

27 January 2009

Dear Consultee,

CONSULTATION ON DESIGNING STREETS

I am writing to seek your views on Designing Streets as a new planning policy. Designing Streets incorporates the principles of PAN 76 (New Residential Streets) as well as more comprehensive information and guidance and will, therefore, supersede PAN 76. Designing Streets is intended to be a companion document to “Designing Places” and aims to apply the principles of good design contained in that policy to both new, and, wherever possible, existing streets. The intended outcome is streets that are better designed to accommodate the needs of pedestrians, cyclists and public transport users, as well as contributing to the quality of the built environment and place-making. This document can be downloaded from the Scottish Government website www.scotland.gov.uk/Publications/2009/01/23131802/0.

The Scottish Government has pro-actively engaged with a number of stakeholders in developing this draft. A stakeholder workshop was held in Edinburgh earlier this year with an attendance of some 40 people, incorporating stakeholders from a wide range of organisations representing a variety of relevant disciplines. Comments from this workshop were used to draft a subsequent version of Designing Streets which have been on the SCOTS website since July. We have received a significant number of comments from SCOTS, pedestrian and cyclist organisations, the police (ACPOS), Architecture and Design Scotland, SEPA and many other organisations.

Designing Streets is *relevant to everyone* who plays a part in shaping the built environment. It promotes joint working by encouraging an holistic approach to street design while assigning a higher priority to the needs of pedestrians, cyclist and public transport users. It also highlights the importance of all departments within Local Authorities working together from the outset to take forward quality design principles and minimise conflicts and unnecessary delays. This holistic and integrated approach is equally applicable to developers.

Responding to this consultation paper

We are inviting written responses to this consultation paper **by Monday 23 March 2009**.

A list of consultees who have already contributed to the develop of this document are listed in Annex B, their points have been noted and considered in this draft. Consultees who have already provided comments on this document do not need to respond unless there is anything else they wish to add.

Please send your responses on the proforma in Annex A, to sustainabletransport@scotland.gsi.gov.uk or addressed Admin. Team, Scottish Government, Area 2-E, Victoria Quay, EH6 6QQ.

If you have any queries on the content of the consultation paper to the consultation process, please contact: sustainabletransport@scotland.gsi.gov.uk or 0131 244 0607.

Handling your response

We need to know how you wish your response to be handled and, in particular, whether you are happy for your response to be made public. Please complete and return the Respondent Information Form at Annex A and we will ensure that we treat your response appropriately. If you ask for your response not to be published we will regard it as confidential, and we will treat it accordingly.

All respondents should be aware that the Scottish Government is subject to the provisions of the Freedom of Information (Scotland) Act 2002 and would therefore have to consider any request made to it under the Act for information relating to responses made to this consultation exercise.

Publishing Responses

Where respondents have given permission for their response to be made public (see the attached Respondent Information Form), these will be made available to the public in the Scottish Government Library and on the Scottish Government Consultation web pages within 6 weeks of the close of the consultation. Where agreement to publish has been given, we will check all responses for any potentially defamatory material before logging them in the library or placing them on the website. You can make arrangements to view responses by contacting the SG Library on 0131 244 4552. Responses can be copied and sent to you, but a charge may be made for this service.

What happens next?

Following the closing date, all responses will be analysed and considered. The Scottish Government plans to publish the final document later in 2009.

Comments and complaints

If you have any comments about how this consultation exercise has been conducted, please send them, marked Designing Streets, to the postal or e-mail address given previously.

Yours sincerely

Sam Anwar
Sustainable Transport Team

ANNEX A: RESPONSE FORM : DESIGNING STREETS COMMENTS

Please use this form for submitting your comments to Scottish Government.

1. Please put each new comment in a new row.
2. Please insert the **chapter / section number and page** in the first column. If your comment relates to the document as a whole, please put **'general'** in this column.

Your completed form MUST be returned by Monday 23 March 2009, we would very much appreciate it if you could return comments to us as early as possible.

Name:	
Organisation:	
Section number Indicate chapter/section number and page or 'general' if your comment relates to the whole document	Comments Please insert each new comment in a new row.

Please add extra rows as needed

When complete, return by email to: sustainabletransport@scotland.gsi.gov.uk

or post to: Transport Admin. Team
 Scottish Government
 Area 2-E
 Victoria Quay
 Edinburgh
 EH6 6QQ.

RESPONDENT INFORMATION FORM: DESIGNING STREETS

Please complete the details below and return it with your response. This will help ensure we handle your response appropriately. Thank you for your help.

Name:

Postal Address:

1. Are you responding: (please tick one box)

(a) as an individual

go to Q2a/b and then Q4

(b) **on behalf of** a group/organisation

go to Q3 and then Q4

INDIVIDUALS

2a. Do you agree to your response being made available to the public (in the Scottish Government library and/or on the Scottish Government website)?

Yes (go to 2b below)

No, not at all We will treat your response as confidential

2b. **Where confidentiality is not requested**, we will make your response available to the public on the following basis (**please tick one** of the following boxes)

Yes, make my response, name and address all available

Yes, make my response available, but not my name or address

Yes, make my response and name available, but not my address

ON BEHALF OF GROUPS OR ORGANISATIONS:

3. The name and address of your organisation **will be** made available to the public (in the Scottish Government library and/or on the SG website). Are you also content for your **response** to be made available?

Yes

No We will treat your response as confidential

SHARING RESPONSES/FUTURE ENGAGEMENT

4. We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for the Scottish Government to contact you again in the future in relation to this consultation response?

Yes

No

EQUAL OPPORTUNITIES QUESTIONNAIRE

This Equal Opportunities Questionnaire is requested in order that the Scottish Government can build an accurate picture of the make-up and diversity of the people and groups that our planning policies impact on, and to ensure that the way in which we carry out our consultations is inclusive and not unwittingly discriminatory. If you have responded to this consultation as an individual it would be helpful if you could complete the form. This information is **only** used for this purpose.

If you have a disability that requires us to make a reasonable adjustment to enable you to complete this form, please notify us.

Name	
Consultation to which you are responding	
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female

Ethnic Origin

How would you describe your ethnic or cultural origin?					
White Scottish		White British	<input type="checkbox"/>	White European/ Other	<input type="checkbox"/>
Black Scottish	<input type="checkbox"/>	Black British	<input type="checkbox"/>	Black African	<input type="checkbox"/>
Black Caribbean	<input type="checkbox"/>	Black Other	<input type="checkbox"/>		
Asian Scottish	<input type="checkbox"/>	Asian British	<input type="checkbox"/>		
Indian	<input type="checkbox"/>	Pakistani	<input type="checkbox"/>	Chinese/ Other Asian	<input type="checkbox"/>
Bangladeshi	<input type="checkbox"/>				
Mixed Racial Origin	<input type="checkbox"/>				
Other					

Age

Under 25 <input type="checkbox"/>	25-39 <input type="checkbox"/>	40-54 <input type="checkbox"/>	55-65 <input type="checkbox"/>	65+ <input type="checkbox"/>
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Disability

Do you have a disability as defined by the Disability Discrimination Act 1995 (DDA)?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
The definition of a disability under the DDA is “a physical or mental impairment which has a substantial and long term adverse effect on a person’s ability to carry out normal day to day activities.”	

ANNEX B: ORGANISATIONS ALREADY CONTRIBUTED

Local Authorities

Aberdeenshire Council
Angus Council
Argyll & Bute Council
Borders Council
Dumfries & Galloway Council
Dundee City Council
East Ayrshire Council
Glasgow City Council
Highland Council
North Ayrshire Council
Perth & Kinross Council
Renfrewshire Council
Scottish Borders Council
South Ayrshire Council
South Lanarkshire Council
Stirling Council
West Dunbartonshire Council
West Lothian Council

Other Stakeholders

ACPOS
Architecture & Design Scotland
DfT
Grampian Fire & Rescue Service
Homes for Scotland
Living Streets Scotland (LSS)
Royal Town Planning Institute in Scotland
SPOKES, The Lothian Cycle Campaign
Strathclyde Partnership for Transport (SPT)
The SUDS Working Party

PLANNING /
TRANSPORT

Designing Streets

Consultation Draft

January 2009

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Executive Summary

Designing Streets puts well-designed streets back at the heart of sustainable communities in Scotland, building on a rich history of successful place making. This Executive Summary highlights the key messages in *Designing Streets* and the status and application of the document.

For too long, the principal focus has been on the movement function of streets. The result has often been places that are dominated by motor vehicles and so fail to make a positive contribution to achieving a good quality of life. *Designing Streets* demonstrates the benefits that flow from good design and assigns a higher priority to pedestrians and cyclists. It sets out an approach to the design, particularly of residential and other lightly trafficked streets, that recognises their role in creating places that work for all members of the community. *Designing Streets* refocuses on the place-making function, giving clear guidance on how to achieve well-designed streets and spaces that serve the community in a range of ways.

Designing Streets updates the link between planning and transportation policy and street design. It places particular emphasis on the importance of collaborative working and coordinated decision-making, as well as on the value of strong leadership and a clear vision of design quality at the local level. It also highlights the linkage between street design and a range of other policy objectives.

Research carried out in the preparation of *Manual for Streets*¹, on which this document is based, indicated that many of the criteria routinely applied in street design across the UK are based on questionable or outdated practice. For example, it showed that, when long forward visibility is provided and generous carriageway width is specified, driving speeds tend to increase. This demonstrates that driver behaviour is not fixed; rather, it can be influenced by the environment.

Designing Streets addresses these points, recommending revised key geometric design criteria to allow streets to be designed as places in their own right while still ensuring that road safety is maintained.

Previous guidance contained in *PAN76 New Residential Streets*² made it clear that uncoordinated decision-making can result in disconnected, bland places that fail to make a contribution to the creation of thriving communities. The principle is further reinforced in *Designing Streets*, which recommends that those involved in design and approval are encouraged to work together strategically from an early stage to negotiate issues in the round and retain a focus on the creation of locally distinct, high-quality places. *Designing Streets* also highlights the value of tools such as masterplans, quality audits and design codes.

Neighbourhoods where buildings, streets and spaces combine to create locally distinct places and which make a positive contribution to the life of local communities need to become more widespread. *Designing Streets* provides a clear framework for the use of local systems and procedures; it also identifies the tools available to ensure that growth and change are planned for and managed in an integrated way. The principles of *Designing Streets* – interdisciplinary working, strategic coordination and balanced decision making – will only become a reality if they are developed and applied at a local

¹ York, A Bradbury, S Reid, T Ewings and R Paradise (2007) *The Manual for Streets: Redefining Residential Street Design* TRL Report No. 661. Crowthorne: TRL

² Scottish Executive (2005) *Planning Advice Note 76: New Residential Streets*. Edinburgh: Scottish Executive

level. This is already happening in some places, and the results are promising as demonstrated in the case studies included. This document aims to make the adoption of such practice the norm.

Designing Streets is expected to be used predominantly for the design, construction, adoption and maintenance of new streets, but it is also applicable to existing streets subject to re-design. For new streets, *Designing Streets* advocates a return to more traditional patterns which are easier to assimilate into existing built-up areas and which have been proven to stand the test of time in many ways.

Designing Streets is a companion document to *Designing Places* and applies the principles of good design contained in that policy to both new and existing streets. Like *Designing Places*, it marks the Scottish Government's determination to raise standards of urban and rural development and is aimed at everyone who plays a part in shaping the built environment. *Designing Places* highlights six key qualities of successful places. *Designing Streets* explains how these qualities are applied to street design as follows:

DISTINCTIVE: responding to local context to create places that are distinctive.

SAFE AND PLEASANT: creating safe and attractive places using imaginative layouts to minimise vehicle speeds naturally.

EASY TO GET TO AND MOVE AROUND: enabling ease of movement by all modes of travel, particularly walking and cycling, connecting well with existing streets and allowing for links into future areas of development.

WELCOMING: encouraging positive interaction between neighbours, creating a strong sense of community,

ADAPTABLE: planning networks that allow for future adaptation.

RESOURCE EFFICIENT: using materials and designs that are durable and cost effective to construct and maintain.

The government wish to see these 6 key qualities of successful places taken forward in street design and approval. To assist this process, a number of key policy principles have been developed following close consultation with key stakeholders. These can be summarised as follows:

- applying a user hierarchy to the design process with pedestrians at the top, followed by cyclists, public transport users and then motor vehicles;
- promoting a collaborative approach to the delivery of streets both within local authorities and developers' teams and with other key stakeholders;
- promoting a more streamlined and consistent approval process across Scotland, linking Roads Construction Consent with planning approval;
- promoting the importance of the community function of streets as spaces for social interaction;
- promoting an inclusive environment that recognises the needs of people of all ages and abilities;
- promoting the value of masterplans and design codes that implement them, supporting local diversity and context;
- promoting networks of streets that provide a high degree of permeability and connectivity to main destinations and a choice of routes to help support wider transport and environmental objectives;
- making streets distinctive, and diverse by developing street character types on a location-specific basis;

- using design led approaches to influence driver behaviour to deliver safe streets for all;
- adopting a design led approach to parking;
- encouraging innovation with a flexible approach to street layouts and the use of locally distinctive, durable, sustainable and maintainable materials and street furniture;
- using quality audit systems that demonstrate how designs will meet key objectives for the scheme including safety;
- designing to keep vehicle speeds at or below 20 mph on residential streets unless there are overriding reasons for accepting higher speeds whilst using the minimum of road design features necessary to make the streets work properly.

STATUS AND APPLICATION

Designing Streets is split into two separate parts – the first, *Policy* has the status of statutory government policy and lays out the context and principles for taking forward the design of residential and lightly trafficked streets in Scotland, and thus is a material consideration in decisions in planning applications and appeals. This section also provides important information on risk and liability issues.

The second part, *Supporting Guidance*, is split into three, sections A and B provide design principles and detailed design issues, section C consists of 5 detailed case studies which demonstrate current aspects of best practice.

Designing Streets, as well as providing new policy principles, also provides more comprehensive technical guidance than the previous advice contained in *PAN 76 – New Residential Streets*. *PAN76* is therefore now withdrawn, but its principles are maintained and developed within this new document.

Designing Streets has been developed by the Scottish Government from *Manual for Streets (MfS)*, which was produced for the Department for Transport as a collaborative effort involving a wide range of key stakeholders with an interest in street design. It was published in England and Wales in March 2007. The additional information and changes necessary to make the document appropriate for use in Scotland have also been subject to significant stakeholder consultation. It has been developed by a multi-disciplinary team of roads and transportation engineers, urban designers, planners and legal advisors. The recommendations contained herein are based on a combination of:

- primary research undertaken in developing MfS;
- case studies;
- existing good practice guidance; and
- consultation with stakeholders and practitioners.

During its preparation, efforts have been made to ensure that *Designing Streets* represents a broad consensus and that it is widely accepted as good practice.

MfS superseded *Design Bulletin 32* and its companion guide *Places, Streets and Movement*. Although the latter two documents were not formally adopted in Scotland, they were often referred to by Roads Authorities when determining local standards. It is therefore important to recognise that they are no longer considered to represent up-to-date good practice.

Most local authorities in Scotland have developed their own guidance and standards on streets and there is still seen to be a key role for local guidance to ensure that street design responds to local context. These existing documents will contain useful information for example construction details and local palettes of materials which may still be relevant. However, in many cases, other existing local guidance for example on the general layout of developments and street geometry will not be consistent with *Designing Streets* in both principle and detail and this information will need to be redrafted. Local authorities should thus, individually or collectively, take on board *Designing Streets*, developing local guidance that is in line with the new policy.

Designing Streets complements Scottish Planning Policy SPP3: Planning for Housing and *SPP:17 Planning for Transport*.

Designing Streets provides key policy principles that should be followed in designing and approving residential and many other lightly-trafficked streets, but many of its key principles are also applicable to other types of street, for example rural and high streets.

Designing Streets does not generally apply to trunk roads, but in some locations, such as where a trunk road passes through the centre of a small town, and the 'place function' (see Chapter 1) is high, a more sensitive design that follows the principles of *Designing Streets* may well be appropriate.

1

Streets in context



1 Streets in context

CHAPTER AIMS

- Provide an historical perspective on streets.
- Explain the distinction between 'streets' and 'roads'.
- Summarise the key functions of streets.
- Propose a new approach to defining street hierarchies, based on their significance in terms of both place and movement.
- Set out the framework of legislation, standards and guidance that apply to the design of streets.

STREETS - AN HISTORICAL PERSPECTIVE

Most places owe their layout to their original function. Towns have often grown up around a market place a bridgehead or a harbour; villages were formed according to the pattern of farming and the ownership of the land. The layouts catered mostly for movement on foot. The era of motorised transport and especially privately-owned motor vehicles has, superficially at least, removed the constraint that kept urban settlements compact and walkable.



When the regulation of roads and streets began, spread of fire was the main concern. Subsequently health came to the forefront and the classic 36 ft wide bye-law street was devised as a means of ensuring the passage of air in densely built-up areas. Later, the desire to guarantee that sunshine would get to every house led to the requirement for a 70 ft separation between house fronts, and this shaped many developments from the 1920s onwards.

It was not until after the Second World War, and particularly with the dramatic increase in car ownership from the 1960s onwards, that traffic considerations came to dominate road design.

1.1 STREETS AND ROADS

1.1.1 A clear distinction can be drawn in functional terms between streets and roads.¹ Roads are essentially thoroughfares whose main function is accommodating the movement of motor traffic. For the purposes of this document, a street is defined as a thoroughfare that has important public realm functions beyond the movement of traffic. Streets are typically lined with buildings and public spaces, and while movement is still a key function, there are several others, of which the place function is the most important.

1.1.2 Streets have to fulfil a complex variety of functions in order to meet people's needs as places for living, working and moving around in. This requires a careful and multi-disciplinary approach that balances potential conflicts between different objectives.

1.1.3 In the decades following the Second World War, there was a desire to achieve a clear distinction between two types of road:

- distributor roads, designed for movement, where pedestrians were excluded or, at best, marginalised; and
- access roads, designed to serve buildings, where pedestrians were accommodated.

This led to layouts where buildings were set in the space between streets rather than on them, and where movement on foot and by vehicle was segregated, sometimes using decks, bridges or subways. Many developments constructed using such layouts have had significant social problems and have either been demolished or undergone major regeneration (Fig. 1.1).



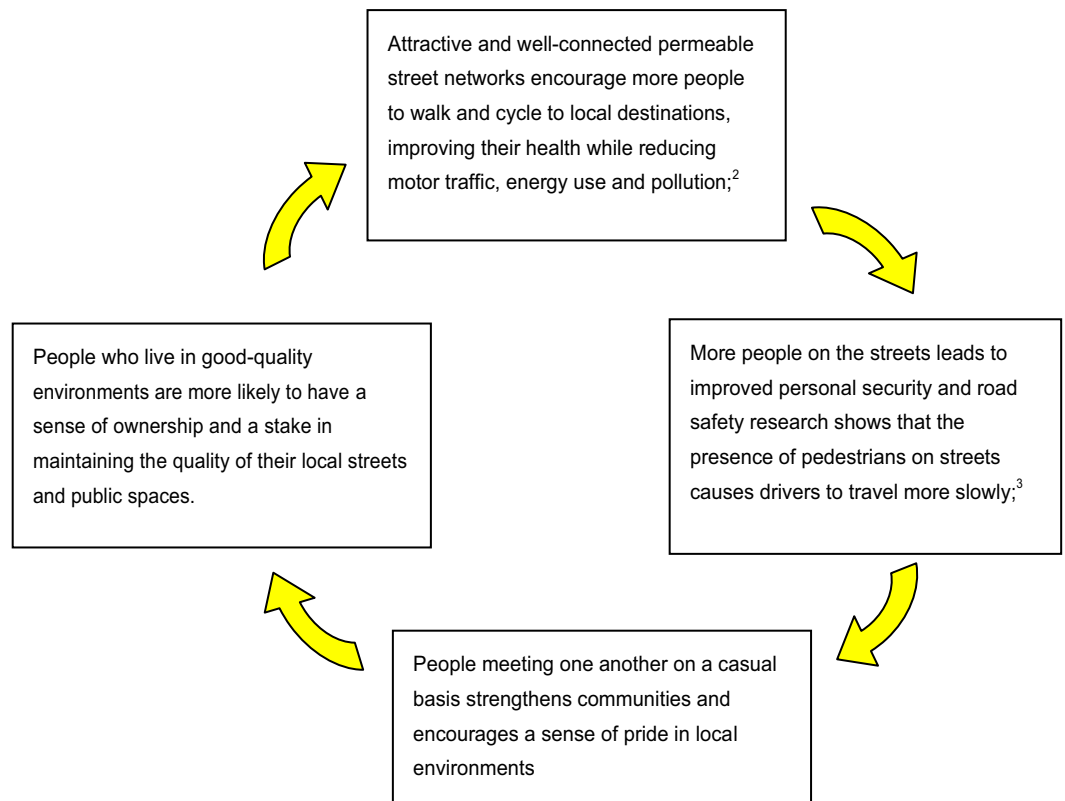
Figure 1.1 A poor-quality space with a layout where pedestrians and vehicles are segregated. It has not been a success and the area is now undergoing regeneration (EDAW, Bowmar, Alloa).

¹ In *Designing Streets* the term 'Road' is generally used as set out in Para 1.1.1. Legally, all new streets are 'Roads' under the *Roads (Scotland) Act 1984*

1.1.4 This has led to an approach that believed segregated streets were safer streets; we now understand that this is not the case, moreover there have been health and social disbenefits from following such an approach. Creating streets which are places, and changing driver behaviour through the design of our streets, does not create additional risk. Aspects of risk and liability, as they concern the design of streets, are discussed at the end of this chapter.

1.1.5 The conventional approach to network planning also limited the design of multi-functional streets to only the most lightly-trafficked routes. This led to development patterns where busy distributor roads link relatively small cells of housing. Such layouts are often not conducive to anything but the shortest of trips on foot or by bicycle. It is now widely recognised that there are many advantages in extending the use of multi-functional streets in urban areas to busier routes.

1.1.6 Streets that are good quality places achieve a number of positive outcomes, creating a virtuous circle:



1.1.7 Well-designed streets thus have a crucial part to play in the delivery of sustainable places.

1.1.8 Lanes in rural areas can also provide other functions than just movement, including various leisure activities such as walking, cycling and horse riding.

² Snellen, D. (1999) *The relationship between urban form and activity patterns*. In Proceedings of the European Transport Conference, Cambridge, 1999. London: PTRC. pp. 429-439.

³ ODPM and Home Office (2004) *Safer Places: The Planning System and Crime Prevention*. London: TSO.

1.2 MIXED AND WALKABLE NEIGHBOURHOODS

1.2.1 It is vital that street patterns are laid out carefully as they are critical to how a place functions; and experience has shown that street patterns last the longest of any aspect of a development. It is very difficult to change a street alignment once it is in place - it will typically be lined by private land in multiple ownership and will carry significant public infrastructure **(Image of an historic Scottish town showing how the street pattern has endured.)**

1.2.2 The type of road planning described above has, in recent decades, been accompanied by patterns of development where housing, employment, retail and other facilities were all developed in separate areas, which were often poorly connected with one another, particularly for journeys other than by car. **(Include aerial photograph of Scottish new town – e.g. Cumbernauld)**

1.2.3 Government policy now supports the creation of mixed-use neighbourhoods with well-connected street patterns, where daily needs are within walking distance of most residents. Layouts built on these more traditional lines are likely to be more adaptable and will lead to lower car use thus contributing to wider transportation and environmental objectives.



Figure 1.2 (a) dispersed and car-dependent versus (b) traditional, compact and walkable layout

1.2.4 Street networks serving these mixed use areas should, in general, be well connected. Connected, or 'permeable' networks encourage walking and cycling, and make places easier to navigate through. They also lead to a more even spread of motor traffic throughout the area and so avoid the need for distributor roads with no frontage development.

1.2.5 Further guidance on planning the overall layout of neighbourhoods and urban areas is given in Chapter G1.

1.3 PRINCIPAL FUNCTIONS OF STREETS

1.3.1 Streets have five principal functions;

- place;
- movement;
- access;
- parking; and
- drainage, utilities and street lighting.

PLACE

1.3.2 The place function is essentially what distinguishes a street from a road. The sense of place is fundamental to a richer and more fulfilling environment. It comes largely from creating a strong relationship between the street and the buildings and spaces that frame it.

1.3.3 A sense of place encompasses a number of aspects, most notably the street's:

- local distinctiveness;
- visual quality; and
- propensity to encourage social activity.

Guidance on ensuring consideration of the place function is outlined within Chapters G1 and G2.

MOVEMENT

1.3.4 Providing for movement along a street is vital, but it should not be considered independently of the street's other functions. The need to cater for motor vehicles is well understood by designers, but the passage of people on foot and cycle has often been neglected. Walking and cycling are important modes of travel, offering a more sustainable alternative to the car, making a positive contribution to the overall character of a place, public health, social interaction and to tackling climate change through reductions in carbon emissions.

Guidance in rethinking how we provide for all movement is covered in more detail in Chapters G3 and G4.

ACCESS

1.3.5 Providing frontages that are directly accessible on foot and that are overlooked from the street is highly desirable in most circumstances as this helps to ensure that streets are lively and active places.

1.3.6 Access to buildings and public spaces is another important function of streets. Pedestrian access should be designed for people of all ages and abilities.

1.3.7 Guidance for providing access is given in Chapters G3 and G4.

PARKING

1.3.8 Parking is a key function of many streets. A well-designed arrangement of on-street parking provides convenient access to frontages and can add to the vitality of a street. Conversely, poorly designed parking can create safety problems and reduce the visual quality of a street. Generally a variety of solutions will be required.

1.3.9 Guidance for parking is covered in more detail in Chapter G5.

DRAINING, UTILITIES AND STREET LIGHTING

1.3.10 Streets are the main conduits for drainage and utilities. Buried services can have a major impact on the design and maintenance requirements of streets. Surface water management including sustainable drainage systems bring environmental benefits, such as flood control, creating wildlife habitats and efficient wastewater recycling. Well designed street lighting needs to take account of the local context as well as function. Drainage and utilities are covered in Chapter G6, and street lighting is covered in Chapter G8.

1.4 THE BALANCE BETWEEN SPACE AND MOVEMENT

1.4.1 Of the five functions, place and movement are the most important in determining the character of streets.

1.4.2 In the past, road design hierarchies have been based almost exclusively on the importance attributed to vehicular movement. This has led to the marginalisation of pedestrians and cyclists in the upper tiers where vehicular capacity requirements predominate. The principle that a road was primarily for motor traffic has tended to filter down into the design of streets in the bottom tiers of the hierarchy.

1.4.3 This approach has created disjointed patterns of development. High-speed roads often have poor provision for pedestrian activity, cutting residential areas off from each other and from other parts of a settlement. In addition, the hierarchy does not allow for busy mixed use arterial streets, which feature in most traditional towns and cities.

1.4.4 Streets should no longer be designed by assuming 'place' to be automatically subservient to 'movement'. Both should be considered in combination, with their relative importance depending on the street's function within a network, with their relative importance depending on the street's function within a network and often varying along their length and at different times of the day. It is only by considering both aspects that the right balance will be achieved. Away from motorways and some other inter-urban trunk roads it is seldom appropriate to focus solely on one to the exclusion of the other, even in streets carrying heavier volumes of traffic, such as high streets.

1.4.5 Place status denotes the relative significance of a street, junction or section of a street in human terms. The most important places will usually be near the centre of any settlement or built-up area, but important places will also exist along arterial routes, in district centres, local centres and within neighbourhoods.

1.4.6 Locations with a relatively high place function would be those where people are likely to gather and interact with each other, such as outside schools, in local town and district centres or near shops. Streets that pass through these areas need to reflect the importance of these places in their design.

1.4.7 Movement status can be expressed in terms of traffic volume and the importance of the street, or section of street, within a network either for general traffic or within a mode specific (e.g. bus or cycle) network. It can vary along the length of a route, such as where a trunk road passes through a town centre.

1.4.8 Road authorities assess the relative importance of particular routes within an urban area as part of their normal responsibilities, such as those under the *New Roads and Streetworks Act 1991*⁴.

1.4.9 Another way of assessing the movement status of a street is to consider the geographical scale of the destinations it serves. Here, movement status can range from national networks (including motorways) through to city, town, district, neighbourhood and local networks, where the movement function of motor vehicles is slightly lower.

PLACE AND MOVEMENT MATRIX

1.4.10 Defining the relative importance of particular streets/roads in terms of place and movement functions should inform subsequent design choices. For example:

- motorways - high movement function, low place function;
- high streets - medium movement function, medium to high place function; and
- residential streets - low to medium movement function, low to medium place function.

1.4.11 This way of looking at streets can be expressed as a two-dimensional hierarchy⁵ where the axes are defined in terms of place and movement (Fig.1.3). It recognises that, whilst some streets are more important than others in terms of traffic flow, some are also more important than others in terms of their place function and deserve to be treated differently. This approach allows designers to break away from previous approaches to hierarchy, whereby street designs were only based on traffic considerations.

⁴ *New Roads and Street Works Act 1991*. London: TSO.

⁵ Jones, P, Boujenko, N & Marshall, S (2007) *Link and Place: A Guide to Street Planning and Design*. London: Landor Publishing Ltd



Figure 1.3 Typical road and street types in the Place and Movement hierarchy.

1.4.12 Once the relative significance of the movement and place functions has been established, it is possible to set objectives for particular parts of a network. This will allow the local authority to select appropriate design criteria for creating new links or for changing existing ones.

1.4.13 Movement and place considerations are important in determining the appropriate design speeds, speed limits and road geometry, etc., along with the level of adjacent development and traffic composition.

1.4.14 The detailed guidance contained in *Designing Streets* concentrates on streets with a fairly low movement function, in particular residential streets. However, many of the design principles also have application on streets with a higher movement function and corresponding place function (Fig 1.4).



Figure 1.4 Melrose town centre, an example of streets with a high movement function which in light of a recent innovative design approach retains a high place and movement function (Scottish Borders Council).

1.5 POLICY, LEGAL AND TECHNICAL CONTEXT

1.5.1 There is a complex set of legislation, policies and guidance applying to the design of streets. There is a tendency among some designers and approving authorities to treat design guidance as hard and fast rules because of the mistaken assumption that to do otherwise would be illegal or counter to a stringent policy. This approach is wrong. It restricts innovation, and leads to standardised streets with little sense of place or quality. In fact there is considerable scope for designers and approving authorities to adopt a more flexible approach on many issues. It is therefore Government policy in *Designing Places* to encourage street design which engenders place and quality.

1.5.2 By copying a standard example without due consideration, designers surrender their own professionalism. When doing so, they still retain responsibility for the design as it is their decision to copy a standard example which has been produced by individuals who may never have seen the site in question, and which may therefore not be suitable.

1.5.3 The following comprise the various tiers of instruction and advice:

- the legal framework of statutes, regulations and case law;
- government policy;
- government guidance;
- local policies;
- local guidance;
- design standards; and
- evidence and research base and the concept of “evidence-based design”.

1.5.4 The Westminster and Scottish Parliaments and the Courts have established the legal framework. In this respect certain aspects of transport are reserved to Westminster in terms of the *Scotland Act 1998*. For example, this includes the provisions which are the subject matter of the Road Traffic Act 1988, namely traffic signs and speed limits.

1.5.5 The Scottish Government develops policies aimed at meeting various objectives which roads and planning authorities are directed to follow. *Designing Places* and *Designing Streets* are such policies. It also issues supporting guidance to help authorities implement these policies, including the chapters G1 to G8 of *Designing Streets*.

1.5.6 Evidence based design has been developed as a concept within recent years. A distinction needs to be drawn between policies, guidance and practices that are in essence rule of thumb and that reflect simply a continuation of a conventional approach, and those that are based on science, statistics and designed experimental studies, and regularly challenged to ensure that they are relevant to modern needs and conditions. *Designing Streets* is supported by an evidence base.

1.5.7 Within this overall framework, road and planning authorities have considerable leeway to develop local policies and standards, and to make technical judgements with regard to how they are applied. Other bodies also produce advisory and research material that they can draw on.

1.6 RISK AND LIABILITY

1.6.1 A major concern expressed by some road authorities when considering more innovative designs, or designs that are at variance with established practice, is whether they would incur a liability in the event of damage or injury.

1.6.2 This can lead to an over-cautious approach, where designers strictly comply with guidance regardless of its suitability, and to the detriment of innovation. This is not conducive to creating distinctive places that help to support thriving communities.

1.6.3 In fact, imaginative and context-specific design that does not rely on conventional standards can achieve high levels of safety. The design of Poundbury in Dorset, for example, did not comply fully with standards and guidance then extant, yet it has few reported accidents. This issue was explored in some detail in the publication *Highway Risk and Liability Claims*⁶.

1.6.4 Claims against road authorities relate almost exclusively to alleged deficiencies in maintenance. Claims for design faults are extremely rare. The duty of the road authority to maintain the road is set out in the *Roads (Scotland) Act 1984*⁷, and case law has clarified the law in this area.

1.6.5 The courts in Scotland have adopted a cautious approach when considering the duty of care potentially owed by roads authorities. Merely because a roads authority has powers does not generally open up the authority to liability. The circumstances in which roads authorities have been held liable in damages have been very restricted. The restrictive approach has also been adopted in circumstances where the risk of an accident may well be foreseeable. (See *Murray v Nicholls*⁸ and *Bennett v J Lamont & Sons*)⁹

1.6.6 The Scottish line of authority has been recently reinforced by the House of Lords in the case of *Gorringe v Calderdale MBC (2004)*.¹⁰ A claim was made against a highway authority in England for failing to maintain a 'SLOW' marking on the approach to a sharp crest. The judgement confirmed a number of important points:

- the authority's duty to 'maintain' covers the fabric of a highway, but not signs and markings;
- there is no requirement for the road authority to 'give warning of obvious dangers' and natural road hazards; and
- drivers are 'first and foremost responsible for their own safety'.

1.6.7 A handful of claims for negligence and/or failure to carry out a statutory duty have been made under section 39 of the *Road Traffic Act 1988*¹¹, which places a general duty on road authorities to promote road safety. In connection with new roads, section 39 (3)(c) states that road authorities 'in constructing new roads, must take such measures as appear to the authority to be appropriate to reduce the possibilities of such accidents when the roads come into use'.

1.6.8 The *Gorringe v Calderdale* judgment made it clear that section 39 of the *Road Traffic Act 1988* did not create a duty of care and, therefore, does not form the basis for a liability claim.

⁶ UK Roads Board (2005) *Highway Risk and Liability Claims - A Practical Guide to Appendix C of The Roads Board Report 'Well Maintained Highways - Code of Practice for Highway Maintenance Management*, 1st edn. London: UK Roads Board.

⁷ *Roads (Scotland) Act 1984*. Section 1 London: HMSO

⁸ 1983 SLT194

⁹ 2000 SLT17

¹⁰ [2004] 2 ALL ER 326

¹¹ *Road Traffic Act (1988)*. London: HMSO

1.6.9 Advice to road authorities on managing their risks associated with new designs is given in Chapter 5 of *Highway Risk and Liability Claims*. In summary, this advises that authorities should put procedures in place that allow rational decisions to be made with the minimum of bureaucracy, and that create an audit trail that could subsequently be used as evidence in court.

1.6.10 Suggested procedures (which accord with those set out in Chapter 3 of *Designing Streets*) include the following key steps:

- set clear and concise scheme objectives;
- work up the design against these objectives; and
- review the design against these objectives through a quality audit

1.7 BALANCED DECISIONS

A suggested framework from *Highway Risk and Liability Claims (2008)* which accords with those set out in *Designing Streets* is:-

Vision – there should be an overall vision for an area, that reflects local and national policy and where appropriate, the views of the local community

Objectives / Purpose. There should be a robust understanding of what the scheme is intended to do. This will normally include balancing:

- Movement and Place
- Risk and Opportunity
- Ensuring sustainability

Design – this should be worked up against the objectives

Quality audit – this is a review of the design against the objectives set.

1.8 DISABILITY DISCRIMINATION

1.8.1 Road and planning authorities must comply with the Disability Equality Duty under the *Disability Discrimination Act 2005*¹². This means that in their decisions and actions, authorities are required to have due regard to the six principles of:

- promote equality of opportunity between disabled persons and other persons;
- eliminate discrimination that is unlawful under the 2005 Act;
- eliminate harassment of disabled persons that is related to their disabilities;
- promote positive attitudes towards disabled persons;
- encourage participation by disabled persons in public life; and
- take steps to take account of disabled persons' disabilities, even where that involves treating disabled persons more favourably than other persons.

1.8.2 Those who fail to observe these requirements will be at the risk of a claim. Not only is there an expectation of positive action, but the duty is retrospective and local authorities will be expected to take reasonable action to rectify occurrences of non-compliance in existing areas.

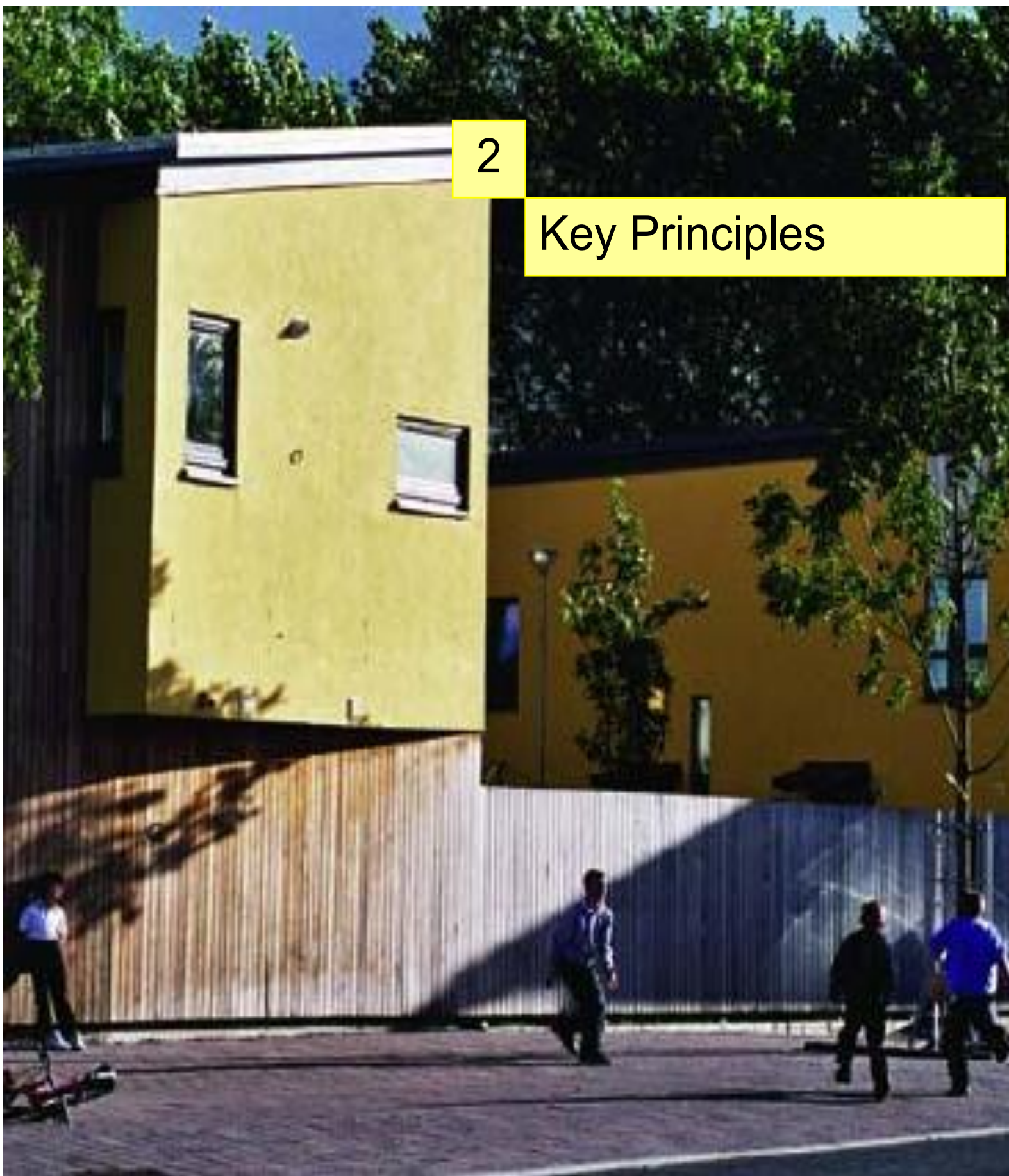
1.8.3 The Disability Rights Commission (DRC) have published a *Statutory Code of Practice on the Disability Equality Duty*¹³ and they have also published specific guidance for those dealing with planning, buildings and the street environment.

