This document has been approved as a Supplementary Planning Document (SPD) by Leeds City Council’s Executive Board on 26th August 2009.
# Contents

1. **Introduction**  
   pg. 1

2. **Preparing Development Proposals**  
   pg. 4

3. **Design Guidance**  
   pg. 7
   - Key Objectives  
   - Street Types  
   - Street Type 1 (Connector Streets)  
   - Street Type 2 (Local Residential Streets)  
   - Street Type 3a (Shared Space Streets)  
   - Street Type 3b (Level Surface Streets)  
   - Street Type 4 (Home Zones)  
   - Speed Restraint  
   - Vertical Alignment  
   - Junctions and Visibility  
   - Pedestrian Movement  
   - Cycling  
   - Designing for Disabled People  
   - Car Parking  
   - Servicing, Vehicle Tracking and Turning Spaces  
   - Emergency Access  
   - Landscape Considerations Within the Highway  
   - Public Utilities  
   - Drainage  
   - Highway Structures  
   - Public Transport  
   - Other Requirements

4. **Materials and Construction**  
   pg. 71
   - General Approach  
   - Specification  
   - Carriageways  
   - Footways, Kerbs and Crossings  
   - Drainage  
   - Conservation Areas

**Index**  
pg. 77
1. Introduction

1.01 Leeds City Council as Highway Authority for the Leeds District is committed to creating excellent new places for people to live and work [LCC Urban Design Principle 6 – see Appendix A] and the purpose of this Street Design Guide is to achieve this aim in practice.

1.02 This Guide supplements the adopted Leeds UDP Review (2006) and is intended to complement a sister document called “Neighbourhoods for Living”. When taken together, these documents are aimed at creating excellent new places for people to live and work.

1.03 This Street Design Guide for Leeds is a key element to delivering high quality residential and mixed development environments in the City, and should be used in the context of other national and local planning or design guidance. The Guide aims to reflect the approach to design as set out in the “Manual for Streets” (2007), and provides specific local guidance to supplement existing national guidance. The Guide supersedes the former West Yorkshire Metropolitan County Council’s “Highway Design Guide” (1985).

1.04 The "Manual for Streets“(MfS) emphasises the overall importance given to placemaking, and encourages the design of streets based on their function rather than purely the level of traffic carried. In this context MfS gives guidance on the balance between 'place' and 'movement' functions, which have been used to develop the street types in this guide. These principles are endorsed by the City Council, and therefore where appropriate, this Street Design Guide refers to the relevant section of MfS. This guide also provides advice regarding where the City Council does not see MfS applying.

1.05 On publication of MfS the previous "Design Bulletin 32" and “Places Streets and Movement” were withdrawn. Some items from those documents have been included within this Street Design Guide where it is considered that the information is still relevant and is not covered by the guidance in MfS.

1.06 The City Council guide for residential design, “Neighbourhoods for Living” [NFL] outlines the range of aspirations for residential design and it is clear that highway design is an integral part of this process, impacting on many
of the considerations. What is also clear is that the design of good quality streets will go a long way towards achieving the overall aspirations.

1.07 The guide is intended for use by developers, design teams and others, and seeks to stimulate innovative designs that are appropriate for the context, character and location of a site and can be used safely by the travelling public. Designs will be encouraged to incorporate quality approved sustainable materials that are visually attractive, require minimum maintenance, and are in keeping with the specific local character of the area.

1.08 The guide covers the design of the 'highway' in its broadest sense, namely the public space between private dwellings or plots which facilitates all public activity, including, but not exclusively, the circulation and storage of motorised traffic. To this end the guide encourages designers to consider 'streets', not just 'roads', and also all the other components that make up the public realm (e.g. signs, cabinets, lighting, landscape, etc).

1.09 Achieving sustainable developments is crucial if the City Council is to meet its social, economic and environment objectives. These relate to sustainability in its widest sense, not only transport accessibility, so that sustainable materials, drainage and other elements are equally important. Reference should therefore be made to the City Council documents “Sustainable Design and Construction SPD” and “Sustainable Drainage in Leeds”.

A standard street width and sinuous alignment fails to relate to adjacent buildings meaning highways dominate the space.

Here buildings define the space and movement requirements are then accommodated within it, i.e. the place comes first, not the road.

1.10 A street caters for the movement of pedestrians and cyclists, vehicular traffic, servicing and access arrangements as well as less dynamic functions such as occasional car parking and landscape features. Well designed streets should accommodate all functions and purposes (including provision for utility services, street lighting and drainage), and their inter-relationship should be considered from
the outset. However the emphasis should be on “people movement” based on the following hierarchy of consideration, with the needs of the disabled, the elderly, and children to be taken into account for all modes:

**User Hierarchy**

<table>
<thead>
<tr>
<th>Consider First</th>
<th>Pedestrians</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cyclists</td>
</tr>
<tr>
<td></td>
<td>Public Transport Users</td>
</tr>
<tr>
<td></td>
<td>Specialist Service</td>
</tr>
<tr>
<td></td>
<td>Vehicles (e.g. Emergency services, waste, etc)</td>
</tr>
<tr>
<td>Consider Last</td>
<td>Other motor traffic.</td>
</tr>
</tbody>
</table>

1.11 The guide should be used for any residential street typically serving up to 700 dwellings, for mixed use developments, and for industrial/commercial schemes.

1.12 Designers will be expected to demonstrate with supporting information how their scheme complies with the principles set out in both this guide and “Neighbourhoods for Living” and National Guidance, to achieve the overall aims of the documents themselves, together with the City Council’s wider aspirations for quality environments.

1.13 Section 2 of this Guide sets out the City Council’s requirements for any development proposals, and the documentation required to support a Planning Application.

1.14 Section 3 contains various design guidance ranging from Key Objectives, the four different Street Types used within this guide and detailed technical guidance on various aspects of highway and street design.

1.15 Section 4 covers guidance on materials and construction details.

1.16 The Street Design Guide was adopted as a Supplementary Planning Document at the Executive Board on 26 August 2009.
2. Preparing Development Proposals

2.01 The preparation of successful high quality development proposals requires the design team and Council Officers to work together and also to involve the wider community [LCC Urban Design Principles 2 and 3 – see Appendix A]. This multidisciplinary approach needs to involve Architects, Planners, Engineers, Urban Designers, Landscape Architects and other stakeholders.

2.02 The design process set out in “Neighbourhoods for Living” [NFL] should be followed, i.e. analysis – concept – scheme – detail.

2.03 Designers and developers are advised to have pre-application discussions with Local Authority Officers at an early stage in the design process. Initial contact should be through Planning and Highway Development Control Officers, who will then bring in other Officers as required (e.g. Policy, Urban Design, Landscape, the Section 38 Adoption Team, Bridges Section, Drainage etc).

2.04 The guidance set out in this document is intended to assist in the design of development layouts that provide safe movement for all street users, including pedestrians of all ages, cyclists, users of public transport, cars, lorries, and others. Therefore designers should select and assemble appropriate design elements to:

- Provide street layouts which meet the needs of all users and do not allow vehicles to dominate.
- Create an environment that is safe for all street users and in which people are encouraged to walk, cycle, and use public transport, and feel safe doing so.
- Help create quality environments in which to live, work and play.

2.05 The City Council is prepared to apply a much greater degree of flexibility in some areas, than it has done in the past. However, where a design or feature is proposed that does not strictly accord with design guidance, advice, or other parameters in this Design Guide, the proposer of the amendment is required to give adequate justification, for consideration by the City Council.
The amendment will only be allowed if it fulfils all of the following requirements:

- Does not result in adverse or differential effects on selected groups, primarily disabled people (mobility impaired, blind/partially sighted, hearing impaired) children, and elderly people.
- Does not diminish the convenience and suitability of facilities for pedestrians, cyclists and public transport users.
- Does not diminish the sustainability of the design under any of the sustainability aspects highlighted in the document.
- Does not contravene UDP policy T2 (namely that “it will not create or materially add to problems of safety, environment or efficiency on the highway network”).
- Does not lead to a reduction in quality of public realm, or the durability of infrastructure.
- Does not lead to a deterioration in any other sustainability consideration.
- Does not result in a lower standard of road safety.

There is a principle of ‘no trade-offs’ in assessing amendments. That is, a positive contribution on one factor cannot be traded-off against a negative effect elsewhere. Amendments which increase sustainability or the design’s user friendliness for selected groups of people, without detriment to others, will be viewed positively. Amendments which are proposed primarily for reasons of minimising costs will only be considered if all of the above requirements are satisfied. Amendments which are proposed primarily to overcome physical site constraints or legal restrictions will be considered on their merits.

It is essential that this guide is used in conjunction with “Neighbourhoods for Living”, and recommendations on the appropriate parts of that document to refer to are included in the relevant sections of this Street Design Guide [as NFL Principle …….]. In City Centre areas, the Council’s SPG 14, “Leeds City Centre Urban Design Strategy” should also be referred to.

Development proposals should be accompanied by various supporting documentation as required by Leeds City Council’s Planning Department. Certain highway and transport reports will/may be required as follows:

i) Design and Access Statement - This will set out the main placemaking, design and sustainability elements of the scheme, and should demonstrate how it complies with the objectives and requirements of this guide and “Neighbourhoods for Living”. Areas to be offered for adoption should be clearly identified. Such a Design Statement will be required for all developments, although clearly a smaller scheme will require a briefer statement than a large development. Advice on the preparation of these statements has been produced by CABE.

ii) Transport Assessment - Developments over 80 dwellings (or others in the DfT’s “Guidance on Transport Assessments”) will normally require the preparation of a full Transport Assessment (TA). The scope of the TA should be agreed in advance with the Local Authority, and should assess both traffic impact and transport sustainability, including an assessment of how well a scheme addresses the needs of pedestrians of all ages, cyclists and non-motorised users.

iii) Transport Statement - Developments of between 50 and 80 dwellings (or others in the DfT’s guidance) will normally require an abbreviated form of a TA, addressing certain limited issues which are relevant to the particular scheme. The scope of the Transport Statement should be agreed in advance with the Local Authority, and should cover accessibility as well as impact.

iv) Travel Plan - Certain developments, as identified by the City Council, will require the provision of a Travel Plan,
to specify the measures that will be taken to encourage the use of non-car modes of transport. Any Travel Plan will need to be approved prior to Planning Permission being granted. Guidance on the preparation of Travel Plans is contained in the draft SPD Travel Plans.

v) **Quality Audit** - All developments require the provision of an audit of the quality of the proposed new streets. This will include a specific safety audit (as described below), and should also consider issues of buildability and maintenance, e.g. resurfacing, cleansing, preventing litter traps, specifying available materials, etc.

vi) **Safety Audit** - A City Council approved organisation shall undertake an independent Stage One and/or Two Safety Audit. These look at highway works from the perspective of the end user, and specifically aim to identify any safety issues that may need to be addressed. The timing and need for a Safety Audit should be discussed with the Local Authority at an early stage. All layouts which meet the requirements for adoption will normally require a safety audit. Any Safety Audit and exception report will need to be approved prior to planning permission being granted. Where relevant, Safety Audits should include an assessment of the likely level of risk. Safety audits should be considered alongside the Quality Audit.
3. Design Guidance

Key Objectives

3.01 In making good places, it is vital that highways and transportation matters are considered at the same time as other aspects of the design of the development. A co-ordinated approach to design should therefore meet the following key objectives, and the Design Statement for any scheme should demonstrate how these objectives have been met:

- Deliver high quality developments that relate the site to its particular neighbourhood [NfL Principle 1]
- Design streets as spaces for people (including the disabled), whilst still accommodating all necessary types of street users [NfL Principles 27 and 29]
- Link the development into the external network of facilities [NfL Principles 5 and 14]
- Identify intrinsic landscape characteristics of the site and its setting, and retain/enhance existing features e.g. trees [NfL Principle 55]
- Provide safe, convenient, direct and easy access to everyday facilities on foot and cycle [NfL Principle 13]
- Maximise choice for people to be able to make journeys by non-car modes [NfL Principle 19]
- Provide convenient and secure cycle parking [NfL Principle 75]
- Regulate vehicle speeds to the appropriate design speed for the street [NfL Principle 34]
- Provide car parking areas that are usable, safe and secure, and can be managed efficiently without dominating the street scene [NfL Principles 76 and 77]
- Use simple, appropriate, well-detailed high quality materials that form a cohesive family of components requiring minimal, economical maintenance (NfL Principles 35 and 37)
- Avoid the potential for “bad neighbour” problems
- Design for community safety [NfL Principle 43]
Street Types

General Approach

3.02 To achieve the key objectives, plus high quality and varied residential spaces, it is necessary to allow a greater degree of flexibility in highway design standards than has previously been allowed, with due regard to current statutory regulations, whilst still maintaining levels of road safety, and the other requirements set out in paragraph 2.06.

3.03 Guidance that contains too many unnecessary rules and restrictions can inhibit innovation, preventing schemes from reflecting local character and distinctiveness.

3.04 However, a more flexible approach also places greater responsibility on the Design Team to demonstrate that the proposals will operate safely and satisfactorily, are maintainable and sustainable, and to justify the design choices that have been made.

3.05 This Street Design Guide covers the following situations:

a) Residential streets serving up to approximately 700 dwellings
b) Industrial or commercial developments serving up to 20 hectares of industrial land
c) Mixed use schemes generating up to approximately 455 two-way peak hour movements, which is the traffic flow likely to be generated by a development of 700 dwellings
d) Private (non-adopted) streets or drives

3.06 Any road that is intended to serve more than 700 dwellings should be discussed with the City Council, and may need to be designed in accordance with the “Design Manual for Roads and Bridges” (published by the Department for Transport), as it is in effect not a residential street. However the principles of the design guidance set out in this Street Design Guide will still be applicable, as the function of the street should still be a key consideration in the design process.

3.07 The City Council supports the principle of Home Zones, and would welcome discussions with Developers who are interested in including a Home Zone within their development. Proposals for home zones will need to take account of the latest national guidance, which is currently the DfT’s “The Quiet Lanes and Home Zones (England Regulations” published in August 2006, and should be in accordance with “Home Zones, Design Guidelines” published by the Institute of Highway Incorporated Engineers.

3.08 The lowest point of any adoptable carriageway should be 600 mm above the 1 in 100 year river flood level. If there are justifiable reasons why this level may not be achievable in any particular circumstance, this matter must be discussed with the City Council.

Street Hierarchy

3.09 Within new residential areas, streets need to accommodate various types of movement in a convenient and safe manner. The needs of motorised traffic must be balanced with those of pedestrians of all ages, cyclists and users of public transport. The design of the street needs to be appropriate for the function of that part of the street, as the function may vary along its length. Streets should also be designed so that they form an attractive environment, responding to their context. To achieve this it is essential that new residential streets form a natural hierarchy that is clear and legible to all users who share the same space.
3.10 This hierarchy should provide an understandable transition from the external distributor roads where motor vehicular space requirements may be more dominant, to residential streets (covered by this Design Guide) where the needs of pedestrians and other non-car users are of greater importance.

3.11 Further guidance on the setting up of a street hierarchy and network is given in the “Movement” section of “Neighbourhoods for Living” [NfL].

3.12 Linked streets are encouraged to allow greater connectivity and accessibility by foot, for wheelchair users and by cycle, and to avoid layouts purely based on culs-de-sac [NfL Principles 16 and 17]. However care is needed to avoid through traffic using a street as a “rat run” [NfL Principle 23], and appropriate measures will be required to minimise the domination of the street by inappropriate through traffic.

3.13 The four adoptable residential street types set out below have been devised to maximise the overall range of design choices which are possible within each category, to enable the overall adopted “corridor” (including carriageways, footways, verges and other areas) to reflect and enhance the overall design, rather than control it:

<table>
<thead>
<tr>
<th>Street Type 1</th>
<th>Connector Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Type 2</td>
<td>Local Residential Street</td>
</tr>
<tr>
<td>Street Type 3 (a&amp;b)</td>
<td>Shared Space Street</td>
</tr>
<tr>
<td>Street Type 4</td>
<td>Home Zone</td>
</tr>
</tbody>
</table>

[Note: This street type numbering system is not intended to match the current “Roads and Street Works Act” (RASWA) category numbers].

3.14 If there is the possibility that a street will serve further properties in the future, for instance if there is an adjacent allocated site which is likely to be developed (and accessed through the first site) then the streets should be designed to the appropriate standard, or be capable of being altered in the future. No “ransom strip” or other gap should be left between the adopted highway and the site boundary to provide a durable and ‘future proof’ street layout.
3.15 Whilst some form of street hierarchy is required in order to construct a network which is understandable for users, the "Manual For Streets" (MfS) warns against the rigid application of a hierarchy based exclusively on vehicular movement. An alternative approach is proposed (at MfS section 2.4) based on a wider consideration of the relative status of Place and Movement. Hence a street within any particular street type may need to be designed differently in the vicinity of shops, bus nodes, adjacent to play areas, etc.

