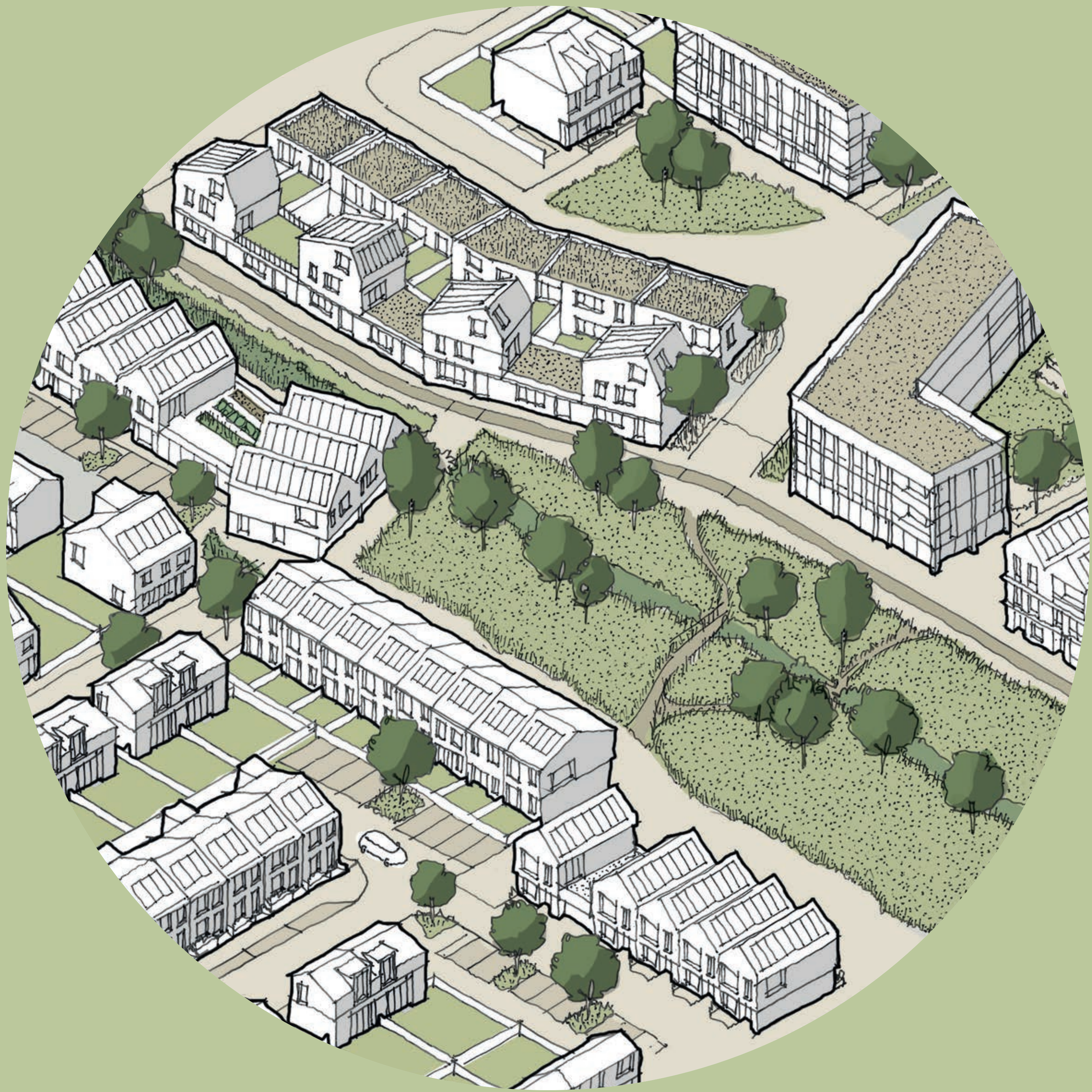

A new development model for Essex

Study prepared for Essex Climate Action Commission

July 2023

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0.0 Contents

1.0 Introduction
1.1 Study brief

Essex is experiencing significant levels of growth. According to the 2021 Census, The East of England is undergoing the largest population increase in all of England and Wales. Every single Local Authority in Essex has grown between 2011 and 2021, with Uttlesford, Thurrock, and Colchester experiencing population increases of over 10% each. Over 9,500 homes are required to be delivered in emerging Local Plans on an annual basis based on adopted requirements and the Standard Method. The County will therefore see considerable change over the coming plan period.

Whilst the type, nature, and quality of growth across the County's Districts, Boroughs, City Councils, and Unitary Authorities is subject to local nuances, the vast majority of new development is led by large housebuilders. New housing is typically low-density and suburban in nature.

Public transport infrastructure across the County is generally limited, and although places like Colchester and Chelmsford have strong links into London, the vast majority of local trips across the County are made by private car. Conventional models of new housing do little to encourage modal shift to encourage the existing residents to walk and cycle.

When taken as a whole, new housing and development across Essex is failing to meet the demands of our dual housing and climate crises.

Jas Bhalla Architects have been commissioned by Essex County Council (Essex Climate Action Commission) to prepare a study investigating the feasibility of new development models in Essex that encourage walking and cycling, and reduce reliance on cars. The COVID-19 pandemic and a wider uptake of remote working has reinforced the importance of local placemaking, and the need to ensure housing development is supported by adequate facilities such as community uses, retail, and open spaces. The expectation that new development will act as car based dormitories - low density housing vacant for large periods of the working day - is now outmoded.

At its heart, this new development model must challenge the hegemony of the private motor vehicle as the principal mode of transport in new development, promoting walking, cycling, public transport and car-share schemes where appropriate. Reducing trips by private car is a central aspect of creating less environmentally harmful forms of new development.

The Essex Climate Action Commission seeks to meet and exceed greenhouse gas emissions targets. To achieve this aim it is imperative that the concept of walkable neighbourhoods is demonstrated to be a feasible - or even preferable - alternative to the standard development model, with a view to exploring how good design principles highlighted through this study might be adopted in new and emerging Local Plans across Essex.

Fig.1 - Low density suburban development north of Colchester, where new homes are surrounding by hard standing to accommodate parked cars

Image source: Google streetview

1.2 Summary of prior work carried out by Place Services

This study builds upon prior research carried out by Place Services which sought to address the increasing emissions from the transport sector in Essex, by exploring the potential for new "Walkable Neighbourhoods".

Walkable Neighbourhoods are new places designed to promote the use of walking, cycling and sustainable transport. These neighbourhoods are planned to reduce the need to travel and include a mix of uses, green spaces, and facilities to support new homes. The Walkable Neighbourhood model seeks to remove the dominance of cars in the streetscape, by exploring alternative methods of parking to promote active methods of transportation. The objective is to design neighbourhoods where all key facilities are with a 15-20-minute walk[1]. Aims of the Place Services study included:

- Creating healthy communities, places, and buildings that both promote good health and wellbeing and address health inequalities and climate changes through a range of measures. This includes reducing the use of energy and water, using more renewable energy, and increasing sustainable transport choices such as walking and cycling.
- Building new net zero energy-efficient housing[2].

Broadening the terms of discussion

The Walkable Neighbourhoods development model explored solutions for large scale new communities of a minimum of 4,000 new homes. Although there are 4 new garden communities proposed across Essex, there is also a significant amount of smaller scale development coming forward which constitutes the majority of new housing delivered annually. New garden communities benefit from a range of design guidance and control, including Design Review Panels, masterplans and design codes, all of which seek to broadly improve design quality and encourage modal shift. A key aspiration of this study will be to analyse and propose potential solutions for development at a range of scales, from sites of circa 100 new homes to urban extensions and new settlements.

1 - The document "20-Minute Neighbourhoods" by the TCPA clarifies the precise number of minutes associated with a walkable neighbourhood can vary.

2 - https://www.essexdesignguide.co.uk/overarching-themes/garden-communities/walka-ble-neighbourhoods/

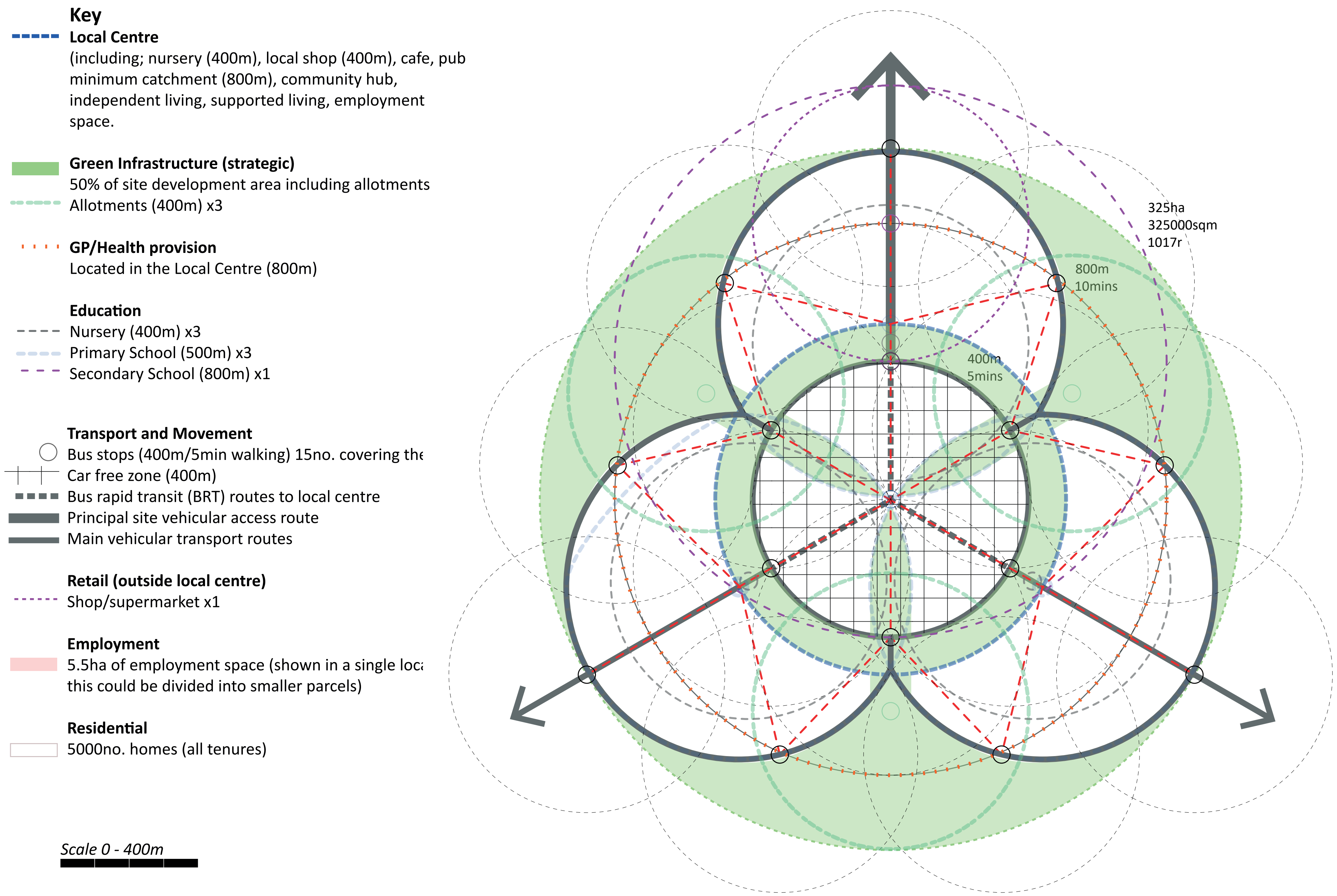


Fig.2 - An extract from the draft Walkable Neighbourhood development model prepared by Place Services, illustrating the conceptual redevelopment of a 325ha development site of which 50% is set aside for green infrastructure. The development model contains 4000 dwellings, 5.5ha of employment and various community and social facilities as itemised in the key.

Image source: Place Services

This study comprises the following sections:

- An overview of how Essex is growing, highlighting common forms of development and the barriers to walkability.
- An analysis of the conventional development model which continues to dominate housebuilding across much of England.
- Examples and analysis of alternative development models, both nationally and internationally.
- A comparative exercise that explores the potential commercial benefits of walkable neighbourhoods, alongside improvements in placemaking.
- A summary of key lessons learnt and how these could be applied to different forms of development across Essex.

Remits of this study

This high-level study is not intended to constitute formal design guidance or planning policy. Rather, it is the first step in identifying what opportunities exist to promote more sustainable development forms in Essex and understanding how best to overcome the barriers to increased walkability.

Once published, the report will form the basis of discussions with individual authorities and departments at County level such as Essex Highways, as well as private sector organisations, including major housebuilders.

Whilst delivery will be addressed at in broad terms as part of this study, economic, financial, and practical barriers to implementation will be explored in greater detail as part of a second stage of work that will follow on from this report. Conversations with third parties will be crucial to ensuring these ideas are viable and deliverable, which remains a central aim of this study.

Fig.3 - The study comprises a "land budget" analysis of a range of conventional and more alternative development models, set out in sections 3 and 4.

Section 02
The current development context

2.0 The current development context
2.1 How Essex is growing

There is currently a "presumption in favour of sustainable development" across more than half of Essex's 12 Districts, Boroughs, and City Councils. Brentwood, Castle Point, Epping Forest and Basildon all failed the 2021 Housing Delivery Test, whilst Braintree, Maldon, and Uttersford cannot demonstrate a five-year housing land supply.

