





# Delivering Streets and Places 2017

Cheshire East Council

Derby City Council

DERBYSHIRE County Council

Nottingham City Council

Nottinghamshire County Council

Leicester City Council

# Foreword

*'Good quality and safe streets are achieved by recognising the fundamental relationship between the built form and the spaces they create'*

During the production of Delivering Streets and Places (DSP) the above message became abundantly clear. Indeed, the design of streets and public places is critical in shaping our cities, towns and villages. Notably, the provision of quality design features can open up significant and valuable opportunities to the economic success, safety and vitality of local communities.

DSP is a collaborative undertaking of the 6Cs Local Highway Authorities along with a number of key stakeholders, including several Local Planning Authorities, major house builders and developers, and special interest groups. The recommendations contained within the guide reflect current best practice and are aligned with national guidance.

This guide requires all stakeholders involved in the design process to commit to adapting practical design approaches whilst encouraging them to work more effectively. Led by a coherent set of eight high-level design principles, this guide seeks a positive transformation of the design, approval and delivery of development streets in the 6Cs area. The introduction of Design Element Sheets (DES) facilitate the implementation of any emerging ideas and future changes in design philosophy as the need arises.

DSP is intended to positively influence local action on issues that matter to all, including the challenges resulting from physical inactivity and social isolation, while delivering cross-sector benefits in the longer term. The 6Cs authorities are delighted to present this design guide as the starting point for highways and development in the 6Cs area.

## Managing this design guide

A management board has been formed to direct the ongoing development and management of DSP. The management board makes decisions about the design guide and considers whether updates, changes, further research or links to other documents are required. The management board consists of officers from each of the 6Cs authorities and is chaired by an independent Chair. Contact information for the board is provided below:

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# Acknowledgements


## Project team

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- 6Cs board members.
- Phil Jones Associates.
- David Lock Associates.
- Opun.
- Edwards & Edwards Consultancy Ltd.

# 1. Introduction

# 1. Introduction

## 1.1 Purpose

DSP aims to provide a coherent and flexible design guide for highways and development that serves as the principal point of reference for all development within the area managed by 6Cs members, which is comprised of the following Local Highway Authorities (LHA):

- Cheshire East Council (unitary).
- Derby City Council (unitary).
- Derbyshire County Council.
- Leicester City Council (unitary).
- Nottingham City Council (unitary).
- Nottinghamshire County Council.

DSP sets out high-level design principles, processes and design outcomes, which are expected to govern street design and development. Its content reflects current best practice, aligns with national guidance and aims to meet, as far as practicable, the needs of all stakeholders involved in the planning, design, approval, construction and maintenance of highways and developments.

Importantly, it does not advocate a 'one-size-fits-all' approach, but instead relies on stakeholders' willingness to work jointly. This includes those who use the guide (e.g. developers, LHAs and Local Planning Authorities [LPA]), those who use the streets (e.g. communities and visitors), and those who have a less explicit, but no less important, stake in overall street operation (e.g. public health bodies, utility companies, bus operators, emergency services, etc.).

The importance of streets in promoting health, happiness and well-being, safety and security, and in engendering community spirit lies at the heart of DSP.

## 1.2 Changes in design philosophy

DSP embraces current design philosophy to promote more flexible design outcomes that enrich local communities and put people first. Key changes incorporated within DSP in contrast to the old 6Cs Design Guide include:

- The identification of eight high-level design principles that serve to guide development and act as a basis for reconciling functions of place and movement.
- The advocacy of a way of working from concept stage to final adoption based on collaboration and shared responsibility.
- A clearer and more concise collaborative design process.
- Consideration of urban design and inclusive design principles as a key component in street design.
- The scope for inclusion of Sustainable Drainage Systems (SuDS) within development schemes including arrangements for the adoption and maintenance of SuDS which varies significantly between unitary and two-tier authorities so early discussion is encouraged.

This guide is mainly applicable to residential and mixed use developments, but also of relevance to commercial and employment-led developments. It may also be referred to for the assessment and design of existing streets with a speed limit of 30mph or below.

Generally, vehicular accesses points on existing roads with a speed limit of 40mph or higher, or where 85th percentile speeds are more than 40mph shall be designed according to the Design Manual for Roads and Bridges (DMRB). This approach is advocated where the introduction of speed restrictions on the exiting highway network is impracticable. For other circumstances, designers shall normally apply DSP.

In the absence of authority-specific advice, the design and construction of works on existing or proposed infrastructure not covered by this guide, shall comply with the DMRB.

# 2. Purpose of DSP

# 2. Purpose of DSP

## 2.1 Statement from the 6Cs authorities

The design of streets and the developments they serve is complex and requires an understanding of the many different functions they provide, including place, movement, access, drainage and parking. To ensure that all the different functions of streets are considered appropriately, the aim will be to work together to achieve the following purpose.

### *The Purpose*

*To deliver adoptable streets and attractive places that are safe, inclusive, healthy and well-managed*

To achieve this purpose, the LHAs require high quality and safe streets to be delivered. Design elements are to be assembled in such a way as to facilitate the integration of the various street functions, as appropriate to context (see Chapter 5). This is with a view to creating well-balanced, sustainable schemes.

The purpose referred to above will be achieved through the adoption of eight 'High-Level Design Principles' to help reconcile the different functions that streets must provide.




An example of a street that responds to the local context and offers an attractive place

# 3. High-Level Design Principles

# 3. High-Level Design Principles

DSP is based around a set of eight high-level design principles, as outlined in Figure 3.1. These principles serve as the foundation for the design process and the detailed technical guidance provided within this document.

**Figure 3.1 High-level design principles within the area managed by the LHA**

- Designing by collaboration
- Enabling walking and cycling
- Providing welcoming public spaces
- Supporting safety and security
- Designing for all
- Responding to the local context
- Increasing resilience for the future
- Supporting innovation

All stakeholders involved in the design, approval and delivery of development streets are expected to sign-up to these design principles.

## Principle 1. Designing by collaboration

An ethos of joint working is an essential part of the design culture to be applied at all stages of the design process and is important to:

- Set shared objectives.
- Understand one another's interests, aspirations and requirements.
- Reconcile any competing interests or site-specific challenges in an efficient and amenable way.

Stretched local government resources means that it is not always practicable for all stakeholders to meet around the table. The inability of a stakeholder to attend a meeting shall therefore not be used as a reason to exclude the involvement of those with a stake in the design. Collaboration can equally be achieved by sharing information and seeking the views of stakeholders, who are unable to attend prior to meetings.

## Principle 2: Enabling walking and cycling

Achieving a greater uptake of walking and cycling, or 'active travel', leads to a wide range of benefits such as:

- Improvements in health and wellbeing.
- Reduced costs to the health service in tackling issues such as obesity and respiratory diseases.
- A more efficient movement of vehicles within the road network leading to decongestion; improved air quality.

A fundamental principle is therefore to enable and encourage walking and cycling through the design process. This will only be achieved if design solutions place these modes at the heart of the movement strategy to give precedence to walking and cycling over motor vehicles wherever practicable to maximise their uptake.

## Principle 3. Providing welcoming public spaces

The public realm is largely made up of streets. Successful designs shall embrace good urban design to ensure that streets are attractive and enjoyable places to linger and pass through. This encourages:

- Walking and cycling.
- Social interaction.



A playground effectively integrated to residential development.



A pedestrian orientated street that provides a welcoming environment.

The nature of the public realm will differ from one street to another and is dependent on the context (See Principle 6). Achieving a sense of place requires designers to give careful consideration to the three dimensional aspects of the highway, the surrounding buildings and open spaces (See Chapter 5).

## Principle 4. Supporting safety and security

Design solutions must promote safety and security for all users through:

- A more inclusive approach involving slower traffic speeds to create a safer environment.
- The promotion of an appropriate level of human activity in private and public spaces to foster natural surveillance and, creation of defensible spaces to minimise crime and the fear of crime.



Housing overlooks this section of cycle route, providing a good level of natural surveillance.



Remodelled space to improve surveillance and address issues of anti-social behaviour.

## Principle 5. Designing for all

**Inclusive Access:** streets shall aim to become national beacons for inclusive street design, actively taking account of the needs of all users including disabled and older people, and others with protected characteristics under the Equality Act 2010. See appendix II for inclusive design advice that involves creating buildings, streets and other spaces, which everyone can use easily, safely, and with dignity. It can only be achieved if the principle of inclusive access is embedded in the design process.

**Service and Emergency Access:** whilst placing people at the centre of design solutions is critical, specialist services are also vital for communities to function so street layout design must accommodate the needs of key services, including emergency and waste collection services.

## Principle 6. Responding to the local context

Designs shall respond to the unique history, cultural heritage and diversity of the local area to help define and/or promote identity and contribute to the enjoyment of public spaces. This will include consideration of existing streetscapes, buildings and landscapes in order to produce suitable design outcomes.

**Note:** Specific local policies and neighbourhood development plans can assist designers with the identification of such attributes.



The surrounding character of this development informed the public realm palette including Yorkstone paving and hot rolled asphalt with buff chippings.

## Principle 7. Increasing resilience for the future

The nature of streets as dynamic, multi-functional spaces invariably dictates that usage will evolve over time. This may be through the effects of further development, from land use alterations, from climatic changes, or through cultural influences. It is vital that due consideration is given to the potential for change from the outset with design solutions that are:

- Simple and cost effective to maintain.
- Coherent and sensitive to future needs and which minimise environmental impact.

This can be achieved by:

- Promoting sustainable travel.
- Minimising rainwater run off through SuDS where feasible and acceptable to the adopting authority.
- Appropriate tree planting.
- Designing solutions that allow appropriate future connections to surrounding areas to enable future growth to take place in a sustainable manner.

# Principle 8. Supporting innovation

The LHAs are open and receptive to innovative designs which help to achieve the above principles without compromising its future resilience, particularly when supported with robust evidence. The LHAs encourage the application of emerging and evolving best practice to overcome specific challenges, meet new needs, or meet existing needs in a better way.



A residential streets project developed in partnership to champion good design focusing on streets as places not movement corridors.

# 4. Urban Design Overview in Development Planning

# 4. Urban Design Overview in Development Planning

## 4.1 Introduction

Urban design is about the creation of durable places for people and is as much about the way places work as well as how they look. It concerns, amongst other things:

- Connections between people and places.
- Movement of people.
- Urban form.
- Nature and the built environment.

Good design:

- Adopts inclusive design principles (See Appendix II).
- Creates places that inspire.
- Builds lively places with distinctive character.
- Creates streets and places that are safe, accessible, pleasant to use and human in scale.

As alluded to in the Foreword: **'Good quality and safe streets are achieved by recognising the fundamental relationship between the built form and the spaces they create'**. The key principles of urban design and aspects of the built form to be considered are depicted in Figure 4.1.

**Figure 4.1 Key urban design principles and aspects of the built form**

| Urban Design Principals | Aspects of the built form |
|---|---|
| Character | Layout |
| Continuity and enclosure | Landscape |
| Quality of the public realm | Density and mix |
| Access for all | Scale |
| Ease of movement | Appearance |
| Legibility | |
| Adaptability | |

Based on the Department of the Environment, Transport and the Regions (DETR) and the Commission for Architecture and the Built Environment (CABE), 2000. By Design, Urban Design in the planning system: Towards Better Practice.

## 4.2 Key urban design principles

Consideration shall be given to the following principles of good urban design:

### Character: A place with its own identity

As alluded to under the high-level design principle 6 'Responding to the Local Context' character relates to the key features that make a place unique. Street design shall, therefore, not just be a product of applying rigid geometric standards as they will only become distinguishable by the types of traffic they deal with, rather than by the places they provide a setting for.

Character, and as such 'place' must be considered alongside movement if streets are to be well designed and integrated within the built environment.

### Continuity and enclosure: Defining streets and places

Strong levels of continuity and enclosure are established when streets and places are well defined by buildings, landscaping and boundaries. This also creates a clear demarcation between public and private spaces.

Key considerations include designing developments that:

- Provide strong perimeter blocks.
- Orientate front doors to face the street.
- Use buildings and landscaping to create legible environments and defined spaces.





Two examples of development by the same housebuilder, with different approaches towards street design affecting the quality of the residential environment. The photograph on the left illustrates poorly integrated parking behind the pavement that reduces the sense of continuity and enclosure. Conversely, the development on the right avoids using standard alignment geometries providing a more informal feel with parking better integrated within the highway.

## Quality of the public realm: A place with attractive and successful outdoor areas

As alluded to in the high-level design principle 3 'Providing Welcoming Public Space', streets form an important part of the public realm and a vital role in providing quality connections between buildings and other spaces.

The quality of the public realm is affected by:

- The physical quality of streetscape materials.
- The palette and durability of materials used.
- The ease and cost effectiveness of maintenance.
- Street furniture including signage and landscaping.

Thoughtfully designed public spaces employing an imaginative choice of features have the following positive social, economic and health benefits:

- Encourages walking and cycling.
- Adds interest and activity.
- Provides opportunities for public art.
- Increases the potential for integrating natural landscaping and water features to increase bio-diversity.
- Provides natural traffic calming.
- Increases property values.
- Attracts investment and hence improve local economies.
- Creates a sense of civic pride community spirit.







Investment in the public realm welcomes people and creates a sense of civic pride.

## Access for all: A place which everyone can use easily, safely and with dignity

Street design shall reflect a full understanding of a wider range of access needs and how these are best addressed by meeting and, where possible, exceeding current design standards and guidance.

Critical to this principle is the effective application of inclusive design principles (See Appendix II) in the built environment so streets and street networks enable everyone to:

- Enjoy their day to day living.
- Promote healthy life styles.
- Enrich communities.
- Tackle social exclusion and isolation.
- Facilitate independent access to services and activities without fear of intimidation or anxiety.

## Ease of movement: A place that is easy to permeate

Street networks shall be designed to encourage walking, cycling and accessible public transport services. This is achieved by creating pleasant, inter-connected and over-looked places to deter anti-social behaviour so communities feel safe.



A poor link between streets, which is not over-looked by the principal windows of neighbouring properties



This footpath is designed to encourage walking and offer pleasant pedestrian connection

## Legibility: A place that has a clear image and is easy to understand

In an urban design context, legible places are those that are easy to get around, guided by physical visual cues from which people can develop spatial associations such as landmarks, gateways and focal points and the landscape. Legibility is particularly important for people with visual impairments and with learning difficulties.



For this development different types of buildings enhance legibility and aids navigation.

Well-designed streets and spaces provide a means to structure land uses, development density, building heights and the scale of development. Key junctions also have the potential to define gateway entrances to places, or focal points of activity such as squares, which in turn can provide the setting for landmark buildings or memorable structures.

## Adaptability: Able to respond to future changes

The movement framework within new developments at the edge of settlements, must consider how streets could be continued to support expansion in the future and provide well connected walking, cycling and public transport.
The use of internalised looped layouts, which will prevent opportunities for further expansion, shall be avoided wherever this is feasible.

Tree lined spine road (Main route in/out)



Access road - Surface treatment



Access road - Surface treatment



Shared private driveway



Examples of different street character types used within the same development to help define the development-specific street hierarchy and enhance legibility.

# 4.3 Key Aspects of the Built Form

In line with national planning practice and design guidance (Department for Communities & Local Government, 2014), essential aspects of the built form are considered below. While these aspects are not exhaustive, they form a starting point for design and need to be translated and reflected appropriately from the early design stages through to implementation.

## Layout: Urban structure and grain

Urban structure is defined as the framework of routes and spaces that connect places locally and more widely, and the way that development routes and open spaces relate to each other.

Urban grain is defined as patterns made with the detailed layout of buildings and spaces.

Both urban structure and grain have a direct relationship with movement. Developments with a fine block structure create a more permeable development that is easier to move around on foot. Areas with a finer grain will tend to contain more buildings that face the street, with more doorways, frontages and more activity. There are clear differences therefore between the fine grain of plots on terraced streets that create a more permeable development and larger well-spaced and detached dwellings providing a more challenging context for creating strong and frequent connections.





Two examples of dwellings in a dense urban area (top) and a more suburban area (bottom). Fine and coarse grain help define connections.

## Landscape

Landscape is defined as the character and appearance of land, including its shape, form, ecology, natural features, colours and elements and the way these features are combined. Landscape features can inform the design and role of streets by for example:

- Using contours to inform the alignment of streets.
- Existing trees, hedgerows and water features can be used to define gateways, spaces and landmarks.

Conversely, streets can provide a context for the types of landscape features that could be incorporated into streets including street trees, hedgerows for boundary edges and enclosures and water features for integrating SuDS.

In this sense, landscape can contribute to the creation of quality public spaces.



This street successfully integrates an avenue of mature trees.

## Density and mix

Density is defined as the amount of development in a given piece of land and can be achieved by building up (or down), but also through the more efficient use of available space.

Mix is defined as the range of uses that each development accommodates.

To create an appropriate density and mix designers must:

- Consider the relationship between transport, density levels and land usage to adequately respond to the local context.
- Integrate a suitable combination of uses with a view to encourage people to walk and cycle.
- Seek opportunities to enhance the vitality of the areas being developed.
- Strike an appropriate balance in managing movement and creating attractive spaces for pedestrians.
- Create an attractive setting for buildings to frame spaces.

Density and mix can be used to have a positive impact on sustainable travel by ensuring the design avoids:

- Parcels of single use development separated by major highway corridors.
- Local facilities clustered around car parking.
- Mixed-use developments that generate higher proportions of trips internal to a site that do not provide infrastructure to facilitate active travel.

## Scale: Height and massing

**Scale** is the size of a building in relation to its surroundings, or the size of parts of a building, particularly in relation to the size of a person.

**Height** determines the impact of development on views, vistas and skylines.

**Massing** is the combined effect of the arrangement, volume and shape of a building or group of buildings in relation to other buildings and spaces.

Street design can have an impact on the scale and massing of development that might enclose them. Street dimensions in residential areas are therefore critical. Designers must carefully consider the height to width ratios relative to different street types as this helps in creating streets that can:

- Encourage ground level social interaction.
- Create a sense of enclosure.
- Facilitate sustainable movement.

## Appearance: Details and materials

**Details** are defined as the craftsmanship, building techniques, decoration, styles and lighting of a building, structure or piece of public realm.

**Materials** are defined by their texture, colour, pattern and durability and how they are used.

**Appearance** is an important aspect of the quality of street design, having a significant influence on the attractiveness of places and helps to establish a sense of ownership and pride amongst those who use them frequently. Any potential for appearance to be positively influenced by the culture or heritage of a place shall be encouraged.

To avoid undermining the quality of the public realm and create streets that are robust, less costly to maintain and safe:

- Street furniture such as signs, bollards and guard rails and the use of road markings shall be kept to a minimum, and where provided shall be designed to a unified and simple palette.
- The choice and quality of materials shall be appropriate to the function of the street in terms of the surfacing of carriageways and pavements and the definition of kerbs, channels, edges, parking bays, entrance aprons and thresholds.




An engineering-led approach to traffic management undermines objectives to create a pedestrian friendly environment.

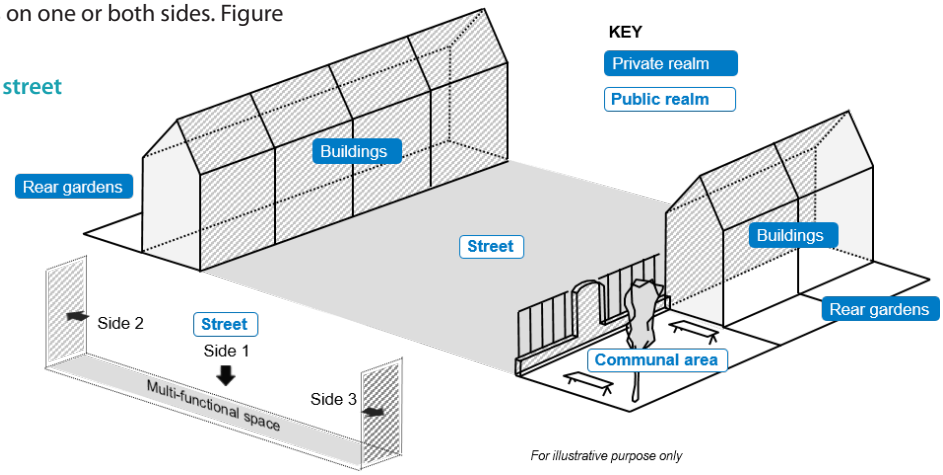
# 5. Street and Key Functions

# 5. Street and Key Functions

## 5.1 Introduction

Streets are multi-functional public spaces that have a significant impact on shaping places and influencing where people choose to live, visit and invest. The term 'street' refers to a multi-functional highway that forms part of the public realm typically with houses and other buildings and any green and/or communal areas on one or both sides. Figure 5.1 illustrates this definition.

**Figure 5.1. Basic concept of a street**

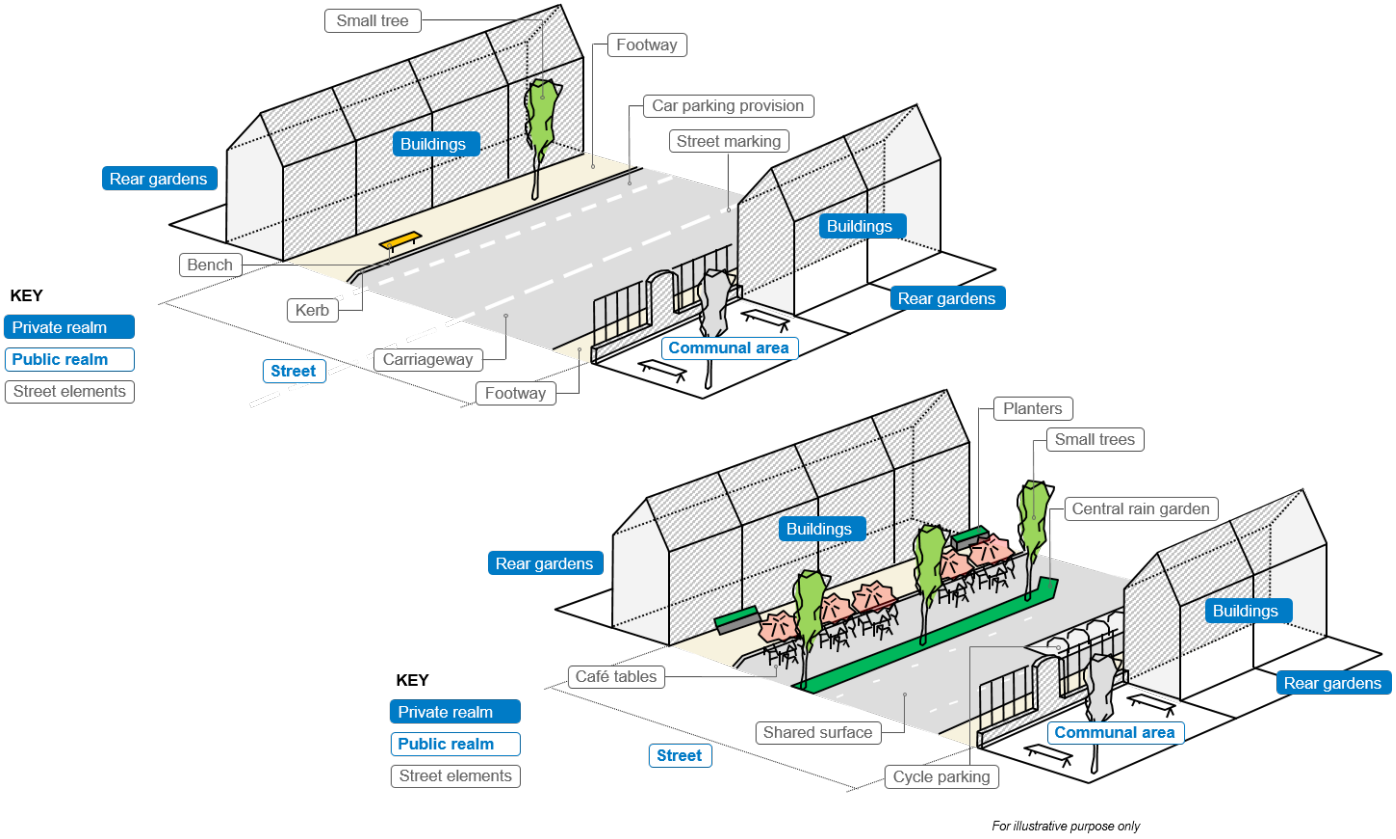



As can be seen from Figure 5.1 streets shall be regarded as 3 sided places - the highway forming the ground plane and the building frontages, together with any green and/or communal spaces, forming the vertical edges. Streets contain a variety of elements or physical features (e.g. carriageway, footway, verges, trees, parking facilities, lamp columns, seating etc.), which help determine how the space functions and how people use it.

For the avoidance of doubt, 'roads' are defined as 'highways whose main function is accommodating the movement of motor traffic'.

Figure 5.2 depicts two illustrative examples of street designs, which place different levels of emphasis on the contrasting functions of a street. The first shows a street designed mainly with movement objectives in mind and the second shows a re-balancing of objectives towards place.

**Figure 5.2. Examples of streets and associated physical features (For illustrative purpose only)**




**Examples of streets** - each street displays different elements to help emphasise core functions of streets - i.e. Place and movement. Adapted from susdrain (2014) the Derbyshire Street Pocket Park, London Borough of Tower Hamlets. http://www.susdrain.org-/case-studies/case_studies/derbyshire_street_pocket_park_london_borough_tower_hamlets_1.html

## 5.2 Principal street types

For the purpose of this design guide, there are just two principal types of streets:

- **Conventional streets** - these are streets traditionally designed with vehicular carriageways separated from footways with conventional kerbs and possibly by verges and car parking bays. Streets with higher traffic volumes may also include separate cycle lanes or tracks and possibly bus lanes.
- **Shared-surface streets** - these are streets designed to promote an environment that encourages all users to behave in a more co-operative manner towards one another while giving informal priority to pedestrians. The design of shared-surface streets will require careful consideration of the needs of disabled people and the inclusive design principles, as set out in Appendix II.

Within these two principal types, designers are encouraged to develop street character types (See Section 6.5) to suit the context and nature of the scheme, building them up by selecting and designing particular elements including the footway, carriageway and landscape features such as street trees. This process is described in Chapter 6.

Detailed design guidance on particular elements, for example the width of the carriageway/vehicle track space to suit the type of traffic using a particular street, is set out in Chapter 8.

In line with the eight high-level design principles, pedestrian and cyclist needs play an important role in determining the physical characteristics of streets. Cycle networks shall preferably be planned on the basis of primary and secondary cycle routes, which will be a critical consideration when finalising street layouts and movement patterns.

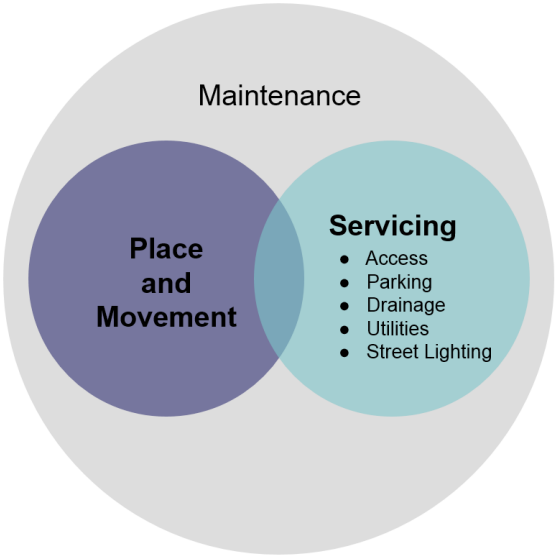
- **Primary cycle routes** - are key corridors between neighbourhoods and a town or city centre, and/or which will in time carry large cycle flows.
- **Secondary cycle routes** - provide links between primary routes and serve trip attractors such as schools, colleges and employment sites. In addition, the basic network of local cycle routes along quiet streets should aim to serve every origin and destination.

Primary cycle routes normally need to be created on major and strategic developments (see Chapter 8 for definitions), which generally create large potential demands for cycling. These may also need to provide secondary routes, including along busier streets.

## 5.3 Key functions

Streets fulfil a number of important functions, which have been grouped into two main headings, as shown below.

**Figure 5.3. Key functions of streets**




Created based on information available from the Commission for Architecture and the Built Environment (CABE) and ODPM, 2002. Paving the Way: How We Achieve Clean, Safe and Attractive Streets. London: Thomas Telford Ltd.

**Place** and **Movement** are the primary functions of streets. Streets are places where people live, work and play, and lie at the heart of community activity, while also being corridors of movement that allow people and goods to get from A to B. The relative importance attached to 'place' and 'movement' is variable and often competing and hence it can sometimes be a challenge to reconcile these functions. This is achieved, however, through an understanding of context and via collaboration.

**Servicing**, which encompasses access, parking, drainage, utilities and street lighting, is a supporting function that is necessary to allow streets to work well at a practical level, and meet their primary place and movement objectives.

Maintenance on streets to be adopted represents a cost to local authorities that needs to be managed efficiently and effectively. Maintenance is therefore a key consideration from the outset of the design process, both in terms of the organisations who will be responsible for each element and through the selection of materials and design details. Where streets are adopted, maintenance represents a cost to local authorities that will need to be managed by securing, where appropriate, commuted sums.

Figure 5.4. Some elements of a street




## 5.4 Place and movement

**Place:** Place-making as a practice is more of an art form than a strict science. Key considerations for designing streets that convey the greatest sense of place include:

- Defining a street hierarchy to maximise the legibility of the development.
- Empowering people to make use of the street as they see fit.
- Giving precedence to active travel over motor vehicles wherever practicable.
- Ensuring all areas, especially public spaces, are well lit and overlooked.
- Integrating the built and non-built environment (e.g. green spaces, trees and water features) to reconcile human activity with nature.
- Working with the material palette of the carriageway, footways and buildings together with intelligent use of elevations and building orientations and frontages (including the appropriate use of public art).
- Championing the design of streets as three-dimensional spaces encapsulating public and private realm and their respective interrelationships.





Ample green space is provided in these two different developments.



This shared surface breaks up an otherwise conventional street and serves two primary roles. Firstly, it facilitates pedestrian movements onto and across the street. Secondly, it heightens the awareness of motorists to the possible presence of pedestrians.



This street displays the functions of place and movement necessary to respond to its urban context. Footways are provided on both sides of the carriageway while dedicated on-street parking facilities and a contraflow cycle lane are also provided.



This street is an example of how materials for both the street and the buildings can positively influence the sense of place.



A shared-surface used on a lowly-trafficked residential street. Soft demarcation of a footway fails to help reconcile on-street parking and pedestrian movements. Parked vehicles within the demarked footway become an obstacle and adversely affect local walking conditions, most critically for disabled people.

**Movement:** relates to the means in which all users are able to travel to, from, and within a site safely and conveniently. Key design features include:

- A holistic approach to street design in order to embrace the unique character of a street (within the context of a defined street hierarchy) to help facilitate walking, cycling and use of public transport.
- Keeping vehicular speeds to appropriate levels.
- Taking account of both internal and external connectivity, which minimises the need for turning movements.
- Ensuring that streets, which have the potential to be used for public transport, are designed to be able to accommodate related vehicles.
- Ensuring that pedestrian and cycle routes follow desire lines to maximise their uptake and promote road safety.

**Note:** Concerns over 'rat running' can be resolved by ensuring extraneous traffic is deterred by making the internal network a low design speed and/or less direct than the external network.

**User groups:** Fundamental to designing sustainable movement is understanding the needs of various user groups. This provides direction on the prioritisation of decision-making for various modes within the design process whilst facilitating sustainable development, an approach strongly supported in paragraphs 17, 29 and 35 of the National Planning Policy Framework.





Pedestrians, cyclists and public transport users have a key role.

Consideration should be given to all user groups to encourage the use of sustainable forms of movement, particularly for short trips, to the benefit of both the individual and the wider community. This shall be a key consideration when developing movement frameworks and the design of the streets themselves.

## 5.5 Servicing

**Access:** relates to the movement of people and vehicles between the street and the buildings or other surrounding which it serves and shall promote seamless, convenient and safe movement for all types of user.

In designing for access, particular emphasis shall be placed on meeting the needs of disabled and older people, and others with protected characteristics under the Equality Act 2010, while active travel and public transport shall also be encouraged.

**Parking:** relates to the organisation of stationary vehicles, including cycles, motorcycles, cars and other vehicles within a development and can be located on or off the street.

Well-designed on-street car parking has the capability to control vehicle speeds and contribute positively to the moving environment. Efforts shall be made to ensure that the visual intrusiveness of on-street car parking is minimised.



The urban setting and dense housing on this street means that off-street parking is not practical. The developer has used a mix of parallel, perpendicular and herringbone parking patterns to maximise the parking efficiency of the street with parking layout effectively acting to calm traffic. Trees also reduce the visual impact of parking on the street.

**Table 5.1. User Groups**

| Mode | Comment |
|---|---|
| | **Pedestrians** - irrespective of the nature of journey undertaken, walking takes place in virtually all journeys. Pedestrians are commonly known as vulnerable public highway users in terms of road safety and particular attention must be given to the needs of the elderly, disabled and young in street design solutions. Walking is strongly linked to health and wellbeing and it must be made the top priority. |
| | **Cyclists** - cycling is also greatly linked to health and wellbeing and thus shall be strongly enabled and encouraged within street design. Like pedestrians, cyclists are also known as vulnerable public highway users when exposed to motor traffic. Designs shall actively promote cycle networks that are coherent, direct, safe, comfortable and attractive. |
| | **Buses, refuse vehicles and similar public service related vehicles** - the movement and operation of users of these vehicles is essential to the successful function of streets. Street layouts shall ensure the efficient operability of these type of vehicles, including provision of bus priority measures when appropriate. Potential conflicts with vulnerable public highway users shall be proactively minimised by reducing the need of reversing manoeuvres by avoiding the use of culs-de-sac. |
| | **Private motor vehicles** - although private motor vehicles are vital to the function of many communities, particularly those in rural areas, previous design approaches have created an unhealthy dependency on car use. Local street layouts shall be designed to accommodate the needs of other highway users first and encourage drivers to adopt considerate driving styles and behaviours. Importantly, within this tier, the needs of motorcyclists and blue badge holders shall take precedence over other user groups. This is particularly relevant in the context of road safety and parking design solutions respectively. |



On-street parking can help reduce traffic speeds. The removal of the centre white line has also helped achieve clutter reduction in this residential street.

Off-street car parking shall be designed for convenient access to frontages. Wherever possible, off-street car parking shall be directly overlooked by the property which it serves for security reasons and to encourage users to utilise the facilities provided. Parking provisions that are not overlooked are strongly discouraged.

Adequate cycle parking will be required for residents and occupiers of buildings and shall be fully secure to minimise the risk of theft and vandalism, irrespective of where it is located. Visitor cycle parking will also be required at destinations such as retail, leisure and employment sites and public transport interchanges.

**Drainage:** relates to the management of rainwater and other forms of precipitation on a given site. The built environment inherently inhibits the natural course of precipitation and a strategy to mitigate the occurrence of negative outcomes, such as excess surface run-off and flooding, is essential to the successful operation of any site.

Consideration should be given to the use of SuDS in any proposed drainage strategy. SuDS is a general term; made up of the use of a variety of techniques - either independently or as a collection of differing and complementary measures. They mimic natural drainage, having some storage capacity, slowing the movement of water and achieving a reduction in volume leaving a development during a storm. They can also improve water quality and provide amenity and biodiversity benefits.

**Utilities:** are the apparatus of Statutory Undertakers and include piped drainage systems and connections to adjacent properties. Straightforward access to buried and overhead services is critical for maintenance purposes. It is necessary to continue to allow traffic to flow on the street when utilities need to be exposed. A good inter-connected street network, which minimises the number of culs-de-sac, is helpful.

Wherever possible, utilities infrastructure shall blend into or be concealed by the surrounding street environment to minimise visual impact.



Designers should discuss with utility companies existing and planned maintenance work to minimise future disruption within the street network.

**Street lighting:** contributes significantly to the safe operation of a street by facilitating safe social interaction for all users during hours of darkness. Designers shall ensure that street lighting is provided to achieve an adequate level of illumination, is located appropriately, is as efficient as possible from an energy consumption perspective and that its visual impact on the street is minimised (or better still, can be used to enhance it).

# 6. Applying the Principles

# 6. Applying the Principles

## 6.1 Introduction

This section explains how the high-level design principles in Chapter 3; the urban design principles in Chapter 4; and the key street functions in Chapter 5 are brought together for a particular development to develop:

- An overall movement framework.
- A street hierarchy.
- Street character types.

These design processes are generally carried out during the Concept Development stage, which is described in more detail in Chapter 7.

Consideration also needs to be given at this stage to the adoption and maintenance principles that will underpin the design of the proposed street network.

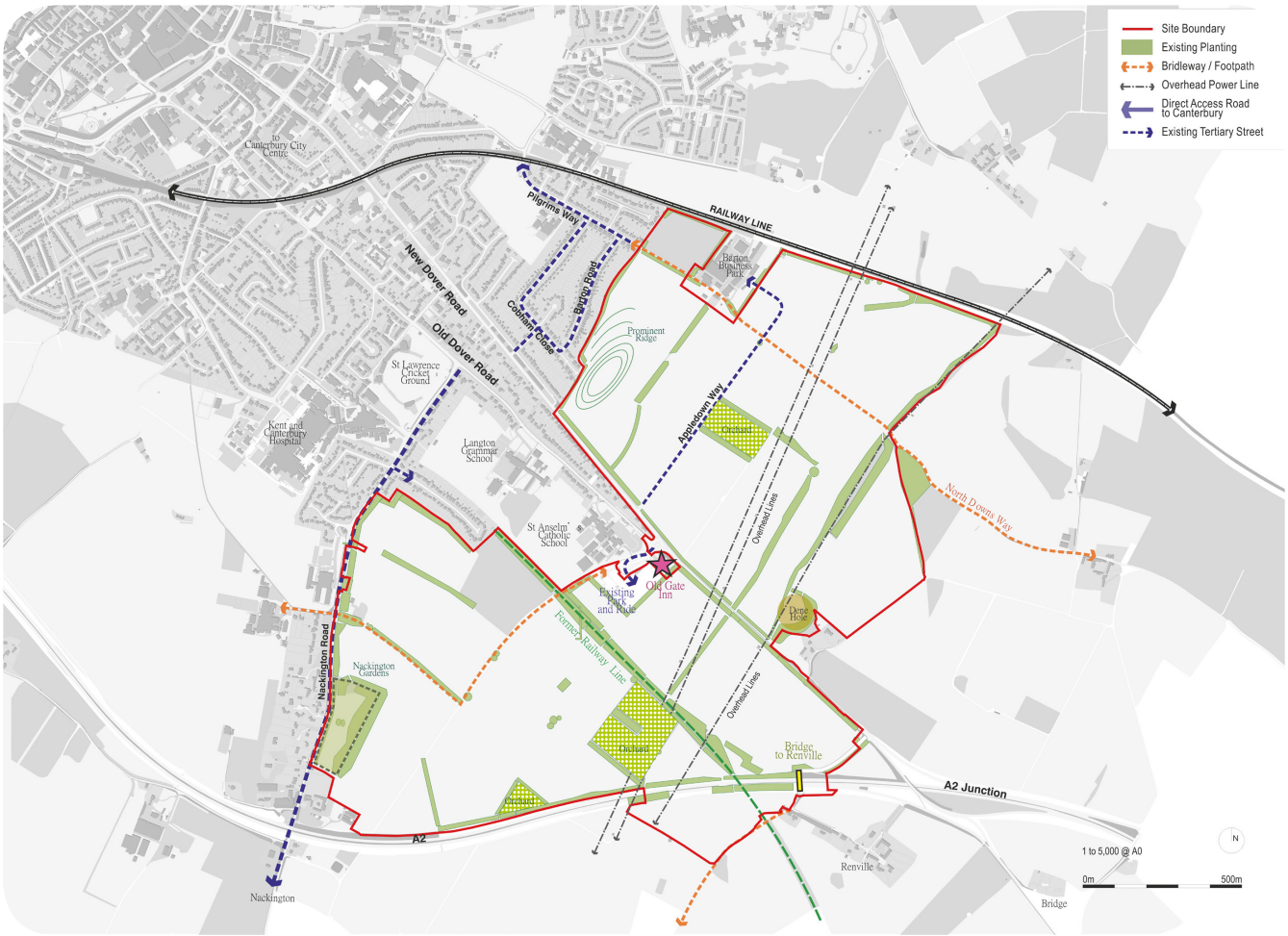
## 6.2 Context appraisal

To inform the design and layout of streets within a development, it is essential to undertake a context appraisal to establish the baseline characteristics of the site and its surroundings. For instance, drainage is likely to be an important consideration where a development site is located close to a floodplain.

A context appraisal is normally required to be undertaken (See Chapter 7), which shall include the following key tasks:

- Review existing places to assess the existing character of streets, buildings and their relationships so that the development is informed by local vernacular.
- Review existing patterns of movement to see how incomplete or poor quality connections can be repaired.
- Identify places that the development needs to connect to.
- Determine if additional facilities need to be provided on the site - e.g. schools.
- Consider topography and the location and land take of SuDS infrastructure.

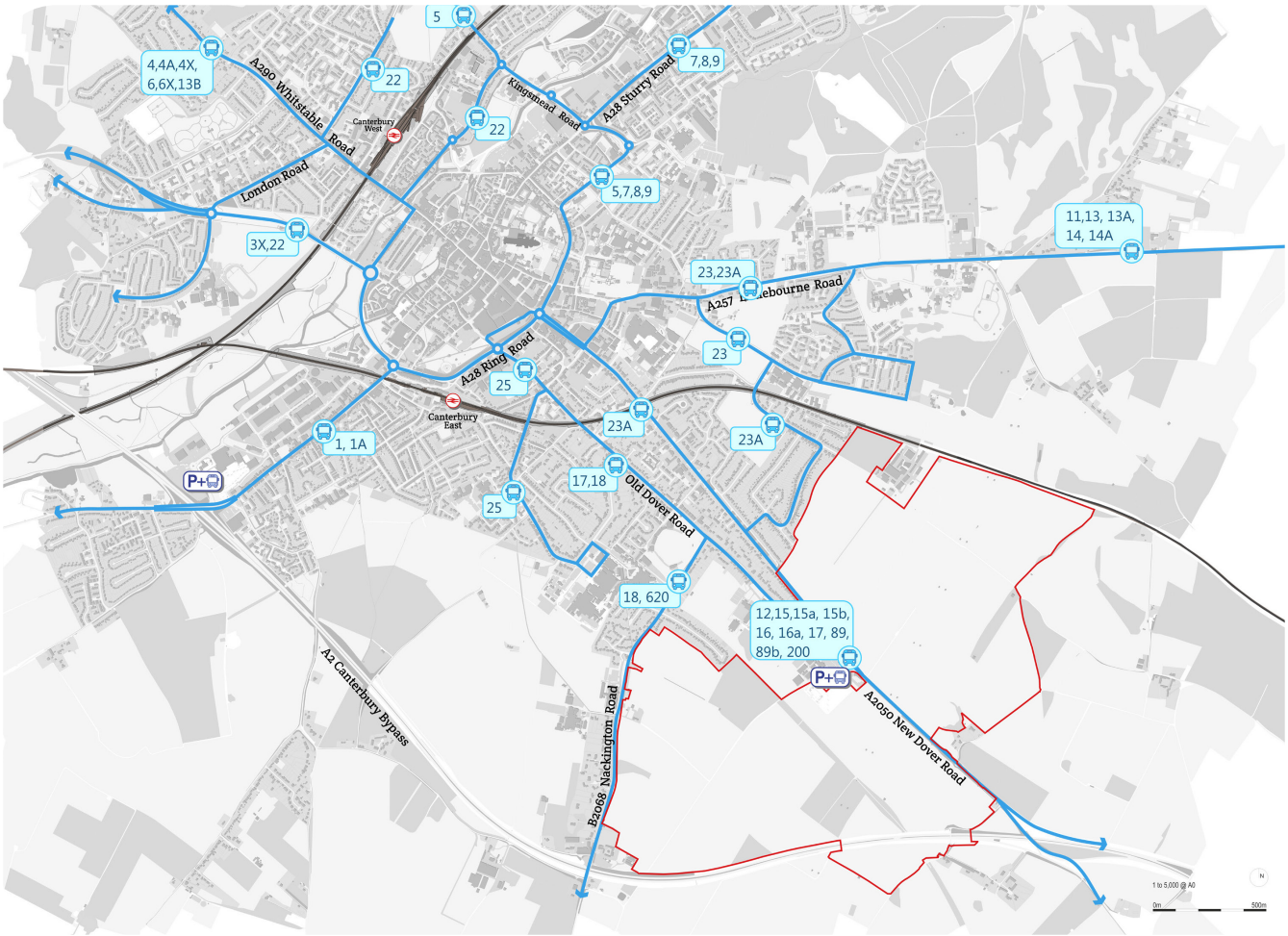
**Figure 6.1. Example of baseline characteristics for large development sites**



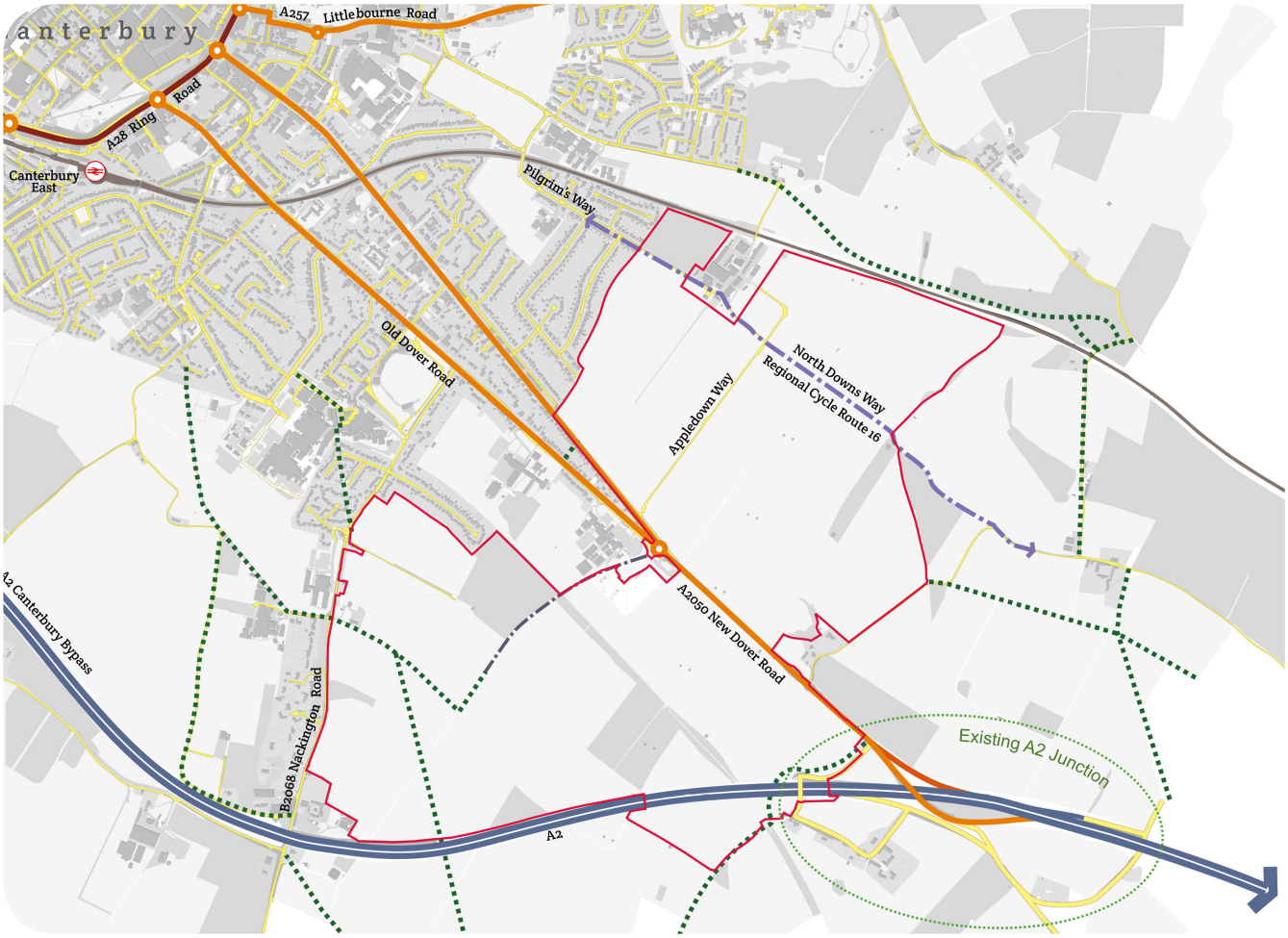

Existing site features.




