8 Access

The purpose of this Chapter is to:

- Review the access requirements to new residential estates.

The key recommendations contained in this chapter are:

- Adequate provision must be made for emergency vehicles through consultation with the emergency services early in the design process and use of permeable layouts.
- The needs of the mobility impaired should be considered throughout the design process.
- Design layouts to provide natural surveillance.
- It is essential that liaison between designers, highway authorities, planning authorities, building control authorities and waste authorities take place early in the design process to agree efficient methods of managing waste are agreed and planned for.
- Recycling of waste should be encouraged, in particular the use of underground containers.
- Roads should not be designed for ever increasing waste collection

8.1 ACCESS TO BUILDINGS

8.1.1 For economy, every effort should be made in design to ensure that most stretches of road in the layout directly serve dwellings. As general guidance, it is currently suggested that frontage access may be provided from residential roads with two-way traffic flows up to a maximum of 320 trips in peak hours. However, there appears to be no basis for this figure and further research might suggest that this could be increased without adverse impact on safety, particularly where vehicles can enter and leave parking areas facing forwards or where design speeds are reduced.

VEHICULAR ACCESS TO STREETS

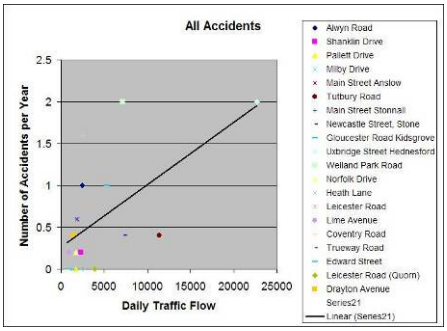
One of the key differences between 'streets' and 'roads' is that streets normally provide direct access to buildings and public spaces. This helps to create activity and a positive relationship between the street and its surroundings.

In the past a relatively low limit on traffic flow, equivalent to the traffic generation of around 300 dwellings (previously assumed to be 300 vehicles per peak hour or some 3000 vehicles per day) has generally been used when deciding whether direct access is appropriate. Above this level many local authority residential road guidelines have required the provision of a 'local distributor road'.

Such roads are often very unsuccessful in terms of placemaking and provision for pedestrians and cyclists. In many cases buildings turn their backs onto local distributors, creating dead frontages and hostile environments. Separate service roads are another design response to the situation, but these are wasteful of land and reduce visual enclosure and quality.

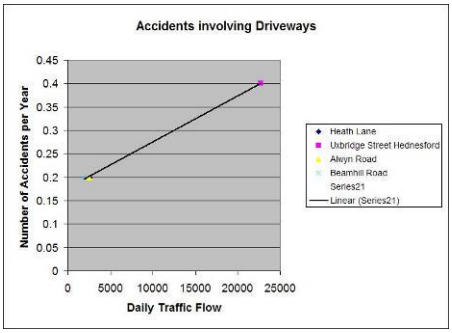
Some initial research has been carried out for Manual for Streets on the relationship between traffic flow and road safety for streets with direct frontage access. Data on recorded accidents and traffic flow for a total of 20 sites were obtained. All of the sites were similar in terms of land use (continuous houses with driveways), speed limit (30mph) and geometry (single carriageway roads with limited side road junctions). Traffic flows at the sites varied from some 600 vehicles per day to some 23000 vehicles per day, with most sites having flows of up to around 11500 vehicles per day.

Both the annual frequency of all accidents and those accidents involving the use of a driveway were plotted against average daily traffic flow on the link.



Frontage Access Streets:

All Accidents vs Traffic Flow



Accidents involving Driveways

The analysis shows the following:

- Although there is considerable scatter, the analysis confirmed the usual trend of increasing accident frequency with traffic flow.
- Accidents involving the use of a driveway formed only a small proportion of the total number of recorded accidents – 5 out of 57 or some 9% of the total. Only 4 of the 20 sites had a recorded accident involving the use of a driveway in 5 years.
- For those links where there was a driveway related accident, the annual frequency was in the range 0.2 to 0.4 (ie 1 to 2 accidents in 5 years). Most links had a no such accidents, however.

On the basis of this research it is considered that links with direct frontage access can be designed for significantly higher traffic flows than have been used in the past, and a guideline figure of 20,000 vehicles per day is suggested. The research suggests that a link carrying this volume of traffic, with characteristics similar to those studied would experience around 1 driveway-related accident every 10 years. Fewer accidents would be expected on links where the speed of traffic is limited to 20mph or less, which should be the aim in residential areas.