3.16 Therefore whilst the table below takes the number of dwellings served from a street as a starting point, the subsequent choice of design elements should reflect the wider function of the street using a similar assessment of both the Place and Movement requirements.
3.17 Design speed is the speed which vehicles are able to travel at but do not exceed. In relation to design speed, the MfS paragraph 7.4.2 recommends a maximum of 20mph. Within the local context set out in this Street Design Guide, it is considered that a design speed of 25mph would be appropriate for many Type 1 Connector Streets, although there are also situations where 20mph would be more relevant. Therefore the function of the street needs to be taken into account when deciding on the optimum design speed.

<table>
<thead>
<tr>
<th>Type</th>
<th>Title</th>
<th>Pedestrian Provision</th>
<th>Max no of dwellings</th>
<th>Design Speed</th>
<th>Speed Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connector Streets</td>
<td>Segregated</td>
<td>700</td>
<td>20-25mph</td>
<td>20 / 30 mph</td>
</tr>
<tr>
<td>2</td>
<td>Local Residential Streets</td>
<td>Segregated</td>
<td>200</td>
<td>20mph</td>
<td>20 mph</td>
</tr>
<tr>
<td>3</td>
<td>Shared Space Streets 3a) Designated routes</td>
<td>3b) Shared</td>
<td>Any development generating up to 100 vph in the weekday pm peak</td>
<td>15mph</td>
<td>20 mph</td>
</tr>
<tr>
<td>4</td>
<td>Home Zones</td>
<td>Variable</td>
<td>Any development generating up to 100 vph in the peak hour</td>
<td>10 mph</td>
<td>20 mph</td>
</tr>
</tbody>
</table>
**Street Type 1**  
*Connector Streets*

3.18 These are the main streets that provide structure for new residential development and connect it to the surrounding urban fabric and highway network.

3.19 Connector Streets can serve between approximately 200 and 700 dwellings, and provide a transition between the surrounding major roads and the more pedestrian dominated Local Residential Streets (Type 2). They provide the primary vehicular access to the area, and link with other street types within the new development to form the back-bone of a permeable network of streets for pedestrians and cyclists. It is likely that this street type would also carry the majority of bus traffic through any new development.

3.20 To be acceptable for adoption by the Highway Authority, they should be designed to comply with the following ranges of requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Range/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) number of dwellings</td>
<td>Up to 700.</td>
</tr>
<tr>
<td>ii) number of vehicular access points</td>
<td>200 to 300 dwellings: at least two preferred (subject to the provisions of 3.21). Over 300 dwellings: at least two must be provided.</td>
</tr>
<tr>
<td>iii) design speed</td>
<td>25mph (except at particular locations, such as outside schools, when a design speed of 20mph is required)</td>
</tr>
<tr>
<td>iv) carriageway width</td>
<td>Minimum of 5.5m up to 300 dwellings, 6.0m over 300 dwellings, or 6.75m if a bus route. Width is dependant on type of traffic, percentage of large vehicles, plus other design considerations, with widening on bends or elsewhere where necessary (see Section 'Servicing, Vehicle Tracking and Turning Spaces'). On-street parking should be accommodated in widened areas that are designed into the street layout.</td>
</tr>
<tr>
<td>v) footway width</td>
<td>Minimum 2m absolute minimum (on each side of road) to increase to 3m or more in areas of identifiably higher levels of pedestrian activity (adjacent to schools, shops, bus stops, railway stations, etc) or if shared with cyclists.</td>
</tr>
<tr>
<td>vi) verge width</td>
<td>Minimum 1m width on streets over 300 dwellings (see 3.22)</td>
</tr>
<tr>
<td>vii) length between speed restraint features</td>
<td>60 or 100m (see Section 'Speed Restraint') dependent on design speed</td>
</tr>
<tr>
<td>viii) minimum forward visibilities</td>
<td>33 (or 25m) dependent on design speed (see para 3.47).</td>
</tr>
<tr>
<td>ix) minimum centreline radius</td>
<td>35m (see also Section 'Servicing, Vehicle Tracking and Turning Spaces')</td>
</tr>
<tr>
<td>x) direct vehicular access</td>
<td>Acceptable if it can be demonstrated that it would not cause a highway problem. Normally only allowed if vehicles do not need to reverse into the carriageway, with off-street turning space available clear of other parked vehicles.</td>
</tr>
</tbody>
</table>

- For vertical design requirements see Section "Vertical Alignment"  
- For junction requirements see Section "Junction Visibility"  
- For drainage requirements see Section "Drainage"  
- For materials/construction requirements see Section 4  
- For other requirements refer to the “Contents” or “Index” Pages
3.21 For developments of between 200 and 300 dwellings, at least two points of vehicular access are preferred to maximise accessibility, connectivity, and efficient operation in emergencies, and so culs-de-sac will not normally be permitted. Although the provision of more than one access is encouraged, where this is not possible a single vehicular access may be accepted providing the internal network forms a loop, with the shortest possible connection between this loop and the point of access.

3.22 For Connector Streets serving over 300 dwellings, a verge or hard margin between the footway and carriageway should be provided to increase separation between vehicles and pedestrians. Tree planting in this zone will increase perception of this separation, and will “green” the street environment, but should not be located in areas which could affect safety.
Examples of typical Type 1 connector streets from new developments
Illustration of potential Type 1 Connector Streets
Street Type 2 (Local Residential Streets)

3.23 These are the general streets within residential areas which carry a wide range of movement types and provide the main setting for new homes, allowing direct access to individual dwellings.

3.24 Local Residential Streets can serve up to 200 dwellings, and depending on the scale of development they may provide access directly onto the existing external network, or may first access onto a Connector Street (Type 1). These streets are unlikely to carry large volumes of traffic or bus routes and the geometry requirements shift as a result, allowing tighter urban streets and the potential for increased on-street parking, when designed into the street layout, so that on-street parking forms part of a high quality design rather than simply allowed to happen in an uncontrolled manner. Overall, the use of unallocated parking results in less car parking allowing a more efficient use of land.
Examples of typical Type 2 local residential streets from new developments

Illustration of potential Type 2 Local Residential Street
3.25 To be acceptable for adoption by the Highway Authority, they should be designed to comply with the following ranges of requirements:

<table>
<thead>
<tr>
<th>Type 2: Local Residential Streets</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) number of dwellings</td>
</tr>
<tr>
<td>ii) number of vehicular access points</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>iii) design speed</td>
</tr>
<tr>
<td>iv) carriageway width</td>
</tr>
<tr>
<td>v) footway width</td>
</tr>
<tr>
<td>vi) maximum length between speed restraint features</td>
</tr>
<tr>
<td>vii) minimum forward visibilities</td>
</tr>
<tr>
<td>viii) minimum centreline radius</td>
</tr>
<tr>
<td>ix) direct vehicular access</td>
</tr>
</tbody>
</table>

- For vertical design requirements see Section "Vertical Alignment"
- For junction requirements see Section "Junction Visibility"
- For drainage requirements see Section "Drainage"
- For materials/construction requirements see Section 4
- For other requirements refer to the "Contents" or "Index" Pages
Street Type 3a (Shared Space Streets)

3.26 This street type can be used on streets serving over 10 dwellings. They have shared spaces with designated pedestrian routes with very low vehicle speeds which should be self-enforcing through good design [NfL Principle 33]. Designated routes should not be regarded as footways which have full height kerbs and therefore fully segregate vehicles from other street users. Pedestrians can safely share the whole street with vehicles, however the designated pedestrian routes are available for more vulnerable pedestrians, e.g. elderly people, disabled people and children.

3.27 Designated pedestrian routes of 2m minimum width should be provided on both sides of the street but occasionally would be acceptable on one side only subject to discussion and agreement with Leeds City Council. These routes should be free from car parking and adequately provide way finding methods which are suitable for blind and partially sighted people. The routes should be provided in a contrasting coloured material. A 30mm kerb upstand with flush crossing points and tactile paving where required.

3.28 Shared Space Type 3a streets are often used as a placemaking feature in conjunction with a type 1 or type 2 street when forming a through route. They are often used at junctions or adjacent to buildings with greater activity. In these circumstances street type 3a should be limited to lengths of 100m.

3.29 Alternatively Type 3a streets can be used in their entirety on streets with weekday pm peak hour traffic flows not exceeding 100 vehicles per hour. Due to the low traffic speeds these streets should be a maximum length of 300m.
3.30 It is required that these streets are block paved and surface materials are chosen to delineate the functions of the different parts of the highway. Where designated pedestrian routes are provided these should be in contrasting colours / tones of material to aid way finding.
Illustration of potential Type 3a Shared Space Street
To be acceptable for adoption by the Highway Authority, they should be designed to comply with the following ranges of requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>i) number of dwellings</strong></td>
<td>Up to 100 vehicles in the weekday pm peak hour or 300m in length</td>
</tr>
<tr>
<td><strong>ii) number of vehicular access points</strong></td>
<td>Up to 50 dwellings: Single access point acceptable. 50 to 200 dwellings: Culs-de-sac should be avoided where possible. If absolutely necessary, they should have a maximum length of 200m. Turning facilities should be provided if the cul-de-sac is longer than 45 metres, and if the length is greater than 100m then additional turning facilities will be required.</td>
</tr>
<tr>
<td><strong>iii) design speed</strong></td>
<td>15mph</td>
</tr>
<tr>
<td><strong>iv) highway width</strong></td>
<td>Variable, but with a minimum overall adopted corridor width of 7.4 metres. On-street parking should be designed into the street layout.</td>
</tr>
<tr>
<td><strong>v) notional carriageway width</strong></td>
<td>Minimum of 4.8m up to 50 dwellings, minimum 5.5m between 50 and 200 dwellings (but can vary to respond to built form and public spaces, on-street car parking, turning from accesses, or if a bus route is to be accommodated) plus widening on bends or elsewhere where necessary (see Section ‘Servicing, Vehicle Tracking and Turning Spaces’).</td>
</tr>
<tr>
<td><strong>vi) pedestrian route</strong></td>
<td>2m minimum designated route (usually on both sides of road). If only one route is accepted then a 0.6m margin should be provided on the other side.</td>
</tr>
<tr>
<td><strong>vii) maximum length between speed restraint features</strong></td>
<td>40m (see Section ‘Speed Restraint’)</td>
</tr>
<tr>
<td><strong>viii) minimum forward visibilities</strong></td>
<td>23m (see para 3.47). Visibilities significantly above this level should be avoided to deter excess speed.</td>
</tr>
<tr>
<td><strong>ix) minimum centreline radius</strong></td>
<td>14m or based on vehicle tracking requirements (see also Section ‘Servicing, Vehicle Tracking and Turning Spaces’)</td>
</tr>
<tr>
<td><strong>x) direct vehicular access</strong></td>
<td>Allowed</td>
</tr>
</tbody>
</table>

- For vertical design requirements see Section "Vertical Alignment"
- For junction requirements see Section "Junction Visibility"
- For drainage requirements see Section "Drainage"
- For materials/construction requirements see Section 4
- For other requirements refer to the “Contents” or “Index” Pages
**Street Type 3b (Level Surface Streets)**

3.32 These are the lowest order of adoptable streets, and have shared surfaces with very low vehicle speeds, which should be self-enforcing through good design [NfL Principle 33]. They provide access for small groups of homes either in courtyard form or short streets.

3.33 Level Surface Streets Type 3b can serve up to 10 dwellings in a cul-de-sac. There are likely to be higher levels of pedestrian and cyclist activity (particularly from children) along these streets, and the design should ensure that these activities are as safe as possible. The needs of different groups of people need to be considered, including disabled people (e.g. mobility impaired, blind / partially sighted, hearing impaired), children, and elderly people. This street type is not suitable to serve developments predominantly housing older or disabled people, e.g. housing for over 55s and supported or sheltered housing.

*Examples of typical Type 3b shared surface streets from new developments*
3.34 Careful consideration needs to be given to how and where car parking is provided including the needs of visitors (also see para 3.178). On-street parking should be designed into the street layout.

3.35 It is required that these streets are block paved and surface materials are chosen to delineate the functions of the different parts of the highway.

3.36 To be acceptable for adoption by the Highway Authority, they should be designed to comply with the following ranges of requirements:

<table>
<thead>
<tr>
<th><strong>Type 3b: Level Surface Streets</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>i)</strong> number of dwellings</td>
</tr>
<tr>
<td><strong>ii)</strong> number of vehicular access points</td>
</tr>
<tr>
<td><strong>iii)</strong> design speed</td>
</tr>
<tr>
<td><strong>iv)</strong> highway width</td>
</tr>
<tr>
<td><strong>v)</strong> footway width</td>
</tr>
<tr>
<td><strong>vi)</strong> maximum length between speed restraint features</td>
</tr>
<tr>
<td><strong>vii)</strong> minimum forward visibilities</td>
</tr>
<tr>
<td><strong>viii)</strong> minimum centreline radius</td>
</tr>
<tr>
<td><strong>ix)</strong> direct vehicular access</td>
</tr>
</tbody>
</table>

- For vertical design requirements see Section "Vertical Alignment"
- For junction requirements see Section "Junction Visibility"
- For drainage requirements see Section "Drainage"
- For materials/construction requirements see Section 4
- For other requirements refer to the "Contents" or "Index" Pages
Street Type 4 (Home Zones)

3.37 Home Zones are residential streets in which the road space can be shared between drivers of motor vehicles and other road users, with the wider needs of residents (including people who walk and cycle, the elderly and children) in mind. The aim is to change the way that streets are used and to improve the quality of life in residential streets by making them places for people not just for traffic. Changes to the layout of street should emphasise this change of use, so that motorists understand and accept that they should give informal priority to other road users.

3.38 Motorists should feel that they have left the normal highway and have entered an area where they can expect to find people who are using the whole of the street. In essence the Home Zone should make motorists feel they are guests in a pedestrian environment, and should drive accordingly.

3.39 Home Zones may consist of shared spaces or level surfaces, indirect traffic routes, areas of planting, and features to encourage the use of the street. “Gateways” and regulatory signing will be needed to mark the limits of the area. In designing Home Zones full consideration of the needs of disabled people should be taken into account. The recommendations included in “Designing for Disabled People in Home Zones”, (JMU Access Partnership 2007) should be followed to ensure that the needs of disabled people are properly considered. Designated pedestrian routes through the Home Zone of 2m minimum width should be provided which should be provided using a 30mm kerb upstand with flush crossing points and tactile paving where required. Visually contrasting materials are required to identify the pedestrian route. Consideration should be given to way finding at each side of, and the start and end of, the pedestrian route.

Examples of completed Homes Zones
3.40 Design guidance and other information on Home Zones, including links to related websites, is available through the Institution of Highway Incorporated Engineers at www.ihie.org.uk and www.homezones.org.uk.

3.41 Procedural guidance is set out within the Department for Transport’s Circular 02/2006 “The Quiet Lanes and Home Zones (England) Regulations 2006“. Home Zones shall be used only where traffic flows are no more than about 100 weekday pm peak hour vehicle movements, so the number of dwellings will vary with the location and nature of the development.

3.42 The statutory process for the designation of a Home Zone and the making of the associated use and speed orders requires that there is consultation with local groups, and in particular the residents of the area. While this does not present a problem with Home Zones in existing streets, there is an apparent difficulty with new build developments in that streets are normally well on the way to being built when residents begin to move in.

3.43 It is therefore required that an information pack is given to all purchasers, setting out general information on Home Zones, together with the key proposals for the site (including a draft wording of the use and speed orders) explaining the way in which the streets will be managed and maintained.

3.44 Purchasers will then be asked to sign this document, stating that they have understood and agree in principle with the Home Zone proposals. Once the streets are open to the public, Leeds City Council will carry out the formal consultation process to enable the Home Zone to be designated and the Orders made at the Developer’s expense.

3.45 Streets designed to Home Zone standards will only be accepted if Home Zone designation is proposed and is realistically achievable.

3.46 To be acceptable for adoption by the Highway Authority, they should be designed to comply with the following requirements:

### Type 4: Home Zones

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) number of dwellings</td>
<td>Home Zone streets should have traffic flows of no more than 100 two-way vehicular movements in the weekday evening peak hour. The maximum number of dwellings will therefore depend on the nature and location of the development.</td>
</tr>
<tr>
<td>ii) design speed</td>
<td>10mph</td>
</tr>
<tr>
<td>iii) maximum length between speed restraint features</td>
<td>30m</td>
</tr>
<tr>
<td>iv) minimum forward visibilities</td>
<td>23m (see para 3.47). Visibilities significantly above this level should be avoided to deter excess speeds.</td>
</tr>
</tbody>
</table>

- For vertical design requirements see Section "Vertical Alignment"
- For junction requirements see Section "Junction Visibility"
- For drainage requirements see Section "Drainage"
- For materials/construction requirements see Section 4
- For other requirements refer to the “Contents” or “Index” Pages
- For all other design requirements refer to the IHIE Design Guidelines, and discuss specific circumstances with the City Council.
Measurements of Forward Visibility (all Street Types)

3.47 Forward visibility should be measured in accordance with the following diagram:

To construct a forward visibility envelope:

i) a line should be drawn parallel to the inside kerb, in the centre of the nearside lane, to represent the path of the vehicle.

ii) the required forward visibility distance for the appropriate Street Type should be identified and measured back along the vehicle path from tangent point A.

iii) the forward visibility distance should then be divided into equal increments of approximately 3 metres, and the increment points numbered in sequence.

iv) the same forward visibility distance should then be repeated around the curve, finishing at a full forward visibility distance beyond tangent point B.

v) the area to be kept clear of obstructions to visibility should then be constructed by joining points of the same number together (i.e. 1 to 1, 2 to 2, etc)

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

3.49 The distance between the driver and the front of the vehicle is typically up to 2.4m which is a significant proportion of shorter stopping distances. Therefore the recommended forward visibility distances include a 2.4 metre allowance for this factor.

