

Sustainable Design

30. The design of residential development has an important role in the move towards more sustainable forms of development and patterns of movement. Considerations, ranging from the facilities provided in residential areas, to designs for individual houses to conserve energy and reduce water use, could all contribute to a more sustainable environment. It will also be important to ensure that the materials and construction techniques are appropriate for the location and will remain in a safe, durable and visually presentable condition, without the need for frequent maintenance or premature replacement.

MIXED USE

31. Mixed use developments, which provide a range of employment, shopping, social and recreational facilities alongside or as part of the residential development will help to reduce overall distances travelled to facilities and promote cycling and walking by providing facilities locally.
32. Mixed uses will normally only be appropriate as part of large developments. Staffordshire Planning Authorities will seek a broad range of local facilities on large sites; for example sites of over 500 dwellings should provide employment and shopping uses within the development.



Canalside mixed use development



Provision for cyclists

MOVEMENT

33. Layout designs should ensure that the convenience of access for pedestrians, cyclists and public transport operators is given priority over the need to accommodate the car. Local facilities such as shops, schools, clinics, leisure and recreation facilities should be grouped along main footpath and cycleway routes. Main footpaths and cycle routes should be built in the early phases of development.
34. Bus routes should focus on local facilities offering opportunities for interchange, and bus services should be provided at the early phases of development to establish patterns of movement. To reduce the use of private cars for local trips houses should be within 350 metres of a regular bus stop wherever possible. Ideally all houses should be less than 600 metres from a primary school or 1500 metres from a secondary school, and layouts should seek to achieve this where new schools are included in development proposals.
35. Cycling and footpath networks should be accessible and direct and only provided where they are likely to be overlooked and where they are likely to generate high levels of movement. This encourages community interaction and aids natural surveillance, which discourages criminal and anti-social behaviour. (More advice on the design of footpaths, cycleways and public transport needs is included in Appendix A).

SURFACE WATER

36. Surface water systems should be designed to capture as much surface water as possible. Surface water should be designed to discharge to local streams or ponds or to recharge aquifers through maximum use of absorbent rather than hard surfaces. Swales, filter strips and storm water balancing basins can be provided in areas of open space to channel water over absorbent ground. Depending on ground conditions roofs and hard surfaced areas within house plots can be drained by soakaways sited a minimum of 4.5 metres clear of the building and highway boundary.
37. The suitability of these features will depend upon site characteristics and should be discussed with the land drainage authority. Maintenance and safety aspects will need to be carefully considered.

BIODIVERSITY

38. Existing features of ecological interest should always be retained within a development and incorporated into open space networks or corridors which can serve a number of functions, such as wildlife corridors and refuges; surface water discharge; shelter belts and for noise and pollution absorption. Such features will contribute to biodiversity, whilst providing local features of educational and visual interest. Green corridors designed for wildlife movement should be a minimum of 5 metres in width and include natural linear features such as hedgerows or streams to provide shelter for wildlife and a rich habitat for a diversity of plants. Where there are corridors, cross roads, or other hazards, thought should be given to providing safe crossovers by culverts for example.



A pond created to accept surface water



Capturing solar energy

ENERGY CONSERVATION

39. Within the design concept and layout principles proposed for the site the designer should consider means of reducing energy use. Adhering to the layout principles in this guide will reduce car journeys. Energy use in buildings can be reduced by careful attention to the design and orientation of dwellings, particularly the position of windows to maximise solar gain.
40. Alignment of principal elevations to 30° of south maximises solar gain potential, care should be taken to avoid overshadowing during winter months (in Staffordshire less than 5% of total potential solar gain are lost if an obstruction angle of 13.5° is not exceeded). The use of terraced house types also helps to reduce energy loss; but terraces aligned north-south should be avoided wherever possible because of their limited solar gain potential.

