Part 3 Street Design (Residential S38)

Introduction

It is expected that the guidance included in this Part of the Design Guide will be appropriate for the design for adoption of Secondary Distributor Roads and below. These types of roads might provide a transition between surrounding major roads, form a network of estate roads or become the more pedestrian dominated link roads, local access roads and minor roads.

Therefore, this section covers the design and technical approval relating to roads which fall into Category 3b, 4a or 4b as defined in Table 1.1 in Part 1 of this guide and described more fully later in this section.

Designers should follow the guidance provided in this section when directed after using the flow chart in Part 1 Figure 1.2 to determine the appropriate design standards for their improvement.

It must be noted that this section is not to present a rigid set of rules that must be followed in the design of residential layouts. Moreover, it seeks to provide a set of standard objectives and principles while indicating minimum standards to be met where necessary.

In addition, Developers should be aware that roads serving industrial developments exclusively are unlikely to be adopted. If there is a desire for an industrial estate to be served by buses, developers may need to enter into private agreements with public transport operators in order to facilitate this.

It is expected that the majority of these roads will be delivered following the completion of a Section 38 Highways Act 1980 Agreement. More information on the S38 process and how to enter into this form of Agreement is contained in Part 10 *Annex 10.1 Highway Works Agreements*

Scheme delivery outline

As stated in Part 1, WCC welcomes and encourages discussions before a Developer submits a planning application. These discussions can result in better quality applications which stand a better chance of a successful outcome and help speed up the decision making process after submission. As a consequence they can help to minimise subsequent costs and avoid abortive applications.

Following planning consent, the delivery process typically follows the process outlined below;

- Developer to apply to enter into a S38 Agreement with appropriate fee.
- Technical review undertaken
- Bond to be calculated
- Technical review certificate issued
- Scheme inspection fees paid
- Scheme constructed by Developer's contractor and inspected by WCC
- Appropriate percentage of bond reduced at certain trigger points as defined in the S38 Agreement
- Any uncompleted remedial works carried out during the maintenance period before adoption is requested
- Road adopted and now maintainable at public expense
- Remaining Bond returned to Developer.

Details of the terms of the S38 Agreement, fees and how WCC calculate the value of the bond required is contained in Part 10 Annex 10.1 of this Guide.

Technical Review and general considerations

To enable the Development Management Team (DMT) to provide a robust and efficient response to a planning consultation, the developer must provide within their application the following information;

- An engineering layout, detailing radii, carriageway/footway/verge widths etc;

- A plan detailing ALL visibility splays; inclusive of junction, forward, pedestrian and driveway splays;

- A proposed adoption plan;

- Plans detailing the swept path analysis of the appropriate refuse vehicle and a fire tender. NB further swept path analysis will be required, such as that of an MPV vehicle exiting driveways, if thought necessary;

- Garage details - if these are proposed to be included within the allocated parking standards;

- Longitudinal sections - if they are not in line the details below, then it is advised that the long sections are provided at an early stage to ascertain if the horizontal design can be amended to improve the gradient.

- Highway drainage - if this is proposed - including road water run-off, pipe design, surface water treatment hazard index, and flood storage calculations. If a soakaway is proposed, suitable percolation test results must be provided (to BRE365). it is advised to enter discussions at this stage as not all highway drainage will be accepted and may preclude adoption.

- A plan detailing highway landscaping.

Road Hierarchy Further Information

The following information is provided to guide designers towards good design principles which WCC expect to see applied to the appropriate category of road.

Type 3b: Secondary Distributor Roads

Secondary Distributor Roads provide a transition between surrounding major roads and more pedestrian dominated link roads, local access roads and minor roads.

They should have at least one point of access, plus additional access points determined by the number of dwellings. Although they principally cater for traffic movements, they must still cater for safe pedestrian movement. Therefore, Design speeds of 20mph are expected in residential areas. Speed restraint measures must take into account the requirements of buses where serving a bus route and also the emergency services. Therefore, design should aim to minimise the use of vertical traffic calming measures wherever possible.