See diagram overleaf.
3.50 The ease, and hence the speed, with which vehicles may move along carriageways depends in part upon the tolerances available both between vehicles and between vehicles and kerbs. On the external highway network where ease of traffic flow is of high priority and where drivers will normally expect to be able to proceed at speeds of 30mph or above, carriageway widths need to be in accordance with the recommendations given in the Design Manual for Roads and Bridges.

3.51 On residential streets however, where traffic flows are light and where journeys are starting or ending, drivers may be expected to accept smaller tolerances consistent with the aim of restraining vehicle speeds and encouraging careful driving.

3.52 Whether or not smaller tolerances will cause unacceptable delay, reduce safety, or result in damage to footways and verges, will depend upon the types and volumes of traffic, the design of the carriageway surrounds and the distances over which drivers have to proceed. Such factors may vary considerably within a layout. The tolerances provided by various carriageway widths are set out below.

3.53 A 5.5m width allows all vehicles to pass each other at low speed. Given the infrequency of large vehicles on residential streets, this width will normally be the maximum required to cope with residential traffic, for up to 300 dwellings. Below 5.5m the carriageway will be too narrow for the free movement of large service vehicles such as pantechnicons. Where such vehicles are allowed access passing places may be required. The carriageway width required between passing places will then depend upon the combinations of vehicle types expected; the frequency with which vehicles may meet each other and the delay which may be caused to traffic movement. These factors may be expected to vary with traffic volumes.

3.54 At 4.8m the carriageway will allow a wide car to pass a large service vehicle such as a pantechnicon.

3.55 At 4.1m the carriageway will be too narrow for large service vehicles such as pantechnicons to pass vehicles other than cyclists. It does however allow wide cars to pass each other. Hence, while being more restrictive on the movement of large vehicles, a width of 4.1m will still provide two-way flow for the majority of residential traffic. Below 4.1m the carriageway will be too narrow for private cars comfortably to pass each other at very low speed and may be uncomfortable for cyclists in conjunction with large vehicles. Widths of less than 4.1m therefore should be regarded as catering only for single-file traffic.

3.56 The choice of width below 4.1m will depend largely upon the frequency and ease with which cyclists and cars may need to pass each other. It is suggested that 3.3 metres be regarded as the minimum width between passing bays on a single-track system.
Private (non-adopted) Streets or Drives

3.57 Any development serving more than 5 dwellings (or an existing Private Street or Drive which does or will serve more than 5 dwellings after completion of the development) should be designed to adoptable standards and offered for adoption. The Local Authority will not normally adopt developments of 5 dwellings or less of any type.

3.58 Whilst Private Streets or Drives can allow the introduction of a different standard of materials, lighting, etc than may be acceptable with an adopted street, the following potential implications should be taken into account:

- future maintenance liabilities
- public liabilities
- street cleansing
- drainage
- public lighting would not be installed
- the Local Authority would have no powers under the Highways Act
- the Police would have no powers to remove obstructions

3.59 A Private Drive serving 5 houses or less should have a minimum width of 3.3 metres, with the first 10 metres having a minimum width of 4.8 metres if access is taken from a Type 1 Connector Street or a more major route to allow two way passing (subject to tracking). No footway or service margin is required, with services being located within the driveway. The horizontal alignment and any need for passing places are based on practical requirements and vehicle tracking where necessary. The requirements for a refuse vehicle to be able to get within 25 metres of all drive-ends or communal storage locations (para 3.222) and for a fire tender to get within 45 metres of all front doors (para 3.235) need to be considered, and on-site turning facilities provided where necessary.

3.60 Private Drives must incorporate adequate visitor car parking provision in addition to private curtilage parking.

3.61 Any gates should be set at least five metres back from the adopted highway boundary.

Industrial Developments

3.62 Such areas will by their nature be more intensively focused towards vehicular movements than residential areas, given the volume and type of traffic expected to use these streets. It will still be required to assess likely needs of other street users and every situation will still be assessed on its own merits. Particular consideration will be required regarding
HGV/cyclist interaction. Direct, safe and convenient pedestrian routes should be provided to public transport stops.

3.63 Industrial roads are categorised as Major or Minor, with the same layout standards being applicable in each case. The difference is the likely number of Heavy Goods Vehicles (HGVs) and therefore the construction details vary (see Section 4). Where a Minor Industrial Road is intended to serve a mainly B1 office development (with a very low number of HGVs) there may be flexibility to vary certain requirements (e.g. radii and turning facilities).

3.64 Major Industrial Roads may serve industrial or commercial developments of up to 20 Hectares. Above this level roads should be designed in accordance with the Design Manual for Roads and Bridges. Commercial vehicles in residential areas are obviously undesirable, and for this reason the design of a large scale industrial estate should try to produce a layout which is self-contained and which segregates industrial from local/residential traffic. It should, however, be acknowledged that pedestrian and cycle movements are likely to be just as numerous on industrial estate roads as people travel to their place of work.

3.65 In principle mixed use schemes will be encouraged, and where a mixed use scheme has been accepted by the Local Authority as being appropriate, then Section "Speed Restraint“ should be referred to for design guidance.

3.66 Small scale direct individual access is not to be encouraged on Major Industrial Roads, and a proper hierarchy should be used within an estate so that this form of access is taken from a Minor Industrial Road.

3.67 Minor Industrial Roads may serve industrial or commercial developments of up to 8 hectares (or an industrial building with a gross floor area of 40,000 square metres), and direct frontage access to individual premises is allowed.

3.68 To be acceptable for adoption by the Highway Authority, an Industrial Road should be designed to comply with the following requirements:

<table>
<thead>
<tr>
<th>Industrial Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) design speed</td>
</tr>
<tr>
<td>ii) carriageway width</td>
</tr>
<tr>
<td>iii) footway width</td>
</tr>
<tr>
<td>iv) maximum length between speed restraint features</td>
</tr>
<tr>
<td>v) minimum forward visibilities</td>
</tr>
<tr>
<td>vi) minimum centreline radius</td>
</tr>
</tbody>
</table>

- For vertical design requirements see Section "Vertical Alignment"
- For junction requirements see Section "Junction Visibility"
- For drainage requirements see Section "Drainage"
- For materials/construction requirements see Section 4
- For other requirements refer to the “Contents” or “Index” Pages
3.69 Some developments propose the formation of small groups of industrial units designed for occupation by either one or two man operations.

3.70 The function of these units is to provide a purpose-made “industrial nursery” for businesses, from which a small company can grow and become established. Once this purpose is fulfilled it is expected that larger premises will be needed by the company, and on relocation of the business, the nursery unit may then be relet.

3.71 It is usual for the industrial units to be up to approximately 150m² in floor area, and generally of a system built construction, sited around a central turning area. Each unit has its own forecourt which acts as both an unloading/loading area and as a casual car parking space. Where additional staff car parking is required this is normally provided in a communal area, conveniently located adjacent to the turning head. In order for this Industrial “Courtyard” to properly function a minimum of two staff car parking spaces must be provided to each unit.

3.72 The shared turning head shall be a minimum of 20m x 20m to enable either a 10m rigid or 16.5m articulated vehicle to turn clear of the unit forecourts.

3.73 Each unit shall have a forecourt of minimum depth 7m, and a 600mm overhang strip shall be provided around the extent of the adoptable or private industrial road. Where units of a greater floor area are proposed, forecourt depths must be increased to accommodate the associated larger vehicles expected to visit the development. The table below indicates the Unit Floor Area to Forecourt Depth requirement.

<table>
<thead>
<tr>
<th>Floor Area Industrial Unit (m²)</th>
<th>Forecourt Depth (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 50</td>
<td>7</td>
</tr>
<tr>
<td>51 to 150</td>
<td>10</td>
</tr>
<tr>
<td>150 and above</td>
<td>15</td>
</tr>
</tbody>
</table>

3.74 Where a definite pedestrian movement is created either from the existing highway into the site, or within the courtyard (from say communal car park/toilet block to units) a separate footway system shall be provided.

3.75 Private areas such as car parking bays and forecourts shall be properly laid out, drained surfaced and sealed in all cases. Various materials are considered acceptable as a running surface (see Section 4) however unsealed and loose materials such as hardcore, crushed stone or gravel have practical disadvantages and therefore will not be accepted.

3.76 The provision of security gates to an industrial courtyard is not permitted in the case where an adoptable public highway is proposed, but may be permissible in the case of a private courtyard. Where gates are proposed they must be set back a minimum of 15m from the highway boundary (back of footway) to allow commercial vehicles to draw off the highway.

3.77 Large numbers of industrial units sited around private courts can give rise to practical working difficulties and possible bad neighbour problems over which there is no statutory control. Except, therefore, in the case of small numbers of industrial units or managed developments, an adoptable highway system should be used in preference to a private court.
Mixed Use Schemes

3.78 As various local and national planning policies are encouraging the greater introduction of mixed use schemes (i.e. residential and commercial served from the same access) highway and street design standards need to be sufficiently flexible to accept such access streets for adoption.

3.79 Connector Streets (Type 1 as described in paragraphs 3.18 to 3.22) can be designed to accommodate a mix of residential and commercial traffic where necessary.

3.80 Such a Street Type will be appropriate where the peak hour traffic flow is not expected to exceed that which could be generated by 700 dwellings (i.e. in the order of 455 two-way peak hour vehicle movements). Above this level the Design Manual for Roads and Bridges should be used, although this should be discussed with the City Council.

3.81 Particular care will need to be taken in the design of such schemes, where there is the potential for a greater degree of pedestrian-vehicular conflict than usual. This may require additional speed restraints or other measures to ensure the safety of vulnerable road users.

3.82 The carriageway widths and other standards will be partly dependent on the percentage of larger vehicles which are expected.

3.83 The point at which a mixed use scheme should be designed as an Industrial Road should be discussed with the City Council.

Speed Restraint

3.84 To ensure that the design speeds identified for each type of street are not exceeded, it is necessary to design speed restraint measures into the development. If they are required, they should be designed from the beginning of the process, and not introduced as
an after thought [NFL Principles 24 and 34]. They must be justified within the Design and Access Statement (see paragraph 2.09 (i)). For speed restraint on bus routes the preference from the bus operator’s is for horizontal deflection rather than vertical deflection.

3.85 The speed of vehicles is the key factor in improving road safety and minimising future potential accidents. There is a significant lowering of the severity of accidents involving pedestrians and other vulnerable road users when the speed of the vehicle involved is less than 20mph. For this reason all Local Residential Streets (Type 2) should be designed to be self enforcing to keep speeds below 20mph, Shared Space Streets (Type 3) below 15 mph, and Home Zones (Type 4) below 10 mph. Connector Streets (Type 1) should be designed to control speeds to 25mph or 20 mph, depending on the circumstances.

3.86 Speed restraint is not just a matter of using the engineering features described in this section but is an inherent feature of the overall design. A driver’s perception of a safe speed is also materially affected by the spacing, form and proximity of the buildings served by the street, plus the surface materials used and the effective use of hard and soft landscape elements. Wherever possible ‘natural’ speed reducing features, which respond to the built form and layout of a development, should be used to prevent the traffic infrastructure dominating the visual appearance of the street. Closing speeds need to be taken into account in locations where the carriageway is not wide enough to accommodate two-way passing of vehicles.

3.87 For all of the following speed restraint features on new layouts it is not intended to sign the features. Therefore over-engineered layouts requiring excessive signage will not be accepted on new developments.
3.88 Although not exhaustive, typical examples of speed restraint measures which may be considered appropriate are set out below. Forward visibilities should not be so excessive as to encourage high vehicle speeds. Speed restraint features should also fit in with the design concept.

i) **Gateways** – These indicate visually to drivers that they are entering an area where reduced speeds are expected (i.e. on the entry to Street Types 2, 3 and 4), and there is a greater likelihood of encountering vulnerable street users. Physical features can be enhanced by landscape elements such as tree planting to visually narrow the gap, and the use of different materials.

Here an archway over the street marks the entrance to a courtyard area, slowing vehicles on entry to a shared surface environment.

ii) **Speed Control Bends** – These are applicable on all Street Types. These should be a specific and obvious speed restraint feature, with the bend being tighter than the normal recommended minimum Centreline radius for the street type, down to an absolute minimum Centreline radius of 7.5 metres. The full forward visibility for the appropriate design speed should still be provided. The deflection angle should be greater than 60°. It must be demonstrated through vehicle tracking that a designated vehicle (e.g. Fire Appliance or refuse vehicle) can utilise the street with the tracking speed to be 5 mph below the normal design speed for the street, and due account must be taken of reverse curves.

Here a shift in building lines create a natural point for the carriageway to narrow avoiding the 'add-on' appearance of an arbitrary build out.

iii) **Carriageway Narrowing** – Carriageways can be narrowed over short lengths for a Type 2 Local Residential Street, a Type 3 Shared Space Street, or a Type 4 Home Zone to a minimum of 3.1 metres between kerbs with appropriate forward visibility. They should take account of servicing and parking requirements, and potentially could include a cycle by-pass. Road narrowings are most effective when they relate to a shift in the building line or a change in tree planting along the street. A design must show how vehicles are to be prevented from overriding landscaped areas or impacting on trees.
iv) **Junction Speed Tables** – These are applicable on Street Types 1 and 2. They should be constructed in materials that differ from the main carriageway, and wherever possible should be aligned with pedestrian desire lines to accommodate a pedestrian crossing area, to create a more ‘natural’ and logical feel to the traffic system. Upstands or abrupt changes in gradient must not be provided, to avoid creating a risk or discomfort to cyclists. The footway width adjacent to the table should be increased to 2.4 metres, and if necessary bollards installed to protect pedestrians and prevent parking on the footway. However the provision of bollards should be minimised to essential locations for pedestrian safety only. Other speed tables, humps, cushions, or vertical deflection features would not normally be accepted in new residential schemes, but will be considered if there is a good design justification. The maximum height of a speed table should be to the top of the kerb, subject to a constructed maximum of 100mm with a preferred ramp gradient on Type 1 streets of 1 in 18 (5.5%) and on Type 2 streets of 1 in 15 (6.7%). On a bus route the ramp gradient should be 1 in 18 (5.5%) and the minimum length of the raised table should be 6m.

v) **Ramps** - These form the standard feature at the entrance to Type 3 Shared Space Streets and can be combined with a change in material to emphasise the shift in priority towards pedestrians. Type 3 streets have an entrance ramp gradient of 1 in 10.

3.89 A mini-roundabout will not be accepted as a speed restraint measure.

3.90 Other complementary measures which would not qualify exclusively as formal speed restraint measures, but which can be combined with formal measurements to assist in encouraging reduced vehicle speeds as part of a comprehensive series of measures, include:

- Vertical elements such as trees, bollards and street furniture where appropriate to the landscape scheme and local context.
- Contrasting textured surfacing. The materials used should be carefully considered to respond to the built context of the scheme and to be effectively maintained in the future (see Section 4 for permitted alternative materials).
- White lining in certain circumstances (see Section "Other Requirements").
- Central landscaped islands (but not interfering with pedestrian desire lines).

3.91 The design of speed restraint features requires consultation with emergency and public transport services. The Designer proposing the features should carry out this consultation and provide consultation responses with the application.

**Vertical Alignment**

3.92 Wherever possible streets should follow the topography of the site to avoid an unnatural appearance, however there will be occasions when this is not possible for safety or design reasons. The introduction of cuttings or embankments in such circumstances must be well integrated into the local topography, and any retaining structures must be equally considered and must relate to the overall development scheme palette of materials. Cuttings and embankments battered back to a stable angle and landscaped are normally preferable to the introduction of retaining structures.

3.93 The desirable maximum carriageway longitudinal section gradient on all adoptable Street Types is 1 in 20 (5%). If this is not achievable then the specific circumstances should be discussed with the City Council.

3.94 The minimum general gradient for adequate drainage is normally 1 in 150 (0.67%) but between 1 in 150 and 1 in 200 (0.5%) channel blocks are required. This relaxation is not appropriate for Type 3 Shared Space Streets. The minimum gradient on a blockpaved carriageway is 1 in 120.