This presumption directly impacts the quality of planning approvals in these areas, as Local Planning Authorities do not have the policy framework (and often internal resource) to promote design-led forms of housing development. Planning consent granted via appeal reduces the ability of Local Authorities to coordinate growth with the infrastructure necessary to promote healthy and sustainable places, in turn promoting travel by private motor vehicle as new homes are often poorly linked to new and existing amenities.

In recognition of these concerns, a report published by Place Alliance, Appealing Design (2022), demonstrates the increased weight of design quality in determination of planning appeals. The report argues the status of the five-year land supply has limited importance in assessment of the planning appeals: ***"Post July 20th, Inspectors were no longer dismissing design arguments just because a shortfall existed in housing land supply; a quality threshold – "well designed development" – now also needs to be met."*** [1]

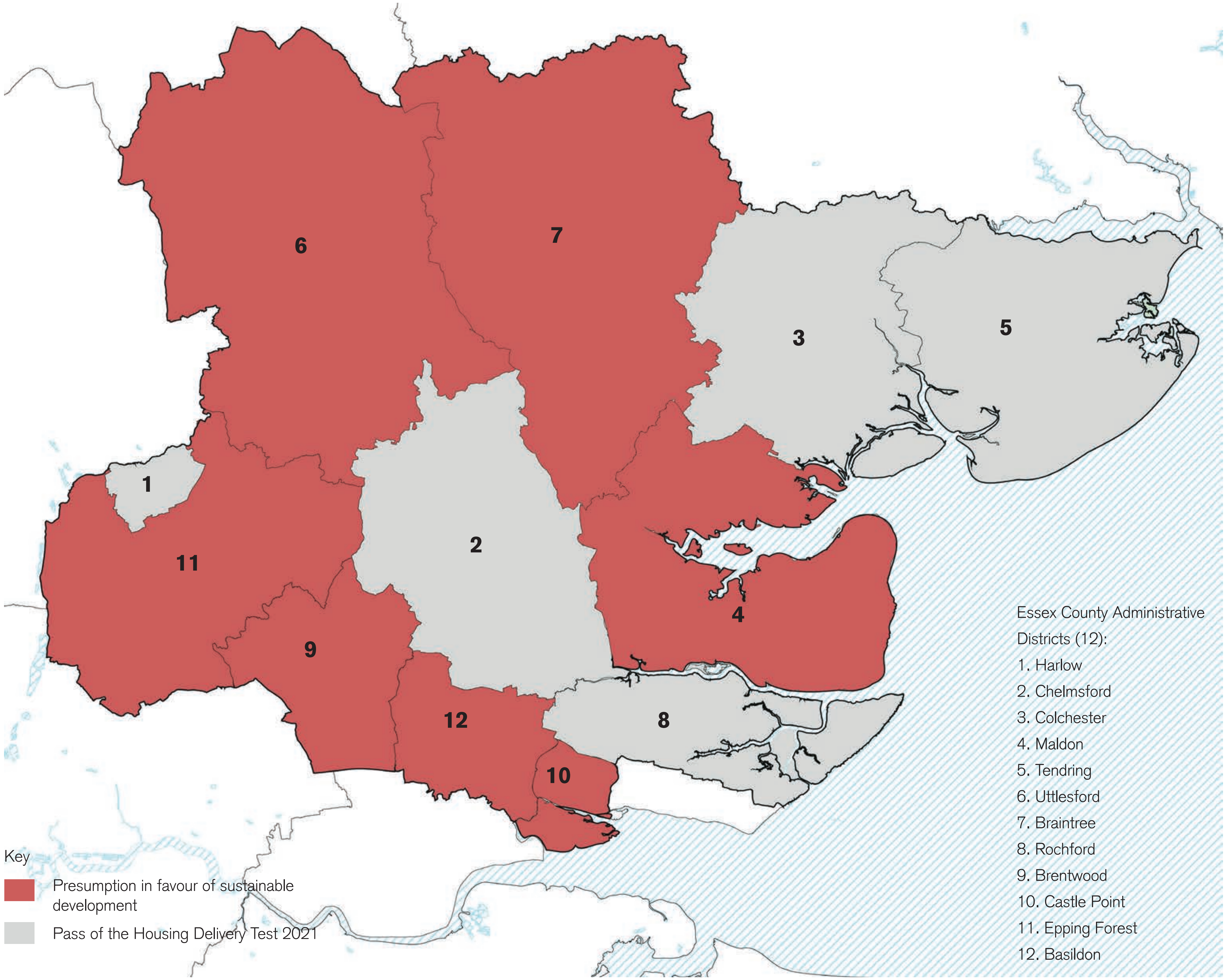


Fig.4 - Authorities across Essex that currently have a presumption in favour of sustainable development

[1] - Place Alliance, Appealing Design, p.7

2.0 The current development context
2.2 The links between car dependency and rail provision

Car travel is the most common method of traveling to work across Greater Essex - almost 70% of residents commute to work by car. 2011 Census data[1] demonstrates that car dependency is reduced around major public transportation infrastructure, including the three main rail corridors, and the underground network.

Whilst rail corridors provide strong links into London, connections between Essex's towns and cities are more limited. Rail provisions allow communities to travel to London for work but do little to discourage car dependencies for local journeys.

As the 2011 Census travel to work data shows (refer to figure 5), Epping Forest, Brentwood, and Thurrock have the greatest proportion of residents commuting to London, as rail links provide a 30-40min connection to London Liverpool Street. The Authorities immediately surrounding Greater London have between 20 and 44% of the population commuting into London via public transport.

Across Essex, even within areas of slightly reduced levels of car dependency, journeys made by bicycle constitute only 10% of all journeys.

The limited access to the rail network suggests new development models cannot rely on public transport provision to reduce car dependency; new development across the County needs to actively dissuade users from making local journeys by private car by ensuring walking and cycling is as attractive as possible.

As higher proportions of the population continue to work from home since the COVID 19 pandemic, there are significant opportunities to complete local trips via active means, promoting the concept of a '15-20' minute neighbourhood.

[1] The 2021 "Travel to work" census data was collected during lockdown, which has significantly skewed the number of residents "working from home". Survey data may need to be recollected to give an accurate and up to date reflection of current travel patterns.

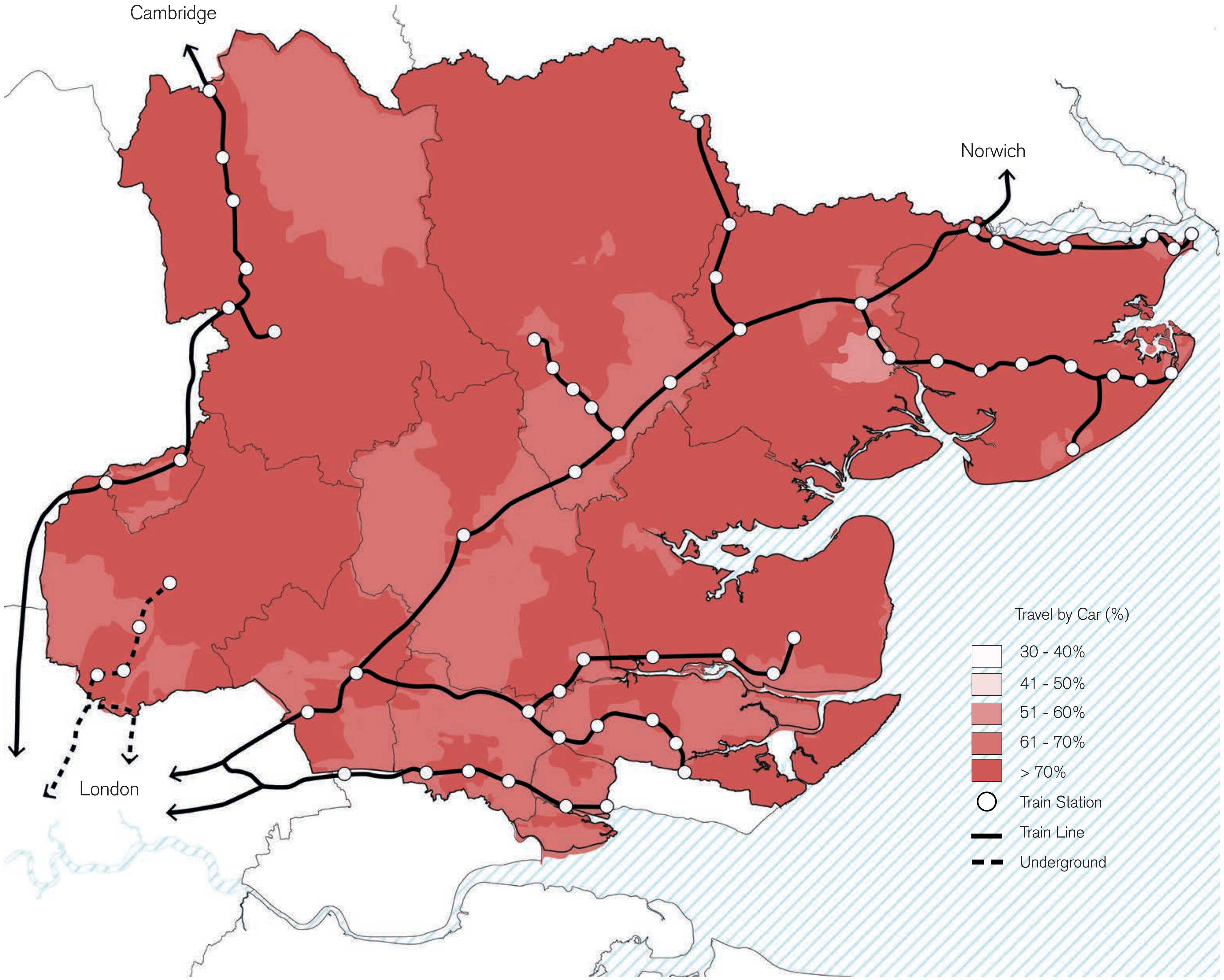


Fig.5 - Despite a strong correlation between car journeys to work and the proximity of rail stations, car journeys make up the vast majority of trips across the County

2.0 The current development context
2.3 Garden towns and villages and major development sites

Figure 6 illustrates the geographic spread of housing development coming forward across the County. The illustration builds on data within the Greater *Essex Growth and Infrastructure Framework, 2017*, and the *Distribution of future housing growth in Essex as at April 2021* provided in July 2022 by ECC.

The garden settlements include:

01 - Harlow and Gilston Garden Town, 16,500 homes
02 - Chelmsford Garden Community, 10,000 homes
03 - Dunton Hills Garden Village, 4,000 homes
04 - Tendring Colchester Borders Garden Community, circa 8,000 homes

Emerging development sites take a range of forms, from new settlements, urban extensions, and sites within established urban areas.

The data provided illustrates a significant amount of growth is currently being promoted outside of the garden communities, as smaller sites will have a substantial role in meeting growth targets. More specifically, figure 6 demonstrates the significant role smaller sites of between 100 and 1,000 units will play in meeting growth targets.

This reinforces the need to explore alternative models for development that can be applied at a range of scales, to deliver benefits to the maximum number of sites coming forward, rather than concentrating on the handful of new garden communities alone.

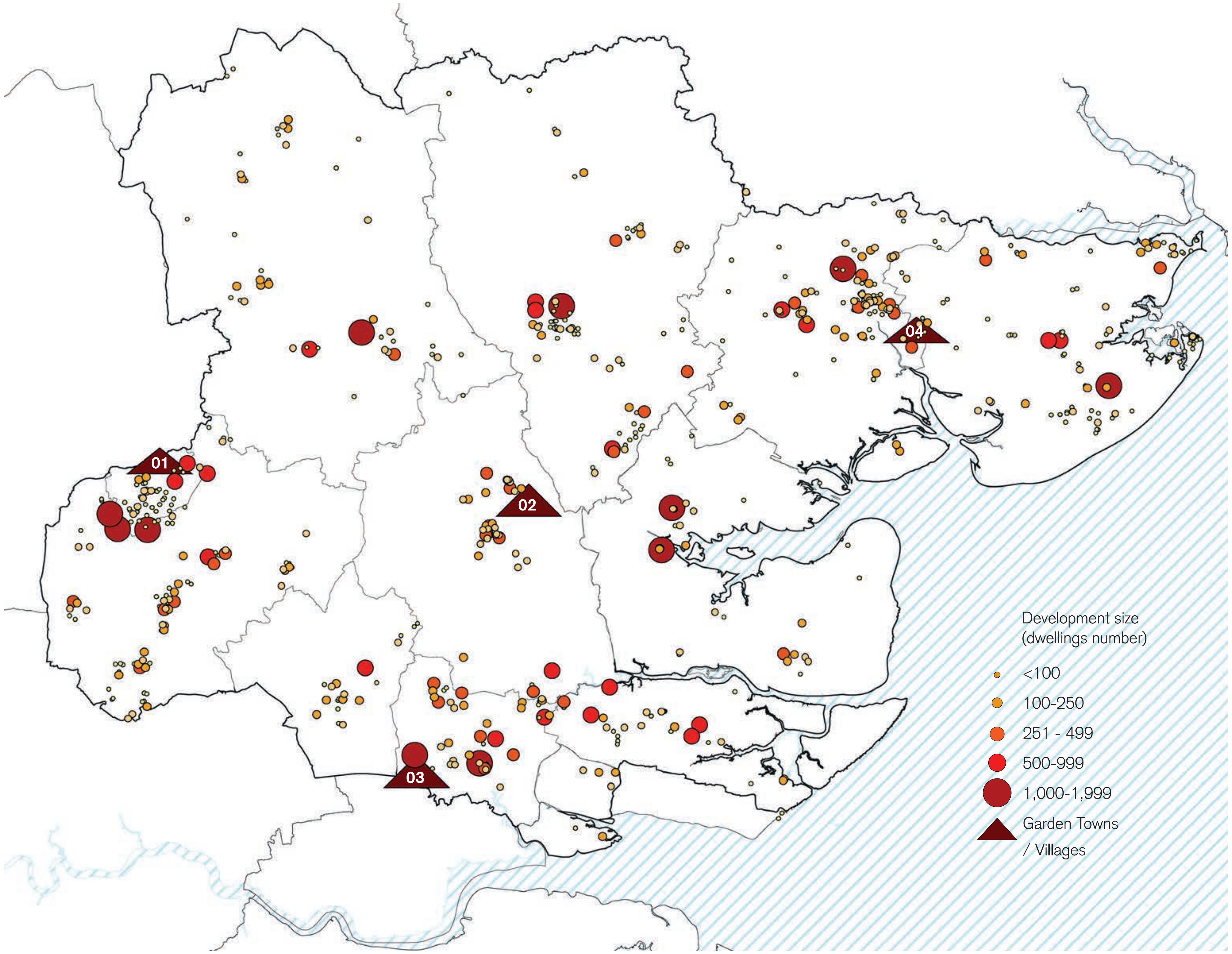


Fig.6 - An illustration of the development pipeline across Essex. Note - the data shown above for developments under 2,000 new homes has been derived from 2017 GIF and has not been independently verified. The data for Garden Towns/Villages is based on data provided by ECC in July 2022. Growth points shown on this plan are indicative only and subject to the adoption of the relevant Local Plan

The schemes below are examples of each development size category in Essex. Despite a wide variety of scales, the form, character and density of new development across the County is remarkably similar.