8.2 PEDESTRIANS AND CYCLISTS

8.2.1 The dimensions required for ease of movement by pedestrians and cyclists is given in Chapter 7. These should be considered when assessing desire lines through a development and how pedestrians and cyclists will be moving through the area.

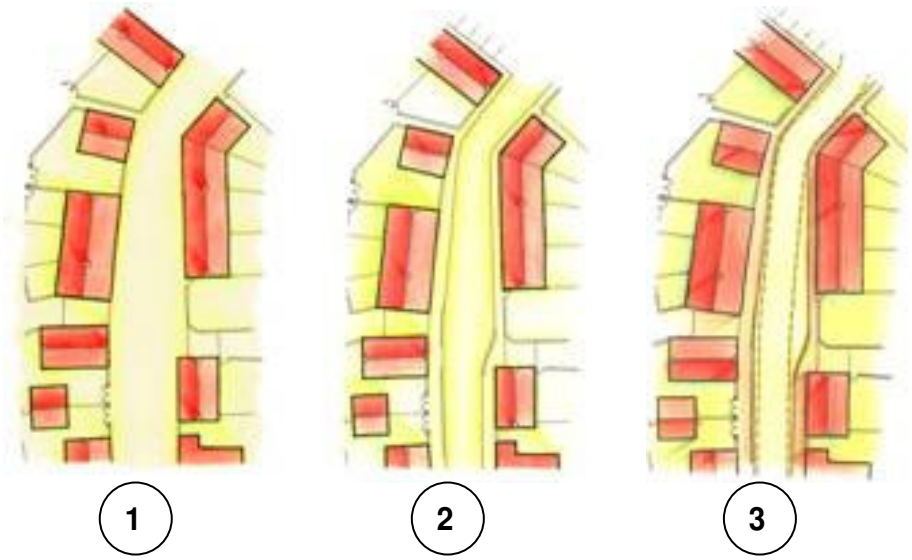
8.2.2 As a general principle the layout should be designed for 20mph including measures that highlight pedestrian priority whilst down playing vehicular dominance (see Cast Study, Beaulieu Park, Appendix B).

8.2.3 These measures should include speed tables at junctions to ease access for pedestrians and cyclists and slow vehicular traffic.

8.3 GENERAL VEHICULAR ACCESS

8.3.1 Tracking is the provision of the required carriageway width for vehicle movement within the overall width of the street. The arrangement of buildings and enclosure does not have to be dictated by highway engineering standards and in some

places may be considered first. Where the distance between buildings is short, or where the width is reduced by parking, trees or other elements, tracking can be used to check against the highway engineering needs for vehicle movement. Images from Places, Streets and Movement.



1: the buildings and urban edge of a street helps to form the place.

2: the kerbline can be used to reinforce this.

3: the carriageway space remaining is tracked for movement and for the provision of places where people may park vehicles.

8.3.2 The areas needed for movement can be checked using the dimensional requirements for vehicles above, the use of CAD tracking models and 3D models may also prove to be beneficial in determining how the street will feel and how vehicles are able to move within it.

8.3.3 With this approach, buildings can be laid out to suit an urban form with pavements and kerbs helping to define and emphasise spaces. Designers can have the freedom to vary the space between kerbs or buildings. With this approach the kerbline need not follow the line of vehicle tracking if care is given to the combination of sightlines, parking and pedestrian movements.

The kerbline of streets need not follow the tracking of vehicles – this can often help to slow vehicle speeds within a street.

8.3.4 An animated street scene (including trees) should also be encouraged. On-street parking in mixed use areas should be encouraged to enhance viability; to increase activity and to help slow the speed of traffic.

Poundbury, Dorchester

8.3.5 In general all streets should be two way in order to provide a connected, permeable network. One way streets should be avoided as they often generate higher vehicle speeds, require signage and disadvantage cyclists (unless a contra-flow cycle lane can be provided, although this again generates more signage). One way streets may be appropriate if site constraints such as topography mean that they are the only solution.

Minimum Carriageway Width

8.3.6 A minimum width of 2.75m is permitted. A width of up to 3.50m will help prevent drivers from parking in a carriageway narrowing. The approaches to a narrowing must be guaranteed to be free of parking, for example by being set out to beyond the outer line of a parking bay.

Widening on bends

8.3.7 Refer to tracking. It should be accepted that larger vehicles will have to use the entire street to manoeuvre through some bends.

