CAMBRIDGESHIRE DESIGN GUIDE

FOR STREETS & PUBLIC REALM

Cambridgeshire Horizons

Cambridgeshire County Council

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FOR STREETS & PUBLIC REALM

Cambridgeshire is growing fast. There is an urgent need to increase the supply of housing to respond to changing lifestyles and to support the continuing growth of the Cambridge economy. The Cambridgeshire and Peterborough Structure Plan, adopted in 2003, represents a significant change in policy that has increased the projected rate of house-building by 40% and allocated major new sites for development, such as the proposed New Town at Northstowe. Detailed plans for these major sites are now being prepared through the Local Development Frameworks being prepared by the City and District Councils and by master plans and outline planning applications being submitted by developers.

An enormous amount of work will be required by everyone concerned over the coming years to ensure that the quality of new developments, large and small, meets the highest possible standards of design and layout. Good design is essentially a collaborative process that involves a wide range of professional and technical experts, as well as the participation of local communities and future users of the developments, and it is vitally important that everyone works together co-operatively and creatively so that we can build successful and attractive new neighbourhoods.

The purpose of this Design Guide is therefore to set out the key principles and aspirations that should underpin the detailed discussions about the design of streets and public spaces that will be taking place on a site-by-site basis. It has been produced by the County Council, with support from Cambridgeshire Horizons and the City and District Councils, and will in particular guide the County Council in the use of its powers as Highways Authority. It compliments national design guidance, such as the Government's Manual for Streets, and the local design guidance that has been produced by the City and District Councils, and that planning authorities will embrace its principles in future Supplementary Planning Documents produced at the local level. Whilst intended to be produced primarily as an electronic document, in its hardcopy format it has been designed as a loose-leaf document so that sections can be easily updated as lessons are learnt and more information becomes available.

We are grateful for the efforts of all the people who contributed to the preparation of the Cambridgeshire Design Guide, and we hope that it will be widely used over the coming years.

Councillor Roy Pegram
Cabinet Member for Environment & Community Services
Deputy Leader, Cambridgeshire County Council

Sir David Trippier
Chairman, Cambridgeshire Horizons

FOREWORD

1 Introduction

This guide has been produced for Cambridgeshire County Council and Cambridgeshire Horizons in partnership with, Cambridge City Council, East Cambridgeshire District Council, Fenland District Council, Huntingdonshire District Council and South Cambridgeshire District Councils. It represents a consensus view on the need to improve the quality of new places and is intended to play a key role in contributing to a more coordinated approach to the design of new places and the future adoption of the public realm.

1.1 Purpose of the Guide

We all want the places we live in to be safe, attractive, sustainable and to have character. Whilst the quality of the buildings we live in is undoubtedly a major consideration, equally important is the quality of the place in which the buildings are located and the ways in which we are able to move around and access the wider area. There is a strong desire to promote good design and avoid mediocrity in the places being created as part of Cambridgeshire's growth.

This guide is intended to help successfully create these streets and places by outlining the key considerations and processes involved. It is not intended to take away responsibility from the designer and does not attempt to give the correct solution to any particular development proposal. It sets out a framework for best practice and provides general guidance on what is likely to be acceptable. It provides some detailed guidance but recognises that there are other sources of information on specific areas and refers to these.

The guide will be used by Cambridgeshire County Council as the basis for agreeing details of highways adoption and is intended to demonstrate design elements that will be expected beyond the previously traditional 'engineered' approach to highways. It will also be referred to by Local Planning Authorities in the evaluation of planning applications. and to be used in the preparation of design briefs.

1.2 Who is this guide for?

Developing new places requires the skills and input of a wide range of people with different emphases throughout the process. This guide is for all those whose roles and responsibilities will require them to influence the nature of these places. Primarily this includes developers and their consultants, together with local planning authority and highway authority development control officers. However, it is also intended to promote a more holistic approach to the way we design places for the future, and therefore should be referred to by those dealing with more specific areas such as housing, drainage, waste recycling etc.

1.3 The development process

The development process is complex, with numerous parties involved at various stages. Many new developments are less successful than they could have been due to the different influences on the process creating tensions, which remain unresolved or are identified at too late a stage.

Figure 1.1 broadly outlines the process together with roles and responsibilities. Whilst there may be a changing emphasis in these as the process moves forward, early involvement by all concerned can help resolve issues that may be difficult to deal with later.

The aim should be to reach consensus through each stage of the process by consultation and collaboration.

1.4 Using the guide

It is recognised that growth in Cambridgeshire presents challenges to those involved in its delivery. The different responsibilities and variation in policies together with the guidance and advice currently available are often perceived to lead to conflicting requirements. This can result in fundamental aims, such as creating places that will be sustainable, functional and enjoyed by all, being missed. The guide has been produced in consultation with representatives of the local authorities in Cambridgeshire and is intended to compliment and coordinate other guidance and information available.

The guide should be used by developers when producing designs as a common point of reference when considering planning applications for new developments and proposals for adoptable highways and public open space. It has been set out with a view to it being an evolving document that can be added to or revised as experience is gained of its use.

It should be used to supplement other guidance

available to the local authorities and wider advice available on specific design issues. Throughout this guide reference is made to other documents or sources of relevant information.

Whilst the guide represents a consensus on what constitutes good design, it is accepted that it will evolve with gained experience of the places being built and possible changes in the needs and expectations of those who will live and work in them. Therefore it is intended to be a dynamic document capable of being updated from time to time in the future.

The following sections cover the key areas that need to be considered and finally a checklist is provided as an aide-memoir.

	Concepts and Principles		Detailed design		Planning application		Detailed Approvals		Construction	Stewardship
Developer	Initial proposals	Establish Agreed principles of development (Workshop or development team meeting)	Responsible for design	Iterative design process with possible further pre-planning joint development team meetings	Makes application	Possible further refinements to layout	Technical development of design	Quality Audit	Responsible	hand over
Local Planning Authority	Regional and Local Plan		Advises / comments		Makes recommendations on approval and conditions		Compliance with conditions (also Building regulations)		Check compliance	Monitors planning conditions
Highway Authority	Local Transport Plan		Advises / comments		Consultee - comments and requests conditions		Highway details and S 38 Agreement		Checking/ supervision	Adopts and maintains
LA - leisure / refuse / housing	Strategies		Advises / comments				Detailed open space proposals (proposals for waste disposal)		Checking/ supervision	Adopts and maintains
Other agencies -drainage -utilities	Strategic infrastrucure proposals		Advises / comments		Consultee - may comment on detail		Adoptable drainage / SUDS		Checking/ supervision	Adopts and maintains
Stakeholders - Parish Councils -Local Communities - Police - Owners etc	Local initiatives		Further joint involvement desirable		Consultee					Takes ownership and responsibilities
notes		Early involvement of those responsible for seeing the process through - consideration of future character and stewardship	Further joint involvement desirable				Important at this stage to ensure comprehensive future maintenance responsibility	Role needs to be established	Important to make sure that quality does not become compromised	Important that there is a comprehensive responsibility for future maintenance

Figure 1.1 Indicative guide to the Development Process

1.5 Overarching Principles

1.5.1 Sustainability

The places we create today must meet the needs of the present without compromising the ability of future generations to meet their own needs. This means that their design should not rely on movement patterns, modes of transport and the use of resources that may not be sustainable in the future. In particular, greater emphasis is placed on encouraging a shift away from use of the private car towards walking, cycling and public transport.

1.5.2 Character

Standardised layouts of roads and buildings have often resulted in places having a consistent character and very little in the way of distinctiveness. Historically, places in Cambridgeshire have had different functions and relationships to the surrounding landscape, which has resulted in them having a unique character. Understanding the character of existing places will help inform the design of extensions to them. Similarly, a concept of the characteristics being aspired to in new places will help ensure that the design achieves these aims and avoids the imposition of standardised layouts.

1.5.3 Future Care & Maintenance

The initial design and implementation process forms a relatively short, if important, part of the overall life of a place. Living in and looking after places will be the primary concern for the future. It is vital that careful thought is given to who will be responsible for future stewardship of the public realm and how the quality of the design can be maintained. For example, whole life future costs of public realm should be taken into account.

1.5.4 Safety

We must all feel safe in the places where we live and work and we have a reasonable expectation that designers will have created places that are safe. This is not to say that an inflexible attitude should be taken to any one particular aspect of the design at the expense of achieving the overall aims. A holistic approach to safety should be taken from the start which takes a balanced and reasonable view and assesses and manages any risk. This may sometimes need to challenge the traditional approach of retrospectively addressing a perceived problem.

1.5.5 Flexibility for the future

New places must be capable of being adapted to suit future changes in lifestyle and different influences on the way they are used. Whilst it is impossible to predict exactly what will be needed in 50 or 100 years time, areas of public realm that will be difficult to modify in the future should be avoided.

http://www.sustainable-development.gov.uk/what/principles.htm.

CHAPTER TWO
WHAT IS THIS PLACE?

Establishing the nature of the place

When we visit a place, it is usually fairly obvious to us what sort of a place it is and what features contribute to its character. It is important that we also consider what the new places we are building will be like and how they will fit in with what is already there.

2.1 Urban Context

If one follows an imaginary line across Cambridgeshire, the character of places will vary from small fenland villages to dense city centres such as Cambridge, and from market towns to new suburban developments.

It is important to understand where a new development will fit into this hierarchy and where there will be transitions between areas having different characteristics. Most development in the new growth areas is likely to be fairly dense. Four main categories of place are used in this guide to indicate appropriate design parameters and to highlight where particular features may need to be given more emphasis. These categories are:

City Very dense with high levels of activity

Urban Dense with moderate levels of activity

Suburban Medium density with low to medium levels of activity

Rural Generally low density with low levels of activity

These categories should not be regarded inflexibly. For example a settlement may have a moderately dense urban core with a much less dense rural character around the periphery.

Also the development of new places may change the nature of the varying character across the county. What matters is to reach an understanding of how the place fits in so as to avoid incongruity. Figure 2.1 indicates how some of the existing places fall into these categories and the potential context of the new growth areas.

2.2 Historical Context

Understanding the historical context of a place will give a greater appreciation of the way it evolved and the street patterns that exist. This is particularly important for extensions to existing towns and villages and should help avoid the imposition of incongruous street layouts. Other features that may have appeared in a place over its history, such as distinctive paving details or boundary treatments may help reinforce its character.

2.3 Geographical Context

Places are often in the location that they are because advantage was taken of geographical features such as rivers, mineral resources and transport corridors. It is important that new places relate well to these features and their setting in the landscape.

2.4 Links to other Places

All too often development areas have been considered in isolation with the result that barriers are created, such as buffer strips, which prevent future movement between different areas.

An appraisal should be carried out of existing and potential routes that will link to neighbouring places, so that in the future all the parts of an area connect to each other.

2.5 What sort of place do we want it to be?

New places can either reflect the existing local character or can have a character of their own. An understanding of the aspirations for a place can help inform design decisions and there should be a clear consensus on what the place will be.

Urban Street

City

Suburban Street

Rural Street

AREAS	CITY	URBAN	SUBURBAN	RURAL
EXISTING — **Cambridge**				
Market Towns				
GROWTH AREAS — Northern Fringe				
Cambridge East				
Southern Fringe				
North West Cambridge				
Northstowe				
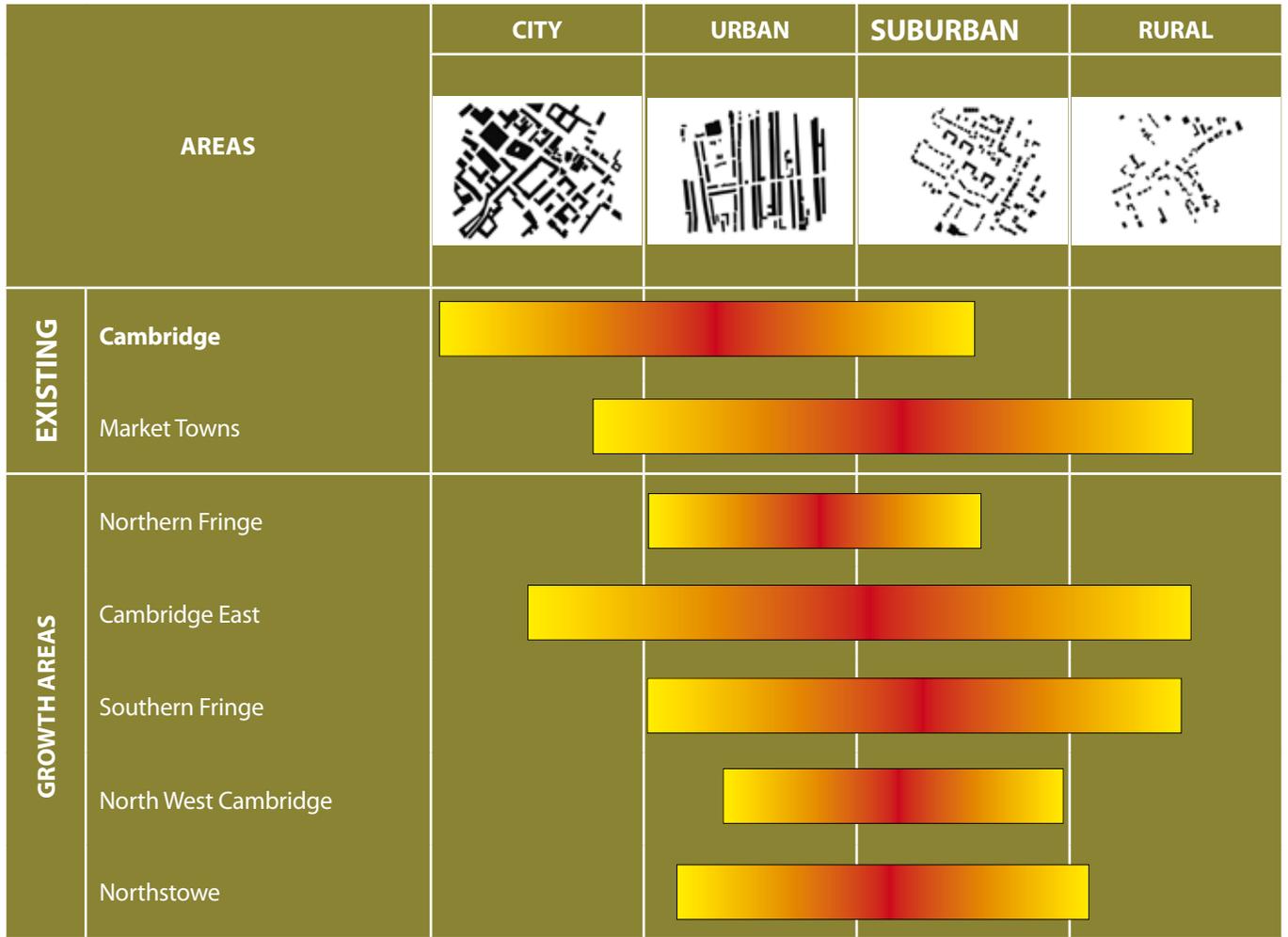
Fig 2.1 How places potentially fit into the varied character of Cambridgeshire

Places should be legible with a clear sense of hierarchy. Traditionally, higher levels of activity and movement together with the presence of more distinctive buildings and higher quality public realm, give a sense of focus to a place. Whilst these functions usually coincide, it is important to understand how they vary across a place to inform design decisions.