Key heritage features.




Existing bus routes near the development site.




Existing access.

As part of the collaborative design process, which is detailed in Chapter 7, it is critical that designers analyse and respond to the local context, taking into consideration urban design and inclusive design principles as defined within Chapter 4 and Appendix II respectively.

The area within which the context appraisal takes place is largely a matter for case-by-case consideration. However, it will largely be governed by:

- The size of the proposed development.
- The size and gravity of relevant neighbouring places and land uses.

## 6.3 Movement framework

A movement framework must be developed to show how the development will be:

- Integrated with the existing movement patterns in the surrounding area.
- Linked to places of significance.
- Permeable.
- Able to respond to the defined user hierarchy.

Initially, this could involve sketching potential movement corridors over a site plan to inform:

- The organisation of land uses internal to the development.
- The creation of integrated street layouts.
- A response to opportunities, constraints and other needs such as public transport connectivity, green infrastructure and those related to the preservation/ creation of views and vistas.

Connectivity: refers to the ease of access between places both internal and external to the development particularly for:

- Pedestrian and cycle routes.
- The quality, location and availability of public transport services.

This includes the ease of access to, from and between housing, education and healthcare facilities, retail and employment areas and leisure facilities amongst other land uses. In order to be well connected, the application of a user hierarchy is vital as is the informed location of facilities and services.

For internal connectivity, this commonly relates to safe and efficient pedestrian and cycle routes, while for external connectivity, the quality, location and availability of public transport services become equally as important.

**Permeability:** The concept of permeability in a street context links very closely to connectivity, but is concerned with the ease of passage within, through and beyond a development rather than access to facilities and services per se. Permeability is always desirable for walking, cycling and public transport, while refuse collection and other utilities vehicles benefit from a permeable street network by making it more efficient to carry out their duties.



This footpath enhances the permeability of this development for pedestrians by providing a more direct off-street route. Meanwhile, the white-painted building forms a distinctive piece of architecture aiding legibility.

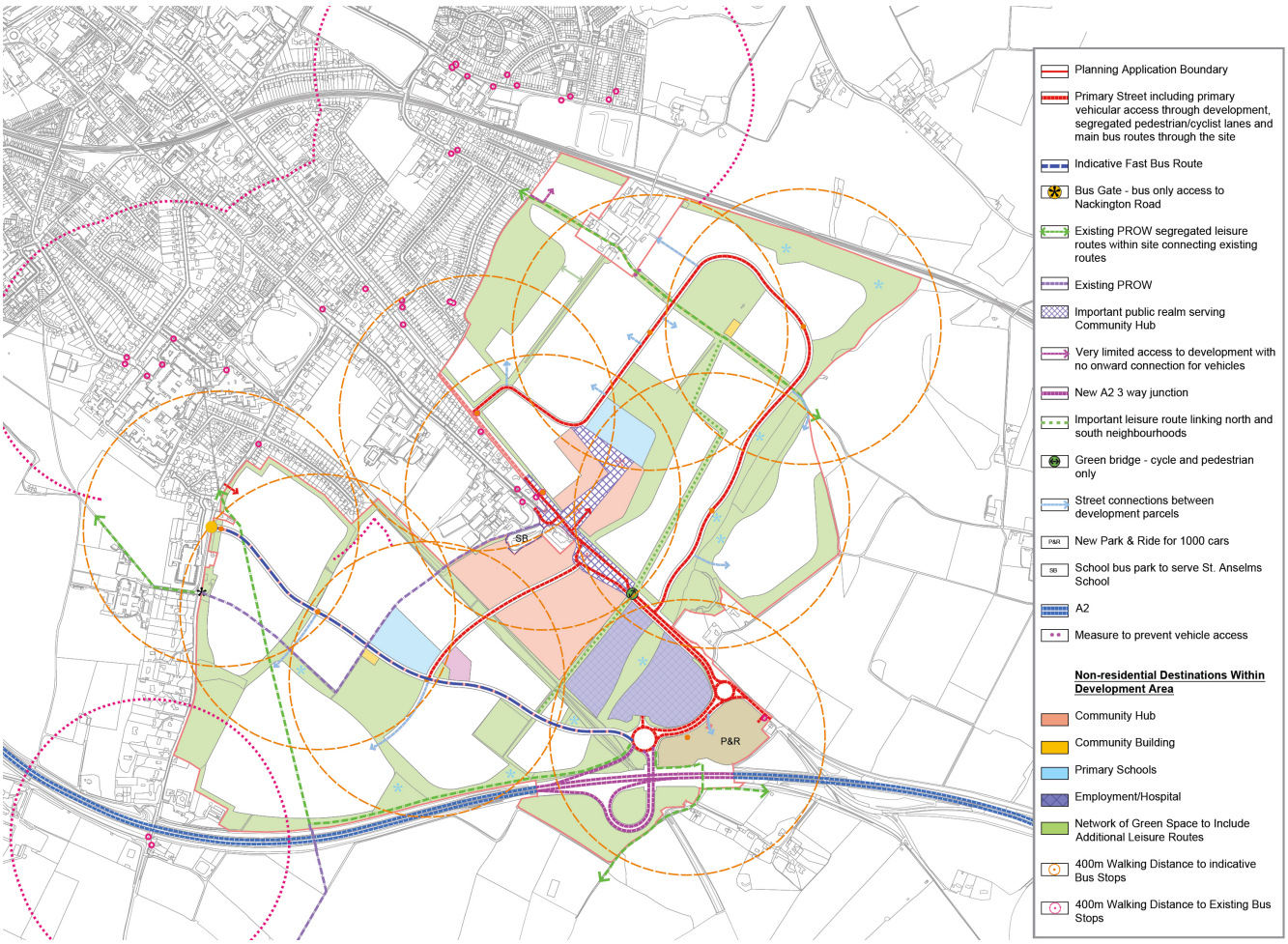


Permeability for pedestrians and cyclists at this point is maintained, while the bollards prevent vehicular access.

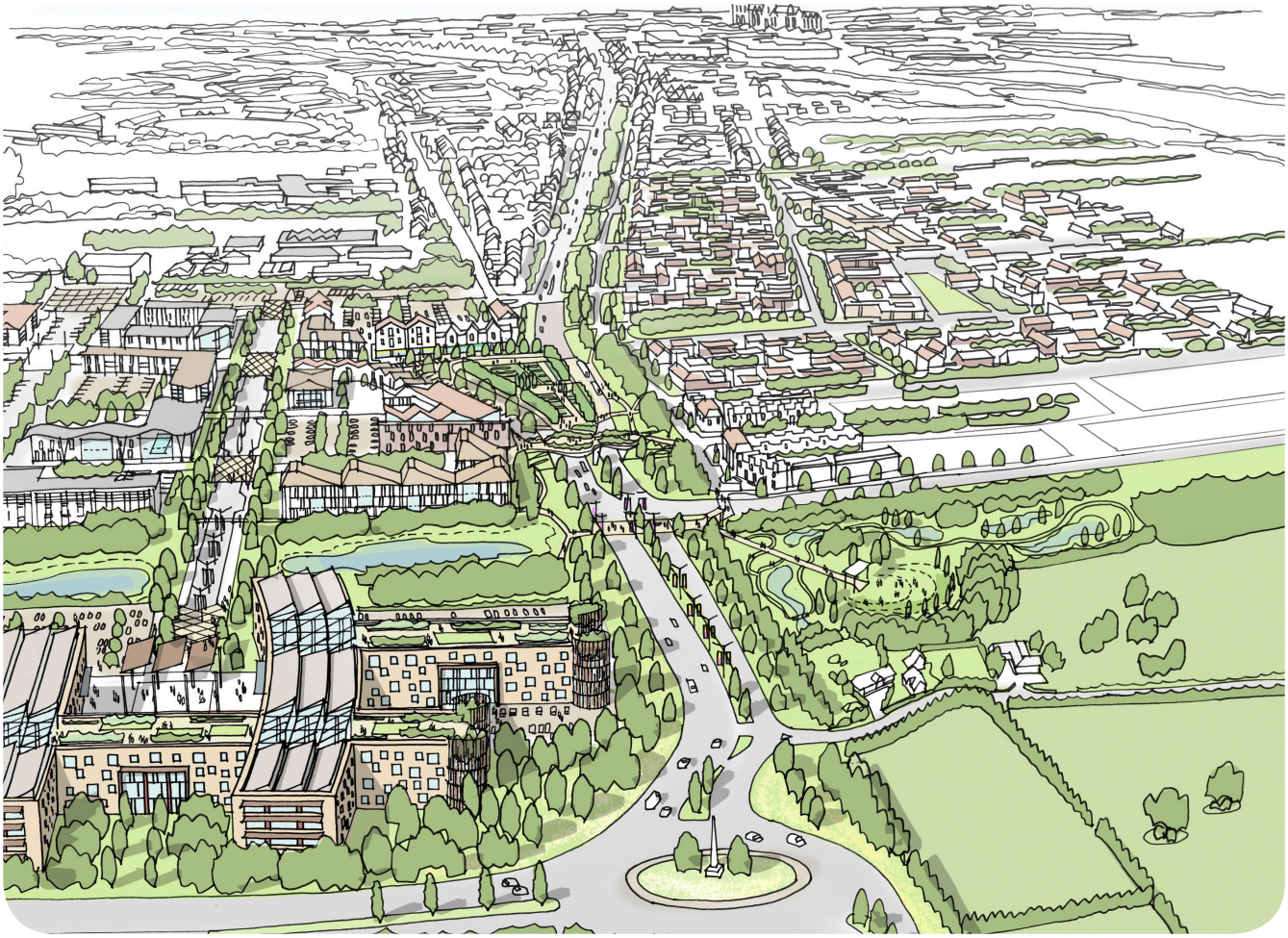
Permeability solutions shall:

- Provide pedestrian and cycle routes that follow desire lines.
- Focus on reducing conflicts with motor traffic, through the provision of suitable pedestrian crossing infrastructure.

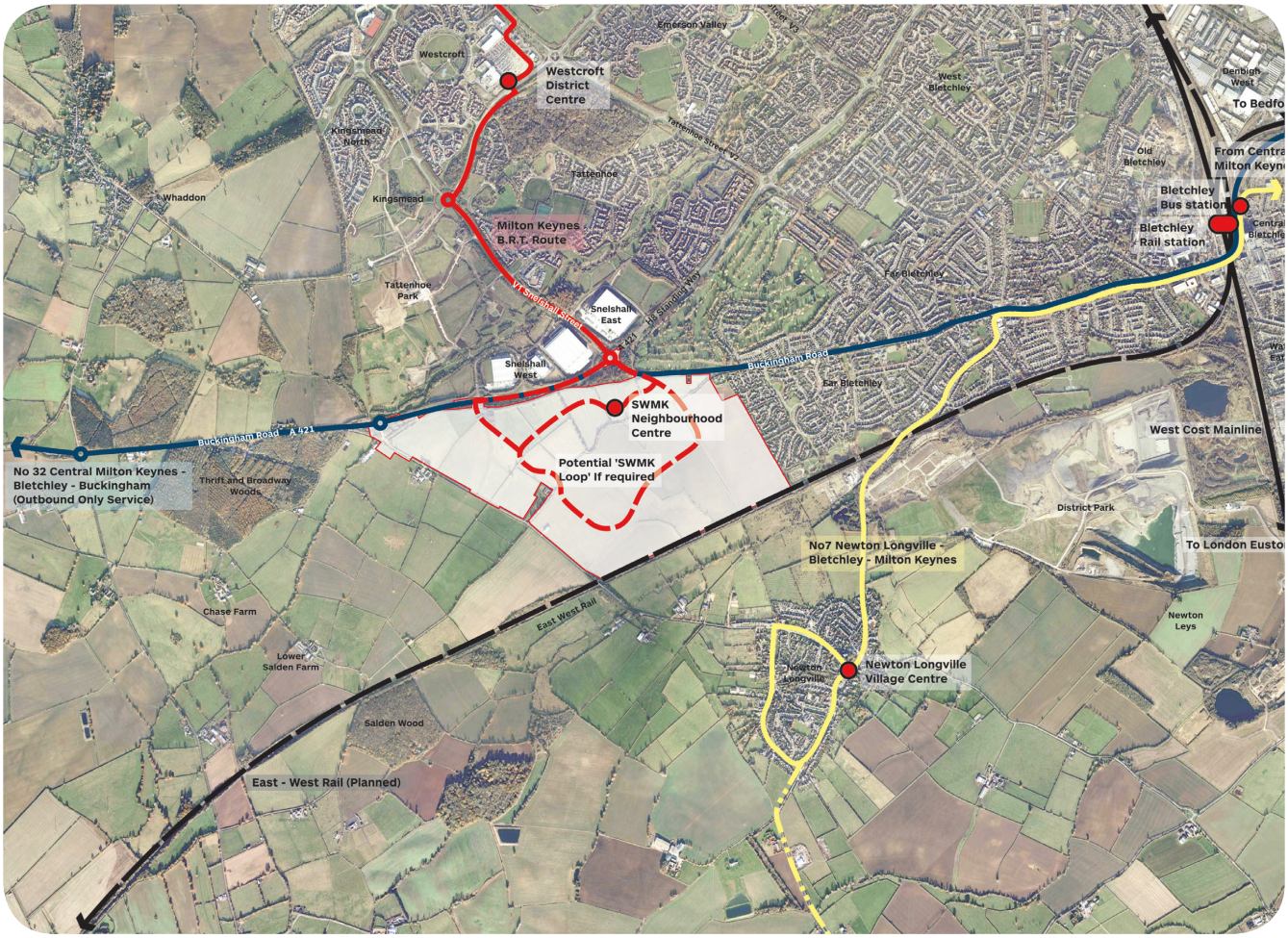
**Figure 6.2. Examples of movement framework**



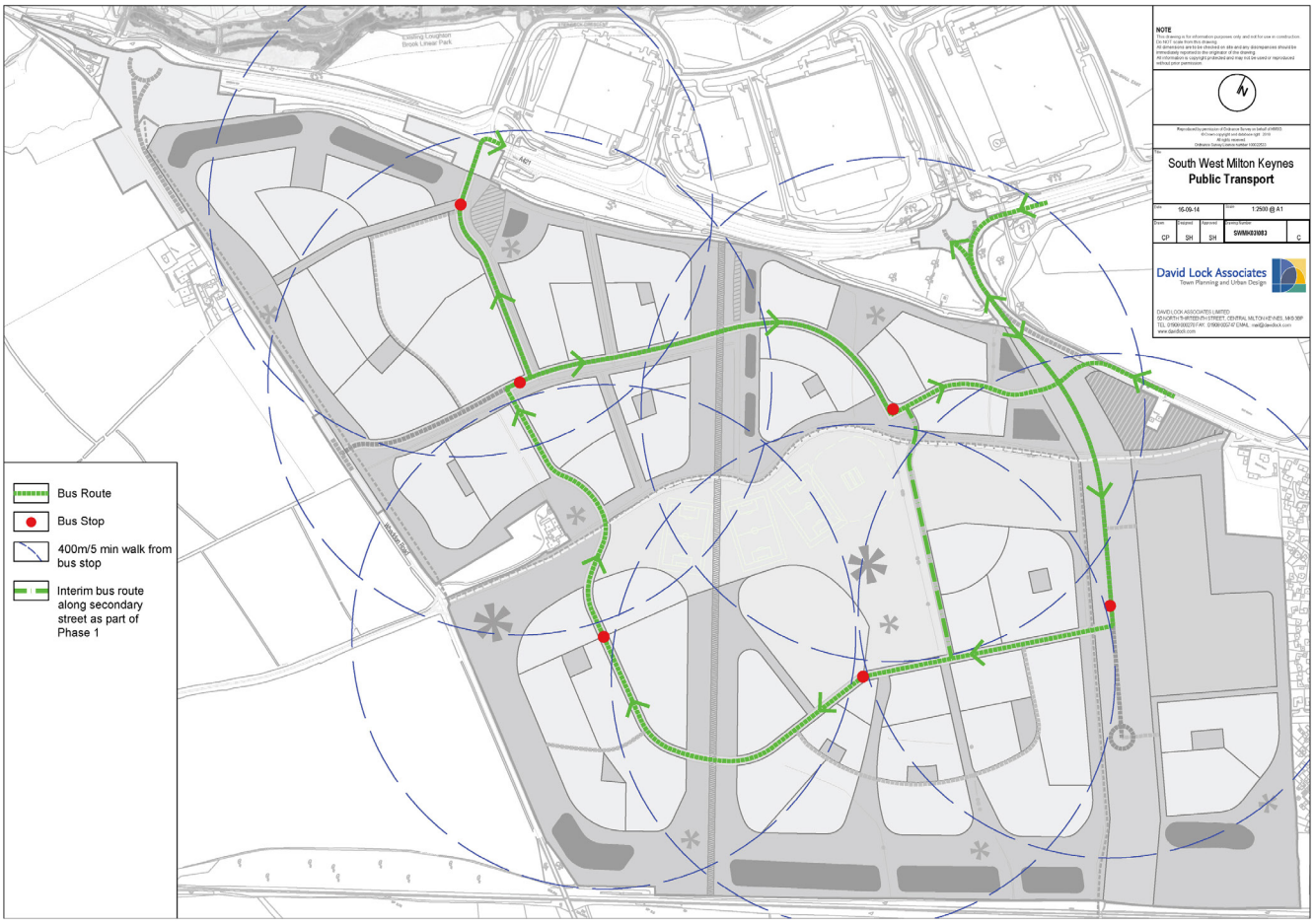

Access & movement framework.



Rover Road 3-D visualisation.




Public transport connectivity - South West Milton Keynes.




Proposed public transport routes - South West Milton Keynes.

## 6.4 Street hierarchy

It is important to use a pattern of street character types in the movement framework. The number of street character types and levels will be dependent on the scale of the development and local context, for example, larger sites will require a main or principle connecting street.

Designers will be free to develop street character types that reflect local context and place making objectives.

The number of levels within the street hierarchy will be dependent on the scale of development and the local context. However, the definition of a street hierarchy shall not be rigidly based on volumes of traffic or the number of buildings served.

**Figure 6.3. Example of street hierarchy**



## 6.5 Street character types

Once the overall movement strategy and street hierarchy have been identified, it will then be possible to begin to develop street character types that reflect local needs and context and which are consistent with the:

- High-level design principles.
- Urban design principles.
- Key street functions.

Good understanding of street character is essential to place-making. Street character is not merely defined by traffic capacity and the physical properties of the street, but also by its relationship to the public and private realm.

On larger schemes it may be appropriate to develop a number of street character types to reflect the overall street hierarchy and the different contexts that are being created. On smaller sites there may be a need for only one or two street character types, but designers shall still look to find ways of creating distinctive designs to give a sense of place to the development.

Street character types originate from either conventional or shared-surface streets.

Examples of descriptive terminology that can be used to inform street character types, each reflecting the relative importance of the different street functions.

- High street.
- Main street.
- Shopping street.
- Mixed-use street.
- Residential street.
- City street.
- Local street.
- Avenue.
- Boulevard.
- High road.
- Mews.
- Courtyard.

Each of these terms is aimed to conjure a different notion in the designer's mind, as a starting point for the assembly of design elements that are required to respond to the local context. Designers could base their proposals on one or more of these types, or choose a different starting point, generally informed by local needs and context.



Example of street character types.

Bottom Right Image Courtesy Jeremy Barrell, TDAG

The decision-making process will need to be collaborative, so that all participants in the design process are in agreement with the resulting street character types, particularly if designers wish to move away from more traditional design solutions.



An example of a more conventional street in a residential environment.



Newhall, Harlow: An example of a shared-surface street displaying enhanced qualities and a more distinctive character.

## 6.6 Adoption and maintenance principles

Adoption and maintenance are fundamental considerations at all design stages and must include:

- Agreement on street character types and street elements that are to be adopted or un-adopted.
- A clear understanding at all design stages of the arrangements for future maintenance for adopted and un-adopted infrastructure.
- Clarity on the commuted sum payments that will be required (Refer to Appendix IV).

Generally, a street will be considered for adoption where it serves more than five dwellings. With regard to streets serving multiple building and multiple-occupation industrial or commercial development the views of the LHA shall be sought. Furthermore, a street will only be adopted when:

- All obligations under the Section 38 Agreement have been met.
- An agreement under S104 of the Water Industry Act has been signed with the relevant water company for the street's drainage to be adopted, or alternatively where an agreement with the relevant LHA has been struck to adopt it instead.
- The development served by the street is acceptable in all other highways and transportation respects, for example in terms of accessibility and parking provision.

Streets of developments of five or fewer dwellings are not normally adopted but should preferably be designed to an adoptable standard (See Chapter 8 - Movement and Access Sections).

# 6.7 Street furniture overview

The term 'street furniture' refers to vertical items located usually within the footway. Whilst street furniture is often associated with the safe and adequate operation of the street environment (e.g. lighting columns and traffic signalling equipment), it can equally be applied to serve the needs of users (e.g. seats, cycle stands and post boxes) or exist for place-making purposes to help enhance people's experience within the public realm (e.g. public art).

Street furniture and/or the use of street furniture shall be:

- In keeping with the nature and context of the area.
- Used proportionately, and preferably sparingly. Excessive street furniture can easily clutter an environment and be counter-productive to place-making objectives.

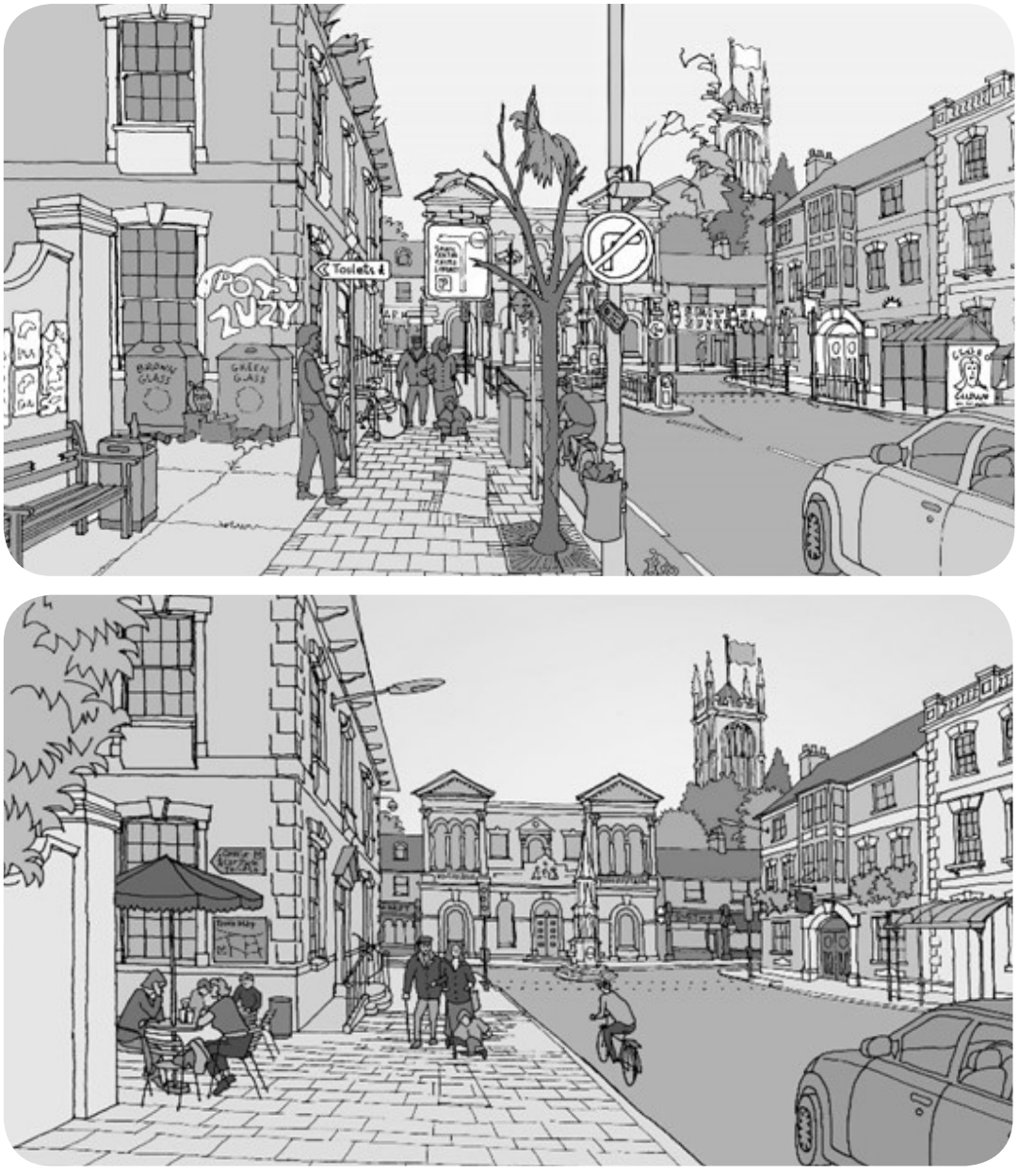
In preparing street designs and building new schemes, items of street furniture must be:

- Located to respond to the needs of disabled people.
- Consistent with inclusive design principles as described in Appendix II.

Additionally, items of street furniture shall be carefully rationalised and grouped so to minimise clutter. To facilitate the safe and efficient use of streets, street furniture items shall:

- Be located in line with one another to minimise obstruction.
- Not obstruct bus passenger boarding and alighting.
- Preferably not be more than 6m in length on footways.
- Be placed at an agreed distance from the edge of the carriageway to avoid creating an obstruction for visually-impaired people and overhanging vehicles.
- Be positioned at the back of the footway.

**Figure 6.4. Illustration of the detrimental impact of street clutter in the same street**




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# 7. Collaborative Design Process

# 7. Collaborative Design Process

## 7.1 Introduction

Translating high-level design principles into well designed streets, spaces and communities requires early engagement in the design process between the various stakeholders - the 'Development Team' - and a strong will to cooperate (see Section 7.2 below). This early investment of time and resource may involve quite detailed investigations and work at the pre-application stage, but when the highway and planning authorities are involved early in the planning process, critical agreements can be reached at the pre-application stages and will result:

- In better designed streets and places.
- Potential resource savings at later stages of the process as schemes are more likely to require fewer changes as they go through the planning and technical approval stages.

This section of the guide therefore sets out who should be part of the development team, the typical sequences of engagement and what process should be followed to ensure consistency of approach so that well-designed streets, spaces and developments are delivered successfully in the 6Cs area.

## 7.2 Development team

The number of different parties that need to come together to form the development team are numerous and the list below are parties that may need to be involved:

- Development management.
- Planning policy.
- Urban design.
- Nature and building conservation including landscape and trees.
- Parks and open space.
- Access and inclusive design.
- Highways.
- Highway Adoption.
- Public health.
- Lead Local Flood Authority (including SuDS).
- Public transport operators.
- Emergency services.
- Environment Agency.
- Highways England.

**Note:** The Planning Case Officer shall decide on the exact make-up of the development team on a case-by-case basis. Prospective applicants are encouraged to contact the Planning Case Officer as soon as possible to initiate pre-application discussions and determine who shall be included in the Development Team. This will largely depend on the complexity of the proposed development and whether it is a 'minor', 'major' or 'strategic' proposal.

The following definitions are provided for guidance purposes:

**Minor development**

A minor development is typically any scheme that falls below one or more of the characteristics given for a major development (see below).

**Major development**

Consistent with the General Development Procedures for England (Town and Country Order 2015) a major development is a scheme that involves any one or more of the following characteristics:

- The provision of dwellings where:
  - The number of dwellings to be provided is 10 or more; or
  - The development is to be carried out on a site having an area of 0.5 hectares or more and the number of dwelling houses to be provided is unknown.
- The provision of a building or buildings where the total floor space - Gross Floor Area (GFA) - to be created by the development is 1,000 $m^2$ or more

  or
- Development carried out on a site having an area of 1 hectare or more.

**Strategic development**

A strategic development is generally considered a major development that has a significant and widespread impact on roads, public transport, the environment or infrastructure such as schools and healthcare. It may require the implementation of major infrastructure or there may perhaps be an opportunity to tie in with existing or emerging plans for economic and infrastructure development over the medium to long term. It will be up to the Planning Case Officer to make the judgement on whether a proposed development will be classified as minor, major or strategic, and therefore which stakeholders should be included in the Development Team.

**Note:** major and strategic developments are both referred to as large developments for the purpose of this design guide.

## 7.3 Collaborative design process - Overview

The life of a scheme, from conception through design and implementation to maintenance can be broken down into a number of stages. The relevance and importance of each stage will vary from scheme to scheme depending on the size of the proposed development. This section describes these different stages, as summarised below, and provides links through to relevant sections of the guide:

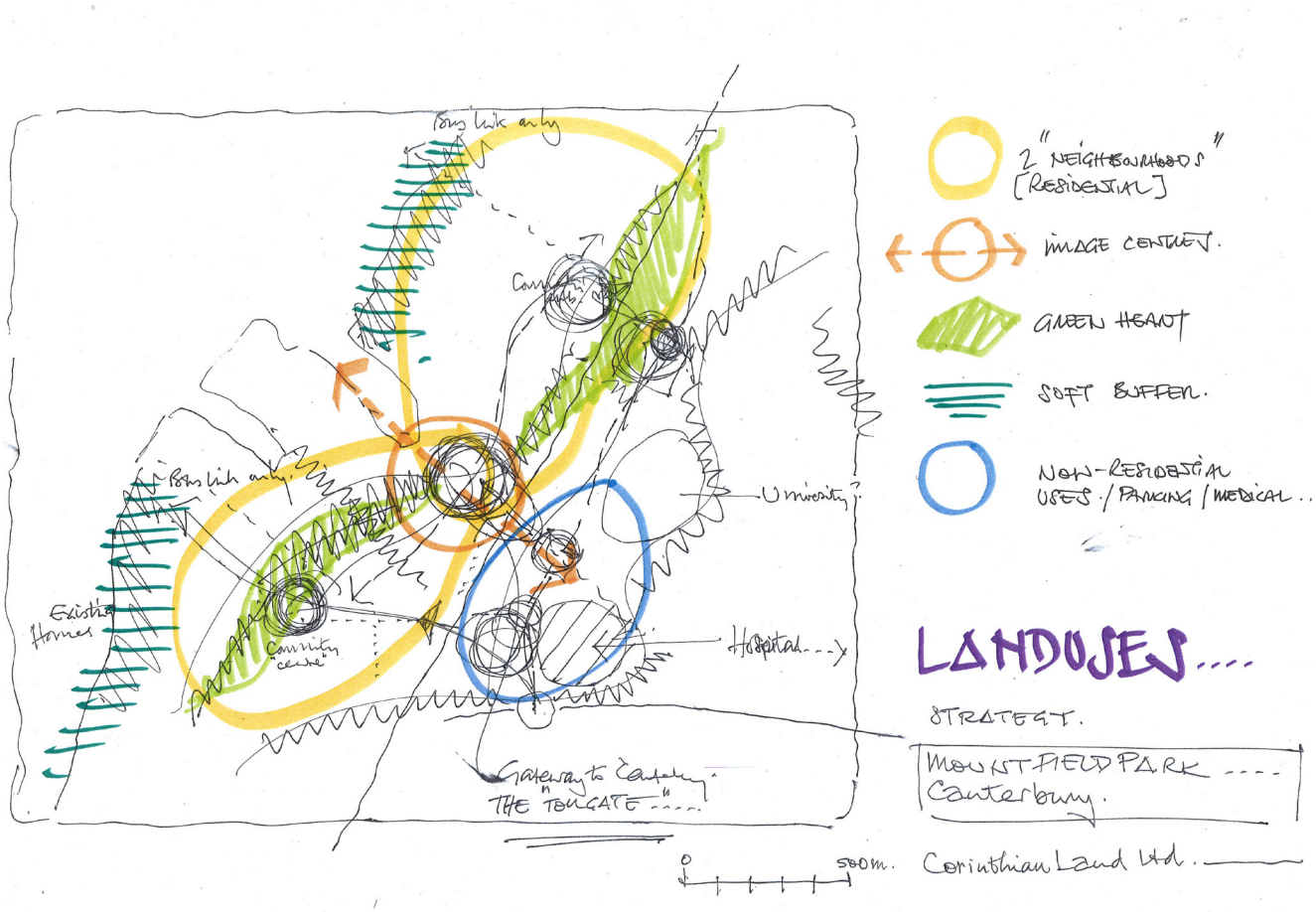
- Concept development (Pre-application stage).
- Design development (Pre-application stage).
- Quality audits and independent design reviews.
- Application submission.
- Reserved matters.
- Technical approval.
- Implementation.
- Monitoring.

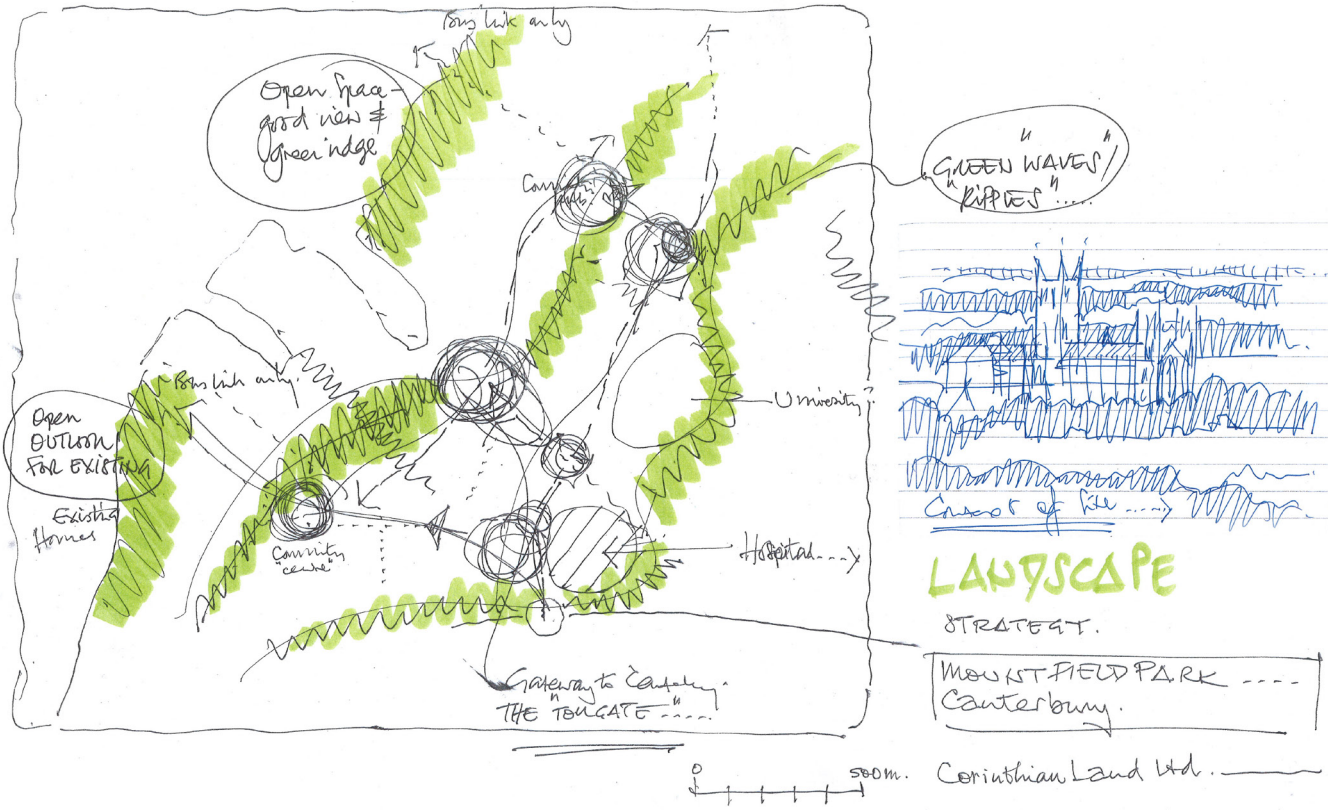
# 7.4 Concept development

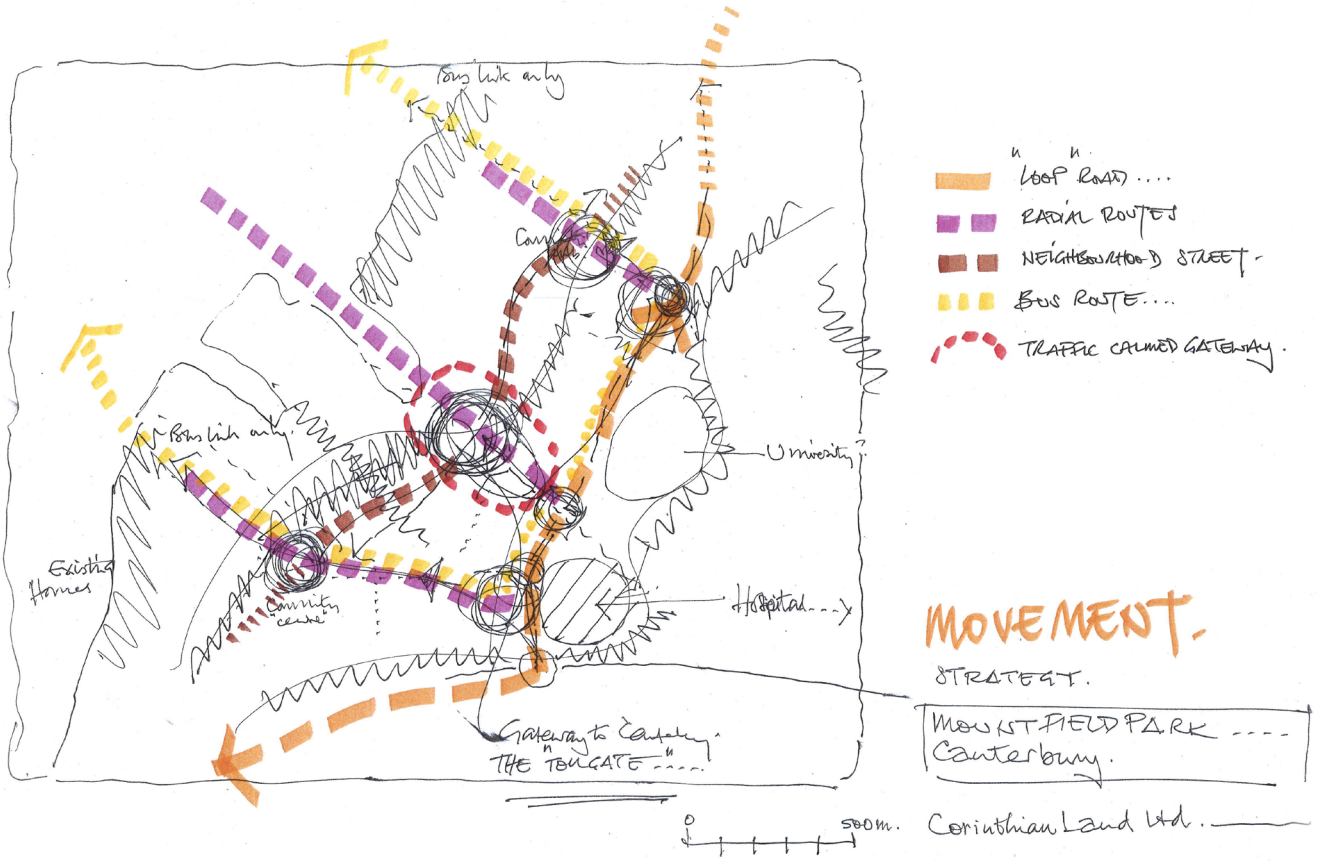
As part of the concept development stage, the prospective applicant shall:

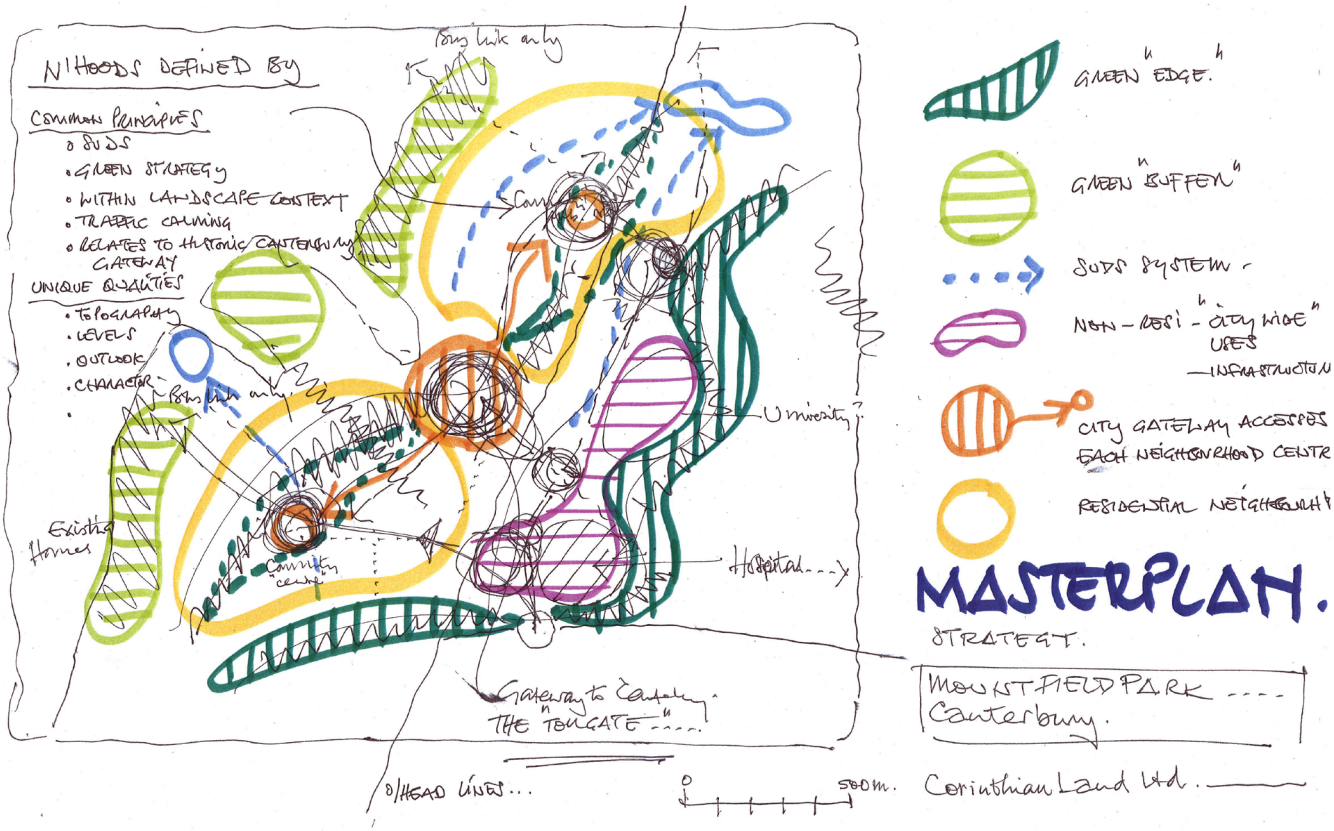
- Initially make contact with the local planning authority to seek advice on:
  - The scope of the information typically required for a given site.
  - Possible charges e.g. pre-application advice and discretionary services.
  - Preferred process of engagement and communication procedures e.g. when and how to keep the local planning, highway and drainage authorities and other interested parties informed, particularly on large schemes (i.e. major and strategic developments).
  - Adoption and maintenance.
- Provide a brief note with sketches setting out an 'initial vision' to stimulate discussion between the parties on the following:
  - The location and size of the site, including a site location plan.
  - Context and site appraisal, considering existing movement patterns, local markers and key buildings; and detailing the main physical, environmental, social and economic characteristics of the site and its surroundings.
  - A review of relevant national, regional and local policy, including the Local Plan and Local Transport Plan.
- An initial analysis of the opportunities and constraints of the site, including information on existing topography, existing landscape, views into and out of the site, etc. This analysis shall summarise the key findings from the above context and site appraisal whilst articulating this with an opportunities and constraints plan.
- Emerging development objectives and foreseen contributions to the locality.
- Simple concept sketches/plans showing how this initial analysis influences:
  - Potential areas for development, including general arrangements for different land uses (e.g. residential, employment, schools and other community facilities, retail, mixed use, etc.).
  - Potential green infrastructure (e.g. open spaces, landscaping, green corridors, etc.) alongside emerging basic details to outline a potential drainage strategy including SuDS.
  - Potential movement strategy, including possible points of access (e.g. modifications to the surrounding road networks or appreciation of potential changes that the development could adopt such as relief roads, realignments, new bus corridors, etc.)
- Information on initially proposed development uses and amounts, including number of dwellings, likely density and land areas of non-residential uses.
- Quantities of dwelling type, size and tenure.
- For larger sites, additional information on the principal movement routes surrounding the development site, and the nearest neighbourhood facilities and bus/rail stops shall also be provided.