Type 3b: Secondary Distributor Roads	
Road Width	6.7m – Bus route with on street parking 6.1m – Bus route with no on street parking
Dwelling Limits	No defined limit but could be limited based on site specific constraints.
Design Speed	20mph
Shared Surface Acceptability	Not acceptable
Footway width	Absolute minimum of 2m (on each side of road). To increase in accordance with Warwickshire County Council requirements in areas of high footfall or shared cycle routes.
Verge/Service Margin Width	3m minimum
Crossfall	1:40
Longitudinal Gradients	1: 125 minimum 1: 20 maximum 1:50 minimum for a distance of 15m along all approaches to junctions
Vertical Curves	Minimum 'K' value of 6 Minimum length of curve – 25m
Pedestrian Visibility	2.4m x 2.4m
Horizontal Layout	The centre line radii, along with turning heads and shared surface streets, shall be prescribed by the swept path analysis of the relevant refuse vehicle used by the Local Planning Authority.
Speed Restraint Centres	Maximum of 70m
Vertical Heights	3m – the prescribed minimum effective height above ground level for any tree canopy within or overhanging a visibility splay.
Direct Vehicular Access	No

Type 4a: Link Roads

The purpose of a Link Road is to connect Main Distributor (Type 3a) and Secondary Distributor (Type 3b) roads. A feature of their design is that they should facilitate a safe and secure environment that encourages a modal shift towards sustainable methods of travel for some journeys.

Link Roads should always have at least two points of access and can serve up to 500 dwellings (no more than 150 from a single point of access). On street parking may be present and prescribed carriageway widths allow for this.

Type 4a: Link Road	
Road Width	5.5m
Dwelling Limits	Up to 500 (no more than cumulatively 150 from a single point of access)
Design Speed	20mph
Shared Surface Acceptability	Not acceptable
Footway width	Absolute minimum of 2m (on each side of road).
Verge/Service Margin Width	1.5 minimum
Crossfall	1:40
Longitudinal Gradients	1: 125 minimum 1: 20 maximum 1:50 minimum, for a distance of 15m along all approaches to junctions
Vertical Curves	Minimum 'K' value of 4.5 Minimum length of curve – 25m
Pedestrian Visibility	2.4m x 2.4m
Horizontal Layout	The centre line radii, along with turning heads and shared surface streets, shall be prescribed by the swept path analysis of the relevant refuse vehicle used by the Local Planning Authority.
Speed Restraint Centres	Maximum of 70m
Vertical Heights	3m – the prescribed minimum effective height above ground level for any tree canopy within or overhanging a visibility splay.
Direct Vehicular Access	Yes; where demonstrably safe with turning space within a private drive to allow for a vehicle to re-enter the public highway in a forward gear.

Type 4bLocal Access Roads

Local Access Roads serve up to 50 dwellings as a loop or cul-de-sac. Provision of an emergency link for larger cul-de-sacs may be considered necessary.

In certain circumstances where pedestrian demand is likely to be minimal, a footway may be substituted for a service verge (a minimum of 1 footway must however be provided).

Type 4b: Local Access Roads	
Road Width	5.0m
Dwelling Limits	Up to 50 (emergency point of access may be necessary for cul-de-sacs)
Design Speed	20mph
Shared Surface Acceptability	Not acceptable
Footway width	Absolute minimum of 2m (on each side of road. A footway may be substituted for a service verge in approval with Warwickshire County Council).
Verge/Service Margin Width	1.5 minimum
Crossfall	1:40
Longitudinal Gradients	1: 125 minimum 1: 20 maximum 1:50 minimum, for a distance of 15m along all approaches to junctions
Vertical Curves	Minimum 'K' value of 4.5 Minimum length of curve – 25m
Pedestrian Visibility	2.4m x 2.4m
Horizontal Layout	The centre line radii, along with turning heads and shared surface streets, shall be prescribed by the swept path analysis of the relevant refuse vehicle used by the Local Planning Authority.
Speed Restraint Centres	Maximum of 70m
Vertical Heights	3m – the prescribed minimum effective height above ground level for any tree canopy within or overhanging a visibility splay.
Direct Vehicular Access	Yes

3.3 Surface Finishes

The standard details of the expected highway surface finishes within a residential development can be found within the WCC Highway Construction Details and the Warwickshire Surfacing Strategy. Surfacing contrary to that contained within the Warwickshire Surfacing Strategy is undesirable and developers must be aware that surfacing other than specified in the above WCC documents will attract a commuted sum.

3.4 Types of Junctions

Generally, within these residential developments, there will only be the need for either a priority bellmouth access or a vehicle dropped crossing to serve a private driveway. A bellmouth arrangement should be used for all accesses to serve over 9 dwellings.

3.5 Junction Spacing

Designers should normally avoid priority-controlled ('Give way') crossroads. When a crossroads cannot be avoided, WCC would normally expect the designer to provide an appropriate form of control such as a roundabout. Mini-roundabouts will not normally be acceptable to provide access to a development unless they form part of a more comprehensive traffic-calming scheme that is either required to reduce the development's impacts or that has previously been identified.