Image source: Taylor Wimpey

○ 101-250

Great Bentley (Weely Road)

Tendring District Council
Site: 7.65ha
No dwellings: 136
Green space: 0.67ha

Image source: Bellway

● 251- 499

Rivenhall Park

Braintree District Council
Site: 16.74ha
Residential units: 370
Green space: 4.14 ha
Employment area: 0.0279 ha

Image source: Bellway

● 500-999

Great Dunmow Grange

Uttlesford District Council
Site: 26.1ha
Residential units: 790

Image source: Taylor Wimpey

● 1,000-1,999

South Maldon Garden Suburb (Handley Gardens)

Maldon District Council
Site: 105ha
Residential units: 1,375
Employment area: 3.4ha
New education facilities: 2
Local centres: 1

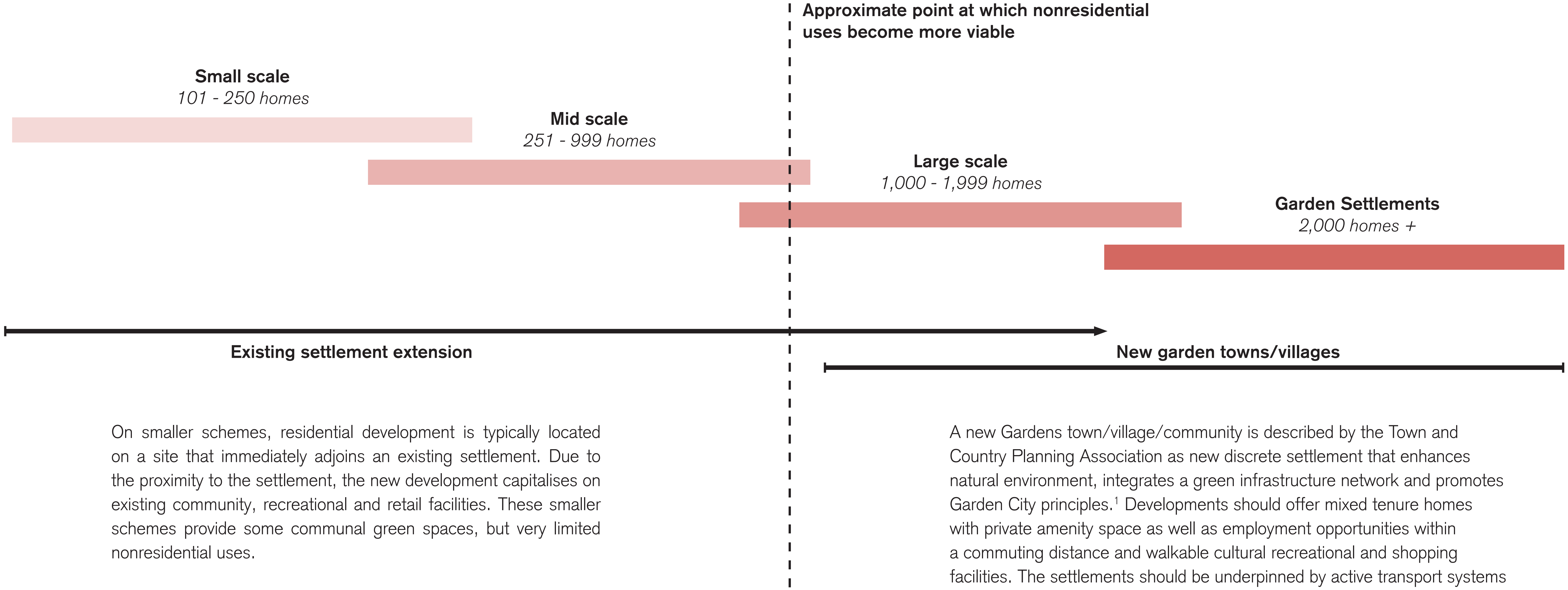
Image source: Essex Design Guide

▲ Gardens towns/ village/community

Chelmsford Garden Community

Chelmsford City Council
Site: 836ha
Residential units: 10,000
Green space: 400ha
Employment area: 46ha
New education facilities: 5
Local centres: 7
Health care/community facility: 5

2.0 The current development context
2.4 Scales of development



On smaller schemes, residential development is typically located on a site that immediately adjoins an existing settlement. Due to the proximity to the settlement, the new development capitalises on existing community, recreational and retail facilities. These smaller schemes provide some communal green spaces, but very limited nonresidential uses.

A new Gardens town/village/community is described by the Town and Country Planning Association as new discrete settlement that enhances natural environment, integrates a green infrastructure network and promotes Garden City principles.[1] Developments should offer mixed tenure homes with private amenity space as well as employment opportunities within a commuting distance and walkable cultural recreational and shopping facilities. The settlements should be underpinned by active transport systems (walking, cycling) and public transport.

It is important to note that of the four remaining garden settlements, construction has not yet begun on two (Dunton Hills and Tendring Colchester Borders), and two (Harlow and Gilston and, Chelmsford) are currently being constructed. As these two projects are only partly constructed, it's not yet possible to assess whether new garden communities are meeting these stated objectives.

1 Town and Country Planning Association, Understanding Garden Villages an Introductory Guide, London: January 2018

Section 03

Development model analysis - Methodology

3.0 Development model analysis
3.1 Introduction

3.1.1 Objective of the study

Sections 04 and 05 of this study set out a quantitative analysis of different forms of residential development. The data derived from different developments is compared to understand whether the various schemes constitute efficient use of land, which is a prerequisite to promoting active travel. To ensure a fair comparison of development in different contexts and scales, this section establishes a methodology for assessment including the following:

1. Summarising key data on each development, including location, size, developer, number of dwellings, net density, gross density, typical sale price. The methodology for calculating net density and gross density is set out in more detail below.
2. Providing an illustrative land budget, which explores what percentage of the development is taken up by houses, roads, parking, footpaths, gardens and green space.
3. Illustrating how densities and land budgets are informed by housing and block typologies through a series of plan and axonometric drawings.
4. Demonstrating how much hard and soft landscape is required for each scheme, which gives a broad indication of how efficient each scheme is, as well as conveying the potential benefits of more compact housing.

3.1.2 Housing density calculations

Housing density is measured in terms of the number of dwellings per hectare and has a significant impact on a range of characteristics, from walkability to overall project viability. The housing density used in this study makes a distinction between net and gross densities, calculated in accordance with standards set out by the Essex Design Guide as illustrated by figures 7 and 8.

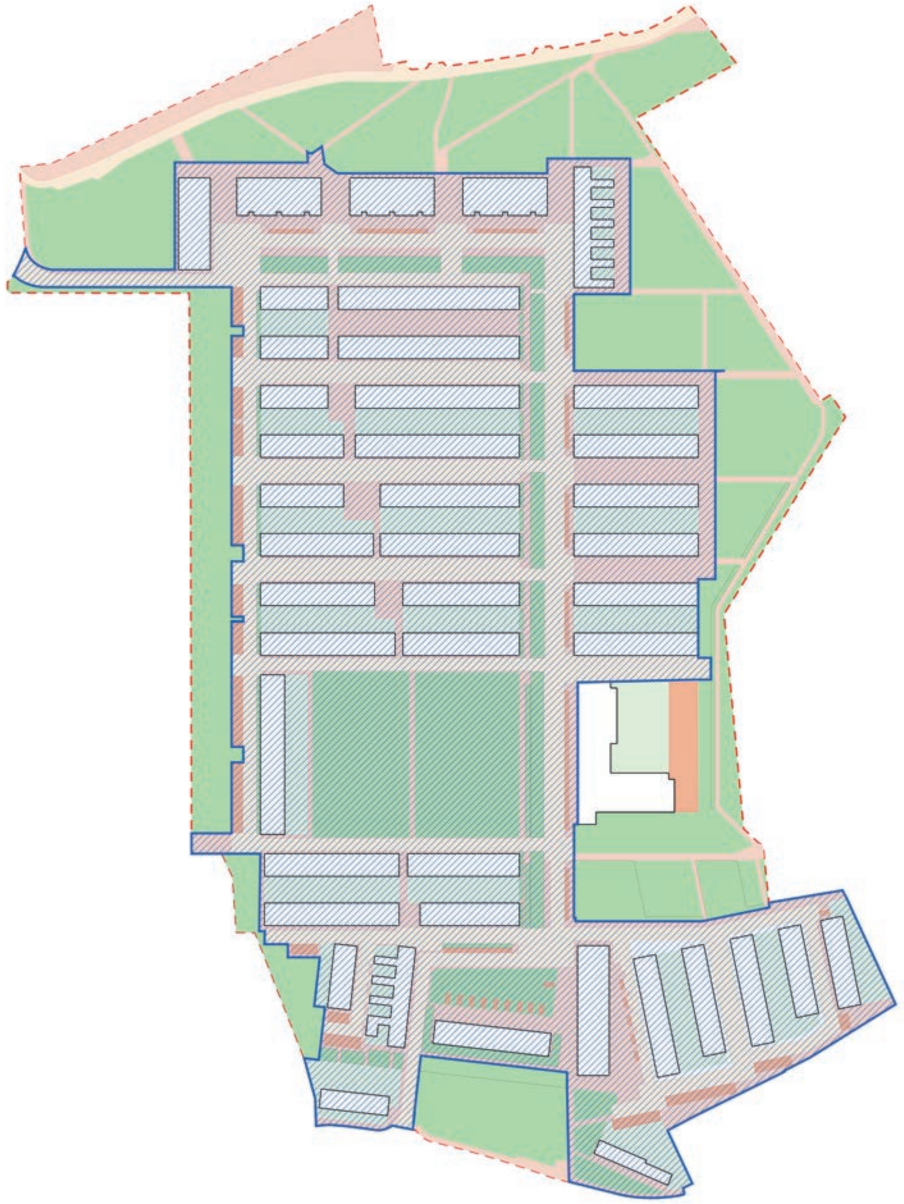


Fig.7 - The net site area includes:

- Private gardens
- Communal open space within residential development
- Internal streets
- Multi-functional public space
- Mixed-use buildings that contain residential accommodation
- The blocks are measured from the centre of the road section

(Density diagrams are based on the development at Lime Tree Square)

