Zebra crossings

- 6.3.9
Manual for Streets

Manual for Streets is expected to be used predominantly for the design, construction, adoption and maintenance of new residential streets, but it is also applicable to existing residential streets subject to re-design. It aims to assist in the creation of high quality residential streets that:

- build and strengthen communities;
- balance the needs of all users;
- form part of a well-connected network;
- create safe and attractive places which have their own identity; and
- are cost-effective to construct and maintain.

Transformation in the quality of streets requires a fundamental culture change in the way streets are designed. This needs a more collaborative approach between design professions and other stakeholders with people thinking creatively about their various roles in the design process. This publication is therefore aimed at all those who have a part to play in creating high quality streets.