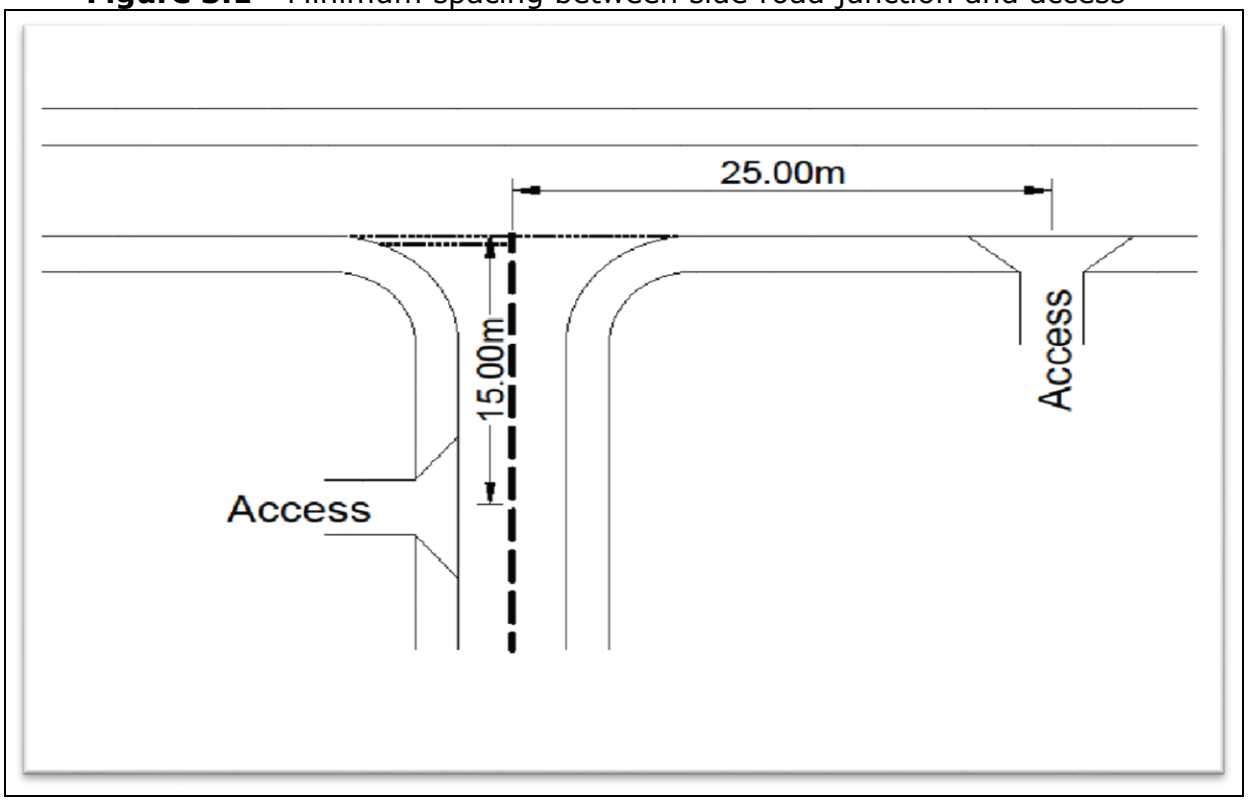
Junctions on the same side of the road should be spaced so that a vehicle waiting to enter the main arm does not interfere with the visibility of a vehicle waiting at another minor arm.

Staggered junctions should be spaced appropriately to ensure that the largest proposed vehicle, when egressing one minor arm, can straighten up before accessing another minor arm. Vehicle tracking may be required to prove that this is achievable.

A minimum clearance of 15.0 metres should be provided between the nearest side of a vehicular access on the major road, (including Byways) (that is the road with the priority), and/or the Give Way line at any adjacent junction with the minor road/side road

For vehicular accesses onto the major road a minimum clearance of 25.0 metres is recommended to/from the centre of the minor road (or Byway) (that is the side road) junction. These clearances ensure that when vehicles are indicating to turn into an access or a junction their intentions are clear to other highway users. In addition such clearances ensure that vehicular visibility is maintained (see Figure 3.1).

Figure 3.1 - Minimum spacing between side road junction and access



3.6 Visibility Splays

Vertical Visibility

The height of 600mm should be taken as the point above which unobstructed visibility should be provided wherever there is potential for conflict between motorists and children.