¹² *Disability Discrimination Act 2005*. London: TSO.

¹³ Disability Rights Commission (DRC) (2006) *Planning, Buildings, Streets and Disability Equality. A Guide to the Disability Equality Duty and Disability Discrimination Act 2005 for Local Authority Departments Responsible for Planning, Design and Management of the Built Environment and Streets*. London: DRC.

2

Key Principles



2 Key Principles

CHAPTER AIMS

- Set out the qualities of successful places.
- Set out the key policy principles of *Designing Streets* and the links with existing policies on design, land-use and transportation.
- Clarifies the audience for *Designing Streets*.
- Promotes greater collaboration between all those involved in the design, approval and adoption processes.
- Explains the status of *Designing Streets*, its relationship with local design standards and the *Design Manual for Roads and Bridges*.

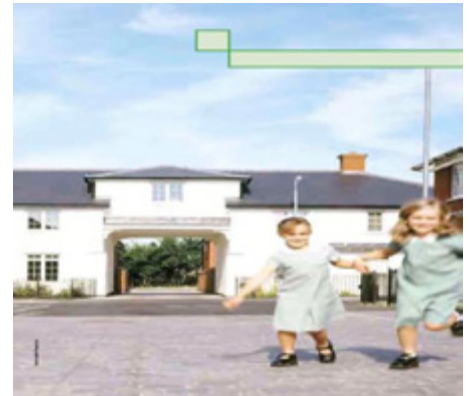


Figure 2.1 Streets should be attractive places that meet the needs of all users.

2.1 INTRODUCTION

2.1.1 The last chapter set out the historical, legal and technical context relating to street design in Scotland, and the need to bring about a transformation in the quality of streets. This chapter sets out a policy framework with key principles that should be followed by all involved in street design and approval to achieve this transformation. This is intended to support a fundamental culture change in the way streets are designed and adopted, including a more collaborative approach between the design professions and other stakeholders. It encourages people to think creatively about their various roles in the process of delivering streets, breaking away from standardised, prescriptive, risk-averse methods to create high-quality places.

2.1.2 Streets make up the greater part of the public realm. Better-designed streets therefore contribute significantly to the quality of the built environment and play a key role in the creation of sustainable, inclusive, mixed communities consistent with the Government's strategic objectives and a number of National Outcomes. Better-designed streets have a role in the delivery of the policy objectives of *Designing Places*¹ and *Scottish Planning Policy (SPP) 3: Planning for Housing*.² They also support sustainable transportation and land-use policies as set out in *SPP17 Planning for Transport*.³

2.1.3 *Designing Streets* is expected to be used predominantly for the design, construction, adoption and maintenance of new streets, but it is also applicable to existing streets. For new streets, *Designing Streets* advocates a return to more traditional patterns which are easier to assimilate into existing built-up areas and which have been proven to stand the test of time in many ways.

2.1.4 Streets should not be designed just to accommodate the movement of motor vehicles. It is important that designers place the highest priority on meeting the needs of pedestrians, cyclists and public transport users including vulnerable users, so that growth in these modes of travel is encouraged in line with sustainable transport policy.

THE QUALITIES OF SUCCESSFUL PLACES

2.1.5 The six key qualities of successful places, as advocated by the Scottish Government, are outlined in *Designing Places*⁴. These qualities should be applied to street design as follows:

Distinctive: Street designs should respond to local context to create places that are distinctive. We need to avoid designing new places that do not sit well with their surroundings.

Safe and Pleasant: Streets should be designed with the aim of creating safe and attractive places. Creative layouts should be used to minimise vehicle speeds naturally. Good design is best achieved through the comprehensive design of streets, buildings and public spaces.

Easy to get to and move around: Streets should be easy to move around by all modes of travel, providing convenient and direct links to places that people want to get to. New streets should connect well with existing streets, walking and cycling networks, and allow for links into future areas of development. Well connected street layouts will encourage walking and cycling which has important benefits for peoples' health.

Welcoming: Street layouts should encourage positive interaction between neighbours. The street should allow for people to meet and interact. This will create a strong sense of community, which will foster a sense of pride, belonging and welcome.

Adaptable: Experience shows that street networks are the most enduring features of our towns and cities. It is therefore important to plan networks that allow for future adaptation.

¹ Scottish Executive (2001) *Designing Places*. Edinburgh: Scottish Government

² Scottish Executive (2008) *Scottish Planning Policy 3: Planning for Housing*. Edinburgh: Scottish Government

³ Scottish Executive (2005) *Scottish Planning Policy 17: Planning for Transport*. Edinburgh: Scottish Government

⁴ Scottish Executive (2001) *Designing Places – A Policy Document for Scotland*. Scottish Executive: Edinburgh

Resource Efficient: New streets should use materials and systems that are durable and cost effective to construct and maintain including the use of recycled and local materials where appropriate.

2.1.6 The guidance detailed in *Designing Streets* is entirely compatible with and supportive of achieving these six qualities. It has much to say about designing for ease of movement, but good streets also have a crucial role to play in the achievement of all of them. Indeed, poorly designed streets can make it impossible to achieve good design. *Designing Places* advises that:

'Much of what makes or mars cities, towns, villages and the countryside does not just consist of buildings, but it is the consequence of the continuous application of, for example, highway standards'.

2.1.7 *Designing Streets* explains how we can avoid these negative outcomes and achieve streets that we can all be proud of.

2.1.8 In summary, *Designing Streets* aims to assist in the creation of streets that:

- help to build and strengthen the communities they serve;
- meet the needs of all users, by embodying the principles of inclusive design (see box);
- form part of a well-connected network;
- are attractive and have their own distinctive identity;
- are cost-effective to construct and maintain; and
- are safe.

It is vital that the principles of inclusive design⁵ are followed, as described below:

Inclusive design:

- places people at the heart of the design process;
- acknowledges diversity and difference;
- offers choice where a single solution cannot accommodate all users;
- provides for flexibility in use; and
- provides buildings and environments that are convenient and enjoyable to use for everyone.

⁵ Commission for Architecture and the Built Environment (CABE) (2006) *The Principles of Inclusive Design (They Include You)*. London: CABE.

2.2 KEY POLICY PRINCIPLES

2.2.1 The government wish to see the 6 key qualities of successful places described above, taken forward in street design and approval. To assist this process, a number of key policy principles have been developed for *Designing Streets* following close consultation with key stakeholders. These principles, which lie at the heart of existing good practice examples in Scotland, are listed below along with the key qualities of successful places that they can impact upon.

	Distinctive	Safe & Pleasant	Easy to get around and move	Welcoming	Adaptable	Resource Efficient
Applying a user hierarchy to the design process with pedestrians first and motor vehicles last.		✓	✓	✓		✓
Promoting a collaborative approach to the delivery of streets	✓					✓
Promoting a more streamlined and consistent approval process across Scotland						✓
Promoting the importance of the community function of streets as spaces for social interaction;	✓	✓		✓	✓	
Promoting an inclusive environment that recognises the needs of people of all ages and abilities;		✓	✓	✓		
Promoting diversity and local context in street design	✓					
Promoting permeable and well connected networks of streets			✓		✓	✓
Making streets distinctive, diverse and characterful	✓	✓	✓			
Use design to influence driver behaviour to deliver safe streets for all		✓	✓			
Adopting a design led approach to parking		✓	✓			✓
Promoting resource efficiency and sustainably including land use, systems and materials	✓					✓

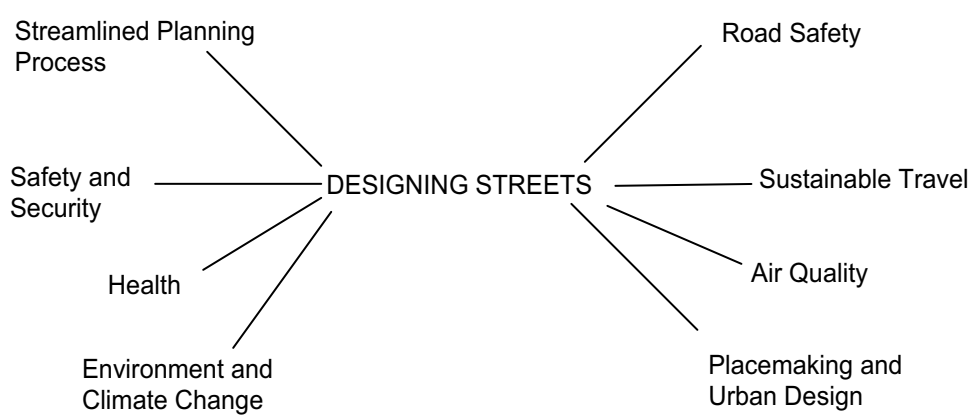
These key principles are covered in more detail in subsequent chapters.

2.3 POLICY LINKAGES

2.3.1 The principles set out above link strongly with the government's key objectives which include a *Safer Scotland*, a *Smarter Scotland* and a *Greener Scotland*.

More specifically, increasing connectivity and accessibility of neighbourhoods, which encourages activity on streets and sustainable modes such as walking and cycling will have a positive impact on people's health and well being and also help meet wider transport and environmental objectives. Increased numbers of people results in a feeling of improved safety and security - streets that are overlooked further enhance the feeling of security. Reductions in land-take for streets along with greater use of resource efficient materials and systems such as sustainable urban drainage (SUDS) can also help address climate change and other environmental agendas.

POLICY LINKAGES DIAGRAM



2.4 WHO DESIGNING STREETS IS FOR

2.4.1 *Designing Streets* is directed to all those with a part to play in the planning, design, approval or adoption of new streets, and modifications to existing streets. This includes the following:

Organisations

- developers;
- disability and other user groups;
- emergency services;
- road and transportation authorities;
- planning authorities;
- public transport providers;
- utility and drainage companies; and
- waste collection authorities.

2.4.2 Within these organisations, the document is relevant to a very wide range of professional disciplines including architects, policy officers and urban designers as well as planners and roads and transportation engineers and many more.

2.4.3 As well as those mentioned above, there are other groups with a stake in the design of streets. Local communities, elected members and civic groups, in particular, are encouraged to make use of this document.

2.4.4 *Designing Streets* covers a broad range of issues and it is recommended that practitioners read every section regardless of their specific area of interest. This will create a better understanding of the many and, in some cases, conflicting priorities that can arise. A good design will represent a balance of views with any conflicts resolved through compromise and creativity.

2.4.5 The Scottish Government recognises that a range of training and other initiatives will be required to assist people taking forward this exciting new agenda both in the roles of design and approval, to support the policy and guidance within *Designing Streets*.

2.5 PROMOTING JOINT WORKING

2.5.1 In the past, street design has sometimes been dominated by some stakeholders at the expense of others, often resulting in unimaginatively designed streets which tend to favour motorists over other users.

2.5.2 It is important for the various parts of local authorities to work together when giving input to a development proposal. Developers may be faced with conflicting requirements if different parts of local authorities fail to coordinate their input. This can cause delay and a loss of design quality. This is particularly problematic when one section of a local authority - for example the roads adoption /roads construction consent (RCC) or maintenance engineers - become involved late on in the process and require significant changes to the design. A collaborative process of partnership and cooperation is required from the outset between all relevant parties.

2.5.3 Similarly it is vital the developer teams also work in an integrated manner to deliver quality street design and provide appropriate interfaces with Local Authorities and other stakeholders.

Insert image of joint working

2.5.4 Research carried out for the Scottish Government in 2005 identified how the Roads Construction Consent process should be better integrated with the planning approval process. This will provide greater certainty for developers taking forward more innovative designs and meet government objectives for streamlining the planning process. Further advice on this issue is given in Chapters 3 and G8.

2.6 DESIGN STANDARDS

2.6.1 The Scottish Government is the road authority for trunk roads in Scotland and acts through Transport for Scotland. The standard for trunk roads is the *Design Manual for Roads and Bridges (DMRB)*.⁵

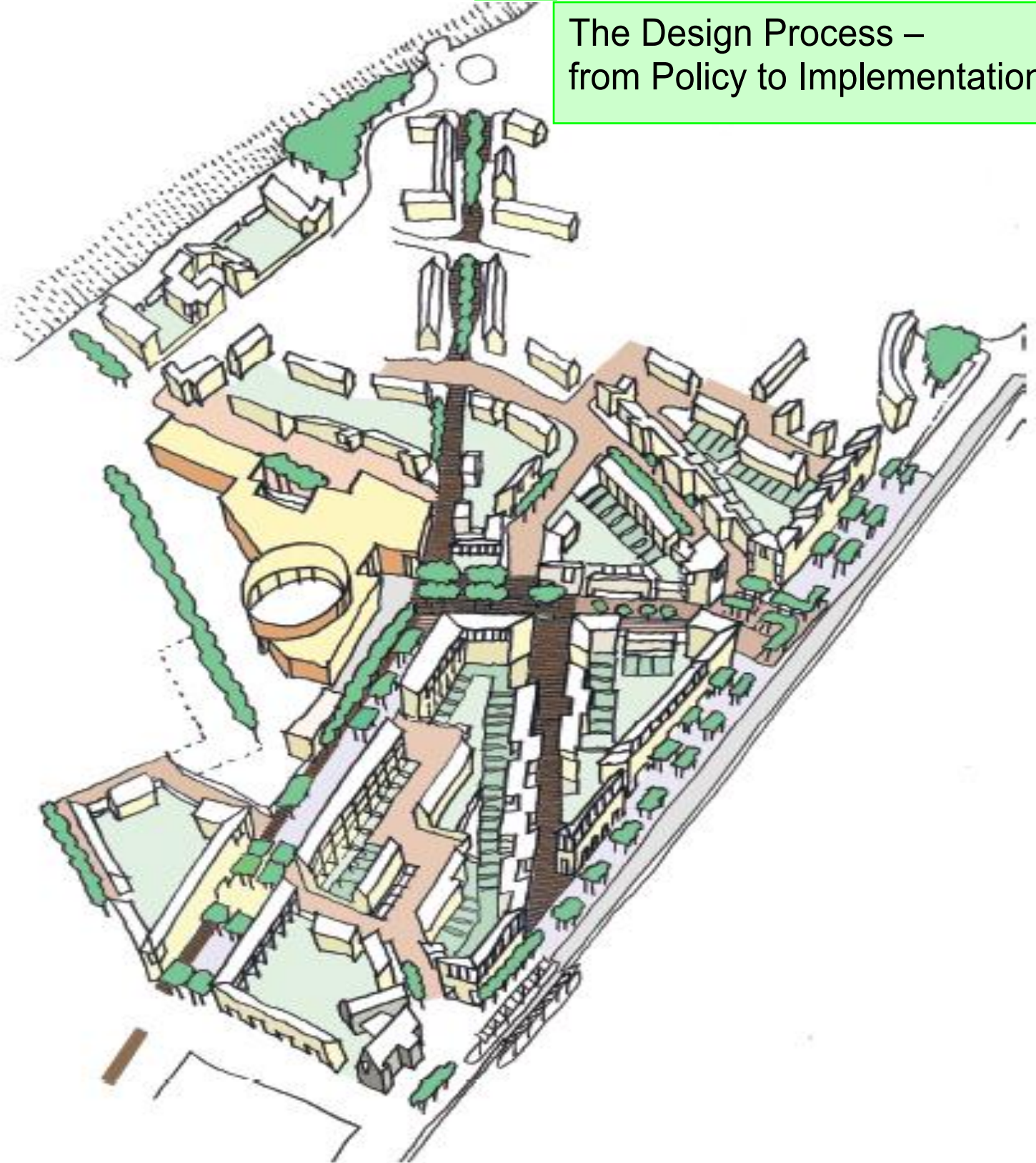
2.6.2 Some trunk roads could be described as 'streets' within the definition given in *Designing Streets*. *Designing Streets* does not generally apply to trunk roads, but in some locations, such as where a trunk road passes through the centre of a small town, and the 'place function' (see Chapter 2) is high, a more sensitive design that follows the principles of *Designing Streets* may well be appropriate.

2.6.3 The *DMRB* is not an appropriate design standard for most streets, particularly those in lightly-trafficked residential and mixed-use areas.

2.6.4 Although *Designing Streets* provides a policy and guidance on technical matters, local standards and design guidance are important tools for designing in accordance with the local context. Many local road authorities have developed their own standards and guidance. Some of these documents, particularly those published in recent years, have addressed issues of placemaking and urban design, but most have not. It is therefore essential that local authorities review their standards and guidance to embrace the principles of *Designing Streets*. Local standards and guidance should focus on creating and improving local distinctiveness through the appropriate choice of layouts and materials while adhering to the overall guidance given in *Designing Streets*.

3

The Design Process –
from Policy to Implementation



3 The Design Process – from Policy to Implementation

CHAPTER AIMS

- Set the design process in broad terms and reinforce the importance of collaborative working.
- Demonstrate the advantages of a team approach, starting with pre-application discussion, as previously set out within *PAN 76*, and continuing through to detailed planning and approval.
- Set out the key stages within the design process including the creation of a masterplan and the use of design codes where appropriate.
- Introduce a user hierarchy where pedestrians are considered first in the design process.
- Recommend a new approach to using Quality Audits and Road Safety Audits.

3.1 INTRODUCTION

3.1.1 The life of a scheme from conception to implementation can be broken down into seven key stages as follows:

- Establishing the Vision
- Appraisal and Analysis
- Design Development
- Testing and Auditing
- Approval
- Implementation
- Monitoring

3.1.2 This seven stage process is generally applicable to all schemes, from large new developments, through to smaller infill schemes, extensions to urban and rural settlements and improvements to existing streets. The key issues are that:

- design decisions should reflect current advice and policies;
- policies should be pragmatically interpreted on a case-by-case basis, and should be used to define objectives; sometimes these may be included within a design/development brief issued by the local authority; and
- scheme designs should be tested against these objectives before approval is given to their implementation.

3.1.3 The process is a general one and should be applied in a way that is appropriate to the size and location of the project. For example, the design development stage refers to the desirability of preparing a masterplan for large schemes. This is unlikely to be the case for smaller developments although it can sometimes be the key to raising design standards. In some cases a scheme layout will be all that is required.

3.2 INTEGRATED STREET DESIGN - A STREAMLINED APPROACH

3.2.1 The developer's team will need to engage with several departments within the Local Authority in order to identify all the relevant issues. It is therefore recommended that the planning and transportation authorities, together with other functions, such as those responsible for waste collection, co-ordinate their activities to ensure that authorities do not give contradictory advice or impose conflicting conditions on the developer and design team. This streamlined approach was first recommended within *PAN 76*¹. The table which forms the final page of this chapter shows how this should work in practice. .

3.2.2 It is therefore recommended that Local Authorities enable developers to engage more effectively with Departments by establishing a single point of contact, who represents the full council team, at the outset from pre-application stage. Some Authorities have created development teams so that all council departments with an interest in street design can work together during the design and approval process (see Case Study box 'Aberdeenshire Council'). This has clear advantages when dealing with both large and small developments. The same approach can be taken by local authorities internally when considering improvements to existing streets.

3.2.3 The benefits of an integrated approach applies to all stages in the process, from pre-application up to deciding how the street will be maintained in the future.

Aberdeenshire: a multi-disciplinary approach



Aberdeenshire Council operates a process of early meetings and discussion with developers prior to the submission of major planning applications. At the pre-application meetings, constraints will be identified and discussed with all consultees likely to have significant input. Planning and Roads officers are always present at these meetings, along with representatives of other key services as required. Advantages of this approach are:

- A more structured process including the encouragement to undertake pre-consultation with other relevant consultees and the community at an early stage;
- Early advice to enable the submission of an application in the most appropriate form;
- Greater certainty and quicker determination at the formal application stage; and
- An improvement in the overall quality of development schemes.

¹ Scottish Executive (2005) *Planning Advice Note 76: New Residential Streets*. Edinburgh: Scottish Executive

3.3 STEPS IN THE DESIGN PROCESS

3.3.1 The process outlined below will need to be tailored to suit particular situations, depending on the type and complexity of the scheme. It is recommended therefore that, at the outset, a project plan is drawn up by the developer and agreed with all stakeholders.

3.3.2 Consultation with the public and with organisations representing particular groups should take place at appropriate points in the process and is required under the *Planning (Scotland) Act 2006*. The timing, number and format of this engagement will vary depending on the size and complexity of the scheme. See *PAN 81 Community Engagement*² for detailed guidance on this issue.

3.3.3 Where schemes are significant because of their size, sensitivity, or strategic nature, local authorities and developers are encouraged to submit their proposals to Architecture + Design Scotland for Design Review at the earliest opportunity. Further information on the design review process is available on Architecture + Design website www.ads.org.uk. Design Review offers expert, independent advice on the quality of design and is ideally made at pre-application stage.

3.4 STAGE 1: ESTABLISHING THE VISION

3.4.1 At the very start of the design process, whether a large masterplan, a small development proposal or improvements to an existing street, it is important to establish what the aspirations are for the site. This should be considered within its wider context, and the goals can be interpreted into a clear vision. This is best achieved with all relevant parties within the process including the developer, the design team, representatives from the relevant local authority departments and input from key partners such as Historic Scotland, Scottish Natural Heritage, Scottish Water and SEPA.

3.4.2 Establishing the vision for a scheme is also critical when changes are being made to existing streets, and this process will require careful consultation with a wide range of stakeholders.

3.4.3 The vision can then be translated into either policy or the brief. For example if the project is being driven by the local authority, the tools which can help formalise the vision may include the Local Plan, Supplementary Planning Guidance and development briefs.

3.4.4 It is important that the vision for a scheme is expressed as objectives that are simple to understand, and which can form the basis for future review as part of the testing stage. As far as street design is concerned, objectives will often be related to the various activities expected to take place in particular locations and streets.

² Scottish Executive (2007) *Planning Advice Note 81: Community Engagement – Planning with People*.
Edinburgh: Scottish Executive

3.4.5 Typical objectives might therefore be:

- enabling local children to walk and cycle unaccompanied from all parts of a development to a school, local park or open space;
- promoting and enhancing the vitality and viability of a local retail centre through access arrangements which carefully balance the needs of all users;
- ensuring that a development will be served by, or connected to, public transport that is viable in the long term;
- keeping traffic speeds at 20mph or less in all streets on a development through design;
- minimising the visual impact of parking requirements within the street scene; and
- encouraging casual social interaction to strengthen a community.

3.4.6 Street design should be consistent with national, regional and local policy. The process begins with a review of relevant planning and transportation policies, and the identification of the required key design principles.

3.4.7 The starting point for the review of local policy is the Local Plan. Other transport policy, such as the Local Transport Strategy will also need to be considered and there may also be a Public Realm Strategy, Open Space Strategy or Core Path Network Strategy which will be of particular importance in establishing fundamental design principles. The policy review should also consider the national policy framework, particularly where the local policy framework is out of date, inconsistent or unclear.

3.5 STAGE 2: APPRAISAL AND ANALYSIS

3.5.1 All good design is responsive to its context and therefore there needs to be a thorough understanding of the site and the area. In most schemes a context appraisal would be undertaken to determine the principles of how buildings and streets are arranged within the area. This will be used to help determine an appropriate form for the development of, or changes to, existing streets. A useful reference in carrying out this preliminary work is the checklist contained within *PAN 68 Design Statements*.³

3.5.2 Examination of the existing movement patterns in and around the site, as well as nearby destination attractors, will allow consideration to be given as to how existing connections can be improved. This may include an assessment of how routes through the site can be enhanced or created, how new routes and spaces will operate in use, and how they can help to make a good place in which to live. An example of a context appraisal is shown in figure 3.1 below.

³ Scottish Executive (2003) *Planning Advice Note 68 – Design Statements*. Scottish Executive: Edinburgh

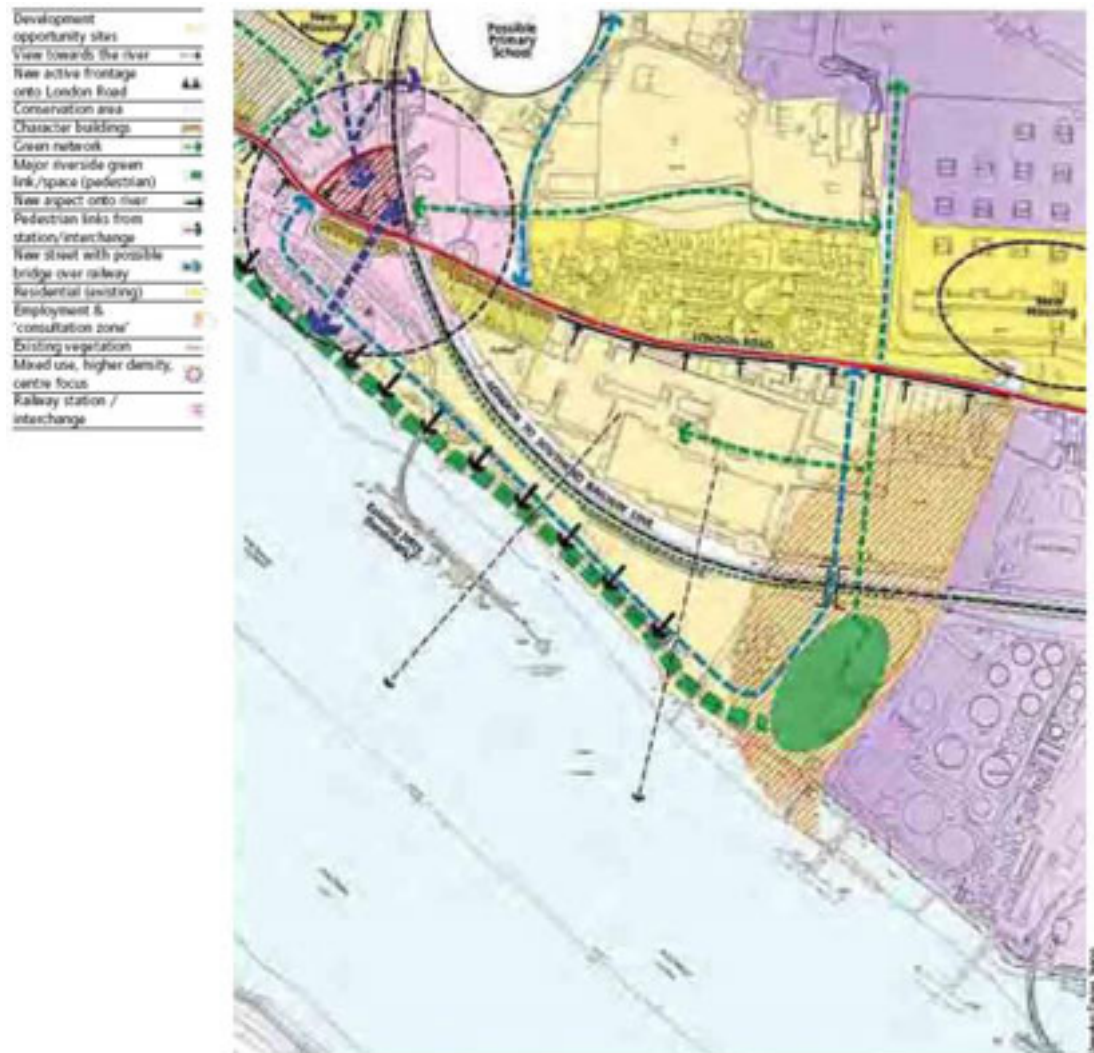


Figure 3.1 Illustration of a context appraisal/ FIGURE TO BE REPLACED WITH CLEARER SCOTTISH EXAMPLE

3.5.3 Understanding where people want to go and how they can get there is fundamental to a successful scheme. Existing destination places within the locality will need to be identified, including educational institutions, areas of employment or commerce, community facilities and public open space.

3.5.4 It is important to be inclusive of all travel modes and mobilities in the appraisal process, in order to encourage the use of walking, cycling and public transport.

3.5.5 It is recommended that the design of a scheme should follow the user hierarchy shown in Table 3.1, which is consistent with wider transportation policy.


<p>Consider first</p>  <p>Consider last</p>	Pedestrians
	Cyclists
	Public transport users
	Specialist service vehicles (e.g. emergency services, waste, etc.)
	Other motor traffic

Table 3.1: User hierarchy.

3.5.6 The hierarchy is not meant to be rigidly applied and does not necessarily mean that it is always more important to provide for pedestrians than it is for the other modes. However, they should at least be considered first, followed by consideration for the others in the order given. This helps to ensure that the streets will serve all users in a balanced way.

3.6 STAGE 3: DESIGN DEVELOPMENT

3.6.1 Establishing a vision for the place, and how the movement framework will contribute toward that, is the starting point in design development.

3.6.2 Design development should then be evolved using the information gathered at the previous stages in the design process. Options which examine different scenarios should be prepared. The layout of the movement network needs as much careful consideration as the design of the buildings.

3.6.3 A Transportation Assessment may be commissioned at this point which may influence design development.

3.6.4 A wide range of issues need to be considered; these can be grouped under the broad headings of context, identity and connection which are referred to throughout Scottish guidance. Aspects of these are dealt with throughout the Guidance chapters of this document and a detailed checklist is contained within section G2.

3.6.5 Guidance on the design of movement frameworks is set out within more detail in Chapter G1. The movement framework (Fig 3.2 below) is a key input to the development of the masterplan; Scottish Government guidance on best practice for masterplanning development is contained within *PAN 83*.⁴



Figure 3.2 Typical Proposed Movement Diagram.

LARGER SCALE OUTLINE MASTERPLANS

3.6.6 An outline masterplan will help establish a scheme's broad development principles and show how it fits within its context. An outline masterplan which has been produced through collaboration with key stakeholders is usually more robust and realistic than it would otherwise be and will help to create a more sustainable community.

3.6.7 For large sites, an engagement process will need to be carefully planned, usually with a series of stakeholder events which brings all relevant parties together and allows a common vision to be formed and agreed. It also helps all parties understand other needs which may need to be balanced in order to promote a robust scheme.

⁴ Scottish Government (September 2008) Planning Advice Note 83 Masterplanning

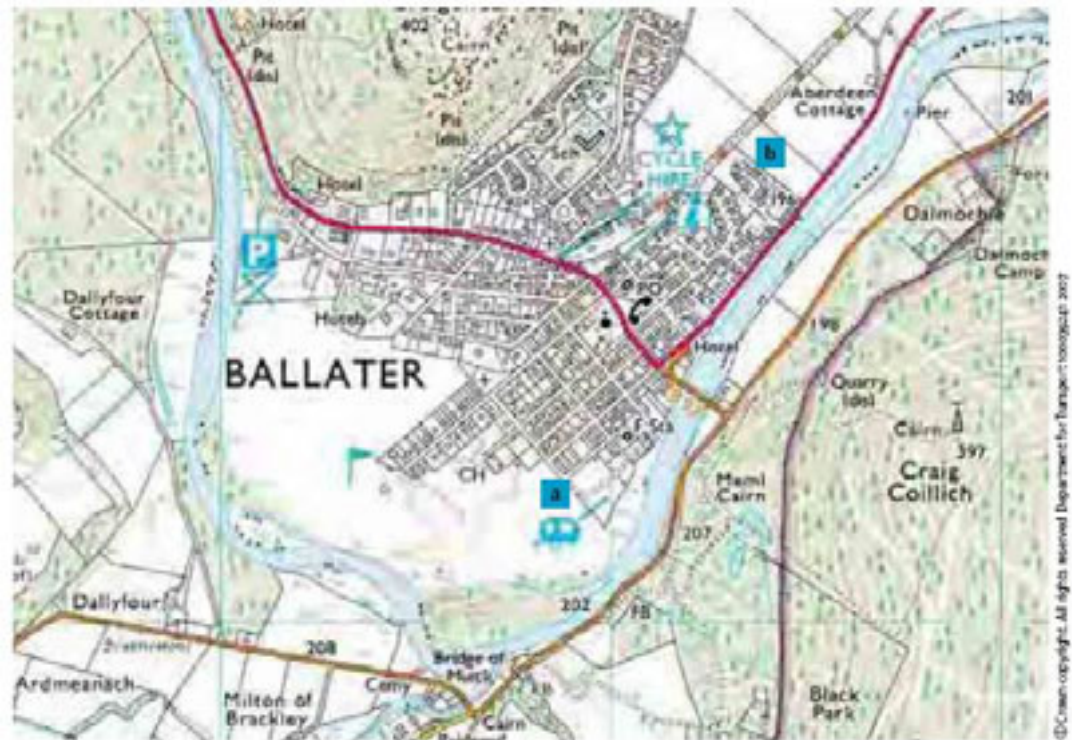


Figure 3.3 Ballater, Aberdeenshire - the ability for future growth is not compromised in the south-west of the village (a) with its permeable street pattern, but more recent cul-se-sac type development in the north-east (b) does not allow for a connected growth of the village.

3.6.8 Once the outline masterplan has been prepared and key movement routes identified, the next step will be to establish the characteristics of the various types of street that are required for the new development. Street character types should be developed by considering the space requirements of people and vehicles rather than through the application of standardised widths relating to dwelling numbers. A hierarchy should be established which relate to the character of the local area e.g. Roads, Drives, Terraces and Places. The mix and combination can help to create distinctive areas. This is because each character type will have key requirements for the dimensions of the street, its relationship with the buildings and the space that encloses it. More guidance on creating street character types is contained in chapter G4.

DETAILED MASTERPLANS

3.6.9 It is important when preparing a detailed masterplan that all of the critical features are carefully considered which impact on the efficiency and quality of the development and which cannot be changed once it is built.

3.6.10 In developing the design the following key features which relate to street design should be addressed:

- Connections to the surrounding area for all transport modes
- Connections through the site for all transport modes
- Speed control
- Street layout, character and dimensions
- Building lines
- Building heights
- Routes for utilities
- Parking provision, design and control
- Landscape design and structure planting
- Materials, management and maintenance regime
- Servicing and access for emergency vehicles
- SUDS and land take requirements
- Sewer routes

SMALLER SITES

3.6.11 For smaller sites the process may not need to be so involved; design proposals can be informed by a simple scheme layout developed through targeted meetings with key stakeholders. It will still be fundamental, however, to understand and respond positively to the character of the area in order to make a good place.

3.7 STAGE 4: TESTING AND AUDITING

3.7.1 Once the design has been developed, it is important to test the concepts against the principles which were established at the outset to see if they are likely to achieve the vision for the site. Masterplanning is an iterative process and the development proposal is likely to go through several changes in order to ensure that the final solution meets all policy, design, economic and social aspirations.

3.7.2 This system can be formalised through a Quality Auditing system. These are becoming commonly used in England and are outlined below. Road schemes are also routinely subjected to Road Safety Audits at this stage and the role of these is also examined in more detail in this section.

QUALITY AUDITS

3.7.3 Quality audits can ensure that street designs are appropriate and meet the objectives agreed at the outset. Documented audit and sign-off systems also provide a strong defence against any liability claims that may arise after the scheme has been implemented, as discussed in Chapter 1. Quality audits can include road safety audit but also other types of assessments.

Quality audits are particularly beneficial in the following circumstances:

- at option testing stage;
- at pre-application stage;
- where strong tensions exist between different objectives a Quality Audit will aid more balanced decision-making.
- for schemes within existing streets, where a quality audit will provide an opportunity for decision-makers to make a balanced assessment of different considerations before approving a particular solution(see the Devon Case Study box).; and
- for smaller schemes where no Design Statement will be required

3.7.4 The audit may include documents required by the local planning authority to support an outline or detailed application. The audit should be undertaken by various professionals, and each will be undertaken within their own relevant guidelines. When the assessments are then grouped together, compromises within the scheme will become apparent hence making it easier for decision-makers to view the scheme in the round.

3.7.5 A quality audit should be integral to the design and implementation and not a tick box exercise. A typical audit may include some of the following assessments but the content will depend on the type of scheme and the objectives which the scheme is seeking to meet:

- a review of how the street will be used by the community
- a road safety audit
- an audit of visual quality
- an access audit
- a walking audit
- a cycle audit



Devon County Council has developed a process whereby both an environmental audit and a road safety audit (Fig. 3.13) are carried out when improvement schemes are being prepared.

The two audits are carried out separately and if there is a difference of opinion between the two over any aspect, the matter is referred to a senior officer for a decision. It is therefore possible to demonstrate that decisions have been properly considered in case of future dispute.

This process is, in essence, a quality auditing process.

ROAD SAFETY AUDITS (RSA)

3.7.6 Road Safety Audits can be a key component within an overall Quality Audit. Road Safety Audits are routinely carried out for many road schemes. The Institution of Highways and Transportation (IHT) Guidelines on RSA sit alongside the relevant standard contained in *DMRB* as the recognised industry standard documents in the UK. The procedures set out in *DMRB* are a formal requirement only for trunk roads.

3.7.7 It is important to understand that RSAs are not mandatory for local road authorities. Many residential streets, where the design is carried out by a developer's consultant, are assessed independently by the local roads authority. In many authorities there is no requirement for a further check by a Roads Safety Audit team, particularly where it is clear that motorised traffic volumes and speeds, and the degree of potential conflict between different user-groups, are not going to be significant.

3.7.8 The purpose of the RSA is to identify road safety problems, with the objective of minimising the number and severity of casualties. An RSA is not a check on compliance with design standards. Audits should take all road users into account, including pedestrians and cyclists. The standard procedure is that the auditor makes recommendations for changes to the design to address perceived road safety concerns. The design team reviews the RSA report and decides whether or not to accept particular recommendations.

3.7.9 It is also important to note that the design team retains responsibility for the scheme and is not governed by the findings of the report. There is therefore no sense in which the scheme “passes” or “fails” the RSA process. Designers do not have to comply with the recommendations of a safety audit, although in such cases they would be expected to justify their reasoning within a written report.

3.7.10 The process set out in *DMRB* requires the audit team to be independent of the design team, and road safety issues are therefore often considered in isolation from visual quality and successful place-making issues. It can therefore be difficult to achieve a balanced design through dialogue and compromise. However the requirement for independence need not prevent contact between the design team and the audit team throughout the process.