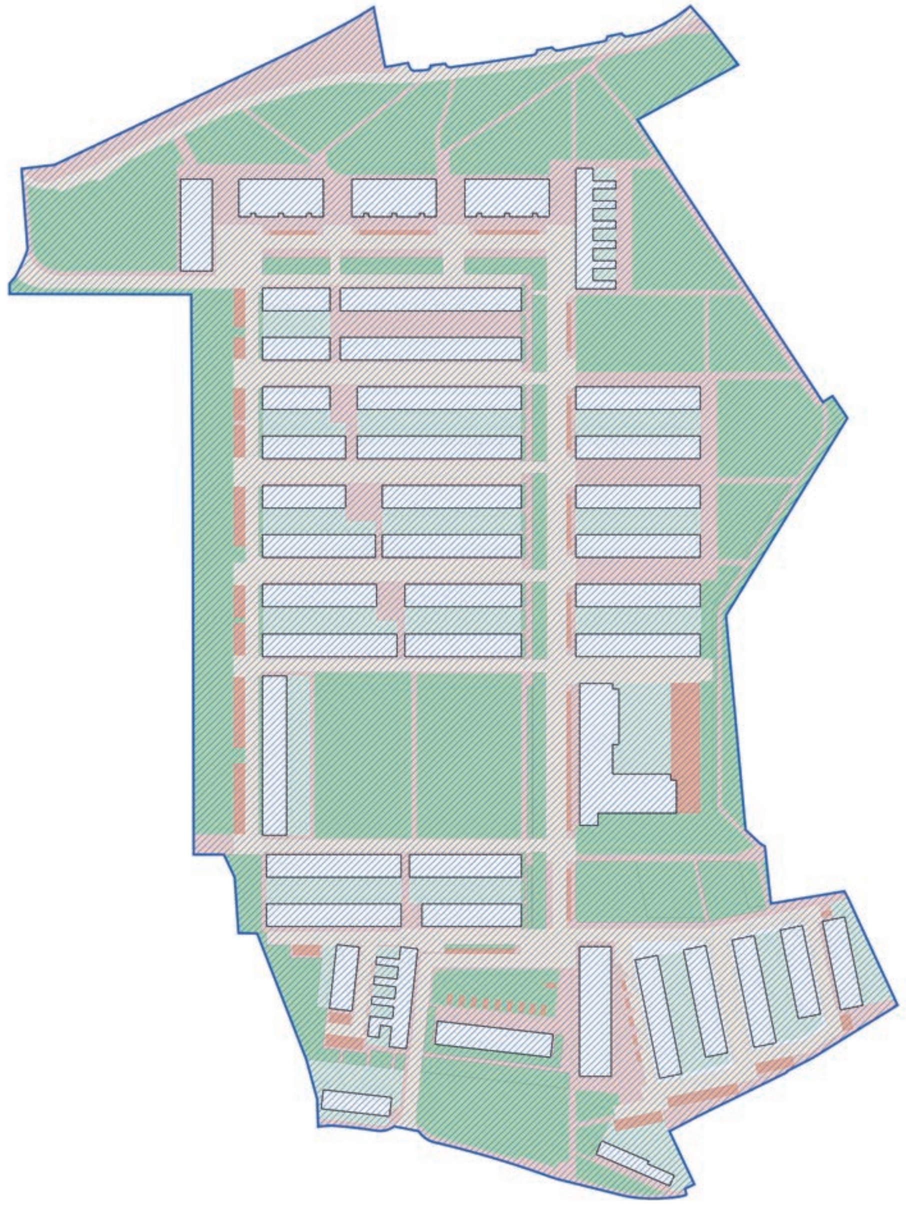


Fig.8 - The gross site area includes:

- All features set out in the net density calculation
- Larger open spaces on the edges of the development
- The streets along the site boundary that serve a wider area
- All non-residential uses

3.2.1 Land budget analysis

The comparative study of different developments is based on a land budget classification which seeks to break down each case study into the following categories:

- Green space
- Verges/Buffers
- Footpaths/cycle lanes
- Parking
- Roads
- Green space specifically for biodiversity
- Private amenity spaces (or gardens)
- Buildings

The footprint for all of the above was measured from a block plan for each case study. The block plan drawings presented in this study have been produced based on the drawings available on the relevant Local Authority planning database.

The classification is based on the function and performance of the space. This information was gathered through a desktop assessment, which uses photographs, satellite imagery, and other documents available in Local Authority planning databases, such as Design and Access Statements. The data for each land use has been presented as a portion of a total site boundary illustrated by the relevant red line boundary on each block plan. This section outlines how each category has been defined in greater detail.

Land uses beyond the ground floor

The analysis shown in this study accounts for uses at ground level only; uses above the ground floor (such as two or three storey dwellings, or multi storey car parks) have been excluded from calculations shown.

Green open space

Green space is an area that includes green infrastructure for the following:

- Green spaces outside of private ownership
- Formal spaces such as public parks and public gardens that include landscaped areas with diverse planting
- Informal amenity spaces with grassland and clumps of trees that enhance biodiversity
- Non-permeable public spaces that are designed to provide doorstep play and local areas of play.
- Outdoor play area with sports facilities such as playing pitches
- Natural and semi-natural green-space characterized by irregular, high and dense vegetation
- Allotments and community gardens

This assessment considers the scale of the development and the number of dwellings the green space provides for. If the green space within the studied area provides facilities for residents beyond the site, such as NEAP (Neighbourhood Equipped Area for Play), only the proportionate area is included in the assessment to ensure the resulting land budget calculation is not unduly skewed to additional dwellings or lower densities.

The category includes green pockets within incidental urban spaces that double up as local areas for play.

Image source: Mikhail Riches Architects

The category excludes major pieces of green infrastructure (existing or proposed) that serve are intended to serve residents beyond the defined study area boundary. This ensures sites that include significant areas of existing green infrastructure that service a wider catchment do not distort findings.

Image source: Hill Group

Verges and buffers

Verges and buffers are green spaces placed alongside transport infrastructure networks such as highways and railways and are not intended for recreational purposes. The form and location of these spaces are almost always derived around the needs of the relevant infrastructure (car or rail) to maintain visibility splays or serve as noise buffers. This category includes:

- Green spaces within the public realm that are not large enough to be used for recreational purposes (approximately less than 2m wide)
- Mown lawns as well as areas planted with wildflowers and scrub to improve biodiversity performance and reduce maintenance costs

The category includes green strips and verges within the public realm, unsuitable to be used for recreational purposes.

Image source: Bovis Homes

The category excludes tree pits located alongside footpaths and parking spaces.

Image source: Mikhail Riches Architects

The category excludes areas of grass within private ownership.

Image source: Bellway Homes

Footpaths and cycle lanes

Defined as a network of hard surfaces designed to facilitate active travel, this category includes:

- Footpaths and cycle lanes within, or on the boundary of, built up areas
- Pedestrian only streets and lanes, as well as small planters and tree pits within them

This category includes pedestrian footpaths along a vehicular road, regardless of the quality of the route.

Image source: Architectural Review

Image source: Mikhail Riches Architects

The category excludes trails, footpaths or cycle routes located within large green spaces. These spaces are accounted for within the 'green space' category.

Image source: Hill Group

Parking

This category quantifies the proportion of the site's footprint dedicated to car parking, which includes:

- Visitor and allocated car parking spaces
- Areas in public and private ownership
- Surface car spaces and purpose-built structures such as garages and carports, shared and individual
- The footprint shown on the analysis diagrams includes the infrastructure associated with the parking provision, such as access roads, driveways, and turning cycles.

This category includes under-croft parking where space is exposed and unlikely to be converted to habitable accommodation without planning consent as there is no formal garage door.

Image source: Proctor and Matthews Architects

This category includes private garages that do not have habitable accommodation or private amenity above. Although these structures could be converted to habitable accommodation in future, as single storey structures their primary purpose is the storage of cars.

Image source: Linden Homes

The category excludes integrated garages with habitable accommodation or private amenity above. Integrated garages are often absorbed by residential uses, converted into habitable rooms, or used as storage space.

Image source: FCBS Architects

Roads

This classification identifies the carriageway portion of streets only and includes:

- Both adopted and non-adopted highways
- Shared surface streets such as homezones

Green buffers and verges that surround roads are excluded from this category.

This category includes shared surfaces where pedestrian, bicycle, and car movements are accommodated on the same surface. Although the lack of demarcated space creates a more pedestrian-friendly environment, the streets' layout is driven by vehicular space requirements such as turning radii and are therefore as roads rather than footpaths.

Image source: FCBS Architects

The category excludes road infrastructure created solely to provide access to parking courts. This space is included as part of the 'parking' category.

Image source: Bidwells

3.0 Development model analysis
3.2 Methodology

Biodiversity

For the purpose of this study biodiversity is used to describe clearly defined areas of dense vegetation that are not designed for recreational purposes. This classification is not assessed on the basis of biodiversity calculations but considers residents' usability of space. Biodiversity provision is often site specific and related to pre-existing site conditions, thus it is separated from the Green Spaces category to allow fair comparison of the public open space created as part of each scheme. All biodiversity space identified sits within the public realm.

The category includes substantial areas of dense vegetation planted alongside green open spaces and footpaths.

Image source: Essex Design Guide

The category includes pre-existing areas of woodlands, however, excludes sporadic trees and hedgerows planted alongside green open space.

Image source: FCBS

The category includes water bodies, both natural and man-made, such as retention basins and rainwater gardens.

Image source: Hill Group

Private amenity

This classification identifies private outdoor spaces dedicated to an individual dwelling. It can be part of the front, rear, and/or side garden of the unit. Private amenity space excludes any footprint dedicated for car use such as allocated parking spaces in front yards, attached/detached garage structures and carports.

The category includes front gardens with substantial areas of green planning alongside footpaths. Whilst the space does not offer a recreational function, it is in private ownership and serves a purpose in reducing storm water run off and improving biodiversity

Image source: Proctor and Matthews Architects

The category excludes paved front yards that have an allocated car parking space or act as a driveway, which is classified as 'parking'.

Image source: Alison Brookes Architects

The category excludes areas within the curtilage of a dwelling that provide access to a car parking space or act as an additional allocated car space (note the classification does not change if permeable surfaces are used for areas of on-plot parking).

Image source: Bellway

Buildings

This category measures the Gross External Area (GEA) of all buildings within the site boundary. The land budget analysis accounts for ground floor area only. It includes the parking spaces that are part of the main building footprint.

The category includes integrated garages with habitable accommodation or private amenity space above.

Image source: Eddington Cambridge

The category includes non habitable spaces used for servicing, such as plant rooms, refuse storage and bike storage, attached to the main building volume.

Image source: Mikhail Riches Architects

3.2.2 Infrastructure Ratio analysis

The land budget analysis described in section 3.2.1 will provide an objective breakdown of how much space is occupied by the different components of residential development. To translate the data derived from this exercise into information that could be used to make design decisions and provide proactive design guidance, this analysis will be supplemented by an "Infrastructure Ratio" for each case study.

This ratio will illustrate the amount of hard and soft landscape (in m^2) deployed per residential unit. Higher density, more compact schemes will have a lower ratio, and likewise lower density, more sprawling development will have a higher ratio.

Using data available from Spon's Cost Guide (2023), an approximate infrastructure cost can then be derived for each of the schemes. Whilst this metric is not intended to provide a precise indication of the exact infrastructure costs associated with each built project, it should provide a rough illustration of the overheads associated with different layouts and densities.

To calculate this Infrastructure Ratio, the following areas will be omitted from the analysis:

1. Land not available for residential development

This analysis looks to illustrate the cost implications of different design decisions. In certain case studies, not all the land within the site boundary is available for residential development. This could include areas of existing woodland, for example. These areas will be omitted from the analysis.

2. Land given over to infrastructure serving a catchment beyond the sample site

The case studies examined in this report are varied in size. Only a small sample portion of larger developments have been examined. To ensure the ratios of different sites can be compared to each other, infrastructure that serves a wider catchment of the scheme, beyond the portion that forms the case study, will be omitted from this analysis. This could include, for example, large access roads and roundabouts, or significant areas given over to biodiversity or rainwater attenuation serving development beyond the case study boundary.

3. Land in private ownership

The purpose of this ratio is to derive an approximate overhead cost of design decisions associated with specific layouts and densities. Land that developers are able to sell (predominantly residential plots) has therefore been omitted from the study.

The resulting area is then divided into the following categories:

1. Usable open space
2. Hard landscape
3. Verges and buffers

These three areas are then divided by the total number of residential units, giving a ratio per unit for each of the three categories.

Fig.9 - Example land budget analysis - Lime Tree Square scheme by FCB Studios

Fig.10 - Example infrastructure ratio analysis - Lime Tree Square scheme by FCB Studios

Section 04
Analysing the conventional development model

4.0 Analysing the conventional development model

4.1 Selecting case studies

This section aims to establish shared characteristics of "conventional development" across Essex. For the purpose of this study, the term "conventional development" is defined by schemes that:

- Are suburban in nature
- Contain a minimum of 50 residential units
- Have building heights that are predominantly between 2 and 3 storeys
- Densities of between 20 - 40 dph
- Completed in the last 10 years
- Approximate parking ratios of at least two car parking spaces per 3 bedroom unit
- Utilisation of standardised house 'types' where internal configurations are not calibrated in relation to the specifics of a particular site, and instead deployed on multiple schemes nationally with occasional minor tweaks to external facade treatment
- Utilise standardised highways layouts

To explore common characteristics of the conventional development model, this chapter examines in detail three case studies of different scales and locations across Essex. To ensure a fair comparison and accurate representation of each scheme, each case study comprises a parcel of 100-250 dwellings. The schemes selected are in different Local Authorities and a variety of urban contexts.

To ensure accurate data is derived on form, density and character, only schemes that are either built or partially constructed have been analysed. Schemes at outline stage only have not been reviewed due to their lack of resolution and the high probability they will undergo significant design changes when full consent is sought.