3.1 Activity Hierarchy

Levels of overall activity will naturally vary throughout a place. Higher levels of activity would normally be expected near shops, schools, community facilities and around major corridors, whereas lower levels of activity might occur in minor residential streets and less formal areas of open space.

Figure 3.1 shows a broad assessment of where higher levels of activity are likely is occur in a potential new development. This is obviously a fairly subjective judgment. However, it is useful if all involved with the planning of new places start to gain an appreciation of how different parts of a place may have a slightly different feel to them.

3.2 Character Hierarchy

Whilst distinctiveness helps give a place identity, some variations in character will also help make it more interesting and legible. Elements that influence character include, function, building height and density, architectural style, materials, landscape and topography. It is relatively easy to assess this in a place that already exists but perhaps more difficult in one that is planned. Nevertheless, an appreciation of how the character might vary and where specific characteristics will occur can be useful in informing the treatment of streets and the public realm.

Figure 3.2 assesses how the charater may vary across the place.

HIGH LEVELS OF ACTIVITY

School Shops Commercial

Fig: 3.1
Higher levels of activity

SCHOOL
HIGH DENSITY HOUSING
LOWER DENSITY HOUSING
COMMERCIAL
GREEN SPACE
EXISTING HOUSING
HIGH QUALITY FRONTAGE
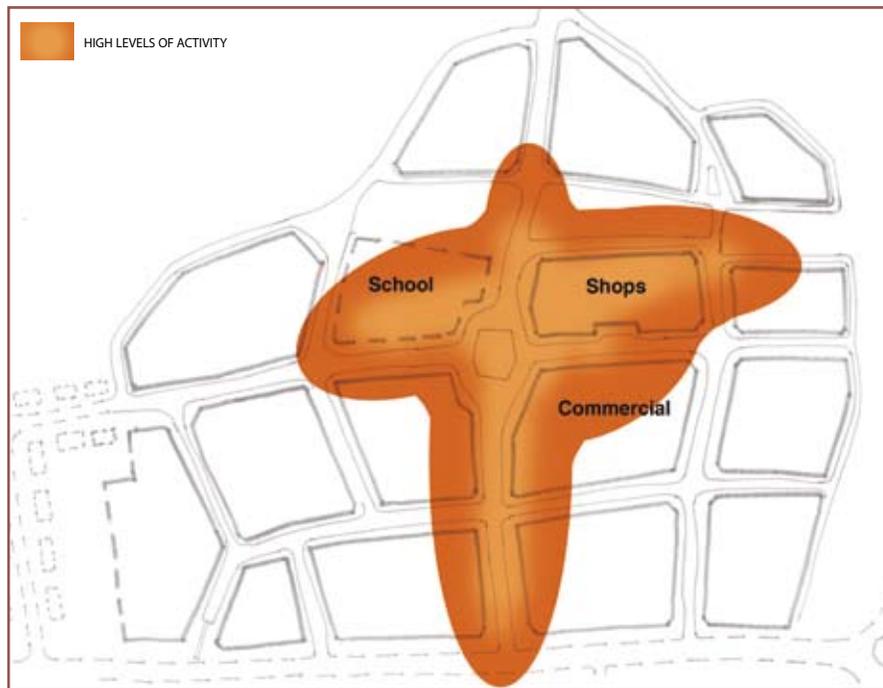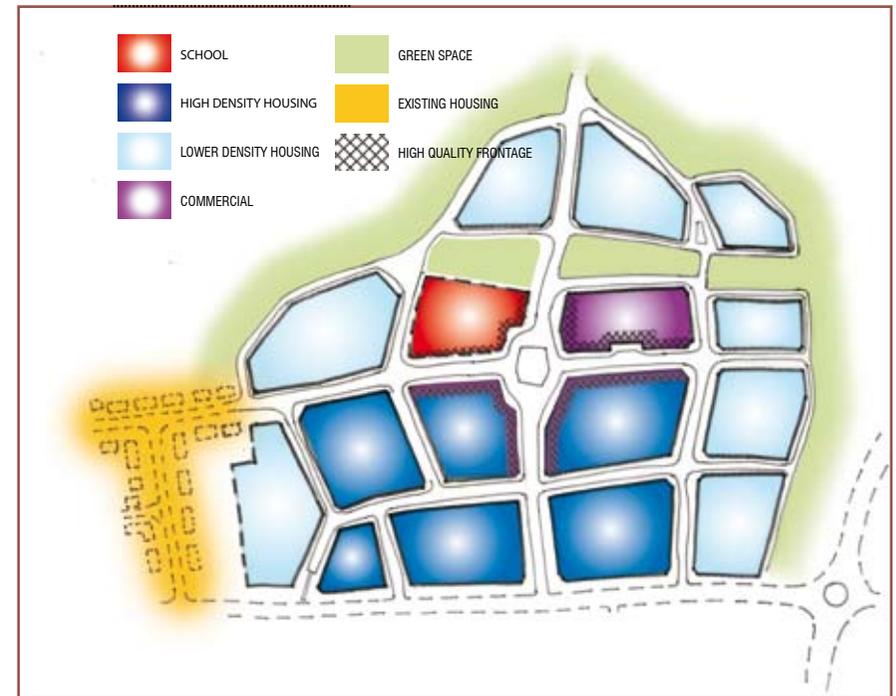
Fig: 3.2
Different Charater

3.3 Movement Hierarchy

A permeable network of streets makes it easier to move around a place and provides a choice of routes. It is particularly important that the routes for walking and cycling are clear and direct. The overall hierarchy must therefore give priority to these modes of transport.

The location of connections to the wider network, together with trip generators and attractors will inevitably result in some streets having higher levels of movement than others; this may vary between different modes of transport and therefore an evaluation of each should be carried out.

It is important that the movement hierarchy is assessed before the layout reaches a detailed stage so that, for example, adjustments can be made to building lines where higher levels of movement are anticipated.

Levels of vehicle and pedestrian/cycle activity should be assessed for each street together with specific requirements, such as bus routes.

In mainly residential areas, levels of vehicle movement can be related to the number of houses served by a street, although a permeable network of streets will require a degree of judgment to be used in making this assessment and changes in modal split will be a factor. Peak hour vehicle flows also give an indication of the levels of traffic a street will need to accommodate. However, it should be remembered that the choice of routes is to some extent influenced by the levels of traffic on them and furthermore, these flows will not be what is typically experienced throughout the day and may not be the same in future years.

Further guidance: Cambridgeshire Local Transport Plan, Chapter 6
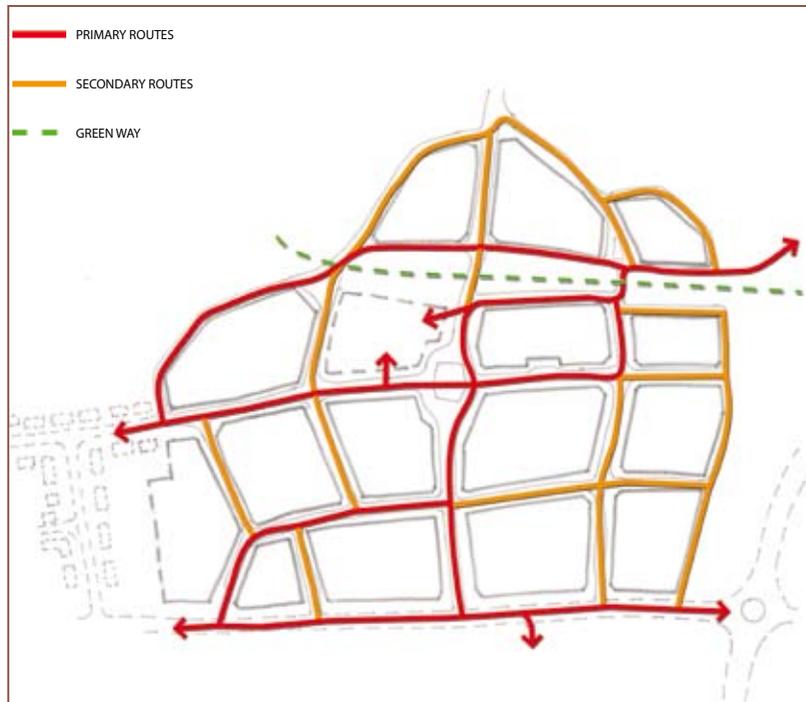
**Fig: 3.3**
Walking & Cycling Hierarchy

PRIMARY ROUTES

SECONDARY ROUTES

GREEN WAY

Fig: 3.4
Bus Route

BUS ROUTE

BUS STOPS

400M RAIDIAL

Pedestrian

Cyclists

Buses

Deliveries

Private Cars
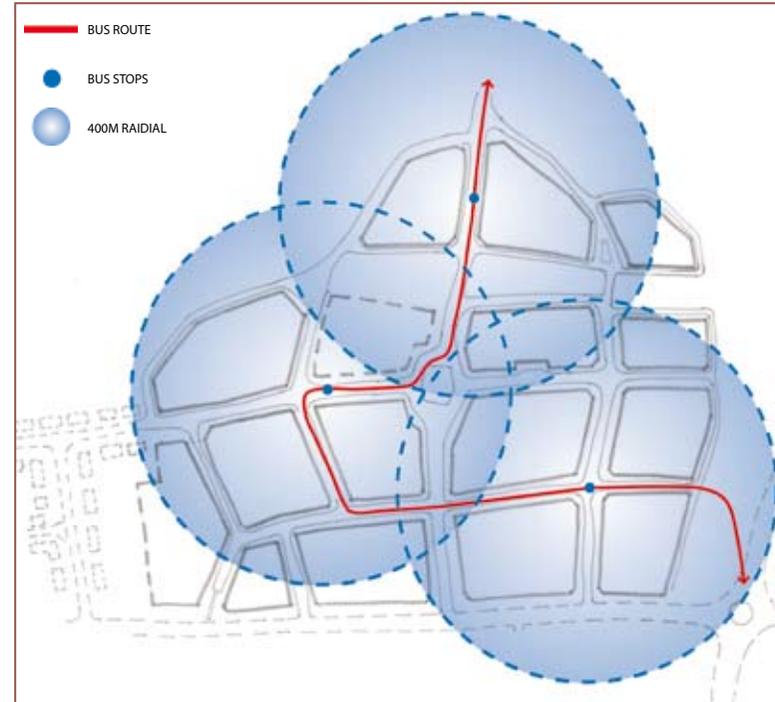
Modal Hierarchy

Although layouts should not be based entirely on a vehicle-based hierarchy, an understanding of the levels of traffic that each street will need to accommodate will help determine appropriate design parameters.

The assessment of pedestrian and cycle flows is likely to be more subjective but should take account of the availability of more direct off-street routes and the location of particular attractions such as shops and schools. Figure 3.3 should be used as a basis for assessing the movement hierarchy

It should be noted that the hierarchy does not have to rigidly applied. There are situations where priority modes are not provided for - buses, for example. However, in any case, all modes should be at least considered in the order given.

3.4 Function of Spaces

There should be no spaces "left over" in a place without any apparent function or ownership. Generally there should be clear definition between areas that are part of the public realm and areas that are private defensible space. Privately owned and maintained areas, such as planted borders at the front of houses, can contribute to the quality of the public domain. However, areas where ownership and responsibility are more ambiguous should be avoided.

3.5 Security
Layout has a crucial role to play in preventing crime and alleviating the fear of crime and it is recognised that poor design can increase the potential for vandalism, theft and assault. Since most crime depends upon concealment, the main aim should be to create public spaces that are well used and overlooked. It should be readily apparent from the design, which areas are public domain, even where responsibility for it may lie with individuals, and which areas are private and may need to be secured against unrestricted access.