8.4 EMERGENCY ACCESS

Highway Layout

8.4.1 The Home Office currently recommends a minimum carriageway width of 3.66m for access roads and this advice is also incorporated in British Standard 5588: Part 1. This width was specified, however, not only to enable the fire appliance to proceed at a reasonable pace but also to allow for operating space around it at the scene of the fire. The Home Office has suggested that simply to reach the scene of the fire, carriageways as narrow as 2.75m may be acceptable to the fire service, provided that roads can be kept clear of parked cars. However, a working width around the vehicle of 3.7m may be required. Fire appliances need to be able to approach to a point that is within 45m of a suitable entrance to any dwelling. In all cases it is essential that early discussions are held with the local fire service.

Emergency Link

8.4.2 An Emergency Vehicular Link (EVL) should be provided when only one point of access serves more than approximately 300 dwellings, or if a cul-de-sac is more than 300m long. It is provided to allow alternative one-way vehicular access in the event of the event of the principle means of access becoming blocked. The EVL shall connect to another adoptable road with an independent means of vehicular access.

8.4.3 The alignment and construction must be suitable for use by emergency services' vehicles including fire appliances. However, measures to prevent the link being used by private motor vehicles must be agreed between the developer and the emergency services. In some cases the EVL could be provided by a controlled access to the development.

8.4.4 The link should be as short as possible with ends intervisible and have a minimum width of 3.7m and a minimum clear headroom of 5.3m. Visibility shall be provided at both ends to the standards appropriate for a private drive. Where possible this should be combined with pedestrian/cycle links to provide an active connection and so avoid a 'mugger's alley'.

8.5 SERVICE VEHICLES

8.5.1 The design of local roads should recognise the needs of service vehicles without dominating the proposed layout. Care should be taken to reduce the impact on the layout facilitated by low traffic flows and speeds, and the reduced likelihood of vehicular conflict. The design should assume that vehicles can use the full width of carriageway available to manoeuvre and should track these manoeuvres accordingly.

8.5.2 Use of permeable layouts will allow easy access and provide a more efficient layout for service vehicles. However, not all residential sites will facilitate this type of layout therefore where cul-de-sacs are provided an adequate turning area must be provided to allow service vehicles to enter and leave in a forward facing manner.

8.6 DDA/DISABLED REQUIREMENTS

8.6.1 As noted in the previous chapter, many people with temporary or permanent physical or sensory impairments are disadvantaged in the built environment primarily by a failure to recognise and respond to their needs. This topic is dealt with in some detail in the DfT guidance document Inclusive Mobility (DfT, 2005), which is commended to designers.

8.6.2 The needs of those people with a disability must always be considered early and throughout the design process. In general, longitudinal gradients should be limited to 5% to cater for self-propelled wheelchairs. Gradients up to 8% may be permissible subject to landings being provided in accordance with the guidelines given in 'Reducing Mobility Handicaps' published by the Institution of Highways and Transportation.

8.6.3 A minimum width of 2.0m should normally be maintained to allow a wheelchair and a pram to pass each other. However, at local restrictions or obstacles this may be reduced to 1.35m provided such obstructions are grouped in a logical and regular pattern to assist visually impaired people.

8.6.4 Pedestrian crossing ramps should be provided with tactile surfacing in accordance with the 'Guidance on the Use of Tactile Paving Surfaces' published by the Department of the Environment, Transport and the Regions', at all crossing points along

and across distributor roads and at other locations where pedestrian flows are likely to be high, such as routes to shops and schools.

8.6.5 The impact of ramps facilitating vehicular cross over of footways to gain access to drives should be limited. Gradients of 25% are recommended since this would leave 1.75m of footway for pedestrians.

8.6.6 Steep slopes or drops at the rear of footways should have a 100m edging upstand as a safeguard for wheelchair users and people with prams and to act as a warning 'tapping rail' for cane users. A handrail or posts and rail fence 1.1m high and in contrasting colour should also be considered at such locations.

8.6.7 In commonly used pedestrian areas, resting places should be provided at intervals of not greater than 100mm. Similarly, seating should be provided at all bus stops and shelters wherever possible. To assist people with sight problems these and other amenity areas adjacent to footways and footpaths should be picked out in contrasting colours.

8.6.8 All street furniture should be located so as not to obstruct the passage or present a hazard to the visually impaired or other people with mobility impairment, e.g. bins are often left before and after collection on footways, this presents an obstruction to pedestrians and a particular danger to those people who have impaired sight. There may therefore be a requirement in some locations (e,g, at the head of private drives and in housing squares) to provides 'wheeled bin' collection points which are adjacent to the highway and clear of the footway.