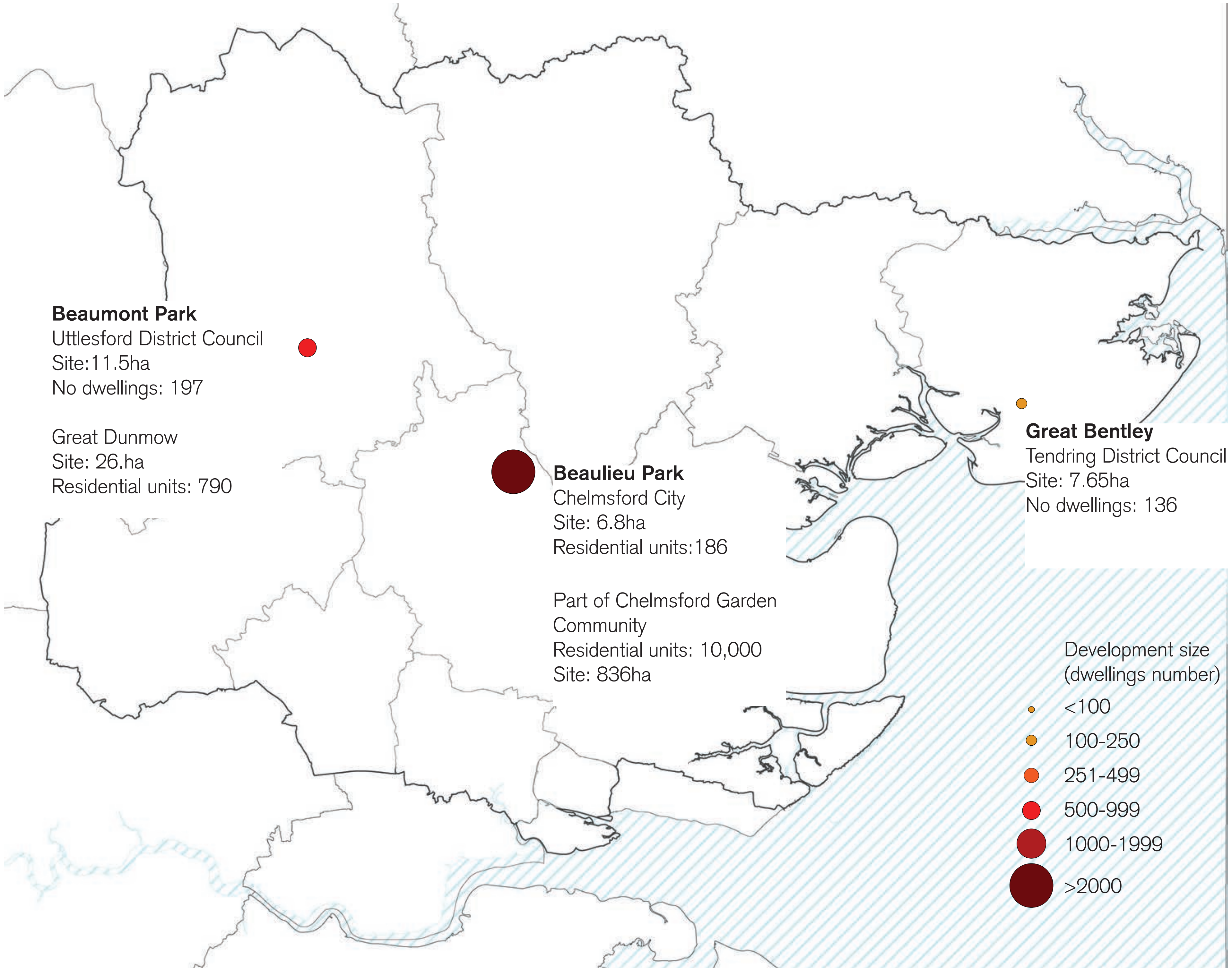


Fig.11- Location of the conventional development models selected for the case study

4.0 Analysing the conventional development model
4.2 Case Study 1- Beaumont Park

4.2.1 Context

Project	Beaumont Park
Location	Great Dunmow (1.6km)
Local Authority	Uttlesford District Council
Gross site area	11.4ha (total site 53ha)
Net site area	7.5ha
Developer	Bellway Homes /Ashberry Homes
No dwellings	197 (out of 790)
Net density	26 dph
Typical sale price	£439,996 - £619,995
Parking ratio	Minimum 1.4 spaces per plot

The studied scheme is a first phase of Beaumont Park, a development for 790 new homes. It is located west of Great Dunmow, a 15 min walk from the town centre, allowing new residents to benefit from existing facilities. The nearest train station, Stansted Airport is a 10min drive away from the scheme.

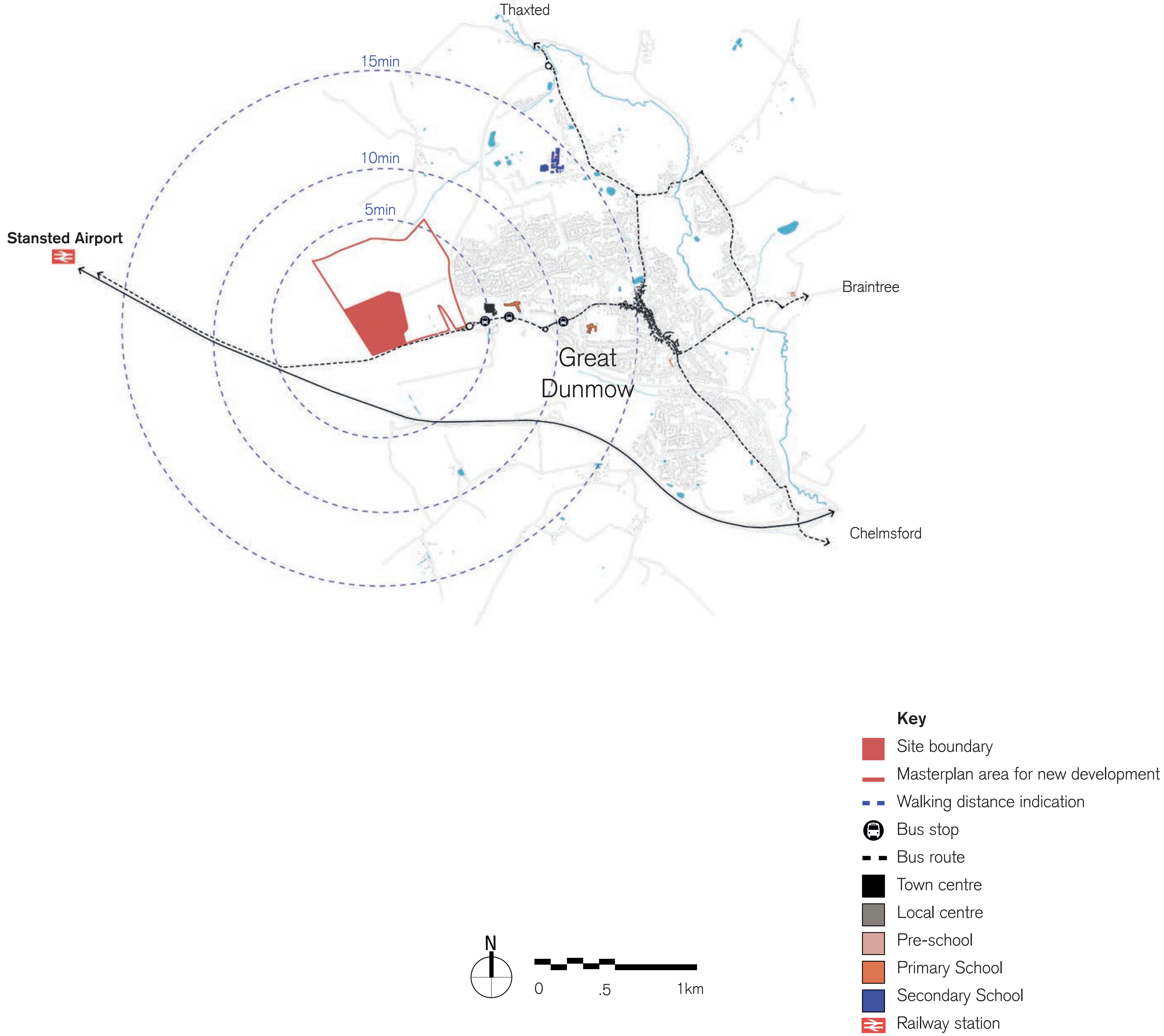


Fig.12- Beaumont Park location

4.2.2 Planning history

- October 2015 - Approved outline application (UTT/13/2107/OP) for 790 new homes on a site (53.2ha).
- December 2016 - Approved reserved matters application for access to the site and principal roads (UTT/16/1466/DFO)
- March 2021 - Approved reserved matters application (UTT/20/3419/DFO) Details of layout, scale, landscaping and appearance relating to the development of the site to provide 464 residential dwellings and associated landscaping and infrastructure works

4.2.3 Wider Masterplan

The approved outline application for 790 dwellings proposes community facilities such as primary school, community buildings, and 26.1 ha of open space (playing fields and allotments).

The application site was divided into two reserved matter applications - north and south the spine road - which were submitted by Barratt Developments and Bellway Homes respectively.

Beaumont Park, the site studied in this document, is located to the south-west of the outline application site and was included as a part of the reserved matters application submitted by Bellway Homes.

There is a landscape buffer to the western edge of the site, creating a separation between the existing woodland (known as High Wood) and new residential development. The open space to the north of the site accommodates existing woodland and provides pedestrian connections to the community and green space facilities located to the north of the site.

Fig.13- Great Dunmow new housing masterplan
Image source: planning application UTT/16/1466/DFO

4.2.4 Land budget analysis

The land budget analysis shows that one fifth of the development area is dedicated to the provision of private amenity spaces. On average, the scheme allows for 98m^2 of outdoor private amenity per dwelling, in-line with the minimum requirements set out in the Essex Design Guide. The narrow frontage of the terraced and semi-detached typology defines the width of the gardens resulting in long rectangular garden layouts.

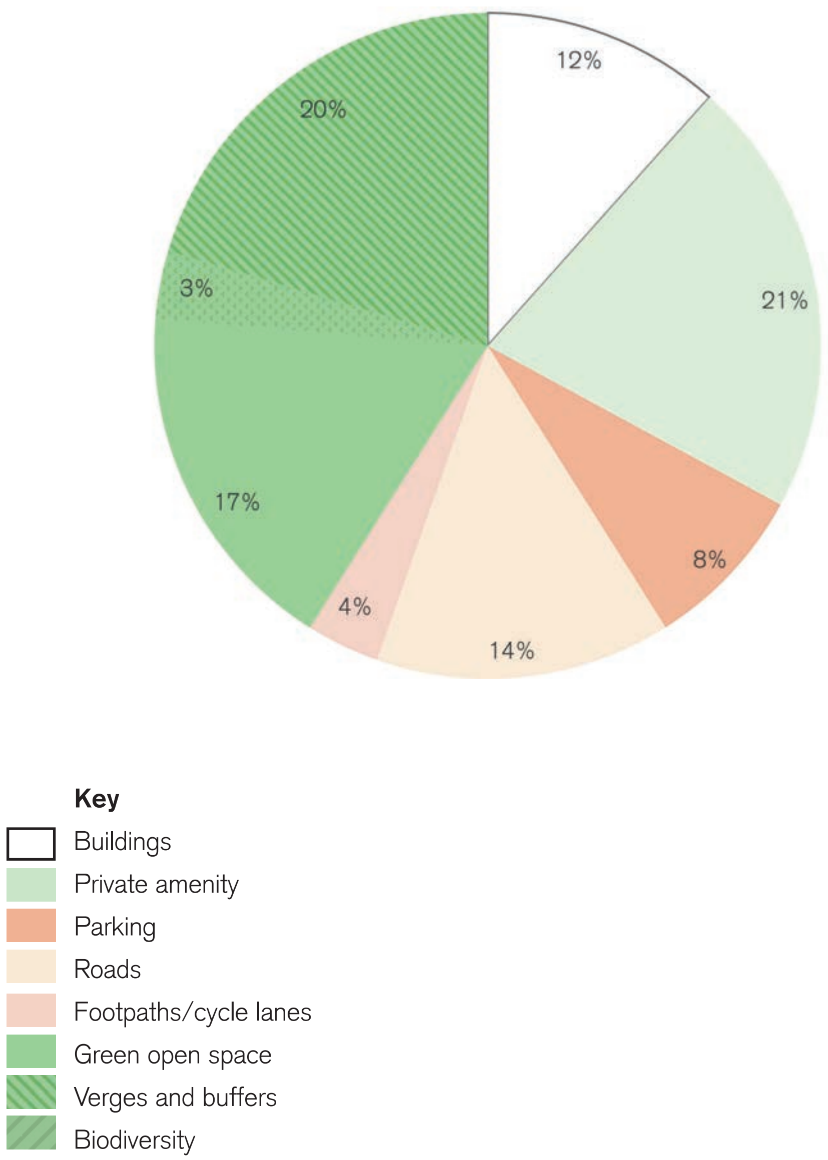


Fig. 14 -Beaumont Park plan with land budget data

4.0 Analysing the conventional development model
4.2 Case Study 1- Beaumont Park

3.2.5 Infrastructure ratio

In Beaumont Park (Fig. 15) the area in private ownership comprises 40% of the 11.4ha site (4.56ha).

A further 24% of the site (3.86ha) is occupied by land not available for development (existing vegetation) or land occupied by infrastructure that serves the wider masterplan.