**Figure 7.1. Concept development | Example of 'initial vision' sketches**




Open space - good view & green edge
GREEN WAVES / "RIPPLES"
Open OUTLOOK FOR EXISTING
Existing Homes
Community Centre
University
Hospital
Gateway to Canterbury - THE "BOUGATE"
LANDSCAPE
STRATEGY.
MOUNTFIELD PARK - Canterbury.
0
500m.
Corinthian Land Ltd.


LOOP ROAD
RADIAL ROUTES
NEIGHBOURHOOD STREET
BUS ROUTE
TRAFFIC CALMED GATEWAY
Existing Homes
Community Centre
University
Hospital
Gateway to Canterbury - THE "BOUGATE"
MOVEMENT.
STRATEGY.
MOUNTFIELD PARK - Canterbury.
0
500m.
Corinthian Land Ltd.




As deemed necessary, the local planning authority will appoint a planning case officer who will be responsible for reviewing the submitted note, in consultation with relevant parties. The case officer will provide (verbal/written) feedback to the applicant. The response will be proportionate to the quality of the information provided by the applicant and tailored to reflect, the type and complexity of proposal development.

Table 7.1 shows the initial vision checklist that will be used by the case officer to make a preliminary assessment as to whether the 'initial vision' is consistent with the high-level design principles and to help identify aspects of the proposal that shall be considered and addressed in the next stage - i.e. Design Development.

**Table 7.1. Initial vision checklist**

| Initial Vision Checklist |
|---|
| **Integrating into the neighbourhood** |
| **Connections** \| Does the development integrate into its surroundings by reinforcing existing connections and creating new ones, while also respecting existing buildings and land uses around the development site? |
| **Facilities and services** \| Does the development provide (or is it close to) community facilities, such as shops, schools, workplaces, parks, play areas, pubs or cafes? |
| **Public transport** \| Does the development have good access to (or facilitate the use of) public transport to help reduce car dependency? |
| **Meeting local housing requirements** \| Does the development have a mix of housing types and tenures that suit local requirements? |
| **Creating a place** |
| **Character** \| Does the development create a place with a locally inspired or otherwise distinctive character? |
| **Working with the site and its context** \| Does the development take advantage of existing topography, landscape features (including watercourses), trees and plants, wildlife habitats, existing buildings, site orientation and microclimate? What approach has been taken for SuDS? |
| **Adoption and Maintenance** |
| **Adopting authority and maintenance regime** \| Have broad principles been established relating to the adopting authority and what maintenance regime will be required in multi-functional public spaces to realise the vision? |

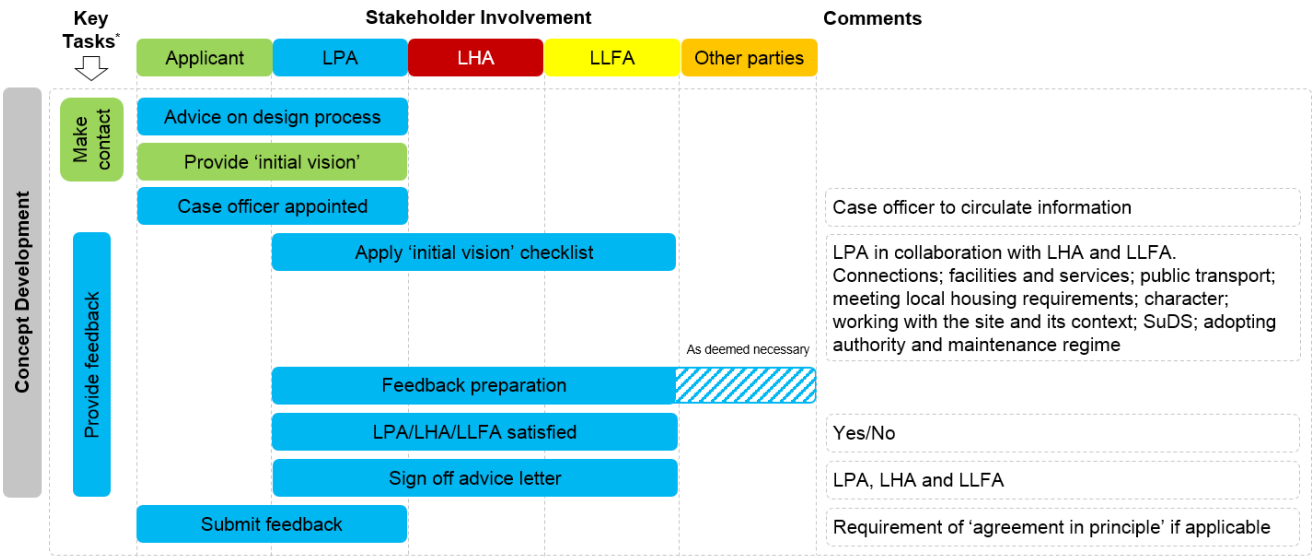
Feedback from case officers might include:

- Main issues concerning relevant national and local policy.
- Concerns the case officer, highway officer and other consultees may have about the 'initial vision', summarising the main reasons why the proposal might need to be reviewed.
- Details of reports or impact studies the applicant may need to prepare during design development and/or prior to application submission (Please see Table 7.3).
- Advice on the involvement of specialist professionals in progressing the 'initial vision' further.
- Initial considerations in terms of commuted sum payments and opportunities for variations in the scheme design to avoid a commuted sum payment.
- Advice about which authority will adopt public space and what the maintenance regime will need to include. For example, adopted streets containing street furniture, trees, hedgerows and amenity planting may only be acceptable if the highway authority is able to convey the maintenance responsibility, under a license arrangement, to a responsible authority (e.g. a district, borough or parish council).
- An indication of whether the proposal will require an 'agreement in principle' with the local planning authority and highway authority during design development, particularly when dealing with large schemes. Any 'agreement in principle' would not be binding but would allow the developer to proceed with some degree of confidence with the further development of plans and designs.

An 'agreement in principle' may not be required for minor developments. Subject to the proposal details submitted, the case officer will inform the applicant whether the local planning, highway and lead local flood authority officers are satisfied with the 'initial vision', giving more certainty to applicants to progress proposals to the next stage.

If applicable, reaching an 'agreement in principle' during design development puts emphasis on joint working and it will help ensure the views of the local authorities are considered. This agreement is also likely to help applicants improve the quality of proposals.

**Figure 7.2. Concept development overview**




* Text box colour highlights the stakeholder that will normally lead each task

KEY: LPA: Local Planning Authority | LHA: Local Highway Authority | LLFA: Lead Local Flood Authority

# 7.5 Design development

Having identified opportunities and resolved preliminary issues surrounding the proposed vision, applicants can then move forward with some confidence and begin to add detail to the proposal. The design development stage will begin to resolve technical matters that may affect the overall structure of the development in line with the outcomes of the concept development stage. Layouts and key features of the development will begin to emerge to help materialise the vision for the scheme.

Table 7.2 shows the design development checklist that will be used by the applicant to assist further the design development stage.

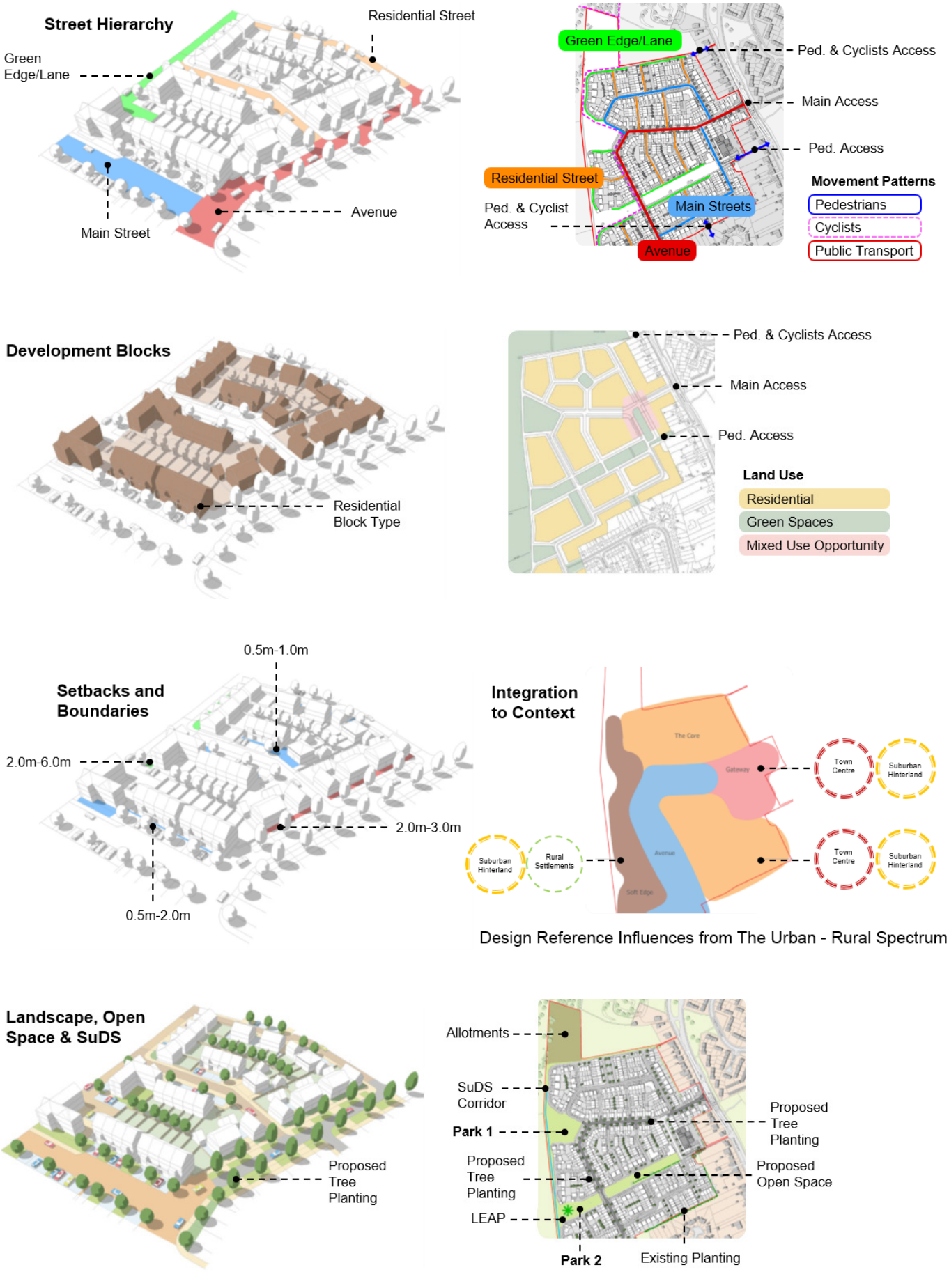
**Table 7.2. Design development checklist**

| Design Development Checklist |
|---|
| **Creating a place** |
| **Creating well defined streets and spaces** \| Are buildings designed and positioned with landscaping to define and enhance streets and spaces? And are buildings designed to turn street corners well? |
| **Easy to find your way in and around** \| Is the development designed to make it easy to find your way around? |
| **Street and home** |
| **Streets for all** \| Are streets designed in a way that encourages low vehicle speeds and allows them to function as social spaces? |
| **Parking** \| Is resident and visitor car parking sufficient and well integrated so that it does not dominate the street? |
| **Public and private spaces** \| Will public and private spaces be clearly defined and designed to have appropriate means of access and to be able to be well managed and safe for use? |
| **External storage and amenity space** \| Is there adequate external storage space for bins and recycling, as well as for vehicles and cycles? |
| **Active streets** \| If the development is in a more urban location, does the development engage with the street so passers-by will understand the movement between the building and the street, and is there an obvious visual link between inside and outside? |
| **Adoption and Maintenance** |
| **Adopting authority and maintenance regime** \| How will future maintenance be arranged and made acceptable to the affected authorities (e.g. the local highway authority might require maintenance responsibility to be conveyed under licence and also require a commuted maintenance payment)? Has there been liaison with the affected parties to avoid surprises at a later design stage? |

Applicants shall prepare and submit a design development document that includes:

- Development proposals/layouts/plans responding to findings of the site appraisal and development objectives, considering and/or showing:
  - Street layout (e.g. street pattern and principal dimensions).
  - The proposed movement strategy, including the points of access to the site, street hierarchy derived from place and movement matters and inclusive design considerations, covering the movement of pedestrians, cyclists, buses, refuse vehicles and emergency vehicles, and private motor vehicles (including motorcycles and cars) and any other applicable vehicles, and the proposed junctions and connections (including levels of segregation and routes).
  - Details of proposed street character types, together with drawings of principal street sections, location and details of key walking and cycling infrastructure, public transport facilities, treatments of major junctions.
  - Car, motorcycle, and cycle parking arrangements, including details of both on-street and off-street provisions. This will include details of parking numbers/dwelling including whether a garage is provided.
  - Arrangement of proposed and retained features and land uses (including frontages, open space and ownership) including drainage arrangements (including rainwater run-off systems and SuDS components).
  - Routeing and details of public utilities.
  - Layout, massing and type of buildings and spaces.
  - Illustrative building and street elevations with general types of materials proposed.
- Table or plan showing accessibility to key facilities, including details of on-site community facilities (e.g. schools, children's playgrounds, shops, leisure facilities, etc.).
- Uses and magnitudes of development, including number of dwellings and likely density and land areas of non-residential uses.
- Quantities of dwelling type, size and tenure.
- Outline public realm and landscape design proposals (including details of proposed and retained street furniture, trees and other planting).
- Details of the expected adoption and maintenance regime with evidence of liaison and agreement with the affected parties.

**Figure 7.3. Design development | Examples of design development plans**




Adapted from Castle Fields Design Code (2011)

For major and strategic developments the submission of the design development document will instigate the establishment of the development team co-ordinated and managed by the planning case officer (see Section 7.2).

Using the design development checklist and the master checklist presented in Table 7.2 and Table 7.4 respectively, as a guide the development team will jointly consider whether the design development is consistent with the high-level design principles and identify aspects of the vision or proposed design that might need to be reviewed, addressed or further developed through follow-up design iterations and/or meetings.

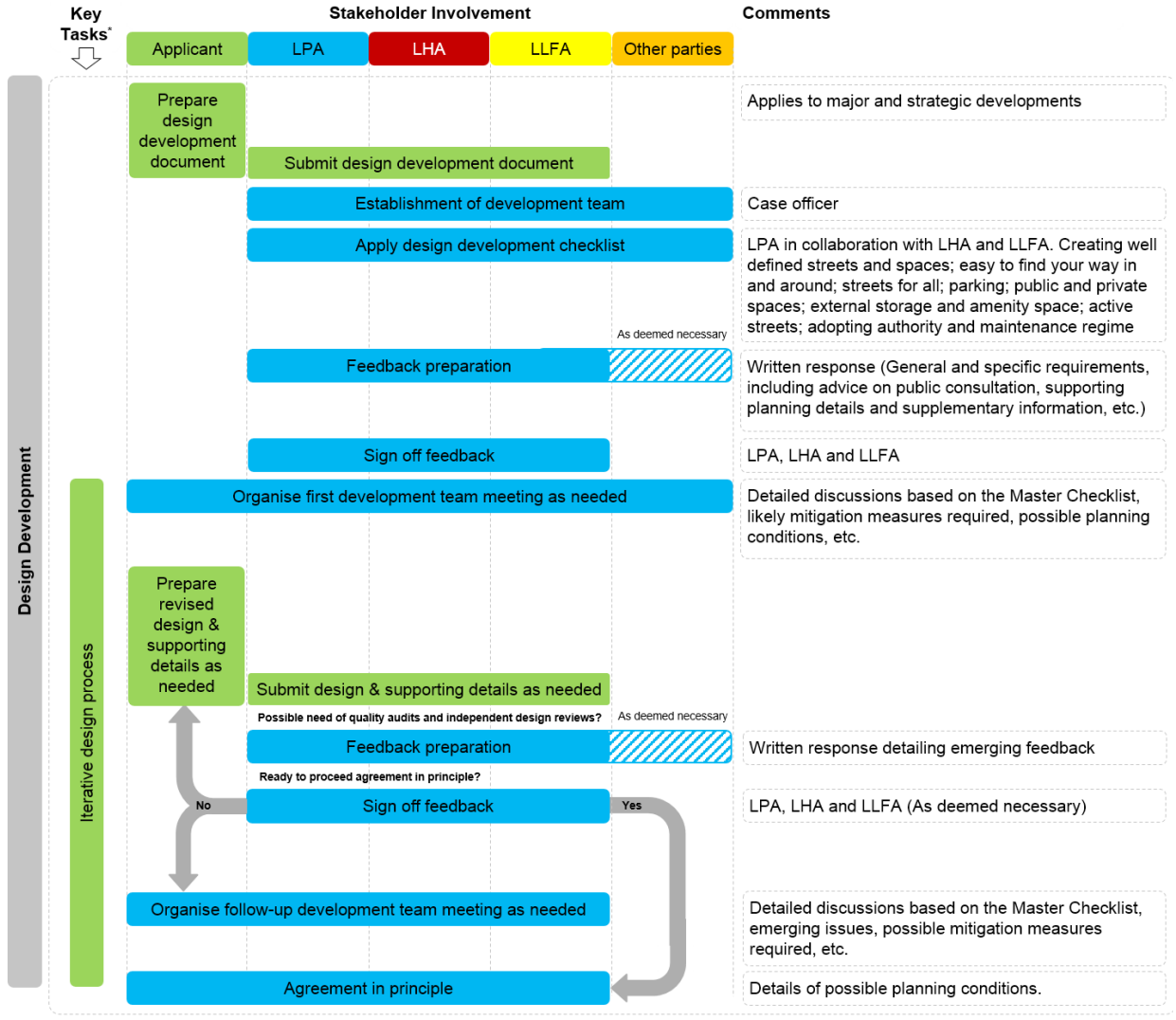
Following the first development team meeting, a written response, in a form to be agreed at the development team meeting, to the applicant, will be provided by the case officer. The issues covered will depend on the case but where applicable will cover:

- Views on the principle and details of the design development proposal.
- Requirements or suggestions for amendments to the vision or proposals.
- Advice on any publicity and community consultation.
- Identification of any areas to be covered by a planning obligation.
- An indication of the likely commuted sum payments and opportunities for variations.
- Identification of further information and/or supporting submissions required to accompany a formal planning application (and details of their scope and content).
- Identification of any further information required or the need for follow-up meetings and/or assessments, including quality audits, road safety audits and independent design reviews.

In the preparation of feedback, the case officer will include the views of highway authorities and the lead local flood authority. Depending on the scale and complexity of the proposed development, the design development stage may involve multiple iterations of documents, plans, sketches and/or development team meetings. The key objective of this stage is to progress the design of the scheme to a point where the local highway authority can provide 'agreement in principle' on:

- The site layout, including access.
- Areas likely to be adopted as publicly maintained and those areas to be private.
- Any off-site works.
- Any financial contributions.
- Any measures to be included in the Travel Plan, if required.

**Figure 7.4. Design development overview**




* Text box colour highlights the stakeholder that will normally lead each task

KEY: LPA: Local Planning Authority | LHA: Local Highway Authority | LLFA: Lead Local Flood Authority

In line with the National Planning Policy Framework, requests for additional information will be reasonable and proportional to the nature and scale of the development. In some cases, quality audits and independent design reviews may be requested.

## 7.6 Quality audits and independent design reviews

To support outline or detailed planning applications, the case officer may require a quality audit and/or an independent design review to be undertaken on specific proposal features or a combination of design features. Development thresholds will not necessarily be the trigger for a quality audit or independent design review as much depends on the context, the innovation applied, the complexity, conflicts of interest or those derived from the application of checklists, conformity with local plans, etc. Whilst such requests can be made throughout the design process, case officers are normally more likely to require these prior to the submission of planning applications (i.e. pre-application stage).

Independent design reviews shall adhere to the National Planning Policy Framework as well as the ten principles of design reviews as defined by the Design Council et al (2013). It is the responsibility of the case officer to liaise directly with an independent design review manager, who will help establish the type of panel that needs to be assembled[1].

There are a number of discrete studies that might come together to form the requested quality audit, which may, depending on the issues, include an audit addressing:

- Visual quality.
- How the streets will be used by the community.
- Road safety and associated risk assessment.
- Access.
- Walking.
- Cycling.
- Place-check.

In progressing quality audits, local planning and highway authorities will normally appoint a nominated quality audit co-ordinator, who will be responsible for the preparation of the audit brief. Where appropriate, the content of the brief will be informed by the discussions of the development team. It will be the responsibility of the applicant to pay for the quality audit.

Road safety matters remain a critical consideration for highway officers. Changes to the off-site highway network and site accesses to external roads will routinely require safety audits[2], whether as part of a quality audit or as a stand-alone process. Such changes include the implementation of new junctions or improvements to the existing highway network, including junctions and highway links (i.e. Works secured under Section 278 Agreements).

Similarly, proposals that contain innovative features, untried ideas or shared-surface streets (i.e. Works secured under Section 38 Agreements) will normally be subject to a Stage 1 Road Safety Audit prepared at the cost of the applicant.

In requesting road safety audits under the scope of this design guide, there may be cases when a more balanced approach and response is required hence road safety audits may be embedded as part of a broader quality audit process. It will be for the local planning and highway authority to agree the need for and the scope of the quality audit or independent design review on a case-by-case basis.

Overall, it is the applicant's responsibility to commission and pay for studies, independent design reviews and audits while ensuring they are carried out by an accredited/ independent team.

[1]Refer to Opun and the Design Network www.designnetwork.org.uk
[2]For additional information on 'road safety audits' refer to the Institution of Highways and Transportation (2008) Road Safety Audit.

# 7.7 Application submission

If applicable, when an 'agreement in principle' has been reached, the applicant is normally in a good position to finalise and submit the planning application in accordance with current national information requirements.

With respect to design and access statements their scope will vary depending on whether applying for outline or full planning permission and shall:

- Be proportionate to the complexity of the proposal.
- Consider and explain the merit of the proposal and how it relates to the local context.
- Be consistent with the high-level design principles set out in this design guide, as well as relevant national, regional and local policies.

Table 7.3 provides an indication of when design and access statements including other supplementary information is required.

Detailed guidance on the scope and preparation of transport statements and assessments including travel plans can be found on the 6Cs website. It is critical that the applicant proceeds with the application submission having given full consideration to and had endorsement of local planning and highway authorities of future maintenance arrangements. This endorsement is normally detailed as part of the 'agreement in principle'.

**Note:** Transport Assessment Guidance will apply unless Supplementary Planning Documents (SPD) or other area guidance takes precedent.

**Table 7.3. Standard minimum requirements for highway authorities: Applicant's communication tools; supporting planning details and supplementary information**

| | | 6Cs communication tools for the pre-application stage | | Supporting planning details and supplementary information | | | | |
|---|---|---|---|---|---|---|---|---|
| **Class** | **Use** | **Concept development** | **Design development document** | **No formal assessment required [A]** | **Design and access statement [B]** | **Transport statement** | **Transport assessment and travel plan** | **Environmental impact assessments and statements** |
| A1 | Food retail | Required | TBA | GFA < 250 $m^2$ | Large development or GFA [C] ≥ 100 $m^2$ | 250 ≤ GFA < 800 $m^2$ | GFA ≥ 800 $m^2$ | TBA |
| | Non-food retail | Required | TBA | GFA < 800 $m^2$ | | 800 ≤ GFA < 1,500 $m^2$ | GFA ≥ 1,500 $m^2$ | TBA |
| A2 | Financial and professional services | Required | TBA | GFA < 1,000 $m^2$ | | 1,000 ≤ GFA < 2,500 $m^2$ | GFA ≥ 2,500 $m^2$ | TBA |
| A3 | Restaurants and cafés | Required | TBA | GFA < 300 $m^2$ | | 300 ≤ GFA < 2,500 $m^2$ | GFA ≥ 2,500 $m^2$ | TBA |
| A4 | Drinking establishments | Required | TBA | GFA < 300 $m^2$ | | 300 ≤ GFA < 600 $m^2$ | GFA ≥ 600 $m^2$ | TBA |
| A5 | Hot food takeaway | Required | TBA | GFA < 250 $m^2$ | | 250 ≤ GFA < 500 $m^2$ | GFA ≥ 500 $m^2$ | TBA |
| B1 | Business | Required | TBA | GFA < 1,500 $m^2$ | | 1,500 ≤ GFA < 2,500 $m^2$ | GFA ≥ 2,500 $m^2$ | TBA |
| B2 | General industrial | Required | TBA | GFA < 2,500 $m^2$ | | 2,500 ≤ GFA < 4,000 $m^2$ | GFA ≥ 4,000 $m^2$ | TBA |
| B8 | Storage or distribution | Required | TBA | GFA < 3,000 $m^2$ | | 3,000 ≤ GFA < 5,000 $m^2$ | GFA ≥ 5,000 $m^2$ | TBA |
| C1 | Hotels | Required | TBA | < 75 bedrooms | | 75 ≤ bedrooms < 100 | ≥ 100 bedrooms | TBA |
| C2 | **Residential Institutions** | | | | | | | |
| | Hospitals, nursing homes | Required | TBA | < 30 beds | Large development or GFA [C] ≥ 100 $m^2$ | 30 ≤ beds < 50 | ≥ 50 beds | TBA |
| | Residential education | Required | TBA | < 50 students | | 50 ≤ students < 150 | ≥ 150 students | TBA |
| | Residential hostels | Required | TBA | < 250 residents | | 250 ≤ residents < 400 | ≥ 400 residents | TBA |
| C3 | Dwelling houses | Required | TBA | < 50 dwellings | Large development or > 1 dwelling [D] | 50 ≤ dwellings < 80 | ≥ 80 dwellings | TBA |
| D1 | Non-residential institutions | Required | TBA | GFA < 500 $m^2$ | Large development or GFA [C] ≥ 100 $m^2$ | 500 ≤ GFA < 1,000 $m^2$ | GFA ≥ 1,000 $m^2$ | TBA |
| D2 | Assembly and leisure | Required | TBA | GFA < 500 $m^2$ | | 500 ≤ GFA < 1,500 $m^2$ | GFA ≥ 1,500 $m^2$ | TBA |

[A] This requirement must be confirmed by prospective applicants at the end of the concept development stage
[B] As per Town and Country (Development Management Procedure) (England) Order 2015. (SI 2015/595)
[C] Where any part of the development (i.e. provision of a building or buildings) is in a designated area (i.e. conservation area or property appearing on the World Heritage List)
[D] Where any part of the development is in a designated area
TBA - To Be Agreed
GFA - Gross Floor Area

### Master checklist

Table 7.4 shows the master checklist that will be used to guide design prior to application submission. Applications are expected to demonstrate, according to the size of each development, how the proposal addresses this checklist consistent with the high-level design principles and tackles local issues through the implementation of suitable mitigation measures.

**Table 7.4. Master checklist**

| Master Checklist |
|---|
| **Integrating into the neighbourhood**<br>Connections<br>• Where should motor vehicles come in and out of the development?<br>• Should there be pedestrian and cycle only routes into and through the development? If so, where should they go?<br>• Where should new streets be placed? Could they be used to cross the development site and help create linkages across the scheme and into the existing neighbourhood and surrounding places?<br>• How should the new development relate to existing development? What should happen at the edges of the development site?<br>• If the development is in a more urban location, does the scheme respond to the scale of its surroundings, respect existing view corridors (or create new ones) and reinforce existing connections and make new ones where feasible?<br>Facilities and services<br>• Are there enough facilities and services in the local area to support the development? If not, what is needed?<br>• Where new facilities are proposed, are these facilities what the area needs?<br>• Are these new facilities located in the right place? If not, where should they go?<br>• Does the layout encourage walking, cycling or using public transport to reach them?<br>Public transport<br>• What can the development do to encourage more people (both existing and new residents) to use public transport more often?<br>• Where should new public transport stops be located? |
| **Creating a place**<br>Character<br>• How can the development be designed to have a local or distinctive identity?<br>• Are there any distinctive characteristics within the area, such as building shapes, styles, colours and materials or the character of streets and spaces that the development should draw inspiration from?<br>Easy to find your way in and around<br>• Will the development be easy to find your way around? If not, what could be done to make it easier to find your way around?<br>• Are there any obvious landmarks?<br>• Are the routes between places clear and direct?<br>• If the development is in a more urban location, is the scheme designed to make it easy to understand the links between where people live and how you access the building, as well as how you move through it? Is the entrance(s) to the development well-defined? Is it easy to find the front door? |
| **Street and home**<br>Streets for all<br>• Are streets pedestrian friendly and are they designed to encourage cars to drive slower and more carefully?<br>• Are streets designed in a way that they can be used as social spaces, such as places for children to play safely or for neighbours to converse?<br>Car and cycle parking<br>• Is there enough car and cycle parking for residents and visitors?<br>• Is parking positioned close to people's homes?<br>• Are any parking courtyards small in size (generally no more than five properties should use a parking courtyard) and are they well overlooked by neighbouring properties?<br>• Are garages well positioned so that they do not dominate the street scene?<br>• Are car parking spaces and garages big enough to accommodate vehicles?<br>• Will the development be likely to support and encourage cycling by providing cycle parking which people can use with confidence?<br>• Where parking is provided, is this easy to use? Are accesses to car parking designed not to impact on those not in cars?<br>• Are entrances to car parks over-engineered, visually obtrusive or obstructive to pedestrians and cyclists? |

| Master Checklist (Cont.) |
|---|
| Public and private spaces<br>• If the development is in more urban locations and shared spaces are proposed, is the purpose and use of shared space clear? Is it designed to be safe and easily managed?<br>• Where semi-private or private spaces are created, are these clearly demarcated from the public realm?<br>External storage and amenity space<br>• Is storage for bins and recycling items fully integrated, so that these items are less likely to be left on the street?<br>• Is access to cycle and other vehicle parking convenient and secure?<br>• Is waste storage well integrated into the design of the development so residents and service vehicles can access it easily whilst not having an adverse impact on amenity for residents? |
| **Adoption and maintenance**<br>• Have broad principles been established relating to the adopting authority and what maintenance regime will be required in multi-functional public spaces to realise the vision?<br>• How will future maintenance be arranged and made acceptable to the affected authorities (e.g. the highway authority might require maintenance responsibility to be conveyed under licence and also require a commuted maintenance payment)? Has there been liaison with the affected parties to avoid surprises at a later design stage? |

## 7.8 Reserved matters

According to the Town and County Planning, England (Development Management Procedure) Order 2015, any of the following aspects of development for which details may not be provided or may be provided by the applicant 'for illustrative purposes only' can be considered as reserved matters.

- Access.
- Appearance.
- Landscaping.
- Layout.
- Scale.

While these aspects will be reserved for later determination, applications for outline planning permission will always require a basic level of information. Furthermore, applicants must ensure that design considerations and information, as set out in, for example, the design and access statements, provide a clear and consistent link between the outline stage and the subsequent reserved matters stage. For additional design considerations in relation to appearance, landscaping, layout and scale please refer to Section 4.3.

## 7.9 Technical approval

The collaborative design process at pre-application stage will help identify site-specific opportunities and help tackle as many issues and challenges as possible, facilitating the technical approval stage.

### New streets

Developers are encouraged to create, wherever possible, street layouts that are to an adoptable standard that will be offered for adoption.

**Security and Exemptions:** Under Sections 219 to 225 of the Highways Act 1980 the cost of roadworks fronting new buildings on private roads needs to be assessed and the payment of these costs needs to be secured. This ensures that the LHA can complete the works should the applicant fail to do so, and also that those living on the road will not be liable to complete it.

**Section 38 of the Highways Act 1980** provides for the highway authority to take over and maintain at public expense (adopt) a road that has been constructed by a developer. The adoption process is covered by a Section 38 agreement. This will include expenses for maintenance, which will be payable through commuted sums. This approach provides flexibility to adopt non-standard layouts and materials without placing undue burdens on local authority maintenance budgets. Layouts must always be appropriate and acceptable on highway safety grounds for a street to be adopted.

Prior to entering into a Section 38 agreement, full planning permission for the development must have been received from the LPA including approval of any reserved matters relating to the road works. Title to the land to be dedicated as public highway must also be proved, as well as the right to discharge surface water from the highway to an existing or proposed sewer or water course. Drainage proposals must have been approved by the relevant authorities.

The design of road works shall be in accordance with DSP and associated specification and must be approved prior to commencement of construction. Before carrying out technical approval checks, the developer is required to make a payment to cover the costs of the checking and for preparing the Section 38 agreement in case the development does not take place. If a Section 38 agreement is made, this payment will be deducted from the highway authority administration and inspection fees.

The following standard checklist of information needs to be provided for technical approval as checking will only commence once all information has been received:

- Layout.
- Vertical alignment.
- Standard details.
- Ground conditions.
- Drainage.
- Landscaping.
- Street lighting.

Technical approval will only be issued when all design checks are complete. This will include stage 1 and 2 safety audits, which may be part of quality audits. They must be satisfactorily completed where required, and any additional or amended details required will need to be provided and approved.

After technical approval has been given, the specified number of copies of drawings must be provided to the LHA for inclusion in the Section 38 legal agreement.

## Work on existing highways

Construction of works on an existing public highway is covered by Section 278 of the Highways Act 1980 and can be used to allow the developer to employ a contractor to carry out work on the existing public highway. Alternatively, some LHAs may choose to be the employer. The developer is urged to contact the relevant LHA to seek advice about their expectations concerning the design, construction and supervision.

This section of the Act also entitles the LHA to seek expenses for future maintenance of the highway which is achieved through commuted sums (see Appendix IV).

Prior to entering into a developer led Section 278 agreement, full planning permission for the development must have been granted by LPA including approval of any reserved matters relating to highway works. As well as providing detailed designs for the preparation of the agreement, a surety must be provided to protect the LHA against the risk of any unforeseen expenditure should the highway works be unfinished for any reason. Written confirmation must be provided that the Health and Safety Executive has been informed about who has been appointed as the client for the works for the purposes of the Construction (Design and Management) Regulations.

The design of road works shall be in accordance with DSP and associated specification and must be approved prior to commencement of construction. Safety audits, which may form part of quality audits, are required for all highway works covered by Section 278 agreements and must be carried out by an independent team of the designers. These audits must be paid for by the developer.

**Feasibility stage:** The general nature of any off-site highway works shall be agreed prior to submission of the planning application. The LHA will need to be satisfied that the proposed works will offset the highways and transport impacts of the development and are feasible within the land constraints of the development before it will recommend to the LPA that the development is acceptable.

**Preliminary design stage:** When the general scheme layout has been agreed at feasibility stage, the preliminary design for the scheme shall be prepared and submitted to the highway authority along with confirmation that all costs incurred by the LHA will be covered. At this stage, the designers shall liaise with other parties including utility providers to ensure the design takes into account their requirements. The LHA will then check the design and, in the case of traffic-calming schemes, consult with interested parties on behalf of the developer.

**Detailed design stage:** When the preliminary design has been approved by the LHA, detailed design can proceed. At this stage, the LHA will serve the appropriate notices to utility companies under the New Roads and Streetworks Act, carry out noise assessments if required, and design the street lighting.

Once all design checks have been completed, stage 1 and 2 safety audits have been satisfactorily completed, and any amended details have been provided, the LHA will issue technical approval for the scheme.

## 7.10 Implementation

Construction of the works must not begin until:

- The LHA has provided technical approval.
- The Section 38 or Section 278 agreement has been completed and signed and an appropriate surety put in place.
- Written confirmation has been provided by the developer that the Health and Safety Executive has been informed who is the client for the works for the purposes of the Construction (Design and Management) Regulations.
- All necessary fees have been paid.
- The maintenance arrangements within the adoptable highway have been agreed.
- A number of requirements, as set out in Parts 5 (ANR7) and 6 (WEH6), have been satisfactorily completed.

The LHA will issue a provisional certificate of completion once:

- The highway works have been satisfactorily and substantially completed.
- Street lighting has been satisfactorily completed and electrical test certificates provided.
- Landscaped areas to be adopted have been fully planted and established.
- The works have been jointly inspected and no significant defects identified.
- A stage 3 safety audit has been completed and all changes have made satisfactorily.
- A plan has been provided showing any areas of land to be dedicated as highway, along with highway boundary markers.

## 7.11 Monitoring

The developer will be responsible for maintaining the highway works for a minimum period, usually 12 months although an extended period may be required where soft landscaping is involved. This allows any defects in the works to become apparent after they are brought into use.

The highway authority will issue a final certificate of completion when the following actions have taken place:

- At the end of the maintenance period a further joint inspection has been undertaken and any remedial works satisfactorily completed.
- The highway works have been satisfactorily maintained during the maintenance period.
- Landscaped areas have been satisfactorily maintained during the maintenance period.
- A copy of the provisional certificate of adoption for the drainage and sewers, as issued by the relevant water company, has been provided.
- Any commuted sums have been paid.
- Any other charges that are applicable have been paid, e.g. to cover the bulk clean and lamp change for illuminated signs or similar for street lighting.
- Where required, a stage 4 safety audit has been satisfactorily completed.
- As-built drawings have been provided.
- The health and safety file, in line with Construction (Design and Management) Regulations has been provided.
- The land dedication plan has been agreed.
- All staff costs of have been paid.

After all the above have been completed to the LHA's satisfaction, it will:

- Issue a final certificate of completion.
- Cancel the surety bond.
- Adopt any areas dedicated as highway to be maintained at public expense.

It should be noted that monitoring activities may also be linked to site-specific actions derived from travel plans, which may include surveys and confirmation that particular measures have been implemented.

# 8. Detailed Design Guidance

# 8. Detailed Design Guidance

## 8.1 Introduction

The guidance contained within this chapter is intended to assist designers in the design and delivery of high-quality solutions that appropriately reconcile place and movement functions, as supported by servicing requirements, and which are simple and cost-effective to maintain.

It is imperative that design is consistent with:

- The purpose of DSP as set out in Chapter 2.
- The high-level design principles as defined in Chapter 3.
- Urban design principles and inclusive design principles described in Chapter 4 and Appendix II respectively.

This chapter is structured around the principal functions of streets, with maintenance considerations applying to all of them:

- Place and movement.
- Servicing:
  - Access.
  - Parking.
  - Drainage.
  - Utility.
  - Street lighting.

Detailed guidance on the incorporation of these functions in street design is presented through a series of Design Element Sheets (DESs).

**Figure 8.1. Example of a Design Element Sheet**


Delivering Streets and Places
Detailed Design Guidance | Servicing: On-Street and Off-Street Parking

DES: On-Street Car Parking

Design considerations

Carefully designed on-street parking can play a positive role in calming traffic speeds by encouraging cars to drive slower and more responsibly. When integrated with other design elements (e.g. trees, SuDS) and consideration is given to ensure that parking spaces are conveniently located and overlooked they can be successfully assimilated into the built environment.

Effective integration of parking and green space on a development. This example highlights the importance of coordinating parking with trees and SuDS as part of the design development process. © CIRIA, 2015

The following matters shall be taken into account:

- On-street parking spaces must be clearly defined so to encourage the intended users to use them. Parking space definition can be achieved through on-street markings or through material differentiation, which can contribute positively to achieving a sense of place.

Failing to provide a flexible car parking strategy leads to the inevitable footway parking.

Well-designed on-street car parking smooths out demand and prevents pavement parking.

- Traffic Regulation Orders shall be considered to minimise the risks of on-street parking particularly near schools.
- The arrangement of parking shall not cause undesirable obstructions. For example, to pedestrian and cycle movement; visibility at junctions; and the safe and efficient operation of buses, emergency vehicles and refuse collection vehicles.

Clearly defined on-street parking not only encourages use but also benefits the aesthetic of a street by addressing the issue of parking blight.

- Parking provision shall aim to ensure that the level and design of on-site parking and any proposed travel plan measures reflect and complement each other.

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While DESs are presented on an individual 'design element' basis, it is imperative to consider how all design elements interact in the context of the street, the development and the adjoining areas.

Although the DESs set out typical requirements, the LHAs are prepared to be flexible to constructive suggestions brought forward by applicants, which may vary from a particular aspect of this guidance as long as there is justification for doing so and where such proposals do not contradict the high-level design principles set out in this guide. Equally, the authorities will be flexible in accommodating over time any additional design elements that are not included in this guide where adequate justification for their use can be given.

## 8.2 Place and Movement

### General Guidance

When designing new developments and high-quality streets, consideration shall be given to reconciling the primary function of safe movement with place and servicing functions.

Design outcomes shall seek to meet as far as practicable the following function-specific objectives:

1. Provide accessible, safe and convenient connections to all modes to integrate development internally and externally with existing neighbourhoods.
2. Provide good access to public transport.
3. Design places that incorporate solutions for people.
4. Minimise street clutter.
5. Encourage multi-functional public spaces that can be adapted to changing demands over time.
6. Design places that are easy to navigate and find your way around.
7. Promote streets that encourage low vehicle speeds to allow them to function as social places.
8. Create a locally inspired and or distinctive character through the use of good quality materials that have minimal maintenance requirements.
9. Incorporate materials to assist key user groups.
10. Promote green spaces and strengthen their role in supporting other functions of streets.

### Design Element Sheets

Establishing a sense of place and one which functions safely is crucial to the successful operation of a streets activities relating to living, working and playing. There are several components that contribute towards the creation of successful street's and these are considered in the following DESs.

# DES: Boundary Treatments

## Design considerations

Street transitions from areas of public to private realm must be clear and unambiguous to help define the ownership of different parts of the street. This is normally achieved by installing some form of boundary treatment which can also aid streetscape, legibility and navigation for partially sighted people.



This street comprises a mix of railing (left-hand side) and low-level walling (right-hand side) to denote the boundary between the public and private realm.



Despite not being part of the adopted highway, this private driveway is separated from the SuDS feature by wooden fencing. The use of wood as the material responds well to the context of the development.





Front gardens and planting provide alternatives to boundary treatments while strengthening place-making objectives.

