



**Design Details**  
**Highways Technical Manual**  
**V.1**

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## 6. Highways Technical Manual

This section contains the technical information for highways design. It should be read in conjunction with the other sections of this guide – in particular Streets and Roads and Parking – to provide a full understanding of the relevant design principles for new residential developments.

The overarching aim is to ensure that in new residential and mixed-use environments, the circulation and movement of people is pleasant, convenient, safe, responds to local context and combines with good place-making. Motorised vehicle movement must efficiently service development without predominating, while walking, cycling and the use of public transport must be facilitated and encouraged, taking precedence over private modes of motorised transport.

Three fundamental objectives stem from this:

To discourage inappropriate traffic from travelling through residential areas.

To promote very low driver speeds within residential environments.

To discourage the use of the private car, particularly for short or local trips.

‘In principle’ layouts will be developed as part of the planning process, which will include input from the Highways and Transport department at Essex County Council and will reference Manual for Streets as well as ECC guidance. The full access construction details of the site can be finalised with the Highway Authority on this basis.

When proposing a residential layout, developers should attend to all relevant and current documents and guidelines, including but not limited to:

- National Policy and Guidance
- National Planning Policy Framework (NPPF)
- Planning Practice Guidance
- Manual for Streets (2007) and Manual for Streets 2 (2010)
- DEFRA Circular 1/09
- Design Manual for Roads and Bridges (DMRB)
- Use of Tactile Paving
- Building Regulations
- Sustrans Handbook for Cycle-friendly Design
- Local Policy and Guidance
- Essex Design Guide
- Essex Parking Standards Design and Good Practice
- Essex Development Construction Manual
- ECC Development Management Policies
- The SuDS Manual

- Essex Developers' Guide to Infrastructure Contributions
- Essex Street Materials Guide
- Essex Development Management Street Lighting Specification
- Essex Designing for Cyclists
- Designing for Pedestrians: A Guide to Good Practice (ECC)
- Essex Walking Strategy

## Street Type Table

6.1 The table below outlines the key design features of streets and the numbers of dwellings they should serve.

Street type	Street description	Guide to number of dwellings served	Carriageway width, cycle and pedestrian requirements width, cycle and pedestrian requirements	Target maximum driver speed	Maximum gradient	Centre line radius	Kerb radii	Comments
A	Local distributor	n/a	<p>7.3m and 1 x 2m footway + 1 x 3.5m cycle/footway.</p> <p>Buses to use full laybys.</p> <p>Pedestrian and cycle crossings to be provided identified desire lines.</p>		5%	DMRB	<p>10m for residential use, 15m for industrial or mixed use</p>	<p>Multi-purpose through route and classification as county route required (PR2).</p> <p>Minimum 3m wide verges.</p> <p>Built frontage but no direct access.</p> <p>A straight section of carriageway to be provided from the entrance junction for 30 metres.</p> <p>Street lighting will be provided in accordance with ECC Operational Plan.</p>



B	Link	n/a	<p>6.75m and 1 x 2m footway + 1 x 3.5m cycle/footway.</p> <p>Buses to use half laybys or stop on carriageway.</p> <p>Pedestrian and cycle crossings to be provided on identified desire lines.</p>	30mph	5%	44m	10m	<p>Links neighbourhoods and also serves non-residential or industrial uses.</p> <p>Public transport route.</p> <p>Minimum 3m wide verges.</p> <p>No parking unless off carriageway provision is made.</p> <p>Built frontage but no frontage access within 15m from junctions.</p> <p>Egress in forward gear only within 15 - 30m from junctions.</p> <p>A straight section of carriageway to be provided from the entrance junction for 22 metres.</p> <p>Street lighting will be provided in accordance with ECC Operational Plan.</p>
C	Mixed Use	n/a	6.75m carriageway comprising of two 3m running lanes with generally a 0.75m central over run-able	20mph	5%	20m	10m on a bus route otherwise 6m	<p>Major streets in urban centres.</p> <p>Serves mixed uses.</p> <p>On-street parking in bays.</p>



			<p>strip (can be wider) and 2 x 2m footways.</p> <p>Bus route.</p>					<p>Street trees required.</p> <p>A straight section of carriageway to be provided from the entrance junction for 22 metres.</p> <p>Street lighting to be provided in accordance with ECC operational Plan.</p>
D	Feeder	700 units	<p>6m or 6.75m if a current bus route now or one is expected in the future.</p> <p>1 x 2m footway + 1 x 3.5m cycle/footway.</p>	20mph	<p>8%</p> <p>6% on a bus route</p>	20m	<p>6m</p> <p>10m on a bus route</p>	<p>May serve residential and non-residential uses.</p> <p>A 30 mph speed limit may be considered on a public transport route where it is not possible to provide appropriate traffic calming for a 20mph speed limit.</p> <p>3 metre wide verges.</p> <p>No parking unless off carriageway provision is made.</p> <p>No frontage access within 15m from junctions.</p> <p>Egress in forward gear only within 15 - 30m from a junction.</p>



								<p>A straight section of carriageway to be provided from the entrance junction for 22 metres.</p> <p>Street lighting will be provided in accordance with ECC Operational Plan.</p>
E	Access	400 units on a loop or 200 units in a cul de sac	5.5m and 2 x 2m footways.  Single footway where appropriate.	20mph	8%	Minimum 13.6m  maximum 30m	6m	<p>Provide direct access to dwellings.</p> <p>A straight section of carriageway to be provided from the entrance junction for 15 metres.</p> <p>Street lighting will be provided in accordance with ECC Operational Plan.</p>
F	Minor access	100 units on a loop or 50 units in a cul de sac	<p>Combined pedestrian and vehicular surface of 6m.</p> <p>Maximum length around 125m for a cul-de-sac or 250m for a through route.</p> <p>Localised narrowing where appropriate.</p>	20mph	8%	Minimum 13.6m  Maximum 30m		<p>Provide direct access to dwellings.</p> <p>Tabled entrance and priority for pedestrians and cyclists across junctions.</p> <p>A straight section of carriageway to be provided from the entrance junction for 15 metres.</p> <p>Street lighting not required.</p>
G	Mews court	20 units	Combined pedestrian and vehicular	20mph	8%	Minimum 13.6m		<p>Special junction detail featuring entrance ramp/</p>



			<p>surface of 6m.</p> <p>Maximum length around 50m.</p> <p>Localised narrowing where appropriate.</p>	20mph	8%	Maximum 30m	<p>table.</p> <p>Priority for pedestrians and cyclists across junctions.</p> <p>A constricted entrance enclosed by buildings or walls for the first 8m back from the approach street (except for the 1.5m by 1.5m pedestrian visibility splays).</p> <p>No doors, gates or other entrances may open on to the mews within this first 8m.</p> <p>No projections over the net adoptable area of the mews court.</p> <p>No windows, doors or other projections should extend over public areas.</p> <p>A straight section of carriageway to be provided from the entrance junction for 10 metres.</p> <p>Street lighting not required</p>
H	Shared private drive	5 units maximum	5.5m for first 6m tapering down to a lesser width.		8%		Where a private drive joins a 20mph network the width may be

			Desirable maximum length 18m, longer requires a turning head of size 5 and passing bays.					reduced.  A straight section of carriageway to be provided from the entrance junction for 6 metres.  Street lighting not required.
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- 6.2 For all street types junction and forward sight-splays to comply with current policy standards; refer to DMRB or Manual for Streets.
- 6.3 There is a presumption against adoptable lighting on street types F, G and H due to the maintenance costs, though private boundary lighting can be incorporated. If a risk assessment determines that lighting is needed and private boundary lighting is impracticable, a commuted sum could be paid for adoptable lighting, which would include on-going revenue maintenance costs.
- 6.4 For a full description on each of the street types see Street Type Description page.

## Street Type Description

- 6.5 Within new residential areas, vehicular movement should be safe and pleasant, but vehicular access is to be provided in such a way as to be consistent with the achievement of an attractive environment and recognise the needs of sustainable modes which have to share the same corridor. Residential areas should primarily be designed as 20mph zones, with the exception of bus routes.
- 6.6 The aim should be to construct networks from linked streets. Cul-de-sac should be limited in number and restricted to those parts of a site which cannot be served in any other way. While the street types and configurations recommended here (with the exception of private drives) will be adopted for the purposes of maintenance, other solutions which achieve the same purposes will be considered on their merits.

## Criteria Applicable to All Street Types

- 6.7 The following general criteria are applicable to all street types:
- 6.8 Buildings should not overhang existing or proposed highways unless in exceptional circumstances, such as to provide an important gateway feature or historically informed jetty. In such instances, when a specific licence will be required.
- 6.9 No part of any building (including foundations, outward-opening windows, domestic drainage, downpipes, external lighting, gas meter boxes, porches, balconies etc) shall over hang the highway (this includes the footway).
- 6.10 On shared surfaces no part of any building including (including foundations, outward-opening windows, domestic drainage, downpipes, external lighting, gas meter boxes, porches and balconies etc) shall be located less than 0.5m from the carriage. If street lighting is installed in shared areas, this distance increases to 1m in the vicinity of each column. Drawings should show clearly how such spaces will be finished.