The remaining 26% of the site (2.98ha) comprises the infrastructure required to service the 197 dwellings, and is broken down as follows:

Total hard landscape	**1.74 ha**
Unallocated parking	0.08 ha
Roads	1.27 ha
Footpaths/Cycle lanes	0.39 ha
Total verges and buffers	**0.36 ha**
Total usable open space	**0.88 ha**

As the scheme comprises 197 dwellings, the infrastructure per dwelling is summarised below:

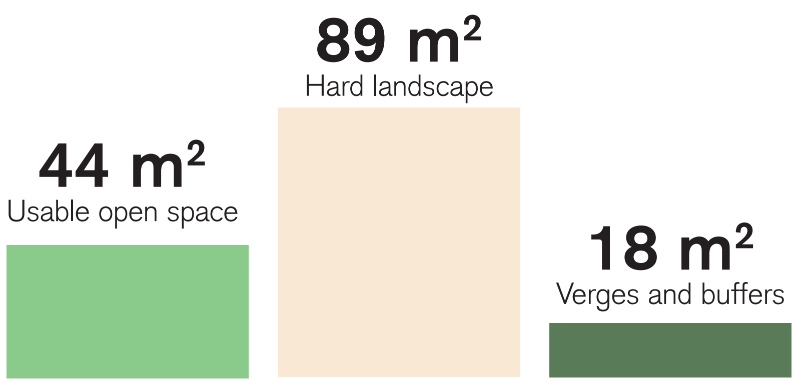


Fig.15- Beaumont Park block plan with infrastructure ratio

4.2.5 House and block typologies

Fig.16 - Typical Block

Block size (centre of the road) - 50m x 98m
Back-to-back distances - 22m - 25m

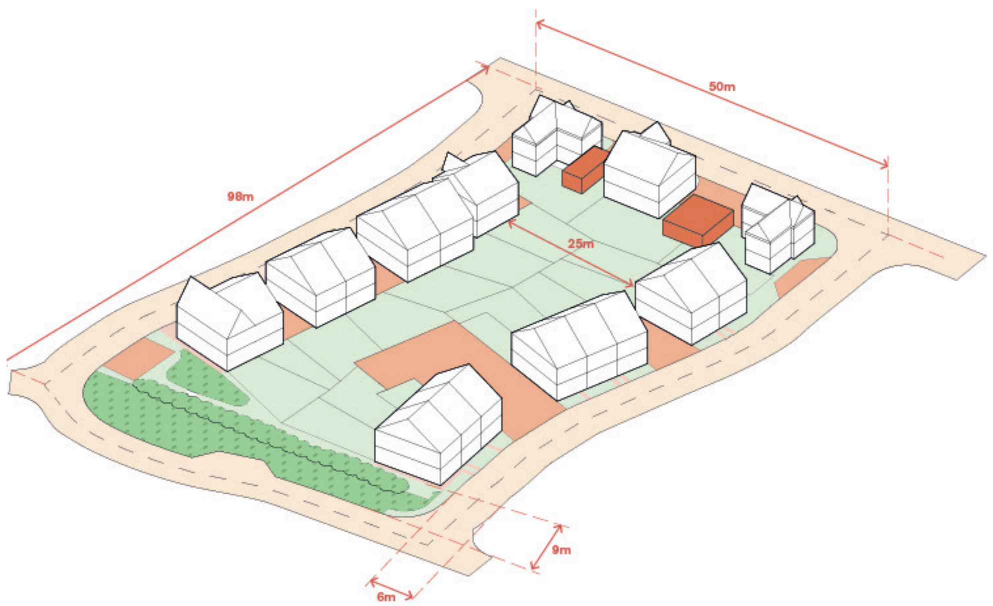


Fig.17, 18 - Typology 1

Detached bungalow
2 bedrooms
2 parking spaces

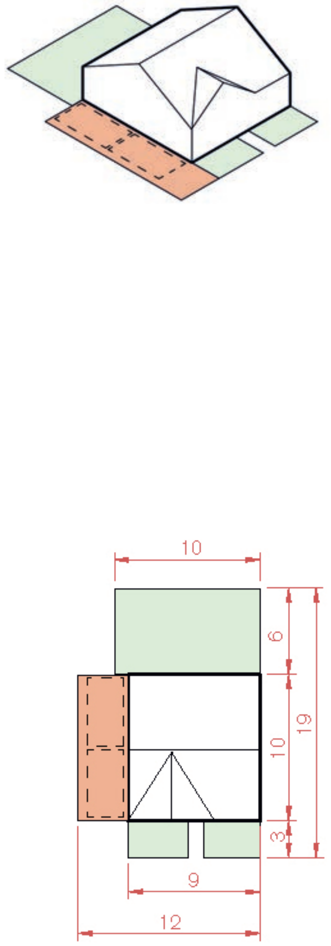


Fig.19, 20 - Typology 2

Terraced house
3 bedrooms
Communal rear parking court

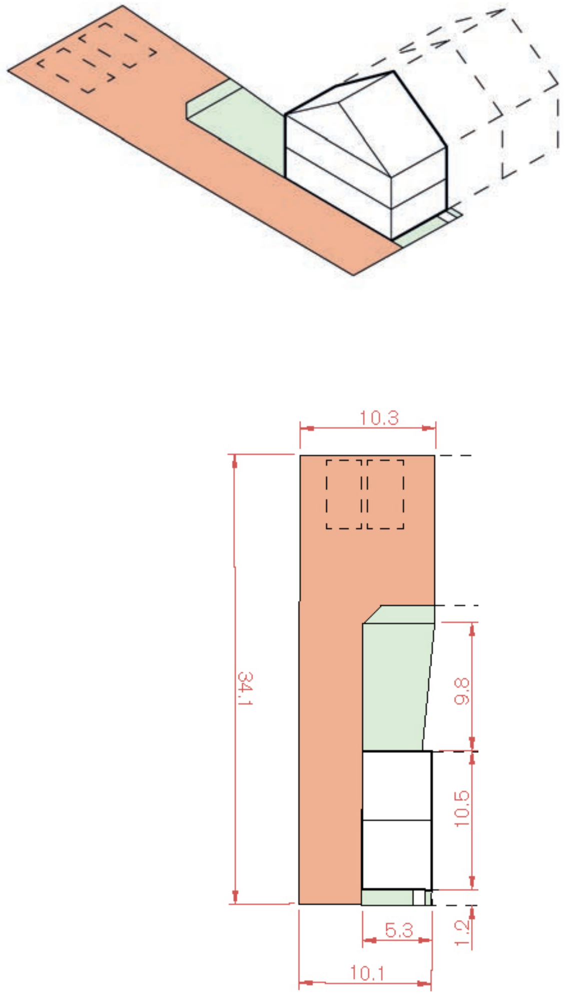


Fig.21, 22 - Typology 3

Semi-detached house
3 bedrooms
2 parking spaces

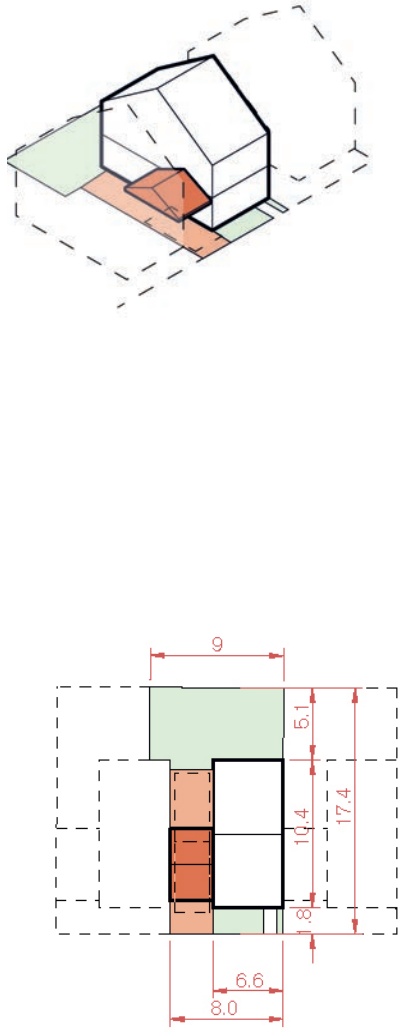
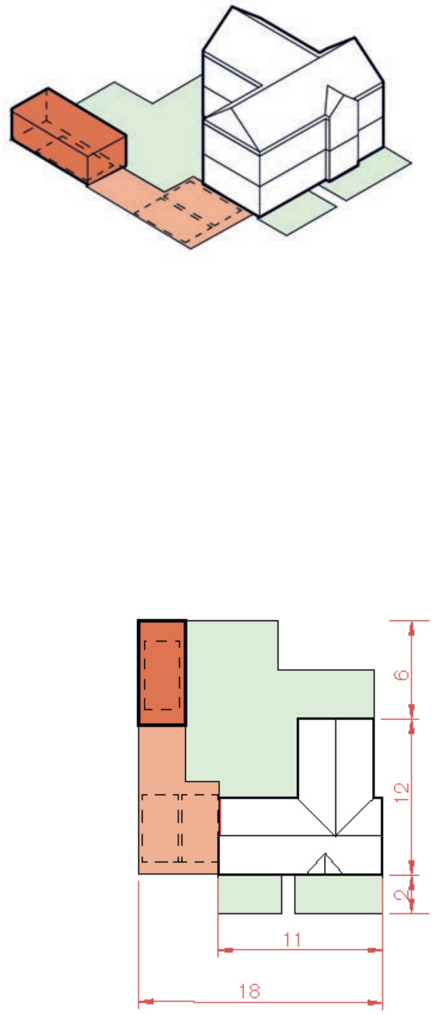


Fig.23, 24 - Typology 4

Detached house
4 bedrooms
3 parking spaces



The typical block in Beaumont Park contains two, three and four bedroom homes which are predominantly semi detached or detached. With the exception of a few rear parking courts, the parking strategy priorities the provision of vehicular parking on-plot in an allocated car parking space, carport, or a detached garage. The provision of parking on-plot widens the plot and allows for usable rear garden space. The car parking strategy complies with Policy GEN8 of the adopted located plan and SPG 'Vehicle Parking Standards', providing 2 spaces per 2-3 bedroom dwelling and 3 spaces for 4+bedroom dwelling.

Note - Diagrams not to scale and all dimensions are indicative only
Not all of the house types shown are located in the typical block

4.3.1 Context

Project	Great Bentley
Location	Great Bentley (0.9km)
Local Authority	Tendring
Gross site area	7.6ha
Net site area	7ha
Developer	Taylor Wimpey
No dwellings	136
Net density	19 dph
Typical sale price	£345,125
Parking ratio	2.8

The development is an extension of an existing village, Great Bentley. The scheme comprises 136 new homes, informal public open space and a Local Area of Play (LAP). The scheme is located 0.6miles from the Great Bentley train station and local town centre which contains a range of shops and services, a primary school and a GP practice.

The site is accessed through vehicular access off Weeley Road. The proposed public open space is located at the heart of the development and contains semi-formal recreational space and a local area of play (LAP). The green buffer to the south of the site provides separation from the adjacent railway line. The pedestrian connection to the adjacent town centre is provided at the north-west point of the site through an alleyway between the rear gardens.

4.3.2 Planning history

- December 2018 - Refused outline application for 790 new homes on 53.2ha site. (17/01881/OUT)
- May 2020 - Outline application (17/01881/OUT) allowed on appeal (APP/P1560/W/19/3231554)
- July 2021 - Reserved matters application validated (21/00977/DETAIL)