Provision of effective boundary treatment can be achieved by taking account of the following:

- Traditional treatments such as walling, fencing and railing can be used although soft and low-level demarcations or planting may be equally as effective, depending on circumstances.
- The use of blank walls and close-boarded fencing that segregate private gardens and other private spaces to the rear of properties from the street are to be avoided. Generally, buildings shall be organised in line with front-to-back principles. Both walling and high-quality fencing is appropriate to demarcate building frontages.
- Wherever the extent of the adoptable highway is not clear e.g. there is no wall, fence or footway edge, an agreed form of boundary marking shall normally be installed.
- The use of high quality materials in particular to boundaries fronting the public realm e.g. low-level garden walls.
- Avoidance of sunken planting beds near direct paths (i.e. soil level lower than surrounding paving) can be a real problem for mobility cane users.
- Avoidance of over-hanging vegetation on pavements i.e. set planting back from edges to allow for eventual size. This will avoid unnecessary obstructions, which are particularly detrimental to disabled users of the pavement.

## Technical criteria

- The highway boundary shall be defined by continuous 50mm x 150mm edging 2type EF to BS 7263 unless agreed otherwise. Nevertheless, alternative approaches to demarcation will be considered on a site-by-site basis, for example, in conservation areas.

## Adoption and maintenance

- Boundary hedges, fencing and walling will not be adopted unless it is a requirement of the local authority.
- It must be made clear to purchasers of individual property at the time of sale if ownership and responsibility for existing boundary hedges, fences and/or walls is being transferred to them.
- It is necessary to establish who is responsible for maintaining boundary treatments in the early stages of the design process i.e. the concept development and design development stages.

## Links and references

- Refer to inclusive design principles in Appendix II.
- For works that the highway authority is to adopt, refer to details on fencing, including brook railings, boundary markers, gates and stiles and pedestrian guardrails in the standard drawings and Appendices 4/1 and 4/2 of the 6Cs specification.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Street Trees

## Design considerations

Street trees are an important element in development planning as the benefits to be derived include:

- **Public and health wellbeing** - trees create environments that encourage physical activity, including active travel, and are associated with improved mental health.



Trees and other planting have a positive impact on street aesthetic. Image Courtesy Jeremy Barrell, TDAG

- **Traffic management** - trees can be used to affect user perception of movement and the actual carriageway width to achieve appropriate design speeds through psychological traffic calming. Trees and other planting can be beneficial in limiting forward visibility for speed management purposes. Trees are also effective at facilitating perception in changes in street geometry (e.g. highlighting bends, junctions, crossings, topographic changes, etc.).
- **Quality and sense of place** - trees help to frame views and vistas, while being place-making features in their own right enhancing the identity and character of the area. Seasonal variations also contribute to the street aesthetic.



New trees are well integrated in proportion to the scale of development, increasing the user perception of movement by lining the main carriageway. Wide footway and verge have the potential to encourage 'active travel' and social interaction.

**Note:** grass is not brought right up to the tree as mulch is preferred surround and avoids damage by strimmers, etc.

- **Carbon sequestration and storage** - trees remove and store atmospheric carbon dioxide, contributing to improved air quality at the street level.
- **Micro-climate regulation** - trees provide shelter from wind and sun.
- **Stormwater management** - trees attenuate both the volume and the rate of stormwater run-off and can also enhance water quality.



The retention of these three existing trees within this development complements the green space upon which they lie. They also provide a habitat for birdlife and insects and a suitable resting place for lunchtime picnickers.

- **Inward investment and retail** - trees in the built environment are associated with higher yields and rental values in commercial properties, while they have been shown to contribute to higher footfall, customer retention and dwell time in retail environments.

The adequate integration of existing trees and the right type of new tree planting in the right places can be achieved by taking account of the following:

- Retain existing street trees within developments wherever possible.
- Trees that are removed must be compensated elsewhere in the development.
- Large trees can provide impressive street features and can aid the legibility of a development.
- The role of trees and their means of incorporation within new development is to be considered at the concept development stage. Trees shall be planted responsibly in areas where they can succeed to minimise the future maintenance burden on local authorities.
- Using a variety of different tree species can benefit resilience and the diversity of the wider tree population.
- Trees can have a screening role in development, protecting properties from undesirable views or noise, while they can also provide shelter from sunlight, wind and precipitation.
- Trees shall not exclude buildings and areas of car parking from enjoying good natural observation from the street.
- Trees can form an important and sustainable component of the drainage strategy.

## Technical criteria

- A tree's surface opening must be of sufficient size to allow infiltration of water and the aeration of the soil below. It must also be suitable to facilitate tree growth (notably radial trunk growth and flare) over time. Refer to page 67 of 'TDAG: Trees in Hard Landscapes: A Guide for Delivery' for guidance on surface opening treatments.
- It is vital that root environments have sufficient access to water. This encompasses processes of infiltration, retention and drainage. Ensuring that trees are adequately spaced is crucial to allowing trees to grow and prosper as intended. Specific guidance for tree spacing shall be informed by the species of tree used.
- It may be beneficial to establish common trenches for tree planting. This helps to minimise the space required to establish adequate planting and growth conditions and lessen the likelihood of conflict between space-competing elements such as tree roots and below-ground utilities infrastructure. Tree root expansion shall be facilitated in a way that protects the integrity of surface and sub-surface street infrastructure, including carriageways, footways, utilities and drainage. Root deflectors and other techniques may be considered as and where appropriate to context.
- Where trees are planted directly into, or where the rooting environment is likely to overlap a load-bearing surface (e.g. a footway, a cycle track, the carriageway, a private driveway, etc.), efforts will likely be necessary to protect the rooting environment from soil compaction.
- Support structures will likely be necessary to protect and support young trees. Instances of subsidence encountered with trees planted in shrinkable clay and silt soils shall be negated by constructing to a suitable foundation depth and through appropriate species selection.
- Tree location shall be co-ordinated with street lighting positioning to ensure that the latter is able to function appropriately. Spacing and separation are directly related to species.

There shall be a 5.1m - minimum height clearance over the carriageway and a 2.1 - 2.3m - minimum height clearance over the footway (clearance requirement varies between LHAs so advice from the relevant LHA shall be sought).

- New trees shall not normally be planted in visibility splays if they are likely to compromise these requirements once mature.
- The impact of trees on visibility shall be considered within the context of the overall visibility envelope.

## Adoption and maintenance

- It is important that trees incorporate an appropriate surface opening treatment. Trees shall not be planted directly into grass because this leads to maintenance issues. This is consistent with BS 8545:2014.
- Trees must be fully planted before a provisional certificate of completion is issued. This planting must be maintained until the issue of the final certificate, including any necessary replacements, to make sure that it is fully established.
- All existing trees that are to be retained within the existing highway or areas to be adopted must be maintained in accordance with BS 8545:2014 and Appendix 30/10 of the 6Cs Specification until the issue of the final certificate.
- Consideration must be given to the future maintenance of any trees within the Public Highway and Commuted Sums are likely to be sought by the LHA.

## Checklists

- Existing habitats and ground conditions must be determined before agreeing specific tree planting types and locations. Should the applicant not possess expert knowledge internally then expert arboriculture advice shall be sought early in the design process.
- As trees can provide habitats for species of bird, insect and bat that are protected by law, it is a legal requirement that all trees be surveyed by an appropriate specialist prior to any work that could threaten or damage a protected habitat taking place.
- Commuted sums may be required for future maintenance.

## Links and references

- For information on possible commuted sum payments refer to Appendix IV.

# DES: Grassed Verges

## Design considerations

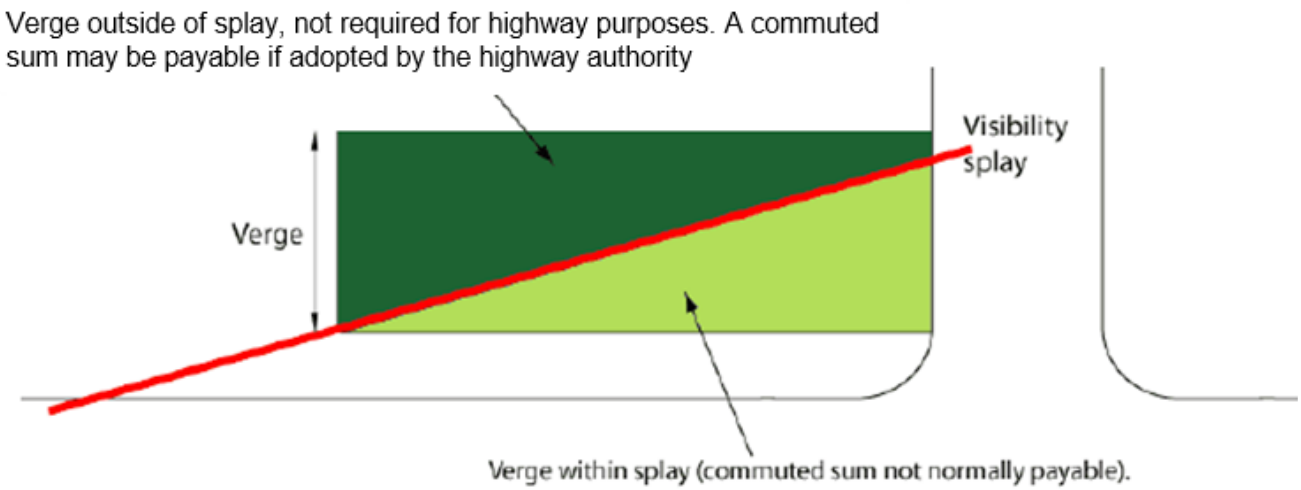
Grassed verges have aesthetic value, enhance drainage capability and benefit cyclists' subjective experience of a safe environment. There is a preference for retaining existing grassed verges within developments in the 6Cs area and the following matters shall be taken into account:

- Generally, grassed verges, as well as embankments and other areas of open space forming part of the adoptable highway, shall be laid out as amenity grass unless some other form of landscaping is proposed to help enhance the quality and appearance of the scheme.
- Avoid using narrow grassed verges to demarcate a footway from a carriageway or from a private driveway as they are usually neglected and/or become overrun by vehicles.
- Where it is necessary to reinforce verges to prevent erosion and/or vehicles are likely to be parked, approved systems of reinforcement shall be used.
- Many rural streets comprise grassed verges that are not demarcated from the carriageway by kerbing, creating an informal appearance. This can be attractive but there can be problems where vehicles regularly overrun the verge. While standard pre-cast concrete kerbs may not always be appropriate, natural stone, riven or exposed aggregate kerbs could be considered to prevent this happening. In some instances, it may be necessary to upgrade verges to include kerbs to improve pedestrian safety, drainage and/or to discourage parking.

## Adoption and maintenance

- A commuted sum may be payable for grassed verges that lie outside of a visibility splay. The diagram below and Appendix IV provide further information on commuted sums.

**Figure 8.2. Consideration for commuted sums and verges outside the visibility splay**





This grassed verge by the side of a footpath adds colour and provides for a safer and more welcoming space. No kerb is required because it does not interface with the carriageway and is not deemed susceptible to erosion.



This grassed verge separates the carriageway from a Local Equipped Area for Play. The grassed verge provides an added layer of separation between playing children and traffic, enhancing the safety of the street.




A car parked across a narrow grassed verge. The narrowness of the verge makes it difficult to maintain while it serves little purpose.



This small grassed verge serves little purpose and creates a maintenance burden for the local authority.

## Links and references

- For guidance on ground preparation work when grassing or planting on any area, refer to Appendix 30/4 of the 6Cs Specification.
- For guidance on grass seeding and turfing, refer to Appendix 30/5 of the 6Cs Specification.
- For guidance on plants and planting works, refer to Appendix 30/6 of the 6Cs Specification.
- For additional information on landscaping, including choice of species, refer to Appendix G: 'Landscaping on New Developments and in Highway Improvement Schemes'.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Other Planting

## Design considerations

Planting schemes make a positive contribution to the quality and character of development. In addition, they can provide an effective means of defining spaces and create an effective contrast between diverse elements of the streets. This can be achieved by taking account of the following:

- Retain existing hedgerows and other significant areas of planting within developments when feasible.
- Planting must consider growing conditions to maturity.
- Avoidance of over-hanging vegetation on footways or footpaths i.e. setting planting back from path edges to allow for eventual size. This will avoid obstructions and assist maintenance.
- Planting shall not exclude buildings and areas of car parking from enjoying good natural observation from the street.
- Any planting in and around car parks shall be kept to low ground-level coverage.
- Sunken planting beds (i.e. where the soil level is lower than surrounding paving) shall normally be avoided as these pose a significant problem for mobility cane users.



The use of trees and other planting in this development successfully helps break up the visual appearance of the car parking.

## Technical criteria

- Verges composed of shrubbery or ground-cover planting shall be at least 1m wide and have a minimum area of 6m$^2$, otherwise they shall be hard landscaped.
- Any planting, shrubbery, etc. located within visibility splays shall not grow to more than 600mm in height above the adjacent carriageway level where the carriageway gradient is level. Where the carriageway is on a slope or where crests or sags are found in its vertical alignment, this criterion may need to be tightened or relaxed dependent on context. In such circumstances, cases will be assessed by the development team on a site-by-site basis

## Adoption and maintenance

Maintenance needs shall form a fundamental part of consideration at the concept development and design development stages.

- The involvement of the community in planting and associated maintenance activities is strongly encouraged throughout the region e.g. local residents, local businesses, school children, charitable organisations, prison inmates, etc.
- Suitable management arrangements and maintenance strategies must be put in place for year-round impact of all planting schemes. Maintenance regimes, especially in the spring/summer periods is important. A commuted sum may be necessary for any planting or shrubbery that the local authority agrees to adopt.
- Areas of shrubbery and other planted landscaping areas must be fully planted before a provisional certificate of completion is issued. This planting must be maintained until the issue of the final certificate, including any necessary replacements, to make sure that it is fully established.
- Existing and new grassed areas must be satisfactorily maintained before a provisional certificate of completion is issued. The developer is expected to maintain grassed areas throughout the maintenance period and until issue of the final certificate in accordance with Appendix 30/7 of the 6Cs Specification.
- A cultivation license will be required to allow planting on areas of the public highway under S142 of the Highways Act 1980.
- All existing shrubs and hedges that are to be retained within the existing highway or areas to be adopted must be maintained in accordance with Appendix 30/10 of the 6Cs Specification until issue of the final certificate.
- As planting can provide habitats for species of bird, insect and bat that are protected by law, they must be surveyed by an appropriate specialist, by law, prior to any works that could threaten or damage a protected habitat taking place.

## Links and references

- For guidance on ground preparation work when grassing or planting on any area, refer to Appendix 30/4 of the 6Cs Specification.
- For guidance on grass seeding and turfing, refer to Appendix 30/5 of the 6Cs Specification.
- For guidance on plants and planting works, refer to Appendix 30/6 of the 6Cs Specification.
- For guidance on plant maintenance, refer to Appendix 30/6 of the 6Cs Specification.
- For guidance on landscaping, including choice of species, refer to Appendix G: 'Landscaping on New Developments and in Highway Improvement Schemes'.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Public Art

## Design considerations

The use of public art may be considered to enhance place-making objectives. Proposals for public art shall preferably be part of simplified streetscape strategies and always be discussed with the authorities by taking account of the following:

- Consideration must be given as to how the use of public art enhances street character. Art that draws from local features, heritage or traditions can be effective in giving streets a stronger identity.
- In some circumstances, it may be appropriate to involve local communities in the development of public art proposals.
- Artistic lighting may be considered as part of the overall street lighting design.

## Adoption and maintenance

- The future maintenance of public art that is not located in the highway itself is normally the responsibility of the Town Council or Parish Council. In the absence of these councils, responsibilities are normally passed to the District or Borough level.
- If the item is duly agreed with the LHA to be located within the adopted highway, the LHA retains the right to convey maintenance responsibility to another authority under a license arrangement.
- It is essential to consider/agree which authority will be responsible for the future maintenance of public art at pre-application stages.

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Art incorporated within a playground.

## Links and references

- For information on possible commuted sum payments refer to Appendix IV.






Bespoke public art and detailing elements.



Bespoke public art to enhance the sense of place within a communal open space.

# DES: Carriageways and Vehicle Track Space

## General

Streets within new development areas shall either be 'Conventional Streets' or 'Shared-Surface Streets'.

All streets must be tracked using the largest operable vehicle (likely to be a refuse collection vehicle, fire tender and/or pantechnicon) to demonstrate suitability. If the street (e.g. a primary street) is designed with the intention of providing a bus route, either immediately or at some point in the future, the largest likely specification of bus vehicle shall also be included in the tracking assessment to ensure resilience. Tracking assessments shall always account for the potential for on-street parking, whether in dedicated facilities or just on-street.

Within new development areas, and particularly where development has frontage access to the street, the swept tracking path can use both sides of the carriageway to enable consideration to be given to tighter junction radii to aid more direct and convenient pedestrian and cycle desire lines to be achieved. This approach will not necessarily apply at proposed junctions to the existing highway network. Whether or not the swept tracking path can use the whole carriageway or just the inside lane will be dependent upon the context and the agreement of the LHA. Tracking analysis shall be undertaken at an appropriate vehicle speed.

### Conventional streets

Conventional streets are normally required where the volume of motor traffic exceeds 40 vehicles per hour (two-way peak time flow) and/or where vehicles are expected to travel at a speed greater than 15mph.

The design speed of a conventional street shall not normally exceed 20mph for residential streets, 25mph for B1 uses and 30mph for B2 to B8 uses.

Where the street is conventional and serves a mix of land uses, the design speed shall fall to the lowest common denominator e.g. if residential dwellings are present, the street shall be designed to 20mph.

The design speed is calculated as the 85th percentile speed in all cases.

### Shared-surface streets

Shared-surface streets shall normally be considered where two-way traffic flows are below 40 vehicles per hour and the design speed is 15mph or less.

Shared-surface streets are:

- Often considered where there are especially high volumes of pedestrian traffic (e.g. a high street with significant retail activity).
- Not normally advocated for streets used for bus operations[3].
- Not suitable for B1 to B8 land uses.



The carriageway width on this shared-surface street is proportionate to the built form. The buildings provide the street with a sense of enclosure.



As part of the design process multiple functions of the streets need to be reconciled. At this shared-surface street parking may undermine pedestrian needs through the demarcation of footways.

## Design considerations

### Conventional streets

- In terms of road safety, carriageway widths and the use of street-side items of street furniture must take into consideration the needs of all road users, particularly pedestrians, cyclists and motorcyclists.
- The carriageway width may vary along the profile of the street. Localised variations may be accepted and can be effective where the street layout is designed to respond to the nature of the built form or to provide on-street parking space.

[3] As they are provided where traffic flows are low and so demand does not constitute viability under normal circumstances.



Carriageway width reflects the built form, while use of materials conveys a sense of place and creates a sense of shared ownership of the street, potentially calming vehicle speeds.



Excessive carriageway width and walls limit the street's place-making qualities.

## Shared-surface streets

- The carriageway width may vary along the profile of the street. Localised variations may be accepted and can be effective where the street layout is designed to respond to the nature of the built form or to provide on-street parking spaces.
- Neither horizontal nor vertical traffic calming measures should be necessary as layout and building form shall be sufficient to control vehicle speed. Where a proposed building fronts directly onto the street, it shall be set back at least 0.5m behind the proposed highway boundary to allow for opening of windows, drainage downpipes, overhanging eaves, etc.

# Technical criteria

## Conventional streets

Carriageway width for two-way traffic:

- The below widths are to be used as a starting point. Alternative widths will be considered if appropriate.
- Tracking assessments need to be provided to validate the suitability of carriageway widths for all streets using appropriate vehicles.

Standard carriageway widths:

- 5.0m - for streets with a design speed of up to 20mph.
- 5.5m - for streets with a design speed of up to 30mph.
- 6.0m - for streets designed to facilitate bus services.
- 7.3m - for streets serving B2 to B8 land uses.

Streets with lane widths of between 3.25m and 3.9m shall be provided with separate cycle facilities, as these widths fall in the 'critical' zone where cyclists can be passed by motor vehicles with insufficient clearance.

Non-standard widths:

- 3.7m (kerb to kerb) - for streets narrowed for speed control e.g. through use of traffic calming feature.
- 3.25m minimum - for streets with a temporary restriction e.g. on-street pedestrian refuge facility.

## Shared-surface streets

General overall widths - Standard width:

- 7.5m - overall corridor width (including space for utility equipment), subject to tracking.

**Note:** Variable width corridors may be considered acceptable providing it can be demonstrated through tracking analysis that swept paths are accommodated and the design encourages drivers to travel at speeds below and up to the relevant design speed.

## Other design criteria

Centre-line radius:

- To be determined by tracking – residential and B1 office uses.
- 55m minimum - B2 to B8 land uses.

Crossfall:

- 1:40 maximum.

Longitudinal gradients:

- 1:100 - flexible surfacing minimum.
- 1:80 - block surfacing minimum.
- 1:20 - maximum (For the majority of cases. Refer to LHAs for allowances in site specific areas).
- 1:30 - maximum at junctions for the first 10m of the side road.

Vertical curves (only necessary where changes in gradient occur due to crests and sags):

- To be calculated based on formula: L = KA.
  - L = length of vertical curve (m).
    - 10m - minimum for streets with a design speed of 20mph or less.
    - 25m - minimum for streets with a design speed of more than 20mph.
  - K = constant.
    - 1.0 - minimum for streets with a design speed of 20mph or less.
    - 4.0 - minimum for streets with a design speed of over 20mph.
  - A = algebraic difference of the gradients expressed as a percentage.

## Adoption and maintenance

- Adoption and maintenance principles can be found on the 6Cs website.

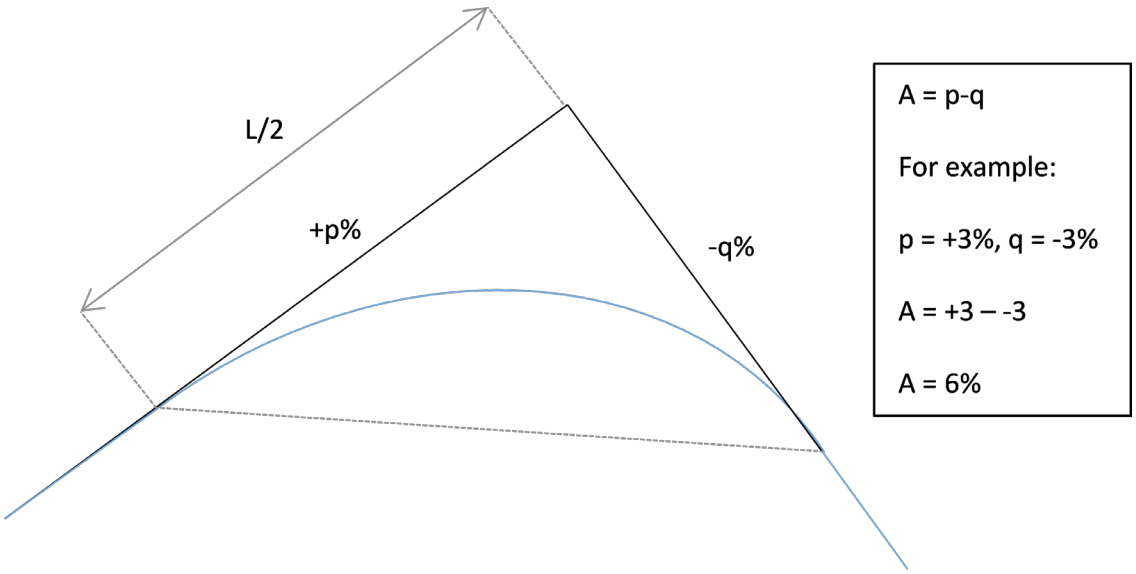
## Checklists

- Tracking assessments of vehicle swept paths will need to be provided to validate carriageway widths and centre-line radii.

## Links and references

- Refer to the Motor Vehicles / Safe Stopping Distances / Speed Control DES and the Street Signs and Regulations DES for guidance on:
  - Design speeds.
  - Stopping sight distances and visibility on bends.
  - Traffic calming measures and standard drawings in the 6Cs specification.
  - Highway signs, street markings and Traffic Regulation Orders (TROs).
- For the adoption of streets under S38 agreement of the Highways Act refer to 6Cs website.
- For information on possible commuted sum payments refer to Appendix IV.
- Standard Drawings Typical Cross Sections and Edge Details - Series 700 can be found on the 6Cs website.

**Figure 8.3. Example of vertical curve**



# DES: Motor Vehicles / Safe Stopping Distances / Speed Control

## Design Considerations

The broad spectrum of vehicles from private car to goods vehicles and public and emergency service vehicles need to be accommodated in new developments. As such, street layouts providing frontage access shall be designed to:

- Provide motor vehicles with suitable and convenient access to the external highway network.
- Discourage external traffic from using the street network as a through route.
- Make the needs of motor vehicles subservient to pedestrians, cyclists and public transport users.
- Accommodate public service vehicles, such as refuse collection vehicles by maximising the efficiency by which they carry out their duties (e.g. by minimising the need for turning and reversing manoeuvres and hence culs-de-sac-based layouts).
- Accommodate motorcycling (Transport for London - Urban Motorcycle Design Guide (http://content.tfl.gov.uk/tfl-urban-motorcycle-design-handbook.pdf) provides valuable guidance that is relevant to use throughout the UK.



This small housing development has a simple U-shaped one-way system street layout and controlled on-street parking in place, which aids refuse collection vehicles in navigating the site.

## Speed control

The means of controlling speeds are many and varied and the appropriate form(s) for development will depend on context. However, in all instances, consideration must be given to how street layout and the urban form can contribute to speed control - i.e. the relationship between streets, buildings and landscape; and to the self-enforcement of speed restrictions.

Methods of implementing speed control through street layout and urban form include:

- The avoidance of visibility splays that are in excess of that required for the design speed.
- The choice of, and variations in, carriageway surface materials.
- Building orientations, plot layouts, etc. to restrict forward visibility to that relevant to the design speed.
- The use of street trees to create a sense of enclosure.
- Carriageway widths that do not exceed that necessary for safe and satisfactory passage.
- Design of on-street parking to force vehicles to 'take turns' in passing on lowly-trafficked streets.



Streets in this development are designed to control speeds through design and layout. Alignment, width and landscaped verges are key components.



Sharp bends used as a speed control measure. Image Courtesy Andy Cameron, WSP

Where urban form is unable to control speeds, traffic calming measures may be considered, but only in exceptional circumstances and as a last resort design solution. In such cases, horizontal calming measures are preferred to vertical calming measures (e.g. speed cushions, road humps, raised tables, etc.). The selection of traffic calming measures shall:

- Take into account the needs of pedestrians, cyclists and motorcyclists.
- Ensure that speed calming measures do not interfere with the sense of place or aesthetic of a street.

The 6Cs authorities will normally require a commuted sum payment for the future maintenance of vertical calming infrastructure.

Neither horizontal nor vertical traffic calming measures are normally advocated on shared-surface streets as the street's purpose and layout shall be sufficient to control speeds. If not, it shall be designed as a conventional street instead.

## Chicanes:

6Cs authorities do not advocate chicanes for new development and some authorities will seek to resist them altogether. In those very exceptional cases where they are proposed Figure 8.4 and Table 8.1 and Table 8.2 shall be used as a starting point to inform chicane design, but not as a template.

Designs shall be made aesthetically pleasing where possible, for example by making the width restriction appear to be a natural response to local constraints such as street trees or buildings, and through the use of other planting and less engineered geometries.

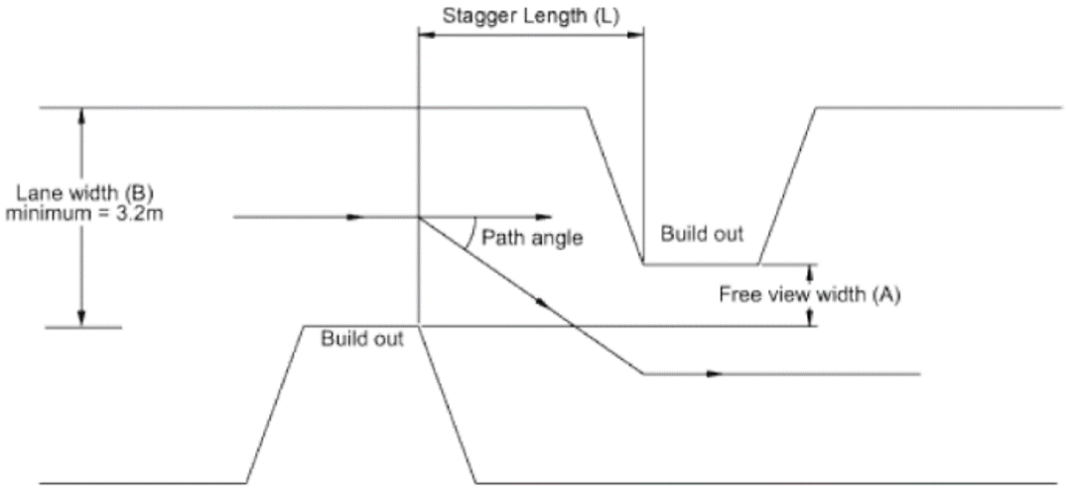
Build-outs shall be designed carefully to fit into the street scene with appropriate hard and/or soft landscaping rather than being intrusive engineered features.





Two examples of intrusive engineered single-function build-outs (narrowings) serving as horizontal speed control measures. In the first example (left) an attempt has been made to incorporate the feature into the street scene through the use of planting and carriageway material differentiation, while the second (right) is a purely engineered solution with no account for the urban context.

**Figure 8.4. Chicane design**




| | |
|---|---|
| Free View Width (A) | - The width of the central gap between build outs on opposite sides |
| Lane Width (B) | - The average width between the build out and the opposite kerb |
| Stagger Length (L) | - The length between the start of the stagger on the offside and the end of the stagger on the nearside |
| Path Angle | - The angle through which the traffic lane is displaced. This should be minimum of 20° for design speeds of 15mph and a minimum of 15° for design speeds of 25mph |

**Table 8.1. Stagger length and car speeds**

| Lane width 'B' (m) | Free view width 'A' (m) | Stagger length 'L' for residential and B1 use streets 20 mph | Stagger length 'L' for B2 to B8 use streets 25 mph |
|---|---|---|---|
| 3.2 | +1.0<br>0.0<br>-1.0 | 9m<br>13m<br>16m | 14m<br>18m<br>- |
| 3.5 | +1.0<br>0.0<br>-1.0 | -<br>12m<br>15m | 11m<br>15m<br>19m |
| 4.0 | +1.0<br>0.0<br>-1.0 | 7m<br>9m<br>11m | 9m<br>12.0m<br>15.0m |

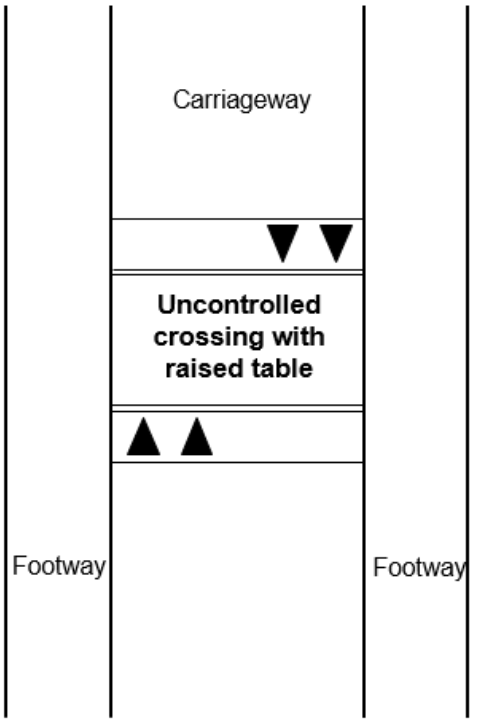
**Table 8.2. Minimum dimensions of stagger length for larger vehicles needed for a free view width of 0.0m**

| Stagger Length 'L' | | | |
|---|---|---|---|
| Lane width 'B' (m) | Articulated lorry | Rigid lorry | Single decker bus |
| 3.2 | 20m | 12m | 13m |
| 3.5 | 15m | 9m | 11m |
| 4.0 | 11m | 7m | 9m |

## Raised tables:

Raised tables can be placed at junctions, side roads entries/exits or on straight sections of carriageway to slow vehicle speeds and facilitate pedestrian crossing activity. Raised tables imply changes in relation to the street's operation and give informal priority to pedestrians.

**Figure 8.5. Uncontrolled crossing with raised table**



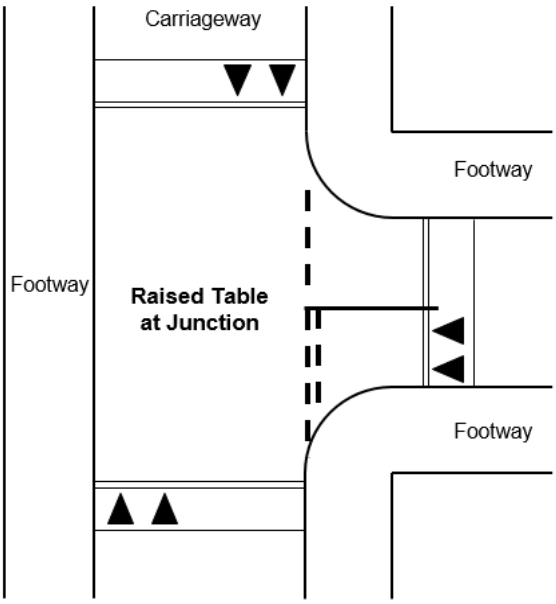

- *Tactile paving at pedestrian crossing points omitted for clarity*



This raised table is constructed from the same material as the footway inferring an element of pedestrian priority.

Raised tables shall normally have a minimum plateau length of 7m and a height of 75mm. The figures below shall be used to inform the design of raised tables.

**Figure 8.6. Raised table at a junction**




- *Pedestrian crossings required across both the through road and the side roa*
- *Table level 50mm below kerb level*
- *Tactile paving at pedestrian crossing points omitted for clarity*

Ramps for raised tables at junctions shall take into consideration how motorcyclists are likely to negotiate corners. The appropriate selection of surface materials and gradients will be critical to provide sufficient skid resistance and safeguard road safety.

**Figure 8.7. Cross-section of raised table**

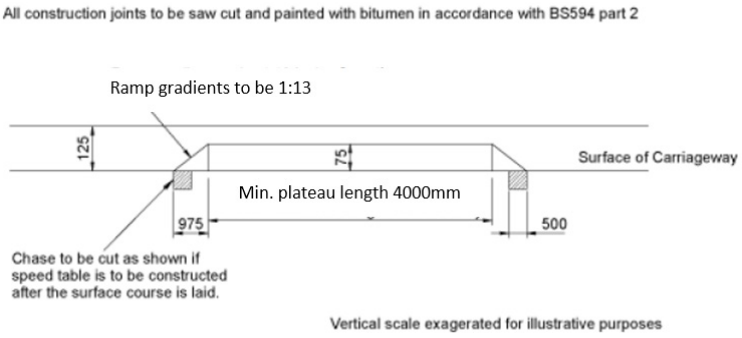



**Figure 8.8. Cross-section of raised table on streets with challenging topography**

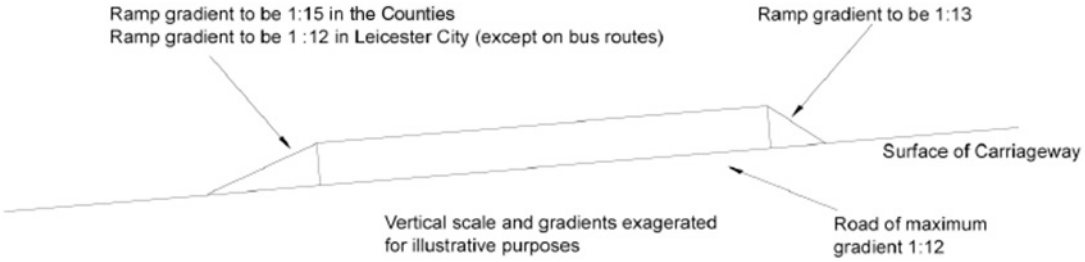
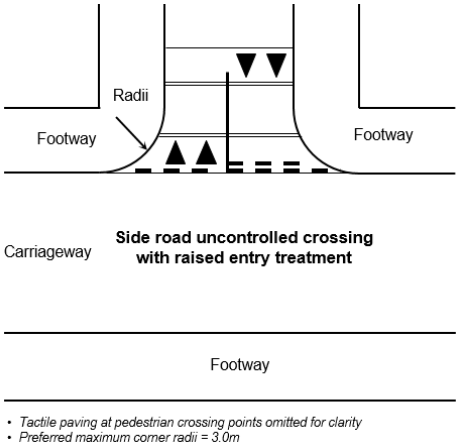



**Figure 8.9. Side road uncontrolled crossing with raised entry treatment**




## Stopping sight distances and visibility

### Stopping sight distance:

The Stopping Sight Distance (SSD) is the distance that a driver needs to see ahead in which to provide sufficient reaction and braking time to bring their vehicle to a halt in the face of a hazard or an obstacle. The SSD values in Table 8.3 are based on the 85th percentile design speed and account for bonnet length:

**Table 8.3. Stopping sight distances**

| Design speed | Stopping Sight Distance |
|---|---|
| 15mph | 18m |
| 20mph | 25m |
| 25mph | 33m |
| 30mph | 43m |

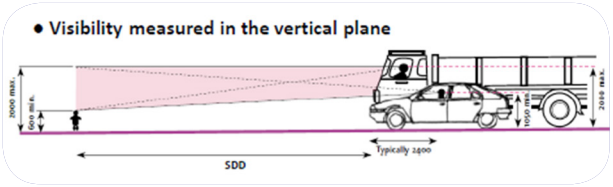
If the street is positioned on a slope the SSD value may need to be revised to account for the gradient. Where this is the case, the gradient shall be measured and the SSD shall be calculated using the Stopping Sight Distance Calculator.

Similarly, when the combined proportion of HGV and bus traffic is more than 5% of traffic flow, the SSD value may need to be revised.

Visibility in the vertical plane shall be measured from a driver's eye height of no less than 1.05m above the street's surface to a point no less than 0.6m above the street's surface. This shall be reduced to 0.26m if the measured speed on the street is above 30mph (85th percentile). This will be most relevant in the context of visibility at site access junctions.

Any structures such as bridges or natural gradient changes that inhibit vertical visibility along an otherwise linear street may require some form of mitigation through design to ensure the safety of all street users.

**Figure 8.10. Stopping sight distance in the vertical plane**




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### Visibility on bends:

While minimum SSDs shall be considered as a starting point, the rigid application of these values at bends can lead to higher than desirable speeds.

Research suggests that reducing forward visibility in residential streets tends to reduce speed which will be beneficial to road safety.

Therefore where the design speed is 20mph or less, forward visibility around bends may be reduced to a minimum of 15m by adopting appropriate building lines or other means such as planting, street trees or parking. Forward visibility shall be measured from the centre of the inner lane.



Example of a bend where the generosity of the visibility envelope (as well as the topography) may encourage excessive cornering speeds. This example represents bad practice from both a design and maintenance perspective.

The required forward visibilities on bends must not be impaired by items of street furniture or street-side features such as inconspicuous or poorly delineated build-outs and refuge islands. Consideration must be given to different carriageway positions that cyclists or motorcyclists may occupy as forward visibility shall allow for the timely detection of hazards.

## Visibility at priority junctions:

The visibility splay at a junction ensures that there is appropriate inter-visibility between major and minor arms necessary for the safe and efficient operation of the junction. Splays that are too restrictive or too generous can both compromise public highway user safety in different ways.

Visibility at junctions shall be calculated from a position set-back 2.4m from the give way line of the minor arm or from the equivalent unmarked position (known as the 'X' distance). This can either be calculated from the centreline of the minor arm, or from the likely position of the driver. If the junction contains a wide splitter island on the minor arm, the latter may be more appropriate.

The 'Y' distance' (See Figures 8.11) is the distance at which the driver - positioned on the minor arm - is required to see along the major arm in both directions. In the majority of cases, the value of the 'Y' distance is expected to be based from the SSD value.

### Table 8.4. Visibility distances ('Y' distances) at priority junctions

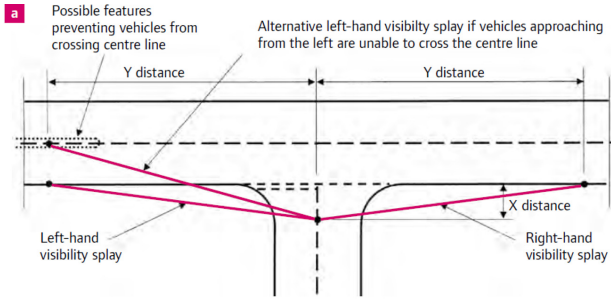
| Design / Measured 85th percentile speed | Visibility distance 'Y' required for streets with less than 5% HGV/ bus flows | Visibility distance 'Y' required for streets with more than 5% HGV/bus flows |
|---|---|---|
| 15mph | 17m | N/A |
| 20mph | 25m | 27m |
| 25mph | 33m | 36m |
| 30mph | 43m | 47m |
| >30mph | Subject to consideration of local circumstances | |

Splays shall be measured to the kerb line, although a more accurate assessment of visibility splay is made by measuring to the nearside edge of the vehicle track.

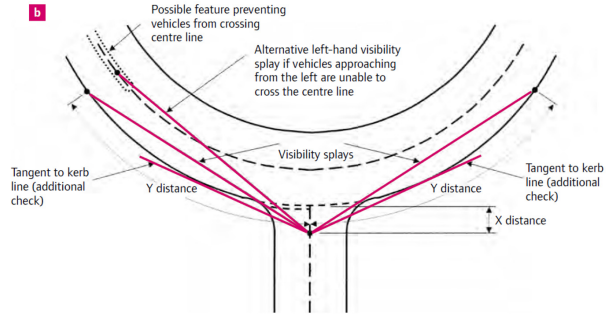


Parking has been used on this street to restrict forward visibility on the bend.

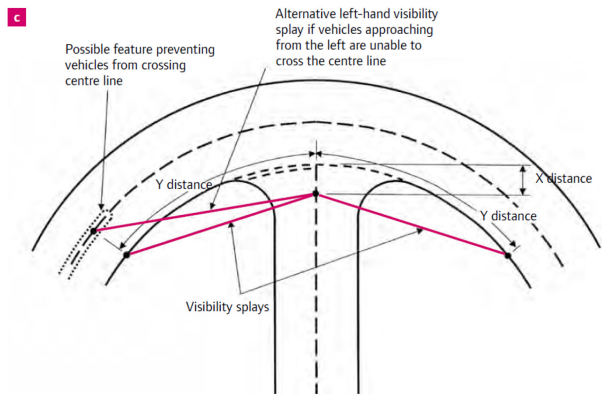
### Figure 8.11a. Visibility splay for priority junctions on linear streets




### Figure 8.11b. Visibility splay for priority junctions on bends




### Figure 8.11c. Visibility splay for priority junctions on bends




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Visibility splays shall be kept free from obstacles that restrict visibility. Obstacles that do not restrict visibility may be acceptable such as trees with narrow trunks. Similarly, junctions shall preferably not be placed in the visibility splay of one another.

# DES: Footways and Footpaths

## Design considerations

Walking shall be safe, convenient and designed to make this mode a viable and attractive alternative to the car. The key considerations are:

- Promoting connectivity and permeability.
- Developing specific street user hierarchies, which reflect the relative importance of different functions of streets in line with the local context and inclusive design principles through the implementation of a series of street character types.
- Managing vehicle speeds through layout design to ensure pedestrians and vulnerable users of the street feel safe.



This development features a main street with wide pavement.



Planting and trees have a positive impact on pedestrian links.

'Footway' refers to any pedestrian path that adjoins a carriageway while 'footpath' refers to any other pedestrian link. An effective footway and footpath network is achieved by taking account of the following:

- Pedestrian routes shall be short and direct, following desire lines wherever possible, in order to link people to places and to public transport facilities.
- Culs-de-sac shall be minimised wherever feasible.
- A minimum of two means of vehicular access shall be provided to development sites where the configuration of sites allow.
- Streets shall be adopted up to the limits of development sites to facilitate the expansion of an inter-connected transport network to neighbouring land, which could potentially be developed in the future.
- Pedestrian routes and connections that are well-lit and well-overlooked shall be provided.
- Guard railing shall be limited to very specific circumstances such as outside schools where it may need to be considered[4].




Poor quality pedestrian link with close-boarded fences on either side.



Main pedestrian walkway adjacent to the main access to this development.

- Pedestrian routes shall enjoy good surveillance from neighbouring buildings and be well lit to minimise opportunities for crime.
- Surfaces used by pedestrians shall be free from hazards that could cause them to trip. Particular attention must be given to waste management practices and the proposed waste management options so pedestrian facilities do not get obstructed by wheelie bins, recycling bags, etc. on collection days.

[4] While the use of pedestrian guardrails is generally discouraged, when installing one, a clearance of 450mm from the carriageway shall be left. This may require the footway to maintain standard footway width past the guardrail.





Wheelie bins and recycling bags impact adversely the use of footways, especially by disabled people. Considerate positioning of these items on collection days shall be influenced through design and encouraged amongst residents.

- Surfaces, wherever possible, shall be even to protect pedestrian safety.
- Street clutter on footways and footpaths shall be minimised (refer to Chapter 6 - Street furniture overview).
- Footways shall be resilient to tree growth and on-footway parking (even though the latter is not desired) to maintain the integrity of the footpath for visual and safety purposes.
- Where a proposed building fronts directly on to the highway, it shall be set back a minimum of 0.5m behind the proposed highway boundary to allow for opening of windows, drainage downpipes, overhanging eaves, etc.
- Wherever possible, pedestrian links shall be open and blank walls and close-boarded fences are to be avoided.
- Directional signing can help to highlight and promote the use of a route - particularly for longer footpaths.