3.7.11 It is recommended that involving roads safety professionals as an integral part of the design team could help to overcome problems. This allows ideas to be tested and considered in more balanced and creative ways; and should overcome situations where perceived safety issues lead to late changes to schemes, often to the detriment of design quality.

3.7.12 Another area of concern with the current system is that RSAs may seek to identify all possible risks without distinguishing between major and minor risks or quantifying the probability of them taking place. There can also be a tendency for auditors to encourage designs that achieve safety through segregating vulnerable road users from road traffic. Such designs can perform poorly in terms of streetscape quality, pedestrian amenity and security and, in some circumstances can actually reduce safety levels.

3.7.13 It would therefore be useful if RSAs included an assessment of the relative significance of any potential safety problems. A risk assessment to consider the severity of a safety problem and the likelihood of occurrence would make it considerably easier for decision-makers to strike an appropriate balance. An example of a risk assessment framework is given in *Highway Risk and Liability Claims 2005*.

3.7.14 Careful monitoring (such as through conflict studies) of the ways in which people use the completed schemes can identify any safety problems. This is particularly useful when designers move away from conventional standards (see section 3.10 below).

3.8 STAGE 5: APPROVAL

3.8.1 New development proposals need to be submitted for approval to the planning authority who, in turn consults with the roads authority on street design issues.

3.8.2 Where outline planning permission is being sought, various supporting information needs to be provided as agreed with the planning and roads authorities. With regard to the street design and movement network this may include some or all of the following, depending on the type, size and complexity of the scheme (this list is not necessarily exhaustive):

- preliminary street designs and layouts;
- a Design Statement;
- Design Codes (see section 3.9 below);
- a Transport Assessment;
- a Travel Plan;
- an Environmental Statement;
- a Sustainability Appraisal;
- a Flood Risk Assessment; and
- a Drainage Strategy, including Impact Assessments and SUDS Strategy.

3.8.3 As many issues as possible should be resolved at the outline planning stage so that they can receive thorough and timely consideration. This will help to make the detailed planning applications or the consideration of reserved matters as straightforward as possible. If an integrated approach has been taken to team working throughout the process from both the Authority and the Developer side, then determination of the Application should be a relatively quick process.

3.8.4 Ideally, following outline consent, only matters of detail, such as the detailed layout and material choices, will be left for consideration at detailed application stage. Further discussions on this are contained within Chapter G6.

3.8.5 For smaller developments and schemes in sensitive locations, such as conservation areas, it will often be appropriate for detailed planning approval to be sought without first obtaining outline consent. This enables the approving authorities to consider the effects of the development in detail before approving the development in principle.

3.8.6 In existing streets the roads authority is normally both the designer and the approving body and planning permission is not normally required. It is recommended however that well documented quality audit and approval systems are used that properly assess the impact of proposed changes to prevent the gradual degradation of the street scene through ill-considered small scale schemes.

3.9 STAGE 6: IMPLEMENTATION

DELIVERY MECHANISMS: DESIGN CODES

3.9.1 Once a masterplan has been finalised and approved, further, more detailed design guidance may be needed, in the form of, for example, a design code to help move the masterplan to the detailed design stage. When submitted as part of the outline masterplan, the design code can give the Local Authority comfort in providing the blueprint for how the development proposals will be delivered in a co-ordinated and cohesive way.

3.9.2 A design code is a document accompanied by detailed drawings or diagrams that elaborate on some of the design principles set out in the masterplan. The design code will provide a degree of detailed specification on the matters which the masterplan has identified as non-negotiable and which are not expected to change in the foreseeable future. If a matter does not relate to a specific design principle it should not be coded. The code may cover a group of buildings, a street or a whole area within a masterplan area.

3.9.3 A code can be adopted by an authority as Supplementary Planning Guidance, or it can be given status as a condition to a planning permission. Although gaining the commitment of all relevant parties to a design code may take some time and effort to establish, it will generally contribute to the speed, quality and certainty at later stages of the development process.

3.9.4 Codes must be prepared by designers who understand how to create successful places and need to have the full commitment of all relevant parties. Codes will work successfully only if the landowners and local authorities which use them have the necessary skills and understanding to evaluate the response.

3.9.5 Overall, design codes can be good delivery mechanisms to ensure that detailed design and construction takes place in line with the masterplan. But whilst providing a level of certainty and prescription, they must also have a degree of flexibility. Codes must be possible to adapt in response to changing conditions for example in order to allow increased density of development. One of the pilot Coding projects in England was at Upton in Northamptonshire where the Code established street character and design principles at a very early stage of the design process. The physical results can now be seen and more information on this is provided within the Case Studies.

DETAILED DESIGN, TECHNICAL APPROVAL, PHASING, CONSTRUCTION AND ADOPTION

3.9.6 In the past, developers have sought to satisfy the detailed planning process before commencing the detailed design of the streets in order to comply with the RCC process. This has sometimes led to problems where the detailed design and technical approval stages throw up problems that can only be resolved by changing the scheme that was approved at the detailed planning stage. This has caused problems and delays.

3.9.7 A more integrated approach is required with roads adoption engineers being fully involved throughout, so that the schemes that are approved at detailed planning stage can move through the technical approval stage without requiring any significant changes. Early involvement of the Local Authority officers involved with Road Construction Consents is thus vital. Road adoption issues are dealt with in more detail in chapter G6.

3.9.8 Considerable thought must be given to establishing an appropriate phasing programme covering utility and road infrastructure, SUDS, spaces, ground preparation and buildings.

3.10 STAGE 7: MONITORING

3.10.1 One way to try and ensure continuity of a masterplan is to ensure a process by which it will be monitored. As the masterplan is prepared in detail, it should be monitored and reviewed to ensure that it reflects the specific requirements of the proposal and will deliver the vision.

3.10.2 Detailed proposals should be constantly monitored against the masterplan's aims. Any lessons learnt from early phases that could have a positive effect on future phases should be fed into a revised masterplan to ensure it remains relevant. This may cover issues such as changing economic circumstances, the availability of new products and materials, or changes in policy.

3.10.3 Once schemes are completed, monitoring can also be used to see how they or redesigned street environments function in practice, so that changes can be made to new designs, particularly innovative ones, at an early stage. This was achieved with relation to SUDS especially within the Ardler regeneration scheme in Dundee. This is discussed further as a Case study.

3.10.4 Monitoring can also be an important aspect of residential travel patterns, where patterns of movement are reviewed against planned targets.

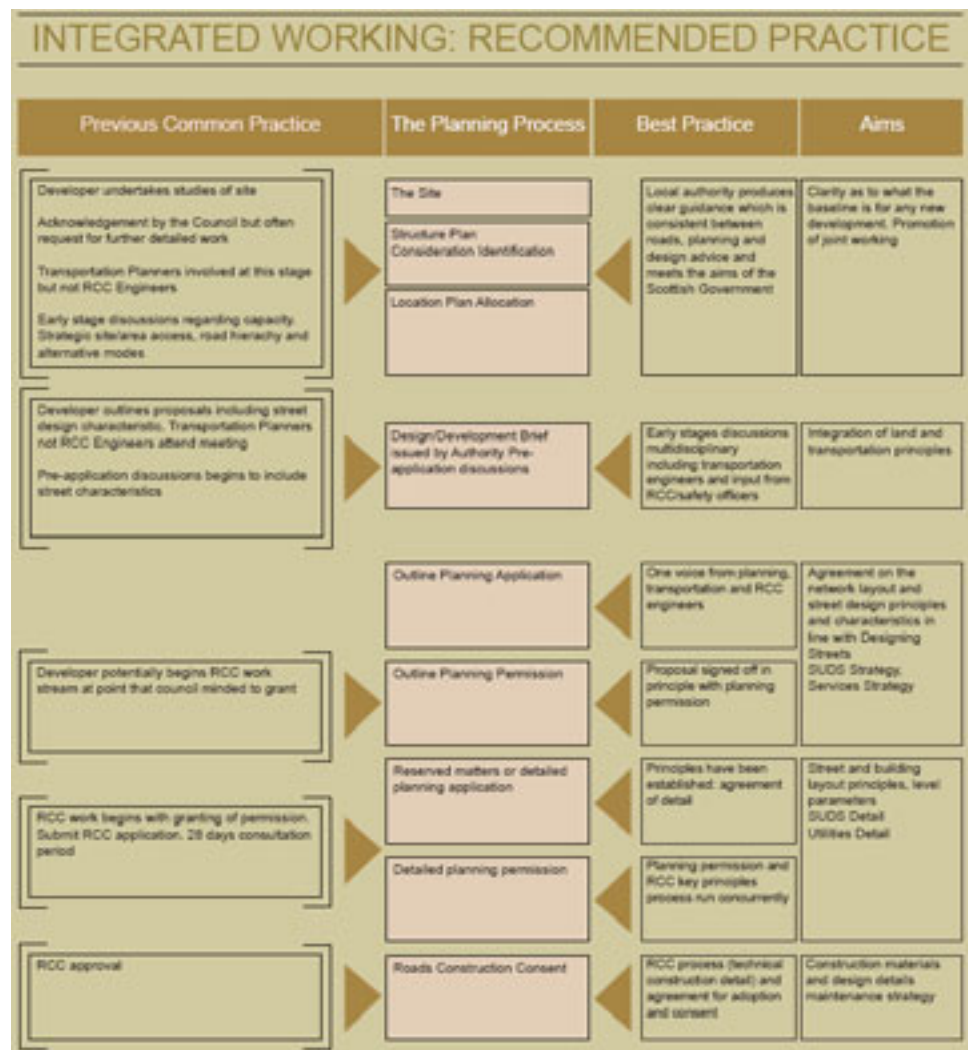
3.11 CONCLUSION

3.11.1 *Designing Streets* is Scottish Government policy and will result in a step change in the design of our streets and settlements. The place function of streets is considered at the outset rather than the street as an engineered solution. This requires more integrated working between Local Authorities, other stakeholders and Developer Teams.

3.11.2 Some of the key aspects of *Designing Streets* that will influence masterplan design include:

- altering attitudes toward risk and changing the perception of what makes a “safe” street allowing flexibility and a reduction of clutter within the street
- creating permeable streets, and designing streets by their character and not by the projected vehicle movements
- allowing a “tighter” urban form through reduced visibility at junctions and use of the crossroads as a junction form
- encouraging less onerous forward visibility requirements which give more flexibility to street design, and allow the use of the urban form to promote slower speeds
- encouraging a variety of parking solutions, and moving away from parking at the front of the plot

- 3.11.1 *Designing Streets* responds to changes in the planning system through encouraging dialogue and collaborative working between the planners, engineers, developers and the public at the outset. This in turn will highlight issues to be resolved at the beginning of the process and speed up the planning consent process through plans being developed collaboratively and thus reducing the chances of objection and change later on in the process.
- 3.11.2 The attached supporting documentation, the Guidance section of this document, sets out the practical applicability of *Designing Streets* through detailing the design principles and detailed design issues and considerations. Five case studies are also included to provide additional guidance and examples of good practice which embody some of these principles in the implementation of *Designing Streets*.



G1

Layout and connectivity



G1 Layout and Connectivity

CHAPTER AIMS

- Set out design concepts for the structuring of towns and cities.
- Set out principles for walkable neighbourhoods.
- Illustrate appropriate layouts and street forms.
- Consider internal permeability and external connectivity.
- Give advice on crime prevention.

G1.1 PLANNING FOR THINGS YOU CANNOT EASILY CHANGE LATER

G1.1.1 The way streets are laid out and how they relate to the surrounding buildings and spaces has a great impact on the aesthetic and functional success of a neighbourhood. Certain elements are critical because once laid down, they cannot easily be changed. These issues are considered in the masterplanning and design coding stage, and need to be resolved before detailed design is carried out.

G1.1.2 This chapter highlights the issues likely to be encountered in developing detailed designs, and ways of dealing with them. There are also tips on avoiding unwanted consequences of particular design decisions.

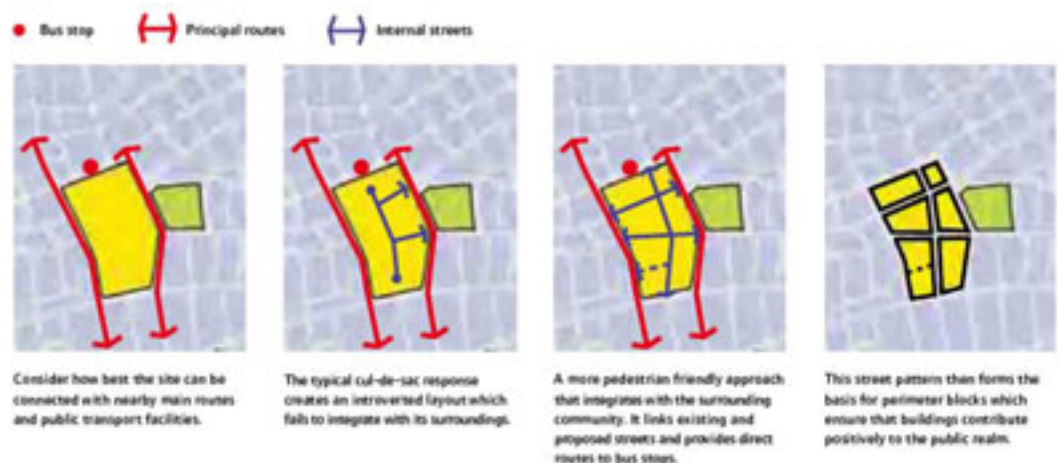


Figure G1.1 Integrating new developments into the existing urban fabric is essential (source: *The Urban Design Compendium*¹).

G1.2 THE MOVEMENT FRAMEWORK

G1.2.1 A key consideration for achieving sustainable development is how the design can influence how people choose to travel. Designers and engineers need to respond to a wide range of policies aimed at making car use a matter of choice rather than habit or dependence. Regional and local transport strategies can directly inform the design process as part of the policy implementation process.

¹ Llewelyn Davies (2000) *The Urban Design Compendium*. London: English Partnerships and The Housing Corporation.

G1.2.2 It is recommended that the movement framework for a new development be based on the user hierarchy as introduced in Section 3.5.5. Applying the hierarchy will lead to a design that increases the attractiveness of walking, cycling and the use of public transport. Delays to cars resulting from adopting this approach are unlikely to be significant in residential areas. The movement framework should also take account of the form of the buildings, landscape and activities that form the character of the street and the links between new and existing routes and places (Fig. G1.1).

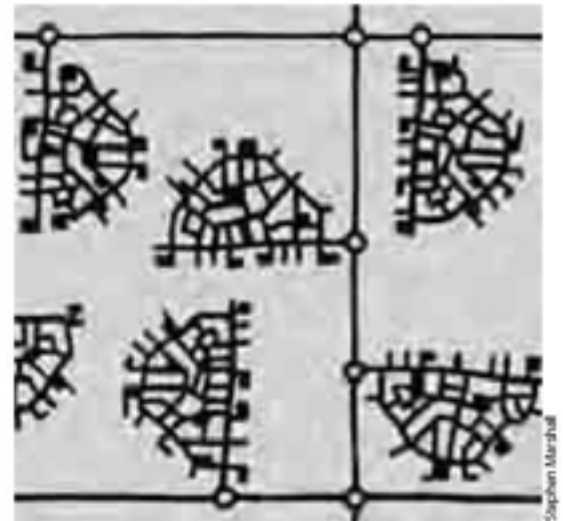


Figure G1.2 Internally permeable neighbourhoods lacking direct connections with one another – to be avoided (source: Marshall 2005, *Streets and Patterns*. London: Spon Press).

G1.2.3 Street networks should, in general, be connected. Connected, or ‘permeable’ networks encourage walking and cycling, and make places easier to navigate through. They also lead to a more even spread of motor traffic throughout the area and so avoid the need for distributor roads with no frontage development. Research² shows that there is no significant difference in collision risk attributable to more permeable street layouts.

G1.2.4 Pedestrians and cyclists should generally be accommodated on streets rather than routes segregated from motor traffic. Being seen by drivers, residents and other users affords a greater sense of security. However, short pedestrian and cycle-only links can be acceptable if designed well. Regardless of length, all such routes in built-up areas, away from the carriageway, should be barrier-free and overlooked by buildings. Narrow routes hemmed in by tall barriers should be avoided as they can feel claustrophobic and less secure for users.

CONNECTING LAYOUT TO THEIR SURROUNDINGS

G1.2.5 Internal permeability is important but the area also needs to be properly connected with adjacent street networks. A development with poor links to the surrounding area creates an enclave which encourages movement to and from it by car rather than by other modes (Fig. G1.2).

² York, A Bradbury, S Reid, T Ewings and R Paradise (2007) *The Manual for Streets: Redefining Residential Street Design* TRL Report No. 661. Crowthorne: TRL

G1.2.6 External connectivity may often be lacking, even where layouts generally have good internal permeability. Crown Street, Glasgow, is shown in Fig. G1.3a, with an indication of where connectivity was not realised.

G1.2.7 The number of external connections that a development provides depends on the nature of its surroundings. Residential areas adjacent to each other should be well connected, as should residential areas with local centres or high streets.

G1.2.8 To create a permeable network, it is generally recommended that streets with one-way operation are avoided. They require additional signing and result in longer vehicular journeys.

THE HIERARCHIES OF PROVISION

G1.2.9 If road safety problems for pedestrians or cyclists are identified, conditions should be reviewed to see if they can be addressed, rather than segregating these users from motorised traffic. Table G1.1 suggests an ordered approach for the review.

G1.2.10 These hierarchies are not meant to be rigidly applied and there may be situations where it is sensible to disregard some of the solutions when deciding on the optimum one. For example, there would be no point in considering an at-grade crossing to create a pedestrian/cyclist link between developments on either side of a motorway. However, designers should not dismiss out of hand solutions in the upper tier of the hierarchy.

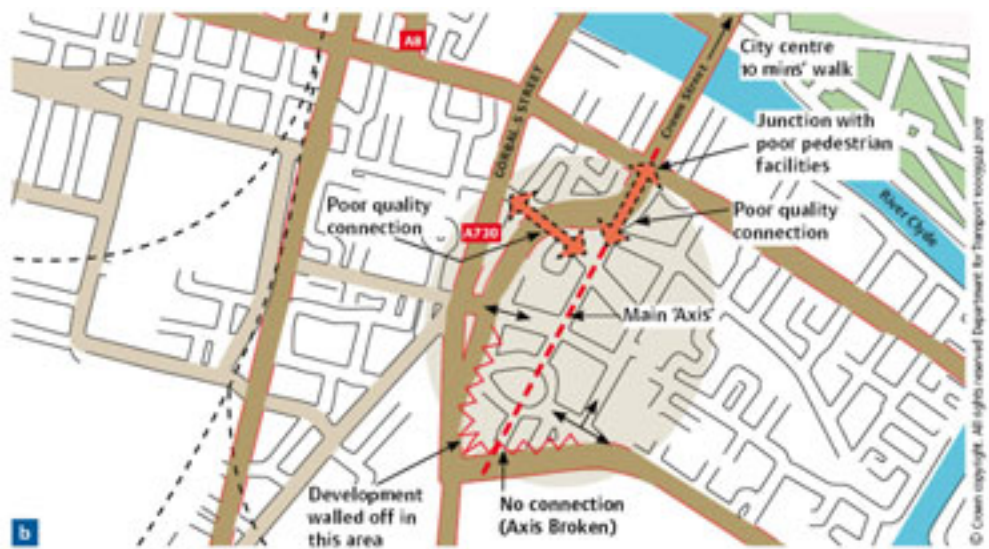
G1.2.11 It is recommended that the hierarchies are used not only for a proposed scheme but also for connections through existing networks to local shops, schools, bus stops, etc.

G1.3 BUILDING COMMUNITIES TO LAST

G1.3.1 Good design is a key element in achieving the Scottish Government's aim to create thriving, vibrant, sustainable places. Sustainable places meet the diverse needs of existing and future residents, are sensitive to their environment by minimising their effect on climate change, and contribute to a high quality of life. They are safe and inclusive, well planned and promote social inclusion, offering equality of opportunity and good services for all.



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Figure G1.3 Crown Street, Glasgow: (a) the Crown Street development in the background is separated from the main road to the city centre; and (b) map.

	Pedestrians	Cyclists
Consider first ↓ Consider last	Traffic volume reduction	Traffic volume reduction
	Traffic speed reduction	Traffic speed reduction
	Reallocation of road space to pedestrians	Junction treatment, hazard site treatment, traffic management
	Provision of direct at-grade crossings, improved pedestrian routes on existing desire lines	Cycle tracks away from roads
	New pedestrian alignment or grade separation	Conversion of footways / footpaths to adjacent -* or shared-use routes for pedestrians and cyclists

* Adjacent-use routes are those where the cyclists are segregated from pedestrians.

Table G1.1 The hierarchies of provision for pedestrians and cyclists

G1.3.2 Areas of local amenity should be evenly distributed, with good connectivity, so that the overall layout encourages access by walking or cycling, and shortens the distances travelled by car (Fig G1.4).

G1.3.3 When considering a site there needs to be a broad understanding of its historic development and its relationship with other communities, whether at the village, town or city scale (Fig G1.5).

G1.3.4 The provision and viability of facilities needs to be assessed in relation to the location and scale of proposals. In many cases, it may be better for a new development to reinforce existing centres and facilities rather than providing alternative facilities. The greater the density of development, the more facilities can be supported.



Figure G1.4 (a) dispersed and car-dependent versus (b) traditional, compact and walkable layout



Figure G1.5 The plans of many Scottish villages, towns and cities illustrate different patterns of development over time, from (1) historic cores, through to (2) experimental 'Radburn' layouts from the 1960s, to (3) recent cul-de-sac layouts.

G1.4 THE WALKABLE NEIGHBOURHOOD

G1.4.1 Walkable neighbourhoods are typically characterised by having a range of facilities within 10 minutes (up to about 800 m) walking distance of residential areas which residents may access comfortably on foot. However, this is not an upper limit. *SPP17*³ states that:

'Within an approach to integrated land use and transport planning, mode of personal travel should be prioritised according to the following principles:

- walking: the most sustainable form of travel, capable of substituting for the car over short distances with very significant health benefits and environmental gains.
- cycling: a sustainable form of transport with significant health benefits and environmental gains

Designing Streets encourages a reduction in the need to travel by car through the creation of mixed-use neighbourhoods with interconnected street patterns, where daily needs are within walking distance of most residents (see figure G1.6).



Figure G1.6 The Walkable Neighbourhood

³ Scottish Executive (2005) *Scottish Planning Policy 17 Planning for Transport*. Edinburgh: Scottish Government

G1.4.2 By creating linkages between new housing and local facilities and community infrastructure, the public transport network and established walking and cycling routes are fundamental to achieving more sustainable patterns of movement and to reducing people's reliance on the car. A masterplan (or scheme layout for smaller-scale developments) can help ensure that proposals are well integrated with existing facilities and places.

G1.4.3 Density is also an important consideration in reducing people's reliance on the private car. *SSP17*³ encourages a flexible approach to density, reflecting the desirability of using land efficiently and the need to promote higher density development in places well served by public transport. Residential densities should be planned to take advantage of proximity to activities, or to good public transport linking those activities. *Better Places to Live By Design*⁴ advises that a certain critical mass of development is needed to justify a regular bus service, at frequent intervals, which is sufficient to provide a real alternative to the car.

G1.5 LAYOUT CONSIDERATIONS

G1.5.1 Streets are the focus of movement in a neighbourhood. Pedestrians and cyclists should generally share streets with motor vehicles. There will be situations where it is appropriate to include routes for pedestrians and cyclists segregated from motor traffic, but they should be short, well overlooked and relatively wide to avoid any sense of confinement. It is difficult to design an underpass or alleyway which satisfies the requirement that pedestrians or cyclists will feel safe using them at all times.

G1.5.2 The principle of integrated access and movement means that the perimeter block is usually an effective structure for residential neighbourhoods. A block structure works in terms of providing direct, convenient, populated and overlooked routes. In addition, it makes efficient use of land, offers opportunities for enclosed private or communal gardens, and is a tried and tested way of creating quality places (Figs G1.7 and G1.8).



Figure G1.7 Perimeter blocks enclosing a pleasant communal open space

⁴ DTLR and CaBE (2001) *Better Places to Live: By Design*. A Companion Guide to PPG3. London: Thomas Telford Ltd.



Figure G1.8 A roads-dominated layout with buildings that have a poor relationship to the road (EDAW, Drumchapel).

G1.5.3 Several disadvantages have become apparent with housing developments built in the last 40 years which departed from traditional arrangements. Many have layouts that make orientation difficult, create left over or ill defined spaces, and have too many blank walls or façades. They can also be inconvenient for pedestrians, cyclists and bus users.

G1.5.4 Within a block structure, the designer has more freedom to create innovative layouts. The layouts in Fig. G1.9, and variations on them (such as a 'broken grid' with the occasional cul-de-sac), are recommended when planning residential and mixed-use neighbourhoods.

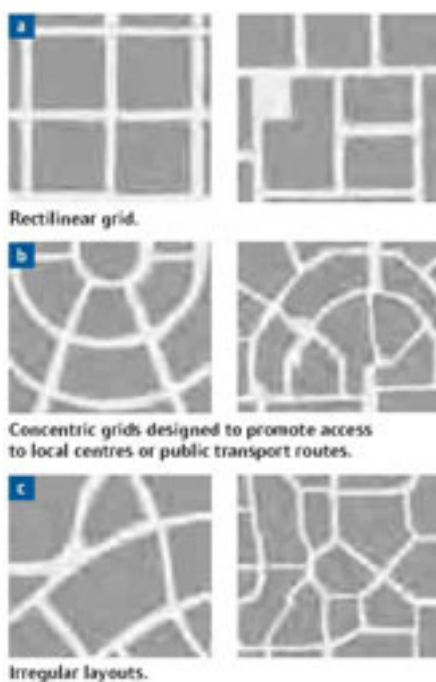


Figure G1.9 Variations on the block structure.

GEOMETRIC CHOICES AND STREET PATTERN

G1.5.5 Straight streets are efficient in the use of land. They maximise connections between places and can better serve the needs of pedestrians who prefer direct routes. However, long, straight streets can also lead to higher speeds. Short and curved or irregular streets contribute to variety and a sense of place, and may also be appropriate where there are topographical or other site constraints, or where there is a need to introduce some variation for the sake of interest. However, layouts that use excessive or gratuitous curves should be avoided, as they are less efficient and make access for pedestrians and cyclists less direct.

G1.5.6 Geometric choices and street pattern should be based on a thorough understanding of context.



Figure G1.10 A good example of a pedestrian/cycle route. It is short, direct and overlooked.

G1.5.7 Conventional cul-de-sacs, which are often favoured by new home owners, can offer some benefits. For example, their design creates an open area that children can play in, and without through traffic residents are more likely to use their front garden space. Their success is largely dependant on the size and layout of the cul-de-sac, the detailing of road carriageways, boundary treatments (or lack of them), how parking is addressed holistically throughout the development and the attitudes of local residents. Consequently, conventional cul-de-sac layouts without inter-connection are discouraged. The preference is networked routes and spaces which connect new residential areas together and link with existing development forms.

G1.5.8 Cul-de-sacs may sometimes be required because of topography, boundary or other constraints. Cul-de-sacs can also provide the best solution for developing awkward sites where through routes are not practical (Fig. G1.10). Caution must, however, be exercised when planning for cul-de-sacs, as they may concentrate traffic impact on a small number of dwellings, require turning heads that are wasteful in land terms and lead to additional vehicle travel and emissions, particularly by service vehicles. Any through connections for pedestrians and cyclists should be provided and well overlooked with active frontages.

G1.6 CRIME PREVENTION

G1.6.1 The layout of a residential area can have a significant impact on crime against property (homes and cars) and pedestrians. Section 17 of the *Crime and Disorder Act 1998*⁵ requires local authorities to exercise their function with due regard to the likely effect on crime and disorder. To ensure that crime prevention considerations are taken into account in the design of layouts, it is important to consult police Architectural Liaison Officers as advised in *Planning Advice Note 77: Designing Safer Places*.⁶

G1.6.2 To ensure that crime prevention is properly taken into account, it is important that the way in which permeability is provided is given careful consideration. High permeability is conducive to walking and cycling, but can lead to problems of anti-social behaviour if it is only achieved by providing routes that are poorly overlooked, such as rear alleyways.

G1.6.3 *Designing Safer Places* highlights the following principles for reducing the likelihood of crime in residential areas.

- Local characteristics

Early discussions with the local authority and police can help to identify any physical, social and economic circumstances that could have an impact on local crime characteristics. Understanding the problems should enable better design.

- Orientation of buildings

Buildings should be orientated to provide natural surveillance of footpaths and public spaces.

- Mixed uses

An appropriate mix of uses can often encourage activity and movement at all times. Although mixed uses should be compatible.

- Lighting

There is general acceptance that high quality external lighting can help to reduce the incidence of crime. It can add vitality to an area, enhancing its attractiveness and sense of place.

- Pedestrians

Pedestrian routes should have an open aspect, be well lit and have a good level of surveillance. The pedestrian should be able to view the full length of the path on entry rather than negotiate blind corners or recesses.

⁵ Crime and Disorder Act 1998. London: TSO.

⁶ Scottish Executive (2006) *Planning Advice Note 77: Designing Safer Places* Edinburgh: Scottish Executive



Figure G1.11 Active frontage to all streets and to neighbouring open space should be an aim in all developments. Blank walls can be avoided, even on the return at junctions, with specially designed house types.

G1.7 STREET CHARACTER TYPES

G1.7.1 Traditionally, road hierarchies (e.g. district distributor, local distributor, access road, etc.) have been based on traffic capacity. As set out in Chapter 2, street character types in new residential developments should be determined by the relative importance of both their place and movement functions.

G1.7.2 Examples of the more descriptive terminology that should now be used to define street character types are:

- high street;
- mixed-use street
- brae
- crescent
- end
- gait
- mews
- neuk
- terrace
- way
- shopping street;
- avenue
- courtyard
- cross
- feus
- lane
- mill
- row
- vennel
- wynd

G1.7.3 The above list is not exhaustive. Whatever terms are used, it is important that the street character type is well defined, whether in a design code or in some other way. The difference in approach is illustrated by Figs G1.12 and G1.13.



Figure G1.12 Alternative proposals for a development: (a) is roads-led; while (b) is more attuned to pedestrian activity and a sense of place.



Figure G1.13 (a) Existing development in Upton turns its back on the street; while (b) a later development has a strong presence on the street. The latter was delivered using a collaborative workshop design process and a design code.

G2

Quality Places



G2 Quality Places

CHAPTER AIMS

- Promote the place function of streets and explain the role that streets can play in making better places.
- Stress the importance and value of urban design as a framework within which streets are set out and detailed.
- Set out expectations for the design of quality places, as well as routes for safe and convenient movement.
- Discuss local distinctiveness.

G2.1 INTRODUCTION

G2.1.1 The previous chapter described how to plan sustainable communities, covering issues such as the need to plan for connected layouts, mixed uses and walkable neighbourhoods. This chapter develops those themes by demonstrating the importance of quality and encouraging the use of three-dimensional urban design.

G2.2 THE VALUE OF GOOD DESIGN

G2.2.1 Good design plays a vital role in securing places that are socially, economically and environmentally sustainable. This is underpinned by policy and guidance from the Scottish Government. In terms of national policy, *SPP1 "The Planning System"* emphasises the importance of good design in reaching planning decisions. *"Designing Places"* was published in 2001 and is the sister document to this one; it sets out the government policy on urban design and establishes a toolkit for delivering places that are sustainable.



Figure G2.1 New development at Staiths South Bank, Gateshead.

- A significant level of detailed effort was required to negotiate deviation from standards - this was resource intensive. *Designing Streets* guidance aims to avoid this by promoting the acceptance of innovation (Fig. G2.1).
- The homes are relatively affordable which shows that high-quality design need not be expensive.
- Parking was limited to a ratio of one space per house, which provided scope for a higher-quality public realm.
- The scheme was designed as a Home Zone.

G2.2.2 The value of good design is reinforced by other publications such as “*A Policy for Architecture*” first published in 2001, updated and added to in 2007 and 2008. A series of design-based Planning Advice Notes (PANs) has followed the publication of *Designing Places* and these reinforce the importance of design in the regeneration and creation of “place”. They advocate that good design is based on good appraisal in order to ensure that new places will take of the **context** in which they are placed, will have a clear **identity** of their own and have good **connections** both within and outwith the new development area ensuring a permeable layout.¹

G2.2.3 There is growing evidence that good urban design, with well thought out and well maintained open space and public realm, provides not only economic returns but also social and environmental benefits. An integrated design process that considers all aspects of the scheme beyond it’s construction, can have an impact not only on quality, efficiency and sustainability but on the long term costs of maintenance and management.

G2.2.4 CABE has collated a supporting evidence base,² which includes the following:

- compact neighbourhoods that integrate parking and transport infrastructure, encourage walking and cycling, and so reduce fuel consumption;
- properties adjacent to a good-quality park have a 5-7% price premium compared with identical properties in the same area but that are away from the park; and
- the benefits of better-designed commercial developments include higher rent levels, lower maintenance costs, enhanced regeneration and increased public support for the development.



Figure G2.2 Briery Meadow, Haddington - a masterplan-led approach with bespoke housing design (EDAW, needs re-shot).

¹ Scottish Executive (2001) *Planning Advice Note 67: Housing Quality*. Edinburgh: Scottish Government

² CABE (2002) *The Value of Good Design*. London: CABE; CABE(2006) *Buildings and Spaces: Why Design Matters*. London: CABE; CABE (2006) *The Value Handbook*. London: CABE; and CABE (2006) *The Cost of Bad Design* London: CABE.

G2.3 KEY ASPECTS OF URBAN DESIGN

“The architectural design, siting and setting of development in its surroundings are valid concerns of the planning system. The drive for quality should not focus solely on buildings. It should also be concerned with the way that buildings, old and new, work together and create the spaces and sense of place that have such an influence on the quality of life for communities”. *Scottish Planning Policy 1: the Planning System*^{3 4}

G2.3.1 It is important to appreciate what this means in practice. It is easy to advocate places of beauty and distinct identity, but it takes skill to realise them and ensure they are fit for purpose. The key qualities that define successful places are defined within “*Designing Places*” and are further explained within the design suite of a number of Scottish PANs, specifically *PAN 67 Housing Quality*⁵; *PAN 68 Design Statements*⁶; *PAN 71 Conservation Area Management*⁷; *PAN 77 Designing Safer Places*⁸; *PAN 78 Inclusive Design*⁹ and *PAN 83 Master Planning*¹⁰. A number of key documents and initiatives provide an introduction, including the *Urban Design Compendium*,¹¹ *Better Places to Live By Design*,¹² *Building for Life*¹³ and *Designing Places*¹⁴.

G2.3.2 All too often new development lacks identity and a sense of place. Basic good urban design practice is not being met. This lets down communities, can have a wider influence beyond just those who live there and does not meet Government aspirations for a modern planning system that is sustainable.

G2.3.3 These basic aspects of urban design, however, are not being realised in many new developments. All too often, new development lacks identity and a sense of place. In these cases, it lets communities and users down, and undermines the aims of the sustainable places agenda.

G2.3.4 Frequently, it is in the interaction between the design and layout of homes and streets that attempts to create quality places break down.¹⁵ In the past, urban designers sometimes felt that their schemes were compromised by the application of geometrical standards to roads that were current at the time. Roads engineers, in turn, have occasionally raised concerns about layouts that did not comply with the design criteria to which they were working.

³ Scottish Executive (2002) *Scottish Planning Policy 1: The Planning System*. Edinburgh: Scottish Executive

⁴ DETR and CABE (2000) *By Design: Urban Design in the Planning System: Towards Better Practice*. London: Thomas Telford Ltd.

⁵ Scottish Executive (2003) *Planning Advice Note 67 Housing Quality*. Edinburgh: Scottish Executive

⁶ Scottish Executive (2003) *Planning Advice Note 68 Design Statements*. Edinburgh: Scottish Executive

⁷ Scottish Executive (2004) *Planning Advice Note 71 Conservation Area Management*. Edinburgh: Scottish Executive

⁸ Scottish Executive (2006) *Planning Advice Note 77 Designing Safer Places*. Edinburgh: Scottish Executive

⁹ Scottish Executive (2006) *Planning Advice Note 78 Inclusive Design*. Edinburgh: Scottish Executive

¹⁰ Scottish Government (2008) *Planning Advice Note 83 Master Planning*. Edinburgh: Scottish Government

¹¹ Llewelyn Davies (2000) *The Urban Design Compendium*. London: English Partnerships and The Housing Corporation.

¹² DTLR and CABE (2001) *Better Places to Live: By Design. A Companion Guide to PPG3*. London: Thomas Telford Ltd.

¹³ www.buildingforlife.org.uk.

¹⁴ Scottish Executive (2001) *Designing Places*. Edinburgh: Scottish Executive

¹⁵ CABE (2005) *Housing Audit: Assessing the Design Quality of New Homes in The North East North west and Yorkshire & Humber*. London: Ernest Bond Printing Ltd.

G2.4 STREET DIMENSIONS

G2.4.1 Neighbourhoods should include a range of street character types, each with differing characteristics, including type of use, width and building heights. These characteristics dictate how pedestrians and traffic use the street.

WIDTH

G2.4.2 Width between buildings is a key dimension and needs to be considered in relation to function and aesthetics. Figure G2.3 shows typical widths for different types of street. The distance between frontages in residential streets typically ranges from 12 m to 18 m, although there are examples of widths less than this working well. There are no fixed rules but account should be taken of the variety of activities taking place in the street and of the scale of the buildings on either side.

The Principles of Placemaking

The principals of placemaking will be achieved through careful consideration of built form. Those aspects are described below:

- Layout: urban structure - the framework of routes and spaces that connect locally and more widely, and the way developments, routes and open spaces relate to one another.
- Layout: urban grain - the pattern of the arrangement of street blocks, plots and their buildings in a settlement.
- Landscape - the character and appearance of land, including its shape, form, ecology, natural features, colours and elements, and the way these components combine.
- Density and mix - the amount of development on a given piece of land and the range of uses. Density influences the intensity of development, and, in combination with the mix of uses, can affect a place's vitality and viability.
- Scale: height - scale is the size of a building in relation to its surroundings, or the size of parts of a building or its details, particularly in relation to the size of a person. Height determines the impact of development on views, vistas and skylines.
- Scale: massing - the combined effect of the arrangement, volume and shape of a building or group of buildings in relation to other buildings and spaces.
- Appearance: details - the craftsmanship, building techniques, decoration, styles and lighting of a building or structure.
- Appearance: materials - the texture, colour, pattern and durability of materials, and how they are used.

