

Design Details Layout Details V.1

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EPOA Essex Planning Officers Association

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3. Layout Details

Key Messages

- Design permeable layouts that connect well with the existing walking and cycle networks within and outside of the development.
- Community facilities and strategic open spaces should be co-located within the layouts of new developments.
- Residential layouts should encourage walking and cycling through the creation of direct routes.
- Covered and secured cycle storage should be located in prominent and accessible locations as part of the design of new homes.
- High-quality communal spaces should be provided with supporting facilities which encourage activity by all users.
- Designing-in flexibility helps to futureproof streets and spaces, enabling technological innovation and adaptation over time.
- All new developments, including homes and shared communal spaces, should be well-connected to digital infrastructure (including high-speed internet) from the outset.
- Nodal points and the core should provide flexible community amenities including workspaces, community centres and pick-up and drop-off locations for online orders, reflecting changing shopping and working habits.
- Sustainable energy systems and supplies should be designed into the layout of developments and homes.
- All dwellings should be designed to cater for all ages and a range of physical and mental abilities, and should be capable of accommodating changes in circumstances over a lifetime.

Key Questions

- Does the layout promote a coherent, direct, safe, comfortable and attractive network of walking and cycling routes suitable for all users, both within and outside the development?
- Does the layout promote the co-location and concentration of key retail, community and open-space uses?
- Are the walking and cycling routes within the layouts safe, well-lit, overlooked, welcoming and attractive, well-maintained, durable and clearly signposted?
- Is secure and covered residential cycle storage provided in a prominent location which encourages cycle use over car use?
- Have private communal spaces been designed to encourage a range of activities to allow all to take part, including activities for all genders, ages and cultures?
- Does the layout enable flexibility and adaptation to allow for future innovation in technological design and changing habits?
- Does the layout of the dwelling enable flexibility and adaption to allow for changes in personal circumstances?

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Permeability and Legibility of the Layout

3.1 A street layout that encourages walking and cycling is permeable in that it is well-connected and offers a choice of direct routes to all destinations. It is also legible, in that it is structured to provide a comprehensible distribution of distinctive places and spaces; this allows easy, effective orientation and navigation, and is particularly important for the partially sighted, the blind and people with dementia, for whom clear wayfinding plays a part in encouraging interaction and reducing isolation.

The Street System

- 3.2 A residential area should be structured around a street system made up of urban spaces, and such spaces should be formed according to the principles of this guide.
- 3.3 Design of the street system should start with the establishment of a clear and legible articulating structure for the area. It is important not to allow design to be dominated by the technical demands of traffic, the fundamentals of which are likely to alter significantly as technology evolves to incorporate autonomous and semi-autonomous vehicles. The overarching layout may instead be suggested by topography, natural desire lines and/or access points to the site.
- 3.4 In the words of the Belfast Healthy Cities report 'Walkability Assessment for Healthy Ageing', the street system should be 'designed around pedestrian use or cycleways after its form has been established by urban design criteria, with particular attention given to ensuring accessibility of the layout to the elderly or disabled.'

Permeability

- 3.5 It should be possible for pedestrians and cyclists to move freely between all parts of a layout, both locally and on a wider scale. The disadvantage of a layout based entirely on culs-de-sac and loops is that routes for pedestrians are indirect and boring; pedestrian and cycle movement is thereby discouraged in favour of car use. This creates dead areas which are vulnerable to property-related crime. Cul-de-sac layouts also result in higher traffic levels on feeder roads, and consequently have a negative impact on residents of those roads.
- 3.6 The use of such layouts can also deter the elderly, less mobile or those with dementia from engaging with the wider community. The design lends itself to walking long distances to access services and facilities, which is unattractive to both the elderly and the less mobile, while the presence of dead ends can cause confusion and anxiety for those with dementia. In addition, the repetitive nature of these layouts, with no clear distinction between areas, can add to a sense of confusion.



a. Pedestrian/cycle street linking parts of road network

b. Crossroads possible where one branch serves few dwellings

c. Indirect pedestrian route and lack of route choice

d. Heavier traffic loads

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- *a.* Pedestrian/cycle street linking parts of road network
- b. Crossroads possible where one branch serves few dwellings
- c. Nodal point
- d. Frontage to major road reserved by private drives
- e. Pedestrian/cycle link across major road
- f. Ransom strip prohibits vehicle access
- g. Pedestrian/cycle link between new and existing
- 3.7 A more permeable layout offers pedestrians and cyclists a choice of routes, thereby providing greater visual interest and generating a higher level of pedestrian and cycling activity. This in turn enhances the security of those using the routes.
- 3.8 The higher the number of pedestrians on the street, the greater the chance of casual social encounters and the lower the chance of thieves gaining access to houses or cars unobserved. This is a benefit to all age groups and to people with a wide range of physical and mental abilities. Higher numbers of pedestrians also help to reduce the risk of social isolation among the elderly, the less mobile and people with dementia.
- 3.9 From a freedom-of-movement perspective, the development ideal is a deformed grid based on the small residential block. The advantages of culs-de-sac and loops in preserving amenity and quiet, supervised space can be combined with those of a permeable layout by bringing the heads of culs-de-sac together, or else by creating pedestrian/cycle streets between otherwise separate parts of the road system. Pedestrian and cycle links can also be created across major roads that would otherwise form a barrier.
- 3.10 There is evidence to suggest that more permeable layouts have a positive impact on local economies both through direct income (trade) and fiscal savings. The Living Streets report 'The Pedestrian Pound' (2013) noted up to 40% increases in trade when places are made attractive to pedestrians. Work commissioned by the National Institute for Health and Care Excellence (NICE) in 2011 assessed the economic impact of improving walking and cycling infrastructure; it found that the costs of the improved infrastructure were significantly outweighed by the savings to local healthcare services at a ratio of 60:1 for walking and 168:1 for cycling. A number of tools (including the Heath Economic Assessment Tool, or HEAT) have been developed to provide quantitative evidence for such claims, and their use should be considered during the development process.

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3.11 Wherever possible, a permeable layout should offer both good connections between adjacent housing schemes and where applicable the wider locality beyond the developments, including a choice of routes between one location and another. Where it is not viable for traffic routes to link existing and new residential areas, whether because of 'ransom strips' left by developers or because of the need to avoid introducing new traffic into existing residential developments, pedestrian and cycle links between the relevant areas may offer a solution, providing the links are overlooked. It should be remembered, however, that permeability should not be pursued to the detriment or exclusion of other goals – most particularly the need to focus a layout on cores and nodal points.





(Left) Incorrect. Conventional neighbourhood centre (Right) Correct. A neighbourhood core centre

- a. Buildings isolated within layout
- b. Residential area segregated from community facilities
- *c. Pedestrian access across major road and car park*
- *d.* Buildings directly front streets, with a high concentration of entrances
- e. Car parks fragmented and located at rear of buildings
- f. Residential buildings form continuous frontage with community facilities

Legibility

- 3.12 The street network should focus on a core area of greatest pedestrian concentration. Large developments may need to provide this core on-site through 'hub' locations which bring together in a single location services, transport networks, transport facilities and employment. Smaller developments may focus on the existing core of a neighbouring site.
- 3.13 It is in the core that any non-residential uses should be located for example, primary schools, flexible community spaces used for a range of purposes (including workspaces or healthcare infrastructure) local shops, pubs and bus stops. densities should be higher in this vicinity. Effective design can enable streets and other public spaces to support a range of civic, cultural and community functions such as markets, public art and open-air performances. Supplying a multi-functional open space provides ever-changing reasons for people to come together and be active within their community, which is increasingly important in our culture, where people can become isolated. When a streetscape is well-designed, 'people don't leave work and hurry home they leave work, walk slowly and socialise with others. They stop and talk to people and as a result they improve their wellbeing' (Building for Health in South Essex, South Essex Health, Wellbeing and Planning Summit, 2016).

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- 3.14 Social interaction is proven to have significant health benefits both physically and mentally. Creating a sense of community can help to combat loneliness as well as increasing consumer spending. The immediate local environment can therefore be a fundamental factor contributing in particular to the quality of life of older people. It can be enabling or disabling, and therefore promote or reduce loneliness and isolation.
- 3.15 The core area should be characterised by a high concentration of entrances to buildings opening directly off the street. Buildings should not be located in an isolated fashion, separated by car parks or access roads, and residential and non-residential land uses should merge into each other.



Focus on a core area within the site

Focus on a core area on a neighbouring site

- 3.16 The street system should radiate from the core area, with radial routes being more direct and minor linking routes being more tortuous. These relationships of core to periphery have been found to generate greater levels of pedestrian activity. The core should also be laid out so as to accommodate flexibility through future adaptation, whether in the form of changing land uses, modes of access to the core or the use of spaces for mobility.
- 3.17 The future will see growing levels of integration, with services increasingly combined or shared in one location. It is therefore important to consider how the layout and legibility of a block and its buildings may change, and how this will relate to the wider street, local access points and the broader development context.

Nodal points

- 3.18 A residential area should be structured around a series of nodal points. These are irregularly or regularly shaped urban spaces formed at the junctions of routes, and may be emphasised by key buildings or groups of buildings.
- 3.19 Residential densities may be higher in the vicinity of such nodal points, forming a 'village' cluster, with lower density areas between one cluster and the next. If there is a sufficient concentration of non-residential uses and community facilities in the associated core area, it may be appropriate to locate other community facilities such as a convenience shop, childcare nursery or pub at nodal points. These will then act as focal points, generating pedestrian movement. Nodal points can also provide opportunities to complement the core for example, offering local pick-up and drop-off locations for online orders stored in electronic lockers, shops or community facilities. Layouts partially built around

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nodal points also help to limit social isolation, offering groups and individuals from every part of society the chance to access services and facilities, and to interact with each other in proximity to the home.