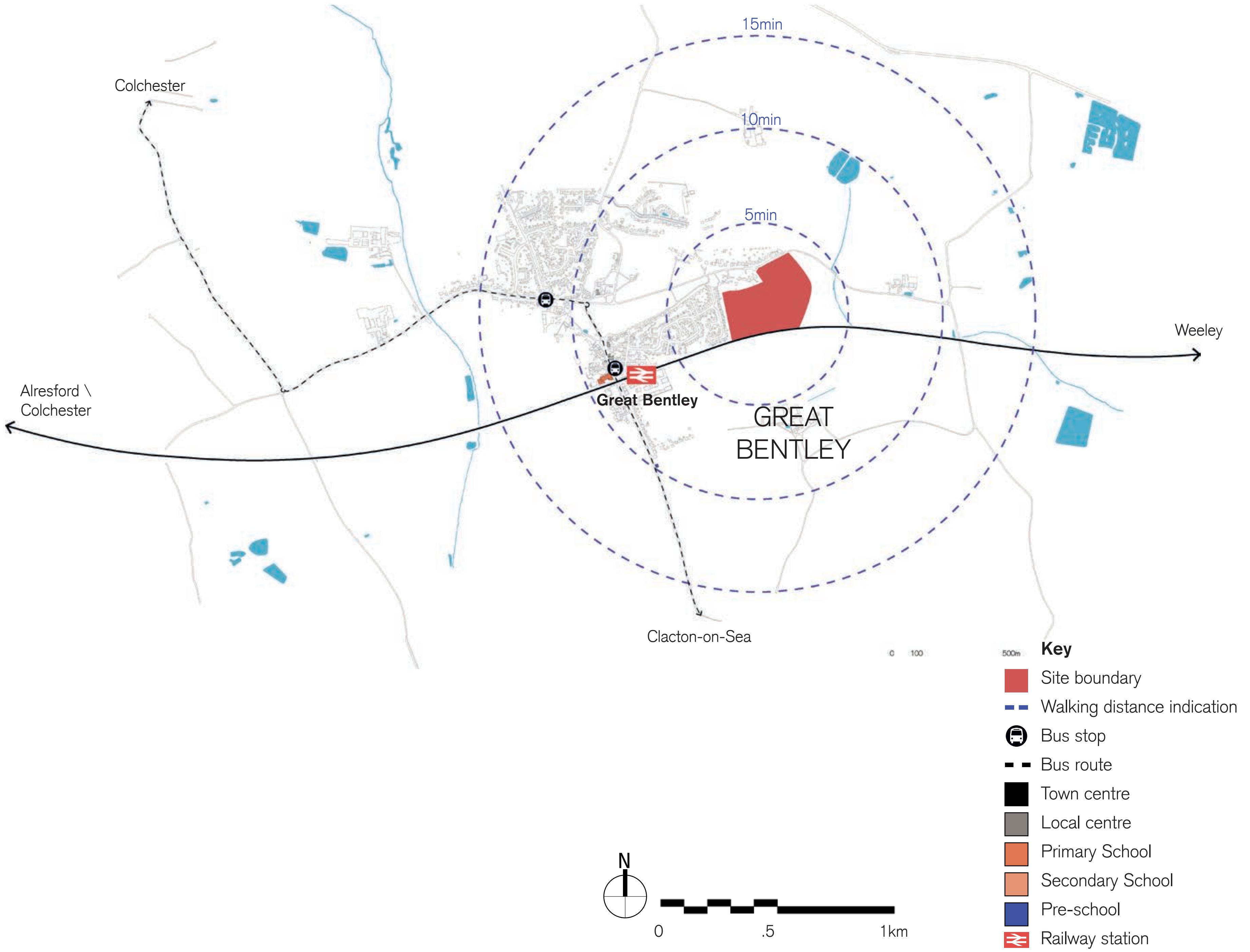
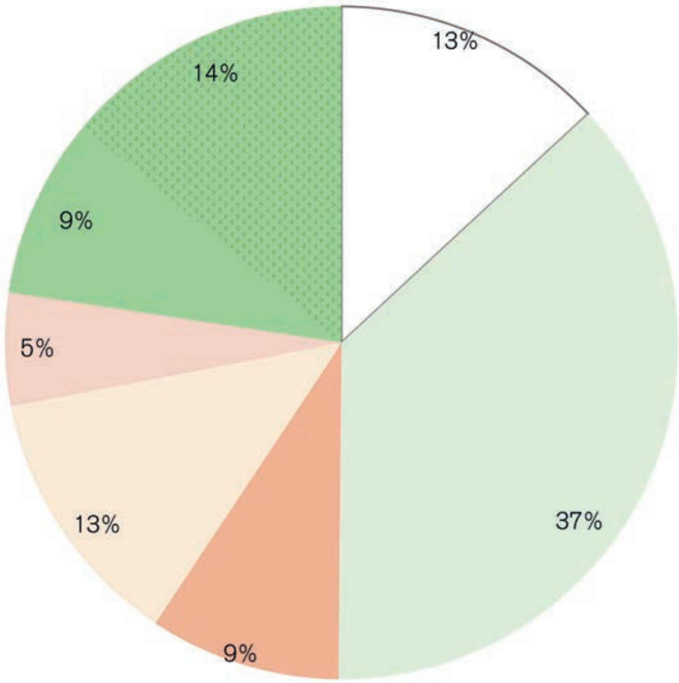


Fig. 25- Great Bentley plan location plan

4.3.3 Land budget analysis

The land budget analysis shows that over one third of the development area is used for private amenity spaces and 13% is dedicated to buildings. The green space along the southern site boundary is categorised as redundant verge as it provides a buffer from the adjacent railway infrastructure, and it accounts for 14% of the overall development area. The infrastructure related to vehicles occupies 22% of the development and includes parking spaces and roads.



Key

- Buildings
- Private amenity
- Parking
- Roads
- Footpaths/cycle lanes
- Green open space
- Verges and buffers
- Biodiversity

Fig. 26- Great Bentley plan with land budget data

4.0 Analysing the conventional development model
4.3 Case Study 2- Great Bentley

4.3.4 Infrastructure ratio

In Great Bentley (fig. 27) the area in private ownership comprises 58% of the 7.6ha site (4.37ha).

The site does not contain any land unsuitable for residential development, or infrastructure that serves housing beyond the area selected for analysis.

The remaining 42% of the site (3.23ha) comprises the infrastructure required to service the 136 dwellings, and is broken down as follows:

Total hard landscape	**1.49ha**
Unallocated parking	0.09ha
Roads	0.98ha
Footpaths/Cycle lanes	0.42ha
Total verges and buffers	**1.07ha**
Total usable open space	**0.67ha**

As the scheme comprises 136 dwellings, the infrastructure per dwelling is summarised below:

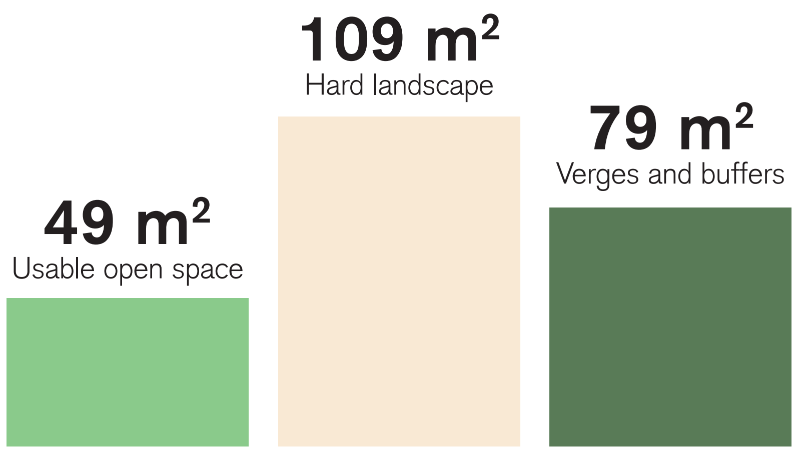
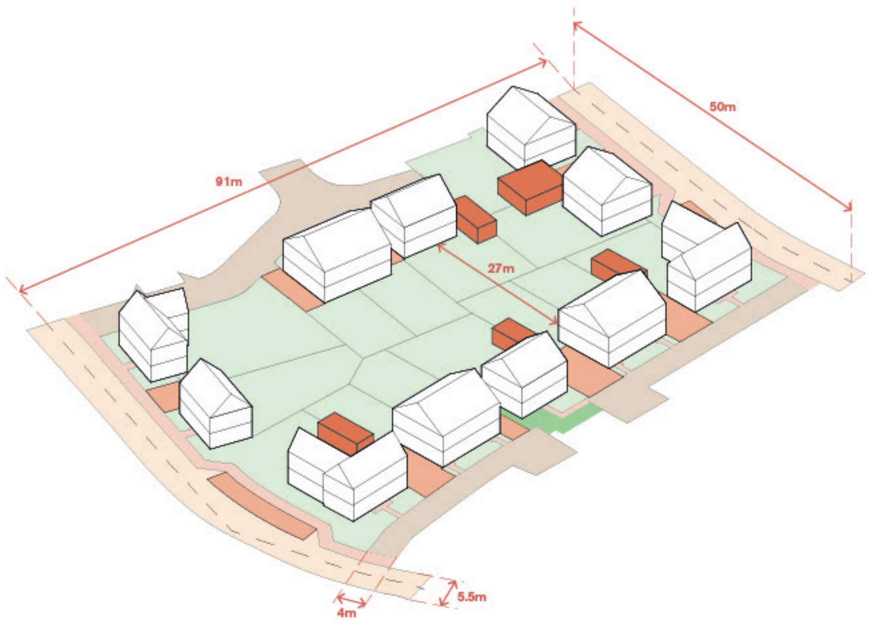


Fig. 27- Great Bentley block plan with infrastructure ratio

4.3.5 House and block typologies

Fig.28 - Typical Block

Block size (centre of the road) - 50m x 91m
Back-to-back distances - 23m - 27m



The typical block contains two, three and four bedroom detached and semi-detached homes. Vehicle parking is contained on-plot by allocated parking spaces or free standing garages. The parking spaces occupy a large proportion of the plot as garages at the rear garden utilise long driveways used to house additional parked cars. The car parking strategy complies with Policy GEN8 of the adopted located plan and SPG 'Vehicle Parking Standards', providing 2 spaces per 2-3 bedroom dwelling and 3 spaces for 4+bedroom dwelling.

Fig.29, 30 - Typology 1

Terrace
2 bedrooms
2 parking spaces

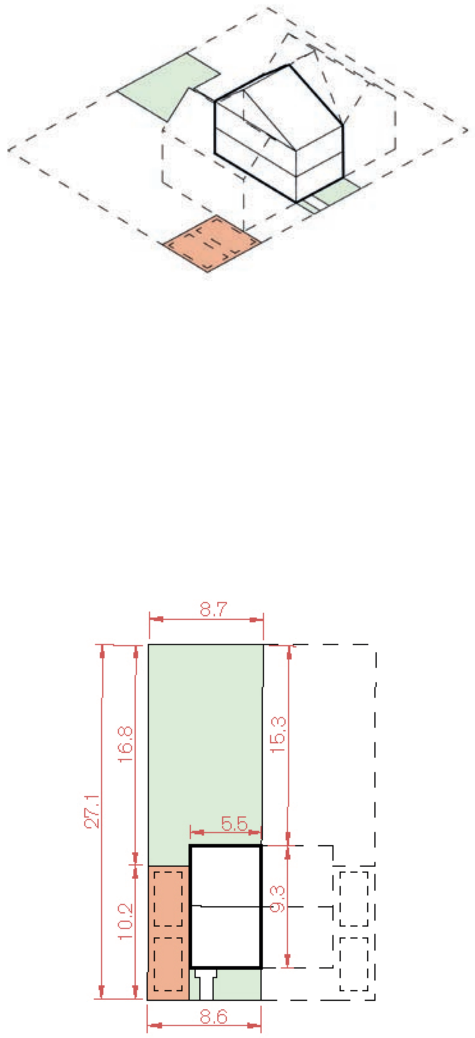


Fig.31, 32 - Typology 2

Semi-detached
3 bedrooms
2 parking spaces

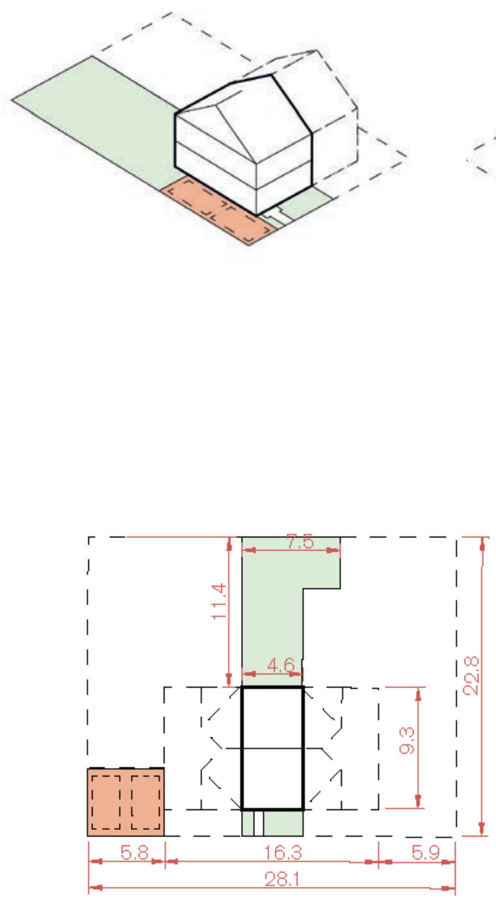


Fig.33, 34 - Typology 3

Detached
4 bedrooms
3 parking spaces

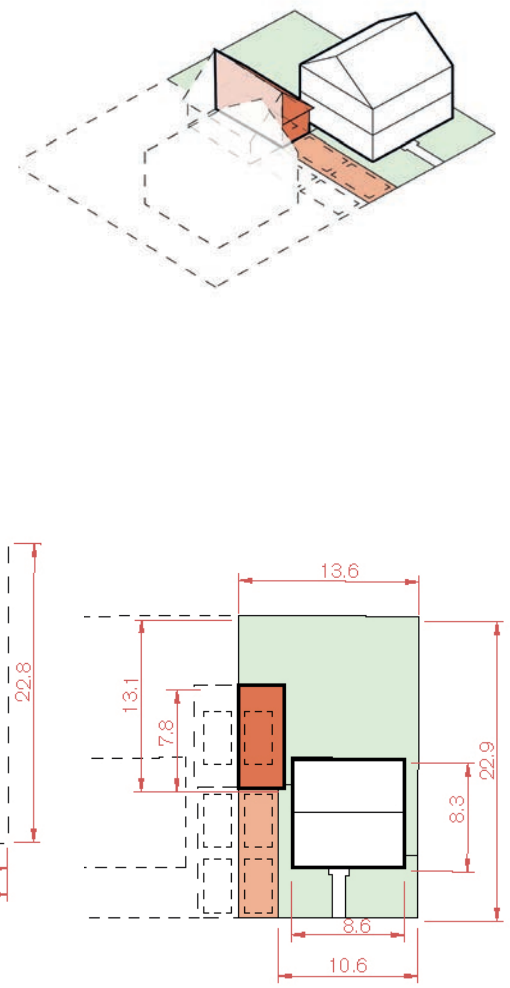
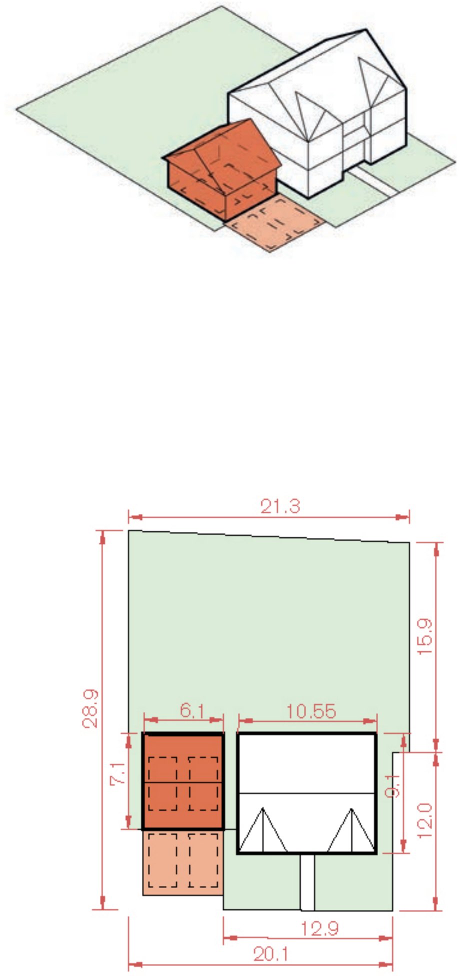


Fig.35, 36 - Typology 4

Detached
5 bedrooms
4 parking spaces



Note - Diagrams not to scale and all dimensions are indicative only
Not all of the house types shown are located in the typical block

4.4.1 Context

Project	Beaulieu Park
	Beaulieu Park Zone 1 (Chelmsford Garden Community
Location	Chelmsford (3.3km)
Local Authority	Chelmsford City
Gross site area	9.2ha (out of 836ha)
Net site area	6.4ha
Developer	Countryside Zest (Beaulieu Park) LLP
No dwellings	186 (out of 10,000 by 2044)
Net density	29 dph
Parking ratio	2.9
Typical sale price	£584,492

Beaulieu Park is located in Zone 1 of Beaulieu Park development, an initial phase of the Chelmsford Garden Community, an area which is allocated in the Chelmsford Local Plan as a strategic growth site. The Garden Community is located in North-East Chelmsford and will comprise approximately 10,000 dwellings once complete.