When assessing vertical visibility, both drivers and pedestrian lines of vision need to be considered in both vertical and horizontal planes. Adequate forward visibility must be provided to allow drivers to see a hazard and react in an appropriate and controlled manner before reaching it.

Junction and Forward Visibility

Table 3.1 shows the required junction and forward visibility splays, for 'street' design. A developer will either use Design Speed for new developments OR measured 85%ile speed for improvements within existing development

In accordance with Manual for Street recommendations, Warwickshire County Council will accept an 'X' distance of 2.4m in most built up situations (as this

offers a good representation of the maximum distance between the front of the car and the driver's eye in driving position).

Table 3.1 - Required visibility splays for 'Streets'

Design Speed (mph) (New Development Only)	Measured 85%ile vehicle speed (mph) (Existing Development)	'Y' Distance & Forward Visibility (m)*
15	10-15	17
20	16-20	25
Speeds on a residential development should be controlled, via the horizontal layout to 20mph	21-25	33
	26-30	43
	31-37	59

3.7 Private (non-adopted) Streets or Drives

WCC encourage that all housing developments are designed to adoptable standards whether or not that they are expected to be adopted in the future. WCC will however not normally adopt any development of 6 dwellings or less.

Any private drive serving more than 9 units should be served by a bellmouth arrangement, rather than a simple dropped crossing.

Undercroft accesses should be a minimum of 5.5m wide to accommodate any expected utility apparatus.

Where developments are to remain unadopted, developers must be aware that the Highway Authority will not be liable for future maintenance, street cleansing, lighting, parking enforcement, drainage or other public liabilities as they will have no powers under the Highways Act.

Where developments are proposed to remain unadopted, Warwickshire County Council encourage developers to enter into discussions early in the design stage in order to satisfy any specific highway requirements that may be present on a case by case basis.

The practical requirements for servicing by a refuse vehicle and/or a fire tender in case of emergency must be incorporated into the design of all developments whether they are proposed for adoption or not.

Parking associated with unadopted developments must not have a negative impact on the adopted public highway. Unadopted developments must therefore

allow for adequate visitor parking provision in addition to private curtilage parking.

Access for a private drive serving multiple dwellings should have a minimum width of 5m for a distance of at least 7.5m if unbound on both sides. Where bound on one or both sides the access should be a minimum 5.5m for a distance of at least 7.5 metres.

Any gates should be set at least 5.5 metres back from the back of the public highway footway.

Private driveways will not be adopted as public highway.

Positive drainage measures must be incorporated into design to ensure that driveways do not discharge surface water onto the public highway.

To prevent extraneous material being deposited within the limits of the Public Highway, private driveways must be surfaced with a suitable bound material for the first 5m from the back of the public highway footway.

The connection from a private driveway to the public highway shall be laid out as a dropped crossing in accordance with Section 184 of The Highways Act 1980, set out at 90 degrees to road where possible. Connections not at 90 degrees may be considered unacceptable for reasons of highway safety and would be assessed on a case by case basis.

Turning Area for private drives must be provided where deemed necessary by the Highway Authority.

Visibility splays on approach to and on exit from private drives/developments must be provided in accordance with the requirements as set out in Chapter 2 of Warwickshire County Council's design guide.

Each access onto the public highway is considered a potential point of conflict. The Highway Authority therefore does will not allow for more than a single point of access to new private dwellings or addition accesses to be added to existing dwellings unless it can be demonstrated that provision of additional access points are absolutely necessary and/or will not compromise public highway safety.

3.8 Vehicular Access Width

With the rise of larger cars prevalent within Warwickshire, such as MPV's and large 4x4's, individual vehicular accesses (up to but not exceeding 45.0 metres in length from the highway boundary) serving parking spaces for single dwellings should have a minimum width of 3.0 metres and a maximum width of 3.7 metres at the highway boundary.

Vehicular accesses serving two to five dwellings, (up to but not exceeding a maximum length of 45.0 metres from the highway boundary), should have a minimum width 5.0 metres for the first 7.5 metres from the back of highway boundary. This enables two opposing vehicles to pass each other at the point of access. This in turn ensures that a vehicle entering a site does not stop and turn within the highway to allow an emerging vehicle out. A maximum width of 5.5 metres also applies.

All accesses should be aligned square (90 degrees) to the highway to ensure that visibility for and to emerging drivers is optimised.