- 6.11 For all junctions, the approach gradient should be no steeper than 2.5% within 10m of the junction. Any exceptions should be discussed with the Highway Authority.
- 6.12 All junctions should be set at no more than 10 degrees from the right-angle. If non-right angle junctions are agreed these should only be on type E streets and lower, with all car movements achievable within the running carriageway. Below 80 degrees, overrun spaces for service vehicles become necessary.
- 6.13 Delivery vehicles larger than 7.5-tonnes (such as those servicing retail stores or supermarkets) should gain access via a street no smaller than type D.
- 6.14 Surfacing materials should have regard to the current SuDS Design Manual and guidance information for private areas as well as the Development Construction Manual for adoptable areas.
- 6.15 Type A Local Distributor
- 6.16 These are multi-purpose streets which link settlements and give access to residential areas and other land uses, and which form part of the local county route network. Built frontage is required on these streets; houses should face the road rather than turn their backs to it. Direct access is not generally permitted but frontage dwellings can be made accessible by a parallel access way and parking accessed from the rear.. This can form part of a continuous cycle route following the type A street.
- 6.17 Pedestrian and cycle routes should cross these streets where necessary so that the street does not act as a barrier to local movement.
- 6.18 This street type may only take access from an existing county route or another type A street.

The design of a junction with an existing county route should be in accordance with the requirements of the Highway Authority.



*Type A Street*

- a. 3.5m Footway/ cycle route
- b. Carriageway 7.3m or 6.75m
- c. Verge 3m minimum
- d. Footway 2m
- e. Non-residential uses
- f. Private drive or service road

**Type B Link Road**

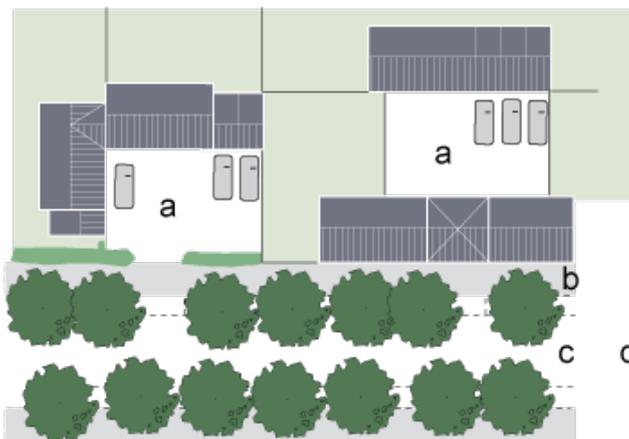
- 6.19 These are streets which link neighbourhoods within a large residential area. Again, built frontage is required. This street type may take access from an existing county route or a type A or B street. The

design of a junction with an existing county route should be in accordance with the requirements of the Highway Authority.



### Type B Link Road

- a. 3.5m Footway/ cycle route
- b. Carriageway 6.75m
- c. Verge 3m minimum
- d. Footway 2m
- e. Turning space in front

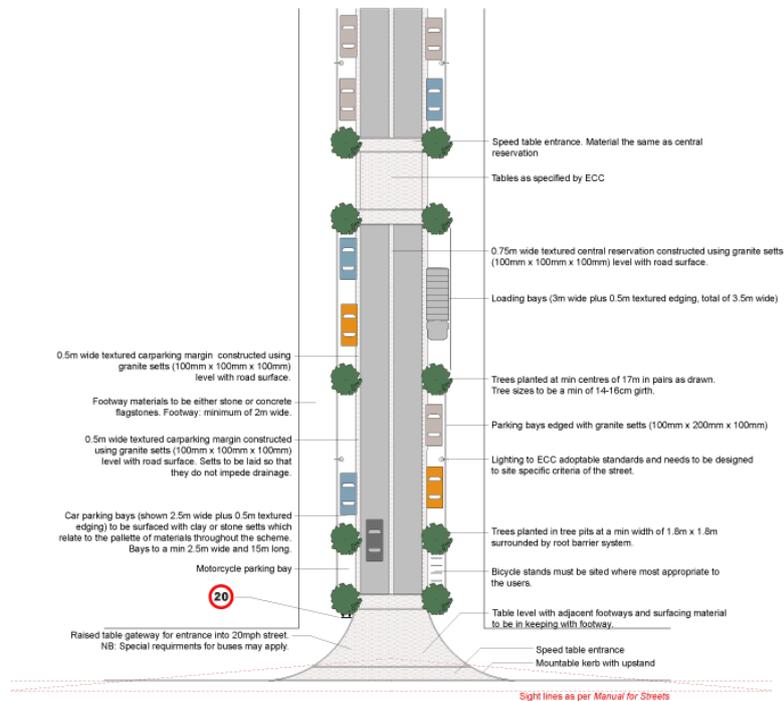


### Turning Area to Enable Egress in Forward Gear

- a. Turning space
- b. Footway 2m
- c. Carriageway
- d. Street type A, B, D

### Type C Mixed-use

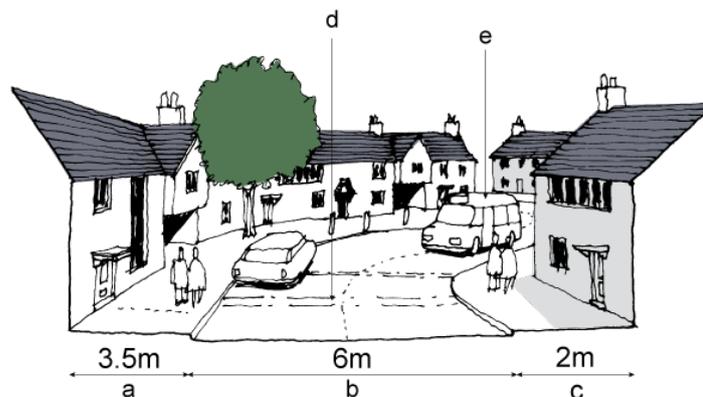
6.20 The function of this road type is to link neighbourhoods in urban areas where commercial or retail use may mix with residential, and where loading access may be required for service vehicles over 7.5 tonnes. These roads may also serve as local bus routes.



Type C Mixed-use street

## Type D Feeder Road

- 6.21 These are streets within a 20mph network serving around 700 dwellings. No part of a residential area should be farther than 400m from a type C or higher category street.
- 6.22 The target maximum speed is 20mph and this should be enforced with speed-restraint design.



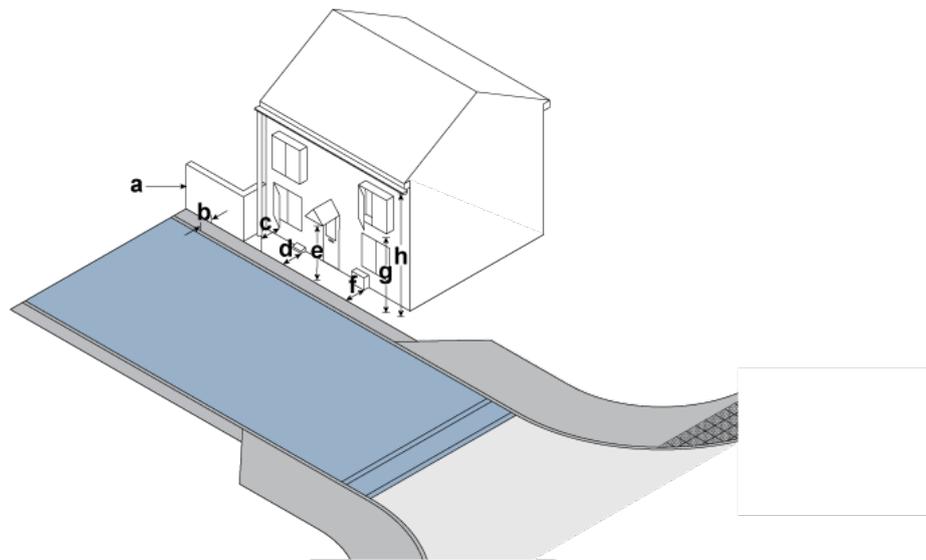
Type D Feeder Road

- a. 3.5m Footway/ cycle route
- b. Carriageway 6m
- c. Footway 2m
- d. Traffic calmed to 20mph (30 kph)
- e. Bus route

- 6.23 The maximum gradient is typically in the order of 8%, but steeper gradients will be considered where the retention of existing topography is desirable, subject to the use of a special surface finish that affords better adhesion.

## Type E Access Road

- 6.24 These are access streets within a 20mph network that give direct access to dwellings. Manoeuvring space of 6m is required to facilitate egress from domestic parking spaces. The target driver speed is maximum 20mph and this should be enforced with speed-restraint design.
- 6.25 This street type may take access from an existing county route and a type A, B, C, D or E street. The design of a junction with an existing county route should be in accordance with the requirements of the Highway Authority. Other junctions require a minimum kerb radius of 6m.
- 6.26 The maximum gradient is typically in the order of 8%, but steeper gradients will be considered where the retention of existing topography is desirable, subject to the use of a special surface finish that affords better adhesion.