3.95 The preferred carriageway crossfall is 1 in 40 (2.5%) although where there is sufficient design justification (e.g. to minimise impact on adjacent trees) this can be increased to an absolute maximum of 1 in 25 (4%). On super-elevated carriageways crossfalls of 1 in 40 from the high side to the centerline, and 1 in 25 from the centreline to the low side, should be provided to reduce the visual impact of the crossfalls, unless an alternative acceptable solution is proposed.

3.96 A vertical clearance of 5.3 metres will normally be required over the full carriageway width, plus 450mm to either side. A minimal vertical clearance of 4.2 metres will be allowed for Type 3 streets where access is via an archway. Further advice on vertical clearance is included in Chapter 6 of the DfT document TD/27/05 “Cross Sections and Headrooms”.

3.97 Where a change a gradient occurs, vertical curves will be required at sags(Valleys) and crests (Summits) for driving comfort, and at crests to provide adequate forward visibility.

3.98 The maximum gradient of drives to individual garages is 1 in 12.5 (8%).
3.100 The lowest point of any adoptable carriageway should be 600mm above the 1 in 100 year river flood level as identified by the approved flood risk assessment. If there are justifiable reasons why this level may not be achievable in any particular circumstance, this matter must be discussed with the City Council.

### Junctions and Visibility

**Principles**

3.101 The geometry of new junctions (either onto the existing external highway network or within the development itself) must take into account both the type of traffic on the minor route, and also the existing (or likely future) traffic flows and speeds on the major route.

3.102 The number of new accesses, junctions, and private means of access will be restricted in the vicinity of sites which generate high pedestrian flows (e.g. schools) and those which are considered acceptable should not involve reversing manoeuvres onto or off the street.

3.103 As a general principle junctions should be avoided near the crest of a street, or on a bend.

3.104 The minor route should normally meet the major route at right angles, although the minor route may deviate by up to 10º where it will not adversely affect vehicle swept paths.

3.105 “Manual for Streets” (MfS) introduced reduced visibility guidelines, on routes within built-up areas having 85%ile wet weather vehicle speeds of 37 mph or less. For the purposes of this Design Guide, the MfS recommended visibilities are considered to be appropriate in the following circumstances:

i) Within new residential developments themselves

ii) Plus the access junction onto external highway network, where the major route meets all of the following in the vicinity of the junction:

   a) It is not a Distributor Road or Strategic Route (See Appendix G)
   b) It is within a built-up area
   c) The eighty-fifth percentile wet weather speed is 37 mph or less
   d) The place function of the street is more important than the movement function.

3.106 The question of whether a particular location is “built up” will need to be discussed with the City Council, but in general terms it relates to an area where there is development on at least one side of the road or street, with accesses, junctions and other features which will influence driver behaviour. The definition of “Distributor Road” and “Strategic Route” is based on the City Council’s maintenance hierarchy, with the routes currently classified as such being set out in Appendix G.

3.107 In all other circumstances the visibility guidelines set out in paragraph 3.120 should be utilised for priority junctions unless otherwise agreed by the City Council. For non-priority and other junctions, the design guidance will be as set out in DMRB.

### Measurement of Splays

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

3.109 The Y distance represents the distance that a driver who is about to exit from the minor arm can see to his left and right along the main alignment. It is measured along the nearside kerb line of the main arm, although vehicles will normally be travelling a distance from the kerb line. The measurement is taken from the point where this line intersects the centreline of the minor arm (unless, as above, there is a splitter island in the minor arm).

3.110 The result of applying the X and Y distances is to provide an envelope of visibility that enables the whole of the carriageway to be seen by the driver.

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

3.112 In some circumstances offside obstructions may reduce the envelope of visibility to an unacceptable level. This needs to be fully considered.

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

3.114 The measurement of X and Y distances is shown on the diagrams below.

Diagrams displaying the different measurement of splays
X- Distance

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

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

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

3.118 Longer X distances enable drivers to look for gaps as they approach the junction. This increases junction capacity for the minor arm, and so may be justified in some circumstances, but it also increases the possibility that drivers on the minor approach will fail to take account of other road users, particularly pedestrians and cyclists. Longer X...
distances may also result in more shunt accidents on the minor arm. TRL Report No. 184 found that accident risk increased with greater minor-road sight distances. Therefore an x-distance of 4.5 metres will only be required where there is likely to be a capacity issue.

**Y – Distance**

3.119 The Y distance should be in accordance with the table below, if the criteria in paragraph 3.105 have been met. For intermediate speeds, the next highest speed which appears in the table should be utilised (or refer to formula in Manual for Streets). Measured eighty-fifth percentile wet weather speeds should be used if available.

### Table A: If Speeds Known

<table>
<thead>
<tr>
<th>Major route speed (kph)</th>
<th>120</th>
<th>100</th>
<th>85</th>
<th>70</th>
<th>60</th>
<th>50</th>
<th>40</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major route speed (mph)</td>
<td>75.0</td>
<td>62.5</td>
<td>53.1</td>
<td>43.8</td>
<td>37.5</td>
<td>31.3</td>
<td>25.0</td>
<td>18.8</td>
</tr>
<tr>
<td>“Y” distance (m)</td>
<td>295</td>
<td>215</td>
<td>160</td>
<td>120</td>
<td>90</td>
<td>70</td>
<td>45</td>
<td>33</td>
</tr>
</tbody>
</table>

Notes: (a) Table A should be used where the actual eighty-fifth percentile wet weather speed of vehicles is known.
(b) If speeds are unknown, then the speed limit in Table B should be used.
(c) Where it can be shown that vehicle speeds will be contained to either 30 mph or 20 mph, the respective major road ‘y’ distance can be amended to 60 metres and 33 metres respectively.
(d) Relaxations may be considered if the full recommended standards are not achievable.
(e) Traffic calming measures or a reduction in the speed limit would not normally be considered to be appropriate, if proposed solely to achieve the necessary visibility splays.

3.120 For accesses onto the external highway network which do not meet the criteria set out in paragraph 3.105, the following Y-distances should be utilised:

### Table B: If Speeds Unknown

<table>
<thead>
<tr>
<th>Speed limit (mph)</th>
<th>70</th>
<th>60</th>
<th>50</th>
<th>40</th>
<th>30</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Y” distance (m)</td>
<td>295</td>
<td>215</td>
<td>160</td>
<td>120</td>
<td>90</td>
<td>45</td>
</tr>
</tbody>
</table>

Notes: (a) Table A should be used where the actual eighty-fifth percentile wet weather speed of vehicles is known.
(b) If speeds are unknown, then the speed limit in Table B should be used.
(c) Where it can be shown that vehicle speeds will be contained to either 30 mph or 20 mph, the respective major road ‘y’ distance can be amended to 60 metres and 33 metres respectively.
(d) Relaxations may be considered if the full recommended standards are not achievable.
(e) Traffic calming measures or a reduction in the speed limit would not normally be considered to be appropriate, if proposed solely to achieve the necessary visibility splays.

3.121 For visibility splay guidance relating to pedestrian/vehicle conflict at driveways see paragraph 3.200.

3.122 For visibility splay guidance relating to cycle track entry/exit points, see paragraph 3.160.

**Obstacles to Visibility**

3.123 The impact of obstacles, such as trees and street lighting columns, should be assessed in terms of their impact on the overall envelope of visibility. In general, occasional obstacles to visibility that are not large enough to fully obscure a whole vehicle or a pedestrian, including a child or wheelchair user, will not have a significant impact on road safety. However, defined parking bays should be provided outside the visibility splay.
**Junction Layouts**

3.124 Recommended radii and visibilities are as follows:

<table>
<thead>
<tr>
<th>Priority Route</th>
<th>Non-Priority Route</th>
<th>Radius [see note (a)]</th>
<th>X-Distance [see note (b)]</th>
<th>Y-Distance [see note (c)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Road Network</td>
<td>Type 1</td>
<td>10m</td>
<td>2.4m or 4.5m</td>
<td>See note (c)</td>
</tr>
<tr>
<td></td>
<td>Type 2</td>
<td>10m</td>
<td>2.4m or 4.5m</td>
<td>See note (c)</td>
</tr>
<tr>
<td></td>
<td>Type 3</td>
<td>See para 3.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 1</td>
<td>Type 1</td>
<td>6m</td>
<td>2.4m</td>
<td>33m (or 25m)</td>
</tr>
<tr>
<td></td>
<td>Type 2</td>
<td>6m</td>
<td>2.4m</td>
<td>33m (or 25m)</td>
</tr>
<tr>
<td></td>
<td>Type 3</td>
<td>4m or splays (see 3.125)</td>
<td>2.4m</td>
<td>33m (or 25m)</td>
</tr>
<tr>
<td>Type 2</td>
<td>Type 2</td>
<td>6m</td>
<td>2.4m</td>
<td>25m</td>
</tr>
<tr>
<td></td>
<td>Type 3</td>
<td>4m or splays (see 3.125)</td>
<td>2.4m</td>
<td>25m</td>
</tr>
<tr>
<td>Type 3</td>
<td>Type 3</td>
<td>4m or) splays (see 3.125)</td>
<td>2.4m</td>
<td>23m</td>
</tr>
<tr>
<td></td>
<td>Type 4</td>
<td>4m or splays (see 3.125)</td>
<td>2.4m</td>
<td>23m</td>
</tr>
<tr>
<td>Type 4</td>
<td>Type 4</td>
<td>Dependent on tracking</td>
<td>2.4 m</td>
<td>23m</td>
</tr>
<tr>
<td>External Road Network</td>
<td>Major Industrial Road</td>
<td>15m</td>
<td>4.5m or 2.4m</td>
<td>See note (c)</td>
</tr>
<tr>
<td></td>
<td>Minor Industrial Road</td>
<td>15m</td>
<td>4.5m or 2.4m</td>
<td>See note (c)</td>
</tr>
<tr>
<td>Major Industrial Road</td>
<td>Major Industrial Road</td>
<td>15m</td>
<td>2.4m</td>
<td>33m</td>
</tr>
<tr>
<td></td>
<td>Minor Industrial Road</td>
<td>10m</td>
<td>2.4m</td>
<td>33m</td>
</tr>
<tr>
<td>Minor Industrial Road</td>
<td>Minor Industrial Road</td>
<td>10m</td>
<td>2.4m</td>
<td>33m</td>
</tr>
</tbody>
</table>

Notes:
(a) Radii are typical values, but are subject to variation depending on route types and widths. The 15m Industrial radii can be reduced if the development comprises mainly B1 offices. As a principle, radii should be minimised to assist pedestrians, and should be checked using vehicle tracking.
(b) The x-distance will depend on the level of development proposed. An x-distance of 4.5m will only be required where capacity is an issue. Consideration should also be given to the impact of the x-distance on the built form.
(c) The y-distance is dependent on measured eighty-fifth percentile wet weather speeds if they are available. If not, then the existing speed limit or the design speed of the road should be used. Any reductions in the normal y-distance will only be considered if appropriate speed restraint measures are proposed, they form part of a wider scheme, and are considered to be appropriate. Reference should be made to the tables in paragraph 3.119 and 3.120 for appropriate visibilities at different speeds.
3.125 The junction into a Type 3b only Level Surface Street can be any of the arrangements shown below. Option A should be used where there is a need to get vehicles off the priority route as quickly as possible. If option C is used for a junction on to a Type 1 street, then the ramp will need to be set back 5 metres from the junction with footways extending beyond the ramp. Option D should only be used onto a Type 2 street.

3.126 The junction of a Private Drive onto a Type 1, 2, 3 or 4 Street should be formed using a dropped crossing. On higher standard routes 4 metre minimum radii should be provided. Where access is taken from a Type 1 Street or a higher standard route, the initial 10 metre section of Private Drive should be 4.8 metres wide.
3.127 An adoptable visibility zone should be provided for drivers turning left into a minor route, to enable them to view potential hazards. The required visibility radii, tangential to the kerb, for different junction angles and kerb radii, are as follows:

<table>
<thead>
<tr>
<th>Junction Deflection (degrees)</th>
<th>Visibility Radius for each Kerb Radius</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4m</td>
</tr>
<tr>
<td>80</td>
<td>10m</td>
</tr>
<tr>
<td>90</td>
<td>9m</td>
</tr>
<tr>
<td>100</td>
<td>8m</td>
</tr>
</tbody>
</table>

3.128 Minimum spacings between side streets are as follows:

<table>
<thead>
<tr>
<th>Priority Route</th>
<th>Design Speed or Speed Limit (mph)</th>
<th>Minimum Junction Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Consecutive</td>
</tr>
<tr>
<td>External Network</td>
<td>40 mph Speed limit 30 mph Speed limit</td>
<td>90m</td>
</tr>
<tr>
<td>Type 1</td>
<td>25 mph Design Speed</td>
<td>45m</td>
</tr>
<tr>
<td>Type 2</td>
<td>20 mph Design Speed</td>
<td>33 m</td>
</tr>
<tr>
<td>Type 3</td>
<td>15 mph Design Speed</td>
<td>To suit circumstances</td>
</tr>
<tr>
<td>Type 4</td>
<td>10mph Design Speed</td>
<td>To suit circumstances</td>
</tr>
<tr>
<td>Major Ind Road</td>
<td>30 mph Speed limit</td>
<td>60m</td>
</tr>
<tr>
<td>Minor Ind Road</td>
<td>30 mph Speed limit</td>
<td>60m</td>
</tr>
</tbody>
</table>

Notes (a) right / left staggered junctions are preferred, as they generate fewer conflicting movements  
(b) priority crossroads will be allowed on Type 2, 3 and 4 streets  
(c) raised plateaux are an acceptable feature at crossroads
Other Matters

3.129 The gradient of the non-priority route on the approach to a junction should be a preferred gradient of 1 in 40 (2.5%) for the initial 10 metre length with an absolute maximum of 1 in 25 (4%).

3.130 Junctions must be pedestrian friendly with crossing points conveniently located on pedestrian desire lines to encourage proper use, and situated where visibility in all directions is optimized; excessive walking distance must be avoided. For low levels of development dropped crossings are preferable to kerb radii to give priority to pedestrians. Further guidance on recommended pedestrian provision is included in Sections "Pedestrian Movement" (below) and "Designing for Disabled People".

Pedestrian Movement

Principles

3.131 Pedestrian routes are classified as either footways (which are adjacent to the carriageway or verge) or footpaths (which are not related to the carriageway). Footways and footpaths serving new residential development should be adopted and lit (see paras 3.293 and 3.294 for further details on Street Lighting). Pedestrian movements are also catered for on Shared Space Streets Type 3a and Home Zones Type 4 - through the use of designated routes for vulnerable road users.

3.132 Within new residential areas, pedestrian movement should be convenient, lit, safe and pleasant. Direct routes should be provided to bus stops, local facilities, schools and adjacent neighbourhoods, in such a way that it is more convenient and attractive to walk than to drive to such destinations [NfL Principles 6 and 13].

3.133 Where pedestrian links are provided to create preferential routes, they should be as short as possible with good intervisibility between the ends, be well lit, and be overlooked or open to
view [NF原则44]。障碍物或类似物应被用来防止行人被车辆滥用，同时仍然保持对行人的访问，包括轮椅使用者。

3.134 作为连通性是一个主要考虑因素，警察联络官应该被咨询关于连接和布局（特别是在存在犯罪和反社会行为的地区）以确保压力不会在高速公路当局在道路通过时被施加一旦发展被占用。

3.135 关注和注意应给予到街道家具的位置来避免隐患和来提高整体设计。

Widths

3.136 最小的行人道宽度（和人行道）应正常是2米在道路的一侧，但是在某些情况下一个行人道可能在没有很大可能行人使用一个第二行人道的情况下是可以接受的。在这种情况下，如果有一个合理的可能的行人道在任何时间在未来被需要，将需要被采用。或者，如果没有很大的可能在将来需要行人道，那么1m的草带或0.6m的硬边是必要的。最小的行人道宽度应该增加到3米在认定的高行人活动区域，如学校，商店，公共汽车停车点等。在特定的地点（如公共汽车站），更大的宽度可能需要。

3.137 对共享的行人道/自行车道，请参阅第3.157段。

Gradients and Crossfalls

3.138 最理想的纵长截面的可采用的人行道或人行道的斜率是1/20（5%）。如果这是不可行的，那么斜率应该被讨论与城市委员会。

3.139 所有的行人道和人行道应该有1/40（2.5%）的横坡使到通道。

Vertical Clearance

3.140 一般的垂直高度2.6米的行人道应该被提供，有绝对的最小2.1米的垂直高度的标志。在距离车行道边缘450毫米，完全的5.3米的垂直高度要求将要被应用，参考第3.96段的条款。

Steps

3.141 步道的水平高度应被做出一个斜路路的特殊路径（参见第3.170 - 3.173段关于斜路路的设计）。如果一个斜路路不可以在空间内被容纳，那么步骤的设计应该被制定出来以适应尽可能多的人。

3.142 步道的水平高度应被做出一个常高的高度，最小100毫米，最大150毫米。在0.6毫米的宽度或最小的硬边是必要的。最小的水平高度宽度应增加到3米在认定的高行人活动区域，如学校，商店，公共汽车停车点等。在特定的地点（如公共汽车站），更大的宽度可能需要。

3.143 手扶栏杆应被提供，应该光滑和连续的，如果有多个台阶。手扶栏杆应在步道的末端和‘关闭’到墙，手扶栏杆应被设置在0.9米到1.0米的高度，超过踏步的每个台阶和应被设置在台阶之间。手扶栏杆应该被提供在两侧，一个最小的1.2米和一个最大的1.8米。

3.144 非滑的厚毛被应该被提供在步道的顶部和底部。
Crossing Points

3.145 Dropped kerbs should be provided at all junctions and particular pedestrian desire lines, including connections to external footpaths.