SECURITY AND CRIME

41. The design of housing layouts can make a major contribution to the prevention of crime and anti-social behaviour and in alleviating the fear of crime. The following factors are particularly influential:
- Crime depends on concealment - well used and overlooked streets will deter criminals.
 - Anonymity provides opportunity for crime; there should be a clear definition of ownership and responsibility for all parts of a development, and defensible space around houses.
 - Routes through a development for all forms of movement should be as clear and direct as possible.
42. Crime reduction measures must be considered as an integral part of the overall design and moderated by the design concept for the whole residential environment. Normally this will lead designers to rely on natural surveillance and overlooking to act as a deterrent. This will impose fewest restrictions on the permeability of the development especially for pedestrians and cyclists; the public realm quality and opportunities for community development and interaction.
43. The starting point is an assessment of the potential risks and crime rates in the locality, in consultation with the Police Architectural Liaison Officer. Measures, which are considered necessary to deter crime in an area of particularly high risk, may be unjustifiable elsewhere. In the interests of maintaining the quality of the public realm and to increase the convenience of walking and cycling measures to
- exclude access by gating entrances or closing connecting routes should only be necessary in areas of particularly high crime risk. In most of Staffordshire designs to deter crime should be based on natural surveillance; increasing pedestrian activity on the street, creating defensible space and clear and direct movement routes.
44. Local Authorities have a responsibility under Section 17 of the Crime and Disorder Act to take account of the need to deter and prevent crime (particularly burglary and speeding) in exercising their functions including forward planning and development control. However, security considerations will not always take precedence; Planning Authorities will need to balance security considerations against other design objectives as described above.
45. Security and crime deterrence will always be assisted if the following basic principles are adhered to in designing housing development:
- Front gardens, the approach to front doors and car parking areas should be visible from neighbouring houses.
 - Long segregated footpaths should be avoided, where possible footpaths should follow the line of roads and be visible to road users. Any segregated footpaths should be well lit with visibility from end to end with no places where criminals can hide from view.
 - Shared car parking areas or garage courts should be no larger than 15-20 parking spaces and visible from windows in the houses they serve.
 - All open spaces should be overlooked from the front of some houses and play areas for small children should also be within earshot of nearby houses.
 - Open spaces or segregated footpaths adjoining the rear gardens of houses should be avoided wherever possible.



Open space overlooked from the front of houses

DEFENSIBLE SPACE

46. Designs should clearly establish the hierarchy of spaces from public to private. The spaces related to Lower Order Roads should be designed as semi public spaces where only residents or visitors to individual houses or groups of houses are expected. These should be directly supervised from surrounding houses.
47. Front boundaries of private gardens should be clearly defined, although the boundary treatments and structural planting should be part of the overall spatial concept.
48. Private spaces in rear gardens should not be overlooked except by immediate neighbours and should not abut public or semi public spaces without secure boundary treatment such as walls or high fences.
49. Segregated footpaths linking culs-de-sac can provide alternative escape routes for criminals to avoid pursuit and should not be used indiscriminately. Footpaths should be seen as part of the overall movement strategy and linked to facilitate easy and direct routes for pedestrians. In high crime areas this ease of movement may need to be tempered by concerns for safety.
50. Entrances into semi public areas should always be visible from adjoining houses to oversee the entrance, providing natural surveillance over comings and goings.



Natural surveillance of an entrance

PRIVACY

52. Reliance on spatial separation from other properties to maintain privacy through rigid enforcement of 'back to back' distances can result in stereotyped and uninteresting layouts of regularly spaced parallel rows of housing offering no spatial variety or visual interest.
53. Equivalent or higher standards of privacy can be achieved by designing layouts and individual house types to avoid problems of overlooking. The careful orientation of houses, the positioning of upper floor windows, inclusion of walls, fences and planted screens provide opportunities for more varied and interesting relationships between buildings without compromising privacy.
54. Some overlooking of rear gardens from adjoining property is inevitable except in the lowest density layouts and is generally accepted by residents. Opportunities for small privacy zones which are entirely not overlooked, for example a screened patio at the rear of a house, should be included wherever possible.



Attractive space where traffic moves slowly

PROMOTION OF NEIGHBOURLINESS

51. The design objectives for roads and footpaths that are set out in this guide will also assist the development of community spirit. Places which achieve these objectives will make residents feel more secure and deter crime. Key elements are:
 - Safe and attractive public spaces where traffic moves slowly.
 - Direct, short connections for pedestrians and cyclists to local facilities.
 - Overlooked and supervised public spaces where residents can meet each other, children can play in safety, neighbours can support each other, and strangers can be identified.
 - All development must take account of elderly and disabled people. Particular care and attention needs to be given to parking (and servicing) arrangements for sheltered housing and retirement homes; this includes development that, whilst not dedicated to such uses, is attractive to the elderly or infirm.