### Type E Access Road

- a. Garden Wall adjacent to No Build Zone
- b. 500mm No Build Zone set back from kerb face
- c. Window opening not encroaching into No Build Zone
- d. Gas Meter Box located outside No build Zone
- e. Porch Overhang not encroaching into No Build Zone
- f. Alternative Gas Meter Box located outside No Build Zone
- g. Building Overhangs located outside No Build Zone
- h. Eaves and Guttering located outside of No Build Zone

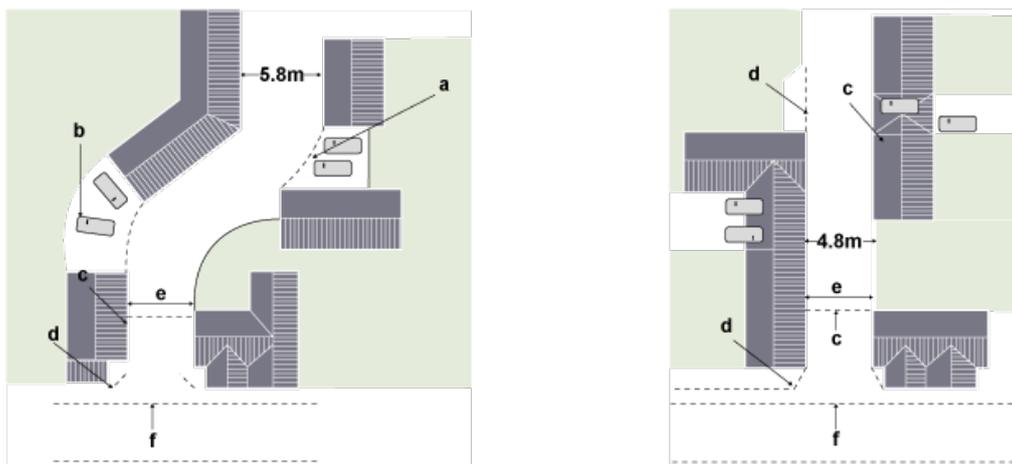
## Type F Minor Access

- 6.27 These are streets within a 20mph network giving direct access to dwellings. A combined pedestrian and vehicular surface of 6m is required. Manoeuvring space of 6m is required to facilitate egress from domestic parking spaces.
- 6.28 This street type may take access from an existing county route and a type A, B, D or E street.



speed-restraint design. This street type may take access from an existing county route and a type A, B, D or E street. The design of a junction with an existing county route should be in accordance with the requirements of the Highway Authority.

- 6.36 The maximum gradient is typically in the order of 8%, but steeper gradients will be considered where the retention of existing topography is desirable, subject to the use of a special surface finish that affords better adhesion.
- 6.37 A special surface in accordance with the Street Materials Guide or other agreed measures to encourage slow speeds will be required.
- 6.38 A 50mm upstand must be provided where planted areas abut the mews surface, so as to retain soil. Adjacent paved surfaces must be strengthened to withstand vehicle overrunning, and will not necessarily be adopted by the Highway Authority.



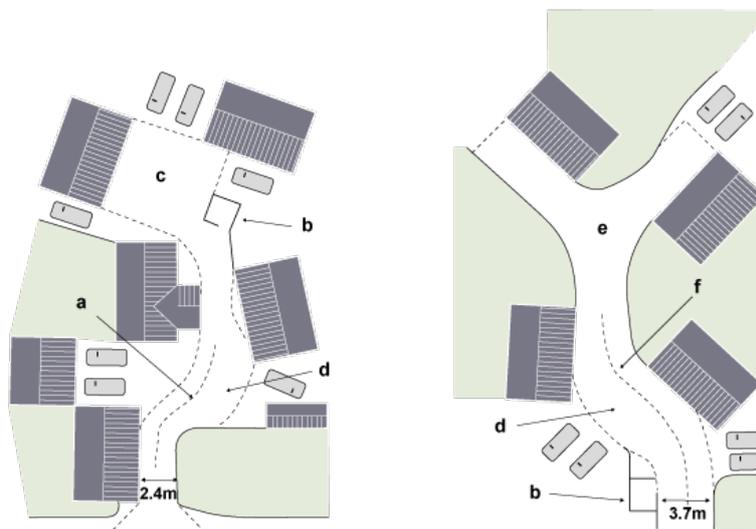
### Type G Mews Court

- a. No sight-splays required
- b. Unadoptable space abutting mews
- c. 50mm ramp, 6m back from footway
- d. 1.5m x 1.5m sight-splays behind footways
- e. Mews enclosed by buildings and/or 1.8m-high walls for first 8m back from footway (no openings)
- f. Mountable kerb

### Type H Shared Private Drive

- 6.39 Shared private drives are ways giving access to a maximum of 5 dwellings.
- 6.40 Shared private drives may take access from all street types, but in the case of a county route the junction should be in accordance with the requirements of the Highway Authority.
- 6.41 Where they take access from type A and B streets, turning facilities are necessary to enable egress in forward gear. This also applies within 30m of a junction on type D streets. On type G streets, private drives may not take access within the first 8m of the length of the street.
- 6.42 A shared private drive taking access from street types F or G or a parking square should be 3m wide. A shared private drive taking access from a county route or street types A-E should be 5.5m wide for the first 6m from the street, tapering over 6m down to a minimum width of 3m.

- 6.43 Typically, refuse collection vehicles will not enter private drives, and any dwellings more than 25m from the highway will require a bin-collection point within that distance, residents should not have to carry a bin more than 30m (excluding vertical distances). Drop kerbs should be provided to facilitate wheeled bin collection. Any dwelling more than 45m from the highway will necessitate use of the drive by fire tenders, in which case specifications should be as indicated in the 'Access for Fire Tenders' section of this guide, i.e. a minimum width of 3.7m and capable of carrying a 12.5-tonne vehicle.
- 6.44 Vehicle and pedestrian sight-splays of 1.5m x 1.5m from the rear of any footway should be provided on each side of a drive. No obstruction over 600mm high should be placed within any vehicle or pedestrian sight-splays. Sight-splays are not required where a drive joins street types F or G or a parking square. This is in keeping with advice given in Manual for Streets (2007); however, in cases where reasonably high pedestrian footfall is expected – for example, near a school or local shops and amenities – sight-splays can be provided.
- 6.45 On shared private drives, parking facilities for each dwelling must be provided clear of the shared drive area, turning space, passing bays etc. It is essential in both single and shared drives that adequate manoeuvring space is provided to allow vehicles to enter and leave all garages and parking spaces when all other available parking spaces are full.
- 6.46 All drives longer than 18m should have a turning head equivalent to at least size 5. Any drive that takes access from a type A or B street, or from a type D street within 30m of a junction, should have a turning head of at least size 5. A drive that may be used by fire tenders must have a turning head of at least size 3.



*Type H Shared Private Drive*

- a. Minimum centreline bend, radius 6m
- b. Bin-collection point no more than 25m from road
- c. Size 5 turning head
- d. Passing bay
- e. Size 3 turning head
- f. Minimum centreline bend, radius 7.75m where enclosed by walls

- 6.47 Passing places are required on shared drives greater than 18m in length, or on any drive from which ends are not intervisible.

- 6.48 A drive should meet the highway at an angle such that a car can turn in either direction in one movement. Typically, this would necessitate the drive meeting the highway at an angle within 10 degrees of a right angle. Where the drive is to be used by fire tenders, a fire tender should be able to turn in either direction in one movement. Usually the minimum centreline bend radius should be 6m, but a radius of 6.55 metres (or 7.75 metres if enclosed by walls) is necessary where the drive is to be used by fire tenders.
- 6.49 The maximum gradient is typically in the order of 8%, but steeper gradients will be considered where the retention of existing topography is desirable, subject to the use of a special surface finish that affords better adhesion.
- 6.50 Minimum headroom is typically 2.5m, but where the drive is to be used by fire tenders it should be no less than 3.7m.
- 6.51 Suitable surface materials are those which help to reduce vehicle speeds and have a pleasant appearance – for example, loose gravel (which should be bound with an approved binder within 6m of the highway), tar spray and shingle dressing (likewise to be bound within 6m of the highway), coloured asphalt, concrete or clay block paving, granite or man-made setts, cobbles or stable blocks.
- 6.52 As with mews courts, shared drives are likely to offer substantial redevelopment opportunities as a result of the increasing uptake of autonomous vehicles. Partly, this is because speeds will be restricted automatically and vehicles will be aware of potential hazards. This will reduce collisions and incidents caused by human error, thereby eliminating many of the concerns currently associated with this street typology.
- 6.53 If the primary purpose of the shared drive is to provide access to residents' parking spaces or private garages, what purpose will a shared drive designed for the present day serve at a time when the private car is longer a prerequisite? With this in mind, thought should be given to how these spaces could operate when their primary function is removed or substantially reduced.

## Driveways to Individual Dwellings

- 6.54 The minimum width for a drive serving a single dwelling is 3m. The drive in front of a double garage should be the width of the garage or a minimum of 5.5m for a length of at least 6m in front of the garage doors.

## Cul-de-sac

- 6.55 Where the end of a cul-de-sac abuts a site for possible future development, the cul-de-sac should be of a street type capable of serving the likely future number of dwellings (as far as can be determined).

## Parking Square

- 6.56 These are spaces occurring at intervals within a 20mph network. The number of dwellings served by a parking square will depend on the size of the space, which should not exceed 50m in any direction. No vehicle or pedestrian sight-splays are required at egresses on to the parking square; cycle parking should be designed into the space.
- 6.57 A minimum 6m-wide vehicle-way should traverse the space. The square should be of a tabled form. If this table is to be used as a specific speed-restraint feature, the vehicle-way should change direction across the square.
- 6.58 A junction of routes may occur within the square. In the case of a square without a junction, a central

feature can be located in the middle of the vehicle-way, which should be widened to allow traffic to pass on either side. Due to slow speeds, it should not be necessary to provide road markings or signs. As a built feature within a future highway, a developer contribution may be required towards future maintenance of the central feature.