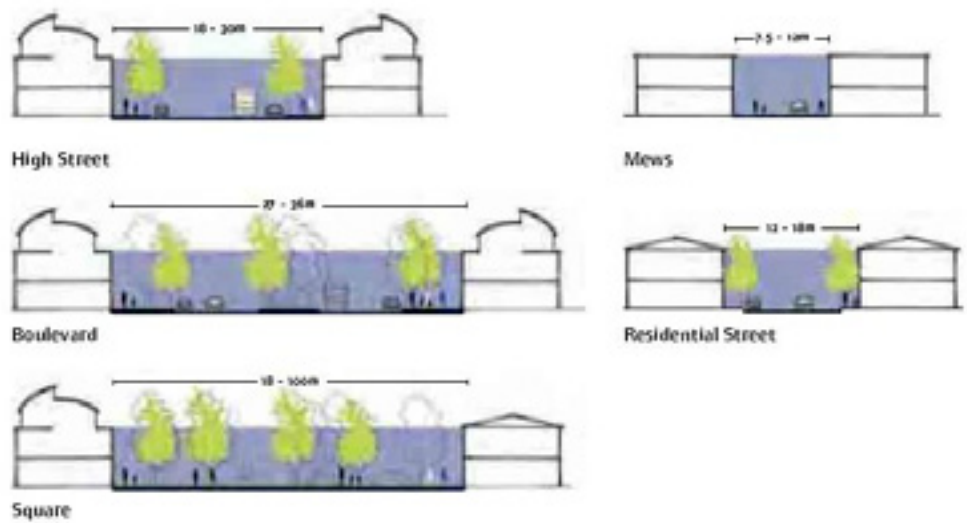


Figure G2.3 Typical widths for different types of street.

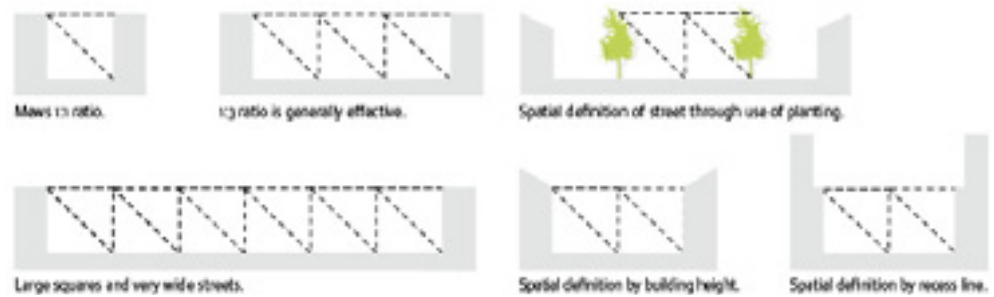


Figure G2.4 Height-to-width ratios.

HEIGHT

G2.4.3 The public realm is defined by height as well as width or, more accurately, the ratio of height to width. It is therefore recommended that the height of buildings (or mature trees where present in wider streets) is in proportion to the width of the intervening public space to achieve enclosure. The actual ratio depends on the type of street or open space being designed for. This is a fundamental urban design principle. The height-to-width enclosure ratios shown in Table G2.1 and illustrated in Fig. G2.4 can serve as a guide.

	Maximum	Minimum
Minor streets, e.g. mews	1:1.5	1:1
Typical streets	1:3	1:1.5
Squares	1:6	1:4

Table G2.1 Height-to-width ratios

G2.4.4 The benefits of taller buildings, such as signifying locations of visual importance, adding variety, or simply accommodating larger numbers of dwellings, must be weighed against the possible disadvantages. These include an overbearing relationship with the street, overshadowing of surrounding areas, and the need to provide more parking. Design mitigation techniques, such as wider footways, building recesses and street trees, can reduce the impact of taller buildings on their settings (Fig. G2.5).

LENGTH

G2.4.5 Street length can have a significant effect on the quality of a place. Acknowledging and framing vistas and landmarks can help bring an identity to a neighbourhood and orientate users. However, long straights can encourage high traffic speeds, which should be mitigated through careful design (see Section 7.4 'Achieving appropriate traffic speeds').

G2.5 BUILDINGS AT JUNCTIONS

G2.5.1 The arrangement of buildings and footways has a major influence on defining the space at a junction. It is better to design the junction on this basis rather than purely on vehicle movement (Fig. G2.6). In terms of streetscape, a wide carriageway with tight, enclosed corners makes a better junction than cutback corners with a sweeping curve. This might involve bringing buildings forward to the corner. Double-fronted buildings also have an important role at corners. Junction treatments are explored in more detail in Chapter G4.



Figure G2.5 Two streets demonstrating different levels of enclosure. Street (a) has a height-to-width ratio of approximately 1:3, enabling a pleasant living environment to be shared with functionality in the form of traffic movement and on-street parking, some of it angled. Street (b) has a height-to-width ratio of about 1:1.5. Again, this works well in urban design terms, but the need to accommodate on-street parking has meant that traffic is restricted to one-way movement.



Figure G2.6 Wide, curved junctions reduce enclosure. In this example, the relationship between the buildings and the amenity space at the centre of the circus is diminished.

G2.6 BACKS AND FRONTS

G2.6.1 In general, it is recommended that streets are designed with the backs and fronts of houses and other buildings being treated differently. The basic tenet is 'public fronts and private backs'. Ideally, and certainly in terms of crime prevention, back gardens should adjoin other back gardens or a secure communal space. Front doors should open onto front gardens, small areas in front of the property, or streets.

G2.6.2 The desirability of public fronts and private backs applies equally to streets with higher levels of traffic, such as those linking or providing access to residential areas. If such streets are bounded by back garden fences or hedges, security problems can increase, drivers may be encouraged to speed, land is inefficiently used, and there is a lack of a sense of place (Fig. G2.7). Research carried out for *MfS*¹⁶ shows that streets with direct frontage access to dwellings can operate safely with significant levels of traffic.



Figure G2.7 (a) and (b) Cul-de-sacs surrounded by a perimeter road that is fronted by back fences - no sense of place, no relationship with its surroundings, no quality, with streets designed purely for vehicles

¹⁶ York, A. Bradbury, S. Reid, T. Ewings and R. Paradise (2007) *The Manual for Streets: Redefining Residential Street Design*. TRL Report No. 661. Crowthorne: TRL.

G2.7 DESIGNING STREETS AS SOCIAL SPACES

G2.7.1 The public realm should be designed to encourage the activities intended to take place within it. Streets should be designed to accommodate a range of users, create visual interest and amenity, and encourage social interaction. The place function of streets may equal or outweigh the movement function, as described in Chapter 1. This can be satisfied by providing a mix of streets of various dimensions, squares and courtyards, with associated 'pocket parks', play spaces, resting places and shelter. The key is to think carefully about the range of desirable activities for the environment being created, and to vary designs to suit each place in the network.

G2.7.2 High-quality open space is a key component of successful neighbourhoods. Local Development Frameworks, often supplemented by open space strategies and public realm strategies, should set out the requirements for provision in particular localities. As with streets, parks and other open spaces should be accessible and be well overlooked.¹⁷

G2.8 OTHER LAYOUT CONSIDERATIONS

G2.8.1 The layout of a new housing or mixed-use area will need to take account of factors other than street design and traffic provision. They include:

- the potential impact on climate change, such as the extent to which layouts promote sustainable modes of transport or reduce the need to travel;
- climate and prevailing wind, and the impact of this on building type and orientation;
- energy efficiency and the potential for solar gain by orientating buildings appropriately;
- noise pollution, such as from roads or railways;
- providing views and vistas, landmarks, gateways and focal points to emphasise urban structure, hierarchies and connections, as well as variety and visual interest;
- crime prevention, including the provision of defensible private and communal space, and active, overlooked streets (see Chapter G1);
- balancing the need to provide facilities for young children and teenagers overlooked by housing, with the detrimental effects of noise and nuisance that may result; and
- providing SUDS for Surface Water Management ensuring that the challenges in maintaining water quality, amenity and biodiversity are met.

G2.8.2 Often satisfying one consideration will make it difficult to satisfy another, and invariably a balance has to be achieved. This is one of the reasons for agreeing design objectives at an early stage in the life of the scheme.

¹⁷ Scottish Executive (2008) *Planning Advice Note 65: Planning and Open Space*. Edinburgh: Scottish Executive/Scottish Executive (2006) *Scottish Planning Policy 11 Physical Activity and Open Space*. Edinburgh: Scottish Executive



Figure G2.8 Trees, bollards, benches and the litter bin have the potential to clutter this residential square, but careful design means that they add to the local amenity (Ian White Associates).

G2.9 WHERE STREETS MEET BUILDINGS

G2.9.1 The space between the front of the building and the carriageway, footway or other public space needs to be carefully managed as it marks the transition from the public to the private realm. Continuous building lines are preferred as they provide definition to, and enclosure of, the public realm. Blank gables onto the street frontage should be avoided to ensure maximum passive surveillance and sense of security.

G2.9.2 For occupiers of houses, the amenity value of front gardens tends to be lower when compared to their back gardens and increased parking pressures on streets has meant that many householders have converted their front gardens to hard standing for car parking. However, this is not necessarily the most desirable outcome for street users in terms of amenity and quality of place, and can lead to problems with drainage. Where no front garden is provided, the setback of dwellings from the street is a key consideration in terms of:

- defining the character of the street;
- determining a degree of privacy;
- amenity space for plants or seating, etc.; and
- functional space for rubbish bins, external meters or storage, including secure parking for bicycles.

G2.9.3 Keeping garages and parking areas level with, or behind, the main building line can be aesthetically beneficial in townscape terms.

G2.9.4 The context within which the development sits will also have an influence on how the building sits within the plot and relates to the street.

G2.10 REDUCING CLUTTER

G2.10.1 Street furniture, signs, bins, bollards, utilities boxes, lighting and other items which tend to accumulate on a footway can clutter the streetscape. Clutter is visually intrusive and has adverse implications for many disabled people. Designers should work with the agencies responsible for such items and those who will manage the street to identify ways of reducing their visual impact and impediment to users.

G2.10.2 Strategies for signage should be included at an early stage in the design process as the layout design can reduce the need for signage. Signage should be kept to a minimum and be well-located in order to avoid clutter and maximise its benefits.

G2.10.3 Examples of reducing clutter include:¹⁸

- mounting streetlights onto buildings, or traffic signals onto lighting columns;
- locating service inspection boxes within buildings or boundary walls;
- specifying the location and orientation of inspection covers in the footway;
- ensuring that household bins and recycling containers can be stored off the footway; and
- designing street furniture to be in keeping with its surroundings (Fig. G2.8).

G2.10.4 Where terraced housing or flats are proposed, it can be difficult to find space for storing bins off the footway. In these circumstances, sub-surface or pop-up waste containers may be a practicable solution (Fig. G2.9).



Figure G2.9 Sub-surface recycling bins for communal use.

G2.11 LOCAL DISTINCTIVENESS

G2.11.1 Creating a local identity and distinctiveness are fundamental to ensuring a successful place. The following considerations can achieve this:

- carrying out a site appraisal at the outset and ensuring that the findings are then incorporated into design strategies. PAN 68 *Design Statements* and PAN 83 *Masterplanning* both offer guidance on what should be included;
- involving the community early on in the process;
- using local materials where possible (which can also reduce embodied energy);
- using grain, patterns and forms sympathetic to the predominant vernacular styles (fig G2.10);¹⁹
- identifying which existing site features are assets and retaining them if possible;
- celebrating any historic and cultural associations that the site may have through the design; and
- ensure that the design, quality and setting of street furniture and signage does not detract from the overall street design, view points and vistas.

¹⁸ Joint Committee on Mobility of Blind and Partially Sighted People(JCMBPS) (2002) *Policy Statement on Walking Strategies*. Reading: JCMBPS.

¹⁹ For region specific guidance, see English Heritage's *Streets for All* series at www.english-heritage.org.uk

G2.11.2 Some Local Authorities may have local design guidance which aims to enhance local character in new developments. Such local guidance is encouraged and should be used in preparing designs for new development. For example Shetland Islands Council produced its own supplementary planning guidance entitled *The Shetland House*, which aims to 'offer broad guidance covering every aspect of designing and developing a house in Shetland'.²⁰

G2.12 PLANTING

G2.12.1 Space for planting must be integrated into the layout from the outset and considered as part of a wider landscape framework which connects through and out of the site. It is important to ensure that all planted areas fall clearly into either the public or private realm.

G2.12.2 Planting adds value; it helps to soften the urban street-scene, creates visual and sensory interest, and improves the air quality and microclimate. It can also aid local biodiversity. Flowers and fruit trees add seasonal variety.

G2.12.3 Planting can provide shade, shelter, privacy, spatial containment and separation. It can also be used to create buffer or security zones, visual barriers, or landmarks or gateway features. Vegetation can be used to limit forward visibility to help reduce vehicle speeds and help demarcate parking areas especially in shared surface schemes.

G2.12.4 Existing trees can occupy a substantial part of a development site and can have a major influence on layout design and use of the site, especially if they are protected by Tree Preservation Orders. Layouts poorly designed in relation to existing trees, or retaining trees of an inappropriate size, species or condition, may be resented by future occupants and create pressure to prune or remove them in the future. To reduce such problems, specialist advice is needed in the design process. An arboriculturalist will help determine whether tree retention can be successfully integrated within the new development, specify protection measures required during construction, and recommend appropriate replacements as necessary (Fig. G2.11).



Figure G2.10 Fowlis, Dundee – Small village where sympathetic simple new build with retention of narrow street form and use of boundary treatments walling and hedges has ensured new development blends well (Angus, EDAW).

²⁰ Shetland Islands Council (2005) *The Shetland House, Guidance for Housing Development in Shetland*. Shetland: Shetland Island Council



FigureG2.11 Mature trees help to structure the space, while buildings are placed to create a sense of enclosure (EDAW).

G2.12.5 Sustainable planting will require the provision of:

- healthy growing conditions;
- space to allow growth to maturity with minimal intervention or management;
- species appropriate to a local sense of place and its intended function, and site conditions; and
- well-informed proposals for new planting (or the retention and protection of existing plants) and longer-term maintenance. These proposals should be agreed with the adopting local or road authority, trust, residents' or community association or management company.

G2.13 STANDING THE TEST OF TIME

G2.13.1 Places need to look good and work well in the long term. Design costs are only a small percentage of the overall costs, but it is the quality of the design that makes the difference in creating places that will stand the test of time. Well-designed places last longer and are easier to maintain, thus the costs of the design element are repaid over time. The specification for materials and maintenance regimes should be written to provide high standards of durability and environmental performance. Maintenance should be straightforward and management regimes should ensure that there are clear lines of responsibility. These themes are covered further in Chapter G6.

G3

Street users' needs



G3 Street users' needs

CHAPTER AIMS

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

G3.1 INTRODUCTION

G3.1.1 Street design should be inclusive. Inclusive design means providing for all people regardless of age or ability. There is a general duty for public authorities to promote equality under the *Disability Discrimination Act 2005*.¹ There is also a specific obligation for those who design, manage and maintain buildings and public spaces to ensure that disabled people play a full part in benefiting from, and shaping, an inclusive built environment.

G3.1.2 Poor design can exacerbate the problems of disabled people - good design can minimise them. Consultation with representatives of various user- groups, in particular disabled people, is important for informing the design of streets. Local access officers can also assist here.

G3.1.3 Designers should refer to *Inclusive Mobility*²; *The Principles of Inclusive Design*³; *Guidance on the Use of Tactile Paving Surfaces*⁴; *PAN 75 Planning for Transport*⁵ and *PAN 78: Inclusive Design*⁶ in order to ensure that their designs are inclusive.

G3.1.4 If any aspect of a street unavoidably prevents its use by particular user groups, it is important that a suitable alternative is provided. For example, a safe cycling route to school may be inappropriate for experienced cyclist commuters, while a cycle route for commuters in the same transport corridor may be unsafe for use by children. Providing one as an alternative to the other overcomes these problems and ensures that the overall design is inclusive.

G3.1.5 This approach is useful as it allows for the provision of a specialised facility where there is considerable demand for it without disadvantaging user groups unable to benefit from it.

¹ *Disability Discrimination Act 2005*. London: TSO.

² Department for Transport (2002) *Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*. London: Department for Transport.

³ CABE (2006) *The Principles of Inclusive Design (They include you)*. London: CABE.

⁴ DETR (1999) *Guidance on the Use of Tactile Paving Surfaces*. London: TSO.

⁵ Scottish Executive (2005) *Planning Advice Note 75: Planning for Transport*. Edinburgh : Scottish Executive.

⁶ Scottish Executive (2006) *Inclusive Design*. Edinburgh: Scottish Executive.

G3.2 REQUIREMENTS FOR PEDESTRIANS AND CYCLISTS

G3.2.1 When designing for pedestrians or cyclists, some requirements are common to both:

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

G.3.3 PEDESTRIANS

G3.3.1 The propensity to walk is influenced not only by distance, but also by the quality of the walking experience. A 20-minute walk alongside a busy highway can seem endless, yet in a rich and stimulating street, such as in a town centre, it can pass without noticing. Residential areas can offer a pleasant walking experience if good quality landscaping, gardens or interesting architecture are present. Sightlines and visibility towards destinations or intermediate points are important for navigating and personal security, and they can help people with cognitive impairment.

G3.3.2 Pedestrians may be walking with purpose or engaging in other activities such as play, socialising, shopping or just sitting. For the purposes of this manual, pedestrians include wheelchair users and people pushing wheeled equipment such as prams.

G3.3.3 As pedestrians include people of all ages, sizes and abilities, the design of streets needs to satisfy a wide range of requirements. A street design which accommodates the needs of children and disabled people is likely to suit most, if not all, user types.

G3.3.4 Not all disability relates to difficulties with mobility. People with sensory or cognitive impairment are often less obviously disabled, so it is important to ensure that their needs are not overlooked. Legible design, i.e. design which makes it easier for people to work out where they are and where they are going, is especially helpful to disabled people. Not only does it minimise the length of journeys by avoiding wrong turns, for some it may make journeys possible to accomplish in the first place.

G3.3.5 The layout of our towns and cities has historically suited pedestrian movement (Fig. G3.1).



Figure G3.1 Edinburgh New Town – the block dimensions are of a scale that encourages walking (EDAW)

G3.3.6 Walkable neighbourhoods should be on an appropriate scale, as advised in Chapter G1. Pedestrian routes need to be direct and match desire lines as closely as possible. Permeable networks help minimise walking distances.

G3.3.7 Pedestrian networks need to connect with one another. Where these networks are separated by heavily-trafficked roads, appropriate surface level crossings should be provided where practicable. Footbridges and subways should be avoided unless local topography or other conditions make them necessary. The level changes and increased distances involved are inconvenient, and they can be difficult for disabled people to use. Subways, in particular, can also raise concerns over personal security - if they are unavoidable, designers should aim to make them as short as possible, wide and well lit.

G3.3.8 The specific conditions in a street will determine what form of crossing is most relevant. All crossings should be provided with tactile paving. Further advice on the assessment and design of pedestrian crossings is contained in *Local Transport Notes 1/95*⁷, *2/95*⁸ and the *Puffin Good Practice Guide*⁹.

⁷ Department for Transport (1995) *The Assessment of Pedestrian Crossings. Local Transport Note 1/95*. London: TSO.

⁸ Department for Transport (1995) *The Design of Pedestrian Crossings. Local Transport Note 2/95*. London: TSO.

⁹ County Surveyors' Society/Department for Transport (2006) *Puffin Good Practice Guide* available to download from www.dft.gov.uk or www.cssnet.org.uk.

G3.3.9 Surface level crossings can be of a number of types, as outlined below:

- uncontrolled crossings - these can be created by dropping kerbs at intervals along a link. As with other types of crossing, these should be matched to the pedestrian desire lines. If the crossing pattern is fairly random and there is an appreciable amount of pedestrian activity, a minimum frequency of 100 m is recommended¹⁰. Dropped kerbs should be marked with tactile paving where this is appropriate and aligned with those on the other side of the carriageway.
- informal crossings - these can be created through careful use of paving materials and street furniture to indicate a crossing place which encourages slow-moving traffic to give way to pedestrians (Fig. G3.2).



Figure G3.2 Informal crossing, Colchester - although the chains and a lack of tactile paving are hazardous to blind or partially-sighted people.

- pedestrian refuges and kerb build-outs - used separately, or in combination, they effectively narrow the carriageway and so reduce the crossing distance. However, they can create pinch-points for cyclists if the remaining gap is still wide enough for motor vehicles to squeeze past them.
- zebra crossings - of the formal crossing types, these involve the minimum delay for pedestrians when used in the right situation but can pose problems for people with visual impairments.

¹⁰ Department for Transport (2005) *Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*. London: Department for Transport.

- signalised crossings - there are four types: Pelican, Puffin, Toucan and Equestrian crossings. The Pelican crossing was the first to be introduced. Puffin crossings, which have nearside pedestrian signals and a variable crossing time, are replacing Pelican crossings. They use pedestrian detectors to match the length of the crossing period to the time pedestrians take to cross. Toucan and equestrian crossings operate in a similar manner to Puffin crossings except that cyclists can also use Toucan crossings, while Equestrian crossings have a separate crossing for horse riders. Signalised crossings are preferred by blind or partially-sighted people. Consideration should be given to the raising of crossings, of whichever type, to pavement height where possible, in order to enhance pedestrian security and convenience.

G3.3.10 Obstructions on the footway should be minimised. Street furniture is typically sited on footways and can be a hazard for blind or partially-sighted people.

G3.3.11 Where it is necessary to break a road link in order to discourage through traffic, it is recommended that connectivity for pedestrians is maintained through the break unless there are compelling reasons to prevent it.

G3.3.12 Pedestrian desire lines should be kept as straight as possible at side-road junctions unless site-specific reasons preclude it. Small corner radii minimise the need for pedestrians to deviate from their desire line (Fig. G3.3). Dropped kerbs (with the tactile paving as appropriate) should be provided at all side-road junctions where the carriageway and footway are at different levels. They should not be placed on curved sections of kerbing because this makes it difficult for blind or partially-sighted people to orientate themselves before crossing.

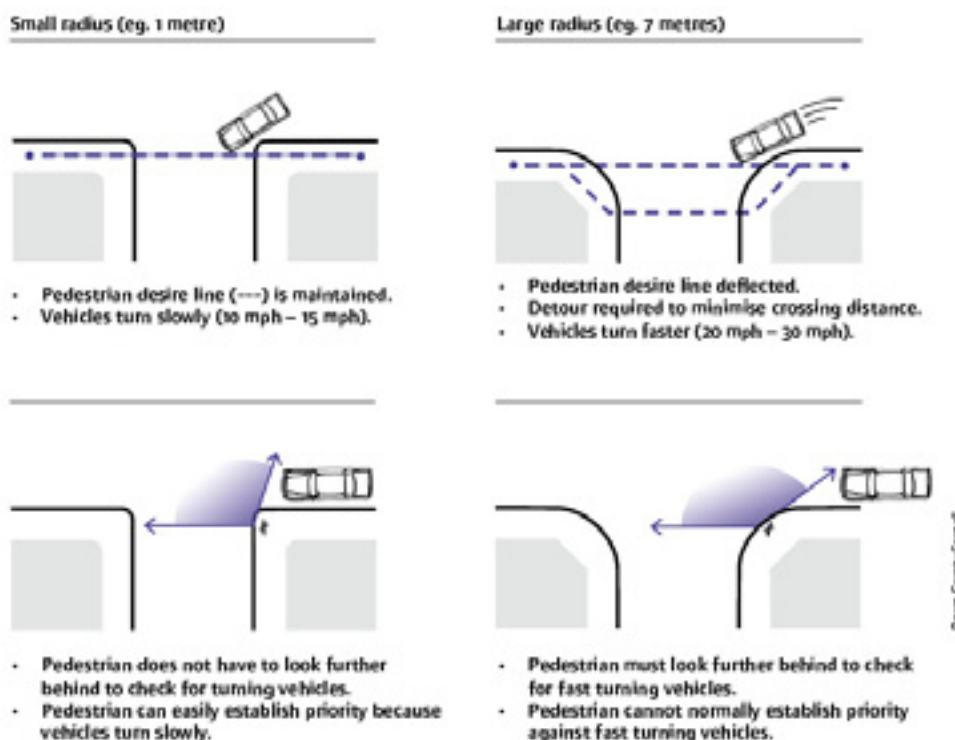


Figure G3.3 The effects of corner radii on pedestrians

G3.3.13 With small corner radii, large vehicles may need to use the full carriageway width to turn. Swept-path analysis can be used to determine the minimum dimensions required. The footway may need to be strengthened locally in order to allow for larger vehicles occasionally overrunning the corner.

G3.3.14 Larger radii can be used without interrupting the pedestrian desire line if the footway is built out at the corners. If larger radii encourage drivers to make the turn more quickly, speeds will need to be controlled in some way, such as through using a speed table at the junction.

G3.3.15 The kerbed separation of footway and carriageway can offer protection to pedestrians, channel surface water, and assist blind or partially-sighted people in finding their way around, but kerbs can also present barriers to some pedestrians. Kerbs also tend to confer an implicit priority to vehicles on the carriageway. At junctions and other locations, such as school or community building entrances, there are benefits in considering bringing the carriageway up flush with the footway to allow people to cross on one level (Fig. G3.4). This can be achieved by:

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



Figure G3.4 Raised crossover, but located away from the desire line for pedestrians and therefore ignored - the crossover should be nearer the junction with, in this case, a steeper ramp for vehicles entering the side street.



Figure G3.6 Uninviting pedestrian link - narrow, not well overlooked, unlit and deserted (Edinburgh, WSP)



Figure G3.5 Inviting pedestrian link (Greenbank Villae. EDAW).



Figure G3.7 Overlooked shared route for pedestrians and vehicles.

G3.3.16 The carriageway is usually raised using short ramps which can have a speed-reducing effect, but if the street is on a bus route, for example, a more gradual change in height may be more appropriate (Fig. G3.4). It is important that any such shared surface arrangements are designed for blind or partially-sighted people because conventional kerbs are commonly used to aid their navigation. Tactile paving may be required at crossing points. Other tactile information may be required to compensate for kerb removal elsewhere.

G3.3.17 Pedestrians can be intimidated by traffic and can be particularly vulnerable to the fear of crime or anti-social behaviour. In order to encourage and facilitate walking, pedestrians need to feel safe (Figs G3.5 and G3.6).

G3.3.18 Pedestrians generally feel safe from crime where:

- their routes are overlooked by buildings with habitable rooms (Fig. G3.7);
- other people are using the street;
- there is no evidence of anti-social activity (e.g. litter, graffiti, vandalised street furniture);
- they cannot be surprised (e.g. at blind corners);
- they cannot be trapped (e.g. people can feel nervous in places with few entry and exit points, such as subway networks); and
- there is good lighting.

G3.3.19 Streets with high traffic speeds can make pedestrians feel unsafe. Designers should seek to control vehicle speeds to below 20 mph in residential areas so that pedestrians activity is not displaced. Vehicle speed control should be designed-in and suggested methods of vehicle speed control are discussed in Chapter G4.

G3.3.20 Inclusive Mobility¹¹ gives guidance on design measures for use where there are steep slopes or drops at the rear of footways.

G3.3.21 Places for pedestrians may need to serve a variety of purposes, including movement in groups, children's play and other activities (Fig. G3.8)

¹¹ Department for Transport (2005) *Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*. London: Department for Transport.

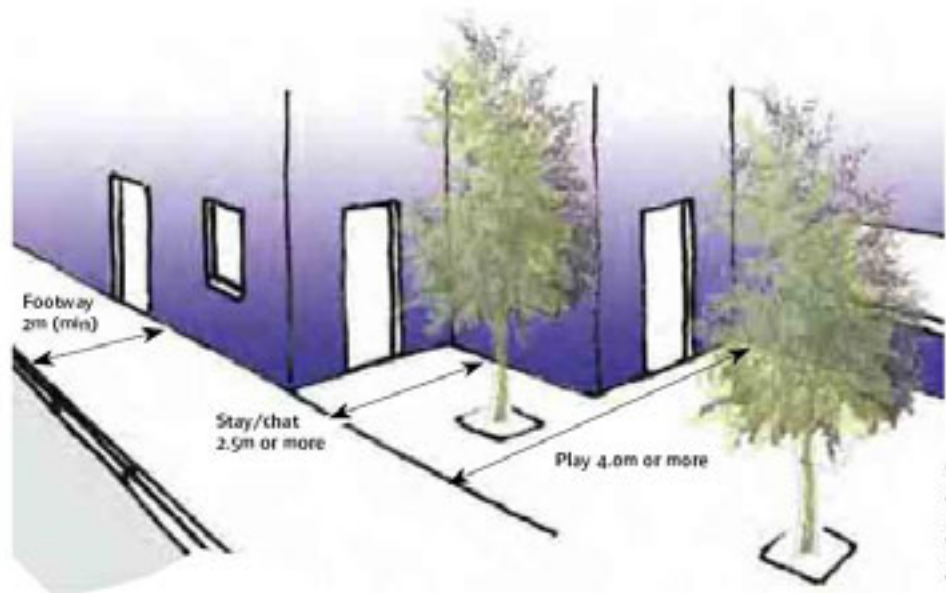
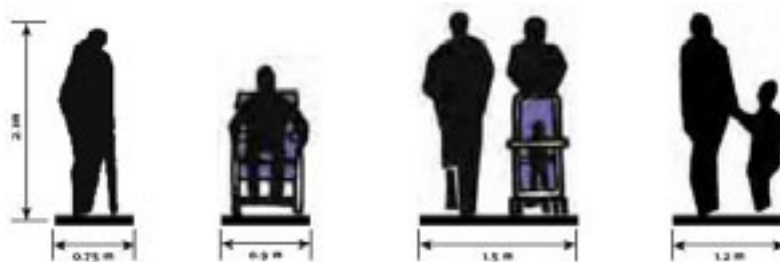


Figure G3.8 The footway and pedestrian areas provide for a range of functions which can include browsing, pausing, socialising and play.

G3.3.22 There is no maximum width for footways. In lightly used streets (such as those with a purely residential function), the minimum unobstructed width for pedestrians should generally be 2 m. Additional width should be considered between the footway and a heavily used carriageway, or adjacent to gathering places, such as schools and shops. Further guidance on minimum footway widths is given in *Inclusive Mobility*.

G3.3.23 Footway widths can be varied between different streets to take account of pedestrian volumes and composition. Streets where people walk in groups or near schools or shops, for example, need wider footways. In areas of high pedestrian flow, the quality of the walking experience can deteriorate unless sufficient width is provided. The quality of service goes down as pedestrian flow density increases. Pedestrian congestion through insufficient capacity should be avoided. It is inconvenient and may encourage people to step into the carriageway (Fig. G3.9).

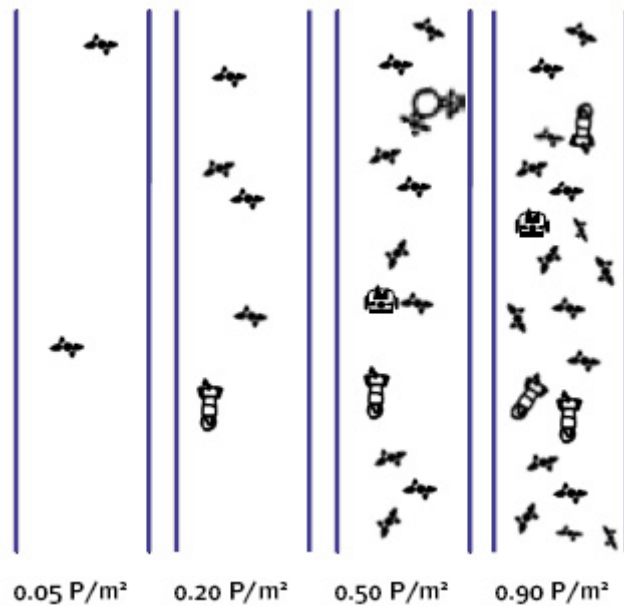


Figure G3.9 Diagram showing different densities of use in terms of pedestrians per square metre. Derived from *Vorrang für Fussgänger*.¹²

G3.3.24 Porch roofs, awnings, garage doors, bay windows, balconies or other building elements should not oversail footways at a height of less than 2.6 m.

G3.3.25 Trees to be sited within or close to footways should be carefully selected so that their spread does not reduce pedestrian space below minimum dimensions for width and headroom (Fig. G3.10).



Figure G3.10 Poorly maintained tree obstructing the footway.

¹² Wissenschaft & Verkehr (1993) *Vorrang für Fussgänger*. Verkehrsclub Österreich.

G3.3.26 Low overhanging trees, overgrown shrubs and advertising boards can be particularly hazardous for blind or partially-sighted people. Tapering obstructions, where the clearance under a structure reduces because the structure slopes down (common under footbridge ramps), or the pedestrian surface ramps up, should be avoided or as a minimum pedestrians should be kept clear of the hazard.

G3.3.27 Designers should attempt to keep pedestrian (and cycle) routes as near to level as possible along their length and width, within the constraints of the site. Longitudinal gradients should ideally be no more than 5%, although topography or other circumstances may make this difficult to achieve (Fig. G3.11).



Figure G3.11 In some instances it may be possible to keep footways level when the carriageway is on a gradient, although this example deflects pedestrians wanting to cross the side road significantly from their desire lines.

G3.3.28 Off-street parking often requires motorists to cross footways. Crossovers to private driveways are commonly constructed by ramping up from the carriageway over the whole width of the footway, simply because this is easier to construct. This is poor practice and creates inconvenient cross-falls for pedestrians. Excessive cross-fall causes problems for people pushing prams and can be particularly difficult to negotiate for people with a mobility impairment, including wheelchair users.

G3.3.29 Where it is necessary to provide vehicle crossovers, the normal footway cross-fall should be maintained as far as practicable from the back of the footway (900 mm minimum) (Fig. G3.12). Where narrow pavement widths would reduce the width of normal cross fall footway alternatives including a short steep ramp into the carriageway or the use of steeply angled kerbstones should be considered.

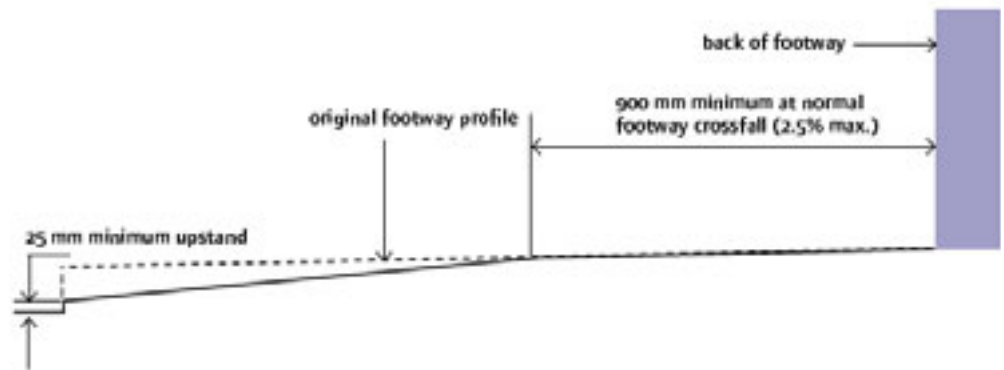


Figure G3.12 Typical vehicle crossover.

G3.3.30 Vehicle crossovers are not suitable as pedestrian crossing points. Blind or partially-sighted people need to be able to distinguish between them and places where it is safe to cross. Vehicle crossovers should therefore have a minimum upstand of 25 mm at the carriageway edge. Where there is a need for a pedestrian crossing point, it should be constructed separately, with tactile paving if appropriate, and kerbs dropped flush with the carriageway.

G3.3.31 Surfaces used by pedestrians need to be smooth and free from trip hazards. Irregular surfaces, such as cobbles, are a barrier to some pedestrians and are unlikely to be appropriate for residential areas.

G3.3.32 Designs need to ensure that pedestrian areas are properly drained and are neither washed by runoff nor subject to standing water (Fig G3.13).



Figure G3.13 Poor drainage at a pedestrian crossing place causes discomfort and inconvenience.

G3.3.33 Seating on key pedestrian routes should be considered every 100 m to provide rest points and to encourage street activity. Seating should ideally be located where there is good natural surveillance.

PEDESTRIAN CHECKLIST

GOOD PRACTICE

- Direct pedestrian routes that are easy to navigate
- Permeable networks with connected links
- Crossings with tactile paving where appropriate
- Crossings matching desire lines
- Dropped kerbs
- Improve perceived safety through ensuring routes are overlooked, avoid blind corners and ensure good lighting
- Minimum footway width of 2m
- Provide raised entrance treatments for side roads
- Small corner radii
- Keep routes level
- Ensure adequate drainage
- Seating every 100m where there is good natural surveillance
- Minimum 900mm footway width at normal crossfall (2.5%) at vehicle crossovers

AVOID

- Footbridges and subways
- Obstructions on footways
- Pedestrian routes that are isolated, signs of anti-social behaviour and blind corners
- Avoid trees that encroach on pedestrian footways and space

G3.4 CYCLISTS

G3.4.1 Cyclists should generally be accommodated on the carriageway in areas with low traffic volumes and speeds, there should not be any need for dedicated cycle lanes on the street (Fig. G3.14). However, where traffic volumes are high, there may be a need for cycle lanes¹³.



Figure G3.14 On-street cycling (Scottish Government).

¹³ The IHT, the Bicycle Association, the Cyclist's Touring Club and the Department of Transport. *Cycle-Friendly Infrastructure Version 2*

G3.4.2 Cycle access should always be considered on links between street networks which are not available to motor traffic. If an existing street is closed off or converted to one-way operation it should generally remain open to pedestrians and cyclists.

G3.4.3 Cyclists prefer direct, barrier-free routes with smooth surfaces. Routes should avoid the need for cyclists to dismount.

G3.4.4 Cyclists are more likely to choose routes that enable them to keep moving. Routes that take cyclists away from their desire lines and require them to concede priority to side-road traffic are less likely to be used.

G3.4.5 Cyclists are particularly sensitive to traffic conditions. High speeds or high volumes of traffic tend to discourage cycling. If traffic conditions are inappropriate for on-street cycling, the factors contributing to them need to be addressed, if practicable, to make on-street cycling satisfactory. This is described in more detail in Chapter G4.

G3.4.6 The design of junctions affects the way motorists interact with cyclists. It is recommended that junctions are designed to promote slow motor-vehicle speeds. This may include short corner radii as well as vertical deflections (Fig. G3.15).

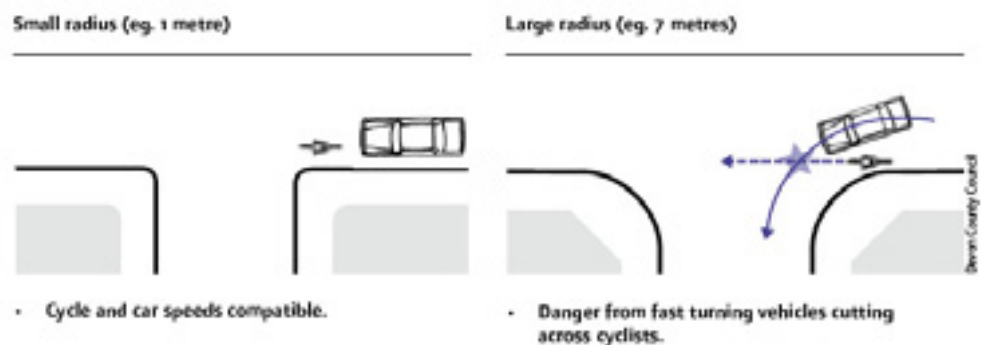


Figure G3.15 The effect of corner radii on cyclists near turning vehicles.