Lower density between nodal points a) Nodal points b) Core area

Character areas

3.20 A large residential area should vary in character between its different parts. This variation should not be based on development density or artificial creation of social differences, but on different types of space, building forms and materials. While it is certainly important to build a sense of place and identity into all parts of a development, the creation of a particular identity in a particular part of the development will do much to define the special character of each area. In addition, the creation of such areas avoids repetition and allows for a clear sense of direction and place – something that is particularly important to older people and those with dementia.



Contrast in character between adjacent areas

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Edges

- 3.21 Edges occur where one type of place or space meets another for example, where an urban space meets the countryside; where houses meet a major road; where a development meets an open space; or where two developments of different characters meet.
- 3.22 Edges should be treated in different ways according to their importance. For example, public open spaces should be treated as focal points onto which houses front, rather than being tucked away behind residences.
- 3.23 In order to avoid rear fences dominating the view, edges where houses sit beside major roads or open countryside should be treated similarly. Houses should front such edges even where it is not possible to provide vehicular access direct from the major road, and where access must instead be taken from service roads or private drives running parallel to or behind the road.
- 3.24 Such edges should be clearly defined in terms of both purpose and status (i.e. public or private). Clear distinctions allow people to understand such spaces, and are particularly important for the partially sighted or people with dementia, who might otherwise become confused or disorientated.



a. An edge onto a public open space b. Access from major road c. Access for rear

Urban grain

- 3.25 When it is decided to perpetuate the pattern of a surrounding area, attention should be paid to repeating the urban grain determined by the pattern of plot subdivision and building form.
- 3.26 For example, where terraces of houses are the norm, a new development should also consist largely of terraces. Where houses are set forward up to the street line, a new development should do the same. Where the existing pattern is irregular, irregularity should also be characteristic of the new scheme. The designer should be wary of laying out a new development in a pattern generated more by abstract design principles or the internal logic of the site than by the surrounding urban grain, as this may result in a ragged, unconsidered edge where the new layout meets existing developments. Care should also be taken to resolve any 'mismatch' of orientation within the site, as this will generally provide a better built relationship with adjoining areas while creating more interesting spaces within the new site.

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(Left) Incorrect. Ragged, unconsidered edge. Layout generated by internal logic of site (Right) Correct. Mismatch of orientation resolved within the site, forming more interesting internal space. Edge forms street with existing development

Landmarks

- 3.27 Landmarks include distinctive buildings, spaces, sculptures and similar recognisable structures. They should be placed at points in the network where they can aid orientation and navigation. They can be particularly useful in areas away from nodal points or other distinctive places; they may also fulfil a useful function in aiding orientation when viewed from a major road.
- 3.28 A landmark may take the form of a distinctive building or simply a taller one, designed to be visible from a wider area. Landmarks do not always need to be new features: the retention, integration and enhancement of existing features into new developments can serve the same purpose, and aids in retaining local distinctiveness and familiarity. The familiar nature of landmarks and their propensity to aid in orientation also helps to promote independence, a recognised mental health benefit.



Landmark building



Bishop Mead, Chelmsford

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External image

- 3.29 A development should have a clear and well-defined image when viewed from the surrounding area. This can be achieved via:
 - A clear design treatment of the urban edge.
 - Clear and defined entrances to the development (for example, pinch points).
 - A well-designed skyline and roofscape, made up of a texture of roof-forms generated by the forms of individual houses.
 - The location and roof treatment of key buildings within the development so as to aid orientation.
 - Taller buildings and blocks of trees that structure the external view.
- 3.30 Such features are once again particularly important to the ageing population and people with dementia.



- External Image
- 1. Clear entrance
- 2. Key buildings
- 3. Block of trees
- 4. Well-defined urban edge

Criteria for Layout at Densities Below 20 Dwellings Per Hectare

- 3.31 As with higher density layouts, the aim here is the creation of a pedestrian-scaled environment by use of enclosing space and structuring chains of spaces. The difference is that the space is enclosed by trees, hedges and shrubs rather than buildings, which become free-standing rather than space-enclosing elements and are contained within the landscape. This is the legitimate context for the detached house.
- 3.32 From the outset of any new development, an appropriate balance must be struck between the design principles of the Arcadia and Boulevard layouts set out below. This balance must address the needs of all users including people of any age and varying physical and mental abilities.
- 3.33 One way to do this is to incorporate into a development some flexibility to adapt or 'customise' parts of dwellings to make them more identifiable for example, the colour of front doors or rendering, or specific types of planting. This may help to orientate and reassure the partially sighted and people with dementia.

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Arcadia, densities up to 8 houses per hectare (3 houses per acre)

- 3.34 In layout terms, Arcadia is the creation of the illusion of a rural environment. It draws on the 'picturesque' approach to landscape design typified by the layout of the parks of British country houses in the eighteenth century.
- 3.35 The guiding principle was the use of meandering walks which revealed successive surprise features hidden in a dominant landscape. In the same way, early 'leafy' suburbs of the nineteenth and early twentieth century conceal houses among mature trees so that the visitor is more aware of the landscape setting than of the houses themselves.
- 3.36 Today's Arcadia should strive for the same effect, with a layout devised to allow houses to appear at intervals among trees as surprise features in the landscape. This effect cannot be achieved at densities over 8 houses per hectare (3 houses per acre). Land economics may well dictate that housing at this density is at present the exception rather than the rule in new residential areas. If a Planning Authority wishes to see a wider use made of development laid out according to Arcadian principles, it would do well to consider a special notation for such sites in its Development Plan documents, so as to predetermine an appropriate land value.
- 3.37 As Arcadian layouts are dependent for their effect on a dominant landscape, the most suitable sites will be those which already have a significant density of mature trees and hedges. Consideration must also be given to how the existing tree cover can be enhanced by new planting or where, if existing vegetation is sparse, a new pattern of substantial tree and hedge cover can rapidly be established. The need for rapid establishment should not, however, influence a choice of plant material that is alien to naturally occurring species in Essex. Front gardens should be enclosed by hedges in order for the landscape to dominate the houses. Some design features including open-plan front lawns that reveal cars parked on drives, built enclosures (such as walls with railings) and substantial gates are not appropriate to the Arcadia layout.



Arcadian street scene

Boulevard planning at densities up to 13 houses per hectare (5 houses per acre)

3.38 Boulevard planning employs a key principle of rural spatial organisation: the landscape dominates the buildings. However, it also employs a key principle of urban design, the enclosure of space –albeit using trees rather than buildings.

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Boulevard street scene

- 3.39 There are two possible variations:
 - Large trees grow on the front boundary of gardens (this would have to be a requirement of the planning consent, with the established trees protected by Tree Preservation Orders). Houses appear at intervals seen through drive entrances, but no more than one or two are apparent from any viewpoint. Trees always provide the link between one house and the next, with more planting at the rear to unify the composition and contain the space between the houses. Care must be taken to ensure that there is sufficient space for trees to establish and mature. The road is a shared visual space for motorists and pedestrians.



a. Footway b. Verge c. Hedge d. Distance not less than half width of house e. Varied houses

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• Avenues of trees line the roads and contain the space for the motorist. At intervals, islands of trees appear to terminate vistas. Buildings are scarcely noticeable. The pedestrian is contained within an inner space formed by the roadside trees and front garden plantings. Such layouts work particularly well when the streets form straight avenues or meander in a gentle, serpentine manner.



Street scene with avenue of trees

Boulevard planning at densities up to 20 houses per hectare (8 houses per acre)

- 3.40 A further variation is possible in a layout that employs a subtle combination of landscape and buildings. Part of the composition relies on creating and enclosing spaces by trees and hedges; part relies on enclosing space with groups of buildings. The appropriate relationship must be created between the height of both buildings and trees and the width of the spaces between them, following the principles elsewhere in this guide.
- 3.41 While the use of detached houses is possible in this context, achieving a positive effect will depend on the use of a common architectural style and detailing for all the houses; on locating garages to the rear of residences; and on using gateways, arches, railings and similar to link houses into a single composition.
- 3.42 Similarly, the houses must be positioned in a strict geometric pattern. It is this geometry of crescent, circus, oval or rectangle that will provide the necessary order. The success of such layouts also depends on abundant and appropriate tree-planting. Sparing use should be made of this layout, with developments of over 20 houses per hectare (8 houses per acre) predominating. This layout is not appropriate for use in smaller sites.

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Criteria for the Creation of Urban Space at Densities Over 20 Dwellings Per Hectare

Boulevard planning incorporated within a housing development a. Arcadia b. Formal urban square c. Boulevard planning d. Village street e. Formal urban space

3.43 The prime underlying principle of all urban places should be the creation of a pedestrian-scaled environment. This should be achieved by using buildings to enclose space. If space is not satisfactorily enclosed, an attractive urban place cannot be achieved. Similarly, chains of spaces must be structured so as to add up to a meaningful urban place that is both legible and navigable.

Pedestrian Scale

- 3.44 To encourage walking and to create spaces in which people feel comfortable, any publicly accessible spaces must be visually satisfactory to the pedestrian. This means that spaces must be visually comfortable in terms of their height-to-width ratio, their balance of static and dynamic spaces and their visual length.
- 3.45 There must also be sufficient visual interest within the planes of the enclosing buildings to engage the eye. Repetition of similar building forms should be avoided, except where formal spaces are being created and there is compensatory detailed design enrichment.