- 6.59 A parking square should be directly fronted by development and a 2m-wide pedestrian margin should be marked out in front. This demarcation can take the form of a different colour of surfacing and may be protected by bollards or other means.
- 6.60 Car parking may be accommodated in those parts of the square not occupied by the vehicleway or pedestrian margin. A parking square should not be regarded as making up part of the residential parking allocation requirement for the individual dwellings but rather as a mechanism to deliver visitor and unallocated parking for the scheme.
- 6.61 No windows or doors should open outwards onto a parking square. Similarly, no overflow pipes, single-storey eaves or similar should project over the public area of the parking square.
- 6.62 A special surface in accordance with the Street Materials Guide or other agreed measure is required in order to encourage slow speeds.
- 6.63 The vehicle-way should be demarcated by formed channels in the same material as the wider space. Allowance should be made for overrunning by larger vehicles where bends in the vehicleway are tighter than a 13.6m centreline bend radius.
- 6.64 Parking squares often occupy large areas at key locations within developments. Thought should be given to how the use of these spaces may change as a result of a shift in culture away from the privately owned car, and to what other uses they could be turned for the benefit of the community. Examples of relevant considerations include how autonomous vehicles might navigate the space; the flexibility of the proposed surfacing; the suitability of the site as an area of public space in its own right; and the provision of utility services.
- 6.65 A parking square may be located on a type E or F street.



Parking squares

## Pedestrian and Cycle Movement

- 6.66 Within new residential areas, pedestrian and cycle movement should be coherent, direct, safe, comfortable and attractive. The walking and cycling network should connect well with the existing network outside of the development and be supported by high-quality signage with distances and times indicated.

### Footways

- 6.67 Where footways are provided, they should be a minimum of 2m wide. In exceptional circumstances, lesser widths may be considered, albeit only for short lengths on streets of type E and below, where pedestrian flows are like likely to be low.
- 6.68 Footpaths might be omitted a one side the street adjoining green space and on lightly trafficked routes, where pedestrians can easily cross and aren't unreasonably inconvenienced. It may also be appropriate to widen footpaths in response to high footfalls, to create a sense of space, encourage pedestrian activities or accommodate desire lines.

### Pedestrian and Cycle Routes

- 6.69 The principles of designing for cyclists are outlined in the Streets and Roads section of this guide.
- 6.70 Where shared pedestrian and cycle links are deemed appropriate, they should be a minimum of 3m wide (if the route is shared) or 3.5m wide (if pedestrians and cyclists are separated). Where the link is bounded by a building, wall or fence, it should be widened on that side by 0.5m.
- 6.71 Appropriate visibility should be provided along cycle routes and at junctions and access points.
- 6.72 Where a cycle route crosses a street, a formal or informal crossing should be provided as appropriate. On a street of type E or below, the crossing should be designed as a speed-restraint measure to drivers. This should be achieved by having the surface material of the cycle route continue across the carriageway and the approach to the crossing ramped up similar to a speed table.

## Bus Stops, Routes and Termini

- 6.73 To ensure effective passenger pick-up and drop-off, the approach to the bus stop should be kept permanently clear of parked vehicles – which may necessitate the introduction of a bus-stop clear-way road-marking. This in turn may impact access to and parking arrangements for nearby dwellings. No dwelling should be more than 400m from a bus stop.
- 6.74 The associated infrastructure should be incorporated as the development progresses. This may include:
- Bus clearway
  - Wider footways
  - Passenger shelters (at boarding points)
  - Disability Discrimination Act (DDA)-compliant 160mm raised kerbs of 3m in length with transition ramps at either end
  - Real-time passenger information
  - A pedestrian crossing-point in the vicinity of the bus stop

- 6.75 The carriageway of a bus route should not be less than 6.75 metres wide. Typically, 30mph vertical-deflection speed-reducing measures should be avoided on bus routes; where they must be used, they should take the form of table arrangements, with a table in excess of 12m in length.
- 6.76 Bus stops should be located within the overall limits of the carriageway of roads where the traffic speed is 30mph or less. In situations where a bus standing in the carriageway is likely to cause congestion, it may be necessary to consider the provision of a half layby.
- 6.77 It should be noted that a full-size bus requires a turning circle 26m in diameter.
- 6.78 For information on the Design of bus routes and how these can be incorporated into street design please see the relevant section of Streets and Roads.

## One-way Street

- 6.79 If site constraints necessitate narrower than normal streets, it is possible to use a type F street as a one-way street.
- 6.80 Around 100 dwellings can be directly served by a one-way street; otherwise it can be frustrating for residents at one end of such a street to have to make a long detour for a trip that could have been made more directly in the contra-flow direction.
- 6.81 For a one-way street, the width of the carriageway can be reduced to 3.7m. In every other respect the design requirements are as for the equivalent street type.
- 6.82 Where a one-way street leaves another street, no sight-lines are required, but where it joins another street, sight-line requirements are as they would be for the equivalent two-way street type. Side junctions onto a one-way street need a sight-line in the direction of oncoming traffic only.
- 6.83 In accordance with the Traffic Signs Manual, one-way streets should be clearly signed as such at their entry, exit and side junctions. Where there are long intervals between side junctions, there should be reminder signs for the benefit of drivers joining the street from frontage premises. These signs should be placed alternately on each side of the street at a minimum spacing of 100m between signs on the same side. Arrows should be painted on the street surface at 30m intervals.

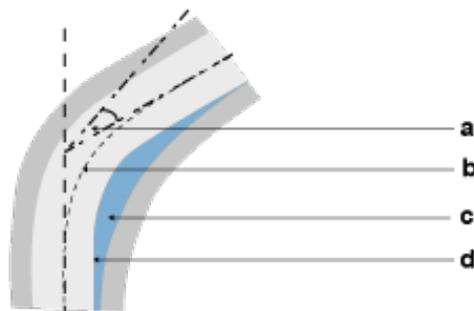
## Speed Restraint Within a 20mph Zone

- 6.84 To encourage adherence to the designed maximum speed of 20mph, it is necessary to implement one engineering measure drawn from lists (a) or (b) below in each 20mph zone. In many circumstances, it will also be necessary to implement a complementary measure drawn from list (c).
- 6.85 Measures to reduce visibility for the driver are not acceptable by themselves. Rumble strips are also not an adequate speed-restraint measure. Speed-restraint measures should be located at maximum intervals of 60m, starting within 50m of the entry junction or zone. They must be well-lit and must comply with the Highways (Traffic calming) and Highways (Road Hump) regulations. They may take the form of changes in horizontal alignment, changes in vertical alignment or complementary measures.
- 6.86 The visibility of a route can be agreed on a case-by-case basis, with the standard being applied to the geometry of the road.

## (a) Changes in Horizontal Alignment

### 6.87 Bends

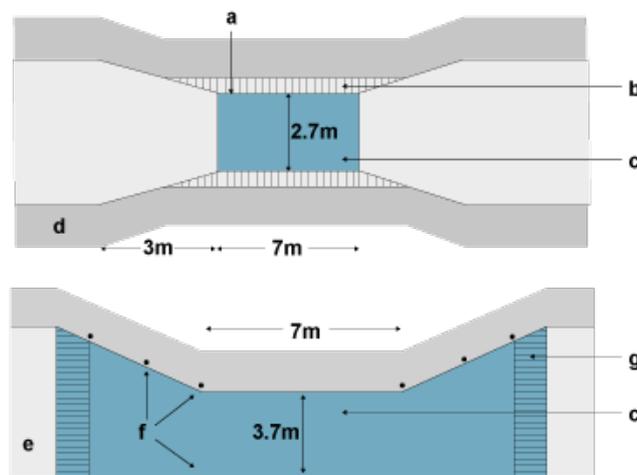
6.88 These should be tighter than the minimum specified for each street type, down to a minimum centreline bend radius of 7.5m. The deflection should be greater than 45 degrees with a mountable shoulder to enable larger vehicles to overrun.



- a. Deflection greater than 45°
- b. Centreline bend radius less than minimum specified for road type
- c. Vehicle deterrent paving 1/36 slope into road
- d. 15mm maximum upstand

### 6.89 Narrows

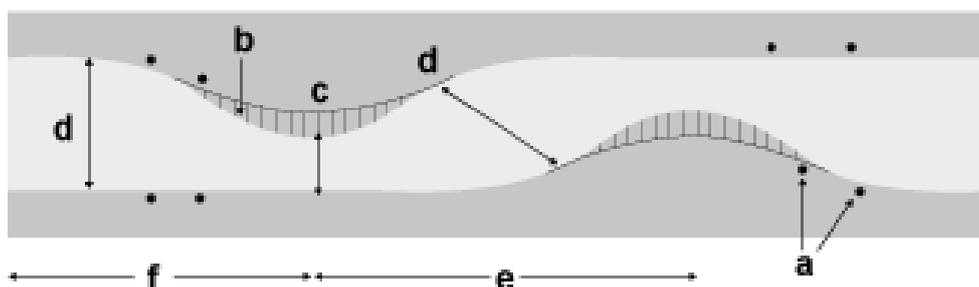
6.90 The narrowing of the carriageway to 2.7m for a length not exceeding 7m will cause drivers to wait for oncoming traffic to pass. A 500mm mountable shoulder either side will allow service vehicles to negotiate this obstruction. This measure is not appropriate for shared surfaces.