G3.4.7 Where cycle-specific facilities, such as cycle tracks, are provided, their geometry and visibility should be in accordance with the appropriate design speed. The design speed for a cycle track would normally be 30 km/h (20 mph), but reduced as necessary to as low as 10 km/h (6 mph) for short distances where cyclists would expect to slow down, such as on the approach to a subway. Blind corners are a hazard and should be avoided.

G3.4.8 Cyclists should be catered for on the road if at all practicable. If cycle lanes are installed, measures should be taken to prevent them from being blocked by parked vehicles. If cycle tracks are provided, they should be physically segregated from footways/footpaths if there is sufficient width available. However, there is generally little point in segregating a combined width of about 3.3 m or less. The fear of being struck by cyclists is a significant concern for many disabled people. Access officers and consultation groups should be involved in the decision-making process.

G3.4.9 Cycle tracks are more suited to leisure routes over relatively open spaces. In a built-up area, they should be well overlooked. The decision to light them depends on the circumstances of the site-lighting may not always be appropriate.

G3.4.10 Like pedestrians, cyclists can be vulnerable to personal security concerns. Streets which meet the criteria described for pedestrians are likely to be acceptable to cyclists.

G3.4.11 The headroom over routes used by cyclists should normally be 2.7 m (minimum 2.4 m). The maximum gradients should generally be no more than 3%, or 5% maximum over a distance of 100 m or less, and 7% maximum over a distance of 30 m or less. However, topography may dictate the gradients, particularly if the route is in the carriageway.

G3.4.12 As a general rule, the geometry, including longitudinal profile, and surfaces employed on carriageways create an acceptable running surface for cyclists. The exception to this rule is the use of granite setts, or similar. These provide an unpleasant cycling experience due to the unevenness of the surface. They can prove to be particularly hazardous in the wet and when cyclists are turning, especially when giving hand signals at the same time. The conditions for cyclists on such surfaces can be improved if the line they usually follow is locally paved using larger slabs to provide a smoother ride.

CYCLISTS

GOOD PRACTICE

- Allow for cyclists on the carriageway in low trafficked areas
- Provide direct, barrier free routes
- Junction design affects how drivers interact with cyclists therefore promote short turning radii on junction corners
- Cycle tracks should have appropriate geometry and visibility for the design speed
- If the route is >3.3m width then consider separating cyclists from pedestrians
- Headroom requirements are >2.7m with an absolute minimum of 2.4m
- Ensure prohibition of car parking in cycle lanes – ideally 24 hours, but certainly in rush hours

AVOID

- Segregating cyclists if combined width is <3.3m
- Granite sets on routes used by cyclists

G3.5 PUBLIC TRANSPORT

G3.5.1 This section concentrates on bus-based public transport as this is the most likely mode to be used for serving residential areas. Inclusive Mobility gives detailed guidance on accessible bus stop layout and design, signing, lighting, and design of accessible bus (and rail) stations and interchanges.

PUBLIC TRANSPORT VEHICLES

G3.5.2 Purpose-built buses, from 'hoppers' to double-deckers, vary in length and height, but width is relatively fixed (Fig. G3.16).

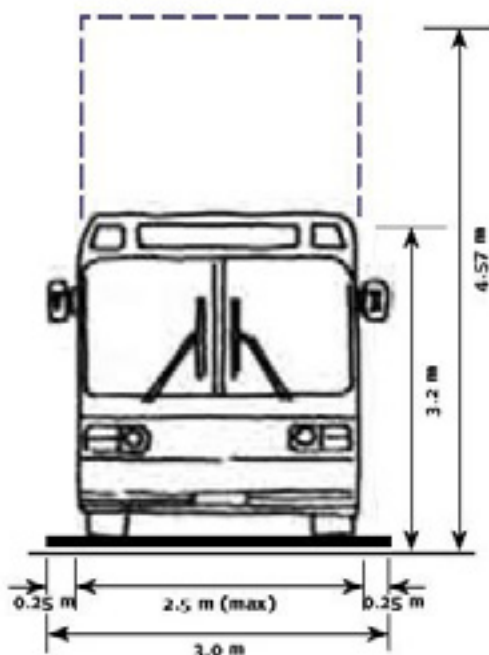


Figure G3.16 Typical bus dimensions

G3.5.3 Streets currently or likely to be used by public transport should be identified in the design process, working in partnership with public transport operators.

G3.5.4 Bus routes and stops should form key elements of the walkable neighbourhood. Designers and local authorities should try to ensure that development densities will be high enough to support a good level of service without long-term subsidy.

G3.5.5 In order to design for long-term viability, the following should be considered:

- streets serving bus routes should be reasonably straight. Straight routes also help passenger demand through reduced journey times and better visibility. Straight streets may, however, lead to excessive speeds. Where it is necessary to introduce traffic-calming features, designers should consider their potential effects on buses and bus passengers; and
- layouts designed with strong connections to the local highway network, and which avoid long one-way loops or long distances without passenger catchments, are likely to be more viable.

G3.5.6 Bus priority measures may be appropriate within developments to give more direct routing or to assist buses in avoiding streets where delays could occur.

G3.5.7 Using a residential street as a bus route need not require restrictions on direct vehicular access to housing. Detailed requirements for streets designated as bus routes can be determined in consultation with local public transport operators. Streets on bus routes should not generally be less than 6.0 m wide (although this could be reduced on short sections with good inter-visibility between opposing flows). The presence and arrangement of on-street parking, and the manner of its provision, will affect width requirements.

G3.5.8 Swept-path analysis can be used to determine the ability of streets to accommodate large vehicles. Bus routes in residential areas are likely to require a more generous swept path to allow efficient operation. While it would be acceptable for the occasional lorry to have to negotiate a particular junction with care, buses need to be able to do so with relative ease. The level of provision required for the movement of buses should consider the frequency and the likelihood of two buses travelling in opposite directions meeting each other on a route.

BUS STOPS

G3.5.9 It is essential to consider the siting of public transport stops and related pedestrian desire lines at an early stage of design. Close co-operation is required between public transport operators, the local authorities and the developer.

G3.5.10 First and foremost, the siting of bus stops should be based on trying to ensure they can be easily accessed on foot. Their precise location will depend on other issues, such as the need to avoid noise nuisance, visibility requirements, and the convenience of pedestrians and cyclists. Routes to bus stops must be accessible by disabled people. New bus stops should, where appropriate, comply with the guidance contained in DfT 2002 publication – *Inclusive Mobility*, particularly section 6¹⁴. Further guidance can be obtained from the TfL 2006¹⁵ document – *Accessible bus stop design guidance*. For example, the bus lay-by in Fig. G3.17 deflects pedestrians walking along the street from their desire line and the insufficient footway width at the bus stop hinders free movement.



Figure G3.17 The bus lay-by facilitates the free movement of other vehicles but it is inconvenient for pedestrians.

¹⁴ Department for Transport (2002) *Inclusive Mobility*. London: Department for Transport.

¹⁵ Transport for London(2006) *Accessible Bus Stop Design Guidance Note BP7/06*. London: Transport for London.

G3.5.11 Bus stops should be placed near junctions so that they can be accessed by more than one route on foot, or near specific passenger destinations (schools, shops, etc.) but not so close as to cause problems at the junction. On streets with low movement function (see Chapter 2), setting back bus stops from junctions to maximise traffic capacity should be avoided.

G3.5.12 Bus stops should be high-quality places that are safe and comfortable to use. Consideration should be given to raised kerbs to assist boarding and to providing cycle parking at bus stops with significant catchment areas. Cycle parking should be designed and located so as not to create a hazard, or impede access for, disabled people.

G3.5.13 Footways at bus stops should be wide enough for waiting passengers while still allowing for pedestrian movement along the footway. This may require local widening at the stop.

G3.5.14 Buses can help to control the speed of traffic at peak times by preventing cars from overtaking. This is also helpful for the safety of passengers crossing after leaving the bus.

BUS

GOOD PRACTICE

- Identify in the design process those streets likely to be used by public transport
- Bus routes and stops are key elements in walkable neighbourhoods
- Provide adequate density of development to support bus services
- Straight routes are better for buses but speed management needs to be considered
- Bus priority measures including bus lanes
- 6m min width for two-way bus routes, parking needs to be considered
- Swept path analysis on bus routes may be necessary – buses require ease of access
- Bus stops should co-ordinate with pedestrian desire lines and should be accessible by pedestrians
- Cycle parking should be provided at bus stops with significant catchment

AVOID

- Torturous, curved bus routes
- Traffic calming that is detrimental to bus passenger comfort
- Long, one-way loops that cannot be accessed by buses
- Bus stops and shelters reducing footway width and impeding pedestrian movement

G3.6 PRIVATE AND COMMERCIAL MOTOR VEHICLES

G3.6.1 Streets need to be designed to accommodate a range of vehicles from private cars, with frequent access requirements, to larger vehicles such as delivery vans and lorries, needing less frequent access (Fig. G3.18). Geometric design which satisfies the access needs of emergency service and waste collection vehicles will also cover the needs of private cars. However, meeting the needs of drivers in residential streets should not be to the detriment of pedestrians, cyclists and public transport users. The aim should be to achieve a harmonious mix of user types.

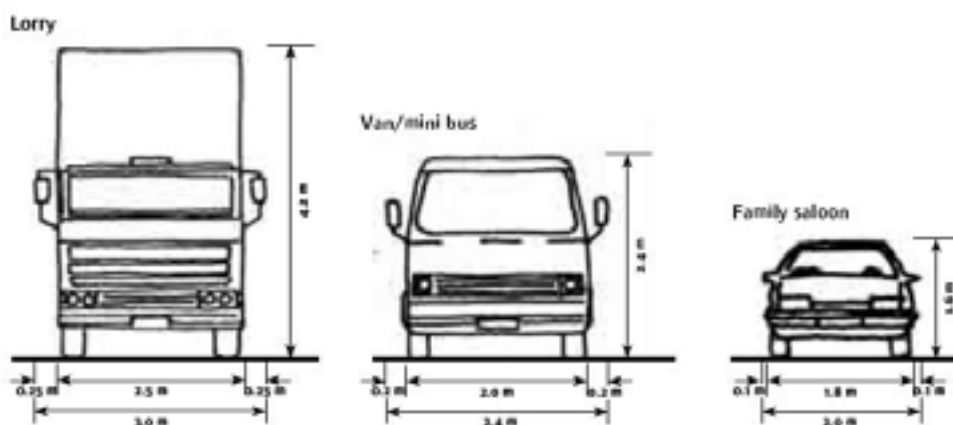


Figure G3.18 Private and commercial motor-vehicles - typical dimensions.

G3.6.2 In a residential environment, flow is unlikely to be high enough to determine street widths, and factors such as the extent of parking provision (see Chapter G5) will affect what is appropriate for the site.

G3.6.3 In some locations, a development may be based on car-free principles. For example, there are options for creating developments relatively free of cars by providing remotely sited parking (e.g. Greenwich Millennium Village see Fig. G3.19a) or by creating a wholly car-free development (e.g. Slatford Green see Fig3.19b). Such approaches can have a significant effect on the design of residential streets and the way in which they are subsequently used. When considering the viability of such approaches it is important to take into account a range of locational factors, including access to public transport and local services.



Figure G3.19a Greenwich Millennium Village. Cars can be parked on the street for a short time, after which they must be moved to a multi-storey car park.



Figure G3.19b Slateford Green, Edinburgh, Car Free Development.

G3.7 EMERGENCY VEHICLES

G3.7.1 The requirements for emergency vehicles are generally dictated by the fire service requirements. Providing access for large fire appliances (including the need to be able to work around them where appropriate) will cater for police vehicles and ambulances.

G3.7.2 *The Building Regulation requirement B5 (2000)*¹⁶ concerns 'Access and Facilities for the Fire Service'¹⁷. Section 17, 'Vehicle Access', includes the following advice on access from the highway:

- there should be a minimum carriageway width of 3.7 m between kerbs;
- there should be vehicle access for a pump appliance to within 45 m of all points within a dwelling house;
- a vehicle access route may be a road or other route; and
- turning facilities should be provided in any dead end access route that is more than 20m long.

G3.7.3 The Association of Chief Fire Officers has expanded upon and clarified these requirements as follows:

- a 3.7 m carriageway (kerb to kerb) is required for operating space at the scene of a fire. Simply to reach a fire, the access route could be reduced to 2.75 m over short distances, provided the pump appliance can get to within 45 m of all points within a dwelling;
- if an authority or developer wishes to reduce the running carriageway width to below 3.7 m, they should consult the local Fire Safety Officer; the length of cul-de-sacs or the number of dwellings have been used by local authorities as criteria for limiting the size of a development served by a single access route. Authorities have often argued that the larger the site, the more likely it is that a single access could be blocked for whatever reason. The fire services adopt a less numbers-driven approach and consider each application based on a risk assessment for the site, and response time requirements. Since the introduction of the *Fire (Scotland) Act 2005*, all regions have had to produce an Integrated Management Plan setting out response time targets. These targets depend on the time required to get fire appliances to a particular area, together with the ease of movement within it. It is therefore possible that a layout acceptable to the Fire and Rescue Service (FRS) in one area, might be objected to in a more remote location;
- parked cars can have a significant influence on response times. Developments should have adequate provision for parking to reduce its impact on response times; and
- residential sprinkler systems are highly regarded by the FRS and their presence allows a longer response time to be used. A site layout which has been rejected on the grounds of accessibility for fire appliances may become acceptable if its buildings are equipped with these systems.

¹⁶ Statutory Instrument 2000 No. 2531, *The Building Regulations 2000*. London: TSO. Volume 1 – *Dwelling Houses April 2007*.

¹⁷ *Fire (Scotland) Act 2005* London: TSO.

G3.8 SERVICE VEHICLES

G3.8.1 The design of local roads should accommodate service vehicles without allowing their requirements to dominate the layout. On streets with low traffic flows and speeds, it may be assumed that they will be able to use the full width of the carriageway to manoeuvre. Larger vehicles which are only expected to use a street infrequently, such as pantechnicons, need not be fully accommodated - designers could assume that they will have to reverse or undertake multi-point turns to turn around for the relatively small number of times they will require access.

G3.8.2 Well-connected street networks have significant advantages for service vehicles. A shorter route can be used to cover a given area, and reversing may be avoided altogether. They also minimise land-take by avoiding the need for wasteful turning areas at the ends of cul-de-sacs.

G3.8.3 However, some sites cannot facilitate such ease of movement (e.g. linear sites and those with difficult topography), and use cul-de-sacs to make the best use of the land available. For cul-de-sacs longer than 20 m, a turning area should be provided to cater for vehicles that will regularly need to enter the street. Advice on the design of turning areas is given in Chapter G4.

WASTE COLLECTION VEHICLES

G3.8.4 The need to provide suitable opportunities for the storage and collection of waste is a major consideration in the design of buildings, site layouts and individual streets. Storage may be complicated by the need to provide separate facilities for refuse and the various categories of recyclable waste. Quality of place will be significantly affected by the type of waste collection and management systems used, because they in turn determine the sort of vehicles that will need to gain access.

G3.8.5 Policy for local and regional waste planning bodies is set out in *SSP10: Planning for Waste Management*.¹⁸ *SPP10* refers to design and layout in new development being able to help secure opportunities for sustainable waste management. Planning authorities should ensure that new developments make sufficient provision for waste management and promote designs and layouts that secure the integration of waste management facilities without adverse impact on the street scene.

G3.8.6 The operation of waste collection services should be an integral part of street design and achieved in ways that do not compromise quality of place. Waste disposal and collection authorities and their contractor should take into account the geometry of streets across their area and the importance of securing quality of place when designing collection systems and deciding which vehicles are applicable. While it is always possible to design new streets to take the largest vehicle that could be manufactured, this would conflict with the desire to create quality places. It is neither necessary nor desirable to design new streets to accommodate larger waste collection vehicles than can be used within existing streets in the area.

¹⁸ Scottish Executive (2007) *Scottish Planning Policy 10: Planning for Waste Management*. Edinburgh Scottish Executive

G3.8.7 Waste collection vehicles fitted with rear-mounted compaction units (Fig G3.20) are about the largest vehicles that might require regular access to residential areas. *BS 5906: 2005*¹⁹ notes that the largest waste vehicles currently in use are around 11.6 m long, with a turning circle of 20.3 m. It recommends a minimum street width of 5 m, but smaller widths are acceptable where on-street parking is discouraged. Swept-path analysis can be used to assess layouts for accessibility. Where achieving these standards would undermine quality of place, alternative vehicle sizes and/or collection methods should be considered.



Figure G3.20 Large waste collection truck in a residential street (Scottish Government)

G3.8.8 Reversing causes a disproportionately large number of moving vehicle accidents in the waste/recycling industry. Injuries to collection workers or members of the public by moving collection vehicles are invariably severe or fatal. *BS 5906: 2005* recommends a maximum reversing distance of 12 m. Longer distances can be considered, but any reversing routes should be straight and free from obstacles or visual obstructions.

G3.8.9 Section 3.25 of the Scottish Building Standards 2008 Technical Handbook for Domestic Buildings provides guidance on achieving the standards set in the Building (Scotland) Regulations 2004 with regards solid waste storage and collection point. The collection point can be on-street (see Section G3.8.11), or may be at another location defined by the waste authority. Key recommendations are:

- residents should not be required to carry waste more than 30 m (excluding any vertical distance) to the storage point;
- waste collection vehicles should be able to get to within 25 m of the storage point (note, *BS 5906: 2005* recommends shorter distances) and the gradient between the two should not exceed 1:12. There should be a maximum of three steps for waste containers up to 250 litres, and none when larger containers are used (the Health and Safety Executive recommends that, ideally, there should be no steps to negotiate); and
- the collection point should be reasonably accessible for vehicles typically used by the waste collection authority.

¹⁹ British Standards Institute (BSI) (2005) *BS 5906: 2005 Waste Management in Buildings - Code of Practice*. London: BSI.

G3.8.10 Based on these parameters, it may not be necessary for a waste vehicle to enter a cul-de-sac less than around 55 m in length, although this will involve residents and waste collection operatives moving waste the maximum recommended distances, which is not desirable.

G3.8.11 *BS 5906: 2005* provides guidance and recommendations on good practice. The standard advises on dealing with typical weekly waste and recommends that the distance over which containers are transported by collectors should not normally exceed 15 m for two-wheeled containers, and 10 m for four-wheeled containers.

G3.8.12 It is essential that liaison between the designers, the waste, highways, planning and building control authorities, and access officers, takes place at an early stage. Agreement is required on the way waste is to be managed and in particular:

- methods for storing, segregating and collecting waste;
- the amount of waste storage required, based on collection frequency, and the volume and nature of the waste generated by the development; and
- the size of anticipated collection vehicles.

G3.8.13 The design of new developments should not require waste bins to be left on the footway as they reduce its effective width. Waste bins on the footway pose a hazard for blind or partially sighted people and may prevent wheelchair and pushchair users from getting past.

RECYCLING

G3.8.14 The most common types of provision for recycling (often used in combination) are:

- 'bring' facilities, such as bottle and paper banks, where residents leave material for recycling; and
- kerbside collection, where householders separate recyclable material for collection at the kerbside.

G3.8.15 'Bring' facilities need to be in accessible locations close to community buildings but not where noise from bottle banks etc. can disturb residents. There needs to be enough room for the movement and operation of collection vehicles.

G3.8.16 Underground waste containers may be worth considering. All that is visible to the user is a 'litter bin' or other type of disposal point (Fig. G3.21). This collects in underground containers which are emptied by specially equipped vehicles. There were some 175 such systems in the UK in 2006.



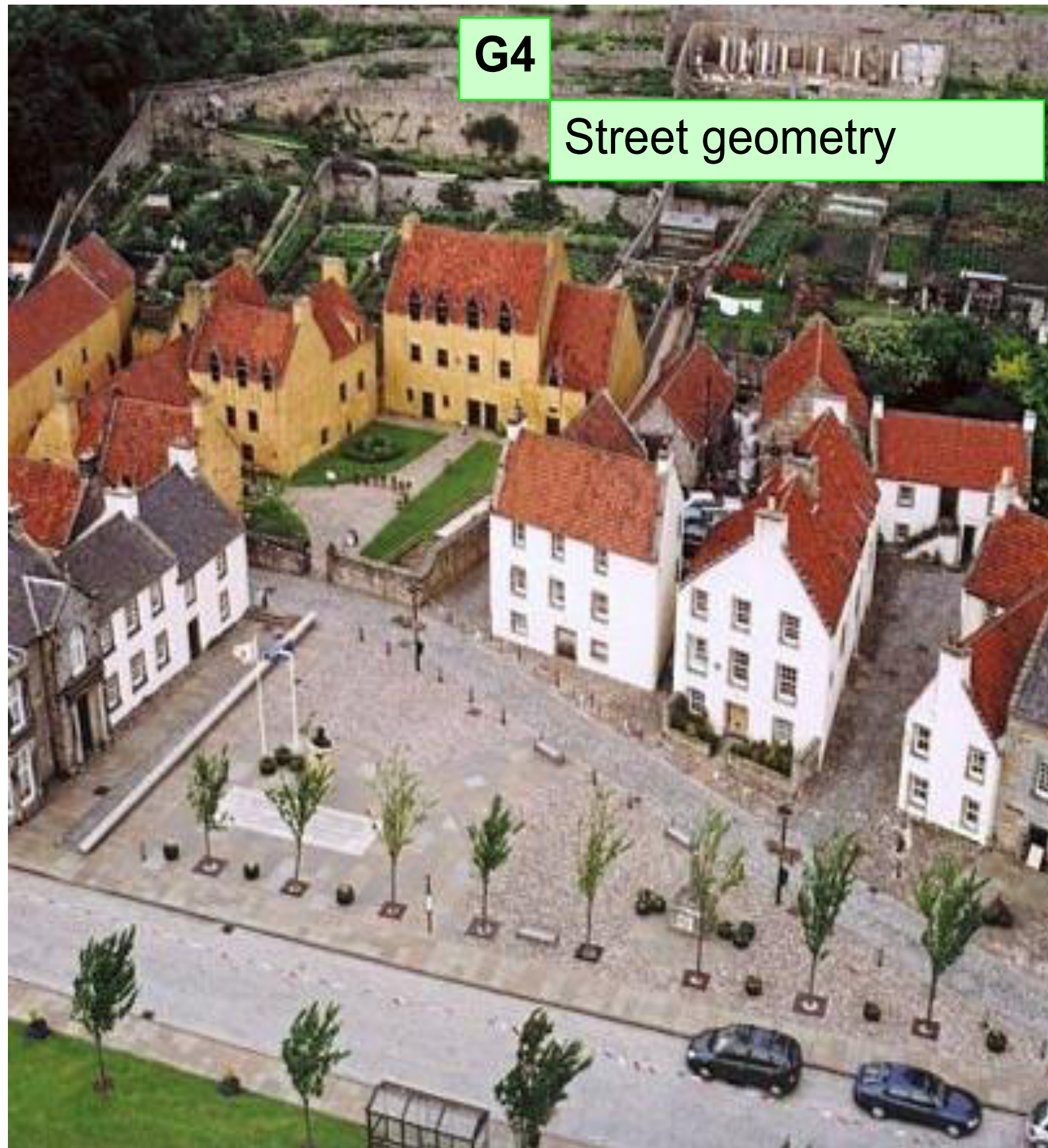
Figure G3.21 Refuse disposal point discharging into underground collection facility.

G3.8.17 Kerbside collection systems generally require householders to store more than one type of waste container. This needs to be considered in the design of buildings or external storage facilities.

G3.8.18 Designers should ensure that containers can be left out for collection without blocking the footway or presenting hazards to users.

G4

Street geometry



G4 Street Geometry

CHAPTER AIMS

- Advise how the requirements of different users can be accommodated in street design.
- Summarise research which shows that increased visibility encourages higher vehicle speeds.
- Describe how street space can be allocated based on pedestrian need, using swept path analysis to ensure that minimum access requirements for vehicles are met.
- Describe the rationale behind using shorter vehicle stopping distances to determine visibility requirements on links and at junctions.
- Recommend that the design of streets should determine vehicle speed.
- Recommend a maximum design speed of 20 mph for residential streets.

G4.1 INTRODUCTION

G4.1.1 Several issues need to be considered in order to satisfy the various user requirements detailed in Chapter G3, namely:

- street widths and components;
- junctions;
- features for controlling vehicle speeds;
- forward visibility on links; and
- visibility splays at junctions.



Figure G4.1 Illustrates what various carriageway widths can accommodate. They are not necessarily recommendations.

G4.2 STREET DIMENSIONS

G4.2.1 The design of new streets or the improvement of existing ones should take into account the functions of the street, and the type, density and character of the development.

G4.2.2 Carriageway widths should be appropriate for the particular context and uses of the street. Key factors to take into account include:

- the volume of vehicular traffic and pedestrian activity;
- the traffic composition;
- the demarcation, if any, between carriageway and footway (e.g. kerb, street furniture or trees and planting);
- whether parking is to take place in the carriageway and, if so, its distribution, arrangement, the frequency of occupation, and the likely level of parking enforcement(if any);
- the design speed (recommended to be 20 mph or less in residential areas); the curvature of the street (bends require greater width to accommodate the swept path of larger vehicles); and
- any intention to include one-way streets, or short stretches of single lane working in two-way streets.

G4.2.3 In lightly-trafficked streets, carriageways may be narrowed over short lengths to a single lane as a traffic-calming feature. In such sections the width between constraining features such as bollards should be no more than 3.5 m. In particular circumstances this may be reduced to a minimum value of 2.75 m, which will still allow for occasional large vehicles. However, widths between 2.75 m and 3.25 m should be avoided in most cases, since they could result in drivers trying to squeeze past cyclists. The local Fire Safety Officer should be consulted where a carriageway width of less than 3.7 m is proposed (see paragraph G3.7.3). Where access by larger vehicles is not permitted this could be reduced to 2.3m.

G4.2.4 Each street in the network is allocated a particular street character type, depending on where it sits within the place/movement hierarchy (see Chapter 2) and the requirements of its users (see Chapter G3). Individual streets can then be designed in detail using the relevant typical arrangement as a starting point. For example, one street might have a fairly high movement status combined with a medium place status, whilst another might have very little movement status but a high place status. The typical arrangement for each street character represented using a plan and cross-section as illustrated in Figure G4.1.

G4.2.5 These street types can be defined in a design code, as demonstrated in the case study box on the next page.

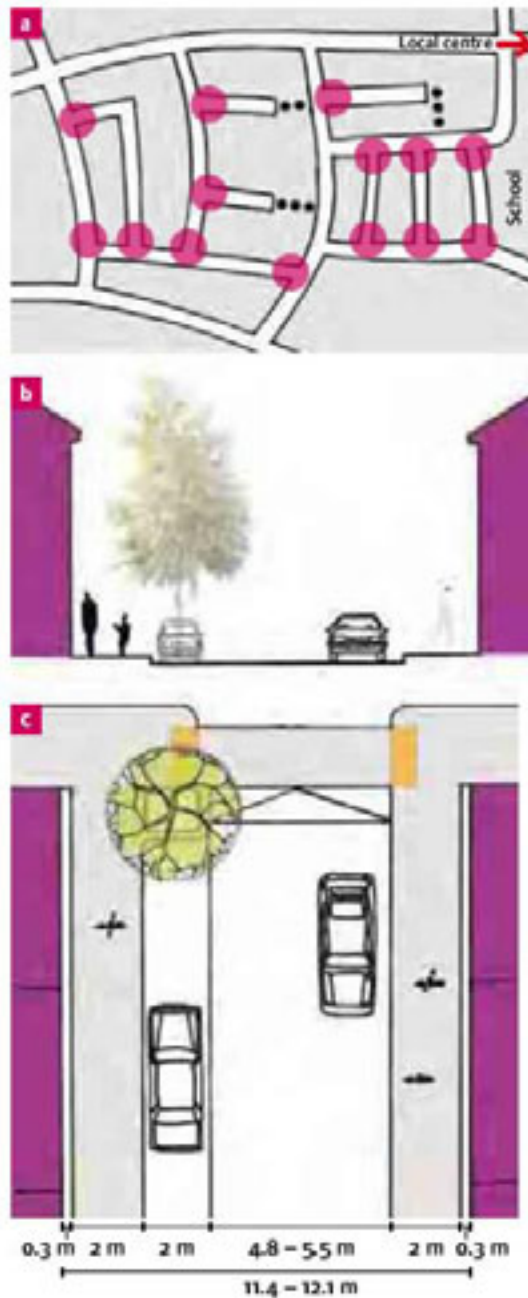


Figure G4.1 Typical representation of a street character type. This example shows the detail for minor side street junctions. Key plan (a) shows the locations, (b) is a cross-section and (c) the plan.



Figure G4.2 On street parking and shallow gradient junction table suitable for accommodating buses.

Newhall demonstrates that adherence to masterplan principles can be achieved through the use of design codes (Fig G4.2) that are attached to land sales and achieved by covenants

- A list of key dimensions was applied:
- Frontage to frontage – min 10.5m;
 - Carriageway width – min 4.8m, max 8.8m;
 - Footway width – min 1.5m;
 - Front gardens – min 1.5m, max 3m
 - Reservation for services – 1m and;
 - Design speed – 20 mph.

The design is based on pedestrian priority and vehicle speeds of less than 20 mph controlled through the street

SWEPT PATH ANALYSIS

G4.2.6 Swept path analysis, or tracking, is used to determine the space required for various vehicles and is a key tool for designing carriageways for vehicular movement within the overall layout of the street. The potential layouts of buildings and spaces do not have to be dictated by carriageway alignment - they should generally be considered first, with the carriageway alignment being designed to fit within the remaining space (Fig. G4.3). Forward visibility should be checked immediately after or as part of the same process. This may result in adjustments to the house layout in some areas.



Figure G4.3 Left to right: (a) the buildings and urban edge of a street help to form the place; (b) the kerb line can be used to reinforce this; and (c) the remaining carriageway space is tracked for movement and for the provision of places where people may park their vehicles.

G4.2.7 The use of computer-aided design (CAD) tracking models and similar techniques often proves to be beneficial in determining how the street will operate and how vehicles will move within it. Layouts designed using this approach enable buildings to be laid out to suit the character of the street, with footways and kerbs helping to define and emphasise spaces. Designers have the freedom to vary the space between kerbs or buildings. However, consideration should be given to the potential impact of on road parking. The kerb line does not need to follow the line of vehicle tracking if careful attention is given to the combination of sightlines, parking and pedestrian movements.

SHARED SURFACE STREETS AND SQUARES

G4.2.8 In traditional street layouts, footways and carriageways are separated by a kerb. In a street with a shared surface, this demarcation is absent and pedestrians and vehicles share the same surface. The key aims are to:

- encourage low vehicle speeds;
- create an environment in which pedestrians can walk, or stop and chat, without feeling intimidated by motor traffic;
- make it easier for people to move around; and
- promote social interaction.

G4.2.9 In the absence of a formal carriageway, experience shows that motorists entering the area will tend to drive more cautiously and negotiate the right of way with pedestrians on a more conciliatory level (Fig. G4.4).

G4.2.10 However, shared surfaces can cause problems for some disabled people. People with cognitive difficulties may find the environment difficult to interpret. In addition, the absence of a conventional kerb poses problems for blind or partially-sighted people, who often rely on this feature to find their way around. It is therefore important that shared surface schemes include an alternative means for visually-impaired people to navigate by.

G4.2.11 Research published by the Guide Dogs for the Blind Association in September 2006¹ illustrated the problems that shared surfaces cause for blind or partially-sighted and other disabled people. Further research has been commissioned by the Department for Transport to address the issues raised, and this work is currently underway.

G4.2.12 Consultation with the community and users, particularly with disability groups and access officers, is essential when any shared surface scheme is developed. Early indications are that, in many instances, a protected space, with appropriate physical demarcation, will need to be provided, so that those pedestrians who may be unable to negotiate priority with vehicles can use the street safely and comfortably.

G4.2.13 When designing shared surface schemes, careful attention to detail is required to avoid other problems, such as:

- undifferentiated surfaces leading to poor parking behaviour;
- vulnerable road users feeling threatened by having no space protected from vehicles; and
- the positioning and quantity of planting, street furniture and other features creating visual clutter.



Figure G4.4 A shared surface in a residential area

¹ The Guide Dogs for the Blind Association (2006) *Shared Surface Street Design Research Project. The Issues: Report of Focus Groups*. Reading: The Guide Dogs for the Blind Association

G4.2.14 Subject to making suitable provision for disabled people, shared surface streets are likely to work well:

- in short lengths, or where they form cul-de-sacs (Fig. G4.7);
- where the volume of motor traffic is below 100 vehicles per hour (vph) (peak); and
- where parking is controlled or it takes place in designated areas.



Figure G4.5 (a) and (b) A shared-surface square in Poundbury, Dorset **TO BE REPLACED BY SCOTTISH IMAGES**

G4.2.15 Shared surface streets are often constructed from pavements or other materials rather than asphalt, which helps emphasise their difference from conventional streets. Research for MfS has shown that block paving reduces traffic speeds by between 2.5 mph and 4.5 mph, compared with speeds on asphalt surfaces (Fig. G4.6).



Figure G4.6 A shared surface scheme. Beaulieu Park, Chelmsford. **TO BE REPLACED BY SCOTTISH IMAGE**



Figure G4.7 Home Zone, The Drum, Bo'ness (Phil Jones, Phil Jones Associates)

HOME ZONES

G4.2.16 Home Zones are residential areas designed with streets to be places for people, instead of just for motor traffic. By creating a high-quality street environment, Home Zones strike a better balance between the needs of the local community and drivers (Fig. G4.7). Involving the local community is the key to a successful scheme. Good and effective consultation with all sectors of the community, including young people, can help ensure that the design of individual Home Zones meets the needs of the local residents.

G4.2.17 Home Zones often include shared surfaces as part of the scheme design and in doing so they too can create difficulties for disabled people. Research commissioned by the Disabled Persons Transport Advisory Committee (DPTAC) on the implications of Home Zones for disabled people, published in 2007, demonstrates those concerns. Design guidance relating to this research has been published.²

G4.2.18 Home Zones are encouraged in both the planning and transport policies for new developments and existing streets. They are distinguished from other streets by having signed entry and exit points, which indicate the special nature of the street.

G4.2.19 The first Home Zones emerged in Scotland in 2000 when the Scottish Executive invited local authorities to put in bids to take part in a pilot study to evaluate the success of Home Zones. As a result the following four areas were selected as pilot home zones: Aberdeen (Tillydrone Area), Dundee (redevelopment of the Royal Infirmary site), Edinburgh (Caledonian Area), and Thurso, Ormlie (see case study page 106). A report evaluating the success of these home zones, and two additional home zones was published by the Scottish Executive in 2007³.

G4.2.20 Local authorities in Scotland were given the powers to create and designate roads as Home Zones in section 74 of the *Transport (Scotland) Act 2001*⁴. The legal procedure for creating a Home Zone in Scotland is set out in *The Home Zones (Scotland) Regulations (2002)*⁵ and guidance is provided in *Home Zones Guidance Consultation*⁶.

² DpTAC (2007) *Design for Disabled People in Home Zones*. London: DpTAC

³ Scottish Executive (2007) *Transport Research Series, Home Zones in Scotland, Evaluation Report*. Edinburgh: Scottish Executive

⁴ *Transport (Scotland) Act 2001*, section 74

⁵ Scottish Stationary Instrument (2002) *The Home Zones (Scotland)*

⁶ Scottish Executive (2002) *Home Zones Guidance Consultation*. Edinburgh: Scottish Executive

CASE STUDY

ORMILE, THURSO

Ormlie is a small housing estate on the south western side of Thurso in the northern Highlands. It comprises of a mixture of one, two and three bedroom houses, served by walkways and residential roads, including a number of cul de sacs. The Home Zone was developed in a response to widespread concern over road safety and many aspects of the layout of the estate and the fabric of the housing. In particular there were major concerns about alleyways leading on to roads; increasing numbers of cars; and high walls that obscured sightlines.

Features of the Ormlie Home Zone

- tree and shrub planting in a formerly expansive open environment
- horizontal deflections provided by long radius curves along the streets
- vertical deflections provided by a raised table and raised pedestrian crossing point (fig G4.8 a)
- incorporation of bus and delivery vehicle access in the Home Zone design
- public art developed with involvement of the local community (fig G4.8 b)



Fig G4.8 (a) Raised speed table Lord Thurso Court, helping to reduce vehicle speeds and facilitate pedestrian movement (b) wavy wall created using local Caithness Stone aiding the sense of context and place identity (Scottish Executive⁷).

The Home Zones in Scotland Evaluation Report⁸ concluded that the Home Zone is making a difference to the way the community interacts, has increased the use of outdoor space and the sense of ownership, connection, care and enjoyment of their place.

⁷ Scottish Executive (2007) *Transport Research Series, Home Zones in Scotland, Evaluation Report*. Edinburgh: Scottish Executive

⁸ Scottish Executive (2007) *Transport Research Series, Home Zones in Scotland, Evaluation Report*. Edinburgh: Scottish Executive

Research on shared space streets

A study of public transport in London Borough Pedestrian Priority Areas (PPAs) undertaken by TRL for the Bus Priority Team at Transport for London concluded that there is a self-limiting factor on pedestrians sharing space with motorists, of around 100 vph. Above this, pedestrians treat the general path taken by motor vehicles as a 'road' to be crossed rather than as a space to occupy. The speed of vehicles also had a strong influence on how pedestrians used the shared area. Although this research project concentrated on PPAs, it is reasonable to assume that these factors are relevant to other shared space schemes. This does not mean that shared surface schemes are unsafe above this level of traffic, but does indicate that at higher flows pedestrians are unlikely to share the space.

G4.2.21 Developers sometimes implement 'Home Zone style' schemes without formal designation. However, it is preferable for the proper steps to be followed, which where possible should involve the new community in deciding how the street will be used.

G4.2.22 In existing streets, it is essential that the design of the Home Zone involves significant participation by local residents and local access groups. In new-build situations, a partnership between the developer and the relevant authorities will enable prospective residents to be made aware of the proposed designation of the street as a Home Zone. This will pave the way for the formal consultation procedure once the street becomes adopted.

G4.2.23 Further guidance on the design of Home Zones is given in *Home Zones; Challenging the Future of Our Streets*⁹, the Institute of Highway Incorporated Engineers' (IHIE) *Home Zone Design Guidelines*¹⁰ and at the website www.homezones.org.uk.



Figure G4.10 Quadrant kerbstones used instead of large radii at junctions reduce the dominance of the carriageway. This is reinforced by the placement and form of the adjacent buildings. However, note the lack of dropped kerbs and tactile paving (WSP, Hopeman).

⁹ Department for Transport(2005) *Home Zones: Challenging the future of Our Streets*.London: Department for Transport

¹⁰ IHIE (2002) *Home Zones Design Guidelines*. London: IHIE

G4.3 JUNCTIONS

G4.3.1 Junctions that are commonly used in residential areas include:

- crossroads and staggered junctions;
- T and Y junctions; and
- roundabouts.