3.146 Guidance on the use of tactile paving or other suitable and approved materials is given in paragraph 4.38 and at all times the use of simple, appropriate, well-detailed, high quality materials should be a key objective.

3.147 In some locations pedestrian guard rails are required for safety reasons to protect pedestrians and guide them to the appropriate crossing point, although wherever possible unnecessary “street clutter” should be avoided. The presumption is not to use pedestrian guard railing unless required due to risk assessment outcomes.

3.148 Where a pedestrian refuge is provided, the dropped kerbs should be aligned with the refuge. A minimum refuge width of 1.8 metres should be provided.

3.149 Where dropped kerbs are provided across the minor route within a major/minor junction they can lie within the corner radius for junctions with radii of 4 or 6 metres. However for junctions with radii of 10 or 15 metres, they should be positioned further from the major route to reduce crossing distances. For low levels of development, dropped crossings are preferable to the provision of kerb radii to give priority to pedestrians.

3.150 Pedestrian crossing points can be delineated by raised plateaux, but they should not be designed to give pedestrians a false sense of security.

Cycling

Principles

3.151 Cycle routes in developments should meet the same basic criteria as pedestrian routes; namely convenience, safety, attractiveness, and directness.

3.152 Cycle linkages between key areas within the development and around it should be designed into a scheme from the start, with particular attention to routes to schools, local facilities and adjacent neighbourhoods.
3.153 Connectivity for cyclists should be maintained within estates, with culs-de-sac being provided with through accesses for cyclists and pedestrians.

3.154 New infrastructure for cyclists should link to existing and intended routes, as shown on the “Leeds Strategic Cycling Network Map”.

3.155 Evaluating how cyclists are best provided for in a scheme should be addressed within the Design Statement, and is considered in detail in Local Transport Note (LTN) 1/04, and on the Cycling England website (www.cyclingengland.org.uk)

**Widths**

3.156 Whilst cycle lanes on residential streets are not normally appropriate, where they are considered beneficial on Type 1 streets, they should be 1.5 metres wide (down to 1.2 metres as a minimum in exceptional circumstances).

3.157 While good quality off carriageway routes may be favoured, shared unsegregated use of a path alongside the carriageway by cyclists and pedestrians is a last choice option. Where this is proposed the minimum width is 3 metres. Reduced widths can be provided in exceptional circumstances – please seek advice of the City Council.

3.158 If the pedestrian and cycle routes are parallel but segregated by level difference, the preferred widths are 2 metres for each route. See LTN 2/04.

**Access Controls**

3.159 Where off-road cycle tracks are installed away from the carriageway, access measures such as “K” frames or bollards should be used to prevent access by cars or motorbikes. All access barriers must comply with Disability Discrimination Act (DDA) regulations. These measures should be installed if abuse is considered likely.
Visibility

3.160 Where a cycle track joins a carriageway, an appropriate x-distance must be provided with a normal minimum of 2.5 metres. Where a crossing or a junction with a carriageway is approached by means of a “jug handle” arrangement the x-distance can be reduced to 1.0m, or if the cyclist is physically slowed to a stop immediately before the crossing or junction by means of a barrier. Further details are in DMRB 6/3 Part 5.

Further Guidance

3.161 For further guidance on the design of cycle routes, please read:

- Local Transport Note 2/08 Cycle Infrastructure Design
- Updated guidance from Sustrans.

Cycle Parking

3.162 The City Council's guidelines for cycle parking within development should be followed. These are stated in the UDP Volume 2 Appendix A9C.1.

3.163 For all dwellings secure cycle storage should be provided. For dwellings with garages they should be designed to accommodate cycle storage in addition to parked cars. For preference, such garages should therefore be at least 6m long and 3m wide.

3.164 For apartments, communal cycle facilities can be provided which are secure, conveniently located, and covered [NFL Principle 75]. They should enjoy good natural observation, be lit, and should not obstruct pedestrian or cycle routes.
3.165 Commercial and industrial developments should be provided with secure, conveniently located, and covered long stay cycle parking facilities as specified in the UDP. This can take the form of cycle lockers or lockable compounds. They should be located where they are easily observed by the development’s occupants, be lit, and should not obstruct pedestrian or cycle routes, or pedestrian desire lines. Adequate shower and locker facilities must be provided to encourage cycling as a means of transport. Short stay cycle parking provision should be provided for visitors of the site in the form of Sheffield Stands or similar, situated in full view as close as practical to the main entrance of the building.

3.166 ‘Butterfly’ type cycle stands, or other types that do not easily allow users to directly secure wheels and frame, should not be used in any circumstances.
Designing For Disabled People

Principles

3.167 The City Council’s “Neighbourhoods for Living” document requires developers to design streets and spaces to provide good access and clarity for disabled people [NfL Principle 29]. It also seeks to ensure that routes are accessible to all, and are not obstructed.

3.168 This Street Design Guide considers the needs of disabled people within all elements of the design guidance, so that their requirements are incorporated from the start of the process, rather than added as an afterthought.

3.169 Potential obstacles to be aware of include steps, steep gradients, narrow passages or footways, badly located street furniture, uneven surfaces, excessively smooth surfaces, parked cars and poor attention to construction details. Changes of gradients at bends (especially at side street crossings) need to be carefully designed to prevent problems for wheelchair users. Shared Surface Streets do form a specific concern for blind and partially sighted people who perceive them to be unsafe. Way finding is a specific concern as is indiscriminate parking causing obstructions. These issues should be properly considered in the choice of whether a Shared Surface Street is appropriate in any particular circumstance.

Ramps

3.170 Ramps into individual buildings must not be located within the adopted footway, however re-grading of the footway can be considered on a site by site basis.

3.171 Pedestrian ramps should have a desirable gradient of less than 1:20 (5%) which should be regarded as the norm. Gradients must not exceed 1 in 12 (8.3%) and if this gradient is utilised then it should not be for a greater length than 2 metres. Should this not be achievable, the specific circumstances should be discussed with the City Council.

3.172 The maximum length of a ramp shall not exceed 6m unless provision is made for a level landing of preferred length 2m (with or without an adjacent resting platform). Slopes of between 1 in 12 and 1 in 20 need at least a handrail down one side. Stepped ramps should be avoided.

3.173 Ramps should be 2000mm wide to permit wheelchairs to pass. The minimum width over short lengths can be 1500mm. Handrails should be set 1000mm above the ramps and provided on both sides.

Tactile Paving

3.174 Tactile paving to assist blind or partially sighted people should be utilised in accordance with national guidance.

Disabled Car Parking

3.175 The number of car parking spaces for disabled people for a particular
Development should be in accordance with the City Council’s UDP guidelines. If overall parking levels are below the maximum provision recommended within the UDP, then the number of disabled spaces should be 10% of the maximum UDP provision, not 10% of the actual number of spaces provided.

3.176 The size of car parking spaces for disabled people in private parking areas should be in accordance with BS 8300. Disabled spaces will not be marked out in such a way on the Public Highway.

3.177 Where car parking spaces for disabled people are proposed, consideration must be given to their convenient location, and the provision of either dropped kerbs or a ramp to gain access to the adjacent footway.

**Car Parking**

**Principles**

3.178 Car parking is one of the most difficult issues to deal with effectively within a development. Car parking needs to be considered as an integral part of the overall design of a scheme and street, and not considered as an “add-on” or a detailed issue to be left to the end of the design process.

3.179 Government policy on car parking is to manage unnecessary car usage by locating new housing in locations which are accessible by public transport, and to have access to local facilities on foot and by bicycle. These measures can encourage a greater number of trips to be made sustainably, however, car parking still needs to be accommodated whilst not dominating the streetscene or dictating the overall layout.

3.180 Car parking provision should be based on expected car ownership and the need to cater for visitors, and should be provided to suit the nature and location of the development. As a general rule the City Council will seek...
to ensure car parking provision is at an appropriate level, taking into account both the potential impact on the surrounding area, and the availability of public transport in the vicinity [NfL Principle 73].

3.181 “Neighbourhoods for Living” sets out five further principles to be taken into account in the design of car parking areas;

- ensure car parking is usable, safe and secure [76]
- avoid car parking dominating streetscenes [77]
- use discreet and innovative solutions for car parking [78]
- ensure parked cars are unobtrusive [79]
- set car parking behind the front of the dwellings [80]

3.182 Designated parking locations must be convenient for residents, within easy reach and ideally visible from their homes. This should ensure that residents do not find it more convenient to park on-street adjacent to their dwelling rather than use their dedicated space.

3.183 On-street parking can be appropriate for visitors and for servicing/deliveries so long as there are no highway safety, design or amenity reasons why this should not occur. Residential streets need to be wide enough to accommodate the likely levels and positions of on-street parking and widening may be required to accommodate this. The design should be self enforcing so that bad neighbour problems are not created. Individual parking bays shall be avoided where possible as they become ‘owned’ by residents. In some locations however, it may be appropriate to provide on-street parking in communal bays, with pavement buildouts and tree planting visually separating the parking area from the main carriageway.

3.184 Where on-street parking is to be used a source of parking by visitors and residents it is likely that the incidence of on-street parking will increase. It is important in the interests of good design that when this is expected the street should be designed to accommodate vehicles through carriageway widening or other means of accommodating vehicles. This requirement is to ensure a quality and user friendly street environment, rather than to address concerns of safety.

3.185 On-street parking needs to be accommodated in such a way as not to obstruct or make access to private drives too difficult. Similarly on-street parking should not be allowed so close to a residential window or main door so as to be oppressive, block access or light or intimidate the occupier. Where on street visitor parking cannot be accommodated then visitor parking needs to be provided off street.

3.186 The appearance of parking areas (both in the street and in parking courts) should be enhanced by the provision of shrub and tree planting, with consideration given to the angle of viewing, to reduce the visual impact of the vehicles. The detailed design and specification should avoid compromising personal safety or facilitating car crime.

Here generous front gardens and planting prevent parking being visually intimidating to the adjacent properties.
3.187 Two methods are set out below for calculating the appropriate number of car parking spaces for residential developments within Leeds. It is generally most appropriate to use Method Two for major residential planning applications. For smaller infill developments Method One may be more appropriate. The footnotes included in Method One apply to Method Two as well.

**Method One**

3.188 Method One is based on research carried out relating to new developments in Leeds, and provides benchmark figures based on dwellings size and type. From current practice it is expected that this methodology would average parking levels across the Leeds district of 1.5 spaces per dwelling or less.

3.189 The car parking benchmarks detailed below are regarded as a starting point that would be appropriate for a typical urban area of Leeds, and the footnotes provide guidance on where it may be appropriate to provide a lower or higher provision.

3.190 Benchmark Car Parking Guidelines:

- 2 spaces per dwelling for 3 bed + visitor parking
- 1.25 - 1.5 spaces per dwelling for 2 bed houses and flats + visitor parking
- 1 space per dwelling for 1 bed dwellings + visitor parking
- 1 space per dwelling for all dwellings in city centre fringe and local centres + visitor parking as appropriate
- 1 space per dwelling for all dwellings in city centre core as a maximum provision. It is expected that city centre core locations would generally average no more than 0.6 spaces per dwelling. Visitor parking is not normally appropriate.
- Visitor car parking to be provided at a rate of 1 space per 5 units (see footnote 5)

Footnotes

1. The above benchmarks are regarded as a start point for off-street car parking provision in a typical urban area of Leeds.

2. Developers will be permitted either a reduced or increased parking provision where it is demonstrated that car ownership of the occupants is likely to be lower or higher than the Leeds average.
3. Residential Car Parking Research published by the Department of Communities and Local Government (DCLG) in May 2007 suggests that major factors influencing car ownership are dwelling size, type and tenure. The location, availability and quality of public transport, availability of on-street parking and specific measures promoted to reduce car ownership eg car clubs, may also influence car ownership. The allocation of spaces to individual dwellings can influence the efficiency of car parking provision. Highway Officers may require changes to a Developer’s parking provision based upon these factors. Where either the Developer or Highway Officer requires a different parking provision to that stated above, the justification should be based upon likely car ownership and allocation of parking spaces, not car usage. The following factors need to be considered:

**Type of Housing** - i.e. houses, flats, rented, affordable (note: the revised appendix A9A of the UDP provides separate guidance for Student and Retirement and Sheltered Housing).

**Location** - The above benchmarks are regarded as a starting point for off-street car parking provision in a typical urban area of Leeds as stated. Therefore the types of locations that could be considered differently include: city centre, city centre fringe, S2 town and district centres, beyond the outer ring road, outer-lying/rural settlements. The convenience of a location to facilities and employment also needs to be considered, i.e. employment centres, shopping, banking, schools, and health and leisure facilities.

**Availability and Quality of Public Transport** – consideration needs to be given to the proximity of bus/train stops, variety of services and frequency, capacity and journey times when compared to an equivalent car journey time for all journey types.

**Type of Potential Occupier** – i.e. age, income, families, professionals.

**Availability of On-Street Parking** – Consideration needs to be given to whether there are restrictions that prevent convenient opportunities to park on street, i.e. parking restrictions (TROs) and existing competing demand for on-street parking.

(The above list of factors is not exhaustive)

4. Where a property is provided with allocated parking, at least one ‘open’ or surface car parking space is required per unit in all the cases stated above, i.e. where a residential unit is considered to require only one car parking space, that space should not be a garage (see also footnote 9).

5. Where a proposal includes communal parking areas a suitable condition will be used to ensure that parking spaces are not sold on to individual plots/units. A further condition is required to ensure that visitor and disabled persons’ parking spaces remain so in perpetuity and cannot fall into individual ownership. Where visitor parking is provided off-street, it should be freely accessible ie not be enclosed behind private gates, etc. A Section 106 Agreement may be required to control this issue.

6. Where parking is remote from the dwelling but allocated the applicant will be asked to identify all parking spaces with its associated plot/unit number. The parking spaces will then be conditioned to be retained by the dwellings identified.

7. Where housing layouts are designed on Type 2 or 3 streets the Method One visitor parking requirement can be provided on street if the carriageway is a minimum of 5.5m wide and suitable on street parking spaces can be identified that do not impede pedestrians, access to drives/
parking areas or otherwise prejudice highway safety. However, care is needed to ensure that emergency vehicles and refuse vehicles are not impeded. Visitor parking should not be waived where on-street parking causes safety concerns, i.e. close to bends or junctions, or where limited plot frontages could lead to blocking of driveways, i.e. terraces and townhouse designs. In these instances additional carriageway width is required to accommodate on-street parking or off-street spaces should be provided.

8. Where parking is likely to take place around turning heads, the housing design should preferably be modified, or alternatively the turning head enlarged so that parked vehicles do not prevent other vehicles turning.

9. Garages are not always used by owners for parking a car. Fewer still will use a garage for short-term parking and only use a garage for overnight storage. Additionally, many modern garages are impractical to use due to the limited internal dimensions. Where internal dimensions are below 5.0m x 2.8m the garage will not be counted as contributing to the parking provision. If the garage is 5.0m x 2.8m or larger then it will be counted as a parking space only if alternative bicycle storage is provided. Garages of 6m x 3m internal dimensions or greater will be counted as a parking space regardless of separate cycle storage.

10. Drive lengths should be a minimum of 5m long, or 5.6m long in front of a garage door to accommodate one car parking space (the additional 0.6m will allow a garage door to be opened). Careful consideration should be given to driveways between 8.5m and 10m long (9.1m and 10.6m in front of a garage door) where there is a footway in front of the property. In this range there is a risk that residents could park two cars on the drive and overhang the footway.

11. When assessing car parking provision in new developments, unnecessarily large driveways are an inefficient use of land and could distort the likely parking provision. Layouts should make efficient use of land, but where such driveways are unavoidable, the recorded parking provision for an individual dwelling will be limited to three spaces and the visitor parking requirement will still apply.

Method Two

3.191 Method Two is based on the published methodology outlined in the DCLG document “Residential Car Parking Research” May 2007. The figures shown are calculated from Leeds averages but it is envisaged that ward specific car ownership data would be used where available. The DCLG document uses 2001 census area statistics and suggests that car ownership varies most directly in relation to dwelling type, size and tenure. The variables given are: type – house or flat, size – number of habitable rooms (i.e. all rooms excluding bathrooms – as used in census) and tenure – owned or rented.