Safer places
http:// www.communities.gov.uk/
embedded_object.asp?id=1144724

Private frontages form part of the public domain

HIGH LEVELS OF ACTIVITY (>300 VPH)

MEDIUM LEVELS OF ACTIVITY (100 - 300 VPH)

LOW LEVELS OF ACTIVITY (<100VPH)

GREEN WAY

Fig:3.5
Vehicle Movement Hierarchy

4.1 Direct routes

Routes for pedestrians must be as direct as possible, and, wherever possible focus on landmarks and landscape features.

4.2 Overlooking

Pedestrians feel safer if they are on routes where they can be seen, either by other users of the route or from overlooking windows. Care should be taken to avoid routes which may have low levels of use and where people using the route will be hidden from view.

4.3 Inclusive access

Places should be capable of being used by the whole community. Designs should avoid the creation of barriers to movement that prevent everyone from participating in mainstream activities independently.

4.3.1 Dimensions

To allow sufficient space for wheelchair users and pedestrians to pass each other, footways should have a minimum width of 1.5m.

Residential streets should normally have a footway width of 2m. This generally provides sufficient width for all but the busiest areas. However, where there is expected to be relatively high levels of pedestrian movement, such as around schools and shops, footway widths of 3m should be considered.

4.3.2 Gradients

Wherever possible gradients should not exceed 5% (1:20). In exceptional circumstances gradients of up to 8% (1:12.5) can be used, provided that relatively level platforms are provided at least every 5m.

4.3.3 Crossings

Crossing points should be provided at locations where it can be reasonably expected that pedestrians will want to cross the carriageway. Crossings at junctions with side roads should follow the "desire line" for pedestrians as closely as possible. Ideally they should be achieved by raising the carriageway to the same level as the footway as this provides the most friendly layout for pedestrians although dropped kerbs could be provided as an alternative where site conditions require. In either case, there should be a maximum of 6mm level difference. The width of the crossing should normally be similar to the width of footway, typically 2m. The design of a crossing point should aim to integrate pedestrians in a safe manner without guardrails, which are inconvenient and visually obstructive.

4.3.4 Tactile surfaces

Tactile surfaces should be provided at uncontrolled crossings where traffic speeds are anticipated to be 30mph or higher and in locations where pedestrian flows will be higher than normal. At controlled crossings tactile paving must be provided.

4.3.5 Steps

Steps should be avoided wherever possible. Where they cannot be avoided or where to do so would result in a particularly indirect route, an alternative route for people with disabilities must be provided.

4.3.6 Footpaths and Bridleways

Consideration should be given to how pedestrian routes link with the surrounding area and with existing rights of way. New rights of way such as public footpaths and bridleways or permissive routes may need to be provided to facilitate access by pedestrians to areas outside the development that could also benefit cyclists and equestrians. Changes to existing public rights of way may also be required which can often involve lengthy legal processes which should be allowed for within the development timescale.

Guidance on the use of tactile paving surfaces - DFT

Disability Discrimination Act: www.opsi.gov.uk/ACTS/acts2005/20050013.htm

Planning & Access for Disabled People: A Good Practice Guide - DCLG

Cycling in Cambridgeshire

Cambridge has a large number of cyclist. Cambridge city has the highest level of cycle use in the UK - over 25% of residents travel to work by bicycle, according to the 2001 census data. The provision of good cycle routes will further promote cycling in Cambridgeshire, helping to increase cycling levels in less urban areas where these are not yet as significant.

5.1 Location of cycle route

Cycle routes should be direct and should preferably be overlooked. The decision on where to locate cycle routes will largely depend its position in the movement hierarchy and likely levels of use. Figure 5.1. gives guidance, however, consideration should also be given to how specific measures for cyclists will be integrated into the overall streetscape. It should also be borne in mind that experienced cyclists are usually comfortable with cycling on the carriageway whereas those with

less experience may be deterred from using this mode on more heavily trafficked streets unless an off-carriageway facility is provided.

5.2 Low Speed Routes

Shared use of the carriageway with vehicles is appropriate where traffic levels and vehicle speeds are relatively low. This is likely to be the case for most streets in residential areas. It is also important to realise that shared use of the carriageway can, in itself, influence driver behaviour. Carriageway widths should take account of the number of cyclists. In particular road widths in the range up to 4m should be avoided unless traffic levels are likely to be low and speeds will be less than 20mph. Where vehicle speeds are likely to be in excess of 30 mph consider locating cyclists off the carriageway.

Controlled junctions that allow cyclists to proceed when other traffic is halted will reinforce cycle priority.

5.3 Higher speed routes

Where traffic levels are high and vehicle speeds are likely to be 30mph or higher, cyclists can be accommodated by the provision of on road hybrid cycle lanes that have physical demarcation from adjacent traffic lanes possibly incorporating some degree of vertical segregation, giving priority for cyclists across side roads. Different surface treatments or a low kerb between the hybrid lane and traffic lane can reinforce the segregation of cyclists and motorised traffic. Hybrid cycle lanes should be of sufficient width to create an environment that is attractive to both confident and inexperienced cyclists.

Alternatively, cycle routes can be provided on paths away from the carriageway. Where levels of cycling are expected to be high, pedestrians sharing the same path can feel intimidated and it is

preferable to provide some segregation. Different surface treatments or a low kerb between the footway and cycle way can achieve this. Whilst a balance should be struck between this and the aims of creating attractive and uncluttered streets, clearly defining space for the respective modes by using consistent and simple detailing can reduce the need for advisory signage. In situations where the segregated route will be frequently interrupted by the need to connect to other shared use paths and crossing facilities, the visual impact of additional signage and surface treatments should be considered. Sections of segregated route less than about 20m long are preferably avoided. Care should be taken when considering segregated routes so that coherent layout is achieved that will fit in with other design aims.

The design option selected to cater for cyclists may be influenced by the level of cycling activity, the layout of the road network and by the space available having taken into account other design requirements such as highway trees.

5.4 Shared use with pedestrians

On routes where traffic levels are high and vehicle speeds are likely to be 30mph or higher, and levels of cycling and walking are relatively low, shared use of paths may be appropriate. It is also often easier to achieve an attractive and coherent treatment of surfacing when numerous transitions between segregated sections of path can be avoided. Shared use can enable a better treatment of the public realm and a less formal distinction between pedestrians and cyclists. However, wherever possible, they should be avoided where the passage of cyclists would be interrupted by cross routes that require cyclists to give way to other traffic. However, wherever possible, they should be avoided where the passage of cyclists would be interrupted by cross routes that require cyclists to give way to other traffic.

5.4 Shared use with pedestrians

Where traffic levels are high and vehicle speeds are likely to be 30mph or higher, and levels of cycling and walking are relatively low, shared use of paths is appropriate. It is also often easier to achieve an

attractive and coherent treatment of surfacing when numerous transitions between segregated sections of path can be avoided. Shared use can enable a better treatment of the public realm and a less formal distinction between pedestrians and cyclists.

5.5 Parking and storage

As important as providing facilities for people to cycle is the provision of space for cycles to be stored and parked. All dwellings should have space provided that can be conveniently used for cycle storage. Also, other infrastructures such as commercial premises and transport interchanges should provide cycle parking.

http://www.cyclingengland.co.uk

CHAPTER SIX
PUBLIC TRANSPORT

6.1 Bus Routes

Proposals for new development should firstly consider existing bus routes and how they could be enhanced or extended. A strategy should be produced showing how the development will be served and how bus routes can connect with other transport provision such as railways and and bus guideways. Where a guided bus route passes through a development or where a bus gate is to be installed, particular care should be taken to integrate the infrastructure required with the streetscene.

6.2 Bus Stops & Shelters

Bus stops should be located within a reasonable walking distance of dwellings and other facilities. Ideally, this should be a maximum distance of 400m (approximately 5 minutes walking), preferably less near major attractors such as shops and places of employment. In particular, bus stops should be located at interchanges with other routes or other modes of transport.

All bus stops should be provided with some form of shelter and should preferably also have some seating. They should be integrated into the design of the street and therefore should be planned at an early stage rather than being an afterthought. Otherwise it may be difficult to provide enough space in the footway to cater both for the shelter and pedestrians passing by.

The design should consider the needs of the disabled and elderly and should incorporate raised kerbs to enable level access. Cycle parking should be provided when a bus stop is also likely to be used by cyclists.

6.3 Bus Lanes

It is generally undesirable for cyclists to have to share a busy bus lane. However, where this unavoidable, the bus lane should be wide enough to cater for both modes; 4.5m minimum, inclusive of a demarcated cycle lane.

6.4 Bus Information

To encourage use of buses, people need to have reliable information on the services. Wherever possible, real time information should be provided.

Cambridgeshire Bus Strategy
www.Cambridgeshire.gov.uk/transport/strategies/bus_strat.html

CHAPTER SEVEN
ACCOMMODATING
VEHICLES

7.1 Vehicle Speeds and Spatial Perception

People generally want to travel between places as quickly as possible. Where places are further apart, vehicle-based modes of transport (buses and cars) dominate and consequently roads are designed to accommodate higher speeds. However within places themselves, the distances people travel are shorter and streets accommodate a much wider variety of activity. Consequently, vehicle speeds in these streets should be relatively low. In most cases a maximum design speed of 20mph should be the aim. Typically, the following design vehicle speeds related to the movement hierarchy should be aimed for.

Main Streets	20 – 30 mph
Secondary Streets	20 mph
Tertiary Streets (Including Homezones)	10 – 20 mph

7.1.1 Influencing Perception

Highway design in the past has tended to concentrate on providing unrestricted movement for vehicles: with generous carriageway widths, often with additional margins, wide visibility splays, prominent road markings and signs, and the segregation of pedestrians behind barriers. All these give the driver an increased level of confidence and tend to encourage higher speeds. Altering this perception in a driver's mind can help encourage lower vehicle speeds and can create streets that are not only more pleasant to be in but which are actually safer for all. Features that will help influence driver perception include:

Tight geometry in the form of minimum carriageway widths and junction radii

Dense urban form created by locating buildings close to the rear of footways

Accentuating minimal carriageway widths by the use of wide kerbs and channels

Avoidance of over-generous forward visibility·

Incorporating trees into the layout to help give a visual narrowing of street

Appropriately located on-street parking

Minimal use of road markings and highway signage

7.1.2 Physical Measures

To complement measures to influence drivers' perception, physical measures incorporated into the street design can encourage lower vehicle speeds. These should not be seen as afterthoughts that are "bolted" on to a standard highway layout but should be integral to the design of the street. Physical measures include:

- different surface texture treatments
- central island features
- horizontal deflections
- vertical deflections, such as table junctions
- changes in carriageway level
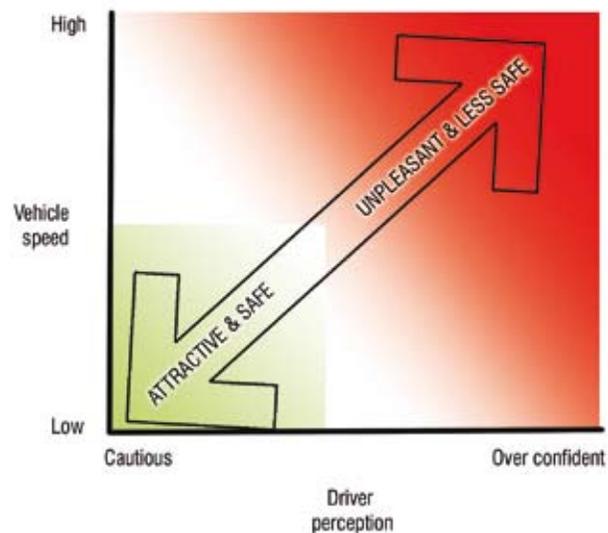
7.2 Street Geometry

7.2.1 Fitting Streets into the Layout

Streets are defined by the buildings, boundary treatments and landscape features that enclose them, rather than some arbitrary standard dimensions applied to carriageways and paths. The starting points for developing the street geometry should be the proposed building layout together with the hierarchy of streets and places. Streets should be fitted into the buildings layout taking account of the guidance on path and carriageway widths together with the provision of any on-street car parking spaces.

7.2.2 Dimensions

Carriageway widths need to be adequate to accommodate the traffic flows and type of vehicles anticipated and need to be appropriate to the character of the street. See Chapter 15 for guidance on carriageway widths.

7.2.3 Tracking

Tracking should be used to check that the carriageway will be able to accommodate the types of vehicle normally anticipated. The following vehicle types will normally need to be accommodated as shown in table 7.1 (below).

7.2.4 Turning

More permeable layouts will generally provide more than one point of access to a street and therefore reduce the need for vehicles to turn. The provision of turning space to accommodate occasional large vehicles making a u-turn or simple 3-point turn is wasteful of space and can result in large expanses of carriageway, which will tend to encourage car parking. If the need for turning space cannot be avoided, consideration should be given to utilising strengthened footways and/or requiring larger vehicles to make a more complicated turning manoeuvre. Standard templates or tracking can be used to assess the space required.