8.7 SECURITY

Assessing The Risks

8.7.1 The relative priority that needs to attached to security in the design of individual developments may vary according to the likely frequency and seriousness of different types of crime and vandalism in the local area, and residents' perceptions of the risks of crimes occurring.

8.7.2 Risks need to be jointly assessed at the outset of the design by developers, their designers and the local crime prevention officer. For blocks of flats and for rented housing it may also be important to consider the role of estate management in reducing risks and sustainable security.

8.7.3 Whilst recognising the causes of crime and vandalism are complex, many studies suggest that housing layout design can play a part in minimising risks – complementing any physical measures needed to strengthen dwellings against intruders.

Natural Surveillance

8.7.4 A number of design principles are now beginning to emerge. The most common thread in the evidence is the importance of designing layouts which will provide natural surveillance and some control over access, and enhance the perceived ownership of an area by its residents. The design should encourage the residents of an area to adopt it as their own and to exercise a proprietorial interest in it, so that they will feel a collective concern for its well being. These aspects of design may act as a deterrent to potential offenders by increasing the chance of them being observed and recognised as strangers, and lead to the possibility of intervention or raising the alarm, by residents.

8.7.5 The location of dwellings to face most stretches of roads will also help to enhance security – provided the dwellings are designed in detail so that natural surveillance is possible from their windows. In this way, the layouts illustrated would help to enhance security.

8.7.6 Permeability of layout for traffic and pedestrians / cyclists will bring movement and life to streets which will further help to raise natural surveillance. Chapters 5, 6 and 7 (Building Communities, Quality Places and Movement) explore these issues in more detail.

8.8 ACCESS FOR WASTE COLLECTION

8.8.1 The need to provide suitable access for the storage and collection of waste is a major consideration in the design of residential buildings, layouts and streets.

8.8.2 Waste Collection Vehicles are the largest vehicles that require regular and frequent access to residential areas. The storage of waste is now a significant issue in all developments, due to the need for separate storage of recyclable and residual waste; the obligations on local authorities to meet increasing targets for recycling following the publication of the Government report Waste Strategy 2000; and the need to achieve higher densities of development.

LEGAL AND TECHNICAL FRAMEWORK

Building Regulations

8.8.3 Part H of the Building Regulations set the basic requirements for waste management by statute, as follows:

Solid Waste Storage

H6. (1) Adequate provision shall be made for storage of solid waste.

(2) Adequate means of access shall be provided –

(a) for people in the building to the place of storage:

And

(b) from the place of storage to a collection point (where one has been specified by the waste collection authority under section 46 (household waste) or section 47 (commercial waste) of the Environmental Protection Act 1990 or to a street (where no collection point has been specified)>

8.8.4 The regulations thus define locations for the storage of waste (for example a bin store) and for the collection of waste, where the waste collection vehicle will stand. The collection point can be on a street, or may be another location defined by the Waste Authority under Section 46 of the Environmental Protection Act 1990.

8.8.5 The Approved Document to Part H of the Building Regulations, published in 2000, provide further details on how these regulations can be satisfied. It should be noted that these guidelines were prepared before statutory targets for recycling were set by Government, however.

8.8.6 Key points of relevance to the layout and design of residential developments and streets contained in the Approved Document to Part H are:

- Residents should not be required to carry waste more than 30m (excluding any vertical distance) to the storage point.
- The storage point should be within 25m of the waste collection point and the slopes should not exceed 1:12. There should be a maximum of 3 steps with waste containers of up to 250 litres and should be avoided when larger containers are used. (Note - BS5930:2005 recommends shorter collection distances, as set out below).
- The collection point should be reasonably accessible to the size of waste collection vehicles typically used by the waste collection authority.

BS5906:2005 Waste management in buildings – Code of Practice

8.8.7 BS5906:2005 provides an update on good practice, taking into account the need for increased levels of waste recycling. It takes the form of guidance and recommendations and should not be taken as a specification. Particular recommendations in BS5906:2005 of relevance to the layout and design of residential developments have been reflected in the subsequent text, except where noted.

Consultation

8.8.8 It is essential that liaison between designers, waste authorities, highway authorities, planning authorities and building control authorities takes place early in the design process to agree the methods of managing waste arising from the development. The following items are particularly critical:

- The methods of storage, segregation and collection of waste to be used
- Details of the waste collection vehicles and the frequency of collection
- The storage capacity to be provided, taking into account collection frequency, the volume and nature of waste expected and the size and type of containers to be used.

8.8.9 BS5930:2005 provide guidance on typical weekly waste arising from residential and other types of development.

Containers

8.8.10 The individual waste container is typically the 240l wheeled bin, but some authorities are moving to 120l bins as the amount of waste produced reduces, with increased recycling. For flats and other multi-occupancy dwellings, larger communal wheeled bins are often used.