3.192 The 2001 census area statistics are then growthed and figures quoted accordingly. Furthermore, requirements for visitor car parking are added in, where applicable, and crucially the level of car parking is dependent on the proportion of ‘allocated’ and ‘unallocated’ spaces provided for a dwelling. The table shown is therefore the Leeds’ equivalent to table C5 in the DCLG document (i.e. it includes for visitor parking). This methodology is in line with the latest government guidance.

3.193 It is essential that the number of habitable rooms and the level of growth to be applied to the census statistics is agreed with the Council. The table shown has growthed the Leeds district 2001 census data by 22%.
3.194 The recommended car parking provision based on tenure (i.e. owned or rented), the number of habitable rooms (excluding bathrooms) plus the number of allocated car parking spaces is as follows:

<table>
<thead>
<tr>
<th>Owned Houses</th>
<th>Number of allocated spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>3 rooms</td>
<td>1.0</td>
</tr>
<tr>
<td>4 rooms</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>5 rooms</strong></td>
<td><strong>1.4</strong></td>
</tr>
<tr>
<td>6 rooms</td>
<td>1.6</td>
</tr>
<tr>
<td>7 rooms</td>
<td>1.9</td>
</tr>
<tr>
<td>8 rooms</td>
<td>2.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flats</th>
<th>Number of allocated spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1 room</td>
<td>0.5</td>
</tr>
<tr>
<td>2 rooms</td>
<td>0.7</td>
</tr>
<tr>
<td>3 rooms</td>
<td>0.7</td>
</tr>
<tr>
<td>4 rooms</td>
<td>0.9</td>
</tr>
<tr>
<td>5 rooms</td>
<td>1.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rented Houses</th>
<th>Number of allocated spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>3 rooms</td>
<td>0.4</td>
</tr>
<tr>
<td>4 rooms</td>
<td>0.5</td>
</tr>
<tr>
<td>5 rooms</td>
<td>0.6</td>
</tr>
<tr>
<td>6 rooms</td>
<td>0.8</td>
</tr>
<tr>
<td>7 rooms</td>
<td>1.1</td>
</tr>
<tr>
<td>8 rooms</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>0.5</strong></td>
<td><strong>0</strong></td>
</tr>
<tr>
<td>1 room</td>
<td>0.3</td>
</tr>
<tr>
<td>2 rooms</td>
<td>0.3</td>
</tr>
<tr>
<td>3 rooms</td>
<td>0.3</td>
</tr>
<tr>
<td>4 rooms</td>
<td>0.5</td>
</tr>
<tr>
<td>5 rooms</td>
<td>0.6</td>
</tr>
</tbody>
</table>

- All spaces unallocated communally available (i.e. no allocated spaces): 10 x 1.4 = 14 spaces
  ∴ 14 unallocated spaces needed
- Each property has a drive, but no garage (i.e. 10 allocated spaces): 10 x 1.7 = 17 spaces
  ∴ 7 unallocated spaces needed
- Each property has both a drive and a garage (i.e. 20 allocated spaces): 10 x 2.3 = 23 spaces
  ∴ 3 unallocated spaces needed

Note: a) A garage of 6m x 3m will be used in this calculation as a parking space.
   b) Allocated spaces have to be allocated to individual dwellings e.g. 2 spaces actually allocated to one dwelling and no spaces allocated to another cannot be averaged to suggest that there is one space allocated to both.

3.196 The unallocated communal spaces should be identified on a plan, and should be conveniently located for the intended users (see also paragraph 3.202 to 3.209). Where it is proposed that the unallocated provision is provided on-street, this requirement must be designed into the street layout by road widening etc. as the demand will not be limited to occasional visitors but also the residents themselves.

*See also footnotes on page 52.*
Garages and Driveways

3.197 From a survey of recent residential developments in the Leeds District, it is clear that only a proportion of properties with garages use their garages for storing their car on a regular basis. Domestic garages have a number of different uses and cannot be seen as adding to the car parking provision for a development unless they meet the following criteria:

i) They are accessible by a private car – this usually requires a forecourt depth of 7.3m where they are in courtyard situations and where drive access alignments are straight enough to accommodate access by a medium sized car.

ii) They have minimum internal dimensions of 6.0 x 3.0 metres, to accommodate the storage of bicycles and other items.

iii) They have minimum internal dimension of 5.0 x 2.8 metres and separate cycle parking provision.

iv) Garage doors should have a minimum width of 2.4m.

3.198 Where these requirements are not met then a garage will not count as a parking space. This is because below these sizes garages are not considered large enough for practical use and to account for the survey data that only a minority of people use their garages for car parking whilst the remainder use them for other things including storage, conversion to room, workshop, etc. Garages will not normally be accepted as sole parking provision for a property as they are used for long term storage in the majority of cases, i.e. not for vehicle maintenance, car washing, unloading shopping, short stays etc.

3.199 Driveways should be at least 3m wide, or 3.3m if the drive provides the main pedestrian access to the dwelling. For a standard ‘up and over’ door, the face of the garage should be 5.6 metres minimum from the back of the footway (Street Types 1 or 2) or from the edge of the shared surface (Street Type 3). In exceptional circumstances this can be reduced to 5.0 metres where the garage door type is controlled by planning condition. Driveways shall preferably be sufficiently long for either 1 or 2 cars, but not an intermediate length which would lead to overhanging of the footway or shared surface.
3.200 2.0m by 2.0m pedestrian sight lines (see diagram below) should be provided where the drive meets the back of the footway on street Types 1 and 2, 2.0m by 23m on Shared Surface Streets (Type 3), and 2.0m by 23m within Home Zones (Type 4). There should be no physical obstructions or planting within these areas, that are above 0.6 metres high. The areas should also be easy to maintain to avoid future obstructions.

3.201 A garage door must not project over the public highway when opened.

Communal Parking Areas

3.202 If communal parking areas are to provide a convenient alternative to on street parking they must be safe and attractive. Parking areas, particularly rear courtyards, must include sufficient levels of overlooking to ensure they do not become oppressive and unsafe environments. They must also be small enough to retain a courtyard feel and not become large, unattractive ‘car parks’. They must also incorporate a convenient pedestrian link to the properties served. Materials, lighting and landscape features within communal parking areas are also important within the overall design.

Pedestrian sight line from driveway

3.203 The treatment of communal parking areas will need to respond to local context and should be considered at the outset. A rear parking court within a relaxed village environment may be publicly accessible and provide a safe and attractive courtyard space whereas

These two images show the importance of detailed design in courtyard settings. Above: a barren, intimidating feel results from blank fencing, limited overlooking and the materials used. Below: more of an inviting courtyard feel is generated through the use of softer materials, and houses which overlook, and are accessed from, the space creating a true courtyard feel.
the same arrangement within a central urban location may create safety issues and a gated communal area may be more appropriate. It is unlikely that a large number of spaces in one area would provide an appropriate solution.

3.204 On street parking should wherever possible be incorporated into the layout of the development as attractive squares and communal spaces, fronted by development. Again the size and treatment of these spaces will be important and must respond to the type and context of a development.

3.205 For parallel parking which is contiguous with the carriageway, parking bays should be 6 metres long and 2.4 metres wide. End bays also require an additional 45 degree splay. Where there is no footway, a 0.6m wide paved margin should be provided to allow pedestrian access.

3.206 For parking which is at the right angles to and contiguous with the carriageway, parking bays should be 4.8 metres long and 2.4 metres wide. There should be a clear 6 metres width in front of the bays to allow vehicles to manoeuvre. Where vehicles may potentially overhang an adjacent footway, then an additional footway width should be provided.

3.207 Communal car parking within parking courts should include 4.8 metres by 2.4 metres spaces and have an aisle width of at least 6 metres. A 3 metre reversing area is desirable at the end of the aisle, with an absolute minimum of 1 metre.

3.208 Angled parking arrangements and other layouts will be considered but it will need to be demonstrated (by vehicle tracking) that they are operationally practical.

3.209 It is possible to be able to denote car parking spaces with contrasting materials for the edges or the whole of the space. This is particularly useful where it is preferable to avoid the use of white lining.
Car Free Developments

3.210 Residential developments which restrict the ownership of cars in locations within Central Areas and Controlled Parking Zones (CPZ’s) are encouraged [NfL Principle 25].

3.211 Residential developments which do not adequately provide for their parking requirements will not be accepted. Whilst a level of on-street parking may be acceptable it depends on the nature of the street and the ability of that street to accommodate on-street parking without causing issues of road safety i.e. restrict visibility, cause unacceptable delay or introduce reversing manoeuvres or bad neighbour/amenity issues. It is likely that even in car free developments that some provision for visitor car parking will be required.

3.212 Such developments should consider the possibility of promoting Car Clubs and providing Car Club spaces within the development. Further advice is contained within the car plus document “A Good Practice Guide for Planners and Developers – Achieving low Low Car Housing: The Role of Car Share Clubs”, or at www.carplus.org.uk/carclubs. Leeds has had a city-wide car club operational since 2004, so that developers do not have to develop a car club scheme themselves.

3.213 Car Free Developments will only be considered if they are genuinely “car free” and legally controlled.

Commercial or Industrial Developments

3.214 In addition to staff and visitor car parking in accordance with City Council guidelines, it may be necessary to consider parking provision (short or long stay) for different vehicle sizes and types. This issue also relates to the servicing and turning requirements set out in Section ‘Servicing, Vehicle Tracking and Turning Spaces’.

3.215 The car parking provision and layout within commercial or industrial developments needs to be carefully considered to ensure that overspill car parking does not occur on access roads or off-site streets and roads.

Other Car Parking Issues

3.216 Some developments may require the introduction of Traffic Regulation Orders (TRO’s) or Resident Parking Schemes. The legal and financial procedures for these should be discussed with the City Council.

3.217 The use of Travel Plans and contributions to the improvement of public transport facilities will also be encouraged to minimise the demand for car parking, and increase the likelihood of sustainable travel modes being utilised.

Servicing, Vehicle Tracking and Turning Spaces

Principles

3.218 The vehicle path is the width required for vehicle movement within the overall street width, given the nature of vehicles likely to utilise the street.

3.219 The position of buildings and other features needs to be considered alongside the requirements for pedestrian and vehicle movements, so that the design is not dictated by standard road layouts [NfL Principle 20]. Vehicle tracking demands need to be accommodated but should not dominate. It should be used to lessen the dominance of the carriageway, so that kerblines do not rigidly follow vehicle paths but take note of the building lines, etc.

3.220 Nevertheless there is still the need to safely accommodate the manoeuvring and turning requirements of larger vehicles, including for refuse collection, deliveries and in emergencies. It is therefore important at the start of the design process to determine which vehicles need regular access, and which can be assumed to use the street only occasionally.

3.221 Linked street layouts reduce the need for culs-de-sac and turning heads.
Servicing Requirements

3.222 The recommended maximum dustbin carry distance is 25 metres, so that designs need to enable refuse vehicles to get within 25 metres of all drive-ends or communal bin storage locations. However where significant gradients exist, heavy bins can be difficult to control, and a shorter distance is more appropriate.

3.223 Bin storage locations shall be clearly identified for all dwellings, with easy, level access from their storage location to the collection location. The increasing need for additional bin storage areas (to accommodate larger bins or additional recycling bins) shall be taken into account.

3.224 Vehicle tracking may be necessary to ensure that refuse vehicles can manoeuvre along the street, and past any likely locations for on-street parking. The requirements for street cleansing and gully cleaning should also be considered.

3.225 The dimensions of the current refuse vehicle used by the City Council is as follows, although this may alter from time to time. Refuse vehicle tracking shall be undertaken at a design speed of 15mph on Street Types 1 and 2, or 10mph on Street Types 3 and 4:

Width = 2.5m
Length = 11.0m
Turning Circle (wall to wall) = 18.6m

The vehicle within the Autotrack database which most accurately represents this vehicle is the Phoenix 2-25w (with Volvo FM 12 Chassis) although this may alter from time to time.

3.226 As a general rule, carriageway widening is normally needed on bends which turn through more than 10 degrees. However the need for widening may vary according to the amount of traffic on the road and may also be influenced by the amount of forward visibility provided between passing places on each side of the bend. On very lightly trafficked roads, the chances of two large service vehicles needing to pass on the bend must be sufficiently remote to make widening unnecessary. Similarly where adequate forward visibility is provided between oncoming vehicles it will be possible for large vehicles to wait until the bend is clear and to use part of the opposite lane when turning. Even with a 15m outer curve radius a pantechicon (i.e. a 10 metre long rigid vehicle) can turn on a 5.5m carriageway without any widening and without using the whole of the carriageway width.

3.227 Turning space is also required to avoid the need for long reversing manoeuvres by refuse vehicles. A range of typical turning space dimensions are shown below, although alternative solutions may be acceptable if demonstrated to be workable using vehicle tracking. The potential implications of vehicle overhang shall be considered within any non-standard layout. The diagrams below show the areas required for vehicle manoeuvring, plus examples of possible treatment to minimise the visual impact of the turning head.
3.228 For a Type 3 Shared Surface Street which is less than 45 metres long, and serves less than 10 dwellings, it may be possible for the refuse vehicle to reverse under supervision from the Type 1 or 2 street into the shared area. Where such arrangements are considered acceptable, the turning space at the end of the Type 3 street may be reduced to that required by a private car only. Typical designs are shown below, although alternatives are possible if proved to work using vehicle tracking.

3.229 There will also be the occasional need for larger service vehicles to be accommodated, including delivery vehicles and furniture vans. These have different turning requirements, and whilst the design does not need to allow for regular use, the potential for these vehicles needs to be considered, and accommodated where necessary.

3.230 Turning areas can be enlarged to allow for the introduction of visitor spaces (in accordance with the City Council’s guidelines), although it should be ensured that visitor spaces are clear of the turning area.

*Alternative refuse collection vehicle turning heads*

*Alternative car turning heads*

Here turning requirements have been accommodated in an area that also provides for parking and driveway access as well as a small amenity space for residents – the result is an attractive, multi-functional space that enhances rather than dominates the overall environment.
3.231 On industrial roads, the turning heads need to accommodate all sizes of vehicles, with some possible layouts being shown below:

3.232 All of the turning head arrangements shown here are indicative only and should not be used as the only solutions – these turning areas are important in the adequate functioning of an area but their design must be balanced against other requirements such as environmental amenity. Wherever possible they should be incorporated within ‘spaces’, not constructed purely as turning heads. It is also possible to incorporate these geometries within communal parking areas or other spaces.

**Emergency Access**

3.233 Adequate access for emergency vehicles must be provided, and consultation with the emergency services is recommended for all schemes.

3.234 Wherever possible developments should be designed so that there is no requirement for “emergency vehicle only” links. These are difficult to enforce if there is no physical barrier, and if there is a physical barrier, it can cause delays for emergency vehicles.

3.235 Fire tenders must be able to reach a point no further than 45 metres from all doors on the ground floor of any residential building.
3.236 Any Street or Private Drive on such an access route must be no less than 3.7 metres wide between kerbs, or 3.1 metres at a gateway or other pinch point over a short length (where separate provision should be made for pedestrians).

3.237 The minimum headroom clearance for Fire appliances is 4.0 metres, and the minimum carrying capacity of the route 2.5 tonnes.

**Landscape Considerations within the Highway**

3.238 The design of landscaped areas should be considered at the early analysis and concept stages of the design process, as set out on page 60 of “Neighbourhoods for Living”. Greenspace is often located to preserve existing trees, and highway designs should similarly respect natural features. This is given further consideration in the forthcoming Council SPD “Trees and Development”.

3.239 Landscape provision within the highway boundary should be integral to its conceptual and detailed design, and be consistent with the wider development and the surrounding landscape context. The form and character of streets within a development will shape its character, as much as the architecture and open spaces, and are an integral part of the place-making process. The quality and variance of hard landscape materials (such as surfacing, kerbing, paving, walls, bollards, railings, etc) combined with carefully selected soft landscape elements (including trees, shrubs and grass) will help to add character to a development, and turn the street types outlined in this guide into recognizable places and liveable spaces.

3.240 In residential areas the Highway Authority will normally only adopt the paved surfaces (i.e. carriageways, footways, footpaths, cycleways and hard landscaped areas) plus grass verges required for the functioning of the highway (e.g. visibility splays) and any trees retained in them, subject to a condition survey.

3.241 However other appropriate soft landscape features will be considered for adoption, although a commuted sum is required if additional maintenance costs are likely.

Here planting helps to visually break up the extent of a blank wall, adding to the visual amenity within a parking court whilst also defining the boundaries of the vehicular space

Here landscaping enhances the central island

3.242 Within the street corridor, trees can aid recognition of spatial geometry of carriageway edges and reduce its overall apparent width. Limited planting of new trees may take place within visibility splays, but only where this would not significantly compromise forward visibility. Some limited retention of existing trees may also be possible, providing the trees are of slender girth when mature, have no foliage lower than 2.6m over the footway, or 5.3m over the carriageway, and their numbers do not have a significant cumulative impact on visibility from a stationary vehicle position.
3.243 The species of new trees must be selected which have a root growth pattern which will not cause future damage to paved highway surfaces. Root barriers may also be needed to prevent root ingress into services.