	City		Urban		Suburban		Rural	
	Nearside lane only	Whole carriageway	Nearside lane only	Whole carriageway	Nearside lane only	Whole carriageway	Nearside lane only	Whole carriageway
Main Street	Articulated lorry	n/a	Articulated lorry	n/a	Articulated lorry	n/a	Bus / Pantechnicon	Articulated lorry *
Secondary Street	Pantechnicon	Articulated lorry	Fire appliance	Pantechnicon	Fire appliance	Pantechnicon	Fire appliance	Pantechnicon
Tertiary Street	Fire Appliance	Pantechnicon	Fire appliance	Pantechnicon	Car	Pantechnicon	Car	Pantechnicon

* If large numbers of articulated lorries are anticipated they should be acommodated within the nearside lane

Table 7.1 Accommodating Service vehicles

7.3 Junctions

The position of junctions will generally be determined by the building block layout. In most cases, this will result in junctions being reasonably frequent. In general there are no restrictions on the location of junctions and cross roads often provide the most logical and direct way of connecting streets and are therefore acceptable. Where vehicle speeds are likely to be higher than 20 mph, it may be necessary to incorporate features such as raised tables, small roundabouts to improve highway safety. Excessive junction radii are less attractive for pedestrians crossing and can encourage higher speeds. Whilst the need to accommodate large vehicles needs to be taken into account, in many cases they will be infrequent and it will be acceptable for them to use the whole carriageway. Therefore the following junction radii given in table 7.2 (right) will normally be considered appropriate.

Side street carriageway width	Car stays in nearside carriageway	Pantechnicon uses whole of main and side road carriageway (assumed 6m wide main road carriageway)	Refuse lorry uses whole side road carriageway (assumed 3m wide main road lane)	Pantechnicon uses whole side road carriageway (assumed 3m wide main road lane)	Pantechnicon stays in nearside lane
4	6	6	6	10	n/s
4.5	4.5	4.5	4.5	7.5	n/s
5	3	3	4.5	6	n/s
5.5	2	2	3	4.5	n/s
6	1.5	1	2	3	12
6.5	1	*	2	3	10
7	1	*	1	3	10

Table 7.2 Junction Radii

**Excessive junction radii requirements results in
less attractive places for pedestrians and cyclists**

7.4 Visibility

Visibility needs to be provided to enable people using streets to see and be seen in sufficient time to enable them to move safely and in reasonable comfort.

For example, pedestrians need to be able to see that it is safe to cross the street, cyclists need to be able to see each other approaching round a building and drivers need to be able to see far enough ahead to be able to stop if necessary.

7.4.1 Forward Visibility for Drivers

As mentioned in section 7.1.1, the provision of overgenerous amounts of forward visibility can raise driver confidence and encourage higher vehicle speeds. Therefore forward visibility should be restricted wherever possible to the minimum amount appropriate to the anticipated vehicle speed.

The assessment of speed and therefore visibility will often be an iterative process, starting with the building layout with the streets fitted into it and then thinking about how vehicles will move around and what their speeds are likely to be. Usually the target speeds suggested in section 7.1 would be an appropriate starting point with adjustments made for features, such as sharp bends, that will slow vehicles down.

Plotting the routes and speeds of vehicles will enable the appropriate amount of forward visibility to be assessed. In some cases it may be necessary to adjust building lines; however, the potential for increased speed as a result of Increasing visibility should be borne in mind.

Forward visibility should be reasonably unobstructed, however this should not preclude trees and other objects that do not create a significant obstruction.

7.4.2 Visibility at Junctions

Visibility from side roads at junctions should be provided to enable emerging drivers to exit safely.

In most cases the notional driver's eye position should be assumed to be 2.4 m back from the edge of the major street along the centreline of the side street (X distance). From this point, vehicles in the major street should be visible for an appropriate distance related to their anticipated speed (Y distance). Appropriate Y distances related to vehicle speeds are shown in table 7.3. Generally the sightline will be taken to the nearside kerb line; however, where vehicles are prevented from crossing the centreline, visibility to the left may be taken to the centreline. see fig 7.1

In cases where traffic flows emerging from the side street are likely to be particularly high, it may be desirable to assume an X distance of 4.5m. However, this is predominantly to address a traffic capacity issue by giving drivers confidence to proceed at an earlier stage and may be counter productive in terms of reducing speeds and giving greater priority to pedestrians.

It should be assumed that the driver's eye height will be between 1.05m and 2m and the vehicles on the main street need to be visible 0.6m above the carriageway level.

7.4.3 Visibility for Pedestrians & Cyclists

Whilst walking speeds are such that there is generally no formal requirement to provide pedestrian visibility, there are some situations where it should be considered. There should be some inter-visibility between pedestrians using a footway and drivers emerging from private driveways. On heavily used pedestrian routes, obstructed sharp corners should be avoided. A 2m x 2m splay will help oncoming pedestrians to negotiate the route more comfortably. Cycles obviously move at higher speeds and it is important that cyclists are able to avoid each other, pedestrians and obstructions. It is suggested that forward visibility of at least 10m in dense city and urban areas is provided, and, if possible at least 20m in less dense suburban and rural areas.

Where pedestrians are expected to cross the street, visibility along the kerb line equal to the Y distance should be provided.

Further reference: Manual for Streets

Vehicle Speed (mph)	Forward Visibility/ Y Distance (m)
10	11
15	17
20	25
25	33
30	43

Table 7.3 Typical anticipated vehicle speeds related to layout features
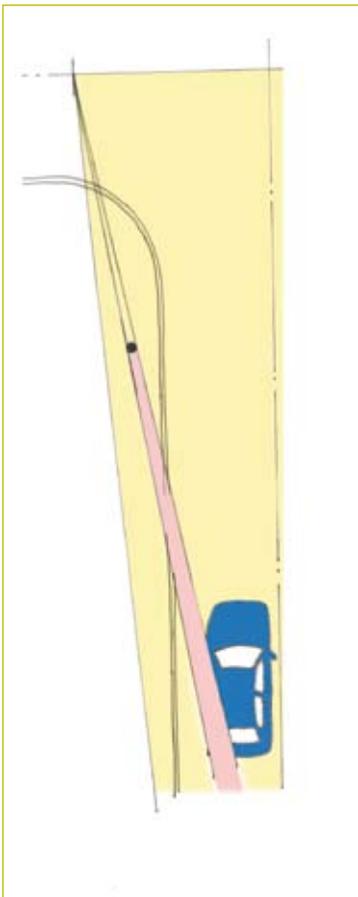
Small obstructions in visibility splay are acceptable

Fig:7.1 Visibility at junction

Intervisibility between driver and pedestrian

X= 2.4m

Y= to tangent

←20mph = 25m F.V

Y= 22m to

←15mph = 17m F.V

Y= 22m

X= 2.4m
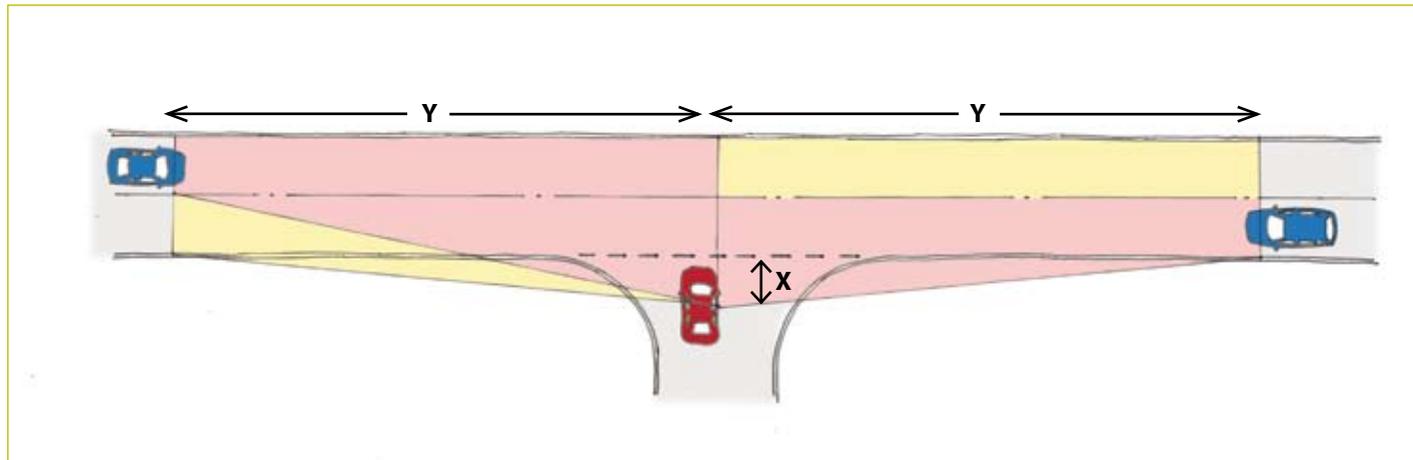
Intervisibility between driver and pedestrian
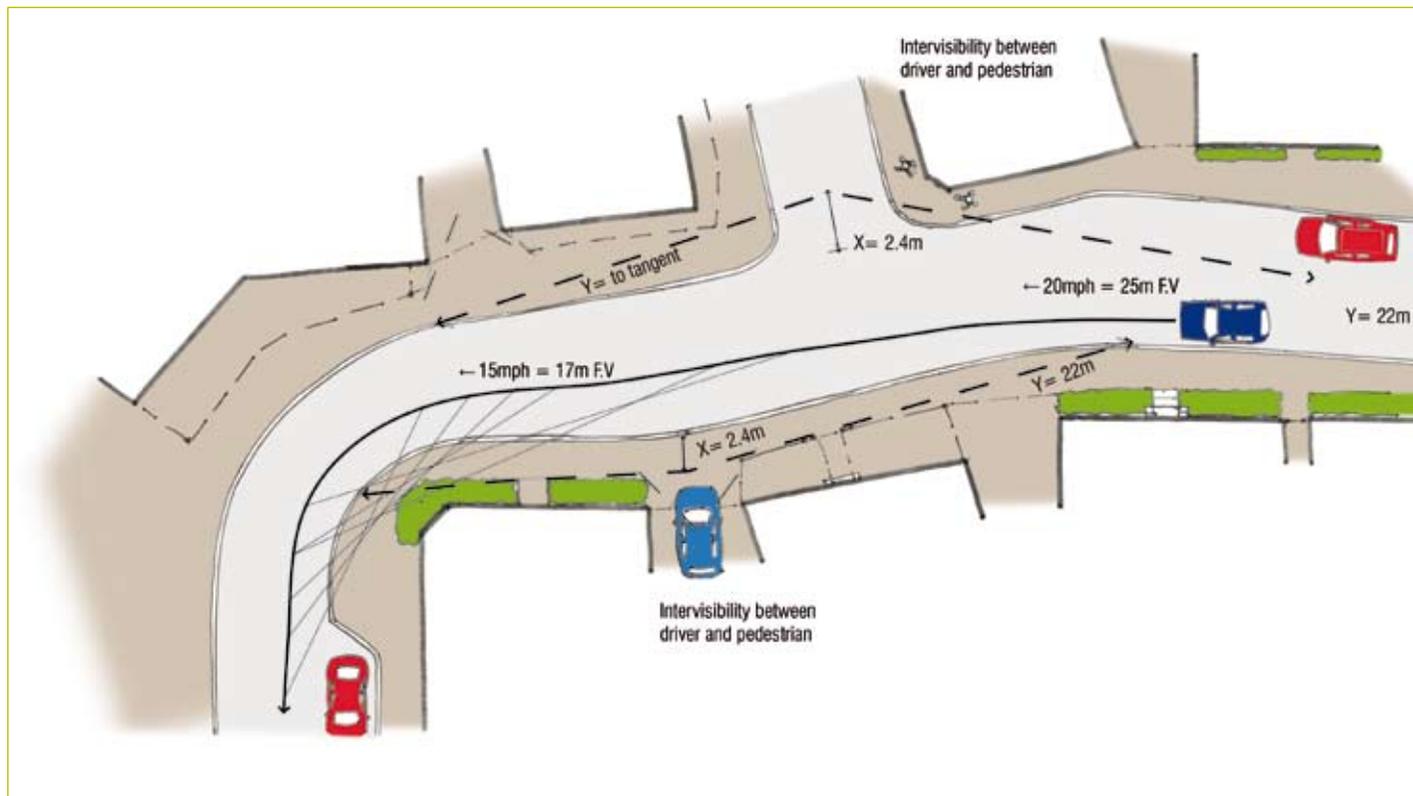
Fig:7.2 Visibility at junction Assessing vehicle speeds and visibility

CHAPTER EIGHT
PARKING

Good provision of public transport and facilities for walking and cycling offer people an alternative to using the private car. Whilst this will encourage a shift away from car usage, it is recognised that the car is the preferred mode of choice for some journeys and levels of car ownership may not reduce significantly in the near future. Therefore, sufficient space should be planned for car parking so that inappropriate parking, which could be detrimental to the safety and amenity of others can be generally avoided. The appraisal of car parking requirements should also take account of their impact on the overall character area of a place and the contribution towards increased street activity.

8.1 Quantity

Quantity of car parking provision should take account of location and access to alternative modes of transport. A balance needs to be struck between an over-provision, which would be wasteful of land and would not help to promote a shift towards other modes, and an inadequate provision, which would either result in high levels of inappropriate parking to the detriment of the streetscape and highway safety or will require retrospective regulation. The tables below indicative levels of car parking reflecting the likely variations in density, level of local amenity and availability of alternative modes of transport.

Since parking standards vary across districts, the quantities suggested in this document must always be checked against the district requirements, which will take precedence.