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- 3.46 At the same time, sufficient density of interest should be provided in the form of:
 - Changes of frontage-widths and building lines.
 - The surface textures of facing materials.
 - Window and door types.
 - Features such as gables, projecting wings, bays etc.
 - A varied skyline incorporating chimneys and dormers.
- 3.47 Such variation and visual interest encourages pedestrians to explore though it is of course necessary to strike a balance between a chaotic proliferation of detail and severe simplicity. Visual variety may be further enhanced by the incorporation of a variety of building types and uses i.e. not purely residential.
- 3.48 Such elements are of particular importance to the partially sighted and people with dementia, who benefit from clear wayfinding.



a. Pedestrian scale b. Visual variety c. Severe simplicity

Height of Buildings and Width of Spaces

- 3.49 A suitable ratio must be established between the width of a space and the height of its enclosing buildings, as this helps to ensure the enclosure operates at a satisfactorily human scale. For an ideal relationship in a pedestrian-dominated dynamic space, the width of the space should be equal to or less than the height of the enclosing planes.
- 3.50 This can be difficult to achieve in practice. Gaps in the height of enclosing buildings, partial widenings of the space and similar should be compensated for by narrowing the remainder of the space and/or increasing the height of buildings on one side. Ultimately, each building must be of sufficient height to command its relevant portion of the enclosed space. In certain circumstances, roof slopes, gables, dormers, chimneys and other skyline features can increase the apparent height of buildings and thus their ability to appropriately enclose space.

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Black Notley (Braintree District)

(Top)- Width of space equal to or less than height of enclosing planes. (Bottom) Drop in height at (a) compensated by rise in height on opposite side

3.51 Most public spaces should be faced by the fronts of buildings and their entrances, not by a predominance of flank elevations or side or rear boundaries. This helps to reinforce visual character, define spaces and promote pedestrian movement. It also contributes to better security by enabling the informal supervision of public spaces by residents. The provision of natural surveillance is thereby likely to reduce both the incidence and fear of crime while increasing the use of spaces by people of all ages and abilities. This in turn promotes social inclusion and community cohesion.



Correct

Incorrect

Dynamic Spaces

3.52 Most urban spaces are inevitably linear and corridor-like in form, contained by buildings and other features. If pedestrians were the only element requiring accommodation, spaces would not need to be wider than 2m, but the requirements of building outlook and vehicle manoeuvring generally preclude such intimate spaces. Typically, the narrower, longer and taller the enclosing buildings of such a space, the greater the sense of dynamic movement it imparts.

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Dynamic space effect

Static Spaces

- 3.53 While the overall network of routes may tend towards the linear, the careful introduction of more placid areas will have a welcome effect. Such static spaces encourage the pedestrian to stop and linger, with positive effects for social inclusion –particularly important for older people.
- 3.54 Static spaces can take a variety of plan forms. Circular spaces and squares bounded by a plane of continuous height are the strongest types; the impact of static space may be enhanced or diminished by its architectural treatment. Such spaces can also be reinforced by the addition of a central feature.
- 3.55 Static spaces should be sufficiently strongly enclosed that a linear feature (such as a road passing through) does not detract from the feeling of enclosure. Such an effect may be mitigated by a design treatment of the ground plane that emphasises the static nature of the space, but this is no substitute for effective enclosure by buildings.



Static space effects

The Problem of Over-wide Spaces

3.56 A space accommodating a vehicular road will inevitably be wider than the ideal, and the pedestrian will perceive such spaces as over-wide. A static space of this width (such as a market square) would, however, not appear over-wide, due to its limited length. This effect can also be created by the design of buildings which command and at least partially enclose the space.

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3.57 Another solution is to treat each street frontage as a more or less unbroken wall or edge, with the footway hugging the built frontage to give a sense of shelter. A further solution is to sub-divide the width of the street by rows of trees to create three parallel spaces, i.e. two footways and the carriageway. In such cases, greater fragmentation of the frontage may be allowed, as this would be concealed by the trees.



Buildings commanding and partially enclosing a space



Street as three parallel spaces



Street frontage as an unbroken edge a. Zone of shelter b. Continuous wall

Length of Spaces

- 3.58 An over-long linear space can be daunting or monotonous to the pedestrian, as too much is revealed at once. This problem may be overcome by limiting a space's visual length using the complete or partial closure offered by a taller terminal building, a curve in the street, a change in the building line, a pinch point or a change in level. These devices conceal the way ahead and arouse the curiosity of the pedestrian. They also reduce the dynamism of the space.
- 3.59 One downside of this form of layout is that it may increase confusion and anxiety in the elderly, the less mobile or people with dementia. The needs of such groups must therefore be carefully considered at the design stage.
- 3.60 It is necessary to achieve a variety of spatial experiences along a route. This may be done by breaking

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the linear space into a series of linked sub-spaces more closely related to the human scale. These sub-spaces can be created or hinted at by relatively minor variations in the height-width relationship; through breaks in the frontage line; by angling facades; and through the detailed design of the buildings. They may also be more positively formed using pinch points; by bridging over the space; or by the introduction of wide eaves overhangs and other projecting high-level features.





(Top) Linear space as series of linked sub-spaces. a. Pinch point (gateway) b. Pinch point (Bottom) Sub-spaces emphasised by projections, eaves, overhands and bridging-over



Limiting visual length by curve in street



Limiting visual length by taller terminal building

Continuity of Route

- 3.61 The continuity of a pedestrian route needs to be emphasised by minimising breaks in the built frontage. Gaps for road junctions and similar should be sited so as to have as little impact as possible on the visual continuity of the streetscape.
- 3.62 The route should be a unifying element, tying groups of buildings together and making its whole length a composition in itself. However, such a route will still require a variety of spaces along its length if it is to provide satisfactory diversity of spatial experience.



Black Notley (Braintree)

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3.63 In addition, developments should offer the flexibility to adapt or 'customise' parts of dwellings or frontages (such as the colour of front doors or rendered surfaces) so as to aid the wayfinding for the both the ageing population and those with dementia.



Flexibility for wayfinding

Character of The Space

- 3.64 The overall design treatment should seek a balance between diversity and unity. A totally unified scheme would be one in which spaces, building forms, roof pitches, eaves lines, openings and materials were the same throughout the scheme. A totally diverse scheme would be one in which they were all different. The former would be monotonous, not to mention confusing for the partially sighted or people with dementia, while the latter would be chaotic and could lead to confusion. The key is to position designs in the 'band of acceptability' between these extremes, with some elements varying and others consistent; it is this balance that makes places attractive.
- 3.65 This principle can be witnessed in many historic settlements. In some, for example, spaces, forms, roof pitches and eaves vary, while a pleasing unity is imparted by consistency of materials and elevational openings. Other settlements owe their character to a variety of materials combined with consistent street frontage and plot widths.
- 3.66 The band of acceptability within the unity-diversity spectrum can be expressed also in terms of formality and informality. Within the band of acceptability, formal design may be characterised as that in which there are a greater number of consistent elements, tending towards unity, while informal design sees a greater variety in elements, tending towards diversity. Formal design tends to suppress the individuality of the dwelling in the interests of creating an overall composition of greater coherence than would be possible dealing purely with individually expressed units.
- 3.67 Spaces may be treated in either a formal or an informal way. A formal space is unified and symmetrical in its treatment, and is based on one or more axes. The character of the space may be reinforced or contrasted by the design of the buildings.
- 3.68 An informal space is more diverse and complex in its treatment, the balance between diversity and unity being struck in a subtler way. The contrast between formal and informal spaces is stimulating, and prevents the monotony of a completely formal or a completely informal layout. Typically, formal spaces should be placed within the matrix of an informal layout so that they can act as a focus. The repetition of similar spaces should be avoided, as this results in monotony and disorientation.

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a. Formal space reinforced by formal buildings

b. Formal space contrasted with informal buildings

c. Informal space and buildings



a. Dynamic formal space – length should be limited to avoid monotony for the pedestrian *b.* Static formal space in matrix of informal layout

Criteria for Placing Buildings at Densities Over 20 Dwellings Per Hectare

Continuity of Frontage

- 3.69 Continuity of built frontage is desirable because it helps to enclose spaces and creates continuous pedestrian routes. Continuity of built frontage is not always easy to achieve, but the following guidelines show how common problems can be avoided or overcome:
- 3.70 Joining a high proportion of dwellings to each other in terraces can create a powerful continuous frontage. This need not mean suppression of the individuality of each dwelling; historic towns and villages are largely made up of individual buildings which happen to be joined to one another. Terraces are comparatively economical to construct and offer improved insulation. They are therefore energy-efficient and easy to connect to district heating systems, renewable energy sources, waste distribution systems and other digital infrastructure. If a high proportion of detached houses is desired, they should be provided within a lower density context.
- 3.71 Even where space is required between buildings for vehicle access, it is possible to maintain continuity by bridging over at first-floor level.

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Maintaining continuity

• At the ends of terraces or in the case of detached buildings, the illusion of continuity may be created by forming an overlapping right-angled corner which, when approached, conceals the gap.



Overlapping right-angled corner

• The flank of the garden of an end house is often the cause of a break in frontage continuity. Windows in these side elevations remove the bland appearance of featureless walls and allow greater natural surveillance, reducing opportunities for crime and anti-social behaviour. End houses should be designed as corner-turning buildings screening at least part of the garden flank, with the remainder screened by a wall at least 1.8m high. The length of garden walls on the street frontage should, however, be kept to a minimum.