- a. 15mm maximum upstand
- b. 500mm vehicle deterrent paving at 1/36 slope into road
- c. Change of surface material
- d. Ramped narrows suitable for roads 5.5m or less in width
- e. Ramped narrows suitable for roads 6m wide
- f. Red and white posts and verge markers
- g. Ramp

## 6.91 Chicanes

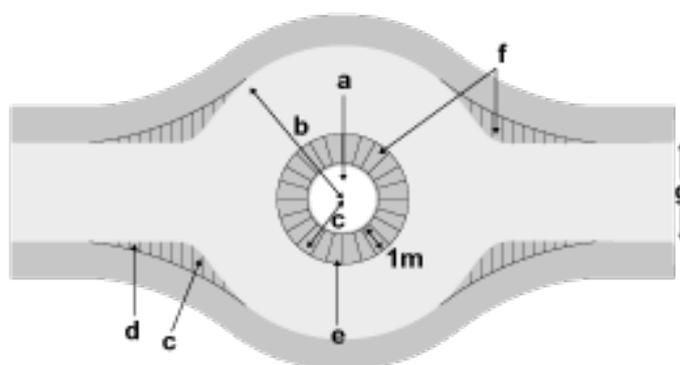
6.92 To be effective, the lateral displacement of the running lane must be at least 2m and the length of the displacement no greater than 10m. A reduction of carriageway width to 2m at the entrance and exit of the chicane is acceptable, but a mountable shoulder may be necessary to provide a 3.1m-wide path for service vehicles. This measure is not appropriate for shared surfaces.



- a. Red and white posts and verge markers
- b. Mountable shoulder in vehicle deterrent paving to provide 3.1m path for service providers
- c. 2m width
- d. Normal road width
- e. Maximum length of displacement 10m
- f. 6m taper

## 6.93 Islands

6.94 An island should result in a lateral displacement of the running lane of at least 2m. The island may be any shape, subject to the minimum dimensions given below. Mountable shoulders may be used to enable the passage of service vehicles, but no vehicle should be able to overrun the centre of the island. This measure is not appropriate for shared surfaces.

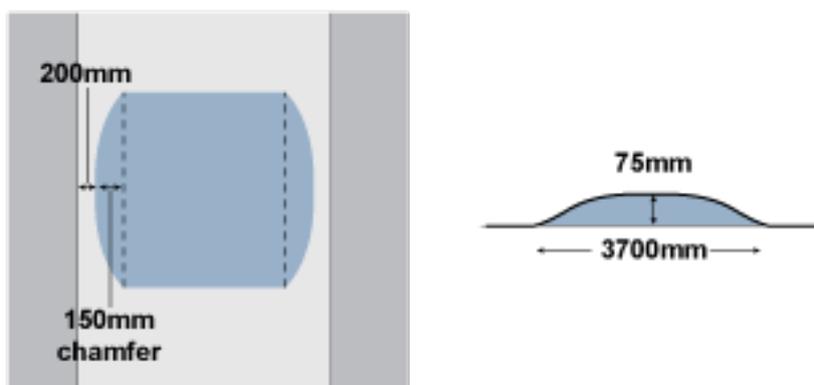


- a. Low shrub planting
- b. 7.1m radius
- c. 2m radius
- d. 20m radius
- e. Upstand to prevent vehicle overrunning
- f. Mountable shoulders in vehicle deterrent paving to provide a 2.1m path for service vehicles overrun
- g. Normal road width

## (b) Changes in Vertical Alignment

### 6.95 Humps

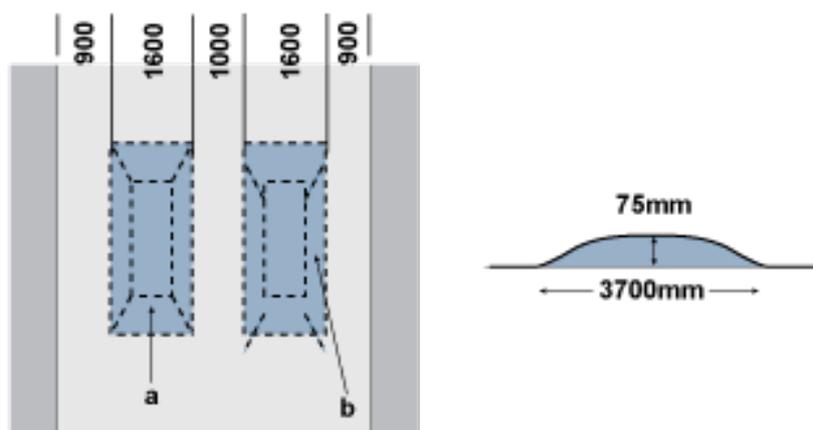
6.96 Round-topped humps should be 75mm high and no longer than 3.7m. They are not appropriate for bus routes, shared surfaces or street types A, B or C.



(Left) Plan view (Right) Section along road

### 6.97 Cushions

6.98 On street types C and D, which are likely to be used by buses and emergency services, speed cushions should be used instead of humps. They are designed to allow the wheels of buses and wide-wheelbase vehicles to pass either side of the raised area while cars still have to negotiate the hump. They should be constructed in pairs.



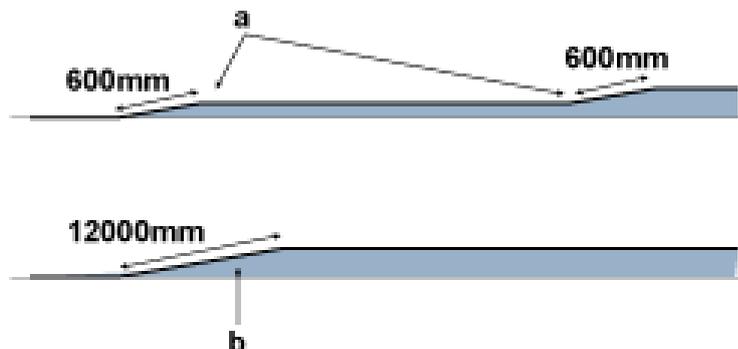
(Left) Plan view (Right) Section along road

a. 1 in 8 max

b. 1 in 4 max

### 6.99 Ramps

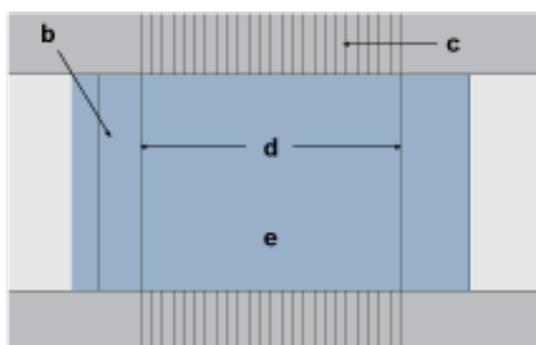
6.100 Single or successive ramps 75mm in height are appropriate within or at the entrances to shared-surface areas.



(Top) Successive 50mm ramps for shared surfaces (Bottom) Single 100mm ramp for shared surfaces  
a. 50mm rise  
b. 100mm rise

## 6.101 Speed Tables

6.102 A plateau may be created by ramps rising 75mm at a rise of 1-in-12. Unless there is a junction, such a plateau should be no longer than 7m – but where it is to be used by public transport vehicles, it should be 12m in length with a rise of 1-in-15. Tactile surfaces should demarcate the border between carriageway and footway for the benefit of the visually impaired. This may be a good way of slowing traffic for a footpath crossing.



(Left) Plan view (Right) Section along road

a. Single 100mm ramp for shared surfaces

b. 600-1200mm

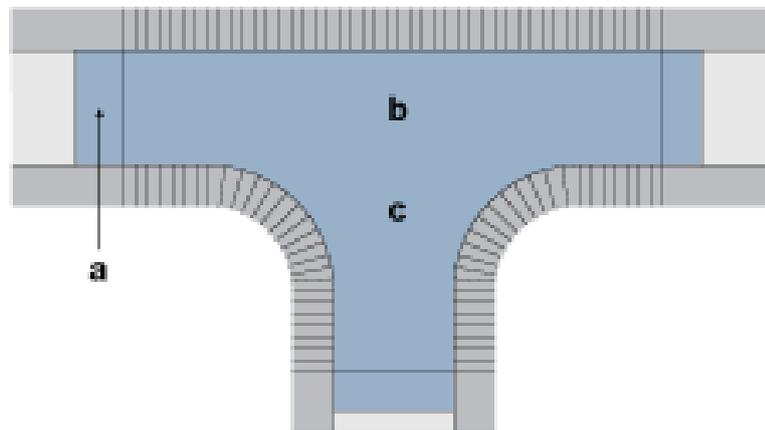
c. Tactile surface to footway, 50mm minimum upstand from this table

d. 7m maximum where there is no junction

e. Surface material different from the rest of the road

## 6.103 Table Junction

6.104 A junction may be treated as a plateau approached by ramps as described in the Speed Tables section of this guide. Tactile surfaces should demarcate the boundary between carriageway and footway.



- a. 600-1200mm ramp
- b. Surface material different to the rest of the road
- c. 100mm above normal road level

## (c) Complementary Measures

### 6.105 Buildings

6.106 Buildings may form an end-stop to a straight stretch of street, or be angled indicating a change of direction. They may also form a gateway through which the street passes. Used in conjunction with other speed restraints, they can induce drivers to reduce speed and take extra care.

## Junction Types and Design

6.107 Basic junction form should be determined at the master planning stage. An overview of illustrative junction layouts and principles designing places with junctions can be found in Manual for Streets. The detailed design stage will consider how they are going to work in practice, traffic priority arrangements and the need or otherwise for signs, markings and kerbs.