Where the maximum quantity of parking provision is proposed, it may be appropriate to provide some of the spaces on an unallocated basis to allow flexibility to accommodate casual visitors. Consideration should also be given to potential future use of the space for other purposes should the future demand for car parking reduce. Where the minimum quantity is proposed, parking space should also be provided on an unallocated basis to accommodate visitors and spaces for the disabled.

8.2 Location

Parking spaces should be provided in a combination of ways so that none will appear to dominate.

8.2.1 On street

As a rule, all on street parking spaces must be clearly defined. In more rural settings, however, the parking spaces should be more subtly evident, in order to suit the informal character of the setting. Where parking is to be provided on street, this should form part of the design process to identify appropriate locations. This may also include consideration of spaces for car club vehicles. Unless identified as a parking location, all carriageway space should be assumed as being required for traffic movement, not for parking. In City and Suburban streets suitable parking controls will need to be implemented as part of any adoption process.

City

No. of Bedrooms	Allocated Minimum	Allocated Maximum
1	0	1
2	0	1
3 & 4	0	2

Suburban

No. of Bedrooms	Allocated Minimum	Allocated Maximum
1	1	2
2-3	1.5	2
4 +	2	4

Urban

No. of Bedrooms	Allocated Minimum	Allocated Maximum
1	1	1.5
2-3	1.5	2
4 +	2	3

Rural

No. of Bedrooms	Allocated Minimum	Allocated Maximum
1	1	2
2-3	1.5	3
4 +	2	4

8.2.2 Parking Courts

Large unsupervised parking courts should be avoided. However, smaller courts serving up to about 6 dwellings can be an acceptable way of relocating car parking from the fronts of dwellings and can help reduce the visual impact of parked cars on the street scene. Parking courts should be well related to the dwellings that they serve and should preferably be overlooked or clearly within the private domain.

8.2.3 In curtilage

Where housing densities are lower, space for car parking can be provided within the curtilage of the dwelling. Care should be taken that this does not result in streets dominated by parking spaces in front of dwellings, or by building facades with large expanses of garage doors. It is preferable to locate parking spaces to the side or rear of buildings.

8.2.4 Garages

Garages can help reduce the visual impact of parked cars. However, it is recognised that garages are often used for other purposes, such as general storage and therefore, if they are of a minimal size, will effectively not provide a car parking space. A realistic view should be taken based on the amount of storage space provided elsewhere within a dwelling and the likely need to accommodate items such as bicycles, freezers etc. It is recommended that garages allow at least a further 4 m2 of floor space over and above the standard 4.8m x 2.4m space for parking a car. Generally, garages should be at least 3 metres wide. In some urban and rural locations it may be appropriate to access garages directly from the street. However, they should not dominate the streetscene.

8.2.5 Undercrofts

For housing densities above 50 / ha, it is likely that sufficient space for car parking cannot be provided by the above types alone without a detrimental effect on the quality of the place. Locating car parking either under buildings or under courtyards can significantly improve the quality of places with these higher densities. Planning Authorities will need to ensure that undercrofts and garages are retained for parking.

8.2.6 Cycle Parking

Consideration should also been given to the provision of cycle parking on street to avoid cycles being left in inappropriate places and causing obstruction, particularly to pedestrians. Cycle parking should be provided at bus stops to facilitate interchange between sustainable modes of transport. As with motor vehicle parking, cycle parking should form part of the design process to identify appropriate locations.

Reference to Planning Policy Statement 3

Further Guidance
'Car Parking- What Works Where'
English Partnerships
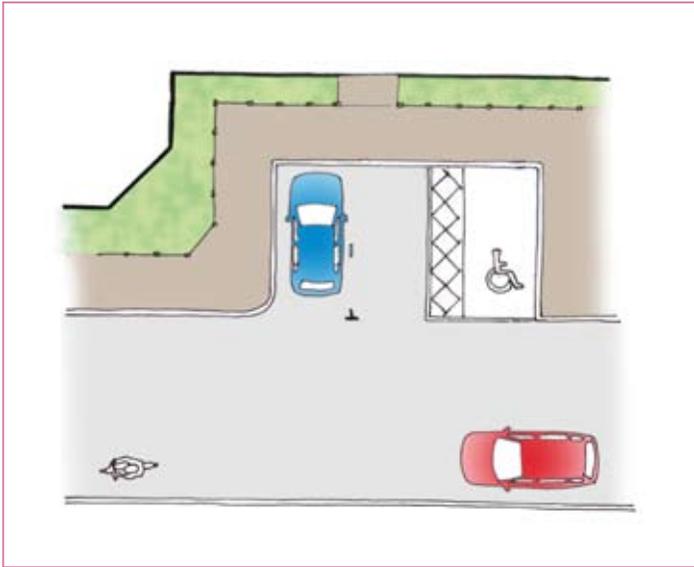
90° Parking
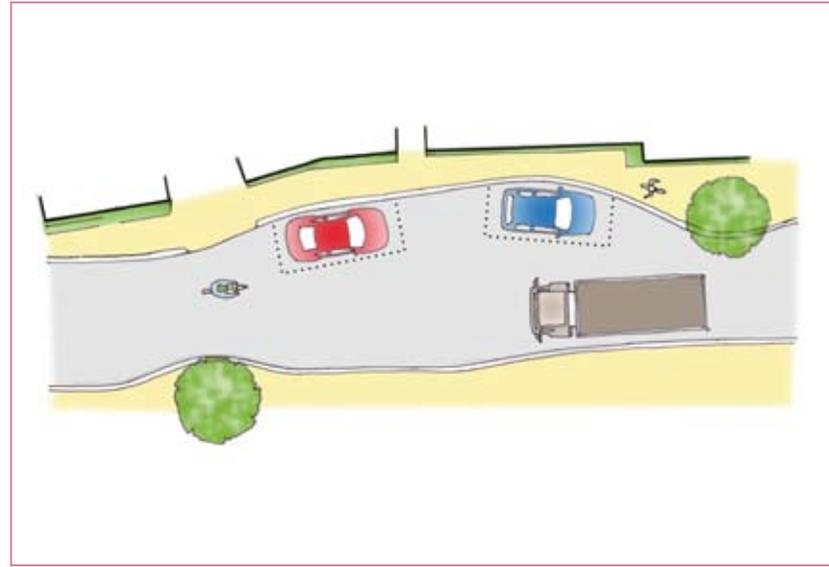
Informal on-street Parking
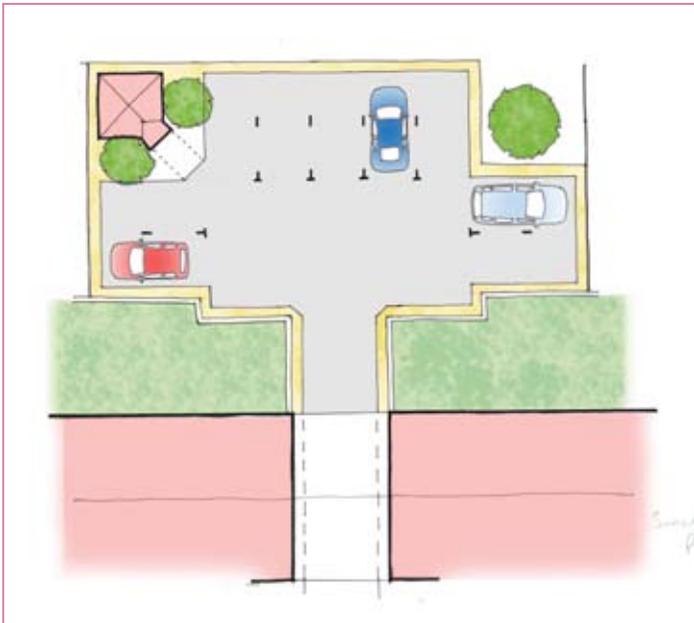
Small Court Yard Parking
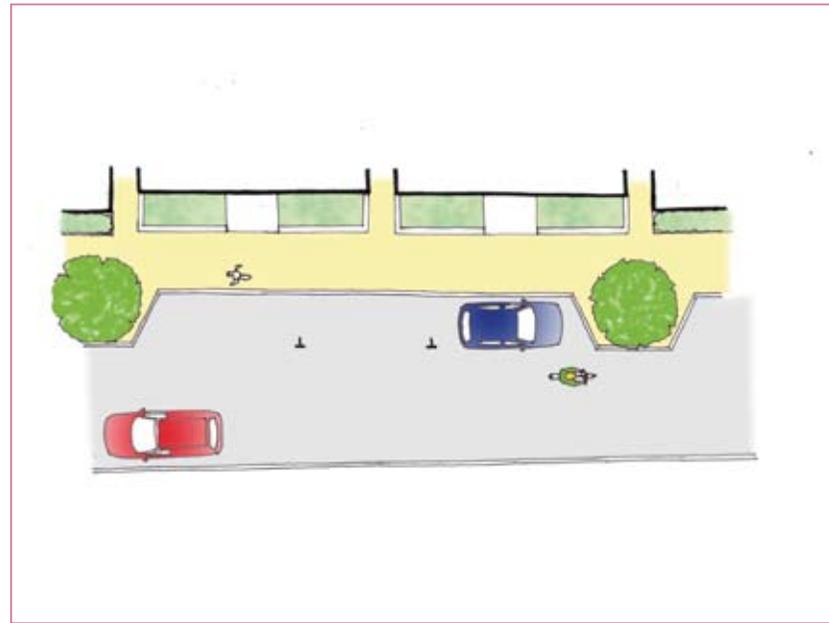
Parallel Parking

9.1 Run off

The strategy for dealing with surface water run off from a development should be based on the existing topography and drainage regime and should be agreed between the different bodies who will be responsible for implementation and future maintenance. Detailed calculations will be required to determine the exact size of drainage facilities to prevent flooding

9.2 Sustainable drainage

9.2.1 Swales

Drainage of roads in rural areas has often traditionally been via ditches. The gentle slope of these has usually meant that surface water reaches streams and rivers more slowly than through piped systems and has offered the opportunity for some infiltration, evaporation and natural treatment of potential pollutants. These principles can be adapted to deal with surface water run off from new streets. Swales are wider and shallower than conventional ditches and can potentially be incorporated into the highway verge. Whilst they are generally more suited to rural locations, they are also appropriate where streets front onto open space or incorporate wide areas of landscaping. In most cases, swales will remain dry for most of the time and therefore it may be appropriate for them to be combined with other amenity space.

9.2.2 Ponds

It can be necessary to temporarily store significant volumes of water. This is to balance the increased rate of run-off from impermeable areas with the limited rates of discharge normally permitted to existing watercourses. Open ponds provide the opportunity to combine this requirement with a feature that can enhance the public realm and contribute towards the ecology of the area. Where ponds are provided, these should preferably be of a type that normally have some water in them but can accommodate additional volumes by allowing higher water levels. The edges should be gently sloping and the use of water tolerant planting can be used to deter access by young children. "Dry" ponds with steep sides requiring safety fencing, and which only have the single infrequent function of providing temporary water storage, should be avoided.

9.2.3 Attenuation devices

Surface water can be attenuated in piped networks by providing larger diameter pipes and chambers with discharge restricted by a flow control device.

9.2.4 Permeable surfaces

An important contribution towards maintaining the existing drainage regime of a site is to allow water to permeate into the ground and either soak away or flow slowly towards a watercourse. The use of open jointed block paving with underlying layer of gravel can significantly reduce run - off by comparison with conventional block paving or macadam

9.3 Street drainage

9.3.1 Gulleys and Gratings

Generally gulleys with iron gratings should be provided to drain impermeable areas of public realm. Gulleys should be located such that there are no large and relatively flat areas that will be slow to drain and should each serve no more than about 200 m2. Surface water from private areas and large unadopted areas should have their own drainage system. However a pragmatic view of this should be taken, which avoids over complicated detailing and the introduction of features that would detract from the appearance of places.

9.3.2 Drainage channels

Where there will be no kerb to guide run-off to gulleys, it may be appropriate to use drainage channels. These can either be open shallow dished channels for relatively small areas (up to 5 m2 / linear metre) or can be of a closed deeper section with either iron or slotted concrete covers. Narrow drainage channels which are likely to require excessive maintenance should be avoided

10.1 General

Soft landscape schemes are one of the most defining features in any street or public realm design. Whether they are an unmanaged indigenous hedge lining a country lane, or an avenue of majestic London Plane trees shading a royal procession along The Mall, the soft landscape has a major influence on the type of space that is created.

10.2 The Locale

Planting schemes should reflect the local landscape character unless special conditions apply. If the setting is rural, the choice of plant species should be indigenous and should be appropriate to the scale of the development. If the setting is urban the choice should echo and enhance the surrounding trends in planting.

Existing planting should be retained and designed into the proposals except under special circumstances. Existing planting will always provide maturity to a scheme in a way that will make it seem to fit more comfortably into its surroundings.

10.3 Street Trees

In particular, it is tree planting that has the most significance for a road, street or spaces. Trees can offer a sense of enclosure and spatial containment, slow traffic, be a barrier between traffic and the pedestrian and/or cyclist. Trees can offer shade, shelter, improve air quality, be a habitat for wildlife, provide a sense of general well-being and be a reflection of the local character. They can even offer an aid to natural drainage – trees absorb the first 30% of most precipitation through their leaf system. Another 30% is absorbed by the root system.

10.3.1 Location of Trees

Trees should be located clear of track ways, set back from kerb lines and should not obstruct sight lines. The set back required will depend on the species of tree and the likely future growth pattern. In most cases, a minimum set back of 1 metre will be required.