Garden walls

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• It is a difficult task to enclose urban space with predominantly detached and semi-detached dwellings, as the gaps between dwellings tend to dominate and the structure of the enclosed space is weakened. The use of a large proportion of detached or semi-detached houses is not conductive to the satisfactory enclosure of urban space and should be avoided in the urban context. The correct context for detached and semi-detached houses is at densities of less than 20 dwellings per hectare (8 dwellings per acre).



Gaps between dwellings

Relationship of House to Road

3.72 Car Parking for buildings should be sited between houses, beneath upper-storey structures or within garages to the rear, helping to reduce the visual impact of parked cars. This also has the advantage of increasing the area of the site available for private rear gardens.



Increased area of plot for private garden

Private Parking and Garages

3.73 The satisfactory enclosure of urban space becomes impossible when houses are set back from the road to accommodate private parking spaces – as may occur when houses feature integrated garages, or when they form a row of terraces without designated parking beneath or behind the houses.

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Reduced area of plot for private garden

- 3.74 For this reason, house types with integral garages should be used sparingly and/or additional parking spaces should be located elsewhere. In the case of terraced houses, visitor parking should be located at the end of or behind the terrace, unless the terrace fronts an enclosed or partially enclosed parking court or square. Parking facilities and garages must be accessible to people of all ages and a range of physical and mental abilities.
- 3.75 Car parking facilities should be designed with future adaptation in mind notably the anticipated decline in private car ownership and the commensurate increase in the use of on-demand autonomous vehicles. The conversion of parking bays to parklets, garden extensions and other green spaces is significant, and could help to enhance both the visual appeal and environmental impact of a development in the future. As such, it is important to consider the location and design of car parking facilities and their relationship with the surrounding plot, street, built environment and open space – as well as how their construction allows (or can be adapted later to allow) for connection to services and conversion to alternate uses.
- 3.76 On-street parking may be subject to similar considerations: it is possible that the removal of car parking bays will greatly alter the perception of and relationship between the built form and the street, most obviously through a widening of footways. It is vital to plan for such changes particularly in terms of service locations, drainage and so on from the outset.

Cycle Storage

3.77 It is important to provide covered, secure cycle storage in a location at least equally convenient and accessible as related garage facilities. One of the greatest deterrents to cycle use for local trips is the inconvenient location (or complete lack) of cycle storage near the home. A centralised cycle parking facility may benefit a development, particularly when garages are not available for every home or space is at a premium. Cycle storage should be as secure as private storage and located so as to be overlooked by homes.

Front Gardens

- 3.78 In layouts at densities of over 20 dwellings per hectare (8 dwellings per acre), there is generally no case for dwellings to incorporate front gardens, with two notable exceptions:
 - One or two dwellings in a street sequence may be set back to create an incidental feeling of extra space and greenery.
 - Three-storey houses are tall enough to maintain a feeling of enclosure even with front gardens which in such cases should be large enough to contain a tree.

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Exceptional use of front gardens in developments at over 20 dwellings per hectare (8 dwellings per acre)

- 3.79 Where a layout requires that a house be set back from the road, the space in front should be either:
- a publicly accessible paved area forming part of the general street space; or
- an enclosed front garden with a wall, railing and/or hedge of at least waist height.
- 3.80 As ever, clear distinctions to such edges are particularly important for the partially sighted or those with dementia, who may otherwise become confused or disorientated.
- 3.81 All such spaces should be overlooked by windows, while alcoves and corners where intruders could hide should be avoided. Indeterminate open areas in front of houses should also be avoided. Experience shows that residents have a lower expectation of privacy from the public or access side of the dwelling; it is therefore not necessary to be as stringent in requirements for privacy on this side.
- 3.82 Traditionally, houses were often set forward up to the rear edge of the footway; thanks to the narrowness and well-inset nature of the windows, a wide field of vision into the interior was not offered. Where houses were set back, a hedged or walled screen to the front garden inhibited the view into the interior.
- 3.83 Houses that are set back with 'open plan' front gardens and wide windows offer less privacy from the street, particularly if they have a through living room where daylight from the rear silhouettes figures in the room. It is therefore recommended that designers return to the traditional format of vertically proportioned windows and houses either set forward to the rear edge of the footway or, exceptionally, set back behind front gardens hedged or walled to above eye-level. This accords with good practice in the creation of a townscape and the enclosure of space.



- a. Visitor spaces next to garage
- b. Integral garage
- c. Freestanding garage at rear
- d. Freestanding garage in front
- e. Visitor parking behind terrace
- f. Visitor parking under cart lodge at end of terrace

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(Left) Indeterminate grassed or planted area in front visually detaches building from street to detriment of townscape (Right) A publicly accessible paved area forming part of the general street space



(Left) Low walls, hedges or fences appear miniscule in scale and fail to offer any sense of 'protection' to the pedestrian (Right) Tall railings, walls or hedges retain 'protection' and provide pedestrian scale



a. The restricted field of vision presented by small windows and set-forward buildings b. Field of vision of historic street superimposed c. Privacy lost through set-back houses giving a wider field of vision

House Design Within the Context of Layout

- 3.84 Rather than deploying a range of house types which share the same relationship to the street, the developer should employ at least some proportion of houses which perform a particular role according to their position in the layout. The plan forms of houses should, for example, be capable of turning both external and internal corners, as this enhances both natural surveillance and passive heating and cooling properties.
- 3.85 A development should also incorporate houses of sufficiently distinctive design to be capable of terminating a vista or changing the direction of a road, as well as houses whose private garden side is at right-angles to their entrance side. Other useful houses are those of tapered plan form, capable of use in curved terraces or crescents, and houses of three or more storeys for use where extra height is required. There may be situations where a combination of several such attributes is needed.

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- 3.86 Where houses front a curve in the road, there has been a tendency to stagger the houses in a saw-tooth fashion so as not to depart from the planning grid. This is T-square planning and fails to respect the realities on the ground. It results in a jagged space and enclosing roofline uncharacteristic of traditional streets, where house fronts curve to follow the line of the street. New developments should adopt the latter method; the consequent slight irregularity of house plan is a small price to pay for a more harmonious street scene.
- 3.87 Flats should also form part of the street frontage instead of being set back behind grassed areas that are too public to be used.



a. House with private garden at right angles to entrance b. External c. Internal d. Curved/tapering e. 3-storey



- *a. Incorrect. Saw-tooth staggered layout*
- b. Correct. Curving layout following road alignment



Flats should also form part of the street frontage instead of being set back behind grassed areas that are too public to be used a. Incorrect

b. Correct

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Criteria for Development Types Over 50 Dwellings Per Hectare

- 3.88 The nature of every development will be shaped, in part, by its adherence to the principles laid out in this guide. There is a collection of large and small complementary influences but fundamental to the strategy for sustainable development is the definition of the four 'development types' for sites within sustainable urban areas.
- 3.89 These development types are self-selecting once due regard has been given to:
 - Local development frameworks with established criteria for densities.
 - Existing planning and development briefs for individual sites.
 - Establishing the appropriate density by means of a Context Appraisal.
 - A site's spatial context and related potential for sustainable development.
 - The area of the site.
- 3.19.89.1 A comprehensive appreciation of the characteristics for each type can only be gained by reference to the complete text, but a summary of the major components is given below.

Compact Development

- Minimum density of 75 dwellings per hectare.
- Schemes should be mixed-use where possible but, as a minimum, half the ground-floor frontage facing major streets should typically be non-residential.
- The mix and proportion of uses should be determined by the Context Appraisal. The potential for home-working should be considered within the design of space.
- Buildings and space should be designed for flexibility of use and, as a minimum, the ground-floor ceiling height of every building should be 3m, or 3.5m if fronting a major street.
- The public realm should be robust, enabling it to accommodate a variety of appropriate uses with the design flexibility to meet future demands.
- Car parking will normally be underground, under-deck, under-croft or multi-storey with some shortstay, unallocated on-street spaces for visitors and customers of local businesses. Opportunities should be available to adapt parking spaces in future to accommodate green space or enable a widening of the footway.
- All homes without exception should be well-connected to digital infrastructure from the outset.

Robust Urban Form

- Variety of housing and apartments.
- Minimum residential density of 50 dwellings per hectare but should be higher if compatible with surroundings.
- The mix and proportion of uses should be determined by the Context Appraisal.
- Buildings and space should be designed for flexibility of use and, as a minimum, the ground-floor ceiling height of every building should be 3m, or 3.5m if fronting a major street.
- The public realm should be robust, enabling it to accommodate a variety of appropriate uses with

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the design flexibility to meet future demands.

- Car parking will normally be underground, under-deck or under-croft. Opportunities should be available to adapt parking spaces in future to accommodate green space or enable a widening of the footway.
- All homes without exception should be well-connected to digital infrastructure from the outset.

Large Sustainable Development

- Minimum site area of 50 hectares.
- Minimum average density across the area of 65 dwellings per hectare, with the highest density at the centre of the extension.
- These schemes should aim to contribute substantially to the employment needs of the town and be largely self-sufficient for all primary services.
- Car parking should be arranged to be compatible with the prevailing density of each part of the extension. Multi-storey car park arrangements are particularly suitable at this scale of development.
- Projects would generally be expected to include sustainable energy and waste recycling infrastructure sufficient to meet 100% of the needs of the development.

Small Infill

- Maximum site area of 0.1 hectares.
- Density to be compatible with surroundings.
- A Context Appraisal is not required just a site appraisal.
- Mix of uses informed by the surroundings but, where the site is in a sustainable location, a minimum of 50% of ground-floor frontage on a major street should typically be non-residential.
- Buildings and space should be designed for flexibility of use and, as a minimum, the ground-floor ceiling height of every building should be 3m, or 3.5m if fronting a major street.
- Car parking arrangements will be informed by the context but should be adaptable.
- All homes without exception should be well-connected to digital infrastructure from the outset.