Footpath-specific:

- Footpath links can be beneficial where it is necessary to provide more direct links to facilities and services and public transport. Footpath links will need to be overlooked spaces to deter crime opportunities.
- Links shall be provided from any proposed development to the nearest bus stops.
- Any obstruction to or proposed diversion of a Right of Way (RoW) will require the consent of the RoW authority.





Designers shall avoid undesirable blank walls (top) and excessively long sections of walls (bottom) to promote natural surveillance from neighbouring buildings and enhance street quality.

## Technical criteria

Widths:

- 2m - minimum footway width for residential, commercial and industrial footways.
- 3m - minimum footway width at a bus stop and outside education and healthcare premises.
- 4m - minimum footway width on shopping areas.

Widths at bus shelters:

- 1.3m - minimum footway width to be provided at the rear of any cantilever bus shelter in areas of low pedestrian activity.
- 1.8m - minimum footway width to be provided at the rear of any cantilever bus shelter in areas of high pedestrian activity.

Widths past an obstacle (e.g. bollards, sign posts, guard railings, street lighting columns, utility equipment):

- 1.2m - absolute minimum in areas of low pedestrian activity.
- 1.5m - preferable minimum in areas of low pedestrian activity.
- 2.0m - minimum in areas of high pedestrian activity.

Longitudinal gradient:

- 1:100 - minimum.
- 1:20 - maximum. This gradient may be relaxed to 1:12 in order to account for the needs of people with impaired mobility on streets with particularly difficult topography

Crossfall:

- 1:40 (Maximum crossfall)

Other criteria:

- Building elements shall not over hang footways at a height less than 2.6m (See comment under 'adoption and maintenance' concerning the need to obtain a license).
- Planting shall not impinge on footway width.
- Pedestrian visibility splays need not normally be provided at vehicular accesses to dwellings, except in the presence of a major trip attractor or generator such as a school or hospital or where bi-directional pedestrian footfall exceeds 100 per hour, in which case they shall normally be constructed to 2.0m x 2.0m on each side.
- Footway strengthening shall be considered at junctions with a corner radius of less than 6.0m in order to prevent damage from overrunning vehicles.

## Adoption and maintenance

- The highway authority may adopt footpaths where they serve a strategic purpose and have been constructed and lit to a satisfactory level, for example, where they form part of a wider network (existing or planned) or provide a more direct link to:
  - A major employment or shopping centre.
  - A school or other community or leisure facility.
  - A bus stop or public transport.
- If any part of a building projects over the adoptable highway, the developer will need to apply for a licence under Section 177/178 of the Highways Act before the street can be adopted.

## Checklists

- Where aesthetic, environmental or other such reasons dictate that non-standard surfacing materials be used, these must be agreed at an early stage. Such materials must meet requirements of quality, durability, maintainability and sustainability and may attract a commuted sum.
- If an obstruction or diversion to an existing RoW is required, the applicant will need to obtain a diversion order from the RoW Authority. The applicant will normally incur all costs associated with this process.
- Where the applicant requires highway rights to be extinguished, for example, to stop-up a length of road, this can be achieved under the Town and Country Planning Act 1990. However, agreement must first be sought from the LHA. The applicant will incur all costs associated with this process.

## Links and references

- Refer to inclusive design principles Appendix II.
- For guidance on segregation between pedestrians and cyclists, refer to the Cycle Infrastructure DES.
- For more information on procedures for adopting new routes under Section 38 refer to 6Cs website.
- For more information regarding works on the existing public highway under Section 278 refer to 6Cs website.
- A guidance note for designers, developers and planners on Development and Public Rights of Way has been adopted by Derby City, Derbyshire County, Leicester City and Leicestershire County Councils. For guidance about Rights of Way in Nottingham City, Nottinghamshire County and Cheshire East Councils, please contact individual LHAs.
- Standard Drawings Kerb & Footways - Series 1100.

# DES: Cycle Infrastructure

## Design considerations

Across England 66% of cycle trips are less than 5 miles in length (Department for Transport, 2015), a distance that can easily be covered by cycle in about 30 minutes. The majority of trips between 1 and 5 miles are completed by car/van and hence transferring a proportion of these short trips to cycle will result in health and societal benefits.



A cycle route and pavement adjacent to a main street.



Segregated cycle route.



This cycle-only link through a local street increases cycle permeability and enhances directness.

### Cycle lanes

Cycle lanes on the carriageway are reserved either exclusively or primarily for the passage of cyclists.

There are three principal types of cycle lane:

- **Advisory Cycle Lanes** - these are marked with a dashed lane marking and delineate an area of the carriageway that is intended for the sole use of cyclists. Other vehicles shall not enter the cycle lane unless it is unavoidable.
- **Mandatory Cycle Lanes** - these are marked with a solid lane marking which makes it an offence for other vehicles to enter the lane during the hours of operation.
- **Light Segregated Cycle Lanes** - this type of lane has physical objects (e.g. planters, retroreflective collapsible bollards, proprietary raised features constructed from PVC or recycled rubber, and similar objects) intermittently placed alongside a mandatory cycle lane marking to give additional protection from motorised traffic.



Advisory cycle lane.



Mandatory cycle lane.

Mandatory lanes shall be used unless the swept path of motor vehicles means that it is not possible for them to avoid entering the lane. However, this shall not result in a narrow mandatory lane - where overall width is constrained it may be better for a wider advisory lane to be used.

Light segregated cycle lanes are typically used as an interim measure when a permanent cycle track is not feasible (See 'cycle tracks' section). They shall not be provided on highways in new developments and if proposed as part of an off-site cycle route, a commuted sum will normally be required to maintain the physical objects.

Because cycle lanes are part of the main carriageway:

- Cyclists are not physically protected when using advisory and mandatory lanes, and it is important that the traffic regime is appropriate to the presence of cyclists on the public highway (NB - light segregated lanes are included under 'cycle tracks' for speeds of up to 30mph).
- The design of cycle lanes requires careful attention to turning movements of both cyclists and other traffic. Where the turning movements of other traffic do not conflict with the lane, it will be possible to use a mandatory or light segregated traffic lane.
- Cycle lanes are only useful when clear of car parking and loading activity - cycle lanes shall be preserved for the use of cyclists at all times by the appropriate use of parking and loading restrictions. Careful attention to this design issue is required especially in town centres and around schools.
- The use of light segregated cycle lanes must take into consideration the needs of all street users, in particular pedestrians, where there is high pedestrian activity, and motorcyclists as objects that provide the segregation must be easy to identify. Physical features that are used to delineate cycle lanes must not form a trip hazard (especially where no pedestrian crossing facilities exist) or a collision hazard for motorcyclists. Special attention shall be given to avoid these features becoming detached from the street surface.

Lanes may have coloured surfacing but the colour has no regulatory meaning. For best effect, colour shall be used sparingly but it can be useful to emphasise the presence of the lane at potential conflict points, such as across the mouth of junctions. Selection of the appropriate colour is a matter for the LHA. Colour shall be added to the material used in the surfacing, rather than as an overlay since this can result in a poor riding surface. A commuted payment may be required where coloured surfacing is used.

The 'END' marking is not a legal requirement and shall not be used where cycle lanes finish.

## Cycle tracks

A cycle track is a right of way for pedal cycles, with or without right of way on foot. It can be:

- Part of a public highway adjacent to a carriageway, or
- A separate public highway in its own right.

Pedestrians and cyclists may be separated on a cycle track by physical barriers, space (e.g. a verge), by level or by markings only.

There are three principal types of cycle track:

- **Stepped cycle tracks** - these are one-way for cycling and are situated at an intermediate level between the footway and the carriageway. The track is normally positioned immediately next to the carriageway, which means that transitions between a stepped cycle track and a cycle lane (and vice versa) are very simple and comfortable.

**Figure 8.12. Good practice - An urban extension expected to provide one-way stepped tracks on both sides of the road**

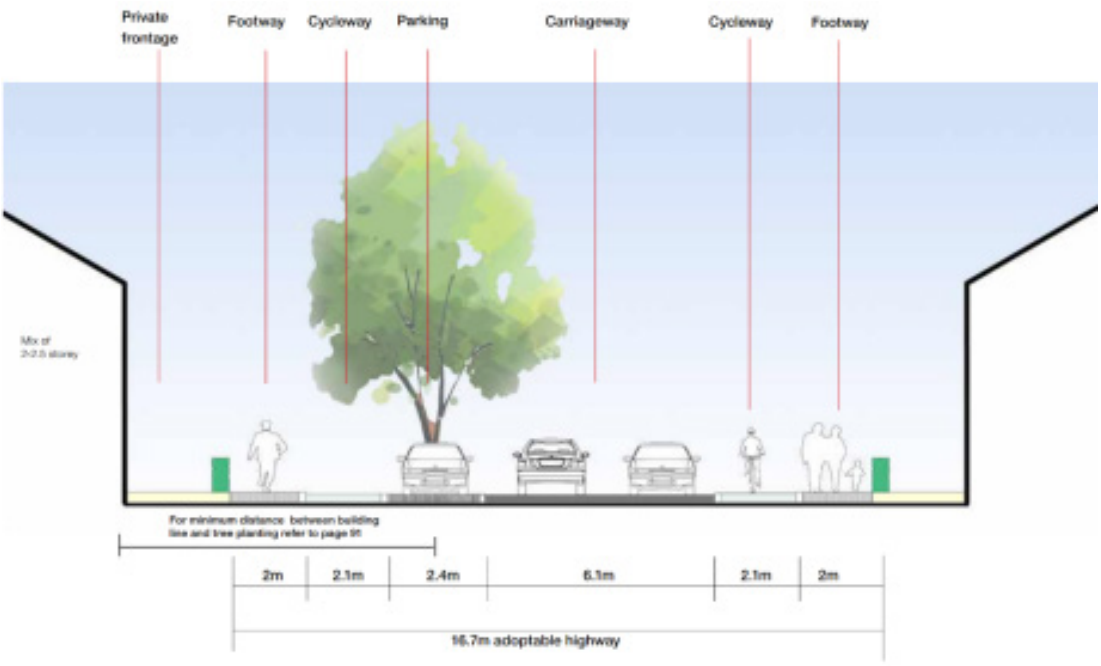



Image Courtesy Terence O'Rourke

- **Segregated cycle tracks** - segregated cycle tracks alongside the carriageway can be either two-way or one-way and involve the use of features such as kerbs, separating strips, islands, grass verges or lines of planting to create a continuous physical barrier between moving motor vehicles and cyclists on links. Parking and loading bays may also form part of the buffer space. This provides a high degree of separation and, if the space is sufficiently wide, it can be designed to provide additional amenities for the street - cycle stands and planting, for example.
- **Cycle tracks separated from streets** - These are routes free from motorised traffic (often referred to as traffic-free routes or Greenways) and can use a wide range of linear corridors. Generally these will be cycle tracks either with an adjacent pedestrian route or else designed for unsegregated shared use where pedestrians and cyclists share the same path.

Where pedestrian routes cross cycle routes the crossing points shall be provided with tactile paving so that visually impaired people know that they are about to cross a cycle route. In some situations, for example where a cycle track is taken behind a bus stop, it will be usual for a zebra crossing to be provided so that pedestrians have right of way over cyclists. Under the Traffic Signs Regulations and General Directions (TSRGD) 2016 there is no need for belisha beacons or zig-zag markings at a zebra crossing of a cycle track.

Techniques for providing for cycling have changed significantly in recent years. There is now the recognition that providing separate space for cycling away from heavy and fast motor traffic, and separate from pedestrians wherever possible, can be helpful to encourage more people to take up cycling for everyday journeys. When it is feasible to provide separation this shall be achieved by more than a white line marking - see Local Transport Note 1/12.

Importantly, cycle routes need to be designed to be inclusive and in doing so need to take account of all street users, including disabled and older people, and others with protected characteristics under the Equality Act 2010. Cycles can be mobility aids and often come in 'non-standard' sizes, while some cyclists cannot balance without support or dismount in a small space. All of these factors need to be considered when providing for cyclists.

In order to provide safe, convenient and attractive cycle routes and connections the following five principal requirements shall form the basis of all cycling provision within the 6Cs area:

1. **Coherent:** routes must be consistent, easy to navigate and designed to integrate into any existing or planned external developments and respond to all significant destinations (for residential developments) and origins (for other types of development) within a 5 mile cycling distance of the limits of the site.
2. **Direct:** routes must facilitate expedient cycle movements along desire lines, and must be no less direct than private motor vehicle routes.
3. **Safe:** separate facilities shall be considered on all busy streets that exceed a 20mph design speed to reduce the risk of collision.
4. **Comfortable:** routes shall be constructed from smooth, bound and well-drained surface materials and be designed to avoid steep gradients insofar as possible.
5. **Attractive:** routes shall be appealing and be perceived as safe and usable.

In order to achieve these principles the following matters shall be taken into account:

- 'Cyclists Dismount' signs shall not be used.
- When cyclists are sharing the carriageway, the speeds of motor vehicles shall be no more than around 20mph.
- Wherever possible, cycle routes shall include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards (e.g. guardrail, build outs, etc.) to reduce the severity of a collision should it occur.
- Carriageways of 7.3m, or above, will require segregated cycleways.
- The starting point for the design of cycle routes is given in Table 8.5 and relates minimum provision to cycle route type, motor traffic volume and speed.

Table 8.5 shows that cycling on carriageways is limited to streets with light traffic flows and speeds of no more than 20mph. This will mean that most residential streets will be suitable for cycling on carriageway.

**Table 8.5. Minimum cycling provisions**

<table>
<tr><th rowspan="2">Speed Limit/Design Speed</th><th rowspan="2">Number of motor traffic lanes</th><th rowspan="2">Motor traffic flow (AADT)</th><th colspan="2">Preferred minimum provision by cycle route type</th></tr>
<tr><th>Secondary cycle route</th><th>Primary cycle route</th></tr>
<tr><td rowspan="3">20 mph</td><td rowspan="3">Irrelevant</td><td>1 – 2,500</td><td rowspan="2">Quiet streets: Combined traffic</td><td>Cycle streets or quiet streets: Combined traffic</td></tr>
<tr><td>2,000 – 5,000</td><td>Cycle lanes</td></tr>
<tr><td>> 4,000</td><td colspan="2">Cycle lanes</td></tr>
<tr><td rowspan="3">30 mph</td><td rowspan="2">2 lanes in total</td><td>0-5,000</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>> 4,000</td></tr>
<tr><td>≥ 2 lanes</td><td>Irrelevant</td><td colspan="2">Cycle tracks</td></tr>
<tr><td>≥ 40 mph</td><td colspan="2">Irrelevant</td><td colspan="2">Cycle tracks (excluding light segregation and stepped tracks)</td></tr>
</table>

**Degrees of segregation for cyclists**

Shared carriageway — Physical segregation

**Notes:**

- This table does not include the basic network of local routes (all-purpose routes) or cycle tracks away from streets
- Designers shall always consider the potential to reduce motor traffic speed and volume to create acceptable conditions
- There is some overlap between motor traffic flow ranges to allow for flexibility
- Speed means speed limit, but if actual speeds are significantly higher, consider next highest category of speed
- Cycle tracks includes light segregation and hybrid tracks unless noted
- In rural areas achieving speeds of 20mph may be difficult, and so shared routes with speeds of up to 30mph will be acceptable, with motor vehicle flows of up to 1000 vehicles per day
- As defined by the Design Guidance: Active Travel (Wales) Act 2013 quiet streets is 'a term given to urban cycling routes on low traffic speed and volume back streets, which are particularly suitable for new and less confident cyclists.'

Historically most cycle tracks along highways in the UK have been built as two-way, but this can create a number of difficulties for users including:

- Establishing cyclist priority over side roads / busy accesses.
- Providing good connections at the start and ends of tracks is more problematic.

Other important considerations:

- Providing one-way cycle tracks on each side of the public highway addresses most of the above issues and will normally be the preferred solution where new busier highways are provided by developments, particularly where there are frequent side road junctions.
- One-way tracks are normally needed on both sides of two-way streets. Two-way tracks are usually provided only on one side of the street, but provision on both sides is useful when it is difficult for cyclists to cross major highways.
- Uncontrolled cycle track crossings of side roads shall, wherever safe and practicable, give priority to cyclists crossing the side road since they allow cyclists to continue without loss of momentum. Options include returning the track to carriageway level as a lane (for one-way tracks only) or continuing it past the junction or access at the same level and marking it in such a way that it is clear to turning motorists that they must give way to cycle traffic ahead.
- The first of these options is particularly suitable for stepped cycle tracks and cycle tracks segregated by a narrow kerbed island, which are in the same position as a cycle lane, i.e. on the left hand side of the carriageway. This type of design can be used where the side road carries more than 2000 vehicles per day.



Stepped cycle track passing junction as cycle lane.




Light segregation cycle track facility.

- Where cycle tracks are further from the edge of the carriageway they can be 'bent in' towards the carriageway and cross the mouth of the side road as a cycle lane, as with the stepped cycle track.
- Alternatively, cycle tracks may be 'bent-out' away from the carriageway so that there is space for a vehicle turning off the main street to yield to cyclists using the track. This type of design is suitable where flows on the side road do not exceed around 2,000 vehicles per day.

**Figure 8.13. Bent-out crossing**



Image Courtesy Nottingham City Council

- A further option for junctions with minor side streets is to continue the cycle track across a side road but without 'Give Way' markings. Again this is suitable for lightly-trafficked side roads carrying less than 2,000 vehicles per day.

**Figure 8.14. Continue cycle track across side road**



Image Courtesy Nottingham City Council

- As a variation on the above, for low volume accesses to culs-de-sac, private forecourts and access roads, a shared area can be created across the junction making priority unclear. The lack of any clear priority will introduce uncertainty for all users and will therefore encourage low motor vehicle and cycle speeds. It is therefore less appropriate for primary cycle routes.

**Figure 8.15. Shared area across side road**



Image Courtesy Nottingham City Council

## Transitions

- Although much of the cycle network in a development or off-site will be along conventional streets, a cycle route from one place to another will often involve sections of different types of provision: carriageways shared with motor traffic, cycle lanes, cycle tracks alongside the carriageway and cycle tracks away from the street. A safe and convenient transition between these different forms of provision is critical to ensure route coherence.
- Transitions in both directions between a cycle track and the carriageway (including a cycle lane) needs to be safe and comfortable. Cyclists shall be able to continue on their path, crossing a flush kerb at right angles, without having to turn sideways or give way to vehicles on the carriageway. The design of a transition point at the end of a cycle track must ensure that cyclists are clearly visible so that motorists are aware that cyclists are likely to be re-joining the carriageway ahead of them.



Transition from cycle track to cycle lane. © Welsh Government



Shared cycle lane and footpath.

### Segregation of cyclists and pedestrians

- Where new cycle tracks are being constructed, both on and off-street, it is generally preferred for pedestrians to be accommodated on a separate footway or footpath, rather than both groups being expected to use a shared use path. Where facilities are segregated cyclists are able to maintain a higher speed and there is reduced perception of conflict by both groups. Segregation must be effective, using features such as contrasting materials, a change in levels or a grass verge.
- Segregation using only a white line (even if raised) will not be effective and is not acceptable on new developments.

### Cycle tracks separated from streets

- Off street cycle routes shall primarily be designed as high quality links for purposeful journeys rather than simply leisure facilities. Routes shall strive to:
  - Be direct.
  - Follow desire lines wherever possible.
  - Avoid steep gradients.
  - Have widths designed to accommodate peak forecast demand.
  - Achieve minimum visibility and corner radii based on the appropriate design speed.
  - Include good quality surface materials.
- The following features shall be avoided:
  - Restrictive access controls that slow cyclists and prevent access by a range of cycle types.
  - Vegetation growth that encroaches on the track (see the Trees and Other Planting DESs as part of the Place Section).
  - Absent, poor or inadequate lighting (see the Street Lighting Section).
  - Unbound surfacing materials.
  - Inadequate drainage (see the Drainage Section).

## Technical criteria

### Cycle lanes

Where cycle lanes are adjacent to parked cars there shall be a minimum buffer zone of 0.5m to allow for the opening of car doors.

**Table 8.6. Cycle lane widths**

| Situation | | Width |
|---|---|---|
| Nearside lanes | Desirable minimum | 2m |
| | Absolute minimum | 1.5m |
| Nearside lanes on approach to Advanced Stop Lines (ASLs) | Absolute minimum for short lengths | 1.2m |
| Central feeder lanes to ASLs | Absolute minimum | 2m |

**Note:** Nearside lanes dimensions also apply to bus stop bypasses. Desirable minimum island width = 2m. Minimum bypass entry / exit taper 1:10

### Cycle tracks

**Table 8.7. Cycle track widths**

| Cycle Route Type | Peak hour cycle flow | Desirable Minimum Width |
|---|---|---|
| 1-way cycle track (including stepped cycle track) | <150 | 2.0m |
| | >150 | 2.5m |
| 2-way cycle track | <50 | 2.5m |
| | 50-150 | 3.0m |
| | >150 | 4.0m |

### Horizontal and vertical alignment

- Where cycle tracks are situated within conventional streets, the alignment of the street will normally be acceptable (See the DES for Carriageways and Vehicles Track Space).
- For off street routes, the alignment shall be adequate to allow cyclists to travel at their desired speed. Most cyclists will wish to travel between around 12mph (20km/h) and 18mph (30km/h). Based on these speeds, plus a lower design speed of 6mph (10km/h), recommended key geometric criteria are shown in the following table.

**Table 8.8. Key geometric criteria for off street routes**

| Parameter | | Design Speed | | |
|---|---|---|---|---|
| | | 18mph (30kmh) | 12mph (20kmh) | 6mph (10kmh) |
| Minimum forward visibility | Desirable | 80m | 50m | 30m |
| | Preferred | 30m | 30m | 30m |
| | Absolute | 25m | 15m | 10m |
| Minimum horizontal curvature, inner radius | Absolute | 25m | 15m | 4m |
| Vertical curvature, crest K value | Desirable | 5.0 | | |
| | Preferred | 1.6 | | |

### Gradient

- Where possible, cycle routes shall avoid steep gradients. The maximum desirable gradient depends on length. People are better able to tackle short steep gradients, but even relatively gentle gradients can become difficult if they are sustained.
- Desirable maximum gradients on new cycle routes are shown in the following table.

**Table 8.9. Desirable maximum gradients on new cycle routes**

| Gradient | | Maximum Length of Gradient (m) |
|---|---|---|
| 2.0% | 1:50 | 150 |
| 2.5% | 1:40 | 100 |
| 3.0% | 1:33 | 80 |
| 3.5% | 1:29 | 60 |
| 4.0% | 1:25 | 50 |
| 4.5% | 1:22 | 40 |
| 5.0% | 1:20 | 30 |

### Use of Colour

- Cycle tracks may be coloured to highlight their presence and to show that their use is different to any adjacent footpath or footway. Selection of the appropriate colour is a matter for the LHA. Colour shall be added to the material used in the surfacing, rather than as an overlay since this can result in a poor riding surface. A commuted payment may be required where coloured surfacing is used.

## Location criteria

### Cycle lanes

- Cycle lanes are normally located on the left or kerb side of the carriageway. In some cases, for example central feeder lanes to Advanced Stop Lines at signals, they may be situated between general traffic lanes.
- Cycle lanes may be used to enable two-way cycling on one-way streets ('contraflow cycling') although this is also possible without the use of a cycle lane where space does not permit one to be provided.
- Where cycle lanes meet bus stops the preferred solution is for them to continue past the bus stop on the left hand (footway) side. This 'bus stop bypass' arrangement is included in the Nottingham, London and Wales guidance documents. Design outcomes must incorporate inclusive design principles as detailed in Appendix II.

### Cycle tracks

- Cycle tracks along conventional streets shall normally be situated between the footway and carriageway, including any off-street parking, loading or bus stops.
- Cycle tracks away from the street network typically pass through green spaces or along other linear features in the landscape, such as canals and rivers.

## Links and references

- For information on cycle parking refer to the Cycle Parking DES.
- Refer to inclusive design principles Appendix II.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Bus Routes

## Design Considerations:

A bus route refers to any section of carriageway designed to facilitate bus operations. In rural areas, bus routes will likely be shared with general traffic; however, in urban areas, they may be provided with some degree of segregation from general traffic through bus lanes or other types of bus priority.

It is highly desirable that:

- Public transport services and infrastructure to new development is integrated with the pedestrian and cycling network.
- Trip attractors and generators (e.g. residential, commercial, employment and recreational land uses) are located within 250m walking distance of a public transport facility (i.e. a bus stop, train station or tram stop) and usually never more than 400m.
- In urban areas, it may be necessary to introduce bus priority measures. Solutions might include in-carriageway bus stop bays (as opposed to those located in segregated lay-bys), junction bypasses and fully segregated bus lanes.
- All streets that are designed to carry buses shall be able to accommodate bi-directional bus flows (unless a one-way system is preferred) and avoid car parking arrangements that may impede bus movement and create safety issues for pedestrians and cyclists (See DES on Carriageways and Vehicles Track Space).



New development infrastructure includes bus lane provision on a new main street that will serve the development.



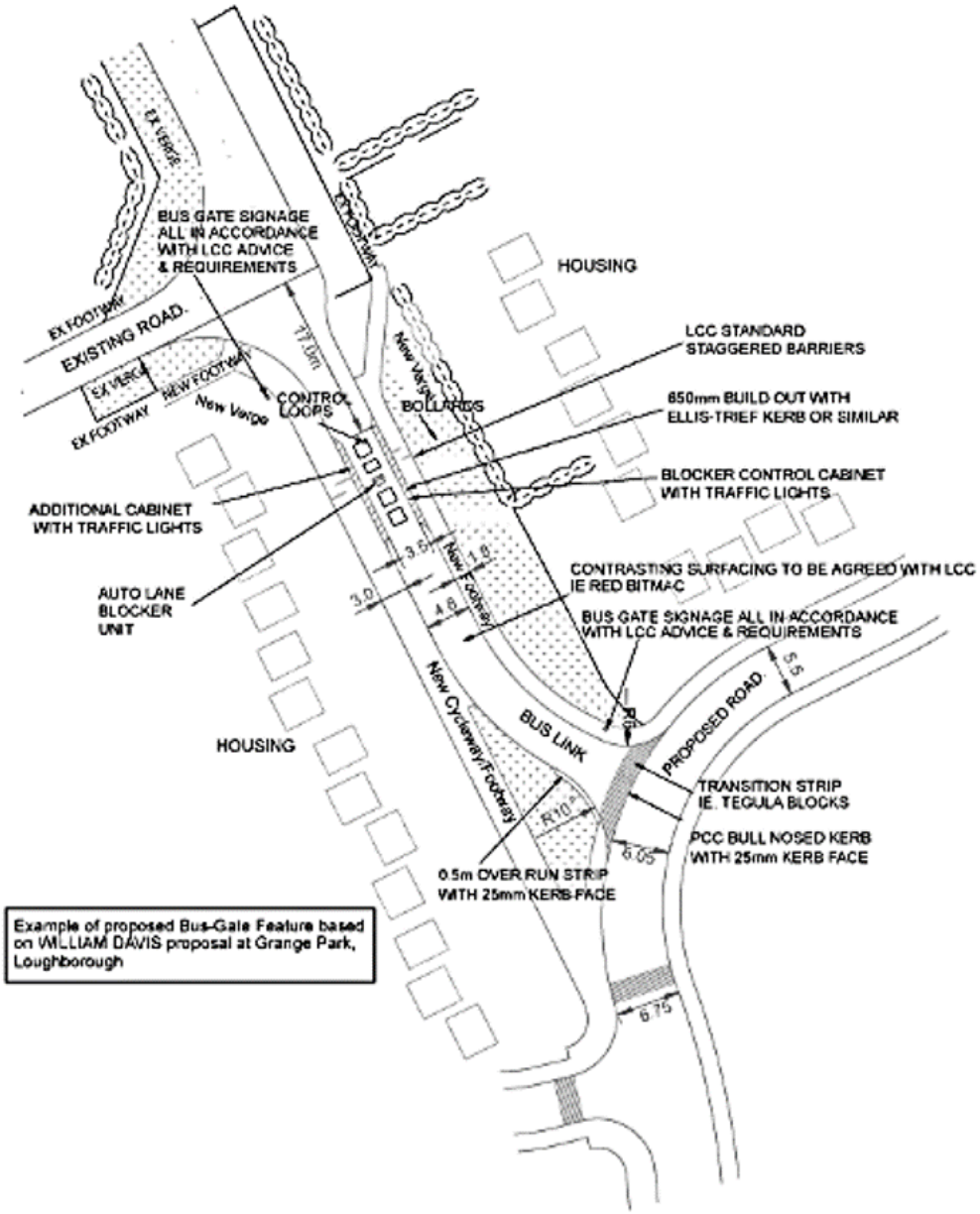
Bus Gate to dedicated bus route.

- Streets for use by public transport shall, as far as possible, be reasonably straight to minimise travel time and distance.
- Developments shall be as permeable to bus operations as possible. This is particularly important for major and strategic developments. Where appropriate, bus priority measures such as bus lanes and traffic signals shall be used to aid bus movement.
- For some developments, particularly larger sites, bus-only links to achieve good permeability for buses may be appropriate. Any such designs may:
  - Require a Traffic Regulation Order (TRO) to control its use by other vehicles.
  - Incorporate an appropriate control system if it is likely that the link would be used by other traffic e.g. automatic rising bollards.
  - Include walking and cycling links.
- Sharp corners shall be minimised on bus routes; however, if they are necessary, they shall be capable of accommodating the swept path of the largest likely specification of bus and be validated using a tracking assessment.




Bus lane along a main road corridor.

**Figure 8.16. Example of a bus only link**




- Vertical traffic calming shall not be used on bus routes unless there is no other practicable speed control solution.

## Technical criteria

Carriageway widths for two-way traffic:

- 6.0m minimum.
- Tracking assessments need to be provided to validate the suitability of the carriageway widths for all streets subject to bus movement based on the largest possible specification of bus applicable to the route in question.

Speed-control specific to bus routes:

The aim shall always be to manage speeds through layout design. In those exceptional circumstances where this is not feasible, however, early engagement with the bus operators and public transport section of the local authorities will be necessary.

## Adoption and maintenance

- Adoption and maintenance principles can be found on the 6Cs website.

## Checklists

- Bus operators shall be engaged at a suitable point in development team discussions where bus routes are being planned for a development.
- Tracking assessments of vehicle swept paths will need to be provided to validate carriageway widths and centre-line radii.

## Links and references

- For general carriageway guidance, refer to the Carriageways and Vehicle Track Space DES.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Bus Stops

## Design considerations

The quality and location of bus stop facilities are crucial to encouraging people to travel by bus. The following matters shall be taken into account:

- Buses shall be able to stop parallel to the kerb and at a distance no greater than 50mm from it. Where on-street parking is present in the vicinity of the bus stop, it may be beneficial to build additional design features into the bus stop, such as a full width boarder, to ensure that this parameter is achievable.
- Bus stops in urban areas shall be positioned so as to maximise the convenience of interchange with other bus stops and between other public transport modes.
- Bus stops located in the vicinity of junctions shall be set far enough back from the junction so as not to affect the operability and safety of the junction.
- Where locating bus stops at junctions in urban areas, it is preferable that they are placed on the exit side of the junction. Any bus stops located on the entry side shall be positioned upstream of any bus priority detection signalling equipment.
- Where a bus route runs in both directions along a street, bus stops shall normally be provided in pairs. These shall be offset at a safe distance to allow traffic to pass in between stationary buses.
- The bus cage (the bus stop marking on the carriageway) shall normally be placed in the main carriageway for priority. Any solution (such as bus bays or lay-bys) that compromises the priority of the bus shall be avoided.
- A pedestrian crossing shall be provided in the vicinity of a bus stop (yet positioned at a safe distance from the bus cage) to enable bus stop users to cross the street at ease. This could be a formal crossing facility (e.g. a zebra crossing) or an informal crossing facility (e.g. an urban design feature with a flush kerb) depending on the context.
- When proposing a new bus stop, appropriate pedestrian links shall be provided/existing routes strengthened.
- Street furniture in the bus stop area shall be restricted to only the most necessary items. Items of street furniture must not obstruct passengers boarding and alighting, particularly wheelchair users and passengers with pushchairs. Street furniture that is not necessary for the safe and satisfactory function of the bus stop shall be rationalised and located beyond the limits of the bus cage in the downstream direction, and preferably not within 20m of the bus cage in the upstream direction for visibility purposes.
- Bus stops shall not be positioned to obstruct private accesses.
- Bus stops in employment or commercial areas shall be positioned near to building entrances where this is feasible.

## Technical criteria

### Bus stop layout:

The layout shall be in accordance with local authority requirements which shall be agreed. These requirements normally include:

- 3m - minimum footway width at a bus stop. Where there is significant pedestrian activity wider footways will be required.
- 2.0m x 2.0m - minimum size of clear area to be provided on the footway - to be measured from the end of the bus ramp (at a gradient no steeper than 1 in 8 (12%)) and the rear edge of the footway. This space is to allow wheelchair users to manoeuvre comfortably when boarding and alighting.
- The bus stop flag must be positioned at the kerb.
- The bus shelter shall normally either be positioned 0.5m from the edge of the kerb facing inward, or at the back of the footway facing outward towards the carriageway. When positioned near to the kerb, the 2.0m x 2.0m clear area must be provided between the bus stop flag and the shelter to allow wheelchair users to manoeuvre.
- 1.3m - minimum clearance distance behind the bus shelter when the shelter is located near the kerb. Where there is significant pedestrian activity, increased clearance distance might be required.
- 1.8m minimum - clearance distance in front of the shelter when positioned at the rear of the footway. Where there is significant pedestrian activity, increased clearance distance might be required.
- 180mm - kerb height at a bus stop and to be deployed for a minimum length of 6.0m (access kerb).
- 2.0m - width for a full width boarder.

**Figure 8.17. Location of a bus stop close to a signal controlled junction with bus priority detection signalling equipment**

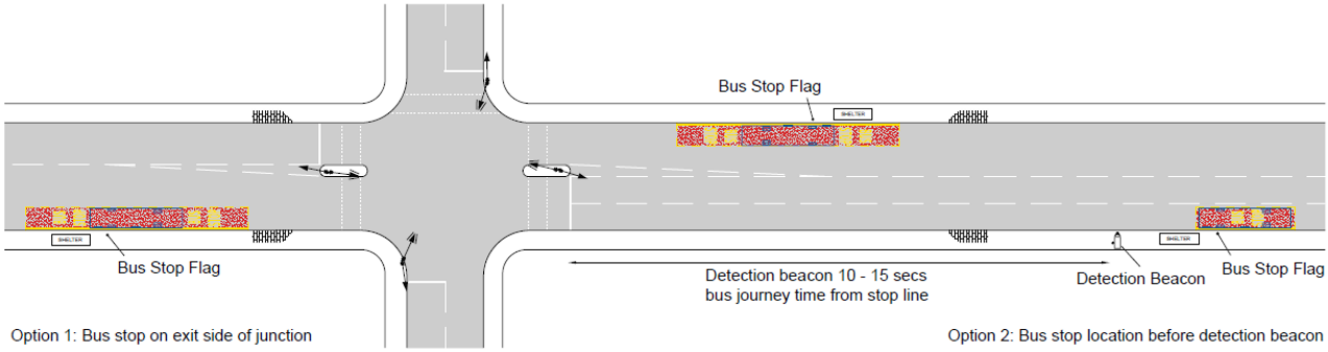
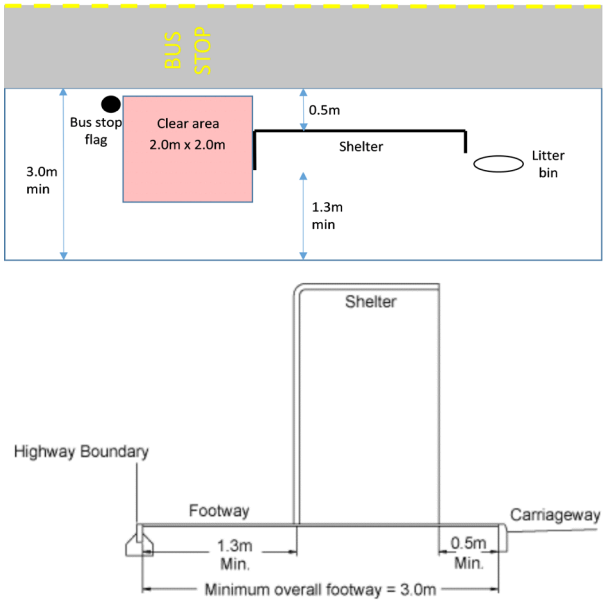



Image Courtesy Transport for London, Accessible Bus Stop Design Guidance

- The bus cage shall normally be marked (in accordance with TSRGD 2016) to discourage vehicles from parking in it and obstructing the operation of the bus stop. The bus cage shall normally be the length of the bus (e.g. 15.0m for a large rigid bus), an additional 2.0m, plus any additional distance necessary to ensure the safe entry and/or release of the bus from the bus stop.

**Figure 8.18. Example bus stop layout at the kerb**




Based on Transport for London (2006) Accessible Bus Stop Design Guidance.

- Although vertical calming features are not normally desirable on bus routes, where they are provided there shall be a 30m minimum distance between the bus stop location and any vertical traffic calming feature.
- If location criteria relating to access distances to bus stops cannot be met satisfactorily or where demand is likely to be low, it may be preferable to advocate a hail-and-ride model through the development allowing passengers to hail the bus from any point along the designated bus route. In such instances, information posts shall be erected along the route to provide bus service information at an agreed spacing. To rationalise street furniture, it may be preferable to build these into lighting columns. Access kerbs (180mm height) shall also be provided to allow for accessible boarding and alighting. A TRO may be required to prevent parking along lengths of access kerb. The viability of a hail-and-ride model must be discussed with the relevant authority from the outset of the design process.

## Adoption and maintenance

- The LHA will normally adopt bus stop infrastructure but may require a commuted sum.

## Checklists

- Whether erecting a new bus stop or relocating an existing one, the agreement of the LHA will be required. The LHA will decide whether the following need to be consulted:
  - The police.
  - The local parish council.
  - The bus operators.
  - Some authorities require frontages directly affected to be notified in writing and a reasonable time allowed for responses to be received.
- Where advertising is to be displayed at a bus shelter, advertisement consent will need to be sought from the LPA.
- Issues and agreement on a general approach for bus stop locations and bus provisions shall be agreed at the design development stage as these may have a bearing on:
  - The layout of the development.
  - Any transport assessments, transport statements and/or travel plans required.
  - Off-site highway mitigation works.
  - Parking provision.
- For larger sites, all public transport facilities and routes shall be clearly identified as part of the concept development stage.

## Links and references

- Refer to inclusive design principles Appendix II.
- For more detailed guidance on bus stop design, refer to TfL Accessible Bus Stop Design Guidance 2006, until superseded.
- For guidance on bus routes, refer to Bus Routes DES.
- For guidance on the bus cage, refer to TSRGD 2016.
- For guidance on TROs, refer to the Highway Signs, Street Markings and Traffic Regulation Orders Section.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Roundabouts

## Design considerations

There are various types of roundabouts, including compact, normal, signalised and mini roundabouts.

The choice of roundabout is dependent on a number of connected factors including speed limits, levels of traffic, land-take constraints and levels of non-motorised users.

Roundabouts will not be normally required within most residential streets that are designed using this guide. However, there may be instances where compact or 3 arm mini-roundabouts with good speed reduction facilities are considered acceptable to provide an access from an existing highway into a development site. They are not usually acceptable, however, unless considered as part of a comprehensive traffic calming scheme.



Standard mini-roundabout with textured surfacing.



Standard mini-roundabout with overrun areas.

The following matters shall be taken into account:

- Mini-roundabouts can be designed to be either flush or domed. Where domed, alternative materials can be used to the standard white island marking to create a feature of the junction. Flush mini-roundabouts tend to work better where traffic flows are relatively high and especially well balanced between at least three arms and on bus routes.
- In order for mini-roundabouts to work effectively, traffic flows shall be reasonably balanced between arms. Ideally, the minor arm flow shall not be lower than 10-15% of the major arm flow. Where the minor arm flow is too low, the major arm will operate under free-flow conditions.
- Domed variants may be preferable where traffic flows are low and/or where flows are less well balanced, but remain above the 10% threshold, or where subtle topographical variances have the potential to lead to forward visibility issues.
- Doming has been shown to have a higher calming effect on speeds as well as encouraging motorists to travel around and not directly over the central island. However, it is also more likely to encourage motorists to travel anti-clockwise at the junction where excess visibility to other arms exists.
- The use of other speed control features and/or crossing facilities in the vicinity can complement the operation of mini-roundabouts in certain circumstances. Attention must be given to the adoption of inclusive design principles.

## Technical criteria

- 125mm - maximum height for a domed mini-roundabout. The height shall preferably be lower on bus routes.
- Four arms - maximum number of arms for mini-roundabouts to work effectively.
- Double mini-roundabout designs or other junction types shall be used where five or more arms exist.
- The position of the central island shall be informed by a tracking assessment. This shall include the largest likely specification of vehicle (e.g. refuse vehicle, pantechnicon and/or bus). Where domed, vehicles will need to pass around the central island; however, where a flush central island is used, large vehicles may pass over the island, but must not encroach to the other side.

## Checklists

- Designers must be able to demonstrate that flows are 'reasonably balanced' where proposing a mini-roundabout across at least three arms.
- Tracking assessments will need to be provided to validate the safe and successful operation of mini-roundabouts.

## Links and references

- Refer to inclusive design principles Appendix II.
- For further guidance on the design of mini-roundabouts, refer to Department for Transport (DfT) mini-roundabouts good practice guidance.
- For guidance on signage and street markings regarding roundabouts and mini-roundabouts, refer to TSRGD 2016.
- For guidance on crossings and tactile paving, refer to the Crossings DESs and the latest version of DfT Guidance on the use of Tactile Paving Surfaces respectively.
- See the Carriageways and Vehicle Track Space DES.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Traffic Signals

## Design considerations

### Traffic signal equipment:

Some 6Cs authorities may design, supply and install traffic signal equipment based on detailed street layout drawings that the applicant has provided. This must be agreed as part of the design process.

The applicant must allow the LHA access to any part of the site at which cables, pipes, ducts or other traffic-signal apparatus are located at all reasonable hours in order carry out installation and maintenance works.

Traffic signals will not be normally required within most of the residential streets that are designed using this guide. However, there may be instances where traffic signals are used to form the principal access to sites, establish bus or cyclist priority and/or provide controlled pedestrian crossings.



Pedestrian crossing facility at a junction.




Pedestrian crossing control panel.

- Traffic signals shall normally only be used to control movement once urban design and street layout solutions have been discounted.
- Equipment associated with traffic signalling can clutter the street environment and hence there is a preference for use only where there is a specific objective to be achieved for which traffic signalling provides the most appropriate answer.
- Pedestrian control positions shall be suitable in relation to the kerb and the direction of traffic to enable users to remain alert of any hazards.
- Pushbuttons shall normally be mounted at $45^0$ to the kerb on poles.
- Traffic signal equipment at crossings must be planned and constructed consistent with recommended practices as described by 'The Design of Pedestrian Crossings Local Transport Note 2/95'. This is particularly important in ensuring that traffic signal equipment integrates important components (audible bleepers, tactile rotating cones, etc.) to respond to the needs of disabled users.
- Tactile rotating cones shall be fitted to all signal controlled crossings.

## Adoption and maintenance

- The applicant will normally be expected to pay the relevant LHA for the reasonable cost of design, supply and installation of traffic signal equipment.
- A commuted sum will normally be required to contribute towards the future maintenance of any traffic signalling equipment.

## Checklists

- If proposing traffic signals as a means of establishing bus priority, bus operators shall also be consulted on proposals.

## Links and references

- Refer to inclusive design principles Appendix II.
- For guidance on traffic control system design, refer to TR2500.
- For guidance on the installation of traffic signalling equipment, refer to LTN 1/98: The Installation of Traffic Signals and Associated Equipment.
- For guidance on audible bleepers, refer to DfT Traffic Advisory Leaflets 4/91.
- For information on the use of Selective Vehicle Detection (SVD) technology in London, see TfL's brochure on Bus Priority at Traffic Signals keeps London Buses Moving.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Priority Junctions

## Design considerations

Junctions within development areas can take many different forms but in all instances shall be informed by the local context. There shall be an emphasis on making junctions as simple as possible so that all users can understand them.

The following matters shall be taken into account:

- Vehicle speeds at junctions need to be managed carefully.
- Junctions can be an effective speed control measure to break-up otherwise straight sections of carriageway.
- Spacing of junctions shall consider a number of factors including safety and user delay.
- Junctions shall be designed so to allow any larger vehicles that may use the street, such as refuse vehicles, to negotiate them without any need to overrun the footway. This consideration extends to managing the approach and exit environment of the junction, particularly where parking is likely to coexist in the vicinity, to ensure that any issues that may compromise the safe and efficient function of the junction are mitigated. The suitability of corner radii at junctions shall be based on tracking assessments using the largest necessary vehicle. This assessment must include checks for refuse vehicles, a fire tender and, if appropriate, a bus. Tracking assessments shall include any on-street parking provided.
- Corner radii shall normally be kept free of any private accesses.
- Bus stops located in the vicinity of junctions shall be set back from the junction so as not to adversely impact on operability and safety. Refer to the Bus Stops DES for information on how to facilitate bus stop accessibility.
- Where a new junction is formed at a bridleway, an equestrian traffic crossing facility (Pegasus crossing) shall be provided and a bridleway sign erected.