Standard 240 litre waste bin

1100l wheeled bins for communal use

8.8.11 BS5930:2005 recommends that the distance over which containers need to be transported by collectors should not normally be more than 15m (two-wheeled containers) and 10m (four-wheeled containers) to increase efficiency of collection.

Recycling

8.8.12 Household waste contains a considerable proportion of recyclable material which should be viewed as a resource. In order for statutory targets on recycling to be met it is essential to incorporate provision for the segregation and storage of both recyclable materials and residual waste in new developments.

8.8.13 The main types of provision for recycling are:

- 'bring facilities' where residents bring material to centralised recycling containers such as bottle and paper banks; and
- 'kerbside facilities' such as kerbside recycling boxes, wheeled bins or sacks, which allow householders to separate recyclable material at home and then have it collected from the kerbside.

8.8.14 In many areas a combination of the two systems may be appropriate to maximise opportunities for recycling.

8.8.15 Bring facilities can be provided in a number of accessible locations within a residential area, close to a community building for example. They may be simple areas of hardstanding for the storage of containers, with adequate room for collection vehicles to manoeuvre.

8.8.16 Underground waste containers are another option that can be considered, whereby all that is visible to the user is a 'litter bin' or other type of chute where users place recyclables into the containers. This chute discharges into a large underground chamber which is emptied by a specially equipped vehicle. There were some 175 such systems in use in the UK in 2006.

8.8.17 Such systems can also be used in developments of flats for general waste as an alternative to standard wheeled bin systems.

Sulo Iceberg system – above ground units

Underground chamber being emptied

8.8.18 Kerbside collection systems require householders to store more than one waste container and this needs to be planned for in the design of the buildings or external storage facilities.

Waste Collection Vehicles

8.8.19 The choice of recycling and waste collection systems by the Waste Authority will determine the type and size of vehicles that need to gain access to a residential area.

8.8.20 For example, vehicles associated with kerbside recycling may require collectors to gain access to the side of the vehicle from where they manually sort recyclable materials into different types – glass, plastics and paper for example. Other authorities may sort waste at centralised facilities and therefore use automated systems to empty waste storage containers into the rear of the vehicle.

8.8.21 In recent years some Waste Authorities have begun to use larger collection vehicles in order to reduce operating costs. Compaction units mounted on the back of vehicles also increase vehicle length. As an illustration of this, the '3 axle large refuse vehicle' used in the computer tracking program Autotrack is 2450mm wide and 9860mm long, but Walsall MBC are presently using 3 axle vehicles that are up to 2500mm wide and 10810mm long. BS5906:2005 notes that the longest vehicles currently in use are around 11600mm in length, with a turning circle of 20.3m.

8.8.22 Whilst one option would be to design residential streets for the largest possible vehicle that may be used in the future, it is considered that this would be unduly onerous. Waste collection authorities and their contractors will need to consider the geometry of existing streets across their area when choosing which vehicles to operate, and it would not be sensible for new streets to be over-designed compared to existing ones. It is therefore sensible to plan for the vehicles currently in use, or planned to be used, by the Waste Authority.

Street Design

8.8.23 Street layouts and geometry should be designed to allow reasonable convenience for the collecting vehicle and waste collectors. Tracking software should be used as a matter of routine to test layouts for accessibility by vehicles. BS5930:2005

recommends a minimum street width of 5m, but narrower widths can be used if on-street parking is discouraged within the street width.

8.8.24 Well-connected permeable street networks (ie without cul-de-sac) have significant advantages for waste collection, and servicing vehicle generally, as they allow the most efficient route to be followed and avoid the need for wasteful turning areas.

8.8.25 Although BS5906:2005 suggests that turning circles may be provided, it is very unlikely that these will be an option in most situations given the need to make best use of land. Cul-de-sac will therefore involve vehicles reversing as part of a 3 (or more) point turn.

8.8.26 Reversing vehicles account for around 1/3 of the number of accidents involving a moving waste vehicle, compared to those moving forward. There were 25 accidents associated with reversing vehicles in 2001/2 (Source: HSE). Given that vehicles spend a relatively short part of their time reversing, it is clear that the risk of an accident is much higher when vehicles are reversing. BS5906:2005 recommends that the maximum reversing distance should be 12m. Longer distances can be considered if there is no alternative and land would otherwise be undevelopable; but any reversing routes should be straight and free from obstacles and visual obstructions.