Housing Layout and Design – Plots and Internal Spaces

Inclusive Design

- 3.90 Designers, developers and housebuilders often seek to create dwellings with a certain stereotypical inhabitant in mind, but this should be avoided. The designs of dwellings should be equally appealing to all users.
- 3.91 For example, a dwelling traditionally marketed as a 'family' house may be occupied by a single person or a couple working from home, who may need space to accommodate family-members for whom they provide care. Similarly, such a house may be occupied by an active older person or persons who undertakes hobbies at home and may need space to accommodate visiting relatives.
- 3.92 Dwellings should be fit for use by people of all ages and a range of physical and mental abilities.

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They should also be futureproofed – designed to allow both flexibility of use and adaptation to future standards, circumstances and technologies. This is emphatically not a new concept – the original Parker Morris Space Standards (1961) sought to encourage flexibility and adaptability in housing design. In brief: many of the core principles of inclusive design can and should be applied to all dwellings.

- 3.93 It is important to note that what benefits a specific group can also benefit other groups. Designing such benefits (and the features that give them) into dwellings from the outset can help to ensure that all parts of the population are catered for. Inclusive design features can support people with a range of needs including visual, hearing, mobility, cognitive and learning.
- 3.94 For example, designing dwellings to incorporate high levels of natural light and ventilation, often with dual-aspect windows, can offer the following benefits:
 - All parts of the internal dwelling being visible:
 - limits confusion and anxiety for people with dementia;
 - helps the partially sighted or blind to navigate around the dwelling; and
 - reduces fuel bills for people of all age groups and abilities, due to lower use of artificial light and increased passive heating from sunlight.
 - Views to the 'outside world':
 - enhance natural surveillance, allowing families to view children playing outside and helping older people to feel safer thanks to the perception that the public realm is being 'watched'; and
 - reduce social isolation, as older or less mobile people can still view activities taking place outside, either in the wider public realm or private space, and feel connected to life in the community.
- 3.95 Another example is the provision of appropriate sound separation. People with dementia can find it difficult to sleep and often move around their dwelling at night; this may also be the case for some of the ageing population. The provision of appropriate acoustic absorbency and the considered location of specific facilities or rooms can limit the impact on surrounding residences and their inhabitants. In addition, enhanced sound separation can also provide benefits for families with children, shift workers or those who work from home.
- 3.96 The provision of open-plan internal layouts offering flexibility in the placement of internal walls and doors is helpful to people with dementia, as it allows them to be able to see from one room to another, and rely on familiar visual prompts. Such internal layouts are also practical for wheelchair users and people with impaired mobility, as well as for families with children, who may benefit from open-plan shared space when children are young but who may want to adapt the space at a later time as their circumstances change. An example can be taken from Page 19 of DWELL's findings document 'Designing for Downsizers'.

Technology and Inclusive Design

- 3.97 The provision of technology in the home is important to all parts of the population, and should be considered from the outset.
- 3.98 Dwellings should be designed to ensure suitable access to broadband so that people can work from home conveniently and effectively, or simply keep in touch with relatives and loved ones. Designs should allow them to take advantage of existing, new and emerging technologies on a similar note, it is

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important to plan for emergent or specialist technological requirements such as the charging of electric cars, bicycles and mobility scooters.

3.99 The appropriate infrastructure can also enable the provision of various medical and tele-care health services particularly useful to older people and those with dementia, including remote access to health professionals and movement monitoring systems within the home.

Additional Measures

- 3.100 It is important to note that there exists a range of more detailed measures considered specifically important to people with dementia, the ageing population or those with physical or mental conditions. These are likely to fall beyond the realm of this guide (and possibly beyond the planning remit) and into Building Regulations. However, it remains vital to ensure that dwellings themselves are designed to be able to accommodate such measures if they are required. Some examples include:
 - Provision of capped services, which can be accessed should a room need to be converted into a wet room.
 - Construction to a standard that can withstand the installation of a stair-lift, hoist, hand rails etc.
 - External and internal materials that can be painted or customised for easy identification.
- 3.101 Many such measures follow the Building Regulations Part M4 Category 2 (Accessible and Adaptable Dwellings) which are relevant to ensuring that homes can be adapted in the future.

Houses for Older People

- 3.102 Flexible and adaptable dwellings allow people to remain in their property as they age, and thereby to retain their involvement in the local community. This can aid in limiting social isolation, which is a particular concern for the aging population. By allowing people to live independently for longer, suitable dwellings can also help to reduce the costs faced by health and social care services.
- 3.103 Research undertaken by the Chartered Association of Building Engineers (CABE) Homes for old age. Independent living by design. 2009 identified a desire among the ageing population to stay in their own homes, thereby retaining independence, space and choice. Dwellings should therefore be designed as homes, not places to receive and access care. The key requirements of inclusive design are that it is:
 - Inclusive
 - Responsive
 - Flexible
 - Convenient
 - Accommodating
 - Welcoming
 - Realistic
- 3.104 The Essex County Council (ECC) Independent Living Programme for Older People Position Statement (October 2016) clarifies the need to design 'flexible homes for life', where individuals needs can be met regardless of changes in circumstances.
- 3.105 The Housing Our Ageing Population Plan for Implementation (HAPPI) initiatives introduced the concept of 'right-sizing' rather than downsizing, and set out a number of principles for designing for the ageing

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population:

- Space and flexibility
- Daylight in the home and shared spaces
- Balconies and outdoor space
- Adaptability and 'care-ready' design
- Positive use of circulation space
- Shared facilities and 'hubs'
- Plants, trees and natural environment
- Energy efficiency and sustainable design
- Storage for belongings and bicycles
- External shared surfaces and 'home zones'
- 3.106 Research undertaken by the University of Sheffield and Designing for Wellbeing in Environments for Later Life (DWELL) identified two types of ageing population: people who are either retired or approaching retirement and remain broadly unaffected by health or mobility problems (the Third Age), and those in a period of their life where health and mobility significantly impacts their well-being or quality of life (the Fourth Age).
- 3.107 The same research identified a need for a range of dwelling types to meet the eight aspirations raised by the Third Age. Such dwellings should be:
 - Connected
 - Spacious
 - Accessible
 - Adaptable
 - Pleasurable
 - Manageable
 - Sociable
 - Green
- 3.108 This research also highlighted the importance to the ageing population of being able to live in better quality, more accessible homes located in 'normal' streets and neighbourhoods, where they may continue to participate in mixed-age communities.

Housing

- 3.109 A considerable amount of time is spent in the home. Housing is a basic human right and the quality and affordability of houses can determine the health status of residents. A Building Research Establishment (BRE) report of 2010 estimated that 20% of the UK's housing stock does not meet a decent standard and that the cost to the National Health Service (NHS) of poor quality housing is £2.5 billion per annum.
- 3.110 Living in good quality and affordable housing is associated with numerous positive health outcomes for both the general population and those from vulnerable groups. As health services continue to digitalise

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and more health-related functions are undertaken in the home, housing should also be capable of integrating these new applications and services effectively. The correct infrastructure will need to be in place to facilitate such changes, preferably from the outset or alternatively, through simple and cost-effective adaptation and retro-fitting.

Principles for Healthy Housing

- Improve quality of housing.
- Increase provision of affordable and diverse housing.
- Increase provision of affordable housing for groups with specific needs.
- Provide physical and digital infrastructure to facilitate changes in healthcare services.
- Provide mix of housing types rather than developing in silos, to ensure social cohesion and help to address loneliness.
- Design housing in a way that promotes integration with the community.

Urban Grain

- 3.111 In most towns, the pattern of streets and paths (how people move between places) has evolved over a very long period of time. Even for newer urban areas in Essex, the layout of routes and public spaces and the disposition of uses was conceived for the convenience and accessibility of pedestrians and cyclists.
- 3.112 Redevelopment and roadbuilding has invariably altered this pattern, to the point that some places are now severed from their surroundings. Commercial and service uses have been placed away from where people live and the quality of public space has been compromised by the need to accommodate the car.
- 3.113 This has altered what once may have been a fine-grained pattern of streets and paths into a coarsegrained pattern. Despite these changes, the urban grain is likely to be (and needs to be) finest near the centre of a town or neighbourhood. This is where the greatest intensity of movement occurs and where the richest pattern of uses can usually be found. Away from the commercial heart of the town or neighbourhood the grain can be coarser, which reflects the less intense demands on movement and agglomeration.



a. Fine-grain street pattern b. Coarse-grain street pattern

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3.114 It is vital that new, more compact development occurs in such a way that its introduction does not alter the fine urban grain of these central locations. In these areas, new development should be designed to imitate the existing pattern. As a minimum, the main streets should be connected to their hinterlands by side streets that occur at approximately 90m intervals. More frequent connections are often desirable and should be accommodated if at all possible.



New development extending an existing fine-grain street pattern

- 3.115 In those rare circumstances where a town centre or neighbourhood environment is coarse-grained (either by original design or because of alteration), new development built in accordance with the principles laid out in this guide will introduce a finer pattern that produces enhanced environmental sustainability.
- 3.116 An overriding objective will be to create patterns of movement to form a connected grid. This can have either a regular or a deformed shape but, importantly, each end of a street or path must be connected to others. Systems that lead nowhere else are not appropriate.