Trees can also be used to divide, designate and shade parking areas and shared surfaces. They can also divide carriageways and can separate footway from roads. But wherever they are located, their mature size must be considered; trees planted too close to buildings or carriageways will always be vulnerable to being removed. To avoid the loss of trees, space must be allowed at the design stage for their mature size. The cross sections in this chapter give guidance on the minimum space to be provided.

10.3.2 Tree Species

As a general principle an adequate distance should be available to accommodate the planting of large scale (forest) trees. Adequate distance should be allowed:

- between building blocks
- between building blocks and tree trunks
- between the road edge and tree trunks
- between trees themselves.

In order to gain some proportion and scale between buildings and trees, there should be a direct correlation between the height of buildings and the mature height of the trees. Therefore, to allow the trees to mature to full size, there must be sufficient space between buildings. This does not necessarily equate to road width, but sufficient width between tree canopies should be allowed to accommodate buses and delivery lorries.

On City streets space for trees of the stature of Platanus x hispanica with a mature height and diameter of 30m x 15m should be accommodated. To allow this street to become a bus route the distance between tree trunks should be a minimum of 14-16m. The minimum distance from trunk to building face should be 8-9m to allow trees to obtain full maturity without the necessity of pruning and still allow light penetration to the building.

On smaller urban streets, trees of the stature of Carpinus betulus, Robinia, Sophora, Gleditsia, Betula, Tilia, Faxinus, Acer with a mature height and diameter of between 25 x 8m to 18 x 8m should be accommodated. The minimum distance between trunks should be 9-10m to allow for delivery lorries. The minimum distance from trunk to building face should be 7-8m to allow trees to obtain full maturity without the necessity of pruning and allow light penetration to the building.

Root zones of trees in streets should also be considered. Space should be allocated within the highway for utilities and should not be placed within grass verges which accommodate trees.

Parking should be accommodated a minimum distance of 2.0m from the trunks of newly planted trees.

10.3.3 Tree Planting & Protection
Trees and other planting should be planted in adequate soil depths. Tree pits should be a minimum of 1x1x1m deep backfilled with good quality topsoil. Shrubs beds should be a minimum of 450mm deep topsoil and grassed areas a minimum of 300mm deep topsoil. Allowance should be made for liquid feeding for trees planted into 'urban' soils.

Trees in vulnerable locations such as shared surface areas should always be protected by some method. For example, bollards, surrounding planting etc.

Trees in pavements should be set within a neat and tidy surround, e.g. tree grilles and guards, setts, natural bound gravel, porous resin-bound gravel. The type of surround will depend on the species of tree; trees prone to maturing with surface roots systems such as London Plane will lift tree grilles creating trip hazards. A more flexible surface such as bound gravel should be used in these instances.

Planting intended for adoption by a public body should 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 adequate foundations to allow for tree and shrub growth may be required.

10.4 Verges
Verges may form part of the street, particularly in suburban and residential areas and can improve the environment of a street by softening the hard paved areas. As well as accommodating tree planting, they can also have a drainage function or provide sightlines. Verges containing tree planting should not accommodate utilities.

10.5 Boundaries & Enclosure
Streets are enclosed by buildings and usually private frontages. For them to have coherence, the interface with the public realm needs to be carefully detailed. It is often appropriate for fences, walls, railings, hedges and other planting to separate private areas from public areas. These can take on many difference designs and convey different approaches to the separation. For instance, railings or a picket fence can convey a welcoming semi-public frontage. Whereas a high fence or hedge conveys a very private space only to be entered by invitation.

Wall and fence design and materials should take a cue from the materials in use in the vicinity and the colour of fencing can be of particular importance.

Hedges should be used where this is typical of local character. These can vary in character from a high unmanaged, rural hedge to a neat, low lavender hedge along a suburban residential road.

Table 13.3 indicates boundary treatments that will normally be appropriate. (Table to be amended.)

10.6 Green Corridors

Green corridors are linear landscape features running through developments dedicated to wildlife movement, informal recreation and often pedestrian/cycle routes. They are primarily designed to include the natural world within a development and to link it to the surrounding countryside.

They can also combine creative use of existing trees, watercourses, topographic features, soft boundaries to open countryside, new wildlife habitats and reinforcement and protection of existing sites of wildlife importance. They can also maximise views from within a site and accommodate sustainable drainage features.

In planning for green corridors, a balance needs to be struck between access, preservation and levels of activity. The overriding objective must be to protect and/or enhance the prime function of the particular corridor and to ensure that design strategies help deliver that prime function.

10.7 Amenity Spaces

Amenity spaces can be created within the streetscape. These can range is size and importance from an incidental pocket park nestling at the pedestrian entrance to housing or a grand urban square, lined with trees and accommodating social and relaxation areas, entertainment opportunities as well as transport interchanges.

Amenity space should be provided in coherent, accessible and above all usable areas. Smaller spaces that may primarily be of value for visual amenity should be limited to prominent key positions.

These spaces should be designed with the user in mind, particularly the pedestrian. They should be clearly defined with pedestrian routes carefully considered at any early stage. They should be designed with only high quality, durable materials and should include tree planting for shade and shelter and to soften the urban fabric.

Typical Cross-Section of City Street with Street

Tree Spp:- London Plane

**Mature Ht at 30 yrs:- 30m**

Mature W at 30 yrs:- 16m

Note - This cross section is of a city street containing two rows of trees at a semi-mature state.

3 Storey Building
Approx height 9m &
3m to ridge line of
roof

MIN 8m   MIN 14m   MIN 8m

3 Storey Building
Approx height 9m &
3m to ridge line of
roof

HARD PAVED PUBLIC REALM   HARD PAVED PUBLIC REALM

VERGE   PARKING UTILITIES   CARRIAGEWAY   PARKING UTILITIES   VERGE   CYCLE PATH

9m   2.1m   8m   2.1m   9m

30.2m
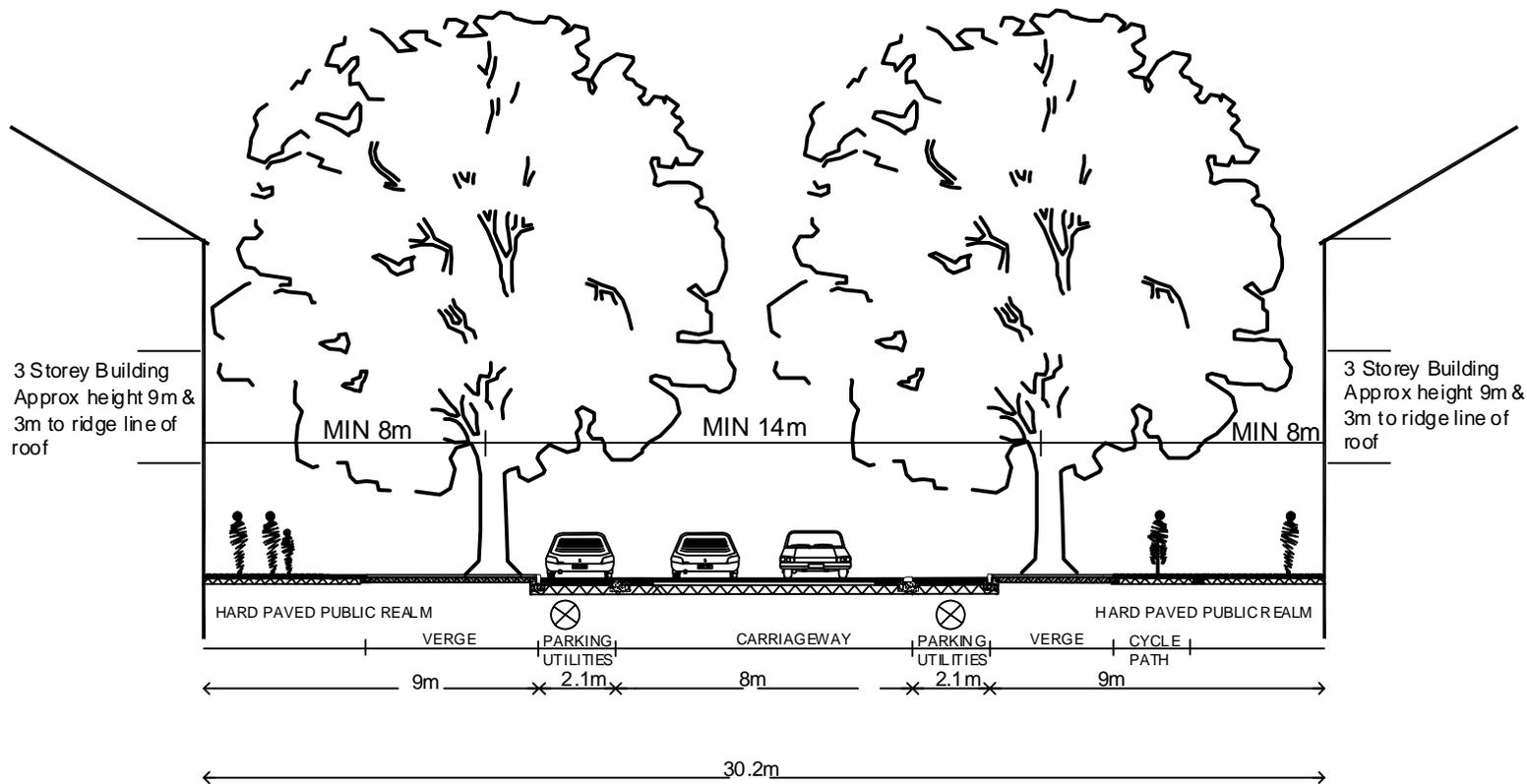
TYPICAL CROSS -SECTION OF SUBURBAN STREET WITH STREET TREES
NOT TO SCALE

Tree Spp:- Lime
Mature Ht at 25yrs:- 20m
Mature W at 25 yrs:- 16m

Note:- This cross section is of a suburban street containing two rows of trees at a semi-mature state.

3 Storey Building
Approx height 9m &
3m to ridge line of
roof

3 Storey Building
Approx height 9m &
3m to ridge line of
roof

MIN 6m   MIN 10m   MIN 6m

PRIVATE FRONTAGE	PATH	PARKING & VERGE	UTILITIES	CARRIAGEWAY	UTILITIES	PARKING & VERGE	PATH	PRIVATE FRONTAGE
2m	2m	3m		7m		3m	2m	2m

22m
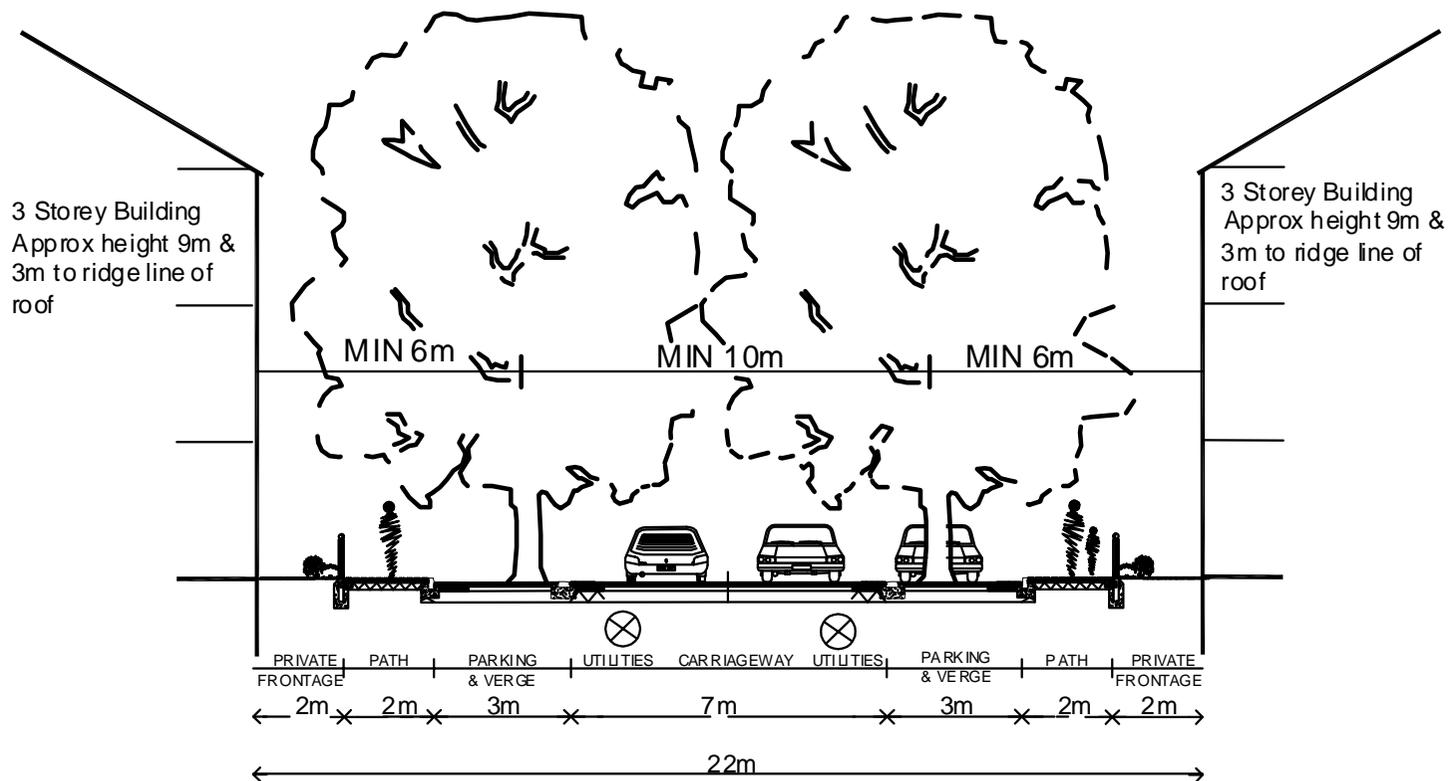
11.1 Location

11.2 Cabinets & Kiosks

Requirements for cabinets and kiosks to house statutory undertakers equipment should be considered when the layout is being planned to avoid them subsequently compromising footway widths and having a detrimental effect on an otherwise attractive street scene.