MANAGEMENT AND MAINTENANCE

55. The issue of maintainability should be an important consideration in the design of any housing development. Schemes should be designed to minimise future maintenance requirements.
56. At an early stage, the responsibility for the future maintenance of roads, footways/footpaths, verges and open spaces should be identified. Developers will be required to submit maintenance proposals with their planning applications to show who the intended responsible maintenance organisation will be for all areas of land that are not intended to be conveyed to the owners of dwellings. See Appendix C 'Adoption Procedures and Requirements' for further guidance on normal maintenance responsibilities.
57. Appendices B 'Street Lighting' and E 'Highway Specification' including para. 60 below provide detailed advice on the permissible specification for new street works. The use of an alternative specification should only be used where justified by the design objectives set out in the Design Concept Statement (see Design Process) and when considerations of durability and maintainability are satisfied.
58. To ensure that new street infrastructure is retained in a safe and durable condition, developers may be required to provide a commuted maintenance payment, to be secured via the Section 38 Agreement, to offset any abnormal future maintenance costs likely to be associated with the use of some materials. Appendix E sets out the 'Permissible Materials for New Streets' where no maintenance payment will be required. Whilst proposed departures from this will be considered, if accepted, they will most likely be subject to a maintenance payment.

59. It will be necessary to ensure that the materials used within the limits of the public highway as well as the form and function of amenity landscaping are acceptable to the responsible organisations. (See Appendix C 'Adoption Procedures and Requirements').

CARRIAGEWAY AND FOOTWAY MATERIALS

60. The following broad principles should be followed when choosing the most appropriate materials:

In most developments the permissible range of materials attracting no maintenance payment, as set out in Appendix E shall be used. Materials outside this, including some materials used for the purpose of providing speed restraints, over-run areas and central islands for mini-roundabouts may be subject to a maintenance payment.

Modular block paving can fade in colour, absorb oil and rapidly become stained. It is therefore essential to limit the acceptable range for adoption to particular colours and textures. (see Appendix E 'Highway Specification' for further guidance). Care also needs to be given to the locations at which they are provided as where surfaces are subjected to stress caused by tight driving manoeuvres and significant volumes of heavy vehicles the formation and edge restraints are liable to fail. As such, their use should be limited to Shared Surface Roads, roads serving small developments in Conservation areas and villages and for the construction of some speed restraints. As far as speed restraints are concerned, block paving should only be used on Minor Access Roads that have not been identified as a bus route and Minor Access Ways.

Coloured or natural finished aggregate surface dressings can be used for small developments not exceeding 50 dwellings. They should generally be restricted to rural locations where such materials will provide a recognisable continuation of existing surface treatments. Their use is likely to give rise to a requirement for a commuted maintenance payment due to their limited durability.

All footways/footpaths that accommodate utility equipment shall have a conventional surface specification to avoid attracting a maintenance payment.

Wherever possible, the use of recycled or secondary aggregates should be considered. Guidance on the acceptability of such materials is included in the Appendix E 'Highway Specification'.

SOFT LANDSCAPING

61. Where landscaping is proposed within the limits of the new street, which is intended for adoption as a publicly maintainable highway, the following broad principles should be observed:

Tree, shrub and hedge planting should be sited well clear of statutory undertakers services so that the root systems at maturity will not damage underground apparatus and so that planting will not be damaged by excavations to maintain the services.

Where licences to plant are granted in service strips on Minor Access Ways, only shallow root plants are appropriate because of the difficulty of reinstatement after maintenance excavations (see Appendix D 'Landscaping' for further details).

In visibility splays, caution is necessary in the treatment of areas critical to visibility. (See Appendix A 'Design Layout Technical Criteria', 'Planting in Sight Lines' for further details.)

The aim of soft landscaping is generally to provide amenity value by the retention of existing trees, the provision of new trees, shrubs and ground cover planting. Where this is proposed in new street areas, intended for adoption as publicly maintainable highways, it is important to ensure that a satisfactory maintenance arrangement is established and agreed with the Highway Authority so that they may be considered for adoption as a publicly maintainable highways. The table right sets out the maintenance arrangements required in these circumstances.

Maintenance Responsibilities for Areas to be Adopted as new Highway

	Maintenance Sum Required	Maintaining Authority
Grass	No	Highway Authority
Grass/Trees	Yes	Highway Authority
Grass/Trees/Shrubs and Ground Cover Planting	Yes	District Council

Notes:

1. The sum will be based on the number of trees, old and new and the areas of soft landscaping.
 2. See Appendix C 'Adoption Procedures and Requirements' for further guidance.
 3. The commuted maintenance sum will be deemed to cover the initial period, during which the trees and shrubs become established.
62. The 12 month maintenance period for the roads will not commence until the associated landscaping has been satisfactorily completed.