3.244 Existing trees to be retained for adoption must be subject to a condition survey, carried out in accordance with B.S. 5837 (2005) “Recommendations for trees in relation to construction” and have any recommended tree work carried out to the satisfaction of the City Council’s arboricultural advisers.

3.245 Within visibility splays and forward visibility envelopes, ground cover shrub planting up to a maximum potential growth height of 0.6m is acceptable as an alternative to grass subject to the relative height difference between the landscape area and the adjacent carriageway. The city council will adopt all visibility splays required for the safe functioning of the highway. New tree and shrub areas must be planted in prepared tree pits and topsoiled areas to dimensions and specifications set by the City Council. Careful consideration should be given to the location of any “spikey” varieties of shrubs.

3.246 For ease of maintenance, grass verges should be at least 1 metre wide and planted areas at least 2 metres wide.

Any tapering verge ends narrower than this should be squared off and hard paved. Any grassed area less than 10 square metres should be avoided, as it would be difficult to maintain.

3.247 Grass should not be used where vehicles or pedestrians are likely to go over it. In such areas the design should be amended, or hard surfacing introduced for the relevant section.

3.248 Grass areas adjacent to vertical structures should be provided with a flush hard paved mowing strip at least 200mm wide.

3.249 A “licence to cultivate” under Section 142 of the Highways Act (1980) can be arranged, which entitles an adjoining owner to maintain the highway verge, although this does not remove the “Statutory Undertakers” rights, or the Highway Authority’s liability.

Public Utilities

3.250 Early in the planning process consideration should be given to the location and installation of utility apparatus in the highway both above and below ground, particularly where surface areas are shared. Where the proposal is for a shared-surface layout
without a separate service margin, or where a development layout is not explicitly covered by this guidance, early discussions should be held with utility providers and details of proposed locations for utility equipment submitted to Leeds City Council for approval. In assessing the proposed layout the City Council will consider the suitability of the layout, in terms of safety and accessibility.

3.251 With Type 3 Shared Surface Streets, a service strip of 1.8 metres should be provided within the carriageway, 1 metre clear of the nearest public sewer and 0.3 metres from the kerb race.

3.252 Any separate service margin should be at least 2m wide, in line with National Joint Utilities Group (NJUG) 7. And any utility equipment that is above ground, for example, cabinets, boxes, pillars and pedestals should be sited so that it:

- does not constitute a danger to the public or to staff working on it;
- does not obstruct a driver’s view, for example, by sitting it in visibility splays;
- does not obstruct pedestrians, wheelchair users, prams, pushchairs, etc. At least 1.2m clearance, increased to 2m in areas of high pedestrian flows (500 pedestrians an hour), shall be provided;
- is not located within 5m of any other street furniture that would create a double obstruction to pedestrians. Any item within 5m must be in line;
- does not enable illegal access to adjacent premises or property (e.g. locating cabinets adjacent to high boundary walls, where the apparatus could be used to climb over the wall);
- does not restrict the outlook from the window of a house, intrude into areas of open-plan front gardens or disrupt the line of low boundary walls;
- does not spoil the view of a listed building; or
- does not result in ‘visual clutter’ by being in an inappropriate place;
- does not indiscriminately create wide sterile easements within verges or Public Greenspace (i.e. grassed areas maintained by the City Council).

3.253 All Utility excavations should be backfilled with Type 1 class material to the underside of the road construction.

3.254 All apparatus above the ground should:

- be positioned so there is enough access for the equipment and the surrounding highway to be maintained and cleaned;
- not be located within any tactile paving (in the case of surface covers);
- allow space for associated jointing chambers;
- allow for future surfacing work, for example by allowing for spare cable if the boxes are raised in future;
- meet the licence requirements for listed buildings and conservation areas; Special consideration to cabinet design in conservation areas is required; and
- incorporate anti-graffiti coating measures.

Note: Street Lighting is normally column mounted in areas not overrun by vehicles. Street lighting can be wall mounted so long as the appropriate agreements are provided.

3.255 Where equipment is to be located in a proposed adoptable highway, cabinets and other apparatus shall be located in the verge where possible, with a hard margin to assist grass cutting without the need for strimming. Cabinets shall be located with at least 1m clearance between the cabinet and the edge of the carriageway in rural areas and 1.5m in urban areas. Access doors should always open to the footway. If there is no verge, cabinets and other apparatus shall be located at the back of footway and keep:

- minimum distance of 1m between the edge of an open access door and the edge of the carriageway where pedestrian flows are low; or
- a minimum distance of 2m between the edge of an open access door and the edge of the carriageway where
pedestrian flows are heavy (500 pedestrians an hour at any time).

3.256 Consideration may be given to adopting any additional small areas outside the natural highway footprint so that above-ground apparatus can be located in accordance with the above requirements. If, however, the above requirements cannot be met within clearly defined adoptable areas, the apparatus should be located outside the adoptable highway, which may necessitate an easement to allow utility providers access for future maintenance.

3.257 Utility apparatus below ground shall be positioned in accordance with the requirements of NJUG7. This should avoid impact on tree root zones by their judicious location and by special methods of working where this is unavoidable, in accordance with NJUG10 and B.S.5837 (2005) “Trees in Relation to Construction – Recommendations”. All utility excavations should be backfilled with Type 1 class material. Recommended apparatus locations are as follows:

Surface mounted access chambers shall be located to:

- minimise disruption to pedestrians and provide adequate access for installing and maintaining equipment, and recovery operations;
- avoid areas of expensive paving as far as possible (e.g. tactile paving);
- avoid locations where 2-wheeled vehicles may be turning or braking;
- avoid other utility providers’ equipment;
- avoid locations which compromise paving surface treatment design;
- allow mechanical equipment to be used during construction and installation, maintenance and recovery operations at the site;
- make sure the type and construction of underground boxes allows for raising the level of covers and frames as part of maintenance operations; and
- avoid potential archaeological features, including foundations to listed buildings.

Where access covers are located within block paved or flagged footway surfaces recessed covers should be used and the paving pattern continued through the cover. However where vehicles can overrun covers (ie shared surfaces or overrunning of footway) they shall be cast iron instead.
3.259 All developments shall make adequate provision for draining surface water from the adoptable highway.

3.260 The use of alternative drainage systems including Sustainable Urban Drainage Systems flow attenuation and storage systems are encouraged, and will be considered on a site-by-site basis. Further information is set out in Appendix E of this Design Guide.

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

3.262 SUDS are more sustainable than conventional drainage methods because they:

- manage runoff flow rates, using infiltration and the retention of storm water;
- protect or enhance the water quality;
- are sympathetic to the environment setting and the needs of the local community;
- provide a habitat for wildlife in urban watercourses; and
- encourage nature groundwater recharge (where appropriate).

They do this by:

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

3.263 The use of SUDS is seen as a primary objective by the Government and should be applied wherever practical and technically feasible. It is proposed that all new streets that are large enough for SUDS to apply should submit a SUDS proposal. It is only when such a submission confirms that the scheme is not feasible will an alternative be considered.


3.265 Only if SUDS are confirmed not to be feasible will highway run-off be intercepted and discharged directly to a public sewer adopted by the Water Authority. If this is not possible, run-off shall be discharged to a separate piped highway drainage system, which shall, with the approval of the appropriate drainage Authority, outfall either to a public sewer or a designated watercourse. Such a highway drainage system shall be adopted as part of the public highway under a Section 38 Agreement. Consent to outfall to a public sewer or watercourse should normally be obtained from Yorkshire Water or the Environment Agency respectively.

3.266 All highway drains shall be located within land to be adopted as highway. In exceptional circumstances it may be permitted for a highway drain to cross private land outside the adopted highway in accordance with Section 100 of the Highways Act (1980) in which case an easement agreement shall be required. The easement agreement shall be in place prior to or shall be a condition of the Highway Adoption Agreement (i.e. Section 38 or 278). Drainage easements should be located to avoid impact on retained trees and their root zones, and should not be located in Greenspace areas where they would
limit the planting of new trees.

3.267 No surface water run-off from areas outside the adoptable highway shall be permitted to discharge into a highway drain.

3.268 Appendix E sets out detailed drainage requirements, including construction details.

3.269 The Developer will be required to pay commuted sums for the future maintenance of SUDS and other drainage items if additional maintenance costs are likely.

**Highway Structures**

3.270 The City Council’s “Procedure guideline for the design and construction of retaining walls and other highway structures requiring the consent of the Highway Authority” are set out in Appendix C.

3.271 This also incorporates a flow diagram illustrating the necessary procedures.

**Public Transport**

3.272 Local, Regional and National Policies all seek to encourage greater use of public transport. Leeds City Council aims to ensure that all new residential and other developments provide a choice of modes of transport for residents and other users.

3.273 Early discussions with the City Council and Metro on the matters outlined below are essential.

3.274 Through the Design and Access Statements, Transport Assessments, Transport Statements and Travel Plans (set out in para 2.09) Developers are required to demonstrate how the City Council’s accessibility and sustainability objectives are being achieved.

3.275 The IHT’s document “Planning for Public Transport in New Developments” contains further advice on these matters, including the following key principles:

- the route for buses through a development should be as direct as possible with entry and exit points compatible with the surrounding network of bus routes.
- the route for buses through a development should not require back-tracking or excessive extra running time or bus route length.
- the footpath system to bus stops and stations must be regarded as part of the public transport system and designed to be direct, safe and easy to use as possible.
- the public transport entry point needs to be as close as possible to the buildings which are the final destination of the passengers. Ideally the walking distance from the bus stop should be less than from the car park that serves the development.
- a new development served by an existing route is likely to be one side of the road carrying the bus route. In these circumstances a safe and convenient means of crossing of that road must be provided.
- developments set back from the bus route must be linked to it by footpaths that are direct, well surfaced and well lit.
- the maximum walking distance to a bus stop should not exceed 400m and preferably no more than 300m (800m for rail stop if available).
- bus stops should ideally be located to minimise walking distances yet to maximise catchment areas.

3.276 In addition, the internal site layout shall ensure that efficient routes are provided to bus stops locations, and where relevant to Railway Stations. New bus stop locations shall be integrated with pedestrian desire lines.

3.277 Residential developments should be designed wherever possible to ensure that the maximum walking distance from any dwelling to the nearest bus stop is 400 metres, although it is recognised that this is not possible in every case.
3.278 Consideration shall be given within larger developments to the introduction of bus routes within the development, integrated into routes within the wider network. The diversion of existing bus routes into new developments requires careful consideration to ensure that the needs of existing passengers are taken into account.

3.279 Minibus feeder services or “Hail and Ride” buses are useful for achieving penetration into smaller sites, or developments which cannot accommodate full sized buses.

3.280 Bus stop design and other guidance is contained within Metro’s “Bus Stop Infrastructure Standards” which set out various requirements, including for the following:

- raised kerbs
- clearway boxes
- lay-bys
- bus boarders
- bus shelters
- “Real Time” passenger information

3.281 Where a development will generate significant additional demand for public transport, or where improvements are required to ensure that the development is accessible by public transport, then a financial contribution to such measures will be required through a Town and Country Planning Act 1990 Section 106 Legal Agreement. The City Council has adopted an SPD on Public Transport Improvements and Developer Contributions which has been adopted for development control purposes.

Other Requirements

Road Markings and Signage

3.282 All proposals for adoptable streets shall incorporate traffic signs and road marking arrangements only where necessary. These shall be as prescribed by the current Traffic Sign Regulations and General Directions (TSRGD) 2002 plus the following specific guidance.

3.283 The developer is responsible for the cost of providing all road markings and traffic signs for the new streets together with any additional or amendments to existing signs and markings located in the surrounding streets, made necessary by the new street. Occasionally, this may involve signage located some distance from the development, (e.g. for routeing HGVs etc.).
3.284 Where required, at the site access to developments, road markings and signs should be provided in accordance with TSRGD.

3.285 All Type 2, 3b and 4 streets should be signed as 20mph zones at their entrance from the wider 30mph network. This will require an appropriate Speed Limit Order, and the design should ensure that the zone limit is self enforcing. Type 3a streets will also need to be signed as a 20mph zone, except where they form part of a through route which is not signed at 20mph.

3.286 The design and location of signage and street furniture should aim to minimise visual clutter.

3.287 Street name plates will be provided by the City Council, with the cost to be notified to the Developer as a separate item to the other road signs.

3.288 Developers wishing to erect signs directing construction traffic or potential purchasers to a site must contact the City Council for permission to erect approved signs. Signs which have not been approved will be removed.

**Traffic Regulation Orders (TROs)**

3.289 Where a development requires changes to an existing Traffic Regulation Order (TRO) or a new order is required, the Developer shall pay all associated costs, including all staff, consultation and legal costs. TROs are subject to statutory procedures and consultations. This can be a very lengthy process and a successful outcome is not guaranteed. The Developer must therefore obtain advice on the likely timescale and take this into consideration when establishing a programme for development.

3.290 Where TROs are critical to the Development, they should be completed and sealed prior to the first occupation.

**Adoption Procedures**

3.291 Leeds City Council’s adoption policies, requirements and procedures are set out in Appendix B.

3.292 A commuted sum is required for all adoptions and shall generally be in accordance with guidance issued by the DfT. Enhanced commuted sums are required for any elements where abnormal maintenance costs are likely to occur.

**Street Lighting**

3.293 Leeds City Council’s procedures for the adoption (accrual) of Street Lighting and Illuminative Apparatus are set out in Appendix D.

3.294 In certain rural or other situations it may be necessary to provide alternative Street Lighting details (e.g. sensitive column designs in Conservation Areas, lights on buildings rather than columns in unlit villages, etc). These situations should be discussed further with the Local Authority.

**Crime and Disorder**

3.295 Local Authorities are obliged under Crime and Disorder Act 1998 to consider the crime and disorder implications of all planning applications. Crime prevention through environmental design (CPTED) is a concept that focuses on designing out crime by developing an understanding of the factors that are likely to contribute to a higher incidence of crime within a community. The built environment can have both a positive and negative impact upon criminal activities, and is a crucial factor to how safe and secure people feel within their community. However, planning out crime can only work if it is part of a wider strategy incorporating other measures such as regeneration, community involvement and town centre management.
4. Materials and Construction

General Approach

4.01 One of the key objectives set out on page 7 is the use of simple, appropriate, sustainable, well detailed, high quality materials that form a cohesive family of components. The selected materials should assist in the making of high quality places, and need to reflect the existing character of an area. Specific instances (e.g. Conservation Areas, in the vicinity of Listed Buildings, or other areas of the historic environment) will sometimes need specific materials not acceptable elsewhere.

4.02 In general terms the key thing is to ‘keep it simple’. A good street scene acts as an attractive backdrop to the built form of a development.

4.03 All materials should combine to form a cohesive palette, with tones and textures that reflect or complement those used in the built development and the local area. There should be no need for a wide range of materials as areas tend to have just one or two different functions within them, while the built form and planting should add the visual interest to a space.
4.04 The future maintenance of materials should be considered, with the number of different materials used being minimised. On larger sites, where several developers may be present, this will require a co-ordinated approach, especially at the interface between different elements of the site.

4.05 There should be no loose material adjacent to or within the highway.

**Specification**

4.06 Unless stated otherwise, all highway works shall be in accordance with the current editions of:

i) The City Council’s Specification for Highway Works


4.07 Where the City Council’s Specification varies from those contained in SHW, the requirements of the City Council will apply.

4.08 All Works shall comply with the requirements of the City Council Standard Detail Drawings. Copies of the Standard Details are included as Appendix F.

4.09 Where proposals contain details not covered by the Standard Detail Drawings, scheme specific drawings shall be developed and submitted to the City Council’s Section 38 Team.

**Carriageways**

**Design Criteria**

4.10 The design of trafficked pavements must take account of the prevailing site ground conditions and likely traffic loads during the life of the development. Designs meeting the following requirements will normally be acceptable. At sites where particularly poor ground conditions are encountered or where it is anticipated that there will be a particularly high frequency of commercial vehicle or abnormal load movements, further analysis in accordance with the “Design Manual for Roads and Bridges” will be required to demonstrate integrity of the design.

**Design Traffic Loading**

4.11 For the purpose of this guide, design traffic shall be based upon the street categories set out in Section 3 of this guide.

**Ground Conditions**

4.12 An assessment of the existing ground expressed as a %CBR (California Bearing Ratio) value is necessary in order to determine the correct pavement foundation. Ideally this value will be determined by testing undertaken by an approved laboratory, after installation of the drainage and utility work.

4.13 In the absence of testing in advance, a preliminary design can be prepared using an “Equilibrium CBR” value based on the appropriate type of sub-grade material as set out in the table below. However, if this method of CBR estimation is used, testing by an approved laboratory will be required prior to construction in order to verify the CBR value used for design.
A granular foundation comprising sub-base or a combination of sub-base and a capping layer shall be provided in accordance with the table below.