## Technical criteria

- 1:30 or less - longitudinal gradient for the first 10m of any arm off a junction.

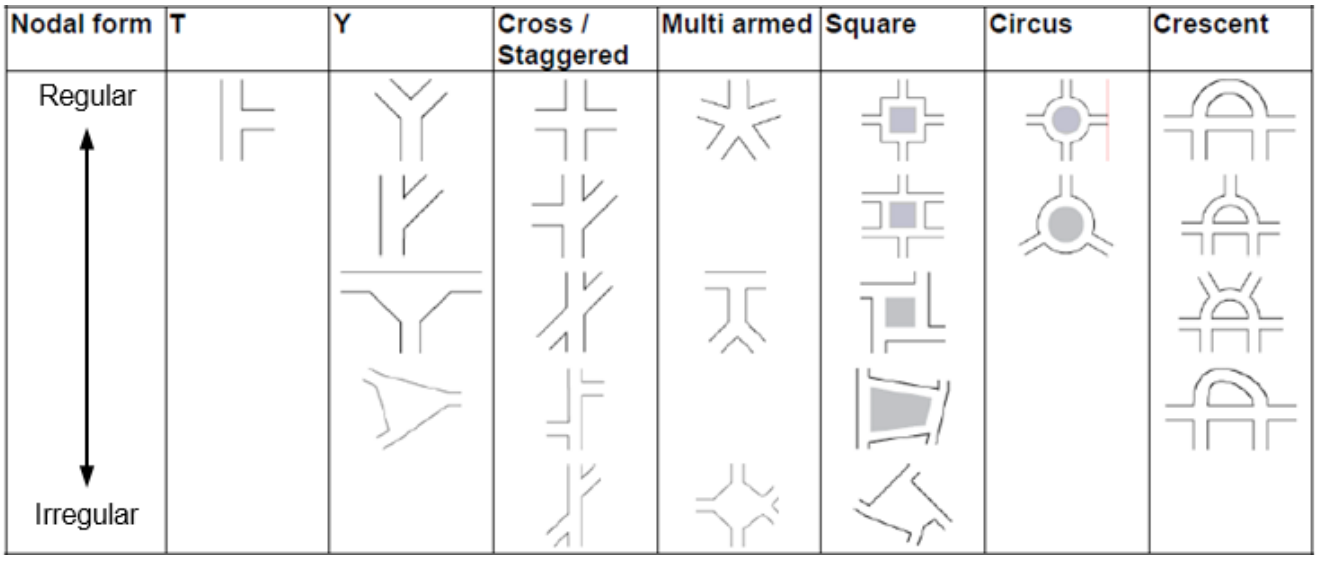
## Checklists

- Basic junction forms shall be determined at an early point of the design development stage with more detailed proposals developed as the development proposal evolves.
- Tracking assessments of vehicle swept paths will need to be provided to validate junction operability.

## Links and references

- Refer to inclusive design principles Appendix II.
- For guidance on visibility at priority junctions and junction spacing, refer to the 'Stopping Sight Distances and Visibility' Section.
- For guidance on designing for cyclists at junctions, refer to the draft Nottingham Cycling Design Guide, the Sustrans Design Manual, the London Cycling Design Standards 2014 and the Welsh Active Travel Design Guidance 2014.
- For more information on signing and lining, refer to the 'Highway Signs, Street Markings and Traffic Regulation Orders' Section.
- See the Carriageways and Vehicle Track Space DES.

**Table 8.10. Broad junction types and corner radii within developments**




Adapted from the Department for Transport and Communities and Local Government (2007) Manual for Streets.

# DES: Informal Junctions

## Design considerations

In many instances, and particularly where speeds are low, it is not always necessary to manage junctions by establishing vehicular priority. Instead, informal arrangements that require all street users to negotiate priority with one another are often effective in managing speeds at junctions.

Informal junctions generally work best where there are high volumes of pedestrian activity. Informal junctions have also been shown to work on four arm junctions and those with peak flows in excess of 2,500 vehicles per hour.



Shared surface junction.

The following matters shall be taken into account:

- The design of informal junctions in particular requires Development Team consideration as they often need to respond to the context and respective vehicular and pedestrian demands placed upon them. A Road Safety Audit ideally incorporated into a Quality Audit can be helpful to reconcile conflicting design interests.
- Vehicular paths shall be limited to a single lane on entries and exits which shall be kept relatively narrow.
- The form and layout of the junction shall respectfully consider the user hierarchy priority which shall place emphasis on pedestrian and vulnerable users. An example of an informal junction that would be unacceptable in a residential context is traffic signalling which may be perceived as inferring priority to the motorist.
- Informal junctions may include formal or informal pedestrian crossing facilities in accordance with pedestrian desire lines. Zebra crossings may be appropriate at busy or large junctions.
- Where crossings are provided, the material used for the crossing shall contrast to that used for the general carriageway. Materials other than standard bituminous surfacing shall generally be used with an objective of enhancing the sense of place and enhancing the visibility of the junction, particularly for the vehicles travelling along the carriageway.
- Tactile paving shall be installed where kerbs are flush or very low. Explicit consideration must be given to the design needs of visually-impaired users who may find informal features challenging to navigate. For tactile paving guidance refer to the latest version of DfT Guidance on the use of Tactile Paving Surfaces.



Unmarked junction highlighted with exposed aggregate concrete.

## Technical criteria

- 20mph - maximum design speed for entry and exit routes from informal junctions.

## Links and references

- Refer to inclusive design principles Appendix II.
- For further guidance on tactile paving design, refer to the latest version of DfT Guidance on the use of Tactile Paving Surfaces.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Street Signs and Regulations

## Design Considerations

### Traffic signs and lines

The applicant is required to provide all street markings and traffic signs on both the internal street network and any sections of external highway that are considered necessary. Occasionally, this may involve signing at some distance from the development, e.g. for HGV routeing.

On larger developments, it may be necessary to provide on and off-site direction signs and markings for wayfinding in order to enable people to use the street network effectively.

At site accesses and for all streets serving commercial or employment uses with the exception of B1 office uses, lining and signing shall be provided in accordance with TSRGD 2016. Large areas of thermoplastic road markings shall be avoided in the interests of aesthetics and road safety. The latter is particularly important for motorcyclists usually within steering, braking and accelerating areas, as grip and vehicle stability can be adversely affected.

Lining and signing will not normally be required on the internal street network for residential or B1 office use classes. It is advisable to contact the relevant LHA for further information in case local circumstances dictate otherwise.

Any signs erected on vertical poles (as well as any other items oversailing the footway) must have a minimum height clearance of 2.3m. If such signs are low-level, designs shall include a lower tapping rail or skirting linking the posts to prevent visually-impaired people from walking into them. The rail or skirting shall be between 300-400mm from ground level, while the sign itself shall not extend more than 150mm beyond the supporting posts.

Where parking bays are not otherwise defined by a change in materials, it is normally expected that appropriate road markings will be used.

All traffic signs (including bollards, retro-reflecting studs and markings) shall be to the size, shape, colour and type set out in TSRGD 2016. These will normally also need to be compliant with Appendix 12/3 of the 6Cs Specification where applicable and shall be depicted on layout plans including colour and type.




A typical 20mph sign.

For traffic signs and lines pertaining to pedestrian and cycle crossings, the applicant shall normally follow TSRGD 2016. Where studs are required at crossings, metal road studs shall be avoided as they can cause problems to two-wheeled vehicles.

The details of individual traffic signs including their posts and foundations shall be as shown on the traffic sign schedule sheets found in Appendix 12/1 of the 6Cs Specification. Details shall normally be compliant with the standard drawings presented in the same appendix. A commuted sum is payable towards the long-term maintenance cost.

Where creating a permanent alteration to the original road or street layout, a sign to diagram 7014 of TSRGD 2016 will normally be required on all approaches to the altered layout. It shall be provided immediately upon implementing the alteration and remain in place for a period of three months. The applicant is typically responsible for maintaining these signs for this period and for ensuring their removal at the period's conclusion.

## Illuminated traffic signs

In some circumstances, illuminated signs may be required in order to meet the requirements of TSRGD 2016.

Most illuminated signs are fed by an electricity company supply. However, certain signs must be fed by a private highway authority supply, and in some situations solar panels may be appropriate.

The location and details of all signs and bollards that require illumination are to be detailed on a layout plan to allow the LHA to identify electricity supply requirements. These requirements are normally incorporated within the street lighting design. Subsequently, the applicant is normally required to:

- Arrange for electricity supply if required (irrespective of source).
- Provide test certificates in accordance with BS7671.
- Take responsibility for all aspects of the works including energy charges, maintenance and 'bulk clean and lamp change' in advance of issue of the final certificate. The cost of 'bulk clean and lamp change' will be provided in the bond figure.




A typical illuminated sign warning of speed humps with an informative on distance.

## Bollards

All bollards (including vertical posts) will require a commuted sum for long term future maintenance and shall as far as is reasonably practicable:

- Take into account the needs of all street users and consider whether such features are required.
- Be positioned to allow at least the minimum footway width (see Footways and Footpaths DES) between them.
- Be at least 1m in height.
- Be clearly visible and remain conspicuous in dark and bad weather conditions, by being a colour that contrasts with the wider street environment and/or including bands that contrast in colour to the rest of the bollard/post at a band depth of 150mm. The top of any bollards shall be coloured likewise. Grey tends to be the least effective colour as it fails to contrast with the carriageway and footway in a typical street environment.
- Under no circumstances be linked with chain, rope or similar.

## Street name plates

The applicant is required to apply to the relevant city, district or borough council to commence street naming proceedings. The city, district or borough council will then advise of any further details required of the applicant. Once street names have been decided, the applicant will normally be responsible for erecting the name plates. Any name plates on unadopted streets or private driveways shall clearly state the street/driveway is either 'unadopted' or 'private'.

## Traffic Regulation Orders

Where a development requires changes to an existing Traffic Regulation Order (TRO) or where a new order is required, the applicant is normally expected to pay all associated costs including consultation and legal costs. The applicant shall seek advice on likely timescales involved with such proposals and factor these into their work programme.

Further information on TROs can be found on the 6Cs website.

# Adoption and maintenance

A commuted sum is payable towards the long-term maintenance cost of:

- Name plates.
- Signs.
- Bollards.

# Links and references

- For information on possible commuted sum payments refer to Appendix IV.

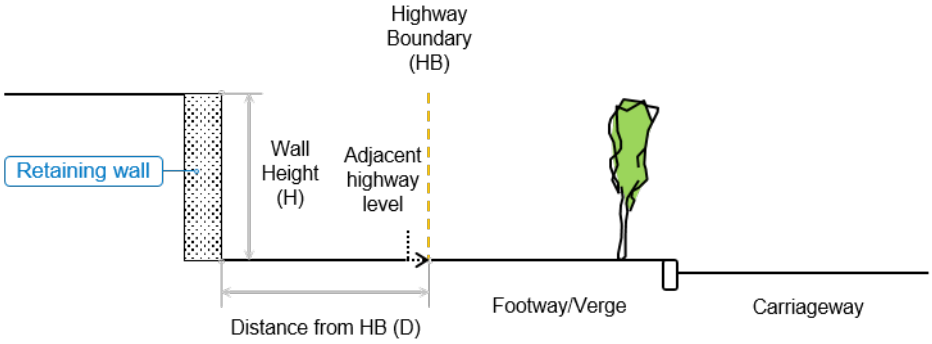
# DES: Highway Structures and Safety Fencing

## Design considerations

There are three broad types of highway-related structures:

- Any structure built in, under, or over the highway.
- Any retaining wall built within 3.65m of the highway boundary where the retained height above the adjacent highway is 1.4m or more. See Figure 8.19a.

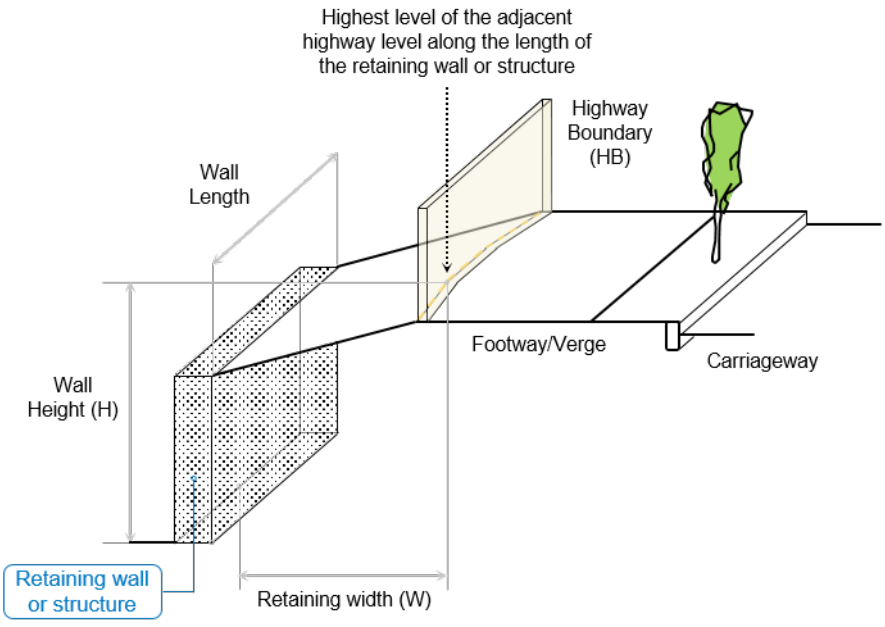
**Figure 8.19a. Defining highway-related structures | Example: Retaining wall A (For illustrative purpose only)**




***Retaining wall is a highway structure if D ≤ 3.65m and H ≥ 1.4m***

- Any retaining wall or structure which supports the highway and where the distance between the highway boundary and the rear face of the wall or structure (W) is less than twice the difference in level (L) between the ground at the front of the wall and the highest level of the adjacent highway at any point along the length of the wall or structure. See Figure 8.19b.

**Figure 8.19b. Defining highway-related structures | Example: Retaining wall B (For illustrative purpose only)**




***Retaining wall or structure is a highway structure if W < 2H***

Highway-related structures, as considered within the 6Cs area, normally include:

- Bridges.
- Fences (including safety fences).
- Retaining walls.
- Corrugated-steel buried structures.
- Reinforced soil and anchored earth structures.
- Reinforced clay brickwork retaining walls of pocket-type and grouted-cavity construction.
- Crib wall retaining walls of concrete or timber construction.
- Environmental barriers (including noise fencing[5]).
- All drains, pipes and box culverts, sewers and drainage structures, other than bridges, that have a diameter or clear span of more than 900mm.

All highway-related structures, whether to be adopted or not, shall be designed and constructed in accordance with current relevant Highways England standards, codes of practice and technical memoranda unless agreed otherwise. Design is normally subject to the technical approval procedure set out in BD 2/12 within DMRB and in the context of this design guide, the technical approval authority is the relevant LHA. The applicant must employ a qualified civil or structural engineer with experience in highway structures, with approval from the relevant LHA, to carry out design and oversee construction.

Prior to construction, the applicant shall provide the LHA with a programme of supervision for approval. This programme shall give details of the level and amount of supervision provided and contain proposals for materials testing. The works will then be audited by the LHA at regular intervals for compliance with the construction programme.

Prior to the request for a full adoption certificate, the applicant shall provide the LHA with the following pieces of information:

- Copies of approved calculations (if not already received).
- Inspection certificates.
- Material testing certificates.
- Digital photographs on CD (.jpg or .bmp format).
- As-built drawings on CD (e.g. an AutoCAD file).
- Maintenance manuals.
- Health and Safety File.
- Construction compliance certificate (in accordance with Annex C6 of BD 2/05 of DRMB).

The applicant is normally required to pay the additional design checking and inspection fees for any highway structure to be charged at 'actual' rates. The relevant LHA will provide an indication of the likely fee at the earliest possible opportunity.

## Safety fencing

Safety fencing shall not generally be required within residential developments because the need shall be designed out by providing layouts that are safe for people to live in. Where safety fencing is unavoidable in a residential area, or required to address existing situations where problems exist or circumstances have changed, then reference shall be made to RRRAP (Road Restraint Risk Assessment Process) contained in TD 19/06 where flows are appropriate.

In the event that flows are not sufficient to meet the thresholds in this guidance then an individual risk assessment shall be made in conjunction with a Road Safety Audit. Care shall be taken to avoid the use of safety fencing to protect users from the dangers of other objects or hazards within the highway boundary by first determining whether the objects in question could be relocated to remove the hazard.

Safety fences and barriers must comply with Section 2 of Highway Construction Details published by Her Majesty's Stationery Office as Volume 3 of Highways England's Manual of Contract Documents for Highway Works.

# Adoption and maintenance

A commuted sum is payable towards the long-term maintenance cost of:

- Structures.
- Safety fencing.

# Links and references

- For information on possible commuted sum payments refer to Appendix IV.

[5] Unless agreed otherwise, noise fencing shall be treated as a highway structure. As such, it must meet the design requirements for a structure. Design checking fees and a commuted sum payment for future maintenance are normally required for noise fencing.

# DES: Emergency Vehicles Access

## Design considerations

New residential developments usually need to provide at least two access points to the existing street network. In some circumstances, this may be particularly important to help emergency services respond to response time requirements.




Due to vehicle size, requirements for emergency vehicle access is normally dictated by fire service vehicles.

Notwithstanding response time requirements, emergency 'only' accesses are not normally accepted because of:

- Enforcement problems arising from their misuse.
- Difficulties encountered by the emergency services.
- Maintenance issues and vandalism of access-control equipment.
- General crime and anti-social behaviour problems.

Emergency services must be consulted throughout the pre-application stage, particularly where traffic calming measures are proposed for key routes. This is especially important for vertical calming measures.

In certain circumstances, there may be a valid reason for only providing a single point of access, particularly where the land being developed has limited frontage to a public highway. Where this is the case and emergency accesses are required it must be ensured that:

- Street safety is not compromised.
- The access is not likely to be a source of crime or anti-social behaviour problems.
- There are appropriate means of controlling its use.
- Emergency services have been fully consulted and the proposals are acceptable. Standard heights of emergency vehicles, particularly large fire service vehicles, shall be confirmed with the relevant emergency service at the pre-application stage in order to provide suitable headrooms compliant with unrestricted height requirements for the area.
- Long-term maintenance responsibilities are clearly defined and secured.
- Additional dedicated pedestrian and cycle access points exist.

Additionally:

- The use of vertical traffic calming on key routes within a development shall normally be avoided so as not to adversely affect the response time of emergency vehicles.

## Adoption and maintenance

- Long-term maintenance responsibilities need to be clearly defined and secured or the LHA may refuse to adopt the development's streets.

## Checklists

- Emergency services must be fully consulted. For the police force, consultations shall include both traffic management and the police force's Architectural Liaison Officer.

## Links and references

- Vehicular Access to Dwellings DES.
- The Building Regulations, Approved Document B, Fire Safety.
- For detailed information on Construction Standards and Materials refer to Appendix III.

# DES: Kerbs

## Design considerations

Kerblines can help to define and emphasise spaces. The type of kerb used, both in terms of height and material, can play an important role in informing street character. Design considerations include:

- Provision of satisfactory drainage where raised kerbs are installed.
- At bus stops, raised kerbing shall be laid out so to allow buses to stop parallel to it.
- In some cases, it may be necessary to provide combined kerb and drainage units to ensure both an acceptable alignment and drainage of the highway.
- A characteristic of many villages is the informal appearance of the highway edge which consists of grassed verges without kerbs. In these areas, standard pre-cast concrete kerbs may not be appropriate and natural stone, riven or exposed aggregate could be used to prevent overriding. It may be desirable to upgrade verges to include kerbs to improve pedestrian safety, drainage and to discourage parking.

## Technical criteria

- Layouts shall be designed to avoid combined kerb and drainage systems; although where this is not considered to be feasible the advice of the relevant LHA shall be sought.



An example of a combined kerb.

## Location criteria

- Dropped kerbs with coloured tactile paving shall be provided at crossings in accordance with the standard drawings. Tactile paving design shall be consistent with the latest version of DfT Guidance on the Use of Tactile Surfaces.
- Accessible raised kerbing to a height of 180mm will be required at all bus stops. The length of raised kerbing shall normally be:
  - 6m in suburban and rural areas and 4m in urban areas; plus
  - 1m transition kerbs at either end with a minimum run of 3m (plus transition kerbs).



The kerb on this conventional street helps accentuate different functions of the street.



The kerb on this street is flush to the carriageway creating a sense of shared ownership of the street.

## Links and references

- Refer to inclusive design principles Appendix II.
- For guidance on the use of tactile paving, refer to the latest version of DfT Guidance on the Use of Tactile Surfaces.
- For guidance on combined kerb and drainage systems refer to the relevant DES.
- For information on possible commuted sum payments refer to Appendix IV.
- Standard Drawings Kerb & Footways - Series 1100. Refer to the 6Cs website.

# DES: Tactile Paving

## General

The use of tactile paving surfaces is critical for visually-impaired people in their ability to navigate the street environment. Tactile paving surfaces enable users to locate, operate and make use of pedestrian crossing facilities.

DfT Guidance on the Use of Tactile Surfaces is the best source of up to date information.

## Links and references

- Refer to inclusive design principles Appendix II.
- For more detailed guidance on the use of tactile paving, refer to the latest version of the DfT Guidance on the Use of Tactile Surfaces.
- For guidance on pedestrian crossings, refer to the Crossings DES.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Vehicle Turning Areas

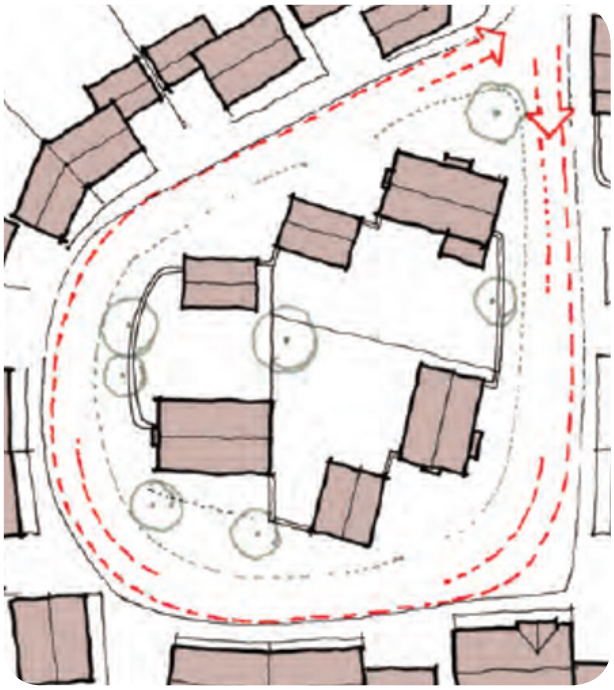
## Design considerations

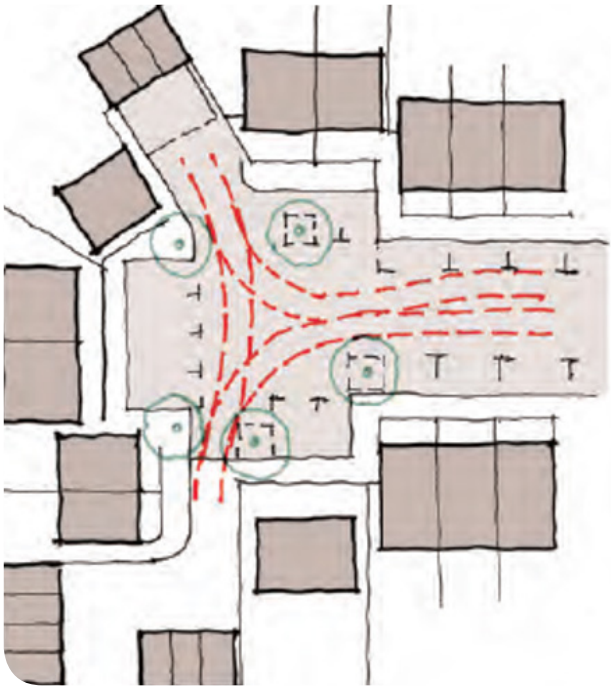
Turning areas are generally only necessary in culs-de-sac although due to a preference against the use of culs-de-sac in the development of new streets in the 6Cs area there shall be a limited need for turning areas in development.

Design outcomes shall normally be conceived to avoid the need for large vehicles such as refuse vehicles and/or a fire tender to reverse. If necessary, turning areas incorporated within an informal square may be used.

Turning areas must take into account urban design and inclusive design principles. Any turning area shall be designed to discourage parking within them, which otherwise might compromise their functionality.

**Figure 8.20. Indicative turning circle layout, facilitating access to large vehicles while reducing the need of hazardous turning manoeuvres (Left). Indicative turning area layout where the proposed design is not dominated by an undesirable turning head arrangement (Right)**





Images Courtesy Richard Guise, Central Bedfordshire Design Guide 2014



Turning area using a more attractive green space and a parking court.

## Adoption and maintenance

- Where any extra areas above that required for the safe functioning of the highway is designated for adoption, the LHA may require a commuted sum for future maintenance.

## Checklists

- Tracking assessments shall be undertaken to validate the functionality of turning areas. This is likely to include a refuse vehicle and a fire tender, but specific vehicle specifications need to be agreed with the relevant authority.

## Links and references

- Refer to inclusive design principles Appendix II.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Crossings

## Design considerations

The provision of crossing facilities will often be essential to create usable pedestrian and cycle connections linking a development to facilities and services. Crossings are particularly beneficial to disabled and older people as well as to children.

Crossings can be uncontrolled, priority controlled (e.g. Zebra crossing) or signal controlled (e.g. Puffin and Toucan) and may also facilitate cyclist and equestrian movements where the need arises.



Example of a Zebra crossing.



Example of a Puffin crossing.

The following matters shall be taken into account:

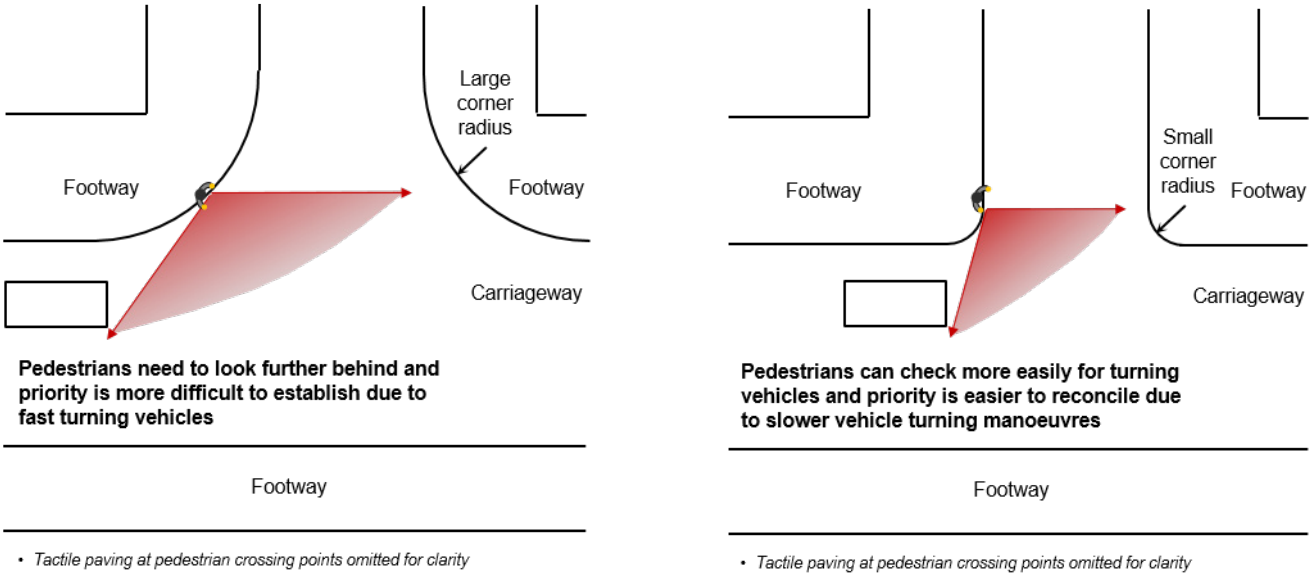
- Where the design speed exceeds 20mph, it may be necessary to consider some form of controlled crossing such as a Zebra, Parallel Pedestrian and Cycle, Puffin and Toucan to provide safe routes for pedestrians and cyclists. However, for design speeds of 20mph or less, informal crossings are generally likely to suffice unless the street is subject to high vehicular flows.
- All crossings must include a dropped kerb and may include some form of material change on the carriageway to give a stronger indication to drivers of the presence of the crossing.
- All formal crossings must include tactile paving. Refer to the latest version of DfT Guidance on the use of Tactile Paving Surfaces.
- Crossings shall be positioned to follow pedestrian and cyclist desire lines.






These two images of the same priority junction show how over engineered car-led designs (top) result in a deflected pedestrian desire line (bottom). Large corner radii can result in vehicles turning faster and pedestrian detours as the desire line is not maintained. This adversely affects convenience and comfort, particularly for disabled and older people (See inclusive design principles in Appendix II).

**Figure 8.21. Effects of corner radii on uncontrolled pedestrian crossing**




Adapted from Department for Transport and Communities and Local Government (2007) Manual for Streets.

- Tighter junction radii at junctions are acceptable to ensure that crossings can follow desire lines. This will be subject to tracking analysis demonstrating that the swept path tracking manoeuvre can be accommodated. See the Carriageways and Vehicle Track Space DES.
- The carriageway segment of a crossing facility shall be kept free of any drainage or other infrastructure to ensure the safety of pedestrians when using the crossing, especially visually-impaired people.
- Drainage solutions in the vicinity of the crossing shall be of sufficient quality to ensure that the crossing is kept free of surface water run-off preventing water from 'ponding'.
- The use of guard railing shall normally be avoided, but may be relevant in certain areas e.g. outside schools.
- In the majority of cases, staggering at crossings shall be avoided. Where it is necessary for a signalised crossing to operate in two separate stages, experience has shown that providing a wide central refuge (4m minimum) will indicate to pedestrians that each side shall be treated as a separate crossing.
- Separate crossings for pedestrians and cyclists can be provided for both priority (Parallel Crossing) and signal controlled situations.



Water 'ponding' at a controlled crossing.



Example of a parallel crossing for pedestrians and cyclists.

- Crossings may be used in conjunction with speed calming measures. Narrowing is particularly effective because the build out of the footway into the carriageway shortens the crossing distance for pedestrians. Similarly, raised tables, including side road entry treatments, can be effective in denoting changes in street character or inferring shared priority, particularly at junctions.
- Visibility at crossings shall be good with the immediate environment kept free from street furniture, parking obstructions, trees and high planting. Build outs may be appropriate solutions to protect visibility in circumstances where this cannot otherwise be avoided.

## Technical criteria

- Crossings shall be planned and designed consistent with recommended practices as described by 'The Design of Pedestrian Crossings Local Transport Note 2/95'. This is particularly important to ensure items of traffic signal equipment integrate elements such as audible beeps and rotating cones to respond to the needs of disabled users.
- Traffic signs at formal crossings must comply with TSRGD 2016.
- Formal crossings shall normally be designed and constructed in accordance with the relevant LHA standard drawings if applicable.
- For further guidance refer to the Traffic Signals DES.
- For tactile paving guidance refer to the latest version of the DfT Guidance on the Use of Tactile Surfaces.
- Where a refuge in the middle of the carriageway is required, this shall be provided to standard drawings with:
  - 2.0m - width for pedestrian-only use
  - 2.5m - width if used by cyclists
  - 3.2m - clearance to the carriageway on either side of the refuge

## Location criteria

- Where there is a footway on the opposite side of the street to a bus stop, a crossing facility shall be provided as close as possible to the bus stop to facilitate access, bearing in mind safety considerations.
- Where a new junction is formed between a bridleway and public highway, an equestrian traffic crossing facility (Pegasus crossing) shall be provided for horse riders (refer to LTN 2/95 for further information).
- In car parks, safe pedestrian and cycle routes shall be provided which follow desire lines wherever possible.

## Adoption and maintenance

- Formal crossings required on new and existing streets as a consequence of development proposals may require a commuted sum for future maintenance.

## Checklists

- The requirements for crossing facilities at sites shall be agreed with the relevant authorities as part of the design development stage.

## Links and references

- Refer to inclusive design principles Appendix II.
- DfT Guidance on Inclusive Mobility.
- The Design of Pedestrian Crossings Local Transport Note 2/95.
- For further guidance on tactile paving design, refer to the latest version of DfT Guidance on the use of Tactile Paving Surfaces.
- For information on possible commuted sum payments refer to Appendix IV.
- Standard Drawings Kerb & Footways - Series 1100. Refer to the 6Cs website.

# 8.3 Servicing: Access to Frontage Development

## General Guidance

Access needs for all users must be considered at street-level. Streets shall always aim to provide direct frontage access to the buildings and public realm immediately alongside them. This principle also applies to existing streets that border developments. This approach helps to promote social interaction, minimise opportunities for crime, calm traffic speeds and achieve better integration between the street and its environment.

## Design Element Sheets

Frontage accesses to buildings for pedestrians shall ideally be level or with only slight slopes for purposes of accessibility and be compliant at all times with the regulations contained within the Building Regulations 2010 (2015)[6].

The remainder of this section provides the DESs for access.



This mixed use high density development has frontages addressing the main street. This includes a supermarket with the main entrance onto the street.



This main street is designed to enable direct frontages with pedestrian access onto shared footpaths and cycleways.

[6] Building Regulations 2010, Access to and the use of buildings, Approved Document M, Volume 1, 2015 edition

# DES: Footway Crossovers

## Design considerations

A footway crossover is a continuous, unobstructed and adequately strengthened surface that enables vehicles (e.g. cars, light and heavy goods vehicles) to traverse the footway. It normally provides a point of entry for motorised vehicles to an individual/shared off-street parking facility whilst maintaining pedestrian priority along the footway.

- Footway crossovers shall not ramp up the full width of the footway.
- Crossfalls shall not adversely affect users passing along the footway.
- Where footway crossovers are provided to private accesses that facilitate heavy goods vehicle movements (e.g. for deliveries or servicing purposes), crossovers need to be strengthened. Special attention must be paid to the possibility of refuse vehicles using the footway crossover.
- The use of tactile paving is not required at footway crossovers.

## Technical criteria

- 900mm - minimum width of footway to be maintained at regular footway crossfall.
- 25mm - minimum kerb upstand height at dropped kerb.

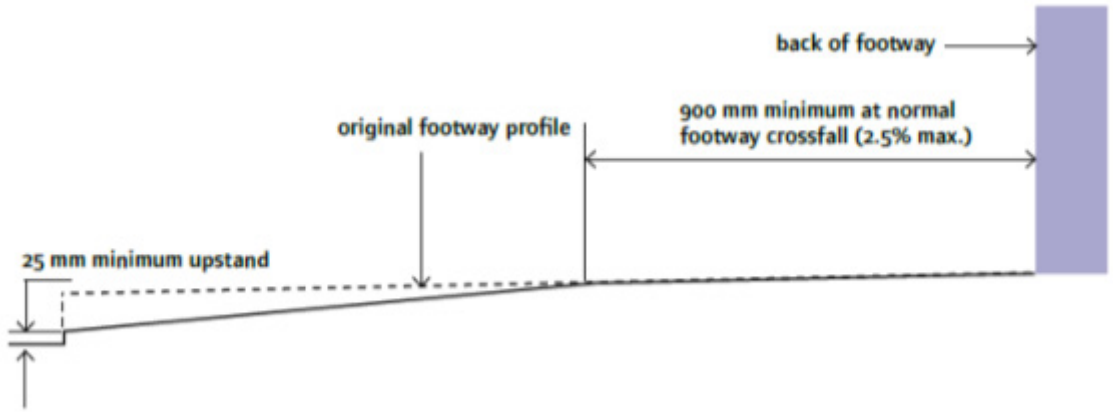
## Location criteria

- Footway crossovers shall not be located within bus stop cages, car parking spaces, loading bays, crossings or junctions.

## Links and references

- For the legal procedures relating to the construction of footway crossovers, refer to Section 184 of the Highways Act 1980 or other relevant statute dependent upon the scale of works.
- For detailed information on Inclusive Design Principles refer to Appendix II.
- For further information on vehicular access, see the Vehicular Access to Dwellings DES.
- For detailed information on Construction Standards and Materials refer to Appendix III.

**Figure 8.22. Typical vehicle crossover**




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# DES: Pedestrian Access to Dwellings

## Design considerations

Pedestrian access to dwellings must ensure that:

- It is possible to gain access to the dwelling, or building containing the dwelling, from the most likely point of alighting a car.
- Step-free accesses are provided where feasible to take into account the needs of a diverse number of users.

## Technical criteria

- The approach route shall:
  - Be level, gently sloping, or where necessary, ramped. On steeply sloping plots, where step-free access is unattainable, a stepped approach may be used providing it can be demonstrated that there is no alternative design solution.
  - Be constructed with a hard bound material.
  - Have a 900mm minimum clear width (including past a parked car) to facilitate wheelchair access.
  - Have a 1 in 40 maximum crossfall.
- If ramped, the approach route shall:
  - Not be more than 10m long if gradient is up to 1:15 - for individual flights.
  - Not be more than 5m long if gradient is up to 1:12 - for individual flights.
  - Have a 900mm minimum clear width between individual flights.
  - Ensure that every flight has a top and bottom landing.
  - Provide an intermediate landing between individual flights and at any change of direction.
  - Have a 1,200mm minimum length of landing (clear of the swing of any door or gate).
- If stepped, the approach route shall:
  - Ensure that steps are uniform with a rise of 75-150mm and a minimum going of 280mm [for tapered steps measured at a point 270mm from the 'inside' (narrow end) of the step].
  - Provide steps with suitable tread nosings.
  - Have a 1,800mm maximum distance between landings.
  - Have a 900mm minimum length of landings which are to be provided at the top and bottom of each flight.

## References and links

- For detailed information on Inclusive Design Principles refer to Appendix II.
- For more information, refer to Section M4 (1) Building Regulations 2010, Access to and the use of buildings, Approved Document M, Volume 1, 2015 edition. Refer to M4 (2) and M4 (3) for further guidance where planning conditions dictate.
- For more information on pedestrian access to dwellings see Lifetime Homes 16 point criteria.

# DES: Vehicular Access to Dwellings

## Design considerations

Direct vehicular access to dwellings is typically provided through an individual private driveway or a shared private driveway to five or fewer dwellings.

In designing vehicular accesses to dwellings, designers must take into account:

- The latest issue of the Building Regulations Approved Document B, Fire Safety, as emergency vehicle needs are normally governed by fire service requirements.
- Waste collection requirements as set out in British Standard 5906:2005. This is particularly important when shared private accesses are to be provided.
- Where private driveways and other unadopted surfaces fall towards the public highway, surface run-off must be prevented from reaching the highway drainage system.
- If applicable, vertical traffic calming features shall not be sited in close proximity to entry points to prevent vehicles grounding, as they turn in or out of the access.
- Any street name plates on a private driveway or unadopted vehicular access way must clearly state that the driveway is 'private' and must remain in place as long as this is the case.
- It is important that there is clear demarcation between the public and private space. The highway boundary shall normally be defined by continuous 50mm x 150mm edging type EF to BS7263 unless agreed otherwise with the LHA. Alternative approaches to demarcation may be considered on a site-by-site basis, for example, in conservation areas.
- On-street parking facilities shall be located so as not to prevent vehicles from accessing driveways, particularly refuse vehicles or when access is required by HGVs.
- Provision of communal refuse collection points may be considered and must be within 15m of the highway boundary.



Purpose-built communal storage facility adjacent to the main street.



Unclear waste collection management.

## Individual private driveways

Table 8.11. concerns the provision of direct vehicular access to individual properties and shall be used as a starting point to inform design. These figures are linked to speed limits/ design speeds of the adjoining conventional street and volumes of motorised traffic (i.e. AADT - Annual Average Daily Traffic).

**Table 8.11. General considerations for individual private driveways**

| Speed Limit/ Design Speed of Adjoining Conventional Street | Estimated Motor Traffic Flow (AADT) Along Adjoining Conventional Street | Direct Access Requirements to Properties |
|---|---|---|
| ≤20 mph | Irrelevant | There are no restrictions on vehicular accesses to individual dwellings permitted for two-way traffic flow streets. Preferably, individual private driveways shall not normally cater for more than 2 parked vehicles (i.e. tandem parking) per dwelling |
| <25 mph | <5,000 | Direct vehicular accesses to individual dwellings is normally permitted for two-way traffic flow streets. Dependent on proposed land uses and site-specific conditions, the provision of turning areas within properties may be required to cater, for example, for light goods vehicles servicing properties or individual private driveways expected to take more than 2 parked vehicles per dwelling |
| <30 mph | <10,000 | Direct vehicular accesses to individual dwellings may be permitted for two-way traffic flow streets. Dependent on proposed land uses and site-specific conditions, the provision of turning areas within properties may be required |

Additional factors to take into account when establishing access designs include:

- The width of the footway.
- Footway users passing along the street (e.g. activity levels, type of users, etc.).
- Opportunities to enable vehicles to turn around within properties.
- The distance between the private boundary and the carriageway.
- The relationship of points of entry on opposite sides and shared surfaces needs (if required).

## Shared private driveways

Shared private driveways shall preferably be avoided as they tend to reduce connectivity and accessibility through a development. A network of adopted streets is preferred. However, designers may consider the use of these driveways as follows:

- Shared private driveways normally give access to five or fewer dwellings and are unadopted.
- Private driveways shall preferably have two points of access to avoid the need for a turning area. However, where no other options are deemed feasible, a shared private driveway may be designed as a cul-de-sac. Any necessary measures shall be taken to ensure that parked cars do not obstruct turning areas.

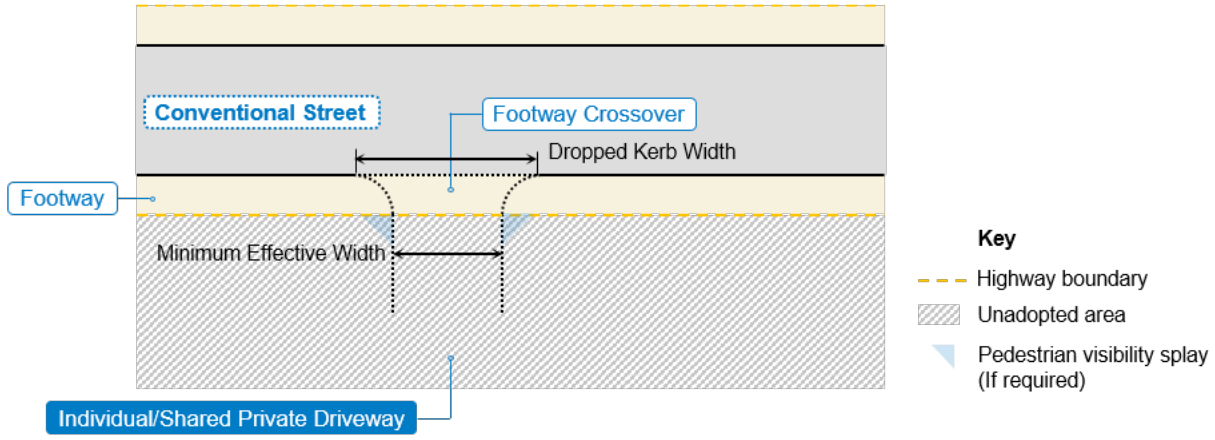
# Technical criteria

In line with BS 5906:2005, vehicular accesses to dwellings must consider that:

- Refuse collection vehicles and fire vehicles shall not normally be required to reverse more than 12m and 20m respectively.
- Waste management collectors shall not normally be required to carry individual waste containers or move two-wheeled containers for a distance of more than 15m.
- Waste management collectors shall not be required to manoeuvre four-wheeled waste storage containers from the storage points to collecting vehicles for a distance of more than 10m.

Depending on the type and scale of the development, private accesses from a conventional street may be designed as follows:

**Figure 8.23. Private driveway access design for residential developments serving up to 5 dwellings and B1 use class developments of up to 3,000m² GFA**




Minimum effective width:

**Table 8.12. Minimum effective width of private driveways**

| Number of Dwellings | Refuse collection vehicle anticipated to use private driveway? | | | | | |
|---|---|---|---|---|---|---|
| | | Minimum Effective Width [a] | Driveway Length Considerations[b] | | Minimum Effective Width [a] | Driveway Length Considerations [b, c, d] |
| Single dwelling | No | 2.75m[e] | (1) (2) (3) | Yes | 5.0m | (1) (3) |
| 2-5 dwellings | | 4.25m | (1) (3) | | | |
| B1 use class up to 3,000m² GFA | | 6.0m | (1) (3) | | 6.0m | (1) (3) |

**Notes:**
[a] 0.5m shall be added if bounded on one side by a wall, fence, hedge, line of trees or similar, and 1.0m if bounded on both sides
[b] Driveway Length Considerations:
(1) Waste management collectors shall not normally be required to carry individual waste containers or move two-wheeled containers for a distance of more than 15m nor to manoeuvre four-wheeled waste storage containers from the storage points to collecting vehicles for a distance of more than 10m.
(2) Where dwelling(s) situated more than 45m from the public highway, the minimum width for access shall be at least 3.7m (between kerbs) to cater for emergency vehicles.
(3) Turning areas within properties (site) may be required.
[c] Refuse collection vehicles shall not normally be required to reverse more than 12m.
[d] Fire vehicles shall not have to reverse more than 20m.
[e] Where the pedestrian access route to the dwelling(s) is fully or partly contained within a private driveway, designers shall make an allowance of at least 900mm so wheelchair users can pass parked vehicles.