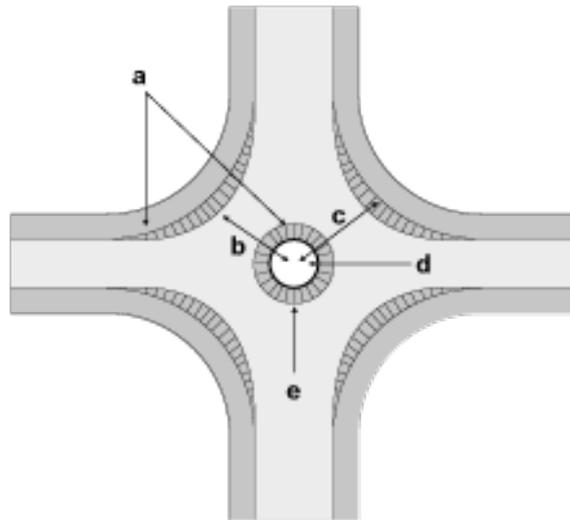
6.108 All junctions should be designed with the needs of pedestrians and cyclists in mind. An Essex Cycle Design portal is currently in development; in the short-term, refer to the Sustrans 'Handbook for Cycle Friendly Design' for details of current best practice.

### T Junctions

6.109 Typically, the side turning is of the major traffic flow, but a T junction that diverts the major traffic flow can be a useful means of reducing speeds.

### Islands and Mini-roundabouts

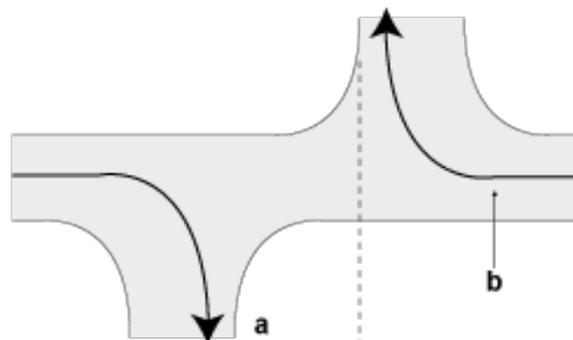
6.110 These will be more appropriate for streets of type D and above. The island may be any shape, subject to the minimum dimensions given below. The siting and use of mini-roundabouts for type A and B streets should comply with the Design Manual for Roads and Bridges (DMRB) standards on size and signing.



- a. Mountable shoulders in vehicle deterrent paving to provide service vehicle overrun
- b. 6.1m radius
- c. 7.1 radius
- d. Centre section of island - 2m radius
- e. Outer edge of island - 1m

## 6.111 Staggered Junctions

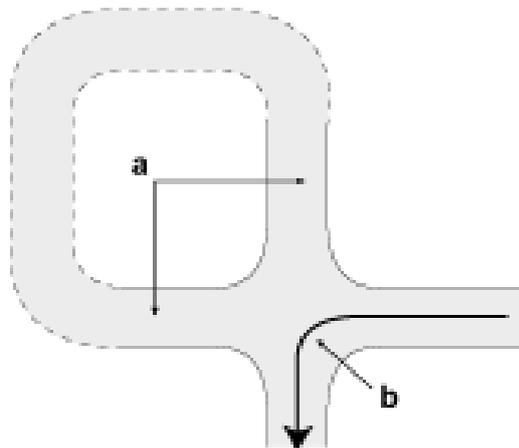
6.112 These are possible on type E and lower roads within a 20mph zone. The side roads should be staggered by the width of one carriageway, and right/left staggers are preferable to left/right, so as to reduce conflicting movements. Such a junction is possible notwithstanding the junction spacing requirements outlined in the 'Junction Spacing' section of this guide.



- a. Stagger=carriageway width
- b. Right-left stagger reduces conflicting movements

## 6.113 Crossroads

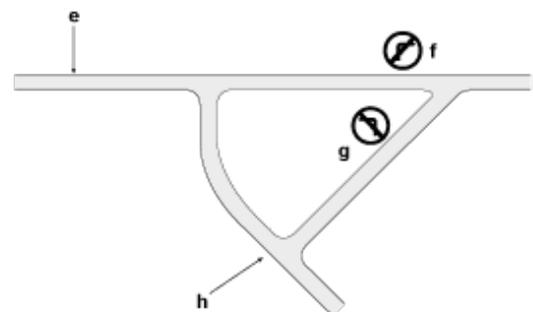
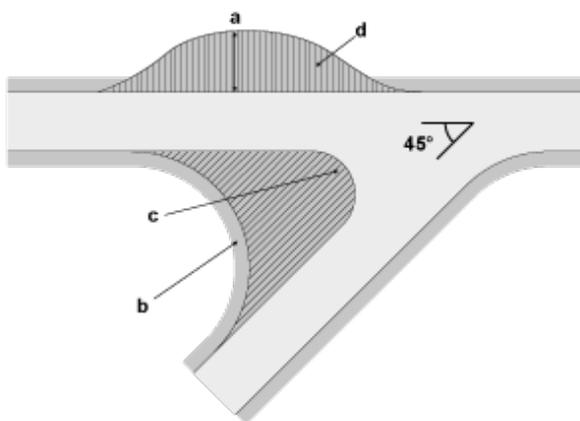
6.114 These should only be used in exceptional circumstances and will be treated as special features within a layout (see picture 38).



- a. On type 4 and higher category roads these arms may serve no more than 25 dwellings each
- b. Main flow of traffic

## 6.115 Non-right Angle Junctions

6.116 On type E and lower category roads, non-right angle junctions will be permitted down to a limit of 45 degrees and should accommodate all car-turning movements within the carriageway. Below 80 degrees, overrun spaces for service vehicles become necessary. In such cases, it may be preferable to ban service-vehicle turning movements around the acute angle, provided an alternative route is available and signed in advance.



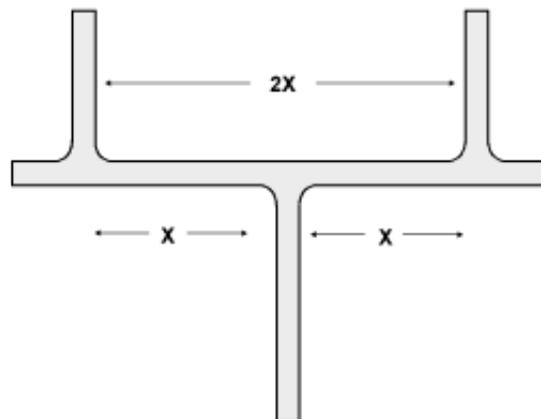
- 6.117 a. 5.6m service vehicle overrun b. 10.5m radius for service vehicles c. 4.5m radius for cars d. Mountable shoulders in vehicle-deterrent paving to provide service vehicle overrun e. 'No right turn ahead, turn right here for Road X' sign f. 'No right turn' sign g. 'No left turn' sign h. 'No left turn in Road X, straight on for Road Y' sign

## Junction Spacing

6.118 For junctions on county routes, it is necessary to consult the Highway Authority. In the case of residential streets, the minimum stagger between junctions on opposite sides of a road is X, where X is determined

using the table below. Where cells in the table are left blank, no restrictions apply. The normal stagger between junctions on the same side of the street is 2X.

Side road at junction	Main road at junction				
	A	B	C	D	E
A Local distributor	50m				
B Link road	50m	30m			
C Mixed-use street	50m	30m	20m		
D Feeder road	50m	30m	20m	15m	
E Access road	50m	20m	15m	15m	
F Minor access road	50m	20m	15m	15m	
G Mews court	30m	20m			
H Private drive	30m	20m			



Side roads joining type A or B roads should have no side-junctions to other roads within 20m of the junction with the major road.

## Visibility

### Vehicle and Pedestrian Sight-splays

- 6.119 These are required where cycleways, house drives, shared private drives, access ways to parking or garage courts and individual parking spaces and garages are accessed across the footway of a street.
- 6.120 Sight-splays should give 1.5m x 1.5m clear visibility above a height of 600mm and may be achieved by splaying back the building or wall abutting the entrance – either by setting the building or wall back 1.5m from the rear edge of the footway, or by widening the entrance by 1.5m on either side. Alternatively, various combinations of these measures may be used to achieve the same result.

### Forward Visibility

- 6.121 At all points on a development's street system (except parking squares and mews courts), there must be sufficient forward visibility to allow the driver of a vehicle to stop comfortably and safely. The forward

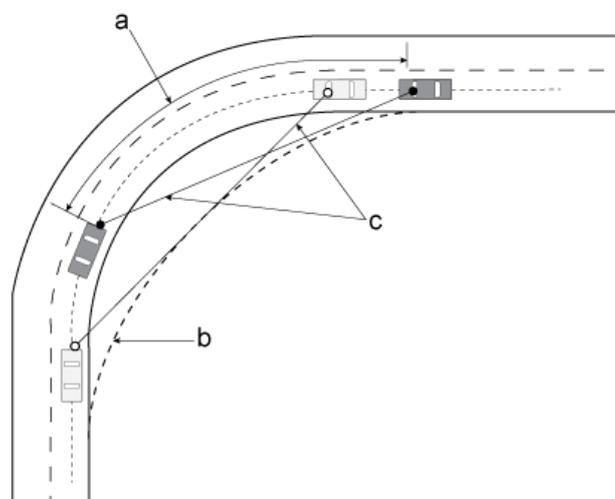
visibility distance is related to vehicle speed, which in turn depends on alignment. The following standards should be applied:

- 6.122 For type A roads with speed limits over 30mph, Design Manual for Roads and Bridges (DMRB) standards will apply.
- 6.123 For streets with speed limits of 30mph or under in particular type B, C and D roads, Manual for Streets standards will apply.
- 6.124 For type E and F roads, Manual for Streets standards will apply unless a bend is introduced with a deflection angle of 70 degrees or more. In such cases, the forward visibility may reduce to the centreline radius of the bend down to a minimum length of 11m.
- 6.125 The table below is reproduced from Manual for Streets (2007). It shows stopping site distances at speeds up to 37mph and is included here as a guide to visibility recommendations in new layouts. Appropriate speed-restraint measures must accompany any layout promoting the use of these values. Streets with speeds above 37mph should be designed to DMRB criteria.