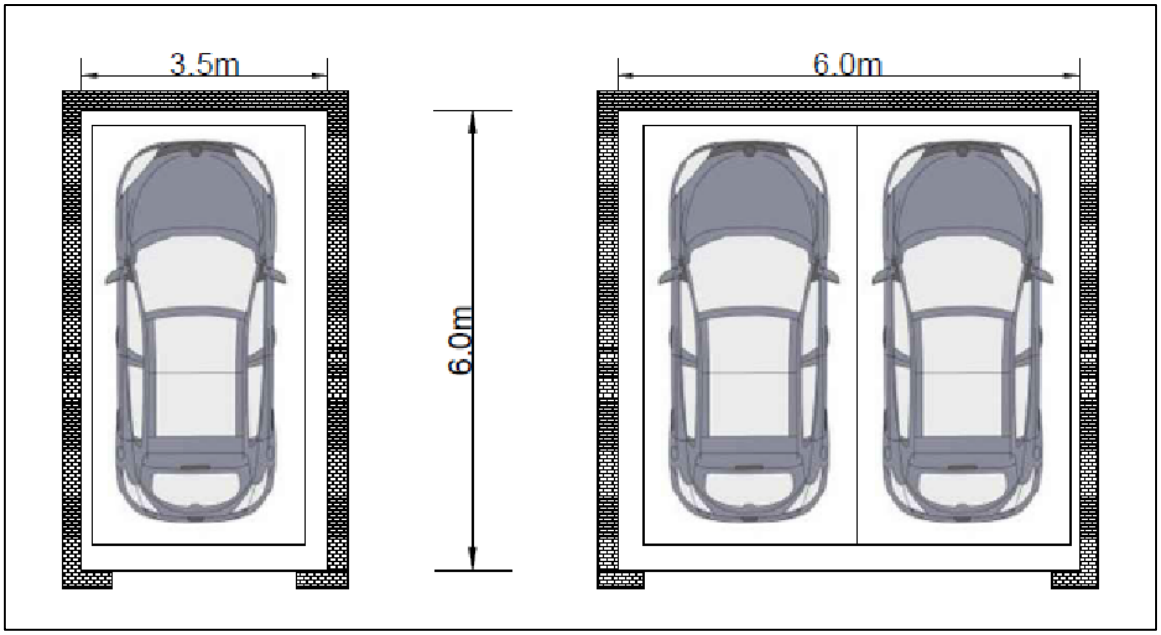
Where access within the development is to be via an under-croft, the minimum width for a shared access would be 5.5 metres. The additional width is required to accommodate utilities equipment (electric/gas meters, etc.) and/or provision of drainage pipes, flues, etc. which, if located within the access, area will reduce the overall available width for passing vehicles.

3.9 Garages

Any garage door should be set back a minimum distance of 5.5 metres from the highway boundary so as to ensure that a vehicle can be parked clear of the highway and so as to ensure that the garage door can be opened without hindrance.

The internal dimensions of a garage should be as shown in Figure 3.2.

Figure 3.2 - Internal dimension requirements for garages and parking spaces surrounded by walls or solid features



3.10 Parking

Each of the five Local Planning Authorities of Warwickshire provides advice/policy with respect to the parking standards sought for respective development(s). Off-street parking provision for new developments should therefore comply with the relevant parking standards and policies. However, it should be noted that since these parking standards were introduced, the level of car ownership has increased. From the 2011 census, it is shown that, within Warwickshire, the number of cars, per 1000 people, has increased by 8% since 2001. Also from the 2011 census, it has shown that the number of 4+ car owning households has increased by 40%. It can be expected that these numbers have only increased from the 2011 census.

On-street parking within a highway cannot be allocated or assigned to any individual person or property, and therefore its availability to accommodate a development's parking requirements cannot be assumed or relied upon. In some circumstances, on-street parking can be seen as an obstruction of the highway.

Car parking spaces should measure a minimum of 2.5 metres x 5 metres. Where parking spaces are adjacent to a wall, fence or a boundary, these should be 3.0 metres wide to ensure clear access around the vehicle. Where these spaces are between walls or fences this dimension should be increased to 3.5 metres wide.

A width of 3.5 metres should be applied to the internal dimensions of a garage or car port, with the overall length of 5.5 metres. This is particularly important

where a garage is to be included in the overall parking provision for a development. Table 3.2 summarises parking space dimension requirements

Table 3.2 - Required Dimensions for Parking spaces

Single parking space (un-restricted)	Double parking space (un-restricted)	Single parking space (restricted)	Double parking space (restricted)	Single garage (internal at narrowest point)	Double garage (internal at narrowest point)
3m x 5.5m	6m x 5.5m	3.5m x 5.5m	6m x 5.5m	3.5m x 6m	6m x 6m

'In/out' access arrangements will not generally be supported by the Highway Authority. They will however be assessed on a case by case basis and could be acceptable where it is judged that it will either improve or not compromise public highway safety.