It may be necessary to vary the foundation design to accommodate significant changes in sub-grade properties across the site. However, the foundation design should not vary frequently along the road. On sites where numerous changes in sub-grade properties are encountered, a design based upon the lowest CBR value will often provide the most satisfactory solution.

Where a CBR value between those in the above table is obtained (either through testing or with reference to the table in para 4.14) the lower value in the above table shall be used for the purpose of design.

Sub-grades that have CBR values significantly less than 2% and deform under construction traffic may be unsuitable to support the pavement. In this case special measures will be required. Further advice is given in DMRB.

No material within 450mm of the finished road surface shall be frost susceptible.

Materials used in capping layers shall be in compliance with the Specification for Highway Works Table 6/1 (and any additional requirements of the City Council). The materials shall be sampled in the frequency stated in the Specification and tested to demonstrate that it has an in-situ CBR value of 15% (or equivalent test result). The Developer should provide confirmation that the tested materials comply with the required Specification.

Sub-base shall be Type 1 in accordance with the "Specification for Highways Works".

<table>
<thead>
<tr>
<th>Type of Soil</th>
<th>Plasticity Index</th>
<th>Equilibrium CBR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy clay</td>
<td>50 or greater</td>
<td>Less than 2</td>
</tr>
<tr>
<td>Heavy clay</td>
<td>40 to 49</td>
<td>2</td>
</tr>
<tr>
<td>Heavy clay</td>
<td>30 to 39</td>
<td>2</td>
</tr>
<tr>
<td>Silty clay</td>
<td>20 to 29</td>
<td>3</td>
</tr>
<tr>
<td>Sandy clay</td>
<td>10 to 19</td>
<td>4</td>
</tr>
<tr>
<td>Silt</td>
<td>Less than 10</td>
<td>1</td>
</tr>
<tr>
<td>Sand (poorly graded)</td>
<td>Non-plastic</td>
<td>20</td>
</tr>
<tr>
<td>Sand (well graded)</td>
<td>Non-plastic</td>
<td>40</td>
</tr>
<tr>
<td>Gravel (poorly graded)</td>
<td>Non-plastic</td>
<td>40</td>
</tr>
<tr>
<td>Sandy gravel (well graded)</td>
<td>Non plastic</td>
<td>60</td>
</tr>
</tbody>
</table>

(based on Design Manual for Roads and Bridges)

<table>
<thead>
<tr>
<th>Equilibrium CBR value to be used for design proposes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Soil</strong></td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Heavy clay</td>
</tr>
<tr>
<td>Heavy clay</td>
</tr>
<tr>
<td>Heavy clay</td>
</tr>
<tr>
<td>Silty clay</td>
</tr>
<tr>
<td>Sandy clay</td>
</tr>
<tr>
<td>Silt</td>
</tr>
<tr>
<td>Sand (poorly graded)</td>
</tr>
<tr>
<td>Sand (well graded)</td>
</tr>
<tr>
<td>Gravel (poorly graded)</td>
</tr>
<tr>
<td>Sandy gravel (well graded)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pavement Foundation Design</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CBR %</strong></td>
</tr>
<tr>
<td>Less than 2</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5-15</td>
</tr>
<tr>
<td>Greater than 15</td>
</tr>
</tbody>
</table>
Pavement Design

4.21 A range of acceptable surfacing materials for use in pavement construction are set out below, although the list is not exhaustive. Other alternatives will be considered on an individual basis, especially in Conservation Areas or near to Listed Buildings. Where alternative surfacing materials are proposed, the developer must obtain written consent from the City Council for the use of the material and must provide the City Council with technical justification that the material meets the relevant design criteria.

Acceptable Materials for Surface to Carriageways
- Hot Rolled Asphalt
- Dense Bitumen Macadam (DBM)

Acceptable Materials for Surface to Shared Surfaces
- Standard 80mm concrete-block paving surface course
- 'Tegula' or similar approved concrete-block paving surface course

4.22 The Developer will be required to pay a commuted sum for the future maintenance of elements within the new adopted highway generally in accordance with guidance issued by the DfT. Where alternative materials are proposed and accepted in writing by the Director of Development, the Developer may be required to pay an enhanced commuted sum for the additional future maintenance costs incurred by the City Council.

The following are approved alternative surface materials for carriageways and Shared Surfaces:

*Alternative Materials for Surface to Carriageways
- Standard surface course materials using a coloured binder and coloured aggregate or chippings

*Alternative Materials for Surface to Shared Surfaces
- Yorkstone setts

* The alternative materials will require commuted sum payments.

4.23 The City Council’s acceptance of any alternative material will be subject to the material meeting appropriate requirements of quality, durability, maintainability, and sustainability and, in the interests of safety, being compliant with the specification, particularly in respect of polished stone value (PSV) and aggregate abrasion (AAV).

4.24 Example designs for the bound pavement layers are detailed in the table below, which shows the minimum design thickness for a variety of alternative materials for the various street types within the scope of this guide. The pavement construction for any street types or roads not included in the table shall be subject to site-specific designs in accordance with DMRB Volume 7.

<table>
<thead>
<tr>
<th>Street type</th>
<th>Base course (mm)</th>
<th>Binder course (mm)</th>
<th>Surface course (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DBM 85</td>
<td>DBM 55</td>
<td>HRA (45mm thick)</td>
</tr>
<tr>
<td>2</td>
<td>DBM 75</td>
<td>DBM 60</td>
<td>DBM 30 (6mm nominal size)</td>
</tr>
<tr>
<td>3</td>
<td>DBM 50</td>
<td>Sand 30</td>
<td>Concrete block pavers (80mm thick)</td>
</tr>
<tr>
<td>4</td>
<td>DBM 50</td>
<td>Sand 30</td>
<td>Concrete block pavers (80mm thick)</td>
</tr>
<tr>
<td>Industrial road</td>
<td>DBM 150</td>
<td>DBM 55</td>
<td>HRA (45mm thick)</td>
</tr>
</tbody>
</table>

HRA = Hot Rolled Asphalt
DBM = Dense Bitumen Macadam
Where alternative surfacing materials are proposed, appropriate construction depths will need to be provided.

The value of commuted sums will be determined by the City Council on a site specific basis. The sum will be calculated and details provided to the Developer in advance of entering into the appropriate agreement (e.g. Section 38 or 278) with the City Council.

**Footways, Kerbs and Crossings**

Footways and crossings shall be provided and laid out in accordance with the requirements of Section 3 of this Design Guide.

A range of acceptable materials that the City Council might consider acceptable in the appropriate circumstances is included in the table below. The alternatives listed and others approved will be considered on an individual basis, especially in Conservation Areas or near to listed buildings.

<table>
<thead>
<tr>
<th>Acceptable Materials for Footways, Kerbs, and Crossings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete flags or small unit paving</td>
</tr>
<tr>
<td>Pre-cast concrete kerbing, channelling and edging products meeting the appropriate British and European Standards having a textured or exposed aggregate finish</td>
</tr>
<tr>
<td>Dense Bitumen Macadam (DBM)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternative Materials for Footways, Kerbs, and Crossings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard surface course materials using a coloured binder and coloured aggregate or chippings</td>
</tr>
<tr>
<td>Standard 80mm concrete-block paving surface course</td>
</tr>
<tr>
<td>‘Tegula’ or similar approved concrete-block paving surface course</td>
</tr>
<tr>
<td>Yorkstone Flags or small unit paving</td>
</tr>
</tbody>
</table>

* The alternative materials will require commuted sum payments.

Example footway construction depths are shown below:

<table>
<thead>
<tr>
<th>Footway Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Pedestrian Footway or Footpath</td>
</tr>
<tr>
<td>Vehicular Footway Crossing</td>
</tr>
</tbody>
</table>

Where vehicular footway crossings are to be provided or in locations where vehicles are able to overrun the footway, the footway construction shall be strengthened to accommodate the additional load imposed by vehicular traffic.

Footway crossings shall not be used for service accesses to commercial properties, industrial accesses, or where particularly heavy vehicles are anticipated. In these circumstances, more formal access junctions shall be provided and the pavement construction shall meet the same requirements as the adjacent carriageway.

In certain circumstances the use of alternative materials to those set out in the above table may be permitted. Where additional alternative materials are proposed and accepted in writing by the City Council, the Developer may be required to pay an enhanced commuted sum for the additional future maintenance costs incurred by the City Council.

The City Council’s acceptance of any alternative material will be subject to the material meeting the appropriate requirements for quality, durability, maintainability, and sustainability.
4.34 Kerbs shall normally be provided alongside all running carriageways (Types 1 and 2) to provide an edge restraint to the carriageway construction, prevent vehicles overriding the footway, and facilitate the management of drainage flows.

4.35 Where kerbs are laid alongside the running carriageway they shall be laid with an up-stand of 100mm (except in shared surface streets). At bus stops this should be increased to 180mm, and Metro should be consulted for any additional requirements.

4.36 Drop Kerbs shall be used at pedestrian and vehicular crossing points. They should be constructed flush with the carriageway at pedestrian crossing points and with a 25mm check at vehicular crossings, and shall be constructed in accordance with the Standard Detail Drawings.

4.37 Pre-cast concrete channel blocks shall be installed in the road channel adjacent to the kerb wherever the longitudinal gradient along the road channel is between 1 in 150 and 1 in 120. The channels shall be laid in accordance with the Standard Detail Drawings.

4.38 Tactile paving to assist blind and partially sighted people should be utilised in accordance with national guidance.

4.39 The value of commuted sums will be determined by the City Council on a site specific basis. The sum will be calculated and details provided to the Developer in advance of entering into the appropriate agreement (e.g. Section 38 or 278) with the City Council.

**Drainage**

4.40 For details of drainage construction requirements see Appendix E.

**Conservation Areas**

4.41 Traditional paving materials, where they still exist, contribute to the character of a conservation area. Therefore in carrying out maintenance, or the provision of new streets, within these areas it is necessary that traditional materials are used. These materials are likely to be made of stone, although alternative new materials such as tegula blocks, conservation kerbs and tarmac dressed with a suitable local aggregate may also be acceptable.

4.42 Street furniture should also be of appropriate materials in keeping with the surrounding area. Advice from the City Council should be sought prior to designing or implementing any works.
# Index

## A

**Access**
- Emergency services 62 - 63
- Service vehicles 59 - 62
- Pedestrian 56, 58

**Adoption**
- Appendix B

**Alternative Materials**
- 74, 75

**Audits** (Quality and Road Safety)
- 6

## B

**Bends**
- Carriageway widths 12, 17, 21, 29, 60
- Speed control 33
- Visibility 26

**Blind & Partially sighted People**
- Provision for 5, 18, 22
- Tactile paving 18, 24, 49, 76

**Buses**
- Carriageway widths 12, 17, 21
- Footway widths 12, 44
- Routes 32, 34
- Stops 43, 44

## C

**Carriageway**
- Design Criteria 72
- Design Traffic loading 72
- Foundation 73
- Gradients 35
- Ground Conditions 72
- Materials 71 - 76
- Narrowing 33
- Passing places 27, 28, 60
- Pavement Design 74
- Widths 12, 17, 21, 27 - 28, 29, 60

**Car Clubs**
- 53, 59

**Car Parking**
- 50 – 59
- Car free developments 59
- Commercial and Industrial developments 30, 59
- Communal areas 30, 57 - 58, 62
- Disabled Car Parking 49 - 50
- Driveway 56
- Garages 56 - 57

Number of spaces 52 - 55
- Allocated 52 - 55
- Unallocated 54 - 55
- On-street Provision 12, 17, 21, 23, 39, 58, 60
- Principles 50 - 51
- Visibility 57
- Visitor Parking 28

**Centreline Radii**
- 12, 17, 21, 23, 29, 33

**Committed Sums**
- 68, 70, 75, 76

**Connectivity**
- 9, 13, 44, 46

**Connector Streets (Type 1)**
- 12 - 14

**Conservation Areas**
- 65, 70, 71, 74, 75, 76

**Crime & Disorder**
- 70

**Crossing Points**
- 45

**Crossroads**
- 43, 44

**Culs-de-sac**
- 9, 17, 21, 23

**Cycling**
- 45 - 48
- Access control 46
- Parking 47
- Principles 45
- Visibility 47
- Widths 46

## D

**Design and Access Statements**
- 5, 32, 68

**Design Manual for Roads and Bridges**
- 8, 27, 29, 31, 72

**Design Principles**
- 4

**Design Speeds**
- 11, 12, 17, 21, 23, 25, 29

**Designated Routes**
- 11, 18, 21, 43

**Designing for Disabled People**
- 49 – 50
- Parking 49
- Principles 49
- Ramps 49
- Tactile paving 49

**Direct Vehicular Access**
- 12, 17, 21, 23

**Distributor Roads and Strategic Routes**
- 36, Appendix G

**Drainage**
- 67 – 68 Appendix E

**Drives**
- 28, 56
- Design 35
- Dropped Kerbs 45, 50

## E

**Easements**
- 65, 67

**Emergency Access**
- 62 – 63

**Emergency Vehicles**
- 3, 35, 62

## F

**Flood Levels**
- 8, 36

**Footpaths**
- Cyclists 46

---

77
<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared Space Streets (Type 3a)</td>
<td>18 – 21</td>
</tr>
<tr>
<td>Signage</td>
<td>32, 69 – 70</td>
</tr>
<tr>
<td>Spacing of Junctions</td>
<td>42</td>
</tr>
<tr>
<td>Specification</td>
<td>72</td>
</tr>
<tr>
<td>Speed Restraints</td>
<td>31 – 35</td>
</tr>
<tr>
<td>- Carriageway Narrowing</td>
<td>33</td>
</tr>
<tr>
<td>- Control Bends</td>
<td>33</td>
</tr>
<tr>
<td>- Gateways</td>
<td>33</td>
</tr>
<tr>
<td>- Ramps</td>
<td>34</td>
</tr>
<tr>
<td>- Tables</td>
<td>34</td>
</tr>
<tr>
<td>Speed Limits</td>
<td>11, 42, 70</td>
</tr>
<tr>
<td>Standard Construction details</td>
<td>Appendix F</td>
</tr>
<tr>
<td>Steps</td>
<td>44</td>
</tr>
<tr>
<td>Street Hierarchy</td>
<td>3, 8 – 11</td>
</tr>
<tr>
<td>Street Furniture</td>
<td>44, 49, 70, 76</td>
</tr>
<tr>
<td>Street Lighting</td>
<td>65, 70 Appendix D</td>
</tr>
<tr>
<td>Street Types</td>
<td>8 – 31</td>
</tr>
<tr>
<td>- Carriageway widths</td>
<td>27</td>
</tr>
<tr>
<td>- General Approach</td>
<td>8</td>
</tr>
<tr>
<td>- Industrial Developments</td>
<td>28</td>
</tr>
<tr>
<td>- Measurement of Forward Visibility</td>
<td>26</td>
</tr>
<tr>
<td>- Mixed Use Schemes</td>
<td>31</td>
</tr>
<tr>
<td>- Private Streets &amp; Drives</td>
<td>28</td>
</tr>
<tr>
<td>- Street Hierarchy</td>
<td>8</td>
</tr>
<tr>
<td>- Street Type 1 (Connector Streets)</td>
<td>12 – 14</td>
</tr>
<tr>
<td>- Street Type 2 (Local Residential Streets)</td>
<td>15 – 17</td>
</tr>
<tr>
<td>- Street Type 3a (Shared Space Streets)</td>
<td>18 – 21</td>
</tr>
<tr>
<td>- Street Type 3b (Level Surface Streets)</td>
<td>22 – 23</td>
</tr>
<tr>
<td>- Street Type 4 (Home Zones)</td>
<td>24 – 25</td>
</tr>
<tr>
<td>Stopping Distances</td>
<td>26</td>
</tr>
<tr>
<td>Structures</td>
<td>68 Appendix C</td>
</tr>
<tr>
<td>SUDS</td>
<td>67</td>
</tr>
<tr>
<td>Sustainability</td>
<td>2, 5, 68, 74, 75</td>
</tr>
<tr>
<td>Tactile Paving</td>
<td>18, 24, 46, 49, 76</td>
</tr>
<tr>
<td>Traffic Regulation Orders</td>
<td>59, 70</td>
</tr>
<tr>
<td>Transportation Assessments / Statements</td>
<td>5, 68</td>
</tr>
<tr>
<td>Travel Plans</td>
<td>6, 59, 68</td>
</tr>
<tr>
<td>Trees</td>
<td>7, 34, 39, 63 – 64</td>
</tr>
<tr>
<td>Turning Heads</td>
<td>54, 59, 60 – 62</td>
</tr>
<tr>
<td>Underground Services</td>
<td>64 - 66</td>
</tr>
<tr>
<td>Urban Design Principles</td>
<td>1, 4, 5, Appendix A</td>
</tr>
<tr>
<td>User Hierarchy</td>
<td>3</td>
</tr>
</tbody>
</table>
Supplementary Planning Document
August 2009

Street Design Guide
Leeds Local Development Framework

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