6.126 Derived stopping sight distances (SSD) for streets:

Kilometres per hour	16	20	24	25	30	32	40	45	48	50	60
Miles per hour	10	12	15	16	19	20	25	28	30	31	37
SDD (metres)	11	14	17	18	23	25	33	39	43	45	59

- 6.127 The minimum forward visibility required is equal to minimum SSD, based on the design speed at the location being considered. It is checked by measuring between points on a curve along the centreline of the inner traffic lane.



a. Forward visibility measured along centre of inner lane. b. Visibility splay envelope. c. Visibility splays. Diagram reproduced from Manual for Streets 2 by CIHT.

## Gradients

- 6.128 Where a change in gradient of more than 1% occurs, a vertical curve is required at both summits and valleys for comfort of driving and, at summits, to ensure forward visibility. In the latter case, a forward

visibility distance of 25m to a point 600mm above the road surface is required within 20mph zones. This forward visibility distance rises to 43m on 30mph roads. For roads over 30mph, Design Manual for Roads and Bridges (DMRB) visibility standards will apply.



Forward visibility 25m in 20mph (30kph) zones; 43m on 30mph (50kph) roads  
a. Vertical curve at summit

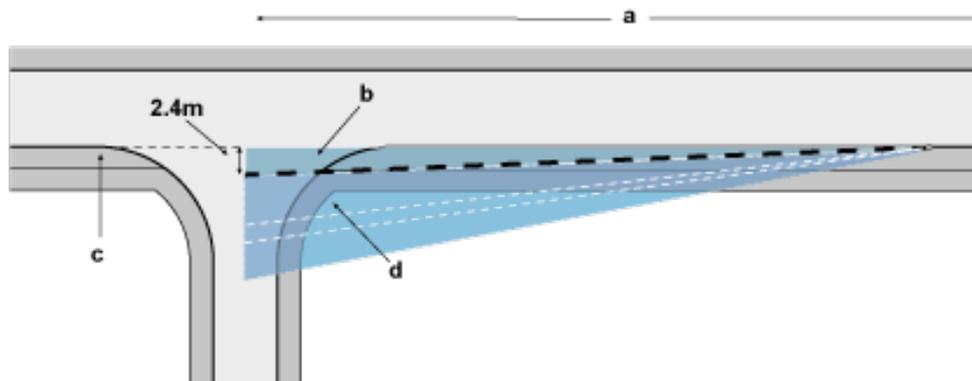
## Planting in Sight-splays

6.129 At junctions, the sight-splay can be divided into two visibility zones. The type of planting considered suitable within sight-splays is set out in the following table:

Planting	Zone A	Zone B
Existing trees	Typically, no trees permitted. However, in exceptional cases trees may be retained. Final decision to be made on-site in consultation with the local Highway Authority and Planning Authority	Trees may be retained. Final decision to be made on-site in consultation with the local Highway Authority and Planning Authority
New trees	No trees permitted	Trees may be permitted. The precise location should be agreed with the Highway Authority
Groundcover	Groundcover permitted providing the plants do not generally exceed 600mm in height when mature	As for Zone A

6.130 All new trees should be of slender girth when mature and have trunks clear of side-growth to a height of 2.1m, or 2.4m if adjacent to a cycle route.

6.131 Grass is not precluded from the areas of sight-splays, but these areas tend to be small and awkwardly shaped, and consequently expensive to maintain. Trees may be allowed, but the locations shall be agreed on-site with the Highway Authority.



*Restrictions on planting in sight splays*

a. 'Y' distance variable

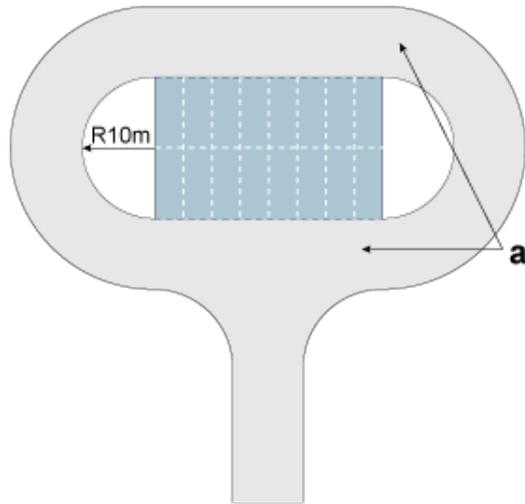
b. Zone A

c. Verge

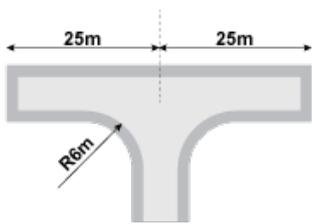
d. 3.6m Zone B applies in the case of Road Types 1 and 2 only

## Turning Heads

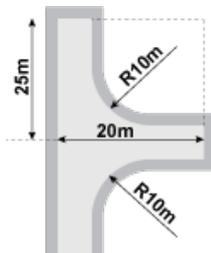
- 6.132 Entrances to premises or private drives should be located at the ends of turning heads, in order to discourage parking. On type D, E and F roads, the size of the turning head should be determined by the expected type and frequency of vehicles manoeuvring.
- 6.133 Any cul-de-sac system off a type A or higher category road is to provide a turning head of not less than size 2 dimensions. This may be contained within the first road junction off the cul-de-sac. Where very large vehicles are likely to frequent the system, it may be necessary to incorporate a size 1 turning bay.
- 6.134 On type E, F and G roads that comprise side turnings from type D, E, F or G roads, and which are less than 20m in length excluding the turning head, a size 4 turning head may be used.
- 6.135 On type G roads of less than 20m in length, a size 5 turning head will be required. In all other circumstances, a size 3 turning head will be sufficient. This is adequate for turning fire and rescue tenders and pantechnicons. The shaded areas in the accompanying diagrams are required for vehicle overhang and must be included as part of the highway. These can form all or part of a footway, but should be adopted highway.
- 6.136 In situations where size 3-5 turning heads would normally be permitted, a turning loop incorporating car parking spaces may instead be used. It is not necessary to construct the turning head in the precise shape shown in these diagrams, or even to distinguish it by means of surface demarcation. It is simply necessary to demonstrate that the space provided is appropriately laid out to accommodate the size of vehicle consistent with the type of development. Turning heads can therefore be 'disguised' to avoid their becoming a dominant presence in a street.



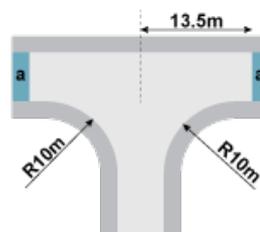
Turning loop incorporating car parking spaces a. 6m width