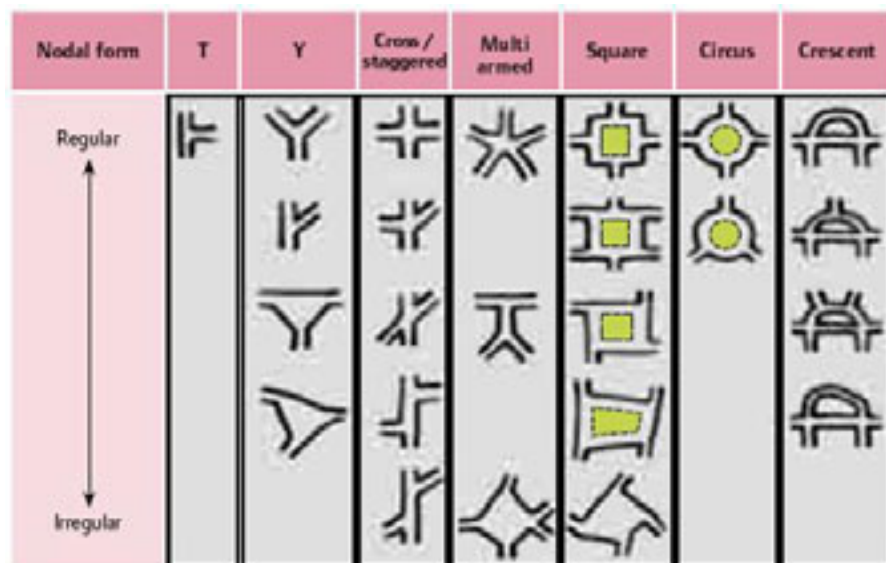


Fig. G4.9 Illustrative junction layouts

Figure G4.9 illustrates a broader range of junction geometries to show how these basic types can be developed to create distinctive places. Mini-roundabouts and shared surface squares can be incorporated within some of the depicted arrangements.

G4.3.2 Junctions are generally places of high accessibility and good natural surveillance. They are therefore ideal places for locating public buildings, shops and public transport stops, etc. Junctions are places of interaction among street users. Their design is therefore critical to achieving a proper balance between their place and movement functions.

G4.3.3 The basic junction forms should be determined at the masterplanning stage. At the street design stage, they will have to be considered in more detail in order to determine how they are going to work in practice. Masterplanning and detailed design will cover issues such as traffic priority arrangements, the need, or otherwise, for signs, markings and kerbs, and how property and building lines are related.

G4.3.4 The resulting spaces and townscape should ideally be represented in three dimensions - see G4.11.

G4.3.5 Often, the key to a well-designed junction is the way in which buildings are placed around it and how they enclose the space in which the junction sits. Building placement should therefore be decided upon first, with the junction then designed to suit the available space.

G4.3.6 Junction design should facilitate direct pedestrian desire lines, and this will often mean using small corner radii. The use of swept path analysis will ensure that the junctions are negotiable by vehicles (Fig. G4.10). However consideration should be given to the robustness of the design to withstand any occasional vehicle overrun.

Presenting design layouts in three dimensions is an important way of looking at aspects of engineering and urban design together (Fig. G4.11). It enables street furniture, lighting, utility equipment and landscaping to be clearly shown. Three-dimensional layouts are also useful in consultation with the public.

Street cross-sections and plans should be developed initially. Perspective or axonometric drawings can then be produced to add clarity and to assist designers in visualising and refining their ideas. Such three-dimensional representation is fairly easy to achieve both by hand and using CAD software. For more complex schemes, a computer-generated 'walk-through' presentation can be used to demonstrate how the proposal will work in practice. It is also a powerful tool for resolving design issues.

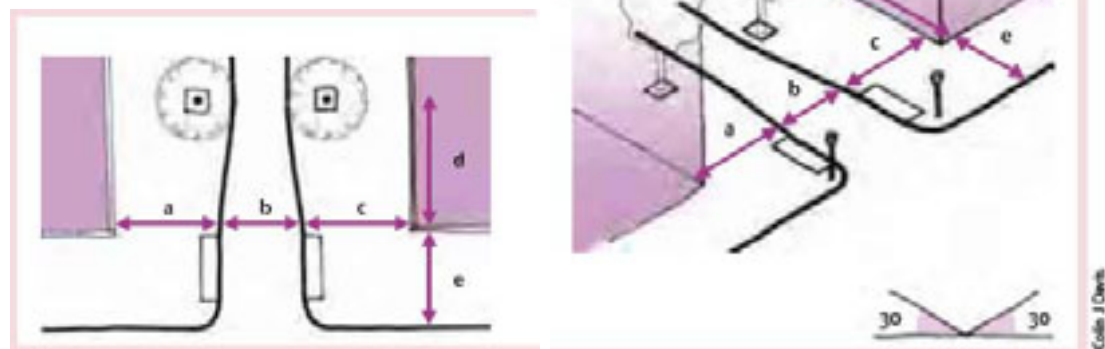


Figure G4.11 Example of three-dimensional presentations.

G4.3.7 Junctions may be marked to indicate which arms have priority, but on quieter streets and at speeds of 20mph or less it would generally be acceptable to leave them unmarked. A lack of marked priority may encourage motorists to slow down to negotiate their way through, making the junction more comfortable for use by pedestrians. However, this approach requires careful consideration (see Chapter G7).

G4.3.8 Crossroads are convenient for pedestrians, as they minimise diversion from desire lines when crossing the street. They also make it easier to create permeable and legible street networks.

G4.3.9 Permeable layouts can also be achieved using T and Y junctions. Y junctions can increase flexibility in layout design.

G4.3.10 Staggered junctions can reduce vehicle conflict compared with crossroads, but may reduce directness for pedestrians. If it is necessary to maintain a view point or vista, and if there is sufficient room between buildings, staggered junctions can be provided within continuous building lines. (Fig. G4.12).

G4.3.11 Where designers are concerned about potential user conflict, they may consider placing the junction on a speed table. Another option might be to close one of the arms to motor traffic (while leaving it open for pedestrians and cyclists).

G4.3.12 Conventional roundabouts are not generally appropriate for residential developments. Their capacity advantages are not usually relevant, they can have a negative impact on vulnerable road users, and they often do little for the street scene. They are also inefficient in terms of land-use.

G4.3.13 Larger roundabouts are inconvenient for pedestrians because they are deflected from their desire lines, and people waiting to cross one of the arms may not be able to anticipate easily the movement of motor vehicles on the roundabout, or entering or leaving it.

G4.3.14 Roundabouts can be hazardous for cyclists. Drivers entering at relatively high speed may not notice cyclists on the circulatory carriageway, and cyclists travelling past an arm are vulnerable to being hit by vehicles entering or leaving the junction.

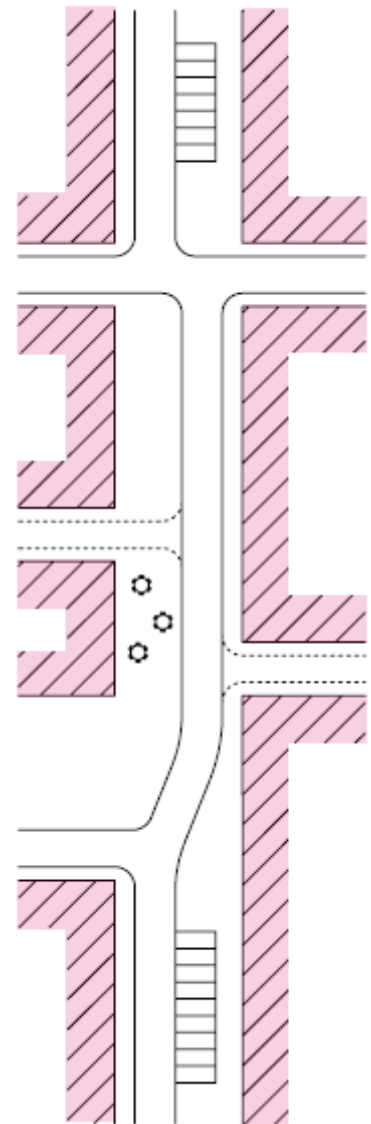


Figure G4.12 - Using staggered junctions to maintain a view point or vista.

G4.3.15 Mini-roundabouts share some of these disadvantages. However they may have some application in residential areas, as they cause less deviation for pedestrians and are easier for cyclists to use. In addition, they do not occupy as much land. Practitioners should refer to *Mini-roundabouts: Good Practice Guidelines*.¹¹

G4.3.16 Compact-style roundabouts (sometimes referred to as Continental Roundabouts) may also be suitable for consideration. They sit between conventional roundabouts and mini-roundabouts in terms of land take. They retain a conventional central island, but differ in other respects - there is minimal flare at entry and exit, and they have a single-lane circulatory carriageway. In addition, the circulatory carriageway has negative camber, so water drains away from the centre, which simplifies drainage arrangements. Their geometry is effective in reducing entry, circulatory and exit speeds.¹² They are safer for cyclists because of the reduced speeds, together with the fact that drivers cannot overtake on the circulatory carriageway. Their use is described in *TD 16 Geometric Design of Roundabouts*.¹³ An example of a compact (continental) – style roundabout can be found on the Ardler case study on in Section G9.

SPACING OF JUNCTIONS

G4.3.17 The spacing of junctions should be determined by the type and size of urban blocks appropriate for the development. Block size should be based on the need for permeability, and generally tends to become smaller as density and pedestrian activity increases.

G4.3.18 Smaller blocks create the need for more frequent junctions. This improves permeability for pedestrians and cyclists, and the impact of motor traffic is dispersed over a wider area. Research in the preparation of *Manual for Streets*¹⁴ demonstrated that more frequent (and hence less busy) junctions need not lead to higher numbers of accidents.

G4.3.19 Junctions do not always need to cater for all types of traffic. Some of the arms of a junction may be limited to pedestrian and cycle movement only.

¹¹ Department for Transport and County Surveyors' Society (CSS) (2006) *Mini-roundabouts: Good Practice Guidance* London: CSS.

¹² Davies D,G. Taylor, MC, Ryley, TJ, Halliday, M. (1997) *Cyclists at Roundabouts - the Effects of 'Continental' Design on Predicted Safety and Capacity*. TRL Report No. 285. Crowthorne: TRL.

¹³ Highways Agency (2007) DMRB Volume 6 (2007) *TD 16/07 The Geometric Design of Roundabouts*.

¹⁴ I York, A Bradbury, S Reid, T Ewings and R Paradise(2007) *The Manual for Streets: redefining residential street design*. TRL Report no. 661. Crowthorne: TRL.



Figure G4.13 This street avoids the use of vertical traffic-calming features, but the irregular alignment is unsightly and unlikely to have much speed-reducing effect, because of the width of the carriageway. It also results in irregular grassed areas that create a maintenance burden while contributing little to street quality.



Figure G4.14 Trees planted in the highway at Newhall, Harlow, help to reduce vehicle speeds (EDAW).

G4.4 ACHIEVING APPROPRIATE TRAFFIC SPEEDS

G4.4.1 Conflict among various user groups can be minimised or avoided by reducing the speed and flow of motor vehicles. Ideally, designers should aim to create streets that control vehicle speeds naturally rather than having to rely on unsympathetic traffic-calming measures (Fig. G4.13). In general, providing a separate pedestrian and/or cycle route away from motor traffic should only be considered as a last resort (see the hierarchy of provision in Chapter G1).

G4.4.2 For residential streets, a maximum design speed of 20 mph should normally be an objective. The severity of injuries and the likelihood of death resulting from a collision at 20 mph are considerably less than can be expected at 30 mph. In addition, vehicle noise and the intimidation of pedestrians and cyclists are likely to be significantly lower.

G4.4.3 Evidence from traffic-calming schemes suggests that speed-controlling features are required at intervals of no more than 70 m in order to achieve speeds of 20 mph or less.¹⁵ Straight and uninterrupted links should therefore be limited to a maximum of around 70 m to help ensure that the arrangement has a natural traffic-calming effect.

G4.4.4 A continuous link can be broken up by introducing features along it to slow traffic. The range of traffic-calming measures available act in different ways, with varying degrees of effectiveness:

- **Street dimensions** - can have a significant influence on speeds. Keeping lengths of street between junctions short is particularly effective. Street width also has an effect on speed (see box).
- **Reduced visibility** - research carried out in preparation of *Manual for Streets* found that reductions in forward visibility are associated with reduced driving speeds (see box).
- **Changes in priority** - at roundabouts and other junctions. This can be used to disrupt flow and therefore bring overall speeds down.
- **Physical features** - involving vertical or horizontal deflection can be very effective in reducing speed. It is preferable to use other means of controlling speeds, if practicable, but there will be situations (e.g retro-fit) where physical features represent the optimum solution. Additional sources of advice on traffic calming can be found in *Traffic Advisory Leaflet 2/05*.¹⁶
- **Psychology and perception** - street features and human activity can have an influence on the speed at which people choose to drive. Research¹⁷ suggests that features likely to be effective include the following:
 - edge markings that visually narrow the road - speed reduction is likely to be greatest where the edging is textured to appear unsuitable for driving on;
 - the close proximity of buildings to the road;
 - reduced carriageway width;

¹⁵ DETR (1999) *Traffic Advisory Leaflet 9/99- 20mph speed limits and zones*. London: DETR.

¹⁶ Department for Transport(2005) *Traffic Advisory Leaflet 2/05 - Traffic calming Bibliography*. London: Department for Transport.

¹⁷ J Kennedy, R Gorell, L Crinson, A Wheeler, M Elliott (2005) '*Psychological' Traffic Calming*' TRL Report No. 641. Crowthorne: TRL.

- obstructions in the carriageway (Fig. G4.14);
- features associated with potential activity in, or close to, the carriageway, such as pedestrian refuges;
- on-street parking, particularly when the vehicles are parked in echelon formation or perpendicular to the carriageway;
- the types of land use associated with greater numbers of people, for example shops; and
- pedestrian activity.

Influence of geometry on speed

Research carried out in the preparation of *MfS* considered the influence of geometry on vehicle speed and casualties in 20 residential and mixed-use areas in the UK. Two highway geometric factors stand out as influencing driving speed, all other things being equal. They are:

- Forward visibility; and
- Carriageway width

Improved visibility and/or increased carriageway width were found to correlate with increased vehicle speeds. Increased width for a given visibility, or vice versa, were found to increase speed. These data are summarised in Fig. G4.15

The relationship between visibility, highway width and driver speed identified on links was also found to apply at junctions. A full description of the research findings is available in TRL report 661.

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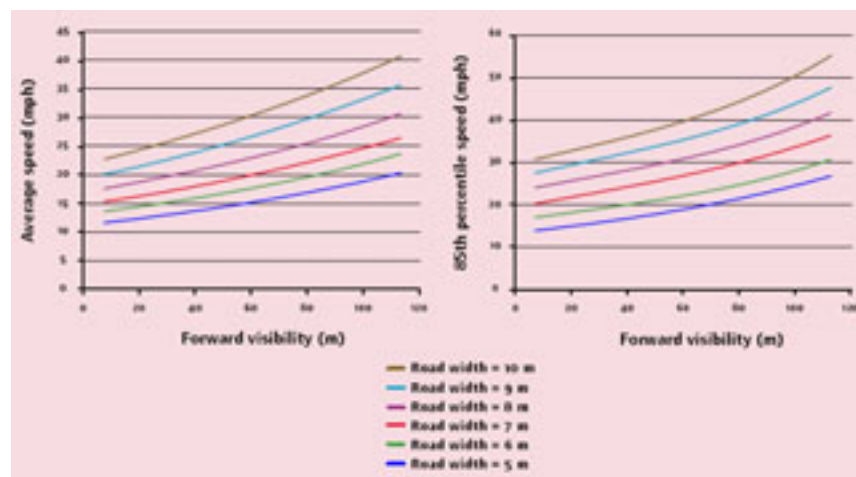


Figure G4.15 Correlation between visibility and carriageway width and vehicle speeds (a) average speeds and (b) 85th percentile speeds. These graphs can be used to give an indication of the speed at which traffic will travel for a given carriageway width/forward visibility combination.

¹⁸ I York, A Bradbury, S Reid, T Ewings and K Paradise (2007) *The Manual for Streets: Redefining Residential Street Design*. TRL Report No. 661. Crowthorne: TRL.

G4.4.5 Speed limits for residential areas are normally 30 mph, but 20 mph limits are becoming more common. If the road is lit, a 30 mph limit is signed only where it begins - repeater signs are not used here. All other speed limits have to be signed where they start and be accompanied by repeater signs.

G4.4.6 A street with a 20 mph limit is not the same as a 20 mph zone. To create a 20 mph zone, it is a legal requirement that traffic-calming measures are installed to ensure that low speeds are maintained throughout. In such cases, the limit is signed only on entering the zone, and no repeater signs are necessary.

G4.4.7 Speed limits below 30 mph, other than 20 mph limits or 20 mph zones, require individual consent from the Scottish Ministers. Designers should note that such approval is unlikely to be given.

G4.4.8 A speed limit is not an indication of the appropriate speed to drive at. It is the responsibility of drivers to travel within the speed limit at a speed suited to the conditions. However, for new streets, or where existing streets are being modified, and the design speed is below the speed limit, it will be necessary to include measures that reduce traffic speeds accordingly.

G4.4.9 Difficulties may be encountered where a new development connects to an existing road. If the junction geometry cannot be made to conform to the requirements for prevailing traffic speeds, the installation of traffic-calming measures on the approach will allow the use of a lower design speed to be used for the new junction.

G4.5 STOPPING SIGHT DISTANCE

G4.5.1 The stopping sight distance (SSD) is the distance within which drivers need to be able to see ahead and stop from a given speed. It is calculated from the speed of the vehicle, the time required for a driver to identify a hazard and then begin to brake (the perception-reaction time), and the vehicle's rate of deceleration. For new streets, the design speed is set by the designer. For existing streets, the 85th percentile wet-weather speed is used.

G4.5.2 The basic formula for calculating SSD (in metres) is:

$$SSD = vt + v^2/2d$$

where:

v = speed (m/s)

t = driver perception-reaction time (seconds)

d = deceleration (m/s^2)

G4.5.3 The desirable minimum SSDs used in the *Design Manual for Roads and Bridges*¹⁹ are based on a driver perception-reaction time of 2 seconds and a deceleration rate of $2.45 m/s^2$ (equivalent to 0.25g where g is acceleration due to gravity ($9.81 m/s^2$)).

G4.5.4 Drivers are normally able to stop much more quickly than this in response to an emergency. The stopping distances given in the Highway Code assume a driver reaction time of 0.67 seconds, and a deceleration rate of $6.57 m/s^2$ (0.67g).

¹⁹ Highways Agency (1992) *Design Manual for Roads and Bridges* London: TSO.

G4.5.5 While it is not appropriate to design street geometry based on braking in an emergency, there is scope for using lower SSDs than those used in *DMRB*. This is based upon the following:

- a review of practice in other countries has shown that *DMRB* values are much more conservative than those used elsewhere;²⁰
- research which shows that the 90th percentile reaction time for drivers confronted with a side-road hazard in a driving simulator is 0.9 seconds (see *TRL Report 332*²¹);
- carriageway surfaces are normally able to develop a skidding resistance of at least 0.45g in wet weather conditions. Deceleration rates of 0.25g (the previously assumed value) are more typically associated with snow-covered roads; and
- of the sites studied in the preparation of this manual, no relationship was found between SSDs and casualties, regardless of whether the sites complied with *DMRB* or not.

G4.5.6 The SSD values used in *Designing Streets* are based on a perception-reaction time of 1.5 seconds and a deceleration rate of 0.45g (4.41 m/s²). Table G4.1 uses these values to show the effect of speed on SSD. These values are independent of traffic flow or type of highway. It is recommended that they are used on all routes with 85th percentile wet weather speeds up to 60kph.

Speed	Kilometres per hour		24	25	30	32	40	45	48	50	60
	Miles per hour		15	16	19	20	25	28	30	31	37
SSD (metres)	9	12	15	16	20	22	31	36	40	43	56
SSD adjusted for bonnet length. See 4.6.4	11	14	17	18	23	25	33	39	43	45	59

Additional features will be needed to achieve speeds lower than 20mph

Table G4.1 Derived SSDs for streets (figures rounded).

G4.5.7 Below around 20 m, shorter SSDs themselves will not achieve low vehicle speeds: speed-reducing features will be needed. For higher speed roads, i.e. with an 85th percentile speed over 60 km/h, it may be appropriate to use longer SSDs, e.g. a driver-perception reaction time of 2 seconds and a deceleration rate of 0.45g unless the route in question is a trunk road, in which case the values given in *DMRB* should be applied.

G4.5.8 Gradients affect stopping distances. The deceleration rate of 0.45g used to calculate the figures in Table G4.1 is for a level road. A 10% gradient will increase (or decrease) the rate by around 0.1g.

²⁰ D.W. Harwood, D.B Fambro, B. Fishburn, H. Joubert, R. Lamm and B. Psarianos. (1995) *International Sight Distance Design Practices, International Symposium on Highway Geometric Design Practices*, Boston, Massachusetts Conference Proceedings Washington USA: Transportation Research Board.

²¹ Maycock G, Brocklebank P. and Hall, R. (1998) *Road Layout Design, Standards and Driver Behaviour*. TRL Report No. 332. Crowthorne: TRL

G4.6 VISIBILITY REQUIREMENTS

G4.6.1 Visibility should be checked at junctions and along the street. Visibility is measured horizontally and vertically.

G4.6.2 Using plan views of proposed layouts, checks for visibility in the horizontal plane and ensures that views are not obscured by vertical obstructions.

G4.6.3 Checking visibility in the vertical plane is then carried out to ensure that views in the horizontal plane are not compromised by obstructions such as the crest of a hill, or a bridge at a dip in the road ahead. It also takes into account the variation in driver eye height and the height range of obstructions. Eye height is assumed to range from 1.05 m (for car drivers) to 2 m (for lorry drivers). Drivers need to be able to see obstructions 2 m high down to a point 600 mm above the carriageway. The latter dimension is used to ensure small children can be seen (Fig. G4.16).

G4.6.4 The SSD figure relates to the position of the driver. However, the distance between the driver and the front of the vehicle is typically up to 2.4 m, which is a significant proportion of shorter stopping distances. It is therefore recommended that an allowance is made by adding 2.4 m to the SSD.

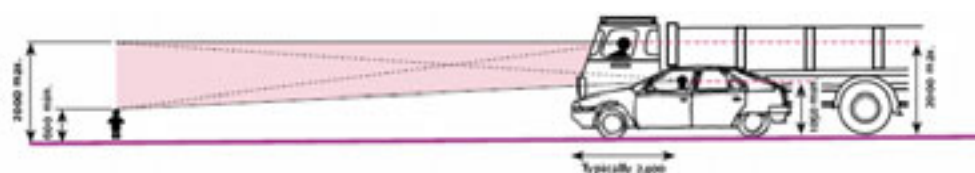


Figure G4.16 Vertical visibility envelope.

G4.7 VISIBILITY SPLAYS AT JUNCTIONS

G4.7.1 The visibility splay at a junction ensures there is adequate inter-visibility between vehicles on the major and minor arms (Fig. G4.17).

G4.7.2 The distance back along the minor arm from which visibility is measured is known as the X distance. It is generally measured back from the 'give way' line (or an imaginary 'give way' line if no such markings are provided). This distance is normally measured along the centreline of the minor arm for simplicity, but in some circumstances (for example where there is a wide splitter island on the minor arm) it will be more appropriate to measure it from the actual position of the driver.

G4.7.3 The Y distance represents the distance that a driver who is about to exit from the minor arm can see to his left and right along the main alignment. For simplicity it is often measured along the nearside kerb line of the main arm, although vehicles will normally be travelling a distance from the kerb line and therefore a more realistic approach would be to measure to the nearside wheel track. The measurement is taken from the point where this line intersects the centreline of the minor arm (unless, as above, there is good reason to measure from the actual position of the driver).

G4.7.4 When the main alignment is curved and the minor arm joins on the outside of a bend, another check is necessary to make sure that an approaching vehicle on the main arm is visible over the whole of the Y distance. This is done by drawing an additional sight line which meets the kerb line at a tangent.

G4.7.5 Some circumstances make it unlikely that vehicles approaching from the left on the main arm will cross the centreline of the main arm - opposing flows may be physically segregated at that point, for example. If so, the visibility splay to the left can be measured to the centreline of the main arm.

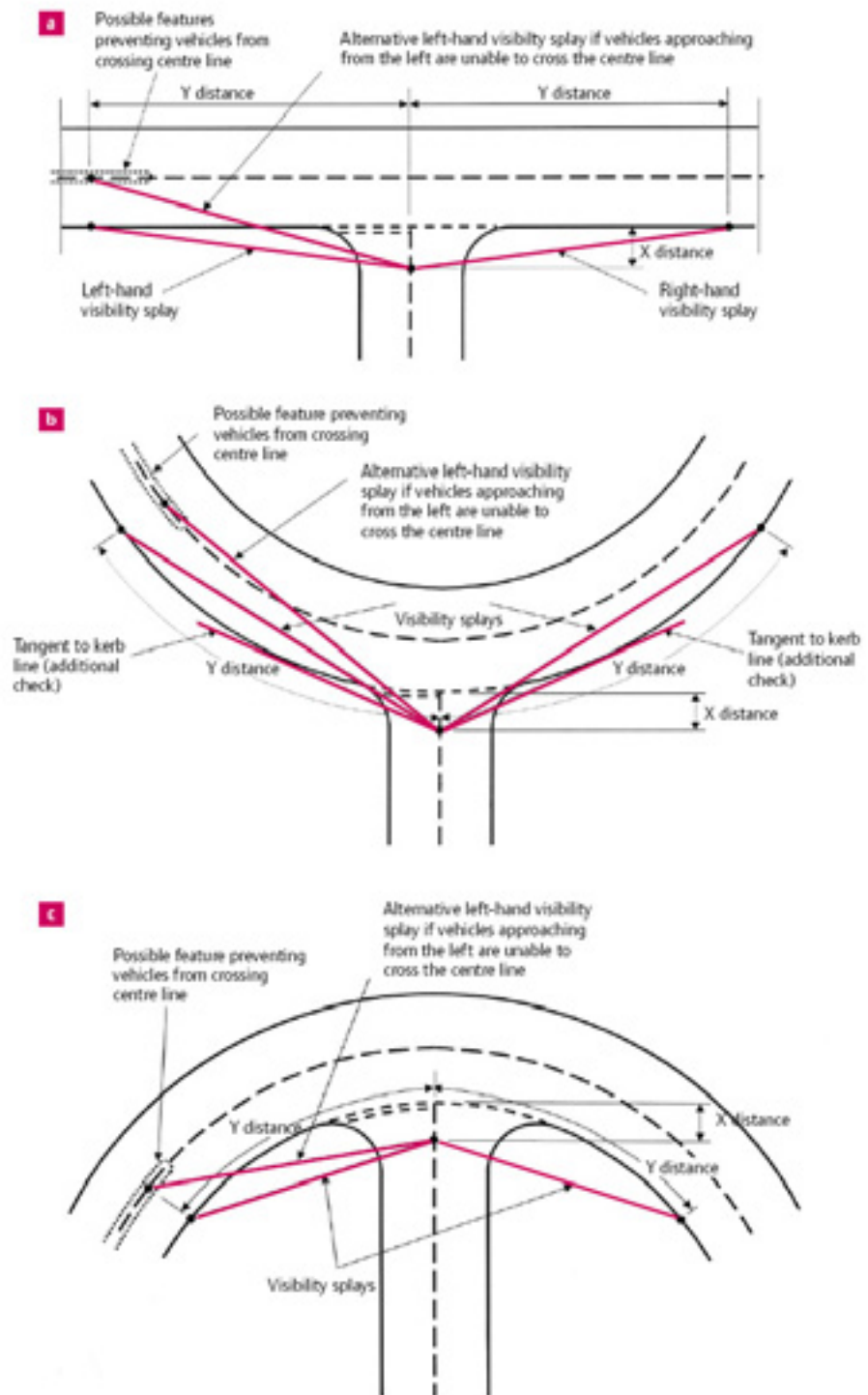


Figure G4.17 Measurement of junction visibility splays (a) on a straight road, (b) and (c) on bends.

X DISTANCE

G4.7.6 An X distance of 2.4 m should normally be used in most built-up situations, as this represents a reasonable maximum distance between the front of the car and the driver's eye.

G4.7.7 A minimum figure of 2 m may be considered in some very lightly-trafficked and slow-speed situations, but using this value will mean that the front of some vehicles will protrude slightly into the running carriageway of the major arm. The ability of drivers and cyclists to see this overhang from a reasonable distance, and to manoeuvre around it without undue difficulty, should be considered.

G4.7.8 Using an X distance in excess of 2.4 m is not generally required in built-up areas.

G4.7.9 Longer X distances enable drivers to look for gaps as they approach the junction. This increases junction capacity for the minor arm, and so may be justified in some circumstances, but it also increases the possibility that drivers on the minor approach will fail to take account of other road users, particularly pedestrians and cyclists. Longer X distances may also result in more shunt accidents on the minor arm. *TRL Report No. 184*²² found that accident risk increased with greater minor-road sight distance.

Y DISTANCE

G4.7.10 The Y distance should be based on values for SSD (Table G4.1).

G4.8 FORWARD VISIBILITY

G4.8.1 Forward visibility is the distance a driver needs to see ahead to stop safely for obstructions in the road. The minimum forward visibility required is equal to the minimum SSD. It is checked by measuring between points on a curve along the centreline of the inner traffic lane (see Fig. G4.19). Consideration should be given to vertical geometry and any other obstructions.

²² Summersgill I., Kennedy, J. and Baynes, D. (1996) *Accidents at Three-arm Priority Junctions on Urban Single-carriageway Roads* TRL Report no. 184. Crowthorne: TRL.

G4.8.2 There will be situations where it is desirable to reduce forward visibility in conjunction with other methods to control traffic speeds - the influence of geometry on speed box describes how forward visibility influences speed. An example is shown in Fig G4.18.



Figure G4.18 Limiting forward visibility helps keep speeds down in Poundbury, Dorset. **TO BE REPLACED WITH SCOTTISH IMAGE**

VISIBILITY ALONG THE STREET EDGE

G4.8.3 Vehicle exits at the back edge of the footway mean that emerging drivers will have to take account of people on the footway. The absence of wide visibility splays at private driveways will encourage drivers to emerge more cautiously. Consideration should be given to whether this will be appropriate, taking into account the following:

- the frequency of vehicle movements;
- the amount of pedestrian activity; and
- the width of the footway.

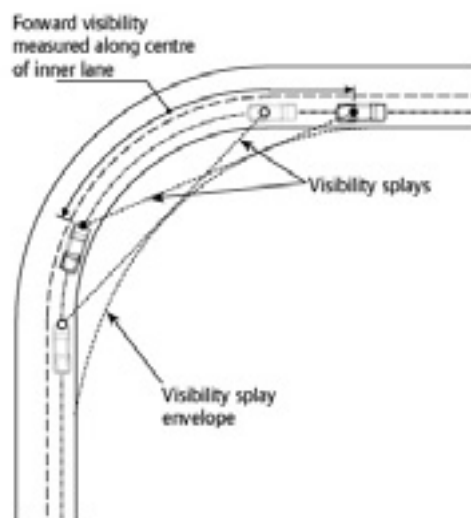


Figure G4.19 Measurement of forward visibility

G4.8.4 When it is judged that footway visibility splays are to be provided, consideration should be given to the best means of achieving this in a manner sympathetic to the visual appearance of the street (Fig. G4.20). This may include:

- the use of boundary railings rather than walls (Fig. G4.21); and
- the omission of boundary walls or fences at the exit location.

OBSTACLES TO VISIBILITY

G4.8.5 Parking in visibility splays in built-up areas is quite common, yet it does not appear to create significant problems in practice. Ideally, defined parking bays should be provided outside the visibility splay. However, in some circumstances, where speeds are low, some encroachment may be acceptable.

G4.8.6 The impact of other obstacles, such as street trees and street lighting columns, should be assessed in terms of their impact on the overall envelope of visibility. In general, occasional obstacles to visibility that are not large enough to fully obscure a whole vehicle or a pedestrian, including a child or wheelchair user, will not have a significant impact on road safety.



Figure G4.20 Beaulieu Park, Chelmsford - low vegetation provides subtle provision of visibility at private driveway.

TO BE REPLACED WITH SCOTTISH IMAGE



Figure G4.21 Beaulieu Park, Chelmsford: the visibility splays are provided by railings rather than boundary walls, although the railings could have followed the property boundary.

TO BE REPLACED WITH SCOTTISH IMAGE

G4.9 FRONTAGE ACCESS

G4.9.1 One of the key differences between streets and roads is that streets normally provide direct access to buildings and public spaces. This helps to generate activity and a positive relationship between the street and its surroundings. Providing direct access to buildings is also efficient in land-use terms.

G4.9.2 The provision of frontage vehicle access onto a street should be considered from the viewpoint of the people passing along the street, as well as those requiring access (Fig. G4.22). Factors to consider include:

- the speed and volume of traffic on the street;
- the presence of gathered accesses – a single access point can serve a number of properties or a communal parking area, for example. This may be acceptable where a series of individual accesses would not be; and
- the distance between the property boundary and the carriageway - to provide adequate visibility for the emerging driver.



Figure G4.22 Frontage access for individual dwellings onto a main street into Edinburgh.

G4.9.3 In the past, a relatively low limit on traffic flow (300 vehicles per peak hour or some 3,000 vehicles per day) has generally been used when deciding whether direct access was appropriate. This is equivalent to the traffic generated by around 400 houses. Above this level, many local-authority residential road guidelines required the provision of a 'local distributor road'.

G4.9.4 Such roads are usually very unsuccessful in terms of placemaking and providing for pedestrians and cyclists. In many cases, buildings turn their backs onto local distributors, creating dead frontages and sterile environments. Separate service roads are another possible design response, but these are wasteful of land and reduce visual enclosure and quality.

G4.9.5 It is recommended that the limit for providing direct access on roads with a 30 mph speed restriction is raised to at least 10,000 vehicles per day (see box).

TRAFFIC FLOW AND ROAD SAFETY FOR STREETS WITH DIRECT FRONTAGE ACCESS

The relationship between traffic flow and road safety for streets with direct frontage access was researched for *MfS*. Data on recorded accidents and traffic flow for a total of 20 sites were obtained. All of the sites were similar in terms of land use (continuous houses with driveways), speed limit (30 mph) and geometry (single-carriageway roads with limited side road junctions). Traffic flows at the sites varied from some 600 vehicles per day to some 23,000 vehicles per day, with an average traffic flow of some 4,000 vehicles per day.

It was found that very few accidents occurred involving vehicles turning into and out of driveways, even on heavily-trafficked roads.

Links with direct frontage access can be designed for significantly higher traffic flows than have been used in the past, and there is good evidence to raise this figure to 10,000 vehicles per day. It could be increased further, and it is suggested that local authorities review their standards with reference to their own traffic flows and personal injury accident records. The research indicated that a link carrying this volume of traffic, with characteristics similar to those studied, would experience around one driveway-related accident every five years per kilometre. Fewer accidents would be expected on links where the speed of traffic is limited to 20 mph or less, which should be the aim in residential areas.

G4.10 TURNING AREAS

G4.10.1 Connected street networks will generally eliminate the need for drivers to make three-point turns.

G4.10.2 Where it is necessary to provide for three-point turns (e.g. in a cul-de-sac), a tracking assessment should be made to indicate the types of vehicles that may be making this manoeuvre and how they can be accommodated. The turning space provided should relate to its environment, not specifically to vehicle movement (see Fig. G4.23), as this can result in a space with no use other than for turning vehicles. To be effective and usable, the turning head must be kept clear of parked vehicles. Therefore it is essential that adequate parking is provided for residents in suitable locations.

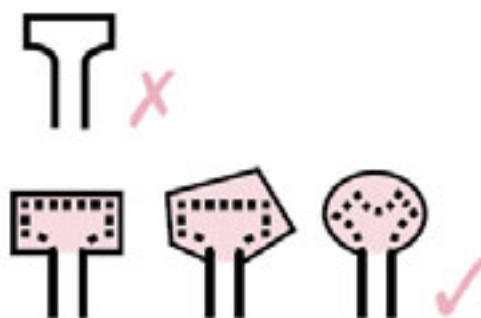


Figure G4.23 Different turning spaces and unusable turning heads

G4.10.3 Routing for waste vehicles should be determined at the concept masterplan or scheme design stage (see paragraph G3.8.4). Wherever possible, routing should be configured so that the refuse collection can be made without the need for the vehicle having to reverse, as turning heads may be obstructed by parked vehicles and reversing refuse vehicles create a risk to other street users.

G4.11 OVERRUN AREAS

G4.11.1 Overrun areas are used at bends and junctions (including roundabouts). They are areas of carriageway with a surface texture and/or appearance intended to deter overrunning by cars and other light vehicles. Their purpose is to allow the passage of large vehicles, such as buses and refuse vehicles, while maintaining 'tight' carriageway dimensions that deter smaller vehicles from speeding.

G4.11.2 Overrun areas should generally be avoided in residential and mixed-use streets. They can:

- be visually intrusive;
- interfere with pedestrian desire lines (Fig. G4.24); and
- pose a hazard for cyclists.

However, they can help to overcome problems with access for larger vehicles and so may represent the best solution in some circumstances.



Figure G4.24 The overrun area at this junction is hazardous for pedestrians and/or requires them to divert from their desire line. Notice also the unsightly placing of inspection covers. The layout is particularly hazardous for blind and partially-sighted pedestrians.

G5

Parking



G5 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 *Scottish Planning Policy 17: Planning for Transport*¹, designers need to recognise the mode hierarchy and adopt good design principles to enhance walking, cycling and public transport facilities with more emphasis on minimising the dominance of the car whether moving or parked.
- 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.

G5.1 INTRODUCTION

G5.1.1 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.

G5.1.2 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.

G5.1.3 A failure to properly consider this issue is likely to lead to inappropriate parking behaviour, resulting in poor and unsafe conditions for pedestrians, including the disabled and mobility impaired.

G5.1.4 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).

¹ Scottish Executive (2005) *Scottish Planning Policy 17: Planning for Transport*. Edinburgh: Scottish Executive

² Statutory Instrument 2002 No. 3113, *The Traffic Signs Regulations and General Directions 2002*. London: TSO.

³ Department for Transport (various) *The Traffic Signs Manual*. London: TSO and HMSO.

G5.2 CYCLE PARKING

G5.2.1 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.

G5.2.2 The need for convenient, safe and secure cycle parking in new developments is recognised in *Scottish Planning Policy 17: Planning for Transport*⁴ (SPP17) which recommends that cycle provision should be located near to building entrances and cycle parking standards should take into account local circumstances, the local authority's development guidelines and Table 11.1 of *Cycling by Design*⁵.

DETERMINING THE AMOUNT OF CYCLE PARKING

G5.2.3 Dependant on development type, 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.

G5.2.4 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.

G5.2.5 Houses tend to have higher levels of cycle ownership than flats. However, it is important to note that desired ownership is likely to be considerably higher than actual ownership in flats, due to the current difficulty or impossibility of bike storage in many flats.

G5.2.6 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.

⁴ Scottish Executive (2005) *Scottish Planning Policy 17: Planning for Transport*: Edinburgh: Scottish Executive

⁵ Scottish Executive (1999) *Cycling by Design*. Edinburgh: Scottish Executive

G5.2.7 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. Alternatively, post development monitoring of new sites provides an opportunity to learn extensively about cycle ownership and usage.