Garden communities

3.117 Garden communities or sustainable urban extensions with an area of at least 50 hectares provide an opportunity to create a cohesive yet varied urban pattern. It may be considered desirable, for instance, to develop a fine-grained orthogonal grid close to the centre and a less formal, deformed grid towards the edge. However, influences on the structure of the development may depend on factors such as the existing landscape character and site topography.

Movement

- 3.118 A well-connected urban environment consists of shared, multi-functional spaces which have convenient and integrated routes for pedestrians, cyclists, cars and public transport and which are therefore more able to support a range of viable travel options.
- 3.119 Cars are likely to be used less often if the journey to the local shops or school is direct, safe and attractive and streets are well-maintained. This promotes sustainable, healthy ways of living via walking and cycling instead of driving.
- 3.120 Though other factors may impact upon the final design, new developments should be planned so as to reduce demand for road space and provide the community with sustainable and realistic alternative

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transport options.

- 3.121 In addition, the importance of the changing digital landscape and the increasing integration of GPS and navigational apps should not be underestimated when considering how the site is used and by whom. This is a constantly evolving field and one which requires consideration throughout the design process, particularly when considering the legibility and permeability of a layout and how the site will be interpreted by users.
- 3.122 A close-knit pattern of connected urban streets and spaces produces a variety of benefits:
 - Travel distance between origin and destination for local journeys is minimised.
 - Encourages the establishment of fine-grain mixed-use.
 - Creates a more sociable and safer public realm.
 - Supports the use of cycling and walking.
 - Supports the formation and use of a central hub at the core of larger developments.
- 3.123 An analysis of existing movement patterns and future development sites should determine approximate desire lines and identify the potential for improving existing routes and creating new ones. A more rigorous prediction of traffic behaviour within the network may be required by the Highway Authority, who will make this requirement known at an early stage. Pedestrian behaviour can be accurately predicted using a spatial syntax model, making it possible to design the alignment and shape of the public realm to ensure maximum flows are captured along preferred routes.
- 3.124 Off-street footways must be designed to maximise personal safety using adequate lighting and natural surveillance from surrounding buildings. The integration of smart street furniture to facilitate and increase the perception of safety on all footways should also be considered.
- 3.125 See Poynton Case Study.

Mixed Uses

- 3.126 Urban development should, wherever feasible, enable mixed uses to take hold and flourish. Much depends upon detailed design, but location on a permeable and accessible street network and close proximity to a compact residential community is often critical.
- 3.127 Mixing uses can create a diversity of activity within streets and contribute to the vitality and sustainability of towns and neighbourhoods by providing employment, leisure and cultural opportunities (as well as services) to the local area.
- 3.128 The more mixed the land use, the more reasons there are to visit a space, increasing footfall and the sense of safety. Consideration should also be given to uses that promote activity across multiple time zones whilst remaining sympathetic to the locality. Large, single-purpose land uses can lengthen journeys which may make walking less practical; they also do not sustain a mix of activity and users across the day. This could serve to make such areas less desirable places to access, particularly via active travel, which has implications for the effective linking of places by these routes. Places with mixed land uses may help to minimise the number and length of trips, creating a positive sustainability impact even if active travel modes are not used to reach the destination.
- 3.129 For example, it can be beneficial to co-locate sport and leisure facilities with other community facilities

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– including retail establishments, schools, health facilities, community workspaces and/or shared amenities such as delivery pick-up facilities. Co-locating such facilities within a central development hub or nodal points greatly increases the convenience of participating in physical activity, increasing the likelihood of people using active travel as well as offering a range of health and social benefits. Where practicable, multiple sports and recreation facilities should be co-located. This allows people to choose from a range of activities in one location and promotes the efficient shared management of facilities improving the long-term viability of facilities.

- 3.130 The principle of co-locating community facilities applies to both major and smaller scale developments; in the latter case, a new community building can be designed to incorporate multiple uses.
- 3.131 There is a presumption in favour of developments that contain a mix of uses within building and street blocks where:
 - the development is located either close to existing services and facilities; or
 - the development is located on a public transport corridor.
- 3.132 The extent and range of uses will depend on the needs and demands identified in the Context Appraisal together with Local Planning Authority regeneration strategies or employment policies. In this regard, the Context Appraisal will add local detail to these policies and identify the opportunities for bringing about new employment, community space and service infrastructure.
- 3.133 It is also important to consider the changing nature of work and workplaces when designing for mixed uses. Developments should be designed to accommodate or adapt flexibly (and with minimum disruption) to the anticipated increased uptake of home-working, temporary and short-term leases on workspaces, shared workspaces and similar. This may be achieved by the inclusion of multi-functional community workspaces at the centre of developments, which can provide highly practical infrastructure as well as fostering an enhanced sense of community identity and integration.



Mixed-use development in Colchester

3.134 On sites within 800m of large town centres or 400m of neighbourhood or small town centres, at least 50% of the ground-floor frontage of developments facing major streets should be allocated for non-residential uses other than vehicle parking.

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- 3.135 The types of uses and block design will require careful consideration to minimise the possibility of conflict between uses. Access arrangements, noise generation and safety issues must be satisfactorily addressed.
- 3.136 All new development fronting a major street within a town centre, neighbourhood, large urban infill or a sustainable urban extension should comprise a mixture of uses identified in the Context Appraisal as both desirable and viable. Elsewhere, the degree to which a location can support non-residential uses should be informed by the outcome of the Context Appraisal and the development's proximity to a major street. It is important to note that in new mixed-use developments, best practice entails the exclusion of fast-food businesses, as this enhances the wellbeing of residents.

Private Space

- 3.137 See also Landscape and Greenspaces.
- 3.138 More compact development necessitates a change in emphasis away from private amenity space and towards public space. Schemes in sustainable locations will look different from those outside. One feature will be a very small number of houses with private gardens; some developments will have none at all. Another feature will be the quality and security of communal amenity spaces and the greenness of the public realm.
- 3.139 Every home should have the benefit of some individual private or communal private amenity space. Homes in larger developments will also benefit from access to a generous provision of public space that has been designed to meet the needs of a wide range of people. This guidance applies to homes of all tenures.
- 3.140 Private space can be provided in a variety of ways:
 - Private gardens
 - Communal gardens
 - Roof terraces
 - Balconies



Walled private garden (Accordia, Cambridge)

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- 3.141 All forms of amenity space should provide the following benefits:
 - Functional
 - Safe
 - Seating for all
 - Protection from noise
 - Accessible to people of all ages and physical and mental abilities
 - Cater for all weathers and seasons
 - Variety
 - Shelter
 - Natural surveillance
 - Visual interest

Gardens for Houses

- 3.142 As densities rise in urban areas, fewer private gardens can be accommodated without compromising the quality and quantity of the public and communal environment. Within compact urban developments there are two options for designers.
- 3.143 First, houses may be provided without private gardens but with direct access to high quality, private communal space from the rear.
- 3.144 Alternatively, houses may have very small private gardens or yards. At densities above 50 dwellings per hectare, a garden size of about 40 sq m is possible for a limited number of houses without unduly compromising the quality of the public and communal environment.
- 3.145 Previous guidance has specified a range of minimum garden sizes correlating with the number of bedrooms in a dwelling but the new best practice guideline emphasises a focus on small, walled outside yards of around 25 sq m. Such private, enclosed gardens benefit from being fully designed and landscaped prior to sale or letting, so that the space can be exploited to the full.
- 3.146 Private gardens larger than 40 sq m may be possible where they make use of awkward site shapes and where there are privacy issues relating to existing development. Elsewhere, however, larger gardens should be avoided.
- 3.147 At densities above 50 dwellings per hectare an outside space of at least 25 sq m is expected for all homes. This should typically be provided in the form of shared communal gardens.
- 3.148 Some Local Authorities may have different standards and applicants should consult the relevant District Council for details of their specific policies.

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Private space facing communal courtyard

Communal courtyard space

Gardens for Apartments

- 3.149 Apartments or maisonettes will comprise the larger part of any higher density development. Their tenure, size and configuration will depend upon market demand as well as housing need surveys undertaken as part of the Context Appraisal. But all will share communal private space.
- 3.150 Poorly-designed areas of grass to the rear of blocks of flats are no longer an acceptable way of providing communal gardens. These spaces are rarely private; they are often overshadowed by tall buildings and are invariably unpleasant places to spend time. Private communal gardens therefore need to be:
 - of sufficient size to be usable and inviting;
 - secure and private;
 - well-designed and integral to the character of the development; and
 - equipped with secure and convenient cycle storage.
 - Communal courtyard (Fulham Island)



Communal courtyard (Fulham Island)



Private terrace facing onto a communal garden

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Design Criteria for Private Communal Space