Minimum corner radii:

- To be determined by tracking - residential and B1 use class developments of up to 3,000m$^2$

Dropped kerb widths:

In line with Figure 8.23, the following are typical dropped kerb widths for private driveways. In the majority of cases (e.g. subject to characteristics observed or foreseen along the adjoining conventional street, for example, where parked vehicles restrict access) vehicular access will need to be supported by a swept path analysis of appropriate vehicles.

Across streets with 85th percentile speed of 30mph or less:

- Access to single dwelling = minimum 3.7m
- Access to between 2 and 5 dwellings = minimum 5.5m

Visibility splays:

- See Stopping Sight Distances and Visibility in the Place and Movement Section.

Pedestrian visibility splays:

- 2m x 2m required only for individual private driveways where there is deemed to be high footfall and/or a significant pedestrian traffic generator in close proximity e.g. a school.
- Green infrastructure may be permitted in the pedestrian visibility splay (e.g. low-level planting below 0.6m of the level of the back of the footway).

Preferable gradients:

- 1:20 or less for the first 5m for a single residential dwelling and 2 to 5 residential dwellings.
- 1:20 or less for the first 15m for B1 use class developments of up to 3,000m$^2$ GFA.
- 1:12 shall never be exceeded in all cases in keeping with BS 5906:2005.

Surfacing:

Bound material, for example, bituminous, concrete or block paving for at least the first 5m for residential developments and 15m for B1 use class developments of up to 3,000m$^2$ GFA.

Turning areas:

- Required where a proposed development takes access from a road with a speed limit above 40mph.
- Normally required where a proposed development takes access from an adjoining conventional street which carries in excess of 500 vehicles per hour at its peak.
- Preferably to be constructed within 50m of the access junction for employment and commercial developments.
- Required elsewhere where road safety may be compromised.

## Adoption and maintenance

- Private driveways are not adopted by LHAs.
- For private developments of six or more dwellings as well as for exempted employment and commercial developments, the LHA will normally serve a notice on the developer with an assessment of the cost of the proposed roadworks under the Advance Payments Code (APC), to protect frontagers' interests (see Sections 219-220 of the Highways Act 1980). The cost of this will reflect the cost of the proposed street works and the developer shall construct the works to an appropriate standard. However, because APCs have been served and money has been paid or retained, the LHAs are not indicating any future intention to adopt and maintain the street works at public expense.
- If development accesses are to be private, the LHA will require the applicant to:
  - Deposit a map with the LHA under Section 31 (6) of the Highways Act 1980, identifying any routes that are to remain private, including suitable demarcation from those that are to be adopted.
  - Provide evidence that the 'unadopted' status of accesses and the practical implications associated with this have been communicated to any potential purchasers of dwellings.
  - Provide evidence that future maintenance of accesses/driveways is secured. This may, for example, be a unilateral undertaking by the applicant/ developer under Section 106 of the Town and Country Planning Act to set up a maintenance management company.
  - Indemnify the LHA against future petitioning by residents to adopt an access/driveway under Section 37 of the Highways Act 1980, where it connects two adopted streets. Indemnification shall normally come in the form of a legal covenant placed on the properties to prevent petitioning. The wording of any covenant must be approved by the relevant LHA.
- The approval of the LHA must be obtained for the construction details of the access of any employment or commercial development.

## Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II.
- For guidance on the APC, refer to the 6Cs website.
- For long driveways and accesses (over 25m), the developer shall refer to BS5906:2005 for further guidance.
- For further details relating to private roads and the emergency services, refer to the latest issue of the Building Regulations Approved Document B, Fire Safety.
- For detailed information on Construction Standards and Materials refer to Appendix III.

# DES: Garages and Gated Accesses to Car Parking Spaces

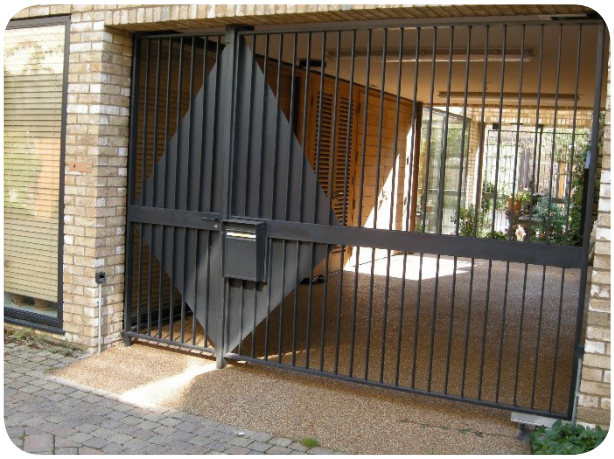
## Design considerations

The following matters shall be taken into account:

- Garages will be counted as parking spaces if they meet the minimum dimensions set out in Table 8.13 below. If not, then they may be excluded by the LHA. In all instances, designers are encouraged to consult the relevant LHA as different authorities may take a different stance with regard to counting garages as parking spaces in light of the local context, specific challenges and/or experiences incurred in the locality.
- Garages shall not dominate the street scene.
- Where an integral garage is proposed (i.e. the garage is part of the house), early discussions on the preferred design of the garage, the house and elevation of the property shall be held with the LPA. Any adverse impact of integral garages must be mitigated, particularly on wheelchair housing developments.
- On plot garages to individual properties shall be preferably located so:
  - Vehicles can park in front of the garage doors.
  - The garage doors can be opened while the vehicle is on the drive without the vehicle obstructing the adjoining street, including any footway or turning facilities.
- Gated accesses to car parking spaces shall be set back a minimum distance of 5m for residential and 15m for commercial developments from the highway boundary to ensure that the public highway (particularly areas used by pedestrians) is not obstructed if a vehicle is parked on the access in front of the gates.
- Recessed garages with obstructive parking must always be avoided.



Example of a garage mews.



Example of a gated car port.



New development including parking and garage courts that are secured with electronic gates.

# Technical criteria

### Table 8.13. Standard dimensions for garages

| Type of Garage | Internal Dimensions for Garages (Width x Length) | | Garage Door (Width) |
|---|---|---|---|
| | Preferred [a] | Absolute Minimum [a, b] | Absolute Minimum [a] |
| Standard single | 3.6m x 6.5m | 3.0m x 6.0m | 2.3m |
| Use by disabled people | 4.2m x 6.5m | 3.3m x 6.0m | 2.8m |
| Double | 7.2m x 6.5m | 6.0m x 6.0m | 4.2 |

**Notes:**
[a] Larger spaces may be required to accommodate large vehicles.
[b] Spaces that are smaller than the stated absolute minimum may be included but are unlikely to count as parking spaces.

### Table 8.14. Garages set-back distances

| Garage Door Type | Distance from Highway Boundary [a] | |
|---|---|---|
| | Preferred [b] | Absolute Minimum |
| Roller-shutter, sliding or inward opening | 6.5m | 5.5m |
| 'Up-and-over' | | 6.1m |
| Hinged, outward opening | | 6.5m |

**Notes:**
[a] Depending on specific circumstances, longer distances may be required to accommodate large vehicles.
[b] When the area available between the garage door and the highway boundary is to be used as a tandem space.




This off-street parking space is ineffective as the car doors cannot be opened.

# Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II. For further details relating to accessible homes, refer to the Lifetime Homes Design Guide.

# 8.4 Servicing: On-Street and Off-Street Parking

## General Guidance

An appropriate car parking strategy matching supply to demand is imperative for the success of any development and key to a successful parking strategy. The number of parking spaces and the distribution of spaces within a development, including the overall parking strategy, requires approval from the development team (if applicable) before the conclusion of the design development stage. Allocated parking is not permitted within the adopted Public Highway.



Front parking options must be considered to better integrate development-specific parking needs. Image Courtesy Andrew Beard.

## Design Element Sheets

The remainder of this section provides the DESs for Parking.

# DES: On-Street Car Parking

## Design considerations

Carefully designed on-street parking can play a positive role in calming traffic speeds by encouraging cars to drive slower and more responsibly. When integrated with other design elements (e.g. trees, SuDS, etc.) and consideration is given to ensure that parking spaces are conveniently located and overlooked, they can be successfully assimilated into the built environment.



Effective integration of parking and green space on a development. This example highlights the importance of coordinating parking with trees and SuDS as part of the design development process. © CIRIA, 2015

The following matters shall be taken into account:

- On-street parking spaces must be clearly defined so to encourage the intended users to use them. Parking space definition can be achieved through on-street markings or through material differentiation, which can contribute positively to achieving a sense of place.



Failing to provide a flexible car parking strategy leads to the inevitable footway parking.



Well-designed on-street car parking smooths out demand and prevents pavement parking.

- Traffic Regulation Orders shall be considered to minimise the risks of on-street parking particularly near schools.
- The arrangement of parking shall not cause undesirable obstructions. For example, to pedestrian and cycle movement; visibility at junctions; and the safe and efficient operation of buses, emergency vehicles and refuse collection vehicles.





Clearly defined on-street parking not only encourages use but also benefits the aesthetic of a street by addressing the issue of parking blight.

- Parking provision shall aim to ensure that the level and design of on-site parking and any proposed travel plan measures reflect and complement each other.

# Technical criteria

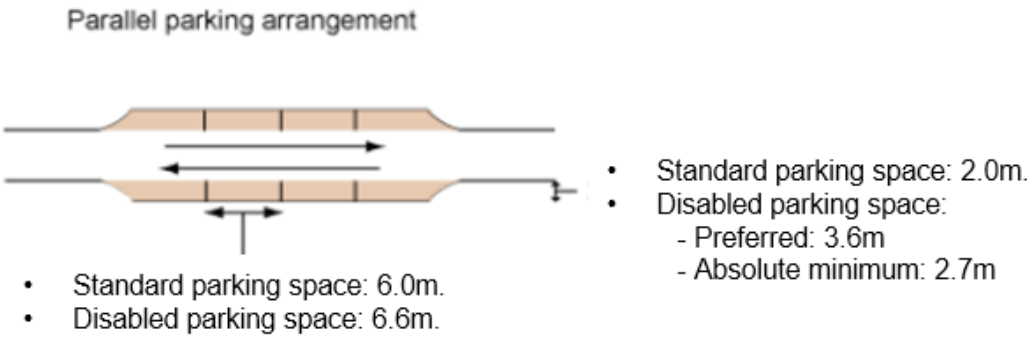
Standard parking bay dimensions:

- 2.0m x 6.0m - parallel parking bays.
- 2.4m x 4.8m - perpendicular and echelon parking bays.

Disabled persons parking bay dimensions: Parking space shall be a clear rectangular space.

- Preferred: 3.6m x 6.6m - parallel parking bays.
- Minimum: 3.6m x 4.2m - at an angle to the kerb.

**Figure 8.24. Standard and disabled parking spaces dimensions for parallel and perpendicular parking arrangements**




Adapted from Department for Transport and Communities and Local Government (2007) Manual for Streets.

- To minimise the risk of collision between cyclists and car doors, a buffer zone of at least 0.5 metres between cyclists and parked cars (e.g. parallel parking arrangement) must be provided where cycle lanes or tracks are being provided.

- Disabled persons' parking bays shall be located where road gradient and camber are reasonably level and no steeper than 1:50. Dropped kerbs must be provided for wheelchair users where designated bays are at a different level from the adjacent pavement.

# Adoption and maintenance

On-street parking shall be considered within tracking assessments to determine suitable carriageway widths.

# Links and references

- See the Carriageway and Vehicle Track Space DES for more information.
- For detailed information on Inclusive Design Principles refer to Appendix II.
- For further guidance on disabled persons' parking facilities, refer to DfT Inclusive Mobility.
- For advice on the provision and design of parking for disabled people, refer to DfT Traffic Advisory Leaflet 5/95 and BS 8300:2009+A1:2010.
- Where a development requires a travel plan refer to the 6Cs website for guidance.
- For more information on on-street parking design, see the CIHT guidance note on residential parking.
- For further guidance and case studies, refer to Space to Park.
- For information about how to help promote personal safety and security see the Secured by Design (SBD) toolkit and other SBD documentation as below:
  - Design Council (2011) Designing out crime: A designers' guide.
  - ACPO Crime Prevention Initiatives (2014) Secured by Design: New Homes 2014.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Off-Street Parking for Residential Developments

## Design considerations

The following matters shall be taken into account:

- Off-street parking shall be well lit and close to the dwelling(s) it serves.
- Parking shall preferably be provided either directly in front of or to the side of the property served (or both) where it has good visibility and convenient access to the street.
- In the interests of crime prevention, parking spaces shall enjoy observation from a window to the side of the property and/or good natural observation from neighbouring buildings.
- Parking spaces that are allocated to individual dwellings shall be clearly distinguishable from one another.
- Off-street parking spaces shall be clearly distinguishable from the public realm.
- Tandem parking solutions (where vehicles are intended to park one behind the other) for more than two vehicles shall be avoided. Where a property contains a garage to be counted as a parking space with a further parking space located in its forecourt, this also classifies as a tandem parking solution.
- Garages shall normally be counted as parking spaces if they meet or exceed the 'Preferred' standard set out in the Garages and Gated Accesses to Parking Spaces DES unless the local authority informs otherwise. Garages that fall short of the 'Preferred' standard may be excluded from classification.
- Separate parking areas which are remote from some or all the properties that they serve and which cannot be easily observed - particularly rear parking courts - are to be avoided as far as possible.

## Technical criteria

### Level of parking provision

The Department for Communities and Local Government methodology (DCLG methodology) shall be applied to determine parking supply in the absence of any specific parking standards from the relevant authority. This methodology applies to residential parking and assesses car parking requirements based on dwelling location, size, type and tenure.

This methodology is sensitive to the different needs of urban and rural locations and allows designers to vary the parking mix by allocated and unallocated spaces as well as on- and off-plot spaces to arrive at the optimal solution.

Parking provision is influenced by a range of factors including:

- The control of on-street parking in the area.
- The development's exact nature and likely use.
- Its geographical location.
- How accessible the development is using other methods of transport, including public transport, walking or cycling.
- The standard of the surrounding public highway network and the traffic and parking conditions on it.
- Opportunities to use SuDS to mitigate the impacts of large expanses of hard surfacing and effects associated to global warming, particularly for new developments and sites within urban areas.



Car parking provision using cart sheds.

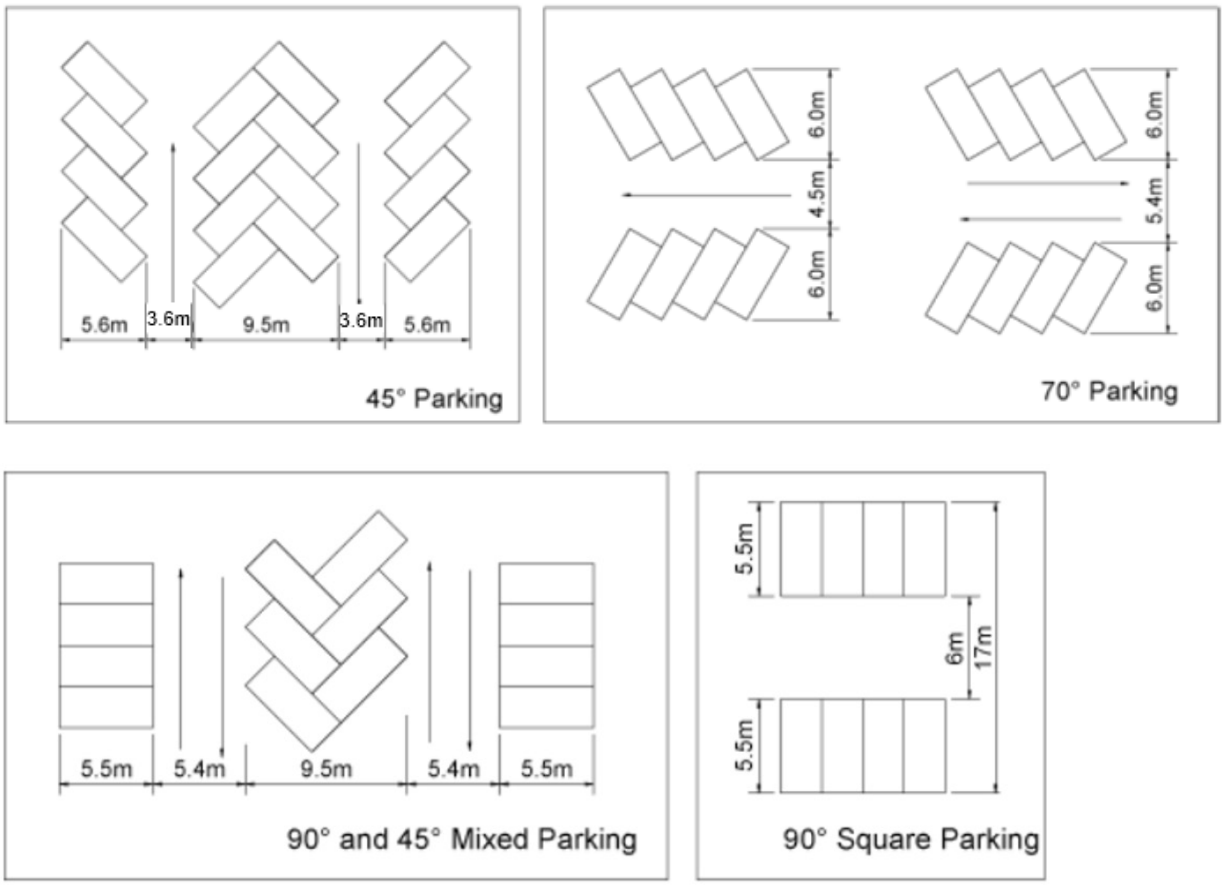


These off-street parking bays are clearly-defined in their separation from one another (important because they are allocated to different properties) as well as from the public realm, particularly the footway.

## Car parking space size and layout

Typical aisle widths and parking space sizes, which may incorporate a wheel stopper, are shown below:

**Figure 8.25. Typical aisle widths and parking space sizes**




- Absolute minimum width - 2.4m.
- Designers shall add 0.5m if bounded by a wall, fence, hedge, line of trees or other obstructions on one side, and add 1m if bounded on both sides.

## Adoption and maintenance

- The LHA will not adopt off-street parking areas. Where they are proposed developers shall provide clear details of future maintenance responsibilities.

## Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II.
- Where a development requires a travel plan refer to the 6Cs website for guidance.
- For more information on on-street parking design, see the CIHT guidance note on residential parking.
- For further guidance and case studies, refer to Space to Park.
- For information about how to help promote personal safety and security see the Secured by Design (SBD) toolkit and other SBD documentation as below:
  - Design Council (2011) Designing out crime: A designers' guide.
  - ACPO Crime Prevention Initiatives (2014) Secured by Design: New Homes 2014.
- For information on possible commuted sum payments refer to Appendix IV.

# DES: Cycle Parking

## Design considerations

Cycle parking shall be provided for all land uses in accordance with the technical criteria table below as well as at public transport interchanges and areas of general public use, especially public areas in which motor vehicles are prohibited.

The following matters shall be taken into account:

- Cycle parking shall be located close to building entrances and in locations where it enjoys good light and observation from its surroundings. Larger facilities will normally benefit from dedicated lighting.
- Cycle parking shall be as secure as reasonably practicable to deter vandalism and crime.
- Cycle parking shall be sited so as not to inconvenience pedestrians or cause obstructions for visually-impaired people using the footway.
- Where 'D' stands are used, they shall be orientated perpendicular to any slope, notwithstanding the presumption that when constructed as a 'toast rack' (i.e. multiple provisions of 'D' stands), they shall normally be located in line. Lower crossbars can be added to 'D' stand structures to make them more suitable for step through cycle frames and children's cycles.
- In public spaces (such as a high street), small clusters of cycle parking infrastructure are generally preferred over large, consolidated parking facilities. Larger, consolidated facilities may be appropriate to service a particular land use e.g. a railway station or a hospital.



Cycle parking shelter.

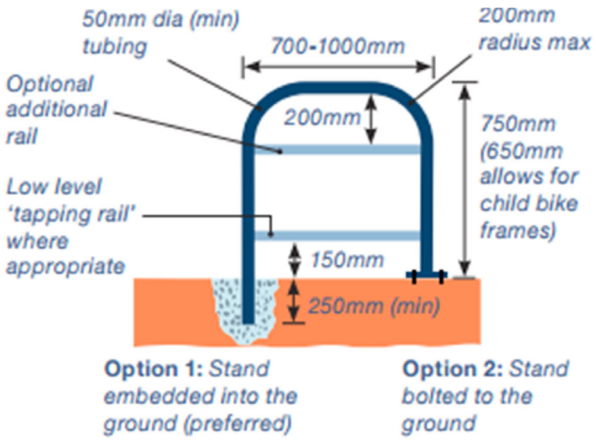


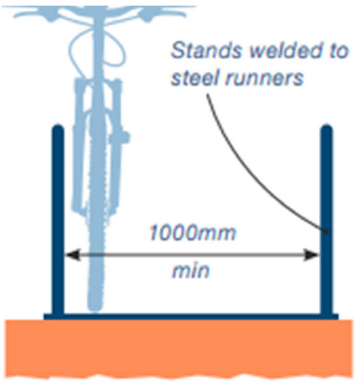
Residential sheltered cycle parking at a residential development.

## Technical criteria

### 'D' stand design

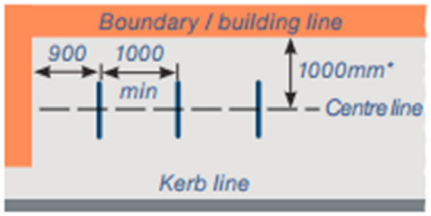
**Figure 8.26. Conventional 'D' stand design**



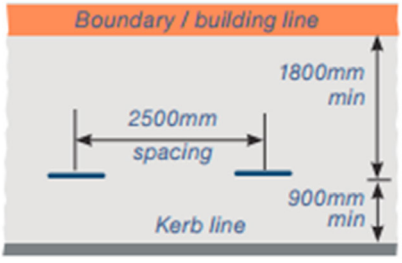

**Layouts**

**Perpendicular**




*If no pedestrian access required, otherwise 2500min

**Along kerb**




© Sustrans November 2014

Minimum cycle parking space standards

- Reference shall be made to LPA standards as may be set out in Local Development Frameworks. In the absence of specific local guidance, the following set of default standards may be used:

**Table 8.15. Default cycle parking space standards**

| Use class | Number of spaces | Threshold |
|---|---|---|
| Retail, pubs and clubs (A1 and A3) | One space per 500m$^2$ of GFA for staff and operational use (to be secure and undercover). Plus one space per 1,000m$^2$ of GFA for customer use (to be cited in a prominent location). | Up to 4,000m$^2$ of GFA. |
| Financial and professional services, R&D and offices (A2 and B1) | One space per 400m$^2$ of GFA for staff and operational use (to be secure and undercover). Customer parking provision to be considered on a site-by-site basis. | None |
| General industry and storage and distribution (B2 to B8) | One space per 400m$^2$ of GFA for staff and operational use (to be secure and undercover). | None |
| Dwellings (D3) | For residential developments with common facilities such as flats, one space per five dwellings (to be secure and undercover and with step-free access) shall be used only in the absence of specific guidance from the relevant LHA. For other residential developments, one space per dwelling, with garages counting towards cycle parking provision if they meet the 'Preferred' standard in the Garages and Gated Accesses to Parking Spaces DES. | None |
| Non-residential institutions, assembly and leisure (D1 and D2) | Staff parking to be considered on a site-by-site basis. Cycle parking equivalent to 5% of the peak visitor demand for the facility (to be cited in a prominent location). | None |
| All other use classes | To be considered on a site-by-basis | N/A |

## Location criteria

- 20m - preferred maximum distance from building entrance to which it serves.

## Checklists

- The applicant shall engage with the relevant LPA to determine whether alternative standards shall be used to determine the number of parking spaces.

## Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II.
- For further information on cycle infrastructure refer to the Cycle Infrastructure DES.
- For cycle parking standards in Leicester City, refer to their Vehicle Parking Standards SPG document.
- For further information, refer to:
  - The draft Nottingham City Cycling Design Guide.
  - Sustrans Design Manual.
  - London Cycling Design Standards - Chapter 4.
  - Wales Active Travel Design Guidance - Chapter 6.
- Where a development requires a travel plan refer to the 6Cs website for guidance.
- For information about how to help promote personal safety and security see the Secured by Design (SBD) toolkit and other SBD documentation as below:
  - Design Council (2011) Designing out crime: A designers' guide.
  - ACPO Crime Prevention Initiatives (2014) Secured by Design: New Homes 2014.
  - Police Services (2015) Secured by Design, Commercial Developments. Official Police Security Initiative.
- For information on possible commuted sum payments refer to Appendix IV.



Cycle storage at a new development.

# DES: Motorcycle Parking

## General

In most instances, it will not be necessary to provide dedicated parking for motorcycles, mopeds or other powered two-wheeled vehicles. However, where a particular need for motorcycle parking has been identified, this DES may be used as a basis for specification.

## Design considerations

### Parking area

- Motorcycles come in a range of shapes and sizes and as such the provision of a parking 'area' usually proves for both flexibility and space efficiency.
- On-street motorcycle parking usually takes a form similar to a car parking bay. Consequently, dedicated motorcycle parking facilities shall be appropriately signed.
- Motorcyclists shall be encouraged to park their vehicles perpendicular to the kerb within parking bays. Bays need not be marked out individually.
- Parking shall be provided on a surface which offers good grip, is well drained, and is relatively flat and firm.
- Consideration must be given to how motorcycle users will be able to manoeuvre vehicles in/out of the parking provision safely. The definition of usable areas must consider the need to mount and dismount vehicles conveniently.

### Security

- As a minimum, parking facilities shall be located so as to ensure good observation from any buildings and the public realm. Designers shall also consider the use of physical security measures such as rails (Preferred physical security measure), hoops or posts to improve attractiveness to motorcyclists and to further minimise crime risk.
- Where motorcycles are parked perpendicular to the kerb, a simple continuous steel rail suffices in most situations. An additional waist-high rail shall normally be added to reduce the risk of tripping, particularly where the rail is otherwise exposed to the footway.
- Facilities shall be well lit and preferably within view of CCTV coverage.
- When providing motorcycle parking facilities in multi-storey car parks, a dedicated area shall be provided on the ground floor within view of parking attendants.

## Technical criteria

- 20m – ideal maximum distance of parking provision from main destination.
- 50m – absolute maximum distance of parking provision from main destination.

Parking bay dimensions, where bays are to be marked:

- 2.1m (length) x 1.4m (width) – minimum.

Preferred physical security measure - Rail:

- 600mm – raised height of any steel rail from the parking surface.

## Links and references

- For further information on motorcycle parking, refer to IHE Guidelines for Motorcycling and DfT Traffic Advisory Leaflet 2/02.
- For signing and lining considerations, refer to TSRGD 2016

# 8.5 Servicing: Drainage

## General Guidance

The National Planning Policy Framework (NPPF) requires that new development is directed away from areas at risk of flooding, but where development is necessary, making it safe without increasing flood risk elsewhere. The provision of suitable highway drainage is a critical part of an integrated surface water management strategy for new developments.

LHA's have a duty to make sure that developments include satisfactory arrangements for draining the adoptable highway. Furthermore, the Local Lead Flood Authority (LLFA) shall be consulted to agree the overarching principles for the management of surface water for new developments, in particular major and strategic developments in the 6Cs area.

Street drainage on new developments typically consist of kerbs, channels, gullies, and drainage pipes and is normally connected to a surface water drainage system that is adopted by the sewage undertaker and is subject to a Section 104 Agreement under the Water Industry Act 1991.

Applicants must engage the relevant LPA, LHA, LLFA and other interested parties at the outset of the design process to discuss these proposals. This will usually be at the concept development stage.

If required, other options might also be considered, including methods where water is drained by a piped drainage system running to an out-fall adopted by the sewage undertaker or an out-fall to a ditch or watercourse agreed by the Environment Agency or LLFA. In order to ensure no increase in flood risk to others, the location and rate of discharge shall always be agreed with the appropriate approving body.

Developers shall also ensure that climate change is considered within the management of surface water, and reference shall be made to the latest guidance on climate change published by the Environment Agency and DEFRA.

In all cases, preferred techniques shall ensure that there is no increase in the rate of discharge of surface water run-off, leading to the increase in downstream flood risk, and that design solutions help take out pollutants.



Rain Garden used as part of a SuDS strategy in a residential area.

### Hydraulic design principles

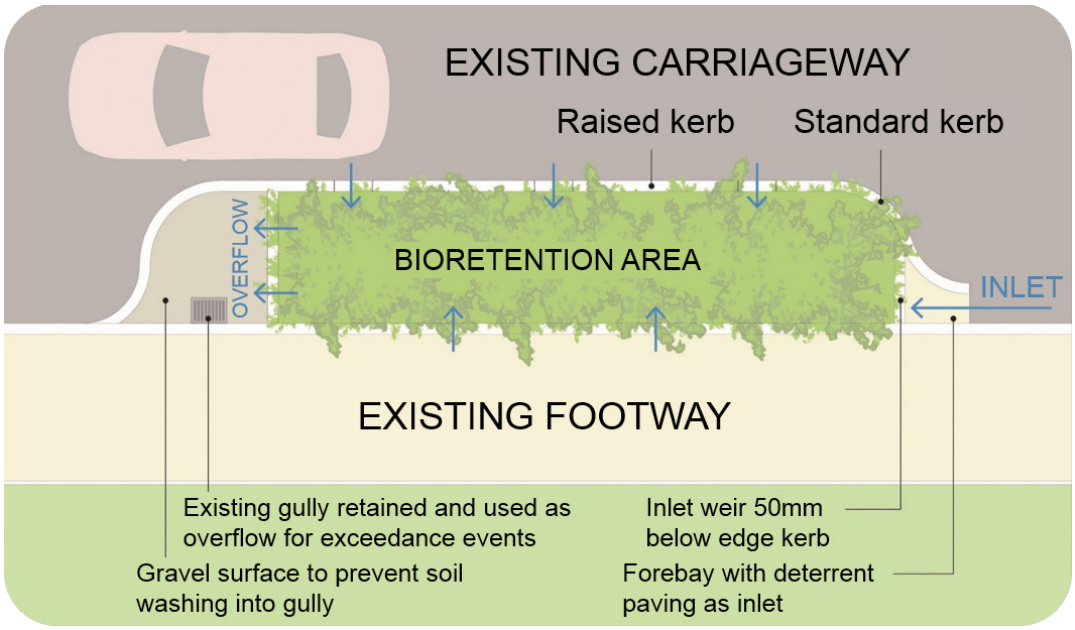
Hydraulic designs of adoptable piped drains must meet the requirements of the current edition of 'Sewers for Adoption' published by WRc plc, and any further requirements of individual sewerage undertakers. The applicant must submit to the relevant case officer detailed calculations using the specified method of calculation and format, and demonstrate the approval of the adopting body.

LHAs will accept output from approved computer programmes using the specified method and parameters.

Designers must protect streets against flooding. The system shall be designed not to flood any part of the street or site in a 1 in 30 year return period design storm or any other return period that is set out in any latest version of 'Sewers for Adoption'. Furthermore, designers shall also incorporate the effects of climate change in accordance with the latest Environment Agency and DEFRA guidance.

As part of the wider surface water management strategy, the development layout and proposed finish levels shall demonstrate the extent and overland routeing of surface water runoff arising from storm events above the design storm i.e. above the 1 in 30 year return period.

**Figure 8.27. Example of bioretention system**




© CIRIA, 2015.

## Highway drains

Highway drains shall be designed and installed to serve adoptable carriageways, footways and verges (i.e. adoptable streets) where the drainage infrastructure is not adoptable by the sewerage undertaker. Designers must take into account the following:

- The minimum pipe diameter for adoptable street drains, other than gully connections, is 225mm.
- All highway drains shall be normally located within land that the LHA will be adopting. Subject to agreement, the LPA, LHA or water company may consider and permit drains in land expected to remain private, including components associated to SuDS features.
- Designers must select correct cover for any adoptable street drain to be installed outside the limits of the adoptable street by an easement agreement. Suitable arrangements shall be in place before, or be a condition of, the Section 38 or 278 agreement.
- LHAs will not adopt a street unless its associated drainage is to be adopted either by a sewerage undertaker or by them.
- Where private non-adoptable driveways and other surfaces fall towards adoptable streets, designers must prevent surface water run-off from reaching the street boundary and entering the street drainage system. LHAs will not normally accept drainage of other non-adopted areas into an adopted street.
- In general, the drainage of most other areas of a development are matters for sewerage undertakers. These drainage systems shall normally be designed in line with the water companies' specifications and requirements.
- Highway drains must be laid:
  - In straight lengths.
  - To straight grades between catchpits (See the Catchpits and Manholes DES).
  - Within the carriageway or verge.
- Designers must not lay drains and sewers and their associated catchpits or manholes in footways, where this space is required for other utility apparatus. Notwithstanding the need to integrate the design of drains and utility components, the position of catchpits and manholes must reflect an integrated approach to health and safety to allow adequate and safe access to chambers.
- Where there is or is likely to be run-off from landscaped areas, open spaces and adjoining land, applicants must make appropriate arrangements for land drainage. This can include providing intercepting drains and ditches with satisfactory outfalls. Early discussions shall be held with the adopting body in this respect.

For the purpose of achieving good highway design outcomes, it is recommended that the following points be considered:

- The applicant must include a system of sub-soil drainage to a suitable agreed outfall to the LHAs' satisfaction where:
  - The winter height of the water table is within 600mm of formation level.
  - The sub-soil is unstable because of being waterlogged.
  - There is a likelihood of water running from or out of adjacent ground.
  - Springs, land drains or watercourses are present.
  - The finished street is below existing ground level, regardless of the water table.
  - The sub-grade is likely to be altered due to groundwater.
- Designers shall take care to avoid water ponding in the transition length when the longitudinal gradient is flat or where there are traffic islands, central reserves or traffic-calming measures. Water ponding must be avoided particularly on footways/footpaths, in and around bus passenger waiting areas/cycle provisions and at the carriageway kerbside.
- The applicant must deal with any drainage systems existing within the development site including land drains, ditches, watercourses, outfalls from adjacent land or drainage systems to the satisfaction of the relevant LHA and that of the Environment Agency and the owner of the systems.
- The applicant must provide written evidence of the right to discharge water from a highway drain into any receiving ditch or watercourse with no liability on the LHA. The Environment Agency will approve all such discharges. Written evidence must be provided to demonstrate the applicant has received any approval and consents needed.

Designers must take into account the following references:

- Standard Drawing Drainage - Series 500. Refer to the 6Cs website.

## Sustainable Drainage Systems

LHAs in the 6Cs area encourage prospective applicants to consider the use of Sustainable Drainage Systems (SuDS), where proposals can be proved workable.

**Note:** The scope for inclusion of SuDS within development schemes including arrangements for the adoption and maintenance of SuDS varies significantly between unitary and two-tier authorities so early discussion is encouraged.



The use of SuDS shall be discussed with relevant planning, highway and the local lead flood authorities from the outset of the collaborative design process.

Due to the nature of SuDS there are numerous techniques and SuDS features that can be used to help define satisfactory arrangements for draining within the 6Cs area. SuDS features suitable for draining streets include but are not limited to the following:

**Table 8.16. Typical SuDS features suitable for draining streets**

| SuDS Component | Description | Possible Applications |
|---|---|---|
| Green roof | Planted layer of soil on the top of a roof. Water is absorbed by the vegetation | Green roofs as part of cycle parking facilities |
| Infiltration system | System which collects and stores run-off allowing it to infiltrate into the ground. Overlying vegetation and underlying unsaturated soil help to protect it from pollutant risks | Small or large infiltration basins as part of the wider surface water management strategy |
| Filter strips | Area of vegetated land that surface run-off is channelled through to promote sedimentation and filtration | General and industrial access streets |
| Filter drain | Trench filled with stone or gravel that temporarily stores surface run-off | Roadside trenches or filter drains at drop off points |
| Swales | Vegetated channels which allow for infiltration. Swales can be permanently wet or dry subject to rainfall | Shallow roadside swales |
| Bio-retention system | Shallow landscaped depression which allows run-off to pond temporarily before filtering through vegetation and underlying soil prior to collection or infiltration | Bioretention system as part of an urban street and rain gardens as part of proposed traffic calming measures |
| Trees and tree pits | Act as a drainage feature in their own right while incorporating soil-filled tree pits amongst other features can help to improve their effectiveness and illustrate the specificity of their role. Saturation of the pit shall always be considered with any excess water runoff directed into the sewer system | Mature trees in planted swales or linear tree pits |
| Permeable pavements | Paving which allows run-off to filter through. This could be paving blocks organised to allow gaps around solid blocks or porous paving where run-off filters through the block directly. Water can then be stored in a sub-base and allowed to infiltrate the ground (subject to local geology), or be released at attenuated rates | Car parks and Park & Ride facilities. The provision of permeable pavements within the adoptable highway, including culs-de-sac and shared-surface streets, is not commonly advocated. This shall be established with individual highway authorities from the outset of the collaborative design process |
| Ponds and wetlands | Features with a permanent pool of water used for attenuation and treatment of run-off. Ponds and wetlands can support various forms of vegetation and wildlife | Attenuation ponds as part of the wider surface water management strategy |

In all cases, preferred techniques shall ensure that there is no increase in the rate of discharge of surface water run-off, leading to the increase in downstream flood risk, and that design solutions help take out pollutants.

The relevant LHA will consider SuDS or alternative drainage systems on a site-by-site basis. Guidance on the design and implementation of specific SuDS features is not provided in this design guide. Please refer to the following references for further information on SuDS:

- Susdrain (2012) Delivering SuDS [Online]. Available from: http://www.susdrain.org/.
- The CIRIA SuDS Manual (2015) C753.
- Working Party SUDS, SCOTS (2015) SuDS for Roads.

As stated by the CIRIA SuDS Manual (Woods Ballard, B., 2015) the following design criteria shall be considered for all developments in the area managed by the LHA. For consistency, the design criteria is presented taking into account overarching design objectives defined by the CIRIA SuDS Manual to deliver SuDS solutions:

**Table 8.17. SuDS Design criteria**

| Design Objectives | Design Criteria |
|---|---|
| Water quantity | Use surface water runoff as a resource |
| | Support the management of flood risk in the receiving catchment |
| | Protect morphology and ecology in receiving surface waters |
| | Preserve and protect natural hydrological systems on the site |
| | Drain the site effectively |
| | Manage on-site flood risk |
| | Design system flexibility/adaptability to cope with future change |
| Water quality | Support the management of water quality in the receiving surface waters and groundwaters |
| | Design system resilience to cope with future change |
| Amenity | Maximise multi-functionality |
| | Enhance visual character |
| | Deliver safe surface water management systems |
| | Support development resilience/adaptability to future change |
| | Maximise legibility |
| | Support community environmental learning |
| Biodiversity | Support and protect natural local habitats and species |
| | Contribute to the delivery of local biodiversity objectives |
| | Contribute to habitat connectivity |
| | Create diverse, self-sustaining and resilient ecosystems |

In line with the CIRIA SuDS Manual: 'The extent and way in which each criterion can be delivered will depend on site characteristics, the developments context and local objectives.' This consideration applies to schemes developed within the context of this design guide.

It is advisable that individual SuDS components be used in combination as well as with piped systems to form part of an overall drainage strategy for development. Where multiple developers are involved in a single development, all developers must mutually agree a drainage master-plan for the site.

The designers must link scheme-specific street trees and other planting plans effectively with the proposed drainage design.

Where designers are proposing SuDS for highway drainage, prospective applicants must enter into discussions with all relevant parties at an early stage to agree ownership and responsibility for the facility. Ease of maintenance is a critical consideration.

For major and strategic developments applicants need to address this in conjunction with other members of the development team usually as part of the concept development stage.

### Piped drainage systems

The following are key considerations in relation to piped drainage systems:

- The end of the pipe must have a headwall and apron that supports the bank above and adjacent to the pipe and prevents any scouring underneath the pipe.
- The banks of the ditch or watercourse must be protected from scouring.
- Any requirements laid down by the Environment Agency must be met.
- If the proposed outfall is to an existing highway drain, its capacity and condition has to be proved before the connection can be proved.
- Where a piped system discharges into an existing ditch or watercourse, the pipe invert (bottom of the inside of the pipe) must not be lower than the level of the average flow in the ditch or watercourse and it shall always be at least 150mm above the ditch or watercourse invert.
- The end of the pipe must be directed so it discharges at an angle less than 60 degrees to the direction of flow in the ditch or watercourse.
- For all works incorporating highway drainage the applicant will need to carry out and prove a copy of a CCTV survey and report. The applicant must carry out any improvement works found necessary, all at the applicant's expense.
- The applicant must have the consent of the Environment Agency for piping an existing ditch or watercourse, in accordance with Section 23 of the Land Drainage Act 1991.

## Design Element Sheets

The remainder of this section provides the DESs for Drainage.

# DES: Catchpits and Manholes

## Design considerations

The following matters shall be taken into account:

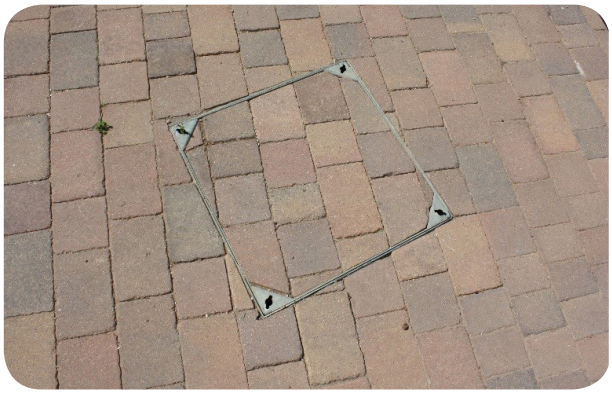
- Designers must include a catchpit (an access chamber, with sump, on a drainage system) where there is any discharge into an existing ditch or watercourse.





Attention to detail around covers can have a positive effect in the appearance of a street. Good construction methods are also critical for the purpose of safeguarding safety of the scheme.

- Inset covers may be appropriate at certain locations and be used to enhance the character of the streetscape, particularly in areas of importance, including heritage sites, conservation areas and near listed buildings.
- Inset covers are not mandatory and the use of these must be agreed with the relevant LHA and utility company on a case-by-case basis.



Inspection cover with paving sets inserted to align with the surrounding paving. Design and construction of inset covers must take into account the orientation of paving materials and cost implications i.e. particularly maintenance costs.

- Consultation shall also be undertaken with the relevant LHA to confirm any local variations or requirements, including the use of ladders or step irons and any requirement for a badge or logo on chamber covers.
- Construction quality is critical to ensure service covers are flush.

## Technical criteria

- Unless otherwise specified, you must use catchpits and not manholes for highway drains on adoptable street drainage systems.
- The outside of catchpits and manholes shall be at least 500mm from the kerb line or the edge of the carriageway.
- On all adoptable drainage runs, designers must provide a catchpit at:
  - Every change of alignment or gradient.
  - The head of all main pipelines.
  - Every junction of pipelines except for single-gully connections.
  - Every change in pipe diameter.
  - Every change in pipe material.
  - A maximum spacing of 90 metres.

## Location criteria

- Designers shall normally locate catchpits or manholes within the verge, and not the carriageway.
- Any catchpits or manholes within a carriageway must be located so that they can be accessed while providing the necessary safety zones and without preventing traffic from passing. This will generally mean that these elements shall not be positioned at or near the centre of the carriageway or within a width restriction. Exceptions may apply for shared-surface streets.
- If located within the carriageway, service covers shall not be placed within the braking and turning areas for cyclists and motorcyclists. Subject to engineering constraints and the local context, anti-skid treatments may also be required.
- Care shall be taken when locating catchpits or manholes within junctions or roundabouts, based on the same criteria.

## Adoption and maintenance

- Catchpit chambers for use on highway drainage networks shall be provided in accordance with Series 500 of the Specification for Highway Works, and the Highway Construction Details set out within the Manual of Contract Documents for Highway Works Volume 3.

## Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II.
- Standard Drawing Drainage - Series 500. Refer to the 6Cs website.

# DES: Gullies

## Design considerations

The following are a series of key design considerations:

- In footpaths, footways, cyclepaths and cycleways, applicants must provide gullies or channels connected to the adopted drainage system where surface water would otherwise discharge onto adjacent property or cause flooding.



Typical gully design.



Gullies in the centre of a lane.

- Designers must not place gully gratings parallel to cyclists' direction of travel.
- Designers must not site gullies adjacent to pedestrian crossing points. Where possible, they shall be located directly upstream of the crossing point.
- Designers shall not site gullies where traffic would be prevented from passing while they are being emptied, for example within a carriageway width restriction.
- Consultation shall be undertaken with the relevant LHA to confirm the requirements for gully pot construction details. All gullies shall incorporate trapped outfalls.