11.3 Covers

The likely location of covers to manholes and other service chambers should be considered. Whilst this may be seen as a detail, numerous covers, located apparently at random and of a contrasting colour to the surfacing, can significantly detract from the overall appearance.

In block-paved areas, the use of recessed tray covers can provide a more uniform appearance to the surfacing. Making sure that rectangular covers are in line with the blockwork, together with careful detailing of the surround, will make a big difference.

11.4 Recycling & Waste Collection

Waste collection is an essential service and therefore must be considered when planning streets and public spaces. Generally, the provision of well connected streets and the avoidance of cu-de-sacs will enable routes for waste collection vehicles to be adequately accommodated. However, it should be recognised that in some circumstances it may be inappropriate in overall design terms to modify a layout simply to accommodate occasional very large refuse vehicles and consideration of other means of waste collection should be considered with the local waste authority as part of the consultative process. Designers should not assume that waste bins can be stored on street.

11.5 Street Cleansing

Future maintenance and cleansing of streets should be considered such that areas are not created that will be particularly difficult to cleanse in the future.

http://www.cambridgeshire.gov.uk/NR/rdonlyres/ BBED0BD8-9697-4493-BD48-988CC280FFEF/0/ herc2005_chap17.pdf

Further Guidance
'Waste Management Design Guide'
Cambridgeshire County Council

Street lights and signs need to be well integrated into the design and the principles agreed at an early stage. Retrospective imposition of a "standard" streetlight layout onto a street without consideration of the position of buildings or the impact of lighting on the wider area is unacceptable. Similarly, the need to accommodate any signage should be considered at an early stage and thought given to how it will be located.

Each element of street furniture must have a clearly defined useful purpose to avoid unnecessary clutter.

12.1 Street Lights

Residents normally expect street lighting within their roads irrespective of the location, therefore lighting will usually be required in all new developments.

However, many rural places in Cambridgeshire do not have the same high intensity of lighting as that provided in City, Urban and Suburban areas.

Indeed, in some rural areas, virtually no street lighting exists. Street lighting is installed primarily to make the passage of vehicles and pedestrians safer but also to provide some security against night time crime and the fear of crime. A careful balance therefore needs to be struck between providing lighting to enhance security and at the same time exercising restraint to maintain the character and dark skies of these places.

The guidance given on lighting levels recommended purely to illuminate highways should not be regarded inflexibly and the creative use of lighting in more urban areas can enhance the setting of buildings and public spaces although designers will need to consider a balance between the environmental impacts and the desire to minimise visual intrusion in the public realm.

12.1.1 Location

Street lights would normally be column mounted as this generally offers the most efficient way

of delivering the desired level of illumination. Wall mounted lanterns can help to minimise the amount of clutter on street but they can be inefficient in the way they deliver light and may require additional lanterns to be provided, thereby increasing power consumption and long term maintenance costs. There is therefore an environmental balance to be made in the amount of energy used and the desire to avoid cluttering streets with street lighting columns.

Designers will need to ensure that the use of building mounted lights does not undermine the efficiency of the design in terms of overall energy consumption. The location of any building mounted lights will need to be sited to allow optimum light onto the highway at the time of installation and into the future and will require appropriate access for maintenance through a wayleave system.

Careless use of street furniture can detract from an otherwise attractive street

The location of lighting columns should avoid impacting on pedestrian and cycle routes. In general they should either be at the rear of paths or within verges. Columns should be set back appropriate distances from the edge of carriageway taking into account the category of road upon which they are placed.

12.2 Signs

The aim should be to create a public realm that is as free from clutter as possible. Minimising highway signage can help achieve this. In a legible place with a strong sense of character and low vehicle speeds, it should be unnecessary to direct people or warn against the unexpected.

Many highway signs are not a legal requirement. However, where there is a statutory requirement for a sign, or where it is considered absolutely essential to provide one, they should be of minimum size and located as sensitively as possible. For example signs can be fitted to existing columns or bracketed from buildings.

Street nameplates should be of a design appropriate to the area and fixed to buildings or boundary walls wherever possible.

12.3 Road Markings

The absence of road markings can significantly enhance the appearance of a street and can reduce the impression of vehicle domination. As with signage, there should be little or no need for road markings if the layout is clear and vehicle speeds are low and it should be presumed that secondary and tertiary streets will not normally require any road markings.

Where markings are required, such as at a junction with a main street or to enforce parking restrictions, they should be of the minimum widths permitted.

FELTON·STREET

Many materials are mainly chosen on the basis of cost and the ability to maintain them in the future. Whilst these are understandable considerations, the aesthetic quality of the materials used in the public realm can play an important part in lifting the character of a place.

A limited, but carefully considered, palette of materials is likely to produce a more pleasing result and will be easier to maintain in the future. The following sections give guidance on materials that will normally be acceptable. However this does not rule out the use of alternatives where it can be demonstrated that they are appropriate for a particular place.

13.1 Surfacing

13.1.1 Carriageways and shared surfaces

Blacktop
The most commonly used material for carriageways is bituminous macadam or asphalt, usually referred to as "blacktop". Whilst in itself, not particularly aesthetically pleasing, it provides a smooth, durable and relatively easily maintainable surface for vehicles.

Small element concrete block paving
This is generally more suitable for areas with low traffic flows and is particularly useful to help reinforce pedestrian priority on shared surfaces or to encourage lower vehicle speeds. It is available in a variety of types that now include some suitable for permeable pavements. Whilst consideration will be given to specific types for a particular development, the following types will normally be preferred.

Regular 200mm x 100mm block with integral spacers and chamfered edges to BS EN1338

Rustic finish blocks of various sizes, Textured granite aggregate setts

Bound gravel surface dressing
This may be appropriate for streets with very low traffic flows and where the number of heavy vehicle likely to use them is insignificant. Adoption of bound gravel materials would depend on the construction specification. Table 13.1. indicates the preferred materials in different locations.

13.1.2 Car parking areas
Car parking areas are subject to wheel scuffing and potential oil staining. Therefore surfaces that could be easily damaged or light coloured should be avoided.

13.1.4 Footways & Cycleways

People walking and cycling tend to have more appreciation of the quality of the public realm. Footways usually abut buildings and boundaries and consequently need to be responsive to them. The materials used for footways and cycleways should therefore be chosen with care, including their future maintenance. Whilst they still need to be durable, they generally do not need to have the same level of structural performance as materials used in the carriageway and therefore there is the opportunity to use more variety. The choice of material should also reflect the context.

Table 13.3 sets out some options for footway and cycleway materials. Blacktop materials can provide a functional surface which can be appropriate in some areas although the appearance can often be bland, adding little to visual amenity.

The use of alternative materials such as paviors and slabs can enhance the look of a street and be more sympathetic to the style of the development, however their proximity to the carriageway may impact upon the future maintenance and suitable construction depths are required . Where blacktop materials are proposed the use of chippings rolled into the material could be considered to enhance the appearance, however technical advice should be sought. Wherever blacktop materials are used on wide footways consideration should be given to softening a bland appearance by suitable edge treatments possibly by the use of paviors.

Shared use footways where cycling is permitted should be identified in city and urban environments by the use of red surfacing. Where pedestrians and cyclists are segregated on shared footways, red surfacing may be useful to indicate the part of the footway for cyclists with a solid white line used to demarcate the segregation.

13.2 Kerbs & Edgings

High quality kerbs and edgings can significantly lift the design of the street. This is particularly important where blacktop is used and where the use of standard concrete units would result in a drab design. Using wider kerbs can also help reinforce the quality of the adjacent footway. Granite kerbs will give a very high quality feel, particularly in city areas. However, textured pre-cast concrete kerbs with granite aggregate can provide a good alternative.

13.3 Boundary Treatments

Boundary treatments form an important part of the streetscene and help reinforce character and local distinctiveness

|	City		Urban		Suburban		Rural	
	Carriageway	Shared Surface	Carriageway	Shared Surface	Carriageway	Shared Surface	Carriageway	Shared Surface
Main Street	Blacktop	(Granite aggregate setts)	Blacktop	(Rustic paving Regular paving)	Blacktop Regular Paving	(Rustic paving Regular paving)	Blacktop	(Rustic paving)
Secondary Street	Blacktop Grainite aggregate setts Rustic paving Regular paving	Grainite aggregate setts Rustic paving Regular paving	Blacktop Grainite aggregate setts Rustic paving Regular paving	Rustic paving Regular paving	Blacktop Regular Paving	Rustic paving Regular paving	Blacktop Rustic paving	Rustic paving
Tertiary street	Blacktop Grainite aggregate setts Rustic paving Regular paving	Grainite aggregate setts Rustic paving Regular paving	Blacktop Rustic paving Regular paving	Rustic paving Regular paving	Blacktop Regular Paving Rustic paving	Rustic paving Regular paving Bound gravel	Blacktop Bound Gravel Rustic paving	Rustic paving Bound gravel

Table 13.1 Carriageway Materials

City	Urban	Suburban	Rural
Paved private strip to building Masonary walls Iron railings	Paved private strip to building Brick walls Iron railings	Hedges Low planter Timber fences Grassed open frontages	Paved private strip to building Low planter Hegdes Timber picket fence

Table 13.2 Boundary treatments

	City	Urban	Suburban	Rural
Main Street	Granite agregate pc slabs Yorkstone slabs Regular paviors Rustic paviors	Granite agregate pc slabs Regular paviors	Granite agregate pc slabs Regular paviors Blacktop	Blacktop Bound gravel
Secondary Street	Granite agregate pc slabs Yorkstone slabs Regular paviors Rustic paviors	Granite agregate pc slabs Regular paviors Blacktop	Granite agregate pc slabs Regular paviors Blacktop	Rustic paviors Blacktop Bound gravel
Tertiary street	Granite agregate pc slabs Yorkstone slabs Regular paviors Rustic paviors	Granite agregate pc slabs Regular paviors Blacktop	Granite agregate pc slabs Regular paviors Blacktop	Rustic paviors Blacktop Bound gravel

Table 13.3 Footpath and Cycle way materials

The public realm will probably have several functions, such as highway, amenity space, and drainage. As mentioned in section 3.4, privately maintained frontages can also effectively form part of the public realm. It is important that future responsibilities are discussed and agreed at an early stage and that a strategy for looking after the whole of the public realm is established. Creating a well-coordinated public realm will inevitably require some flexibility over who will be responsible for what. The aim should be to establish who has predominant responsibility and seek to agree what needs to be done to enable this to happen.

14.1 Highway Adoption

Cambridgeshire County Council, as local highway authority, will normally be responsible for the following areas within the public realm, subject to policy and specification requirements being satisfied:

- Areas available for the movement of people and vehicles, i.e. carriageways, footways and cycle paths. The adoption of permeable surfaced may be dependent on suitable commuted sums being agreed.

- Unallocated parking areas within or adjacent to carriageways with suitable controls funded by developer

- Areas that accommodate forward visibility or junction sightlines

- Margins to accommodate statutory undertakers mains services

- Highway lighting

Where all policy and specification requirements

can't be met it may be possible for areas to be adopted provided suitable commuted sums are agreed.

14.2 Trees

Trees on the highway will normally be maintained by local district or parish councils or other third parties.

14.3 Adoption of open space community facilities

Amenity areas, such as public open spaces and play areas, will normally be adopted by local district councils. These spaces may also include sustainable drainage features provided that they also have some amenity value.

14.4 Drainage Authority

Anglian Water will normally adopt main surface water sewers that do not predominantly take run off from the highway. Currently, the drainage authority will not adopt open watercourses or storage ponds that form part of a sustainable drainage system

14.5 Management Companies

Where there is no duty for spaces to be adopted by any of the statutory bodies, a management company set up on behalf of residents may offer a suitable way of dealing with future responsibilities for maintenance. This option is more likely to be successful in situations where there is clear connection between the responsibilities of the management company and the immediate expectations of residents, for example, a play area within a home zone. It is less likely to be successful where a management company is responsible for remote and less obvious areas.

14.6 Neighbourhood & Private Responsibility

The following areas will normally be expected to be the responsibility of private owners:

- Driveways serving less than about 6 dwellings or individual commercial premises
- Footpaths that are predominantly for the benefit of small groups of dwellings but may provide a public route
- Private or paved strips fronting buildings

14.7

Effective management of on street car parking will usually require the imposition of traffic regulation orders. These should be implemented in such a way as to minimise the need for signage or road markings.

The preceding sections have detailed the different considerations that will have to be taken into account when designing streets and public spaces, and have highlighted the various procedures and responsibilities. The success of the places we create will be largely dependent on how well these different factors have been integrated and how responsibility for looking after them is coordinated.

15.1 Integrated Design
Particular attention should be paid to the interfaces between spaces with different functions and future maintenance responsibility, to ensure that they appear as seamless as possible. The following examples are not intended to represent a particular solution, but indicate some features of integrated design that will be expected related to different types of street.