- Development on sites larger than 0.1 hectares should provide at least 25 sq m of private space for each home. Only space that adheres to design criteria 3, 4 and 5 (below) will be taken into account in meeting this provision.
- Exceptionally, apartments adjacent to and overlooking a park or other large public space of high amenity value could be provided with a smaller amount of communal space. In this instance, apartments should also have balconies with a floor area of at least 5 sq m.
- At least 60% of the private communal space should receive direct sunlight for a minimum of four hours a day in June.
- The space should be enclosed by walls, railings or buildings, with no public access possible.
- The space should be designed as an extension of the built fabric and residential accommodation and contain seating and multi-purpose play areas with a combination of hard and soft landscape features, including trees.
- Consideration should be given to how smart infrastructure can be integrated into the communal areas, including waste disposal points, shared batteries for renewable energy sources etc.
- 3.151 Such communal areas should be designed as social, outside living spaces, and their quality of execution and management must be sufficient to develop a sense of pride in communal ownership and occupancy.
- 3.152 In most instances, private communal gardens will occupy the entire rear courtyard, employing careful design and making use of landscaping to overcome any possible concerns regarding loss of privacy. Individual (rather than communal) private garden areas for ground-floor apartments, houses and maisonettes can be provided in certain building arrangements but, where provided, should generally be left unfenced. Enclosing these areas with walls or fences creates an unattractive 'dead' edge to a communal area and compromises the safety and surveillance of the space. A more acceptable approach is to use low-level planting to define individual gardens. Only a very limited number of enclosed private gardens backing onto communal space are likely to be acceptable in any scheme.
- 3.153 The provision of private roof gardens should be considered on all developments and especially where the private communal and public space standards are difficult to meet. They can be used to help mitigate the loss of green space arising from the building footprint, and should form part of the biodiversity strategy of the site (which may include the use of 'green roofs').
- 3.154 Incorporating balconies into residential accommodation is encouraged and will be expected where the private communal space provision does not equate to 25 sq m per flat. Balconies contribute to the amenity of dwellings but are not always well-designed. They need to be positioned where they are comfortable to use and should be of sufficient size to enable use as an outside living space. All balconies should:
 - be large enough to accommodate a table and chairs to suit the occupancy of the apartment, as well as providing some additional space for planting. A gross floor area of 5 sq m per balcony should be provided for houses or apartments with more than one bedroom wherever communal or private garden size specifications cannot be met;
 - preferably have a southerly aspect but, in any case, receive direct sunlight for part of the day; and
 - be positioned away from sources of noise and poor-quality air that would make them unpleasant to use.

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Private open space: garden

Private open space: balcony

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Densities for Sustainable Development

3.156 The existence of a substantial and compact residential and business community within easy walking distance of an urban or neighbourhood centre is the principal platform for sustainable development.

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This catchment (at least 5000 people for a typical, sustainable neighbourhood) can support a bus route and a variety of shops and services, and can attract other commercial investment. It requires an average neighbourhood density of at least 65 dwellings per hectare with higher density towards the centre of the neighbourhood (or town centre, transport corridor etc.). This allows for lower densities towards the margins of the neighbourhood.

- 3.157 Of course, many sites suitable for development are located within existing neighbourhoods that incorporate a range of densities and these may not combine to an average density of 65 dwellings per hectare. Indeed, this is the case for the majority of urban places in Essex.
- 3.158 In contrast, new large urban extensions can be easily designed to achieve this density but applying it universally across a development would not produce the ideal variety of housing stock or an attractively diverse environment. In such situations, where there is the scope to construct new urban fabric based upon the many sustainable urban design principles contained within this guide, density should become a by-product of the process rather than its driving force.
- 3.159 This guidance requires a range of minimum development densities that are applicable to the different sustainable development types. The most compact development is required in the most sustainable locations, with a progressively reducing minimum density beyond these locations. There is no upper density limit within these specific areas. However, the Context Appraisal will help designers and Local Authorities to determine the appropriate density above the minimum base density prescribed in the guidance. These decisions need to be informed, in part, by the accessibility and quantity of existing local amenities (such as shops, green spaces and schools) that are so vital for higher densities to function. Some of these amenities can be established or improved over time either via the process of new development or through the management of market forces. Nevertheless, within larger developments (of 50 hectares or more) it is essential that these amenities are in place at the beginning of the development of the new community.
- 3.160 Where large urban infill or sustainable urban extensions are proposed, it is important to ensure that a range of development types and densities is accommodated, as this will enable a variety of living and working environments to evolve. The spatial model of the urban centre and neighbourhood should be employed to ensure a varied urban pattern across the site. Development densities will be at their highest towards the centre of these new units of sustainability but reduce towards their boundaries, enabling space for detached houses with gardens at the fringe but still within convenient walking distance of shops, services and public transport. The target population for these developments will be 5000 people per unit of sustainability.
- 3.161 Describing density by habitable rooms, plot ratios or people per hectare can provide a textured picture of a development and is particularly suitable for mixed-use scenarios. However, the terms are not widely used by central government or district councils and therefore the definition of density within this document has been expressed as dwellings per hectare.
- 3.162 Densities are measured in relation to the net site area which includes:
 - Private and communal open space
 - Internal streets
 - Multi-functional public space intended principally for the benefit and enjoyment of occupiers of the development
 - Non-residential uses within a mixed-use building that also contains residential accommodation

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- 3.163 Net density excludes public open space, the streets along the boundary of the site that serve a wider area and any non-residential uses that are not located above or below residential accommodation.
- 3.164 It is understood that there can arise a conflict between two of the requirements outlined in this guide: the need for developers to achieve minimum densities for development and the need for them to accommodate mixed-use development. Achieving minimum density thresholds using the density measure for residential development (dwellings per hectare) alone would be incompatible with encouraging a substantial provision of mixed-use development. The calculations should therefore take account of the space taken up by non-residential uses within mixed-use buildings.
- 3.165 To this end, developers may factor in an allowance of one dwelling per 75 sq m of non-residential use. Note however that the only non-residential space that should be factored into the density calculation is that contained within a mixed-use building that includes residential use. A typical calculation is shown below.

Sample calculation

No. of apartments: 210 No. of houses: 25

Non-residential space with residential use above: Community use $(150 \div 75 \text{ sq m}) = 2$ Commercial use $(3750 \div 75 \text{ sq m}) = 50$

Total 287 Net site area = 2.5 ha Development density = 115 dwellings per hectare



Calculation of density in mixed-use area

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Influences Upon Sustainability

- 3.166 The purpose of this guidance is to help deliver high-quality sustainable development which integrates innovation in design. It establishes a methodology for the process which identifies appropriate development densities, how places are designed and how they should respond to community needs. These requirements are set out in a series of development criteria:
 - Spatial criteria
 - Building and site criteria
 - Community criteria

Development Criteria	Sustainability objectives		
Spatial Criteria	Walkable neighbourhoods and good access to public transport		
	Resource efficiency in use of land density		
	Improving local services and job opportunities		
	Mixed-use development		
Buildings and site criteria	Minimising waste		
	Reducing pollution		
	Sustainable construction, sustainable drainage and energy efficiency		
	Water conservation		
	Conserving and enhancing biodiversity		
	Smart infrastructure and connectivity		
Community criteria	Mixed communities		
	Social cohesion		
	Neighbourly urban design		
	Safe public places		
	Green spaces		
	Digitally connected communities		

Spatial Criteria

- 3.167 Development opportunities offer urban areas the chance to support a more sustainable future. The built environment can be made more accessible to the ageing population, the adaptability of homes and spaces can be enhanced and assistive technology options can be incorporated into designs. And while many elements of sustainable design such as closely integrated mixed-use developments or environments that promote walking and the use of public transport benefit the entire population, it's also true that they almost always promote activity and wellbeing in older people.
- 3.168 In fact, predicted changes in the demographic profile will have land-use and planning impacts beyond

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catering for the needs of an increasing number of older people. As older cohorts increase, the proportion of some age groups will contract as a proportion of the total population. This results in a proportional reduction in demand for certain land uses and facilities. The use of land previously developed to serve demographic groups that are now shrinking will need to be reconsidered (and possibly adapted) to meet the needs and demands of groups that are expanding.

- 3.169 Preserving the hierarchy of densities within different types of urban place (such as urban centres, neighbourhoods and urban extensions) is fundamental to ensuring that they perform to their social, economic and environmental potential. In a similar manner, the preservation of relevant densities helps to ensure that areas not as well-connected to public transport and local services do not become 'over-developed' in regard to their local context.
- 3.170 The most compact developments should therefore occur in the most sustainable locations those which benefit from a high degree of physical and digital connectivity. The design of such compact developments is critical to their success.
- 3.171 Individual dwellings aimed at those requiring care should be located towards the quieter areas of a development site, with clear focal points such as trees, bird tables or views of street life. Dwellings and principal communal spaces should be orientated to ensure sunlight for part of the day, creating a balance of natural and artificial light. Ensuring green amenities are orientated to make best use of the sun will encourage residents to venture out and use outside spaces.

Buildings and Site Criteria

- 3.172 Improved life expectancies have resulted in a smaller proportion of the elderly being widowed. Consequently, an increasing number of older people are projected to remain married and living in couples than were able to do so in the past. While this may serve to reduce the requirement for stateadministered care in some instances, as married couples are able to manage their care needs in their home, it may also increase the need for larger, care-led housing that allows couples to remain living together. It is worth noting, however, that the elderly are relatively immobile in terms of moving house. The longer the elderly can remain in couples, the more likely it is that they will be motivated and financially able to stay in the 'family home'.
- 3.173 As much as 95% of the national housing stock is not fully accessible and it is considerably challenging to retrofit existing stock so as to allow people to live independently as they age. Good design inside the home is therefore of extreme importance, irrespective of whether the primary use is as a family home or one with a care-package specifically attached or delivered. Small changes are often enough to help vulnerable groups feel more independent, providing an environment that is clearly defined, easy to navigate and feels safe.

Community Criteria

- 3.174 As previously stated, the ageing population is fast becoming a key consideration in community planning. Irrespective of the forecasted trend for more elderly married couples as a proportion of the population, the growth in size of the elderly population as a whole means that more elderly people are projected to be living in one-person households. It is this cohort that is particularly susceptible to relocation to communal establishments when support (health-related or otherwise) is required.
- 3.175 Land use may have to be reconsidered in light of such changes. Where land may previously have served a function for a narrow age-band for example, schools, universities, sports and recreation facilities designed to serve children or young adults adaptation may be required to allow it to serve a wider

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range of ages and uses.