## Technical criteria

- The minimum size for a street gully connection is 150mm.
- The maximum length of a gully connection shall not be more than 15m.
- All gullies shall be trapped. It will not normally be acceptable to connect one gully connection directly into another.
- Gully spacing shall be calculated based on the carriageway gradients and areas drained. Gully spacing is shown within the following table.

**Table 8.18. Standard gully spacing**

| Gully spacing | | | | |
|---|---|---|---|---|
| Carriageway gradient | 1/100 | 1/80 | 1/60 | 1/40 or steeper |
| Area drained [A] ($m^2$) | 170 [B, C] | 180 [B, C] | 200 [B, C] | 240 [B, C] |

[A] Includes footways, footpaths, paved areas and verges that fall towards the carriageway.
[B] Gullies must not be spaced more than 40m apart, irrespective of the areas drained, except at summits where the first gully shall not be more than 40m from the high point.
[C] Double gullies must always be provided at sag points and low points and each must have its individual connection to the main sewer or highway drain.

- Gullies shall be sited upstream of the tangent point at road junctions so that surface water in the channel does not flow across the junction.
- Care will be required to avoid ponding near the mid-point of radius kerbs.
- Where the street is super-elevated, gullies shall be sited just before the point where the adverse camber is removed to prevent water in the upstream channel flowing across the carriageway.

## Checklists

- The applicant must provide the LHA with a contour and drainage catchment plan to show that gullies are located in the correct position as part of the design submission for works under Section 38 or Section 278 agreements.

## Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II.
- For information on possible commuted sum payments refer to Appendix IV.
- Water company contact details can be found on the 6Cs website.
- Land Drainage Act 1991.
- Water industries Act 1991.
- Standard Drawing Drainage - Series 500. Refer to the 6Cs website.

# DES: Combined Kerb and Drainage Systems

## Design considerations

The use of combined kerb and drainage systems may be considered based on local gradients and site-specific constraints. Whilst these systems may be perceived as more costly than conventional kerbs and gullies per metre, designers shall take into consideration potential savings due to reductions in the time to lay components and/or the number of gully connections that would be required otherwise. Design considerations include:

- A combined kerb and drainage system solution may be a suitable alternative for streets that have insufficient construction depth to install conventional gully pots.
- This solution may also be considered where the number of gullies required to provide satisfactory drainage increases. Sustainability plays a key role in terms of reducing the stone of concrete backfill needed within the carriageway.
- Consultation shall be undertaken with the relevant LHA to confirm specific requirements for combined kerb and drainage systems, including requirements for maintenance access covers, approved suppliers and product types. Combined kerb and drainage systems shall incorporate trapped outfalls.



Dropped and raised kerb systems.

## Technical criteria

- A combined kerb and drainage system must normally be considered where the minimum longitudinal carriageway gradient is less than 1 in 100 for flexible surfaces and less than 1 in 80 for block paved surfaces.

## Adoption and maintenance

- Future maintenance arrangements must be considered so the use of combined kerb and drainage systems does not result in unnecessary maintenance costs where conventional gullies could provide a more cost effective option.

## Links and references

- Link to the standard drawings for details on combined kerb and drainage systems.
- For information on possible commuted sum payments refer to Appendix IV.
- Standard Drawing Drainage - Series 500. Refer to the 6Cs website.

# 8.6 Servicing: Utilities

## General Guidance

Public utility apparatus are primarily placed within streets so that supply of services to customers is straightforward and the maintenance of equipment can be undertaken efficiently.

It is critical to liaise with the utility companies at an early stage in the design process to consider the location and installation of public utility equipment both above and below ground. This is particularly important where shared-surface streets are used.

Where a shared-surface layout is proposed, early discussion with utility providers is essential to help finalise details of the proposed locations for utility equipment based on proposed levels of segregation and service requirements.

Underground utility apparatus shall be laid in 'corridors'. Designers must check specific standards used by utility providers in relation to the placement and depth of utility apparatus in order to cater for current needs and future demands.

Simplicity is a desirable attribute in street design that can lead to the more effective and cost-efficient provision of utility infrastructure. Designers shall consider carefully the benefits and disadvantages of straight street layouts for the purpose of supporting utility infrastructure whilst complementing speed management measures.

## Design Element Sheets

The remainder of this section provides the DESs for Utilities.

# DES: Service Strips

## Design considerations

### Conventional streets

- Utility apparatus must be placed preferably beneath footways (See the Utility Equipment DESs).
- Consistent with minimum footway width requirements, service strips shall be embedded within footways and be at least 2m wide.

### Shared-surface streets

- Subject to the proposed level of segregation, service strips shall not be generally used on shared-surface streets.
- Utility apparatus shall be placed within the carriageway without interfering with public sewers and drains.
- Utilities shall normally be located on the side of the street that fronts the highest number of buildings.
- Traffic loads must be considered to minimise the risks on utility apparatus.
- Good connectivity within the street network is critical to ensure all users of the street can be re-directed in a seamless manner if it is necessary to carry out maintenance works, repairs or service upgrades.
- Careful consideration shall be given to the use of permeable pavements. Specialist advice must be sought.

## Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II.
- Utility apparatus must be placed in accordance with National Joint Utilities Group (NJUG) requirements.
- BS 7533-12-2006 guide to the structural design of trafficked pavements.
- DfT (2005) Inclusive Mobility.






Service strips shall not be generally used on shared-surface streets.

# DES: Utility Equipment (Above Ground)

## Design considerations

- Utility equipment that is above ground, for example, cabinets, boxes, pillars and pedestals shall always be kept to a minimum and be sited to ensure:
  - There is safe and convenient access for maintenance purposes.
  - Pedestrian desire lines or cycling routes are unhindered.
  - Visual amenity is not adversely affected for example by restricting the outlook from the window of a house or intruding into areas of open-plan front gardens or disrupting the line of low boundary walls.
  - The view of Grade I or Grade II listed buildings are not spoilt.
  - The avoidance of 'visual clutter' by being in an inappropriate place.
- All apparatus above the ground shall:
  - Be positioned so there is enough access for the equipment and the surrounding highway to be safely maintained and cleaned.
  - Not be located within any tactile paving, including surface covers.
  - Allow space for associated jointing chambers.

## Technical criteria

- Any utility equipment that is above ground shall be sited so that it:
  - Provides a clear footway width of at least 1.2m clearance so that equipment does not obstruct pedestrians, wheelchairs, prams, pushchairs, etc. In areas of high pedestrian activity (i.e. pedestrian flows over 500 pedestrians an hour ), the clearance provided shall be increased to at least 2.0m
  - Is not located within 5m of any other street furniture that would create a double obstruction to pedestrians. Any items within 5m must be in line with one another.
- Utility equipment is to be located preferably at the back of the footway, away from windows or walls to prevent unlawful access into surrounding buildings. Access doors to any utility equipment shall open to the footway.
- Where utility equipment cannot be located in the footway, it may be located in the verge with a suitable hard surface area, at least 500mm wide, around the equipment to facilitate the maintenance of the verge.
- Careful consideration must be given so utility equipment does not affect street trees and other planting.
- Where utility equipment is located in the verge, designers must allow utility operatives to face towards the carriageway or any oncoming traffic when opening the doors.
- There shall be at least 1m between the utility equipment and the edge of the carriageway in rural areas and 1.5m in urban areas.





Utility equipment (e.g. cabinets, boxes, pillars and pedestals) is to be located preferably at the back of the footway, away from windows or walls to prevent unlawful access into surrounding buildings.

## Adoption and maintenance

- If applicants cannot meet requirements within adoptable areas, utility equipment may be located off the proposed adoptable highway although an easement will be required to allow utility equipment providers access in future for maintenance purposes.

## Links and references

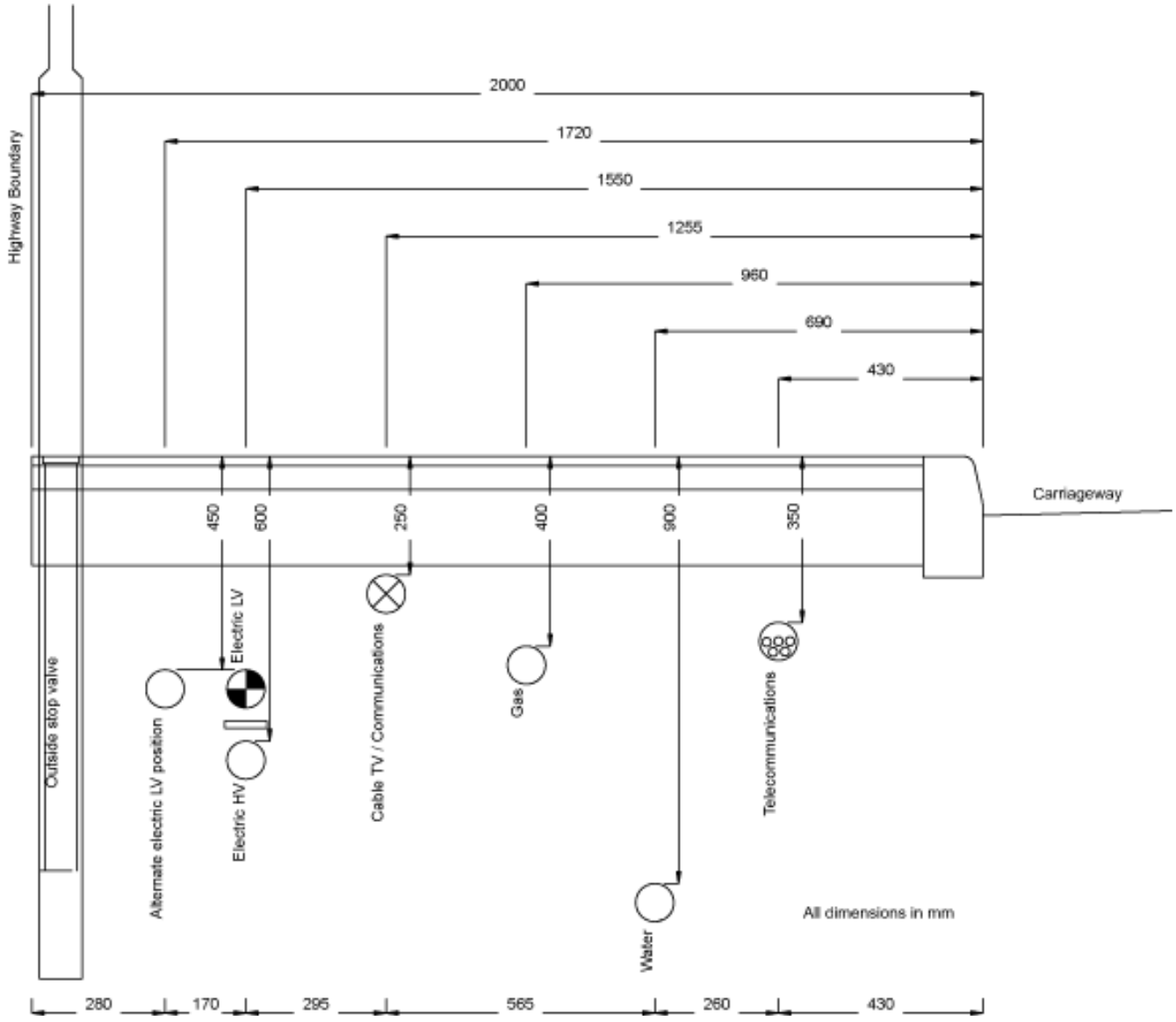
- For detailed information on Inclusive Design Principles refer to Appendix II.
- Standard conditions apply to highway works for new development. Refer to the 6Cs website.
- DfT (2005) Inclusive Mobility.
- Local authorities and utility companies must advise on specific requirements when utilities are to be placed over, under or near highway structures.
- Standard Drawing Drainage - Series 500. Refer to the 6Cs website.

# DES: Utility Equipment (Below Ground)

## Design considerations

- Designers shall locate equipment below ground in line with NJUG Guidance. The standard arrangement of below ground service equipment is shown within Figure 8.28.

**Figure 8.28. Standard arrangement of below ground service equipment**




- Utility companies must always be consulted to ensure the orientation of equipment satisfies servicing requirements.
- The selection of surface materials shall minimise any adverse impact on good visual appearance as access for maintenance/repairs and future replacement will be required.
- For development involving off-site utility work under footways and carriageways, the LHA may require full width reinstatements.
- Low maintenance must be considered so surface materials (e.g. slabs) can be reinstated if lifted off the pavement to enable access to below ground service equipment.
- It is particularly important to coordinate utility routeing plans and street trees.

## Inspection covers and access chambers

- Orientation must be considered when positioning inspection covers and access chambers. This is particularly important in relation to rigid surfaces and kerb edges.



Where possible the orientation must be considered when positioning inspection covers and access chambers.

- Neat joints (equipment laid parallel) shall be provided both at the back of the footway and the kerb edge.
- Inspection covers shall be placed in an inconspicuous manner, particularly in conservation areas.
- Inspection covers and access chambers on the surface must reflect an integrated approach to health and safety to allow adequate and safe access. Access chambers must:
  - Be located to minimise disruption to pedestrians and provide adequate access for installing and maintaining equipment.
  - Take into consideration boarding and alighting zones to avoid future difficulties during maintenance works.
  - Avoid positioning inspection covers where changes in levels occur, for example, dropped kerbs.
  - Allow for using mechanical equipment during construction and installation, maintenance and recovery operations at the site.
  - Take into account any known highway alterations.
  - Make sure the type and construction of underground boxes takes into consideration the potential need to raise inspection covers and frames, for example, when resurfacing work is carried out.
  - Avoid any interference with archaeological features, foundations to listed buildings and street trees.

## Adoption and maintenance

- Legal documentation required by the relevant utility companies must be completed as soon as possible for all adoptable streets.

## Links and references

- For detailed information on Inclusive Design Principles refer to Appendix II.
- NJUG (2007) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.
- Local authorities and utility companies must advise on specific requirements when utilities are to be placed over, under or near highway structures.
- Standard Drawing Drainage - Series 500. Refer to the 6Cs website.

# 8.7 Servicing: Street Lighting

## General Guidance

A suitable system of street lighting on all adoptable streets is required and shall be considered at the beginning of the design process.

Before undertaking the street lighting design it is advisable to contact the LHA to check whether they would be willing to assist with the street lighting design or indeed be willing to undertake the street lighting design on behalf of the developer. In any event, a comprehensive street lighting design shall be undertaken for approval by the LHA.

The design shall demonstrate how the design will illuminate different areas of the scheme sensitively to optimise road safety and to promote personal safety and security. The design shall also demonstrate how the design is integrated with drainage, parking and the provision of street furniture, including utility equipment, trees and other planting. The design shall also include, where applicable, illuminated traffic signs (See Highway Signs, Street Markings and Traffic Regulation Orders within the Movement Section).

Street lighting efficiency and technical performance are critical. The LHA will be able to provide further details in terms of authority-specific design specifications that currently meet performance requirements whilst helping reduce future maintenance costs.

As a rule of thumb, designers must favour the use of energy effective solutions over the lifetime of the scheme.

In order to minimise crime opportunities, the design of street lighting shall be supplemented by the successful application of key urban design principles (See Chapter 4) and design solutions. For example, buildings that face the street, with more doorways, frontages and more activity at street level. The police force's Architectural Liaison Officer shall be engaged at the earliest opportunity.

## Design Element Sheets

The remainder of this section provides the DES for Street Lighting.

# DES: Standard and Heritage-Style Street Lighting

## Design considerations

- Lighting shall be planned at the same time as the street layout is designed.
- Opportunities to reduce street clutter shall be considered, particularly when on-street parking is permitted. Street lighting columns may be used to mount small traffic signs subject to the LHA agreement.



Scale is a key aspect of the built form that helps define the appropriate height of street lighting units. Buildings and the cross-section of the street shall be considered.

- The lighting system shall be designed to reflect the scale of surrounding buildings, the proposed width of the street and height of the building when development proposals are being prepared.
- Special attention shall be paid to providing a sufficient level of lighting along pedestrian and cycle routes, as well as at crossing points and public transport facilities. Street lighting columns must not obstruct these provisions.
- Provision of lighting at a reduced height may be considered along cycle tracks.
- Lighting levels shall be maintained at the same standard along a route, whether a route is adopted or not, to encourage pedestrians to use a route and to feel safe.
- Street lighting columns might be acceptable within visibility splays subject to agreement with the LHA.
- To control light pollution, high light intensity or lighting spilling out on to the surrounding buildings must be avoided.
- The use of trees and planting in street design shall not reduce the illumination that the street (particularly the footway) receives from street lighting. Street lighting and tree planting shall be integrated in accordance with the Code of Practice stipulated in BS 5489-1:2013, paragraph 4.3.3.2.

## Standard street lighting

- Standard street lighting specification comprises of galvanised steel columns with road-lighting lanterns of the appropriate height and wattage.

## Heritage-style street lighting

- Subject to context and agreement with the LHA, designers might consider the use of heritage-style lighting or wall-mounted lighting as part of buildings on a case-by-case basis.



Heritage-style lighting columns and lanterns are available.

- The LHAs have a limited range of heritage-style lighting columns and lanterns that the applicant can specify during design development so early discussion with the LHA is required before designing the street lighting.

## Technical criteria

- The design of street lighting in the 6Cs area shall comply with BS 5489-1:2013 criteria.

## Adoption and maintenance

- Prior to the implementation stage, the applicant shall ensure that:
  - The position of the street lights on site for the street-lighting contractor are exactly marked.
  - The electricity supply is arranged with the electricity company.
  - Test certificates are provided in accordance with BS7671:2008.
  - The approved specification of lighting equipment is consistent with the following two items:
    - The actual specification of the equipment to be installed; and
    - The designer's risk assessment for the lighting scheme.
- The applicants shall pay for all aspects of works, including energy charges and maintenance of the street lights, before the relevant LHA issues the final certificate of completion.
- The applicant shall pay the cost of a 'bulk clean and lamp change' when this is required and in cases where adoption is delayed as shown below:
  - Section 38 agreements: If there are more than three years between:
    - Beginning the work and issuing the final certificate; or
    - Completing the Section 38 agreement and issuing the final certificate.
  - Section 278 agreements: If there are more than two years between:
    - Beginning the work and issuing the final certificate; or
    - Completing the Section 278 agreement and issuing the final certificate.
- Commuted sums are normally payable to cover the increased costs of maintenance and replacement associated with heritage-style equipment. Refer to Appendix IV for further information on commuted sums.

## Links and references

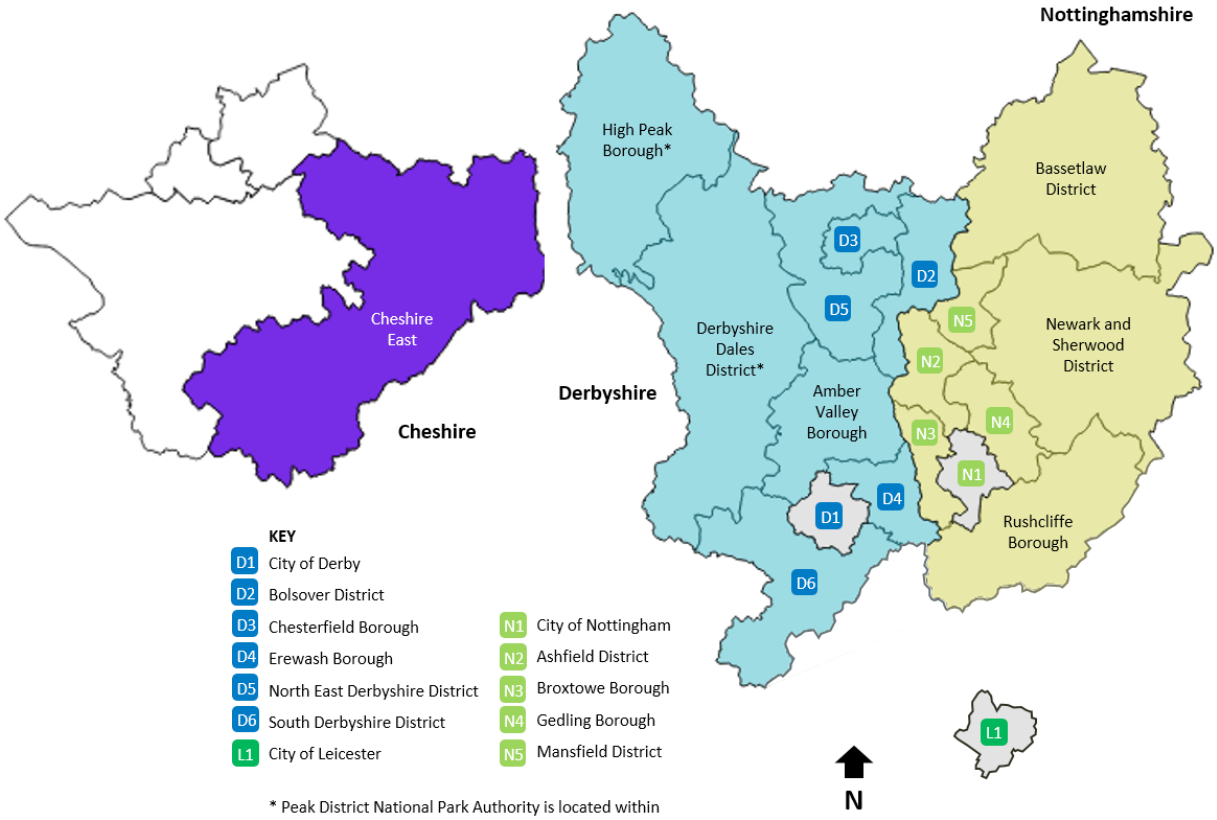
- BS 5489-1:2013. Code of practice for the design of road lighting. Lighting of roads and public amenity areas (Part 1).
- BS EN 40. Lighting columns.
- Refer to Street Lighting - Series 1300 and 1400.
- BS7671:2008 incorporating Amendment 3:2015 (The IEE Wiring Regulations).
- Sustrans (2012) Lighting of Cycle Paths.
- For information about how to help promote personal safety and security see the Secured by Design (SBD) toolkit and other SBD documentation as below:
  - Design Council (2011) Designing out crime: A designers' guide.
  - ACPO Crime Prevention Initiatives (2014) Secured by Design: New Homes 2014.
  - Police Services (2015) Secured by Design, Commercial Developments. Official Police Security Initiative.

# Appendices

# I. Roles and Responsibilities

Figure I-I illustrates the administrative boundaries of the county and district councils covered by this design guide.

**Figure I-I 6Cs map**




In the context of development control, the unitary authorities serve the dual role of Local Highway Authority (LHA) and Local Planning Authority (LPA). In the two tier system, where the counties are the LHA, the role of LPA lies with the district and borough councils.

The LPA is responsible for determining planning applications. The LHAs are responsible for the maintenance of adopted public highways in their jurisdiction with the exception of trunk roads, which are the responsibility of Highways England. The LHAs promote safe and sustainable travel and are a statutory consultee in the planning process. In this role, they make recommendations on planning applications to the LPA. This transport development management function seeks to ensure that new development is delivered in ways that promote sustainable travel and safeguard the efficient and safe functioning of the transport system.

Overall, there are four stages in the planning process (i.e. pre-application, application, enforcement and appeal). At a very early stage (i.e. before submitting a formal application) prospective applicants are advised to discuss their proposed application with the LPA, in addition to discussing any highway and transport issues with the relevant LHA.

Section 7 of this guide encourages early engagement, which can help to resolve issues before they become more difficult to deal with, and explains the concept of the 'Development Team' which comprises the key parties involved in the design and delivery of high-quality and safe streets and developments, including the applicant, the LPA and the LHA.

The list of Local Planning Authorities in the 6Cs area is provided by geographical counties as shown below. Highlighted authorities in this list (unitary) illustrate those which are single tier councils.

Local Planning Authorities

- Derby City Council (unitary).
- Leicester City Council (unitary).
- Cheshire East Council (unitary).
- Nottingham City Council (unitary).

Derbyshire

- Amber Valley Borough Council.
- Bolsover District Council.
- Chesterfield Borough Council.
- Derbyshire Dales District Council.
- Erewash Borough Council.
- High Peak Borough Council.
- North East Derbyshire District Council.
- Peak District National Park Authority.
- South Derbyshire District Council.

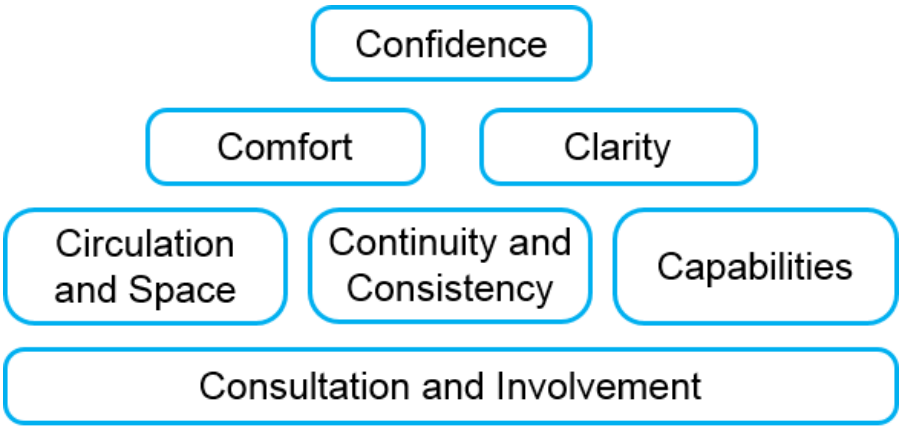
Nottinghamshire

- Ashfield District Council.
- Bassetlaw District Council.
- Broxtowe Borough Council.
- Gedling Borough Council.
- Mansfield District Council.
- Newark and Sherwood District Council.
- Rushcliffe Borough Council.

# II. Inclusive Design Principles

The following design principles shall be used to inform the design process and to help progress and assess proposals.

**Figure II.I Inclusive design principles**




- **Confidence:** people can only lead independent lives if they are confident in getting out and about to undertake day to day activities. Creating places that inspire confidence is the 6Cs key over-all inclusive design principle.
- **Comfort:** An environment where people are and feel reasonably safe ('no nasty surprises') and is comfortable to use - e.g. designing in reasonably short walking distances, accessible seating, even and slip-free paved surfaces, minimising gradients and well-designed features such as ramps, steps and street furniture.
- **Clarity:** Visual and tactile contrast is particularly important for people with sight loss. These street users also require good road crossings (controlled crossings on busier roads), and clear distinctions between pedestrian and vehicular routes. These are important for many other disabled and older people - including people with learning disabilities. Clear signs, information and way-finding is also important, and benefits everyone.
- **Circulation & space:** It is important that circulation is planned to meet the needs of pedestrians, and to minimise conflicts with other users. Appropriate path and access widths are needed to accommodate all users, and the likely volume of use. Other aspects include providing wider, clearly demarcated parking spaces for disabled people - and allowing for standard spaces to be expanded if needed in the future. Homes shall relate to spaces which are more than just car parks: spaces for socialising, safe places to walk and play and positive front gardens/door-step spaces.
- **Continuity and consistency:** This involves ensuring people can reach all areas they need to within a site, and key routes beyond and includes ensuring people will not be 'stranded by design' or excluded because of obstacles or bad experiences being designed in.
- **Capabilities:** Design to support what people can do - their capabilities as well as their needs. Good inclusive design can often help to un-lock this potential - e.g. a person with sight loss may be able to travel by bus to work.
- **Consultation and involvement:** These criteria shall be applied in conjunction with current standards and guidance, and in liaison with access specialists, including local authority Access Officers (where there is one), and disability organisations. It is highly recommended that specialist access advisors are included in development teams to facilitate this. For further information refer to the National Register of Access Consultants at: http://www.nrac.org.uk/.

# III. Construction Standards and Materials

This appendix sets out standard construction requirements and materials based on national standards and advice used in general for constructing and maintaining highways. These shall be applied to all highway works and used in the absence of authority-specific guidance to safeguard user safety and support cost-effective ways to maintain the street network. To achieve these ends, the LHAs have adopted principles of quality, durability, maintainability and sustainability.

Notwithstanding the above, it is recognised that each LHA has regional variants in its palette of construction materials that shall normally be used in places such as City Centres and Conservation Areas. Reference shall always be made to the relevant LHA website for detailed advice on local construction standards and materials.

## Sampling and testing goods and materials

In the absence of authority-specific advice, the applicant or land developer (if different) must arrange and pay for all sampling and testing. A copy of all the relevant test results must be submitted to the pertinent Highway Officer. Refer to the 6Cs website for further guidance.

As deemed necessary, LHAs reserve the right to carry out any sampling and testing to confirm that goods and materials meet relevant specifications. In some circumstances, authorities may also core through any pavement construction at any stage to check the thickness of the layers, and type and standard of construction. The applicant or land developer (if different) is required to pay associated costs to the authority if findings reveal that works do not meet the relevant specifications.

Refer to the 6Cs website for a standard regional list of goods and materials the LHA may ask the applicant or land developer (if different) to supply samples of. This list will be used to establish compliance with specifications.

## Earthworks

Embankments and other areas of fill shall:

- Be formed of acceptable material excavated from within the site or imported on to the site.
- Meet the requirements of specification for use in the permanent works. Refer to the 6Cs website for guidance.
- Have the approval of the relevant LHA's engineer to be used in that particular location.

## Carriageway and shared-surface areas

### Design and construction of accesses to the wider road network and off-site roads

In the absence of authority-specific advice, the design and construction of works on existing or proposed roads/streets not covered by this guide, must comply with the DMRB.

When resurfacing carriageways at junctions with existing roads/streets and widening existing roads/streets, the applicant or land developer (if different) must overlay or resurface the whole of the altered or widened carriageway unless the relevant LHA agrees otherwise. This includes cases where a new carriageway meets an existing county road or an existing county road is widened and:

- The construction joint falls within the running lane of the existing county road; or
- Involves any changes to the county road carriageway, including additional areas of carriageway.

At junctions, the applicant or land developer (if different) must always carry this out over the length from tangent point to tangent point of the junction radii. If the junction includes acceleration and deceleration splays (i.e. lanes) on the main carriageway, the full overlay or resurfacing of the whole carriageway must also include the full length of the splays, unless the relevant LHA agrees otherwise.

### Subgrade assessment

For design purposes, CBR values shall be calculated before beginning construction by an independent laboratory accredited by the United Kingdom Accreditation Service (UKAS). The applicant or land developer (if different) shall notify the relevant LHA in advance of site tests to establish the subgrade strength and give the LHA the opportunity to be present at such tests. Copies of all test results shall be provided to the relevant LHA.

For the purpose of soil-classification tests, the following 'Equilibrium CBR' values as shown in Table III-I shall be used, unless agreed otherwise with the relevant LHA. These values are based on material type.

**Table III-I. 'Equilibrium CBR' Values**

| 'Equilibrium CBR' Values[a] | | |
|---|---|---|
| **Type of soil** | **Plasticity index** | **Equilibrium CBR %** |
| Heavy clay | 50 or greater | Less than 2 |
| Heavy clay | 40 to 49 | 2 |
| Heavy clay | 30 to 39 | 2 |
| Silty clay | 20 to 29 | 3 |
| Sandy clay | 10 to 19 | 4 |
| Silt | Less than 10 | 1 |
| Sand (poorly graded) | Non-plastic | 20 |
| Sand (well graded) | Non-plastic | 40 |
| Gravel (poorly graded) | Non-plastic | 40 |
| Sandy gravel (well graded) | Non-plastic | 60 |

**Notes:**
[a] Values are based on the DMRB.

## Carriageway sub-base and capping layer

Table III-II depicts the standard carriageway thickness of capping and sub-base.

**Table III-II. Carriageway sub-base and capping thickness[a]**

| CBR Value[b] | Min 450mm Frost Susceptibility[a] | | | | | |
|---|---|---|---|---|---|---|
| | Carriageway (250 mm Bituminous Layer Thickness | | Carriageway (200 mm Bituminous Layer Thickness | | Carriageway (300 mm Bituminous Layer Thickness | |
| | Capping (mm) | Sub Base (mm) | Capping (mm) | Sub-base (mm) | Capping (mm) | Sub-base (mm) |
| < 2%[c] | 550 | 200 | 500 | 250 | 600 | 150 |
| 2% | 400 | 200 | 350 | 250 | 450 | 150 |
| 3% | 300 | 200 | 250 | 250 | 350 | 150 |
| 4% | 250 | 200 | 200 | 250 | 300 | 150 |
| 5% to 15% | 200 | 200 | 200 | 250 | 250 | 150 |
| > 15% | | 200 | | 250 | | 150 |

**Notes:**

[a] The foundation design shall not vary frequently along the road. An appropriate value shall be selected for each significant change in the subgrade properties.

[b] Where the equilibrium CBR falls between values in the above table, the value shall be round down to the lower value.

[c] When the subgrade CBR is sufficiently below 2% that capping with sub-base is not sufficient to support the pavement, special measures will be required. Note that the use of geo-textile will only be acceptable in certain situations. Further advice can be found in DMRB 7.2.2 HD/25/94.

[d] Material within 450mm of the finished road surface must not be frost susceptible.

## Capping materials

Approval will be required from the LHA for each site for the capping layer. This shall comply with SHW Table 6/1, Type 6F2 or 6F3. The capping layer shall be tested as necessary to demonstrate that it has an in-situ CBR of 15% (or equivalent test result). The relevant LHA may approve other materials providing it is demonstrated beforehand that such materials will achieve an in-situ CBR of 15% (or equivalent test results).

## Sub-base

Sub-base must be Type 1 to Clause 803 of the Highways England Specification.

## Surface and binder courses and bases

Tables III-IIIa and III-IIIb give the required minimum design thicknesses and options available for flexible and modular (block) materials for different development street types. It shall be noted that:

- The use of block-paving for industrial roads is not usually acceptable.
- Stone Mastic Asphalt (SMA) may be used as an alternative surface course material subject to LHA approval. It shall be noted that:
  - The applicant or land developer (if different) must make up any reductions in thickness of the surface course by increasing the thickness of the binder course by an equal amount.
  - The use of SMA will normally require commuted sums payments to cover additional maintenance costs.

Full details of permitted standard materials can be found on the 6Cs website.

**Table III-IIIa. Carriageway and shared-surface areas construction materials and depths | Residential Streets**

| Type of Street | Conventional Street and Share-Surface Street \| Residential Streets[a, b] | | | |
|---|---|---|---|---|
| Element | Bituminous | | | Block |
| | Depth | | Notes | Depth |
| Surface Course | 40mm | HRA 55/10 F surf 40/60 des | 1, 2 | 80mm |
| | 40mm | AC10 Close surf 100/150 | 1, 2 | 80mm |
| Binder Course | 70mm | AC20 Dense Bin 10/150 rec | 2 | 30mm sand |
| Base | 150mm | AC32 Base 40/60 rec | 2 | 150mm AC32 Base 40/60 rec |
| Total | 260mm | | | 260mm |

[a] Type of use - Mainly vehicles. Bus access is possible. 85th %ile design speed - Normally 15-20 mph

[b] Type of use - Mainly pedestrians and cyclists. Not normally acceptable for the use of buses. 85th %ile design speed < Normally 15mph

**Notes:**

[1] HRA 50/10 bin 40/60 (material ref REG1) may be used for hand laying speed tables.

[2] Hard stone aggregate is required for all bituminous layers.

**Table III-IIIb. Carriageway and shared-surface areas construction materials and depths | Industrial Streets**

| Type of Street | Conventional Street \| B1 and B2 to B8 Uses[a] | | |
|---|---|---|---|
| **Element** | **Bituminous** | | **Notes** |
| | **Depth** | | |
| Surface Course | 50mm | HRA 35/14 F surf 40/60 des (20mm pre coat) | 1, 3 |
| Binder Course | 70mm | AC20 Dense bin 40/60 rec | 3 |
| | 70mm | AC20 HDM bin 40/60 rec | 3 |
| Base | 190mm | AC32 base 40/60 des | 2, 3 |
| | 190mm | AC32 HDM 40/60 des | 2, 3 |
| Total | 310mm | | |

[a] Type of use - Mainly vehicles. Bus access is possible. 85th %ile design speed - Normally 25-30 mph.

**Notes:**

[1] Polish stone value (PSV) of course aggregate in surface course shall be determined from the table of investigatory levels - see DRMB Vol 7 Section 5 HD36/06.

[2] Subgrade assessment capping layer/sub-base design are covered in sections 'Subgrade assessment', 'Carriageway sub-base and capping layer', 'Capping materials' and 'Sub-base'.

[3] Hard stone aggregate is required for all bituminous layers.

Streets not covered in these tables shall be designed on a site-by-site basis to DMRB, Volume 7. Where it is necessary to alter or improve an existing road to serve a development, in all cases the minimum depth of surface course, binder course and base layer shall not be less than that of the site access road, as given in the tables above.

### Concrete-block paving

Where agreed with the relevant LHA, the applicant or land developer (if different) may lay concrete-block paving to carriageways, shared-surface areas.

It shall be noted that a binder course will still be required as per Tables III-IIIa and III-IIIb. Concrete block paving must comply with and be laid in accordance with the requirements set out by Appendix 11/1 of the Specification for concrete-block paving in carriageways.

The use of concrete-block paving may require commuted sums payments.

### High Friction Surfacing

Individual LHA's may have different skid resistant strategies and hence contact shall be made directly with the relevant LHA for clarification.

### Alternative materials for carriageways and shared surface areas

The use of alternative surfacing materials may be appropriate for a number of reasons, including aesthetic and environmental reasons. The materials being proposed shall be discussed with the LHA at an early stage. The LHA are only likely to agree subject to the materials meeting principles of quality, durability, maintainability and sustainability.

To ensure that the surface can be kept safe and durable, the relevant LHA will normally need the applicant or land developer (if different) to pay a commuted sum to cover excess maintenance costs. Please see Appendix IV for further information on possible commuted sum payments.

## Speed control humps or raised tables

Humps and raised tables must normally be constructed in bituminous material using 55%/10mm medium temperature asphalt to BS 594 column 3/4 unless the street feature is used on a block-paved carriageway, where they shall be constructed in the same material as the carriageway, or otherwise agreed.

LHA's reserve the right to require developers to cover the cost of core sampling to test whether carriageway construction depths will adequately accommodate a speed hump. Such testing will only normally be required when developer led improvements are required to existing streets.

Please see Appendix IV for further information on possible commuted sum payments.

## Kerbs, footways, footpaths, cycle lanes and tracks, and other similar paved areas

### Residential footways

The construction of residential footways shall be in line with Table III-IV. The applicant or land developer (if different) must refer to standard drawings and Appendix 11/1 of the current Specification.

**Table III-IV. Residential footways | Construction materials and depths.**

| | Bituminous | | Block Paving | |
|---|---|---|---|---|
| Surfacing | 20mm | AC 6 dense surf 100/150 (MHA material reference SC12) | 90mm | 60mm blocks on 30mm bedding sand (compacted) |
| Base course | 50mm | AC20 dense bin 160/220 rec (MHA material reference BC3) | 70mm | AC20 dense bin 160/220 rec (MHA material reference BC3) |
| Sub-base | 160mm | Granular Type 1 (MHA material reference SB1) | 150mm | Granular Type 1 (MHA material reference SB1) |
| | Or 225mm | Granular Type 1 (MHA material reference SB1) Includes vehicular crossing serving 5 or less dwellings | | Includes vehicular crossing serving 5 or less dwellings |

## Strengthening footways to accommodate heavy-vehicle parking or over-running

Residential footways must be strengthened where heavy vehicles such as delivery (service) vehicles and maintenance vehicles, refuse lorries and buses are likely to be parked on them or overrun them.

**Table III-V. Strengthening residential footways | Construction materials and depths**

| | Bituminous | | Block Paving | |
|---|---|---|---|---|
| Surfacing | 25mm | AC 6 dense surf 100/150 (MHA material reference SC12) | 90mm | 60mm blocks on 30mm bedding sand (compacted) |
| Base course | 90mm | AC20 dense bin 160/220 rec (MHA material reference BC3) | 90mm | AC20 dense bin 160/220 rec (MHA material reference BC3) |
| Sub-base | 270mm | Granular Type 1 (MHA material reference SB1) | 270mm | Granular Type 1 (MHA material reference SB1) |

**Note:** The sub-base is to be increased to 365mm for CBR's of 2% or less.

## Footways and other hard-paved areas on industrial access roads

Construction on industrial access roads shall be in line with Table III-VI. Where a footway crossing is to be used to access an employment or commercial development, the footway crossing must be constructed in line with industrial access road requirements given in Table III-IIIb.

**Table III-VI. Footways and paved areas on industrial access roads**

| | Bituminous | |
|---|---|---|
| Surfacing | 40mm | HRA 55/10 F surf 100/150 des (MHA material reference SC8) |
| Base course | 75mm | AC20 dense bin 160/220 rec (MHA material reference BC3) |
| Sub-base | 270mm | Granular Type 1 (MHA material reference SB1) |

**Note:** The sub-base is to be increased to 365mm for CBR's of 2% or less.

Designers shall normally use high-relief contour paving to deter vehicles where there is a likelihood of regular parking on hard-paved areas or areas that would otherwise be grassed.

# IV. Commuted Sums

A commuted sum is an upfront payment from the applicant to the LHA and is necessary for the additional maintenance liability deemed to be imposed by the proposed layout design, use of materials and other features.

The 6Cs authorities are committed to regularly reviewing its policy and practice pertaining to commuted sums to ensure that its approach is reasonable, relevant and up to date. Although 6Cs authorities aim to ensure that guidance is applied consistently across the 6Cs areas this is difficult to achieve in respect of commuted sums as each 6Cs authority has different political values, corporate objectives and maintenance budget pressures. To this end, each 6Cs member authority:

- Retains the right to publish and enforce its own commuted sums pricing structure.
- Applies its own discretion to vary or waive the commuted sum.

The applicant and the LHA are strongly encouraged to discuss the matter of commuted sums at the earliest appropriate stage in the design process in order for both parties to better understand:

- Whether there are opportunities to consider alternative options to commuted sums without compromising the overall design objectives.
- The benefits arising from the proposed infrastructure in order to consider whether the commuted sum(s) offer best value and continue to meet highway design objectives.
- The provisional commuted sums likely to be required to avoid unforeseen financial, operational, scheduling or other imperatives once the final design has been agreed and legal agreements are being prepared.

## The Legal Basis

Any commuted sums that are deemed necessary as part of the design and layout of new streets being offered for adoption will be secured through either a Section 38 or Section 278 Agreement under the Highways Act 1980 and will normally be payable prior to the issue of the final certificate unless otherwise stipulated in the Agreement.

The relevant parts of the Act are:

- Section 38 of the Highways Act 1980, sub-section (6) provides for paying expenses to the LHA for maintaining any highway, road, bridge or viaduct covered by an agreement made under that section.
- Section 278 of the Highways Act 1980, sub-section (3) provides for the making of payments for maintaining the works the agreement relates to.

## Application

The need for paying commuted sums can be divided into four broad categories:

1. The cost of maintaining areas that are not required for the safe and satisfactory functioning of the highway, including:
    a. Any additional areas which result from the overall development layout design that are over and above what would normally be required to satisfy safety and operational requirements.
    b. Alterations to existing highways, carried out under S278 agreements, which are required only to serve the development and provide no wider community benefits.
2. The cost of maintaining some features of the adoptable works which can be considered as 'extra over'. Examples include highway structures, public transport infrastructure, landscaping, trees, shrubs and so on, additional and non-usual street furniture and noise fencing. The additional cost of maintaining permitted alternative materials and features which are extra over. Examples include surface materials, bollards and street lighting equipment. These additional costs are in excess of what the LHA would have incurred if the materials and features used had been to the standard specification;
3. Sustainable Drainage Systems - e.g. Holding tanks, hydrobrakes.

# Glossary

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| AAV | Aggregate Abrasion Value |
| APC | Advance Payments Code |
| ASL | Advanced Stop Line |
| BfL12 | Building for Life 12 |
| CBR | California Bearing Ratio |
| CGM | Close Graded Macadam |
| DBM | Dense Bitumen Macadam |
| DCLG | Department for Communities and Local Government |
| DES | Design Element Sheet |
| DfT | Department for Transport |
| DMRB | Design Manual for Roads and Bridges |
| DSP | Delivering Streets and Places |
| GFA | Gross Floor Area |
| GSB | Granular Sub-Base |
| HRA | Hot Rolled Asphalt |
| HSCA | High Stone Content Asphalt |
| LHA | Local Highway Authority |
| LLFA | Local Lead Flood Authority |
| LPA | Local Planning Authority |
| NJUG | National Joint Utilities Group |
| NPPF | National Planning Policy Framework |
| Opun | Trading name for Architecture East Midlands Ltd (Architecture and Design Centre for the East Midlands) |
| PSV | Polished Stone Value |
| RoW | Right of Way |
| RRRAP | Road Restraint Risk Assessment Process |
| SBD | Secured by Design |
| SMA | Stone Mastic Asphalt |
| SPD | Supplementary Planning Documents |
| SSD | Stopping Sight Distance |
| SuDS | Sustainable Drainage Systems |
| TRO | Traffic Regulation Order |
| TSRGD | Traffic Signs Regulations and General Directions |
| UKAS | United Kingdom Accreditation Service |

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