The following guidance is intended to illustrate how different streets within the four urban types could be approached incorporating some of the following features.

City
- Broader footways to accommodate higher levels of pedestrian activity
- Brass studs deliniate highway adoption
- Cycle parking
- Some street lamps fixed to buildings
- Designed in space for bus shelter
- Bus ticket machine fixed to shelter
- Parking bays with permeable paving

Urban
- Segregated cycle lanes on primary routes
- Low kerb between cycle lane and footpath
- Bus shelters

- Widened footway to accommodate bus shelter
- Cycle racks near bus stop
- Chamfered corners to provided pedestrian intervisibility
- Cyclists share carriageway in minor street
- Tactile paving
- Widened footway at junction can accommodate trees
- Swale / SUDS within frontage of buildings
- Car parking bays clearly defined

Suburban
- Segregated cycle way and footpath due to high level of cycling anticipated
- Some on street visitor parking
- Street lighting column located between parking spaces
- Paving continued to building with high boundary denoted by marked studs
- Parking stands for cycles on privately maintained forecourts
- Footway and cycle way continued at grade with vehicle access ramped up
- Low kerb between cycle way and footpath
- No distinction between highway verge and open space
- SWALE within public open space forms a feature and deters vehicles

Rural
- Off street parking for shops
- Bus shelter incorporated into building layout
- Variable carriageway width can accommodate some on street parking
- Space within village green can flood to attenuate surface water run off from adjacent

paved area
- Simple materials, bound gravel surface, textured kerbs, black top carriageways
- Minimal road marking to denote priority

Homezones
- Individual designs will vary in character but should contain most or all of the following features
- Entrance gateway feature incorporating ramp, tight radius and carriageway narrowing
- Distinctive surfacing
- Trees and landscaping
- Semi formal car parking spaces
- Cycle parking
- Play equipment
- Street furniture
- Facilities for refuse collection
- No through route for vehicles except interconnection to other homezones
- Links to footway and cycleway network
- The following examples are merely indicative and do not necessarily represent a particular design solution.

15.2 Check list
The checklist is intended to summarise the key points in this guide and to act as an aide memoir throughout the process. The aim should be to answer YES to all the questions.

City

Primary

	Typical	Range
Carriageway width	8.0	6.5 – 10.0
Footway width	2.5	2.0 – 4.0
Cycleway width*	2.0	1.8 – 2.0
Verge / tree set back*	1.5	1.0 – 2.0
Parking bays	formal	
Building set back	0.5	0 – 2.0
(* where proposed)		

Secondary

	Typical	Range
Carriageway width	6.0	5.5 – 7.0
Footway width	2.0	1.8 – 2.5
Parking bays	formal	
Building set back	0.5	0 – 1.0

Tertiary
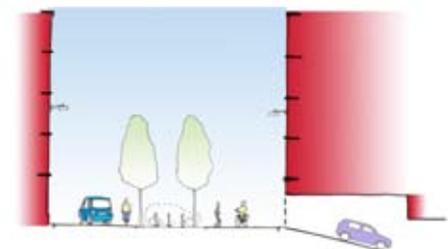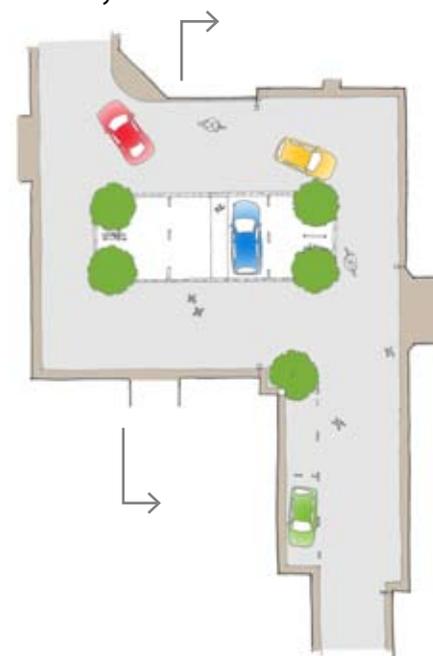
	Typical	Range
Carriageway width	5.0	4.5 – 5.5
Footway width	2.0	1.8 – 2.5
Parking bays	formal	

URBAN

Primary

Secondary

Tertiary
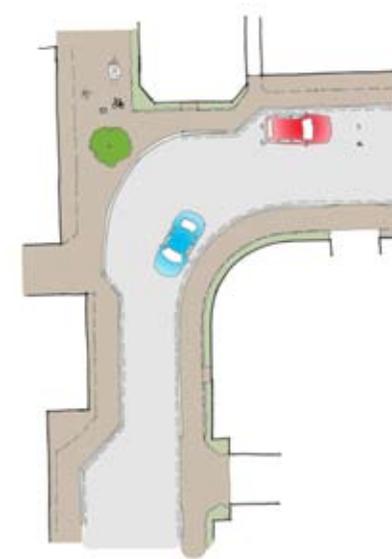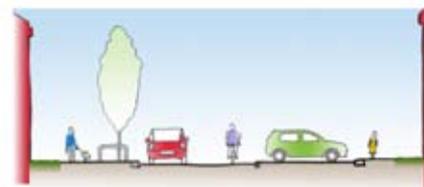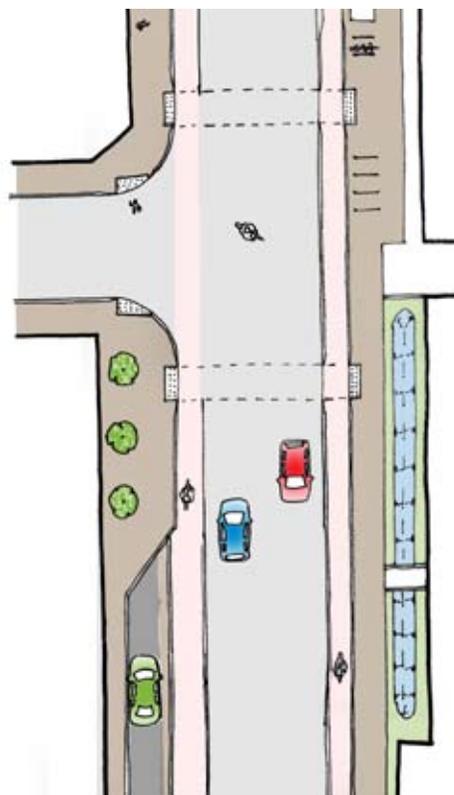
	Typical	Range
Carriageway width	7.0	6.0 – 8.0
Footway width	2.0	1.8 – 2.5
Cycleway width*	2.0	1.8 – 2
Tree set back*	1.0	1.0 – 2.0
Parking bays	formal	
Building set back	2.0	0.5 – 3.0
(* where proposed)		

	Typical	Range
Carriageway width	5.5	5.0 – 6.0
Footway width	2.0	1.8 – 2.5
Parking bays	formal	
Building set back	1.5	0.5 – 3.0

	Typical	Range
Carriageway width	5.0	4.5 - 5.5
Footway width	2.0	1.8 - 2.5
Cycleway width	2.0	1.8 - 2
Verge width	n/a	
Parking bays	formal	

Primary

Secondary

Tertiary

SUBURBAN
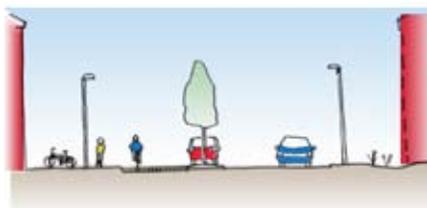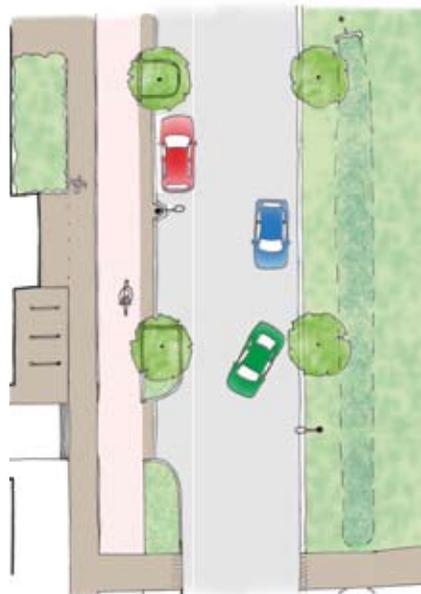
	Typical	Range
Carriageway width	7.0	6.5 – 7.5
Footway width	2.0	1.8 - 2.5
Cycleway width*	2.0	1.8 – 2.0
Verge/ tree set back*	2.0	1.0 – 2.0
Parking bays	formal	
Building set back	3.0	2.0 – 5.0
(* where proposed)		

	Typical	**Range**
Carriageway width	5.5	5.0 – 6.0
Footway width	2.0	1.8 - 2.5
Verge width	2.0	1.0 – 2.0
Parking bays	formal	
Building set back	3.0	2.0 – 4.0

	Typical	**Range**
Carriageway width	5.0	4.0 - 5.5
Footway width	1.5	1.5 - 2.0
Parking bays	informal	

RURAL

Primary

Secondary

Tertiary
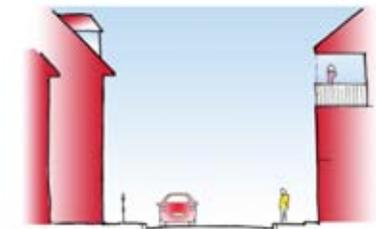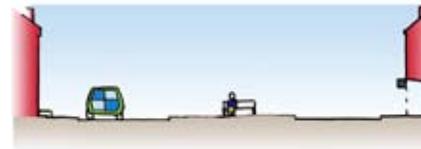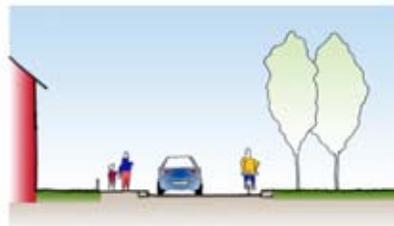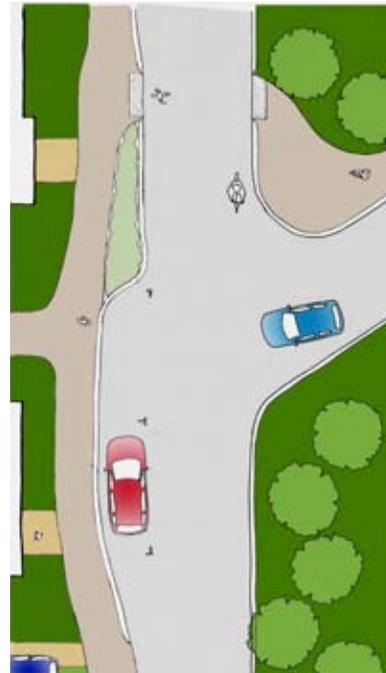
	Typical	Range
Carriageway Width	5.0	4.5 – 5.5
Footway Width	2.0	1.8 – 2.5
Cycleway Width	2.0	On carriageway
Verge Width *	Not normal	
Parking Bays	Formal	Also informal
Building Set Back	5.0	2.0– 10.0
(*where Proposed)		

	Typical	Range
Carriageway width	5.0	4.5 - 5.5
Footway width	1.5	1.5 - 2.0
Parking bays	informal	
Building set back	5.0	0.5 – 10.0

	Typical	Range
Carriageway width	5.0	4.5 - 5.5
Footway width	2.0	1.8 - 2.5
Cycleway width	2.0	1.8 - 2
Verge width	n/a	
Parking bays	formal	

15.2 Check list

The checklist is intended to summarise the key points in this guide and to act as an aide memoir throughout the process. The aim should be to answer YES to all the questions.

#	Question
1	Is a collaborative approach being taken?
2	Have roles and responsibilities been identified?
3	Does everyone understand the urban context?
4	Has historical context been taken into account?
5	Has the topography been taken into account?
6	Will there be good links to other places?
7	Is there a consensus on what sort of place it will be?
8	Have hierarchy plans been produced for Activity, Character and Movement?
9	Does every space on the plan have a function?
10	Are the extents of public space and private domain clear?
11	Have unsupervised or unsecurable spaces been eliminated?
12	Has sufficient space been provided for pedestrians
13	Have the needs of the disabled been taken into account?
14	Are cycle routes appropriately located?
15	Will there be sufficient space for storing cycles?
16	If appropriate, have the needs of equestrians been taken into account?

#	Question
17	Will everyone be within a reasonable walking distance of a regular bus route?
18	Have bus stops and shelters been incorporated into the design?
19	Will the street layout help encourage lower vehicle speeds?
20	Are the streets defined by the buildings and landscape?
21	Can large vehicles be accommodated?
22	Is there the right balance between providing sufficient visibility and creating an attractive urban form?
23	Can the likely demands for car parking be accommodated without adverse impact on the streetscene?
24	Has dealing with surface water run off been integrated into the overall design?
25	Has an appropriate level of landscaping been included in the plan?
26	Have statutory undertakers plant and services been considered and incorporated into the plan?
27	Are facilities for refuse collection and recycling provided?
28	Is there a design strategy for street lighting and signage?
29	Has an appropriate palette of materials been proposed to provide an attractive and contextual public realm that can be maintained in the future?
30	Is there a strategy for future adoption and stewardship of all of the public realm?
31	Have all the elements of the design been well integrated?