Streets should be designed in such a way that, where on-street parking is not desired, drivers are deterred without the need for formal parking controls. If the provision of formal parking controls is unavoidable and required in the interest of public highway safety, developers must be aware that Warwickshire County Council will request commuted sums to cover the provision and associated enforcement of any necessary Traffic Regulation Order(s).

Where a proposed development may of detriment to existing parking provision and/or amenity, developers must undertake and provide parking surveys in order to allow officers to make a considered assessment. As parking demands is sensitive to numerous variables, it is important that the scope of a parking survey is discussed and agreed with Warwickshire County Council in advance of a survey being undertaken. Failure to undertake a survey in accordance with the requirements of Warwickshire County Council may result in a requirement for a developer to commission additional surveys.

3.11 Waste Collections

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

The operation of waste collection services should be an integral part of street design and achieved in ways that do not compromise quality of place. Waste disposal and collection authorities and their contractors should take into account the geometry of streets across their area and the importance of securing quality

of place when designing collection systems and deciding which vehicles are applicable. While it is always possible to design new streets to take the largest vehicle that could be manufactured, this would conflict with the desire to create quality places. It is neither necessary nor desirable to design new streets to accommodate larger waste collection vehicles than can be used within existing streets in the area.

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

Where bin stores are provided at private developments, they must be located no further away than 20m from the edge of the public highway carriageway.

Residents should not be required to carry waste more than 30m (excluding any vertical distance) to the storage point.

Waste collection vehicles should be able to get to within 25m of the storage point (Note: BS 5906: 200518 recommends shorter distances) and the gradient between the two should not exceed 1:12. There should be a maximum of three steps for waste on the way waste is to be managed and in particular: methods for storing, segregating and collecting waste; the amount of waste storage required, based on collection frequency, and the volume and nature of the waste generated by the development; and the size of anticipated collection vehicles.

3.12 Emergency Vehicles

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

The Building Regulation requirement B5 (2000)10 concerns 'Access and Facilities for the Fire Service'. Section 17, 'Vehicle Access', includes the following advice on access from the highway:

- There should be a minimum carriageway width of 3.7m between kerbs for operating space at the scene of a fire);
- There should be vehicle access for a pump appliance within 45m of single family houses;
- there should be vehicle access for a pump appliance within 45m of every dwelling entrance for flats/maisonettes;
- a vehicle access route may be a road or other route; and

- Fire service vehicles should not have to reverse more than 20m.

Simply to reach a fire, the access route could be reduced to 2.75m over short distances, provided the pump appliance can get to within 45m of dwelling entrances

If an authority or developer wishes to reduce the running carriageway width to below 3.7m they should consult the local Fire Safety Officer;

3.13 Provisions for Pedestrians and the Mobility Impaired

Pedestrians routes should be barrier free except at the junctions of footpaths with carriageways when barriers may be required at some locations. A barrier, if needed, must be of the type which does not impair driver visibility, especially of children who may be standing, walking or running behind them. Further guidance is located in the Department for transport document Inclusive Mobility- A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure.

An adequate space for pedestrians to wait should be provided, together with an appropriate level of visibility, wherever a pedestrian route crosses a carriageway or cycleway.

At busier road junctions and along busy roads, the provision of island refuges within the carriageway should always be considered to assist pedestrians to cross.

At road junctions and other road crossings, dropped and flush kerb crossings with tactile surfacing should be provided in accordance with current national advice (Guidance on the use of Tactile Paving Surfaces).

At junctions, footways should be constructed parallel to the back of visibility splays in order to encourage pedestrians to cross the minor road at the narrowest practicable point.

At junctions where footways lead onto shared surface roads, the footways should be extended beyond the corner radii and lead onto the shared surface at a point beyond a driver warning demarcation strip. Any direct vehicular accesses to the shared surface should not conflict with the footway entry to the shared surface.

At the entry to a home zone area it may be appropriate to provide suitable signage to emphasise the status of the area.

Where the recommended maximum gradient of 1:20 for footways, cannot be achieved due to natural topography, then regular landings or level areas should be incorporated at regular intervals, of not greater than 10m.

If it is necessary to incorporate gradients steeper than the prescribed maximum, then an alternative stepped route will also be required.