- 3.176 Planning should respect projected demographics while also promoting the concept of the 'lifetime neighbourhood', where development provision (including both housing and community facilities) are capable of supporting all stages in the life cycle.
- 3.177 In rural communities, particular emphasis should be placed on accessibility through appropriate public transport provision and inclusively designed pedestrian routes, while development should include local convenience stores and other important amenities that can help to foster a sense of community. The population of rural England is ageing faster than that of urban areas and poor access to services is a key cause of socio-economic exclusion, which has strong negative impacts on the wellbeing of older people.
- 3.178 What follows are summary descriptions of generic urban place types, characterising and expressing their potential for sustainable development.

Urban Centres

- 3.179 Urban centres reflect the investment in their success that has occurred over generations. Services and employment have been located there alongside cultural facilities and transport infrastructure.
- 3.180 The fact that some urban areas now perform less well than is desirable makes decisions on where to locate new compact development even more sensitive and potentially vital to future rejuvenation.

Neighbourhoods

- 3.181 Most traditional towns in Essex developed in an outward pattern along the main radial streets. Suburbs were laid out with walking in mind and frequently combined good access to public transport with close proximity to important services such as schools and shops, with an accompanying compact residential catchment. They offered (and typically still offer) a unit of liveability that provides a good model of sustainable community living.
- 3.182 A neighbourhood unit is considered to be around 50 hectares within an area scribed by a circle of 400m radius. This represents a comfortable, 5-minute walking distance for most able-bodied people and is referred to in this guide as a 'unit of sustainability'. Such a unit should ideally contain compact and varied housing stock, a variety of green space from parks to small squares and a community hub containing shops, health and learning facilities, employment opportunities and communal workspaces. Although radii of 400m and 800m represent a 5-minute and 10-minute walk respectively for most people, in practice the street system is likely to make the journey from perimeter to centre longer and more convoluted. Nevertheless, the use of a measured radius has the benefit of simplicity and includes all land with the potential for enhancing the sustainability of the location.
- 3.183 Neighbourhoods such as these exist in abundance in every town, although the degree to which they match the ideal model is dependent upon a number of influences such as decisions to rationalise school and service provision or the loss of a major employer. They also represent a past investment that is capable of being exploited and enhanced in preference to abandonment and re-provision elsewhere. Most neighbourhoods contain deficiencies of one sort or another and new development provides an opportunity to help remedy this, renewing their viability and making them more sustainable in the process.

Neighbourhood Design

3.184 Neighbourhoods are places where people live, work, play and develop a sense of belonging. The design of a neighbourhood can contribute to the health and well-being of the people living there.

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Several aspects of neighbourhood design (such as walkability and mixed land use) can also maximise opportunities for social engagement and active travel. Neighbourhood design can impact on our day-today decisions and therefore have a significant role in shaping our health behaviours.

Principles for building healthy neighbourhoods:

- Enhance neighbourhood walkability.
- Build complete and compact neighbourhoods.
- Enhance connectivity with safe and efficient infrastructure.
- Small Urban Infill
- 3.185 Opportunities exist within every town to build within small urban gaps that are not required for other purposes. At best, such development completes the continuity of frontage of a street and removes a local eyesore. The physical limitation of available site area imposes particular challenges for the designer but the advice contained within this guidance still applies. For instance, it is still possible for a single building to contain a non-residential use on the ground floor, to incorporate a rainwater harvesting system with underground storage, to have an excellent environmental performance and to accommodate biodiversity within the structure.

Large Urban Infill

- 3.186 Occasionally, development opportunities arise on large urban sites. These may once have been in institutional use and, provided they are at least 50 hectares in size, are capable of being developed as sustainable urban infill containing a mixed-use centre and community hub, space for employment, shared community workspaces, services, schools and a compact residential community. If a site contains buildings, their potential for retention and re-use should be examined within any Context Appraisal; there should always be a presumption towards retaining the better buildings that exist.
- 3.187 If less than 50 hectares in area, the development type will be determined by the 'fit' of the site. As with all spatial criteria scenarios, it is essential that a large urban infill site can be connected to its surroundings via a network of streets, footpaths, cycleways and green links, and that its centre is well-served by public transport.

Sites Beyond These Locations

3.188 It is important not to seek high-density development on land that is poorly connected to other places by public transport. Doing so increases the number of unnecessary journeys made by car, adding to local traffic congestion, pollution and carbon emissions. Such developments are the parts of an urban area that are least likely to become sustainable communities; in these situations it is preferable to keep densities below 50 dwellings per hectare.

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Assembled town diagram and small urban centre

- a. Urban centre
- b. Neighbourhoods/small urban centre
- c. Sustainable urban extension
- d. Large urban infill
- e. Small urban infill
- f. Railway station
- g. Green space
- h. Bus route

Renewable Energy for Developments

- 3.189 With technological advances come opportunities to integrate renewable energy systems into developments, increasing the sustainability of homes, reducing the pressure on fossil-fuel provisions and cutting running costs. Renewable technologies are available now and, although slightly more costly in outlay, offer savings over time as technology advances and lifetime energy usage is reduced. Some homes currently being developed are even energy-positive, meaning they produce more energy than they use. This surplus can subsequently be returned to the local or wider energy grid.
- 3.190 Renewable energy technologies include:
 - Solar power systems using the sun's energy to heat water or generate electricity.
 - Wind electric systems using turbines to generate electricity.
 - Hydropower systems using a nearby moving water source to generate electricity via a turbine.

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- Biomass burning plant products or animal waste as fuel to create a heat source.
- Ground-source heat-pumps use underground pipes to extract heat from the sun as a heat source.
- 3.191 These renewable technologies can be used at varying scales alone, in connection with each other or in combination with fossil fuels. It is important to remember that certain renewables are not appropriate for some sites: for example, hydropower is only viable in developments close to a moving water source, whereas biomass systems can be implemented anywhere. Therefore when considering renewable infrastructure the appropriateness of specific systems must be considered in the context of the site.
- 3.192 Another consideration is whether the system is connected to the grid or a standalone system. Standalone systems are suited to small, remote developments where connecting to the grid is less costeffective than the renewable system itself. Connecting a renewable system to the grid means electricity can still be used if the renewable energy supply fails or energy requirements are not met. Connection to the grid also allows the selling-back of any surplus energy (via the Feed-in Tariff, introduced in 2010).
- 3.193 A good example of the incorporation of a renewable energy system in a new development comes from a housing scheme in Neath, Wales. The development of 16 homes uses solar collectors on the walls of the properties to create a source of electricity, which is stored in a shared battery on the development until needed. The unique roof design makes use of a perforated steel skin to create pockets of heat under the surface when the sun shines; this heat is then drawn into the homes and used for heating. If successful, this pilot scheme could serve as the start of a nationwide initiative mitigating the need to build new power-stations.
- 3.194 New developments should consider the incorporation of renewable energy systems at the design stage. Plans should seek to accommodate the related infrastructure not only inside and on individual buildings, but within the wider community layout. This may necessitate measures including:
 - The provision of appropriate ducting and utility services.
 - Designing adaptability into homes for example, allowing for the conversion of roof tiles to solar tiles.
 - The provision of internal storage space for batteries (in their current and possible future iterations).
 - The accommodation of central energy stores and their potential for future maintenance and upgrading as technologies advance.
- 3.195 The Architectural Details section contains further information on how buildings should be orientated and laid out internally to maximise the efficiency that can be achieved from natural light and heating.

Electric Vehicles

- 3.196 A ban on the sale of diesel and petrol vehicles is expected to come into force in 2040, so it is important to ensure drivers can easily switch and make use of alternative fuel vehicles.
- 3.197 Electric vehicles are propelled by an electric motor powered using energy stored in internal batteries. Plug-in electric vehicle batteries are recharged by plugging them into the power grid.
- 3.198 The support and use of electric vehicles in residential developments provides a number of benefits and layouts should therefore give consideration to how charging infrastructure can be integrated:
 - Decreased air pollution in the vicinity due to the lack of exhaust emissions.

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- Decreased noise pollution.
- Opportunity to provide ancillary services to the local power grid, enabling the use of higher share of variable renewable energy and potentially avoiding costly grid reinforcements.

Types of Chargepoint

3.199 There are three types of charging equipment, each with an associated charging time and typical application.

Type of chargepoint	Typical power output	Typical charging time	Typical application
Standard	<7kW	4-7 hours	Residential, workplace
Fast	7-22kW	2-4 hours	Retail, leisure, public
Rapid	>22kW	30-45 minutes	Public, fleet, strategic highway network

- 3.200 The majority of charging currently occurs at home, usually overnight when electricity is cheapest. For residential developments the standard 3-7kW chargepoints are sufficient to provide a full charge overnight. The same chargepoints are suitable for employee parking spaces where cars would typically be parked during office working hours.
- 3.201 Fast chargepoints are suitable for public and retail car parks, leisure centres, visitor car parks and other amenities where drivers can top-up their battery while visiting the location for other reasons.
- 3.202 Rapid chargepoints can provide up to 80% power in about 30 minutes, and are best suited for transport hubs (for example, airports, taxi ranks etc.), electric vehicle (EV) charging hubs and along the strategic highway network, where a quick charge is essential.

Number of Chargepoints

- 3.203 For housing developments with garages and/or dedicated off-street parking, each new dwelling should be fitted with a standard (3-7kW) chargepoint.
- 3.204 For housing developments with no off-street parking, 10% of the unallocated parking bays should have an active (i.e. wired and ready to use) chargepoint. A further 10% should have the necessary underlying infrastructure (i.e. cabling and ducting) to enable quick, simple installation at a later date when there is sufficient demand.