G5.2.8 Research carried out by the Scottish Executive in 2005⁶ found that the proportion of households where at least one bicycle is owned is around 50%, with the average number of people within households who own a bicycle(s) being 1.08. *Designing Streets* recommends that the potential for one cycle to be owned by each resident should be considered during the design process.

VISITORS AND MIXED USE AREAS

G5.2.9 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. This could also be linked into any Travel Plan measures identified at the planning stage.

G5.2.10 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.

G5.2.11 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

G5.2.12 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.

G5.2.13 Greater consideration needs to be given to the provision of bespoke cycle storage. Many flats and houses do not have any suitable provision and the proportion of housing schemes with individual garages is also declining. 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. G5.1).



Figure G5.1 Secure cycle storage (WSP, Leith).

G5.2.14 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 G5.3.4 below).

⁶ Scottish Executive (2006) Research Findings No.215/2006 *Cycling in Scotland 2005* Edinburgh: Scottish Executive

G5.2.15 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.

G5.2.16 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.

G5.2.17 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.

G5.2.18 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.

G5.2.19 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.

G5.2.20 Visitor cycle-parking in the public realm is best provided in well-overlooked areas, which may often be the street itself (Fig. G5.2). Although there is a wide variety of design options, simple and unobtrusive solutions, such as Sheffield stands (Fig. G5.3), 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. G5.4).



Figure G5.2 Cycle parking that has good surveillance and is at a key location - in this example near a hospital entrance.



Figure G5.3 Sheffield stands are simple and effective. The design allows the bicycle frame and wheels to be easily locked to the stand. Note the tapping rail near ground level and the reflective bands on the uprights.



Figure G5.4 A contemporary design for cycle parking - note that this arrangement is not so convenient for locking both wheels to the stand (WSP, Scottish Parliament).

G5.2.21 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.

G5.2.22 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 500 mm to a parallel wall. In addition, there should be at least 500 mm clear space between the ends of individual stands and any wall. As set out in *Cycling by Design*⁵.

G5.2.23 Where cycle parking is provided internally, the indicative dimensions shown in Figs G5.5 and G5.6 are appropriate.

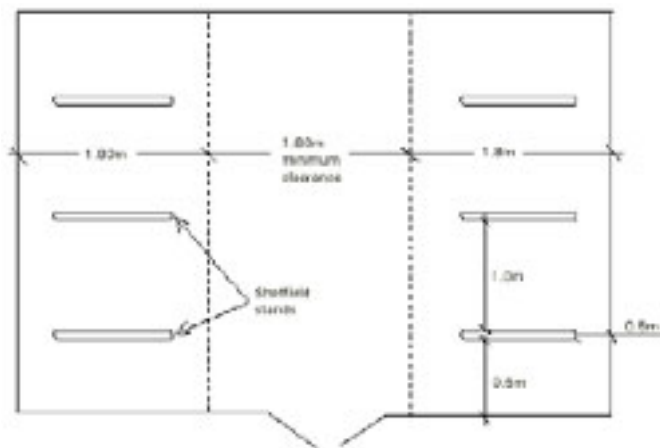


Figure G5.5 Typical Cycle Store Layout⁵

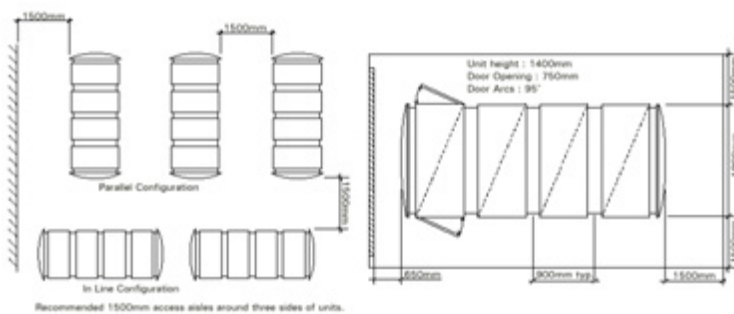


Figure G5.6 Typical Cycle Locker⁵

G5.2.24 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.

G5.2.25 When provided in conjunction with surveillance, cycle lockers offer a secure parking facility which allows accessories to be stored and provides weather protection (see figure G5.6).

G5.2.26 Lockers may be operated by coin or token, or be secured by cycle lock. Credit cards or 'smart' cards may also be used. At public transport interchanges a system of reserving lockers on a weekly, monthly or annual season ticket basis may be appropriate.

G5.2.27 Lockers should be a minimum of 750mm wide, 1,900mm long and 1,200mm high. A minimum space of 1,500mm should be provided in front of the locker door for ease of access.

G5.2.28 The main disadvantages with cycle lockers are that they are likely to be more expensive than Sheffield stands and may be visually intrusive within environmentally sensitive areas⁵.

G5.3 CAR PARKING

INTRODUCTION AND POLICY BACKGROUND

G5.3.1 The availability of car parking is a major determinant of travel mode. The Scottish Government's general planning policy for car parking is set out in *SPP17*¹. The Government's policy on residential car-parking provision is also set out in *SPP17*¹, which is particularly relevant for *Designing Streets*.

G5.3.2 *SPP17*¹ 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.

G5.3.3 The context of a new residential development needs to be carefully considered when determining the appropriate amount of parking (Fig. G5.7). This will be informed by the Transport Assessment, together with any accompanying Travel Plan and the local authority's residential parking policies.



Figure G5.7 Residential car parking (Greenbank, Village, Edinburgh, (WSP).

G5.3.4 Although the ability of residents to reach important destinations by other modes is one factor affecting car ownership, research⁷ has shown that dwelling size, type and tenure are also important.

⁷ Forthcoming Communities and Local Government research document

G5.3.5 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.

In addition parking can cause problems in conservation areas. Planning Advice Note 71: *Conservation Area Management*⁸ recognises that new parking areas may have implications for visual amenity and traffic flow. PAN 71 recommends that consideration should be given to the most appropriate location, design and materials for parking areas which will minimise the impact on the conservation area.

CAR PARKING PROVISION FOR NEW HOMES

CABE research^{9 10} 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.

G5.3.6 Provision below normal demand levels 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. There is also now a need to tackle car ownership in light of the global consequences of oil prices.

G5.3.7 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.

G5.3.8 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*¹¹ (see box).

⁸ Scottish Executive (2004) *Planning Advice Note 71: Conservation Area Management*. Edinburgh: Scottish Executive

⁹ CABE (2005) *What Home Buyers Want: Attitudes and Decision Making amongst Consumers*. London: CABE.

¹⁰ CABE (2005) *What it's Like to Live There: The Views of Residents on the Design of New Housing*. London: CABE.

¹¹ Department for Transport (2004) *Making Car Sharing and Car Clubs Work: A Good Practice Guide*. London: Department for Transport.

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.'

G5.3.9 Road authorities are able to make TROs, limiting the use of on-street parking spaces to car club vehicles. Authorities that have done this include Edinburgh, Bristol, Ealing and Kensington and Chelsea. The supporting traffic signs and markings may need to be authorised by the Scottish Government. (see Fig. G5.8).



Figure G5.8 (a) and (b) A successful car club scheme is operating in Edinburgh, with spaces provided on-street (EDAW).

ALLOCATED AND UNALLOCATED PARKING

G5.3.10 Not all parking spaces need to be allocated to individual properties. Unallocated parking provides a common resource for a neighbourhood or a specific development.

G5.3.11 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

G5.3.12 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.

G5.3.13 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. G5.9).



Figure G5.9 An example of on-street parking in the centre of the street in Glasgow that helps to separate the car from other users and provides strong surveillance of the cars (Scottish Government).

G5.3.14 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.

G5.3.15 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 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 most parking on-street (Fig. G5.9 and G5.10).



Figure G5.10 On-street parking in Crown Street, Glasgow (WSP).

G5.3.16 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.

G5.3.17 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. G5.11).
- 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 opportunistic crime than off-street spaces.
- Can be dangerous and intimidating for cyclists, due to car doors opening and cars moving in and out.



Figure G5.11 Street detailing and pedestrian provision dominated by car-parking considerations.

G5.3.18 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.

G5.3.19 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.

G5.3.20 Where on-street spaces are provided in bays adjacent to running lanes, having them drain towards the street will make cleaning easier.

VISITOR PARKING

G5.3.21 It is recommended that visitor parking is generally served by unallocated parking, including on-street provision.

G5.3.22 Research¹² 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.

G5.3.23 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)

G5.3.24 Spaces for disabled people need to be properly marked and meet the minimum space requirements (see paragraph G5.3.58 below).

G5.3.25 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.

G5.3.26 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.

G5.3.27 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

G5.3.28 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 FOR CAR PARKING SPACES

G5.3.29 Guidance on the design and location of car-parking spaces can be found in a number of recent documents.

G5.3.30 *Better Places to Live*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.

¹² Noble, J. and Jenks, M. (1996) *Parking: Demand and Provision in Private Sector Housing Developments*. Oxford: Oxford Brookes University.

¹³ DTLR and CABE (2001) *Better Places to Live: By Design. A Companion Guide to PPG3*. London: Thomas Telford Ltd.

G5.3.31 *Better Places to Live* notes that courtyard parking can be a useful addition to spaces in front of dwellings and that 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 G5.12 and G5.13); and
- they normally include, at most, 10 parking spaces - if there are more spaces, the courtyard layout should be broken up.

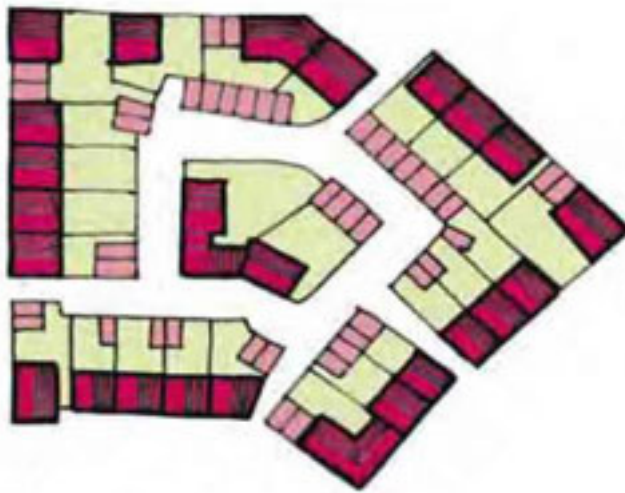


Figure G5.12 This arrangement of buildings creates well-overlooked parking spaces (shown in pink) - through routes increase natural surveillance from passing pedestrians (source: *Better Places to Live*).



Figure G5.13 Well-overlooked parking court (WSP, Gorgie).

G5.3.32 *Better Places to Live* also acknowledges 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.

G5.3.33 *The Urban Design Compendium*¹⁴ advises that 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 curtilage should generally be avoided as it breaks up the frontage, can be unsightly and restricts informal surveillance. Where cars are parked in courts or squares, the design should ensure that they are overlooked by adjoining buildings.

G5.3.34 *Car Parking: What Works Where*¹⁵ provides a comprehensive toolkit for designers that gives useful advice on the most appropriate forms of car parking relevant to different types of residential development. The guidance includes examples of:

- 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.

G5.3.35 The guidance includes detailed case studies that illustrate the application of these parking solutions for different locations and types of housing.

G5.3.36 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)¹⁶ and aimed at reducing crime and the fear of crime in parking areas. *Planning Advice Note 77 Designing Safer Places*¹⁷ also discusses this issue..

¹⁴ Llewelyn Davies (2000) *The Urban Design Compendium*. London: English Partnerships and The Housing Corporation.

¹⁵ English Partnerships and Design for Homes (2006) *Car Parking: What Works Where*. London: English Partnerships.

¹⁶ See www.britishparking.co.uk. Scottish Executive (2003)

¹⁷ Scottish Executive (2006) *Designing Safer Places*. Edinburgh: Scottish Executive

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

G5.3.37 An important planning aim of *SPP3: Planning for Homes*¹⁸ is efficient use of land. This can be achieved through good design, incorporating higher densities without overcrowding, congestion or loss of amenity. The more flexible the use of parking spaces, the more efficient the use of space.

G5.3.38 Each type of solution has different levels of efficiency and flexibility (see Table G5.1).


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

Table G5.1 Efficiency of different types of parking

¹⁸ Scottish Government (2008) *Scottish Planning Policy 3: Planning for Homes*. Edinburgh: Scottish Government

GARAGES

G5.3.39 Garages are not always used for car parking and this can create additional demand for on-street parking.

G5.3.40 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

G5.3.41 In determining what contributes 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;
- the contribution of garaging in meeting parking standards needs to be carefully considered and thus 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

G5.3.42 Footway 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. G5.14). It is therefore recommended that footway parking be prevented through the design of the street.



Figure G5.14 Footway parking at Gilmerton, Edinburgh (Living Streets Scotland).

G5.3.43 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.

G5.3.44 In London footway parking is prohibited, unless expressly permitted by an order. Aberdeen City Council is currently considering the introduction of prohibition of footway parking through an area wide Traffic Regulation Order. 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.

G5.3.45 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.

G5.3.46 Further guidance on deterring footway parking is contained in *Traffic Advisory Leaflet 04/93*.¹⁹ The Department for Transport has also drawn together examples of authorities that have tackled footway parking (also see 'City of Edinburgh Council case study box').



¹⁹ Department for Transport (1993) *Traffic Advisory Leaflet 04/93 - Pavement Parking*. London: Department for Transport.

Figure G5.15 CEC's Parking on Pavements leaflets.

The City of Edinburgh Council have launched a campaign called *Kerb Your Enthusiasm*, to discourage motorists from double parking and parking on the pavement. The campaign is in association with Lothian and Borders Police, Scottish Ambulance Service, Lothian and Borders Fire and Rescue Service and Capability Scotland. The campaign highlights the negative impacts of both double and pavement parking through widespread distribution of the leaflet shown in figure G5.15.

G5.3.47 Where there is a shared surface (Fig. G5.16), conventional footways are dispensed with, so, technically, footway parking does not arise. However, inconsiderate parking can still be a problem (Fig. G5.17). 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.



Figure G5.16 Clearly indicated parking spaces on a shared surface.



Figure G5.17 Untidy and inconsiderate parking.

DIMENSIONS FOR CAR PARKING SPACES AND MANOEUVRING SPACES

G5.3.48 For parking parallel to the street, each vehicle will typically need an area of about 2 m wide and 6 m long.

G5.3.49 For echelon or perpendicular parking, individual bays will need to be indicated or marked. The rectangular bay area should be as follows:

- Absolute min 2.4 m wide by 4.8 m long
- Desirable min 2.5 m wide by 5.0 m long

G5.3.50 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.

G5.3.51 Figures G5.18 and G5.19 show some suggested arrangements.

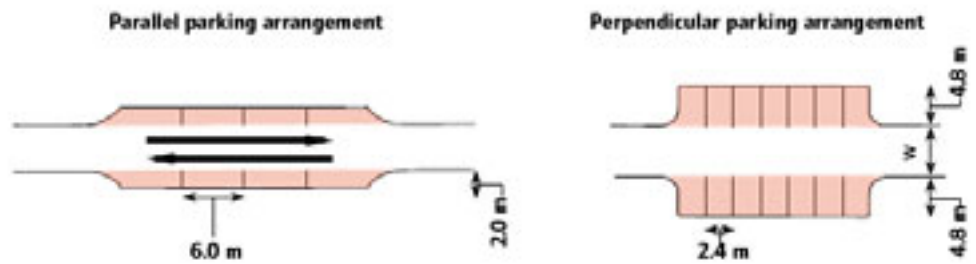


Figure G5.18 Suggested parallel and perpendicular parking arrangements.

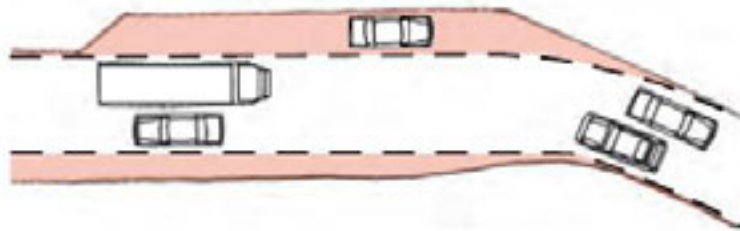


Figure G5.19 Gradual widening of the carriageway to create on-street spaces, with running carriageway checked using vehicle tracking.

G5.3.52 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.

Parking angle	30°	45°	60°
a	4.25	4.70	4.95
b	3.50	4.00	4.50
c	5.00	3.54	2.89
d	2.50	2.50	2.50

Note 1: Dimensions based on Dutch standards.
Note 2: Spaces in Controlled Parking Zones may have prescribed dimensions.

Table G5.2 Typical Dimensions for echelon parking (Source: IHIE, 2002)

G5.3.53 The 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 G5.20).

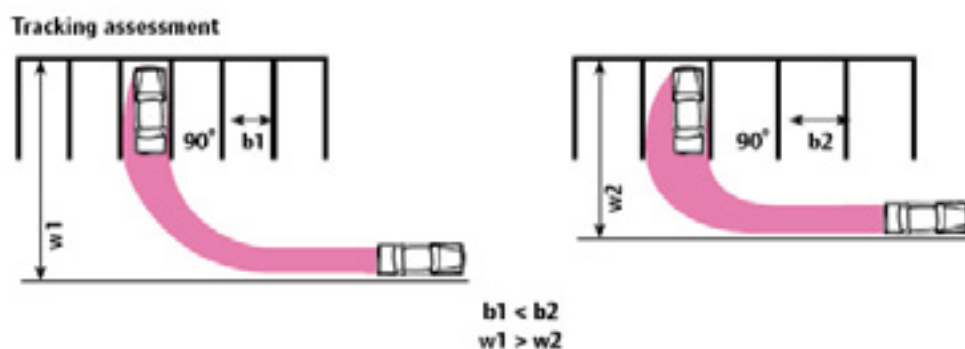


Figure G5.20 The effect on overall street width requirements when wider car parking spaces are provided.

G5.3.54 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.

G5.3.55 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)²⁰.

PARKING SPACES FOR DISABLED PEOPLE

G5.3.56 Detailed design specifications for parking spaces for disabled people are set out in *Traffic Advisory Leaflet 05/95*²¹ and in *Inclusive Mobility*²². 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*²³ and *Traffic Signs Manual Chapter 5*²⁴.

G5.3.57 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. Further information is contained in *PAN 78 Inclusive Design*.

G5.3.58 *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.

²⁰ IStructE (2002) *Design Recommendations for Multi-storey and Underground Car Parks*. London: IStructE

²¹ Department for Transport (2005) *Traffic Advisory Leaflet 05/05 – Parking for Disable People*

²² Department for Transport (2005) *Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure*. London: Department for Transport.

²³ Department for Transport (1986) *Traffic Signs Manual Chapter 3: Regulatory Signs*. London: HMSO.

²⁴ Department for Transport (2003) *Traffic Signs Manual Chapter 5: Road Markings*. London: TSO.

G5.3.59 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.

G5.4 MOTORCYCLE PARKING

G5.4.1 In 2003 there were 1.52 million motorcycles in use - representing around 5% of all motor vehicles. In developing and implementing policies on parking, local authorities should consider appropriate provision for motorcycle parking.

G5.4.2 Guidance on motorcycle parking is contained in *Traffic Advisory Leaflet 02/02*.²⁵ 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 2005.²⁶ Some of the guidance contained in that document has been repeated here for ease of reference.

G5.4.3 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.

G5.4.4 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.

G5.4.5 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.

G5.4.6 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.

G5.4.7 Where designated parking is provided, covered spaces will provide protection from the elements.

²⁵ Department for Transport (2002) *Traffic Advisory Leaflet 02/02 – Motorcycle Parking*. London: Department for Transport.

²⁶ IHIE (2005) *Guidelines for Motorcycling: Improving Safety through Engineering and Integration*. London: IHIE

G5.4.8 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. G5.21). 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.



Figure G5.21 Secure motorcycle parking.

G5.4.9 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.

G6

Materials, adoption and maintenance



G6 Materials, adoption and maintenance

CHAPTER AIMS

- Encourage authorities to adopt a palette of materials which allow for more creative design.
- Show how planting can be included in a street environment.
- Advise on foul water and surface water drainage systems, including the use of sustainable urban drainage systems (SUDS).
- Provide guidance on accommodating utilities, etc. and planning for maintenance in the long term.
- Advise on highway adoption procedures and requirements.

G6.1 INTRODUCTION

G6.1.1 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.

G6.1.2 The latter tasks are commonly the responsibility of the local roads authority, although other public and private-sector bodies can also be involved. It is therefore important that the roads engineers responsible for adoption should be included in all key decisions from the pre-planning stage through to detailed design, as part of a continuous team approach. An overall approach to collaborative working is included within Chapter 3 which discusses the importance of pre-application discussion.

G6.1.3 Details of how planning approval and the adoption process should be better integrated are described in Section G6.7 below.

G6.2 MATERIALS AND CONSTRUCTION

G6.2.1 Developers and local authorities are encouraged to consider the imaginative use of materials, processes or techniques including the use of sustainable/recycled materials where it is appropriate. However there is a need to be mindful of longer term maintenance issues and material availability and therefore early discussion with Local Authorities about adoption of such materials is recommended. This could be supported by Local Authorities adopting as wide as practical palette of suitable local and natural materials, bearing whole-life costs in mind and considering stores of salvaged materials.

G6.2.2 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. G6.1). 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 context



Figure G6.1 The use of good-quality materials achieves a sense of place without leading to excessive maintenance costs.

G6.3 PLANTING

G6.3.1 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. G6.2). Care needs to be taken to preserve existing trees, particularly when changes to a street are planned (Fig. G6.3).



Figure G6.2 Good quality planting softens the street scene (Scottish Government).



Figure G6.3 Existing trees preserved in new development.

G6.3.2 Where trees are to be used, careful consideration needs to be given to appropriate tree selection, 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.

G6.3.3 Consideration should also be given to the potential impact of planting on adjacent buildings, footway construction and buried services. Concerns have been expressed by roads authorities regarding the impact that tree roots can have on road drainage – this can be reduced with tree pits (see Fig. G6.4). Detailed advice on this issue is contained in *Tree Roots in the Built Environment*¹.

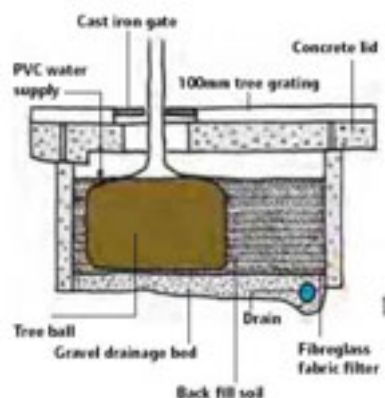


Figure G6.4 Typical tree pit detail.

¹Communities and Local Government (2006) *Tree Roots in the Built Environment*. London:TSO

G6.3.4 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.

G6.3.5 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. The approval and maintenance of proposed planting within the street boundary will be required to comply with sections 50 and 51 of the Roads (Scotland) Act 1984².

G6.3.6 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.

G6.3.7 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 road authority and should be avoided.

G6.3.8 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.

G6.3.9 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.

G6.3.10 Guidance on planting in street environments includes:

- Roots and Routes: Guidelines on Highways Works and Trees – consultation paper³;
- Tree Roots in the Built Environment;
- BS 5837: 2005 Trees in Relation to Construction⁴; and
- National Joint Utilities Group (NJUG), Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees⁵.

G6.3.11 Further advice on planting considerations is set out in Chapter G.2.

² Roads (Scotland) Act 1984. London: HMSO.

³ See www.dft.gov.uk

⁴ British Standards Institute (BSI) (2005) BS 5837: 2005 Trees in Relation to Construction. Recommendations. London: BSI

⁵ NJUG (2007) Volume 4, Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity of Trees. London: NJUG.

G6.4 DRAINAGE

INTRODUCTION

G6.4.1 One of the functions of a street is to provide a route for foul water and surface water drainage (Fig. G6.5).



Figure G6.5 Sustainable drainage systems can form an integral and attractive part of the street (WSP).

FOUL WATER DRAINAGE

G6.4.2 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 Building (Scotland) Regulations 2004⁶ and sewers located in the street where the relevant guidance is found within *Sewers for Scotland*⁷.

G6.4.3 The adoption process for sewers is set by Section 16 of the Sewerage (Scotland) Act 1968⁸. *Sewers for Scotland* acts as a guide to facilitate the procurement, design, maintenance and adoption of sewers by Scottish Water.

G6.4.4 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 Scotland*.

SURFACE WATER DRAINAGE

G6.4.5 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. Forms of sustainable drainage solutions suitable for both private systems or systems adoptable by Local Authority and those adoptable by Scottish Water are set out in The SUDS Manual 2007⁹, with the emphasis on the sustainable management of surface water, whereby conveyance is maintained between SUDS features in the traditional sense using pipework and open channels with SUDS features enhancing water quality, amenity and biodiversity, whilst controlling run-off quantity.

6 Scottish Executive (2004) Buildings (Scotland) Regulations 2004. Edinburgh: Scottish Executive

7 *Sewers for Scotland*, 2nd edn. Swindon: WRc plc

8 Sewerage (Scotland) Act 1968. London HMSO.

9 The SUDS Manual (CIRIA Publication C697, 2007)

G6.4.6 When considering the management of surface water, designers, developers and authorities need to take account of the *Planning Advice Note 61: Planning and Sustainable Urban Drainage (PAN 61)*¹⁰; Scottish Planning Policy 7: Planning and Flooding (SPP7)¹¹ and the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act 2003)¹². WEWS Act 2003 transposes the Water Framework Directive to assess, protect and enhance water environments in Scotland, into national law. The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR)¹³ have been introduced under WEWS Act 2003 to allow regulatory controls on this matter.

G6.4.7 The planning and management of surface water discharge from buildings and roads requires a co-ordinated approach to evaluating flood risk and developing an integrated urban drainage strategy.

G6.4.8 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 at time of design 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 sections 33-37 of SPP7, which advocates a risk-based planning approach.

G6.4.9 The responsibility for undertaking an FRA rests with the developer. However, SPP7 advocates a partnership approach, consulting with the relevant stakeholders to compile the FRA. This will involve the Local Authority as flood authority, SEPA and Scottish Water.

G6.4.10 In addition to a Flood Risk Assessment, Sewers for Scotland recommends and some Local Authorities require, that drainage criteria for new development comply with the drainage assessment requirements set out in Drainage Assessment – A Guide for Scotland¹⁴.

SUSTAINABLE DRAINAGE SYSTEMS

G6.4.11 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 permeable paving, swales, detention basins, filter strips, filter drains, ponds and wetlands. To realise the greatest improvement in water quality amenity and biodiversity and flood risk management, these components should be used in combination, sometimes referred to as the SUDS Management Train, as described in The SUDS Manual.

G6.4.12 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

¹⁰ Planning Advice Note 61: *Planning and Sustainable Urban Drainage*. Scottish Executive: 2001

¹¹ Scottish Executive (2004) *Scottish Planning Policy (SPP)7: Planning and Flooding*. Edinburgh: Scottish Executive

¹² Water Environment and Water Services (Scotland) Act 2003

¹³ Water Environment (Controlled Activities) (Scotland) Regulations 2005

¹⁴ *Drainage Assessment – A Guide For Scotland*. SEPA: April 2008

-
- encourage natural groundwater recharge (where appropriate)
 - can assist in reduction or removal of drainage network constraints.

They do this by:

- dealing with run-off 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.

G6.4.13 The use of SUDS is seen as a primary objective by the Government and should be applied wherever practical, and technically feasible. Granting of Planning Consent will be dependent on agreement between the local planning authority and SEPA, as statutory consultees. It will be a SEPA requirement that sufficient levels of SUDS are provided.

G6.4.14 Detailed guidance on SUDS is contained in *The SUDS Manual and Sewers for Scotland*. 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.

G6.4.15 Adoption issues will need to be clarified at an early stage in the design process, with the likely adopting authorities; Scottish Water, Local Authority and potential private bodies. The draft amendments to Section 7 of the Sewerage (Scotland) Act 1968 have been published for consultation to Local Authorities, focusing on adoption of SUDS at a regional level by encouraging a collaborative approach to shared systems between Local Authorities and Scottish Water. It is important for a continuous team based approach to this matter.

G6.4.16 New guidance is currently being developed by the SUDS Working Party, including representatives of SEPA, Scottish Water and Local Authorities regarding acceptable forms of SUDS to be applied to roads. The new "SUDS for Streets" guidance is due for publication in mid 2009 and until its introduction it is important that early discussion is held with those bodies on SUDS requirements.

G6.5 UTILITIES

G6.5.1 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 Guidance¹⁵ and Local Authority Guidelines.

G6.5.2 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 any legal documentation required by the utility companies is completed as soon as is possible.

G6.5.3 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 factor/management company's obligations. Residents will need to be made aware of these rights.

¹⁵ Available from www.njug.co.uk

G6.5.4 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.

G6.5.5 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.

G6.5.6 In designing for utilities, there are advantages in developing streets along reasonably straight lines rather than introducing gratuitous bends and curves (see Section G4.4 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.

G6.5.7 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 road 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 (*Please note discussions are continuing with SJUG and RAUCS on this matter – the results of these may be known in time for final draft*).

G6.5.8 In shared surface areas, such as in some Home Zones, the routing of services will require careful consultation between designers, utility companies and the roads authority. Guidance on this can be found in RAUCS Advice Note 10.¹⁶ This consultation should take place at an early stage in the planning and design process. Although it may be necessary to route services in the vehicle track in some places, as noted above this may not be a significant problem on well-connected networks.

G6.6 ARRANGEMENTS FOR FUTURE MAINTENANCE

G6.6.1 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 roads authority, the layout and material choices need to be acceptable to the authority.

G6.6.2 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 factor/management companies is given in Section G6.9.

G6.6.3 A road authority will require legal certainty that the streets are going to be properly maintained in perpetuity by these private arrangements. Approval for construction of new private streets will be required under sections 17 and/or 21 of the Roads (Scotland) Act 1984¹⁷, and under Section 13 of this Act The Local Roads Authority has powers to require a private road is maintained at a reasonable standard (as set by them).

¹⁶ RAUCS (2005) *Advice Note 10 v1.00, Guidelines for Positioning Utilities Apparatus in Home Zones*.
¹⁷ Roads (Scotland) Act 1984. London: HMSO.

G6.6.4 A roads 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 movement functions of the street. If there is no private management company, arrangements can be made for such features to be maintained by another Local Authority department.

G6.6.5 In these circumstances the developer must ensure that there is agreement between the adopting party as to:

- which authority is best able in practice to take day-to-day responsibility for each element of planting and/or non-street-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.

G6.7 ROADS ADOPTION - LEGAL FRAMEWORK

G6.7.1 Provision of roads for new developments is controlled and consented by the local roads authority through the Roads Construction Consent (RCC) process, governed by Section 21 of the Roads (Scotland) Act 1984.

G6.7.2 Under the terms of the RCC, the developer is obliged to construct the streets, over which there is a public right of passage, to an agreed standard, having first secured technical approval of the designs from the roads authority. Expenses will be payable by the developer to the roads authority to cover its reasonable costs in inspecting the construction of the works and associated testing.

G6.7.3 The Roads Scotland Act sets out the obligations of the developer to construct the streets and maintain them for a set period normally 12 months. Following the satisfactory discharge of these obligations, the new streets can be offered to the roads authority for adoption. If the road is adopted it will in the future be maintainable by the roads authority.

ROAD BOND SECURITY

G6.7.4 Where Roads Construction Consent is granted relative to roads associated with housing development the granting of the consent will require the deposit of sum or surety (Roads Bond) sufficient to meet the cost of constructing the road¹⁸. The purpose of this bond is to enable the roads authority to meet the cost of constructing or completing the construction of the roads, should the developer fail in his responsibility to do so under the terms of the granted RCC.

G6.7.5 Before any roads works commence on such a housing development the developer will normally be required to have both the Roads Construction Consent and the Roads Bond in place. However under the provisions of Section 17(3) of the Act it is permitted to exclude particular classes of dwelling house from the requirement to provide in Roads Bond and it may be that local roads authorities would apply this exclusion to social housing projects.

¹⁸ Section 17 of the Roads (Scotland) Act 1984 and the Security for Private Roadworks (Scotland) Regulations 1985, SI1985 Number 2080 as amended by the Security for Private Roadworks (Scotland) Amendment Regulations 1998 SI1998, Number 3220.

G6.7.6 Thus, before any construction begins, the developer will normally be required either:

- to secure the payment of the estimated cost of the road works under the requirements of the Roads (Scotland) Act.
- to make an agreement with the road authority under terms of the Act and provide a Bond of Surety.

PRIVATE STREETS

G6.7.7 Where a developer wishes the streets to remain private, some roads authorities have incorporated conditions into the planning approval to require the developer to design, construct and to make arrangements for the future maintenance of the new streets to a standard acceptable to the authority. This agreement may still require the submission and approval of an RCC under the terms of Section 21 of the Act.

G6.7.8 Such a planning obligation will still require the developer to provide a road bond, or other security, under Section 17 of the Act, to the council to guarantee that provision is in place to ensure satisfactory completion of the new streets.

WHAT IS ADOPTABLE?

G6.7.9 The roads authority has considerable discretion in exercising its powers as to whether to grant a roads construction consent under Section 21 of the Act. There are other mechanisms contained in the Act which help to define the legal routes to approval and adoption.

G6.7.10 Section 21 of the Act allows applicants to appeal local roads authority decisions on refusal of or application of conditions to RCC decisions.

G6.7.11 A roads authority can be required to adopt a street constructed in accordance with an RCC. The streets put forward for adoption must be constructed to the agreed standard and will be subject to a 12 month period of use as a road whilst being maintained to the agreed standard by the developer.

G6.7.12 The Local Roads Authority may, under the terms of Sections 13 to 16 of the Act, either require the frontagers of a private road to make up and maintain the road to a set reasonable standard, or on application by, or with the agreement of, the requisite number of frontagers add (or delete) a road to (from) their "List of Public Roads", again subject to the road being made up and maintained to a set reasonable standard.

G6.7.13 Roads authorities have also tended to only adopt streets that serve more than a particular number of individual dwellings or more than one commercial premises. Two to three dwellings is often set as the lower limit, but some authorities have set figures above this.

G6.7.14 There is no statutory basis for the lower limit on the number of dwellings justifying adoption. The use of two to three dwellings as a criterion may have come from the notional capacity of private service supplies (gas, water, etc.) and public servicing of the dwellings by delivery agencies etc. 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. It is recommended that roads authorities set a clear local policy on this issue.

G6.7.15 In exceptional circumstances where it is not intended that the street will be constructed as a road then the roads authority still has a role for ensuring appropriate design in accordance with its role as a consultee in the planning process.

G6.8 DESIGN STANDARDS FOR ROAD CONSTRUCTION CONSENT

G6.8.1 The roads authority has considerable discretion in setting technical and other requirements for a new street. Concerns have been raised over the rigid adherence to

these requirements, leading to refusal to adopt new streets. This issue was explored in England in the report *Better Streets, Better Places*¹⁹ and in Scotland in the research work underpinning *PAN76: Residential Streets*²⁰.

G6.8.2 Roads authorities are now encouraged to take a more flexible approach to road 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 roads authorities will need to ensure that any future maintenance liability is kept within acceptable limits.

G6.8.3 One way of enabling designers to achieve local distinctiveness without causing excessive maintenance costs will be for roads 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 Planning Policy, or within a Local or Structure Plan.

G6.8.4 Developers should produce well-reasoned design arguments, and articulate these in a Design 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 *Designing Streets*. 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 roads authorities should consider responding favourably.

G6.8.5 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.

G6.8.6 Roads authorities would be expected to approve street layouts complying with their Design Guide which have been constructed in accordance with the roads 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 (in some cases);
- 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 road or any other adoptable area;
- street lighting;
- gullies, gully connections and road drains and other road drainage features;
- on-street parking spaces adjacent to carriageways; and
- service strips adjacent to shared surface streets.

G6.9 PRIVATE MANAGEMENT COMPANIES/FACTORS

G6.9.1 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.

¹⁹ ODPM (2003) *Better Streets, Better Places: Delivering Sustainable Residential Environments*: PPG3 and Highway Adoption. London: ODPM

²⁰ Scottish Executive (2005) *Planning Advice Note 76: New Residential Streets*. Edinburgh: Scottish Executive

G6.9.2 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.

G6.10 APPROVAL PROCESSES FOR NEW STREETS

G6.10.1 The design and approval of new streets is governed by both planning and roads legislation. The design process must therefore recognise both sets of requirements. The Roads (Scotland) Act 1984 is the primary legislation for new roads, and all new roads must receive RCC under Section 21 of that Act prior to construction. Previous practice applied by most Local Authorities dictates that the formal RCC approval process only starts with the granting of detailed planning consent, or at least with the agreement of the final planning layout. The process thus results in a 2-stage (planning and roads) approval process that not only significantly extends the overall statutory approval process and delays commencement of development construction, but by more rigid application of engineering requirements at this 2nd stage can lead to a dilution of overall design quality.

G6.10.2 *Designing Streets* requires an integrated approach to approval, involving collaboration between planning officers and RCC engineers. In this way, roads colleagues will be satisfied with the fundamentals of the development proposal, and can approve it in principle concurrent with the granting of planning permission. RCC engineers will have an important role to play as a consultee in the planning application process. It is as a consultee that the roads authority can ensure that an appropriate 2-stage approach is adopted. The roads authority should be satisfied that sufficient information has been provided with the planning application to ensure that a subsequent RCC reflecting the design will not alter the details approved under the planning permission.

G6.10.3 Streets perform several functions and many agencies have a role to play in their design, approval and maintenance. It is vital that there is an early and continued, dialogue between the principal stakeholders i.e. developers, their consultants, planners, road engineers and a range of others including public transport operators, utility companies, the emergency services, drainage and waste authorities. These discussions should take place as early as possible – before a layout is worked up and a planning application submitted.

G6.10.4 Some Local Authorities operate a development team approach whereby all of the departments with an interest in street design work together during the design and approval process. This has clear advantages and is to be strongly encouraged.

G6.10.5 Planners and engineers should take a consistent approach to street design throughout all stages of the design process. A collective decision at the earliest opportunity provides certainty. The principles agreed could then be written into a development brief. This can then be used as a tool to help initial consultations with developers in guiding layout design, obtaining planning consent, receiving RCC, checking construction and finally achieving adoption. It is important that any principles that have been agreed at a point in the design process are not revisited later, unless there has been a significant change in circumstances.

G6.10.6 Planning policies should set the overall benchmark for the design quality of any new development, which includes the new streets as a key part of the public realm. This is why Local Authorities should have specific planning policies on street design ideally within the development plan, or as Supplementary Planning Guidance (See the Case Study on the East Lothian Council guidance). Planners and road engineers should work together to ensure policies are up to date and allow for the most appropriate street patterns.

G6.10.7 The flow chart contained in Chapter 3 shows how a more integrated system should operate, and the key design decisions which would need to be taken, and signed off, at each stage.

G7

Traffic Signs and Markings

Replace with Scottish Image



James Purdie, Edinburgh

G7 Traffic Signs and Markings

CHAPTER AIMS

- Discuss the influence of signs¹ 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.

G7.1 TRAFFIC SIGNS

G7.1.1 The Traffic Signs Regulations and General Directions 2002² (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.