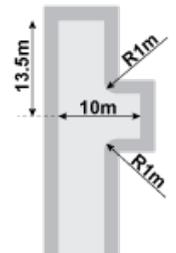
Size 1, T Turn



Size 1, Side Turn

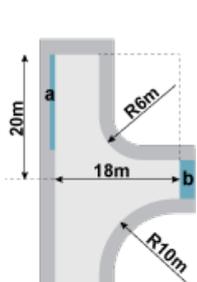


Size 2, T Turn

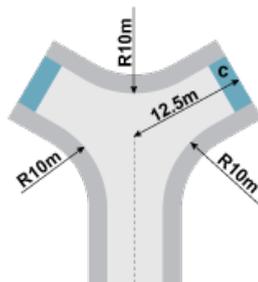


Size 4

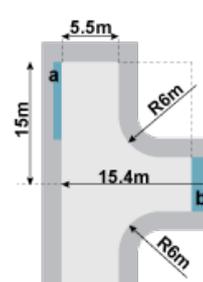
Turning heads  
a. 2m overhang



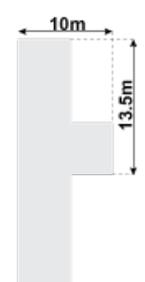
Size 2, Side Turn



Size 2, Y Turn

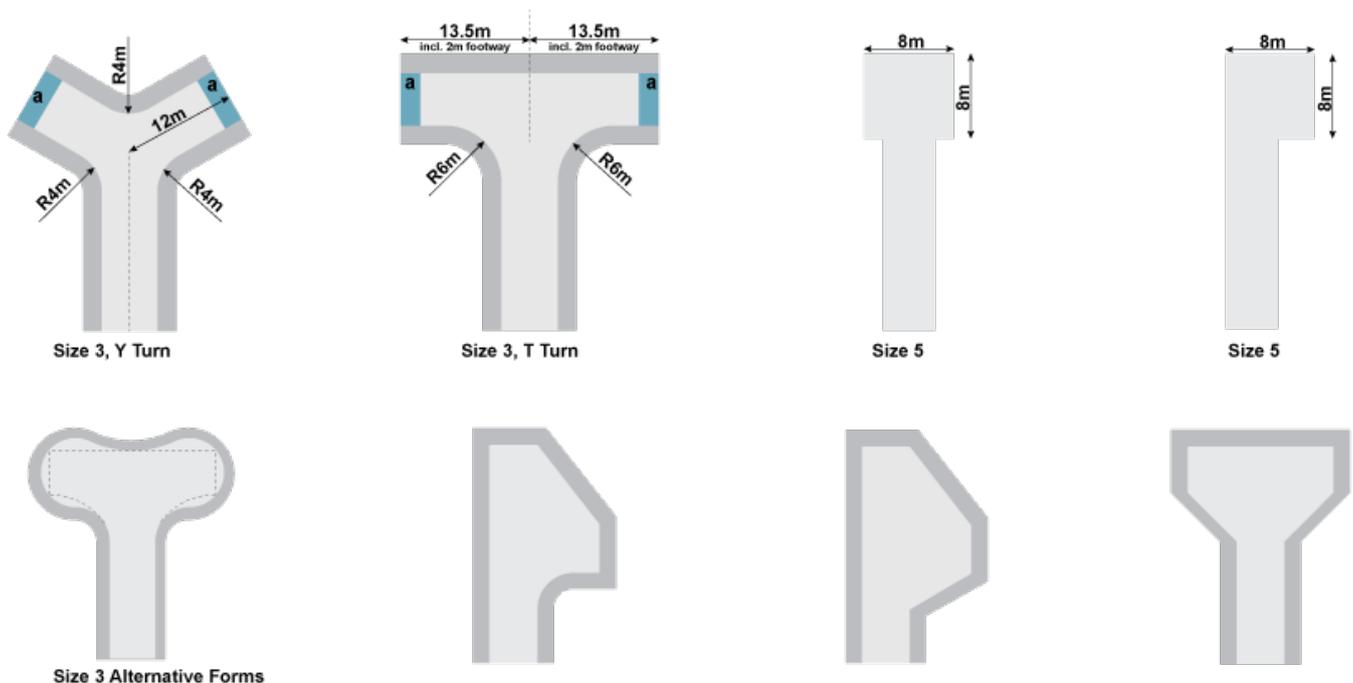


Size 3, Side Turn



Size 5

Turning heads  
a. 1m overhang b. 1.6m overhang c. 2m overhang



Turning heads  
a. 2m overhang

## Vertical Clearance Under Structures

- 6.137 Vertical clearance of 5.03m is required over the full width of a carriageway in addition to a further 500mm at either side. In the event of a cross fall on the carriageway being greater than 2.5% (1-in-40), the 500mm dimension should be increased to 610mm on the low side of the carriageway.
- 6.138 The vertical clearance required at the entrance to a type G mews is 4.1m. If clearance is less than 5.03m, it must be signed. However, if separate service-vehicle access is provided, the clearance at the secondary entrance could be reduced to 2.25m.
- 6.139 Please note that for structures over type A roads, Design Manual for Roads and Bridges (DMRB) standards apply. Further advice should be sought from the Highway Authority.

## Driveways to individual dwellings

- 6.140 House drives are to meet the back of the footway at right angles, and should not deviate from this by more than 10°. Except in the case of type F and G streets and parking squares, a 1.5m x 1.5m pedestrian sight-splay is required behind a footway to give clear visibility above a height of 600mm to at least 1.8m. Vehicular access is not permitted across radius kerbs at junctions.
- 6.141 The minimum width for a drive serving a single dwelling is 3m. The drive in front of a double garage should be the width of the garage or a minimum of 5.5m for a length of at least 6m in front of the garage doors.

## Bollards

- 6.142 Where bollards are used to protect buildings and demarcate footways in parking squares, they should be approximately 1.2m high and made of cast-iron or hardwood.

## Kerbs

- 6.143 The design of kerbs should complement the design-speed and character of the street. For precise details, refer to the Development Construction Manual.

## Street Lighting

- 6.144 Street lighting should be designed to achieve sufficient illumination to enable safe movement by pedestrians and cyclists, reducing opportunities for crime and enabling drivers to see hazards on the street.
- 6.145 Designers should also aim to illuminate the built environment in an attractive way, and to select and position lighting columns so that they enhance rather than detract from the daytime scene. The Highway Authority will adopt all lighting to public areas adopted as vehicle routes, footpaths and cycleways, provided the fittings conform to the council's specifications and the whole installation complies with BS 5489 and BS EN 13201 (latest editions) or other standards that may be appropriate.
- 6.146 Lighting of private areas such as parking courts, service areas and private streets may also be deemed necessary in urban areas to discourage car crime and increase the sense of personal safety. In such areas, lighting will have to be maintained by building owners or management companies. Generally, a mounting height of 6m is required.

## Means of Support

- 6.147 Lanterns may be mounted on columns and should typically be galvanised to BSEN40, but appearance is enhanced if they are supplied polymer-coated in a dark colour. The addition of decorative rings will create the effect of the old cast-iron column type. Columns should typically be located at the rear of the footway or, in the case of a shared-surface area, at the rear of an adopted recess 1m deep x 1m wide.

## Type of Lantern

- 6.148 The type of lantern should be agreed in accordance with the Essex Highways 'Development Management Street Lighting Specification'. In addition, the Highway Authority is prepared to adopt a range of more attractive lanterns, including post-top types, provided the developer pays a commuted sum to cover extra maintenance, replacement and energy costs.

## Particular Locations

- 6.149 Lighting columns should be positioned to illuminate speed-restraint features clearly. Post-top amenity lanterns should be considered for squares, footpaths, cycleways and so on, where they should be accessible by maintenance vehicles. Lighting columns should not be located within 1m of an access point to a private drive.

## Access for Fire Tenders

- 6.150 Under Building Regulation B5, access for fire tenders is required to a point not further than 45m from all parts of the ground-floor of any residential building. Any street or private drive forming part of such a fire access way must be no less than 3.7m wide between kerbs (though this may reduce to 3.1m for a gateway or similar short narrowing) and should have a minimum centreline bend radius of 6.55m (or 7.75m if enclosed by walls) and headroom of 3.7m.
- 6.151 The access way including manholes should be capable of carrying a 12.5-tonne vehicle, though structures such as bridges should have a minimum carrying capacity of 17 tonnes. A cul-de-sac that is more than 20m in length must have a turning head of at least size 3. Where there are flats of more than four storeys there are additional access requirements; for more information, refer to the Building Regulations and/or the local Building Control Authority. Fire access will normally be to the front of dwellings, but rear access is acceptable provided it is clearly signed and the dwellings are also numbered from that side.

## Commuted Sums

- 6.152 Where special materials or products with shorter life expectancies are used, or high-maintenance designs that will necessitate increased levels of care are implemented (such as enhanced lighting columns or lanterns, drainage attenuation, trees and landscaping), payment of appropriate commuted sums will be required by the Highway Authority to cover the additional costs of future maintenance. This is in accordance with the Highways Development Construction Manual and the Essex Developers' Guide to Infrastructure.

## Adoption and Maintenance of Roads, Footpaths and Open Spaces

- 6.153 The Local Authority may adopt and maintain those public areas essential to the functioning and appearance of residential development. Where public adoption is not practical, alternative arrangements will be required so as to ensure the proper maintenance of such areas.
- 6.154 Local Planning Authorities will approve the size and layout of roads and footpaths within housing areas, taking into consideration the views of the Highway Authority. The Highway Authority will approve their construction and drainage for the purposes of adoption.
- 6.155 Individual or communal parking spaces provided for the specific use of individual householders will not be adopted or maintained by the Highway Authority. These spaces must be conveyed to the householders. Where communal parking spaces occur in parking courts, mews courts, parking squares and widened sections of roads, and are not for the regular use of any specific dwelling, they may be adopted by the Highway Authority. Short-term waiting bays for the use of delivery vehicles may also be adopted.
- 6.156 With a view to adoption, highways details should be submitted for approval at an early stage (except where development is located in Thurrock and Southend-on-Sea) to:



*Policy and Development  
Highways and Transportation  
Essex County Council  
County Hall  
Chelmsford  
Essex  
CM1 1QH*

- 6.157 Highways will include carriageways, footways, turning heads, verges, sight-splays and forward visibility curves, pedestrian and cycle routes and footpaths. Highway verges, where provided, should make a visual contribution to the character of the scheme. Soft landscaping and tree-planting should be in species not requiring high levels of maintenance. Where the adopted verges are contiguous with private gardens the householder should be made fully aware of the rights of the Highway Authority and statutory undertakers. Covenants may be required to ensure that the householder does not build walls or fences, or carry out tree and hedge-planting, within the bounds of the highway.
- 6.158 Where new roads have been constructed in accordance with the council's guidelines and are of sufficient public utility, they may be adopted by way of an agreement between the developer and the council under section 38 of the Highways Act. However, the Highway Authority is under increasing pressure to minimise maintenance costs, and adoption will not be considered for those roads which are of little utility to the public, given their private location and small number of units being served. Where roads are adopted, it will only be where adequate commuted sums are paid to provide for ongoing maintenance. Other ancillary areas such as verges, sight-lines and sustainable urban drainage (SuDS) features may have maintenance transferred to third parties, provided of course the Highway Authority retains adequate rights to ensure that the use of these areas does not prejudice the function of the highway.