G7.1.2 Further advice on the use of signs is contained in the *Traffic Signs Manual*,³ 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*:⁴ sets out the background to, and principles of, signing;
- *Chapter 3 – Regulatory Signs*⁵ gives advice on the use of signs which give effect to traffic regulation orders (TROs);
- *Chapter 4 – Warning Signs*⁶ gives advice on signs used to warn of potential hazards;
- *Chapter 5 – Road Markings*⁷ gives advice on the use of road markings in common situations.

G7.1.3 It is important that designers refer to the Traffic Signs Manual before embarking on the design of signing.

G7.1.4 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*⁸ and TAL 06/05 *Traditional Direction Signs*⁹.

G7.1.5 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.

¹ Throughout this chapter references to signs includes road markings and bollards.

² Statutory Instrument 2002 No. 3113, *The Traffic Signs Regulations and General Directions 2002*. London: TSO.

³ Department for Transport (various) *The Traffic Signs Manual*. London: TSO and HMSO.

⁴ Department for Transport (2004) *Traffic Signs Manual Chapter 1: Introduction*. London: TSO.

⁵ Department for Transport (1987) *Traffic Signs Manual Chapter 3: Regulatory Signs*. London: HMSO.

⁶ Department for Transport (2004) *Traffic Signs Manual Chapter 4: Warning Signs*. London: TSO.

⁷ Department for Transport (2003) *Traffic Signs Manual Chapter 5: Road Markings*. London: TSO.

⁸ Department for Transport *Directional Informatory Signs*. London: HMSO.

⁹ Department for Transport (2005) *Traffic Advisory Leaflet 06/05 - Traditional Leaflet 06/05 - Traditional*. London: Department for Transport.

G7.1.6 On occasion designers may find that there is no prescribed sign which suits their purpose or that is standard sign layouts and materials are not appropriate for the setting. If so they can apply to the Scottish Government 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.

G7.1.7 Some streets feature few, or no, signs or markings. This may be appropriate in lightly-trafficked environments specifically designed to promote low speeds. It reduces sign clutter and the relative lack of signing may also itself encourage lower vehicle speeds. However, it is worth monitoring such arrangements to confirm that the level of signing is correct.

G7.1.8 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.

G7.1.9 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 unlike those shown in figure G7.1 (c);
- signs which have no clear purpose should be removed to reduce clutter and to ensure that essential messages are prominent; and
- consideration should be given to incorporating colour contrast bands on poles and columns to help partially-sighted people. A single white or yellow band 150 mm deep with its lower edge between 1.5 m and 1.7 m from the ground is likely to be appropriate.

CLUTTER



Figure G7.1 (a) Sign clutter in residential areas; (b) the yellow backing board adds clutter and its use with the flashing amber lights is counter-productive. In addition, the sign post should not protrude above the sign.



Figure G7.1(c) Signage which dominates the appearance of a street (Fishertown, Nairn, WSP).

G7.1.10 Signs can clutter the street if used to excess (Fig. G7.1). Clutter is unattractive and can introduce hazards for street users.

G7.1.11 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.

G7.1.12 In the case of new developments, some road 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.

G7.2 DESIGNING SIGNS

G7.2.1 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.

G7.2.2 Designers should start from a position of having no signs and introduce them only where they serve a clear function adopting a philosophy of each sign having to earn its place:

'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'.¹⁰

G7.2.3 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 reducing the need for signs.

G7.2.4 The location and design of signs and signposts should be planned to permit effective maintenance (including access for cleaning equipment) and to minimise clutter.

¹⁰ Department for Transport(2004) Traffic Signs Manual Chapter 1: Introduction. London: TSO.

G7.2.5 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.'*¹¹

G7.2.6 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.

Table G7.1 Prompts for deciding on the appropriate level of signing

	Prompts
Users	<ul style="list-style-type: none"> ■ What signs are necessary to assist users, including non-motorised users? ■ Are directional signs needed for vehicular traffic, including pedal cyclists? ■ Is information provided in the necessary formats to be accessible to all? ■ Can navigation be assisted by means other than signs? For example, landmarks or other visual cues etc. ■ Can road markings be dispensed with in some places?
Place	<ul style="list-style-type: none"> ■ How can necessary information be integrated into the place without dominating it? ■ Can some pedestrian direction signs be designed to contribute to the sense of place by using a locally distinctive format? ■ Are traditional direction signs¹² appropriate for the setting?
Safety	<ul style="list-style-type: none"> ■ Are there any hazards that require signs? ■ 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?
Regulation	<ul style="list-style-type: none"> ■ What signing is necessary to give effect to TROs? ■ Is it necessary to regulate traffic or parking? ■ Can behaviour be influenced by means other than signing? For example, can parking be managed by the physical layout of the street?

¹¹ Department for Transport(2004) Traffic Signs Manual Chapter 4: warning Signs. London: TSO.

¹² Department for Transport (2005) Traffic Advisory Leaflet 06/05 - Traditional Direction Signs. London: Department for Transport

Speed	<ul style="list-style-type: none"> ■ Are signs at the minimum size required for the design speed of traffic (new build) or 85th percentile speed (existing streets)? ■ Can traffic speeds be controlled by measures (such as planting to break-up forward visibility) to reduce the need for signs?
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G7.2.7 When designing for minimal signing, care should be taken that safety hazards are not left unsigned.

G7.2.8 The Scottish Government may be prepared to authorise departures from TSRGD to reduce signs and road markings in environmentally sensitive streets.

G7.2.9 *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'.¹³ Lighting equipment may also be mounted on walls (see Chapter G8).

G7.2.10 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.

G7.2.11 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.

G7.2.12 The prompts in Table G7.1 will help when deciding on the appropriate level of signing for a street.

7.3 COMMON SITUATIONS

CENTRE LINES

G7.3.1 The use of centre lines is not an absolute requirement. *The Traffic Signs Manual Chapter 5*¹⁴ gives advice on the correct use of road markings.

G7.3.2 Centre lines are often introduced to reduce risk but, on residential roads, there is little evidence to suggest that they offer any safety benefits.

G7.3.3 There is some evidence that, in appropriate circumstances, the absence of white lines can encourage drivers to drive at 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 on main routes through villages, it resulted in slower speeds and reduced accidents¹⁵ 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. G7.2).

¹³ Department for Transport (2004) *Traffic Signs Manual Chapter 1: Introduction*. London:TSO. Paragraph 1.57

¹⁴ Department for Transport (2003) *Traffic Signs Manual Chapter 5: Road Markings*. London:TSO

¹⁵ Debell, C. (2003) White lines - study shows their absence may be a safety plus. *Traffic Engineering and Control* v. 44 (9) pp316-317

PARKING

G7.3.4 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 G5).

G7.3.5 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*).

G7.3.6 The new edition of Chapter 3 of the *Traffic Signs Manual* (currently undergoing consultation) gives more guidance on footway parking and shared parking spaces.

G7.3.7 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. G7.4).

Case study

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



FigureG7.2 Starston, Norfolk

Starston is a village on the B1134 in Norfolk (Fig. G7.2) 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.¹⁶

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.¹⁷

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

¹⁶

¹⁷

¹⁶ Wheeler, A. H., Kennedy, J. V., Davies, G. J. and Green, J. M. (2001) Countryside Traffic Measures Group: Traffic Calming Schemes in Norfolk and Suffolk. TRL Report 500. Crowthorne: TRL.

¹⁷ Ralph (2001) Innovations in Rural Speed Management. Proceedings of the DTLR Good Practice Conference. London: DTLR.



Figure G7.3 Street with no centre lining.



Figure G7.4 Kerb build-out defines parking area and provides room for planting clear of the footway.

JUNCTION PRIORITY

G7.3.8 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.

G7.3.9 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. G7.5). At UK residential sites studied in the preparation of Manual for Streets, 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 is designed carefully to encourage appropriate speeds.

G7.3.10 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.

G7.3.11 It may be appropriate to begin with the simplest option (i.e. with only the diagram), and introduce further signing only if deemed necessary in the light of experience.



Figure G7.6 Clear and legible street name sign attached to a building.

G7.3.12 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.

G7.3.13 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. G7.6).

G7.3.14 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. G7.7).



Figure G7.5 Four-way junction with no marked priority.



Figure G7.7 Design contributes to sense of place and reduces clutter by incorporating several direction signs on one post.

G8

Street Furniture and Street Lighting



G8 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.

G8.1 INTRODUCTION

G8.1.1 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.

G8.1.2 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.

G8.1.3 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.

G8.1.4 Where street furniture or lighting is taken out of service, it should be removed.

G8.2 STREET FURNITURE

G8.2.1 Excessive street furniture, including equipment owned by utilities and third parties, should be avoided.

G8.2.2 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. G8.1).



Figure G8.1 Well-designed seating.

G8.2.3 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.

G8.2.4 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.

G8.2.5 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.

G8.2.6 Street furniture and lighting should be located within the limits of the adoptable area. 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.

G8.2.7 All street furniture should be placed to allow access for street cleaning and winter maintenance.

G8.2.8 Guard railing is generally installed to restrict the movement of vulnerable road users (Fig. G8.2). In some cases guard railing has been introduced in specific response to accidents.

G8.2.9 Guard railing should not be provided unless a clear need for it has been identified (Fig. G8.2). Introducing measures to reduce traffic flows and speeds may be helpful in removing the need for guard railing. In most cases, it is unlikely that guard railing will be required on residential streets.



Figure G8.2 Guard railing blocking pedestrian desire line - note some pedestrians in the photograph have walked around it (Ellon, WSP).

¹ Department for Transport (2002) Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure. London: Department for Transport.

² BSI (2001) BS 8300: 2001 Design of Buildings and their approaches to meet the needs of disabled people. Code of practice. London: BSI.

G8.2.10 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.

G8.3 LIGHTING

G8.3.1 Lighting can contribute to:

- improving road safety;
- 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.

G8.3.2 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 13201-2³, BS EN 13201-3⁴ and BS EN 13201-4⁵. Guidance on lighting design is given in BS 5489-1, Code of Practice for the Design of Road Lighting⁶, to comply with the requirements of BS EN 13201. Further guidance is contained within *Controlling Light Pollution and Reducing Lighting Energy Consumption*⁷, *Planning Advice Note: 51: Planning, Environmental Protection and Regulation*⁸ and *Planning Advice Note 77: Designing Safer Places*⁹.

G8.3.3 Where streets are to be lit, lighting should be planned as an integral part of the design of the street layout. *PAN 77*⁹ recommends that when considering the most appropriate type of lighting, the following should be taken into account: location, setting, relationship and distribution of other lighting, aesthetic design, intensity, timing (taking into account seasonal differences), resistance to vandalism and the cost, frequency and ease of maintenance. This may require coordination between authorities to ensure that similar standards of lighting are provided for the adopted street and un-adopted areas, such as car parking. Consideration should be given when planting to the potential impact of growth shading out lighting, this is particularly relevant for certain types of trees.

G8.3.4 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 visually impaired people. Consideration should be given to incorporating colour contrast bands on lighting columns.

G8.3.5 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.

G8.3.6 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.

³ British Standards Institute (BSI) (2003) BS EN 13201-2: 2003 Road Lighting – Performance Requirements. London: BSI

⁴ BSI (2003) BS EN 13201-3: 2003 Road Lighting – Calculations of Performance. London: BSI

⁵ BSI (2003) BS EN 13201-4: 2003 Road Lighting – Methods of Measuring Lighting Performance. London BSI

⁶ BSI (2003) BS 5489-1: 2003 Code of Practice for the Design of Road Lighting. Lighting of Roads and Public Amenity Areas. London BSI

⁷ Scottish Executive (2007) Guidance Note *Controlling Light Pollution and Reducing Energy Consumption*. Edinburgh: Scottish Executive

⁸ Scottish Executive (2006) *Planning Advice Note 51: Planning, Environmental Protection and Regulation*. Edinburgh: Scottish Executive

⁹ Scottish Executive (2006) *Planning Advice Note 77: Designing Safer Places*. Edinburgh: Scottish Executive

G8.3.7 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

G8.3.8 Consideration should be given to attaching lighting units to buildings to reduce street clutter (Fig. G8.3). Under the section 35 (5) of the Roads (Scotland) Act¹⁰ Local Authorities have the power to fix lighting to rails, walls or buildings, subject to a statutory consultation with involved parties and a specified notice period. While maintenance and access issues can arise from the installation of such features on private property, some authorities have successfully addressed these concerns. It is important that wall-mounted lighting is carefully designed to reduce obtrusive light. There are likely to be fewer challenges arising from the placement of lighting on buildings in new-build streets.



Figure G8.3 Street light mounted on a building.

PROVISION OF LIGHTING IN RESIDENTIAL AREAS – KEY ISSUES

G8.3.9 Key issues in the provision of lighting in residential areas are:

- context;
- lighting intensity;
- scale; and
- colour

CONTEXT

G8.3.10 Lighting should be appropriate and sympathetic 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 road illumination requirements but is not in keeping with the street environment or the range of uses of that street. A street lighting assessment can be helpful in determining both the level of lighting and the type of equipment used in the area.

¹⁰ Roads (Scotland) Act 1984

G8.3.11 Over-lighting should be avoided. More detailed information is given in the Guidance Note *Controlling Light Pollution and Reducing Lighting Energy Consumption*.⁷ 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

G8.3.12 Guidance on the appropriate level of lighting in an area is contained in BS 5489-1 Annex B¹¹. 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.

G8.3.13 BS EN 13201-2, Road Lighting - Performance Requirements¹², gives details of the necessary minimum and average levels of lighting to be achieved at each of the lighting classes. For lightly trafficked residential streets, 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.

G8.3.14 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.

G8.3.15 Continuity of lighting levels is important to pedestrians. Sudden changes in lighting level can be particularly problematic for visually impaired people.

SCALE

G8.3.16 As much street lighting is actually provided for road purposes, it is often located at a height inappropriate to the cross section of the street and out of scale with pedestrian users.

G8.3.17 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 windows¹³.

G8.3.18 Where road and pedestrian area lighting are both required, some road 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.

¹¹ BSI (2003) *BS 5489-1: 2003 Code of Practice for the Design of Road Lighting. Lighting of Roads and Public Amenity Areas*. London: BSI

¹² BSI (2003) *BS EN 13201-2: 2003 Road Lighting – Performance Requirements*. London: BSI.

¹³ Kennedy, J., Gorell, R., Crinson, L., Wheeler, A. and Elliott, M. (2005) *Psychological Traffic Calming*. TRL Report 641. Crowthorne: TRL.

G8.3.19 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.

G8.3.20 Generally in a residential area, columns of 5-6 m, i.e. eaves height, are most appropriate, however it is important that a range of factors are taken into account when determining the height of columns, particularly if lighting is in a designated conservation area.

COLOUR

G8.3.21 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).

G8.3.22 In terms of discerning colour, 'colour rendering' is measured on a Colour Rendering Index of Ra0-Ra100¹⁴, 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.

G8.3.23 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 to the streetscape.

G9.3.24 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.

G9.3.25 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 co-ordination with discussions about materials and other street furniture.

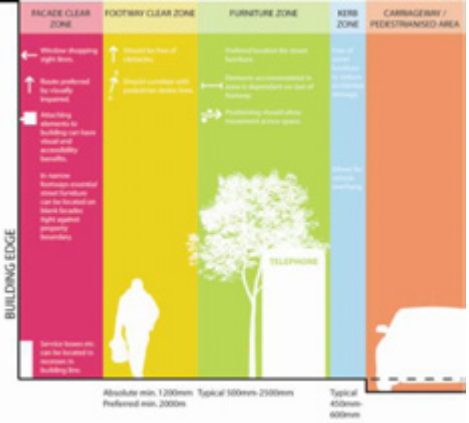
Belfast Streets Ahead Project

EDAW have been engaged by the Department of Social Development since 2005 in preparing a masterplan for the city centre as an integral part of the ongoing regeneration process.

This has now become the Streets Ahead project with exemplar projects currently going on the ground. Consultation has been fundamental to the whole process in order to ensure that the new public realm will be inclusive in its response to the needs of all users. To this end the process included consulting with 50 different, and very diverse, user groups both individually and within workshops. A great deal of concern was expressed at proposals for shared surface solutions within busy shopping streets and accordingly a Code has been drawn up to which all streets will adhere. Whilst the context may vary the detail of the individual street, fundamental principles remain the same between all streets. Hence, for example, clutter has been removed from the zone nearest the buildings and a defined zone for all furniture is being created. This lies within banded stone strips of a different texture and colour and accommodates all types of street furniture including seating, trees, bins etc. This is the same for each street so anyone who has an impairment to mobility will understand where they can travel easily within the street and where they may encounter difficulties.

¹⁴ International Commission on Illumination (CIE) (1995) Method of Measuring and Specifying Colour Rendering Properties of Light Sources. Vienna: CIE.

The same principles are now being applied to Leith Walk in Edinburgh as part of the Edinburgh Tram works.



Case Study G9: Ardler Village

Location	North-West Dundee
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Case study Summary	Public sector-driven regeneration scheme Transformation has been delivered through public/private partnership Demonstrates continuity and design progression
Groups/agencies	Dundee City Council Sanctuary Housing Association Wimpey Homes HTA architects
Case Study Description	<p>Ardler village is effectively a suburb within the north-west of Dundee. It was previously the Ardler housing estate.</p> <p>The original design brief was produced in 1996/ 1997 and the Ardler regeneration scheme started in 1998 when Dundee City Council and the Ardler residents appointed Sanctuary Housing Association, Wimpey Homes and HTA Architects to deliver the regeneration of Ardler from a ring-fenced "estate" consisting of tower blocks and four-storey flats into a reintegrated development. HTA consultants were appointed to prepare the masterplan, produced in 1999, which aimed to create:</p> <ul style="list-style-type: none">- a hierarchy of road types- routes linking Ardler back into the city- a new focus within central Ardler- different neighbourhoods throughout Ardler <p>The Village is almost now built out with the final phase, to the north of the village, started on site. When complete the Village will consist of 1 145 homes, of which there are 834 Housing Association (including 70 refurbished properties) and 311 homes for private sale. All of the high-rise blocks have been demolished; these were originally named after Scottish golf courses and the names have been retained as neighbourhood area names but with added input from local school children.</p> <p>The Village Centre contains the existing primary schools, Ardler Centre which includes a library, sports hall, cafe, and rooms for hire by community groups and banking facilities, the existing church, 3 retail units, 2 offices and workspace, a doctors' surgery, a health clinic and sheltered housing. Buses run through the village every 15 minutes and buses run around the site every 8 minutes so residents are well catered for with public transport.</p> <p>A local community police officer has been appointed for Ardler Village, and is well known locally. He acts as an informal liaison officer between the Ardler Village Trust, the community and the Council.</p>
Design	The scheme advocated innovative street solutions from an early stage, including reduced visibility curves, narrowing street widths, a continental-style roundabout and minimal signage. Pedestrian are

given a greater priority at junction crossings through design measures; different approaches have been taken to allow this to happen but this is most successful within the later stages. Refer to the images accompanying this text.

Cheap, easily maintained materials have been used throughout with the exception of the streetscape within the centre of the neighbourhood centre. Here, higher quality materials and street furniture have been used to help create a central heart to the development with a clear identity.

A variety of street scene has been created either through “traditional” streets with carriageway and footways, streets with tree planting and shared surface streets. Street names reinforce each local area, hence within for example the Gullane area the streets are called Gullane Road, Gullane Place, Gullane Terrace and Gullane Avenue.

Streets in Ardlar were the first in Dundee to drop visibility curves allowing a reduction in forward visibility from 35m to 20m. At Scotsraig Road, north of the neighbourhood centre, further speed reductions have been achieved through reducing the road width to 4.1m.

Most of the private development is to the north-west of the Village and the same principles of road design have been applied there. Overall the scheme has successfully reduced speed through urban design measures and allowed more sustainable use of land through allowing building lines to come closer to corners.

There has been extensive use of SUDS throughout the site which have been considered integrally from the outset and the strategy has been monitored as the development has been built. Swales were initially designed for use through all residential streets. Problems, however, arose with maintenance especially concerning grass cutting and litter collection when the first phases were built and occupied. There were also aesthetic considerations of taking access driveways across the swales and how this impacted on the streetscene. This led to swales being dropped in favour of detention ponds at key points instead on later phases. On streets where swales were planned, but the proposal was dropped before construction, the land width has been kept but used for a grass verge and tree planting instead.

The Council maintain all areas of SUDS. Swales are now used only either in association with areas of open space or where they will have a minimum length of 20m. SUDS are attenuated through both wet and dry ponds; wet ponds are used as a site feature and are at their most successful when linked to other open space within the site development as at Troon Gardens/ Gleneagles Avenue. Dry ponds feature within residential areas and double up as open space for casual play such as at Wentworth Drive.

Other considerations

The regeneration scheme was ahead of its time in engaging with local residents and the benefits of this are apparent in the sense of community that exists at Ardlar Village. Feedback from the Ardlar Village Trust would appear to demonstrate that a strong sense of community exists and that residents like living within the re-ordered environment.

The Ardler area has been completely transformed through this masterplan; it is an exemplar in how it has created a new connected development and “stitched” the area back into the city. This has allowed a regular bus service through the site to be established. Bold decisions have been made both in the strategies for street and drainage designs and how these have been adjusted if seen to be not working as well as was intended.

In meeting the initial aims for the masterplan which were set out ten years ago, the scheme has largely been very successful. Any criticisms should be balanced against the scale of what has been achieved, but a better integration between the layout of the housing plots and the streets would have improved the street scene overall. This is especially true of the privately delivered areas where there is a lack of clarity between what constitutes public and private realm.

Legibility of the different neighbourhood areas within the development areas could also have been improved and would aid orientation through the Village overall. This could also have been achieved through ensuring more variation of building lines, boundary treatments and materials. Adjustments to buildings were made between phases to give variation but these are relatively subtle. Good use has been made of gable windows, however, to promote passive surveillance throughout.

The area benefits considerably from the careful integration of an existing mature landscape.

Summary Details

Name:	Ardler Village Regeneration
Lead Architect/ Designer:	HTA
Project:	Masterplan for the regeneration of a suburb within the north-west of Dundee
Key project attributes:	Use of SUDS within streets Use of narrow streets/ reduced forward visibility and reduced radii as means of promoting speed reduction
Clients:	Sanctuary Housing Association Dundee City council
Planning Authority:	Wimpey Homes (now Taylor Wimpey plc) Dundee city Council

Links

<http://www.ardlervillagetrust.org/avt.html>

Notes for photographer

Refuse collection day: Wednesday

Accompanying images

- Prepare 2 figure ground maps/ showing Ardler before and after for more direct comparison than within PAN 76
- Photos of before and after/ overview shots
- Photo of 20 m forward visibility over marked with dimensions
- Photos of street with SUDS, street with no SUDS but green verge, traditional street all next to each other
- Photo of SUDS pond at Wentworth doubling up as a play area
- Junction diagrams (supplied) next to photographs

Case Study G10: Upton

Location Northampton
England
Upton is part of the South West district of Northampton, a designated growth area which will accommodate 6 000 new homes by the year 2025.

Case Study Summary Policy into practice; the scheme almost built out.
Use of design codes to maintain quality throughout implementation and the first practical use of a design code in Britain.
Exemplar scheme/ winner of RTPI Sustainable Communities award 2007.

Description and Project History In 1997 an outline application was lodged for just over 1000 new houses and consent was granted for the 40 hectare site. This was for a “conventional “ layout which was car-orientated and prepared without community consultation.

Subsequent to this, in 2000, English Partnerships (landowner) embarked on a process to demonstrate and promote sustainable growth whereby a real community could form. This was started through an Enquiry by Design process in association with the Prince’s Foundation, and Northampton Borough Council, and with consultants EDAW (masterplanners), Alan Baxter Associates and Pell Frishmann (Engineers) and Quartet (landscape implementation) and was a 4 day workshop which fully engaged with the local community. This process particularly challenged the Highways Authority and the local communities as to the “normal” way for designing and delivering new streets, and the resultant urban framework plan allowed a fresh look at the form of the development. At the heart of the new plan was the school which was delivered early on in the process to enable an early sense of community and attract families in. The new plan increased the densities of the residential development and hence boosted the numbers to 1400 units, promoted walking and cycling, and provided for a local centre in addition to the primary school.

Subsequent to this a Steering Group was established in order to deliver the framework plan, consisting of English Partnerships, Northampton Borough Council and representatives from the community. It was agreed that the preparation of Design Codes would be the main mechanism for delivery of the plan.

The Design Codes were drawn up by the same team who prepared the Framework in close consultation with the steering group. The resultant Code is especially detailed on SUDS, Street character and building design standards. A high quality of public realm is specified throughout, but using easily obtained materials.

There are 8 phases to the masterplan; each phase has been released to the market through competition. Housebuilders bid for sites in response to a Design Brief and must demonstrate consistency with the Code in their submission. All phases on site have been built by volume housebuilders. The original design team have remained as consultants to English Partnerships and to the Steering Group which has helped ensure that the aims of the Framework and the Code are being met. Their role has also been one of mediation and translation; developers bidding for phases have been encouraged to meet the spirit rather than the letter of the Code.

All buildings on the site have a BREAAAM “Excellent” rating, Some will be awarded Code 6 from the Code for Sustainable Homes, and overall the carbon footprint has been minimised wherever possible. Developers have been encouraged to incorporate innovative technologies where possible.

Design details

The scheme overall comprises 60% houses and 40% flats. On average this equates to a density of 45 per hectare across the site with the lowest density being 30 dwellings per hectare. Affordable housing constitutes 22% of the housing; this is scattered throughout the site in clusters of a maximum of four units.

Parking levels are at 150%; Northampton Borough Council permit garages to be included within that total. Apart from garage parking there is also on-street parking and parking within courtyards. Some courtyards are controlled by gates, others are open. Monitoring usage of the courtyards and feedback from residents has demonstrated that the ideal courtyard size consists of 6 to 8 spaces; some of the first phases have courtyards of up to 20 cars.

Wherever possible, utilities panels have been placed in courtyards rather than within the street.

The Code divides street type into hierarchy of streets, drives, lanes and mews. Street names reflect their context and are named either with reference to the historic local shoe industries, field names or folklore.

Each street type has a different character which is set out in the Code; character is reinforced by width, whether of shared surface or traditional form, and how the building responds to the street within its plot.

Detailed requirements for streets, including how the service arrangement should work and how lighting and street planting should relate to the street type are included within the Code. Examples from the Code are shown within the accompanying illustrations.

The SUDS scheme is integral with the street design and is a design feature which lends place identity as well as performing a function. The SUDS system is, however, unadopted and is managed by the Upton Management Company. Residents pay management fees for the upkeep of all areas of public realm including neighbourhood squares and playing fields as well as the SUDS. The roads are all adopted and are maintained by the Highway Authority.

Comment

The scheme is generally considered to be a success in terms of successful place-making. The design of the streets has been fundamental to this. The timescales are impressive. The framework and code were granted outline consent in February 2003 and within 5 years the site was two thirds built out.

The project provides evidence that upfront investment and longer timescales in establishing design principles can pay dividends especially when associated with collaborative working in setting out the design framework, with associated design coding. Provided, of course, that the detailed applications are compliant with the Codes then consent can be secured very quickly.

The street hierarchy works particularly well and significantly aids place orientation. Investment in a high quality public realm and areas of open space ensures make them robust and sustainable in the long term.

A second Upton phase is currently being planned.

Quotes:
Local residents

“ When you are walking round it.....you feel in a nice secure open environment”
“People walk their dogs, people cycling...there is always something different going on when you look out of the window”

Project Summary

Name: Upton
Lead Architect/ Designer: EDAW
Project: Masterplan for significant urban expansion area with associated design codes

Key project attributes: Use of street hierarchy and associated character attributes in order to establish sense of place

Creative use of SUDS

Client: English Partnerships
Planning Authority: Northampton Borough Council

Links

www.edaw.co.uk
www.englishpartnerships.co.uk/upton.htm

Case Study G11: Polnoon

Location Eaglesham
Scotland

Case Study Summary Making PAN 76 work.
Direct comparison of 2 design approaches to the same site, promoted by the same private housebuilder.

Description and Project History Eaglesham is an Outstanding Conservation Village on the edge of Eaglesham Moor; it is an historic planned settlement with a population of around 4 000 people. The Polnoon site is located on the western edge of the village and is some 5.8 Hectares in size.

This case study is still being developed and it is hoped to be included in the final document.

Case Study G12: East Lothian Council Design Standards for New Housing Areas

Location East Lothian, Scotland

Case study summary Integrating national planning policy with roads design guidance through collaborative working.

Description Planners at ELC have worked hard to change streets design policy to meet new and emerging housing guidance as a means of ensuring that new places in East Lothian offer a better design standard. Close liaison with their Roads and Transportation colleagues has ensured that planning and roads design policy has remained consistent with each other throughout this process.

The project aim was to produce urban design standards that improve the design quality of new housing areas, a key focus being to review standards for road design and to allow Home Zone development in such areas. The new standards revise East Lothian Council's key planning and transportation requirements for the design of new housing areas and detail the urban design principles the Council will apply, as well as establishing the information expected from applicants in support of applications for planning permission and road construction consent. That way, the Council can consider the design principles proposed for these jointly when determining applications for planning permission and road construction consent (RCC). The new standards fundamentally review the direction of the Council's design policies. In response, applicants are required to review their approach, to place more importance on the process and principles of design, and to widen their range and format of products used in development of new housing areas.

The "Design Standards for New Housing Areas" was approved as Supplementary Planning Guidance in May 2008. It became operative and a material consideration in the determination of those planning applications that were submitted on or after 1 June 2008.

The guidance brings East Lothian into line with national policy and advice that encourages emphasis on the systems and process of design. The standards focus on key principles and processes of design, including site contextual analysis and establishing a development strategy informed by this; ensuring the creation of positive relationships among buildings and in the public spaces between them; facilitating movement without compromising the quality of the public realm; and on after care issues, ensuring that adoption and maintenance arrangements are in place.

A key requirement is that the overall layout of buildings and the spaces in between are given first consideration in the design process so that a framework of public spaces with distinctiveness and identity is created. Road layouts will be integrated with and complement building layouts, so roads no longer dictate or dominate the character of public spaces. The intention was to establish standards within which a variety of housing environments can be created by a designer's creative skill and vision in the interpretation, expression and application of the new standards.

The role of the standards is to support the local plan and to explain to applicants how its design policies will be implemented – cross-referencing between the standards and the local plan’s design policies is a key feature of this approach. The standards also underpin the development frameworks and briefs prepared for individual sites, so the design principles of the standards are supplemented with site-specific design objectives to ensure development on the strategic and local housing sites reflects and responds to its local context. This is to be achieved through an integrated design approach and masterplans are the expected outcome of this process. They are to establish a suitably detailed design philosophy that sets clear parameters for the overall design and layout of development on the site. The role of the masterplan is to control the successful delivery of development in the planning, design, market and commercial context. It is to provide the basis for determination of land value, with individual investors buying into the masterplan and collectively delivering its proposals.

This has ensured a “level playing field” to which all developers must respond. The effect has been that developers are working with the briefs in the preparation of their applications for planning permission and RCC.

Sustainable travel also underpins this guidance with promotion of dedicated cycle routes linking into the wider path network and the use of well-connected streets as an encouragement to walking.

The “Standards for Development Roads” document has also been adjusted to ensure that both transportation and planning guidance are consistent with each other.

The standards are now being applied to proposals for key strategic housing release sites across the council area, some of which will be submitted for planning consent by early 2009.

Approach

A working group of officers was established with meetings of the group taking place regularly. Group membership consisted of officers from the Council’s Planning and Transportation Divisions, including those responsible for the formulation and application of related policy. Internal consultation on the standards as they evolved with other Council departments, including Landscape & Countryside, Ground Care, Building Standards and architectural staff raised awareness of and ensured that the design principles and expected outcomes of the standards were corporately supported, embraced and implemented.

The working group was issued with targeted and topic specific briefing notes on key design issues, highlighting the key issues and changes needed in the Councils design policy portfolio. The briefing notes covered matters such as the urban design principles sought as well as the integration of the procedures that would deliver them. Discussions included issues such as the integration of infrastructure provision, inclusion of SUDs technology and securing long-term management and maintenance arrangements. Alongside this, study visits for the group were arranged to exemplar developments in the UK to see how these principles had been put into practice, and to establish where further improvement could be made.

Following this extensive and iterative internal process of consultation on and review of the standards, a draft version of the document was published in 2006 for wider public consultation. Over 250 copies of it were sent to those who have an interest in house building in East Lothian, including social and private housing providers, RSL's, infrastructure and service providers, the emergency services and the Access Forum. Copies were also made available at various Council buildings across East Lothian. Discussion also took place with Homes for Scotland, the group that represents the housebuilding industry in Scotland.

- Illustrations** Extracts from the document
Extracts from the design briefs
Policy into practice; how the large scale release plans are shaping up in response to this policy / check with the Council what we can print.
- Links** www.eastlothian.gov.uk

Case Study G13: Renfrew Riverside: Ferry Village

Location Renfrew, Renfrewshire

Case Study Summary Large scale contemporary masterplan for a 113 Ha site being delivered through design guidance; private sector led regeneration scheme.
Good working relationships both within the Council and with the lead developer.

Description and Project History The Renfrew Riverside area has shared history with other parts of the Clydeside: once an important piece of industrial land connecting Renfrew with the Clyde, by the 1980s it was degraded and neglected.

The majority of the land area now encompassing the Renfrew Riverside was purchased by Capital Shopping Centres plc (CSC) in the 1990s. Regeneration commenced with construction of the Braehead Shopping and Leisure Centre. The Riverside area encompasses some 113 Ha of land in total, mostly within CSC control. Joint working arrangements were put in place between CSC and the Council and in 1999 an Area Development Framework (ADF) was completed by consultants David Lock Associates and Ian White Associates as a basis to guiding future regeneration within the area.

The result of the ADF was land use allocation by the council, consistent with the proposals.

The ADF then formed the basis for an Outline Planning Application in late 2000 and included a Masterplan Statement and an Environmental Assessment. This identified the land parcels for development and the particular characteristics for each site. The development proposal comprised around 2 000 new homes, a business park, region-wide leisure facilities through an expanded Braehead (Xscape), a hotel, and a park incorporating SUDS.

In 2003 the application was approved. The delayed timescale was due to further technical studies which were required (flooding, contamination and archaeology, the complexity of the Section 75 agreement and issues over the key road connections which are discussed in more detail below. Upfront works have included undergrounded pylons and designing and implementing a Flood Prevention Scheme.

The masterplan was adopted as Supplementary Planning Guidance and was intended as to set out design objectives and principles in order to ensure that development of each of the separate sites identified would be co-ordinated and yet distinctive. It was also important that they should be complementary to, and well-connected with, Renfrew itself in order to enable its regeneration.

Design briefs were then been prepared for each development

parcel to which each developer has to conform. These are prepared by the same consultants who prepared the Development Framework and the Masterplan ensuring that there has been a consistency of approach throughout. CSC retains an involvement in discussions for each site alongside the developer for each land parcel.

Xscape was the part of the masterplan approved first, in the knowledge of the other work to follow. By early 2008 the first phase of the business park had been built, the park had been completed and 6 housebuilders were all active on site. 30-40% of the housing has been completed within the first 5 years.

Because of all the upfront discussion and agreements in place, detailed applications which conform to the masterplan and to the design briefs have been processed quickly, generally within 2 months.

Masterplan aims

The aims of the masterplan were to achieve the following:

- ensure that the new urban quarter integrates fully with the existing built-up area of Renfrew
- create a high quality waterfront with public access
- produce a new urban quarter with a strong sense of place
- be robust and flexible
- reduce reliance on the car for short trips
- have regards for human scale and ensure good linkages with walking and cycling routes

Design Detail

There has been close partnership working throughout the process, especially between Renfrewshire Council Planning and Transportation, with CSC and with their consultant team. CSC have acted as lead developer throughout and continue to maintain the site so have a vested interest in the longer term. They also operate Braehead and Xscape so have a vested interest in perception of the area as a whole.

A “fresh approach” has been encouraged throughout to house types and layouts. The 1986 Strathclyde Guidelines were still in place when the masterplan was completed and new guidelines for streets which departed from the standards were established for the masterplan area through debate and discussion. The key principles affecting access and street design were:

- Kings Inch Road, which is a historic link running through the centre of the site, designed as a central boulevard;
- the site would adopt a grid pattern street layout reflecting the Victorian tradition with the building line close to the rear of the footway;
- new development integrated with its context;
- use of public transport, cycling, and walking promoted through design.

The design of Kings Inch Road was a particular challenge. This street would form first impressions of the Riverside area and is the main connection between the Braehead complex and Renfrew. As

it stood, it severed the masterplan area by being an urban throughway. Not only did it have to accommodate vehicles, pedestrians and cyclists, it also had to be designed to accommodate the potential future Light Rapid Transit system (LRT). The solution to meeting the requirements for the road was to treat it as a street and build on the tradition of the Renfrew boulevards. Agreements were reached on reducing what would have been a very wide street by dropping road lane width from 3.65 to 3.375m. The LRT lanes are in place for future use and are set at 3.3m (see photographs).

Within the grid pattern, to enable the key principles to be met, driver uncertainty has been created in order to slow speeds down. This includes some of the measures listed below and also avoidance of the use of road markings. Some of the departures from standards included the following:

- typical corner radii of 6m or less has been accepted, even onto Kings Inch Road
- sightlines have been radically reduced, reduced from a setback of 9m to 2.5m, generally, and as much as 1.5m in some residential blocks;
- no clear hierarchy at grid junctions which, combined with reduced sightlines, has meant drivers have to slow to 5mph on approach
- unique parking layouts were developed within the high density housing blocks to create space for people and reduce the dominance of the car.

Safety audits were only undertaken for the main infrastructure routes.

Parking provision across the site is at 130%

Encouraging bus penetration into the site has been difficult; 22 bus companies operate competitively in the area and there have been difficulties in engagement. The most direct route within the masterplan which connects the development area into Renfrew is Andrew Avenue, which has been designed at 6m width in order to allow buses to use it.

Buses continue to use King's Inch Road.

Conclusion s

The scheme is shaping up impressively and its success can be attributed to some of the following factors:

- consistency of project team and staff throughout from all sides of the process; developer, council and consultants;
- Renfrewshire Council acted as a "joined-up authority" throughout the process and the same officers have been part of the project since inception;
- A single site owner with a positive approach, who kept control and was willing to stay involved- also taking steps to improve anything that needed changing;
- A single site owner has also meant that the implementation of upfront strategic infrastructure works has been straightforward;
- Agreement of the vision, how this should be translated into development at an early stage and the subsequent use of design briefs (or mini codes) has allowed fast consents to developers at the next stage providing that they

- demonstrate conformity;
- Political engagement and support were achieved at an early stage

**Notes for
Graphic
Production
Summary
Details**

This will need photographed and summer would be best.

Name: Renfrew Riverside
 Lead Architect/Designer: David Lock Associates
 Project: Masterplan for the regeneration of a brownfield site into a mixed use new urban area.
 Key project attributes: Flexible masterplan
 Use of contemporary street design principles in order to slow speeds
 Good working relationship between client, consultant and council
 Clients: Capital Shopping Centres plc
 Planning Authority: Renfrewshire Council

Links

www.renfrewshire.gov.uk
www.davidlock.com
www.capital-shopping-centres.co.uk/shoppingcentres/braehead



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