Beaulieu Park aims to encourage active travel. The long term ambition is to minimise parking provision to deliver a parking ratio of less than 1 per dwelling. The masterplan aims to create a culture of travel via bus, with stops located within 400m from every home.

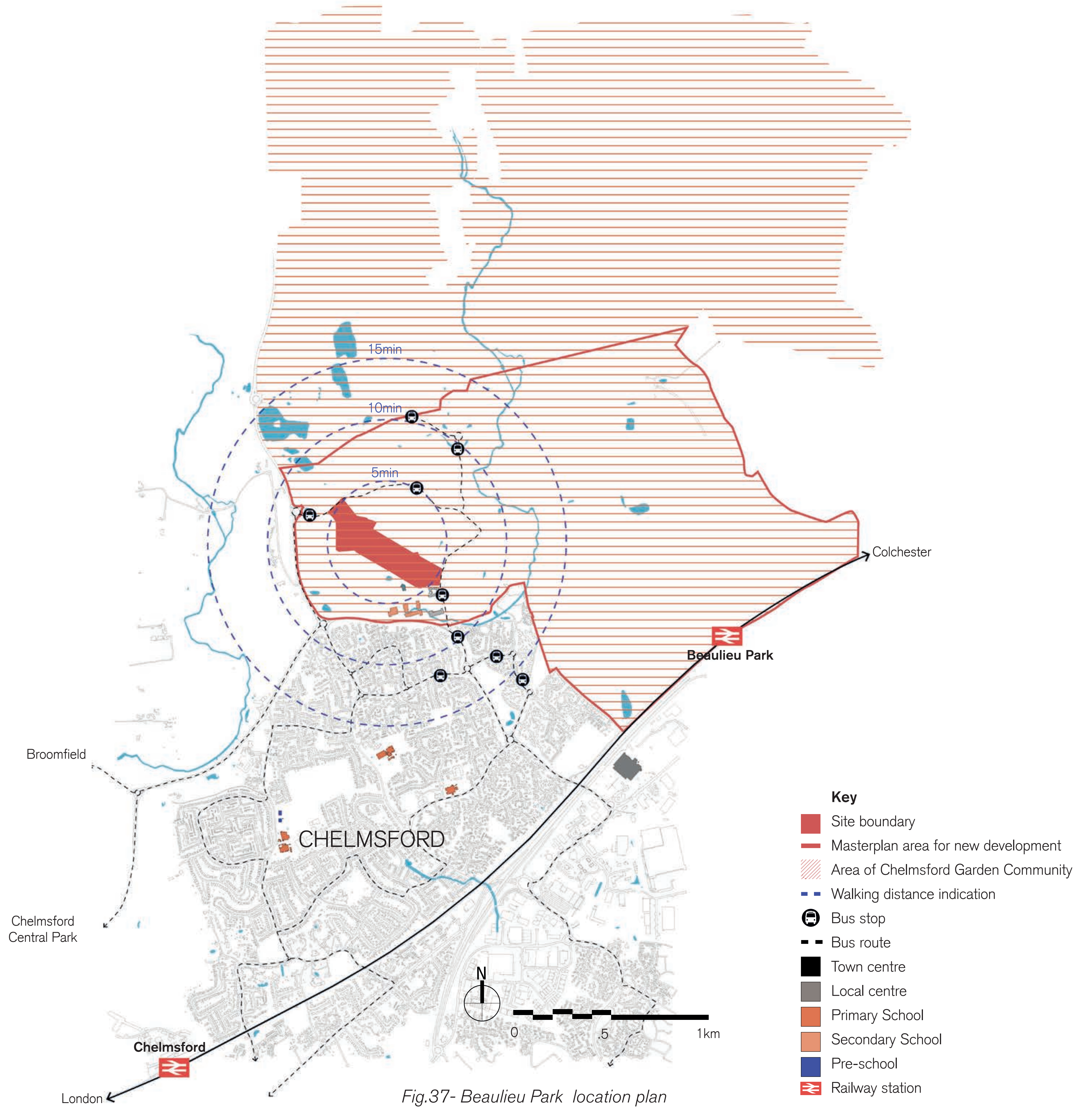


Fig.37- Beaulieu Park location plan

4.4 Case Study 3- Beaulieu Park

4.4.2 Planning history

- May 2013 - Approval for an outline application for New Railway station (10/00021/EAI)
- March 2014 - Approved outline planning application (09/01314/EIA) for a mixed-use development for 3,600 dwellings and facilities including business park, retail, hotel, leisure, education and community facilitates.
- February 2015 - Approved planning application for the construction of 184 houses and apartments, 464 parking spaces and public open spaces (13/01795/REM).

4.4.3 Masterplan

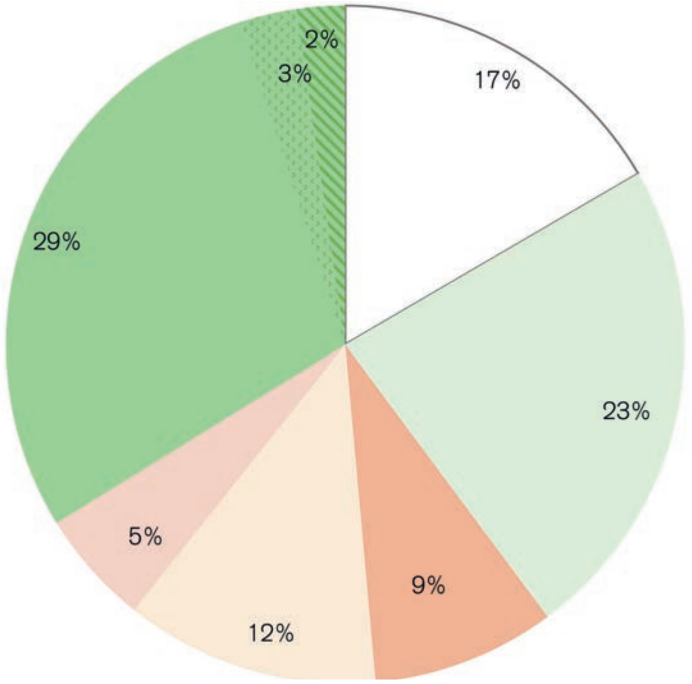
The wider masterplan, Beaulieu Park, is a mixed-use development on 244.3 ha site. In addition to 3,600 residential units, the site includes a business park, retail spaces, open space and education and community facilities. The scheme provides green open space including informal meadows, village greens, community gardens and play spaces. The later phases include a new railway station scheduled intended to be operational in 2026, which will provide links to London Liverpool Street, Stratford, Shenfield, Colchester and Ipswich.

Fig.38- Beaulieu Park masterplan

Image source: planning application 09/01314/EIA

4.4.4 Land budget analysis

The land budget analysis shows buildings comprise 17% of the site and 23% is dedicated to private amenity. The linear park alongside the northern boundary and the green pockets within the street typologies occupy 29% of the total site. Whilst this case study utilises more compact block types than either Beaumont Park or Great Bentley, the analysis shows that over 1/5 of the development is occupied by roads and parking spaces.



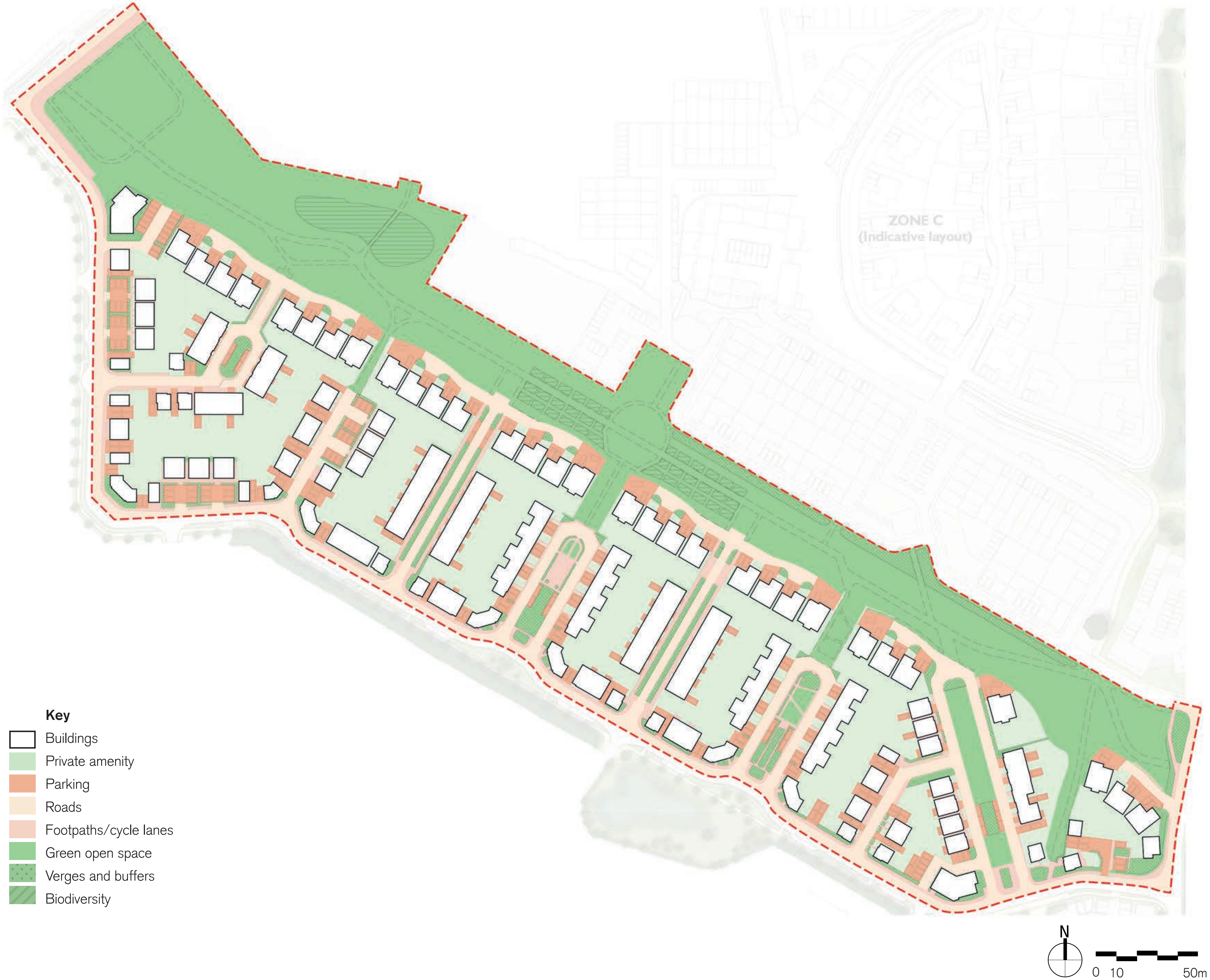


Fig. 40- Beaulieu Park plan with land budget data

4.4.5 Infrastructure ratio

In Beaulieu Park (fig. 41) the area in private ownership comprises 48% of the 9.2ha site (4.41ha).

A further 2% of the site (0.21ha) is occupied by land not available for development (existing vegetation).

The remaining 50% of the site (4.58ha) comprises the infrastructure required to service the 186 dwellings, and is broken down as follows:

Total hard landscape	**1.69ha**
Unallocated parking	0.08ha
Roads	1.11ha
Footpaths/Cycle lanes	0.5ha
Total redundant buffers	**0.25ha**
Total usable open space	**2.64ha**

As the scheme comprises 186 dwellings, the infrastructure per dwelling is summarised below:

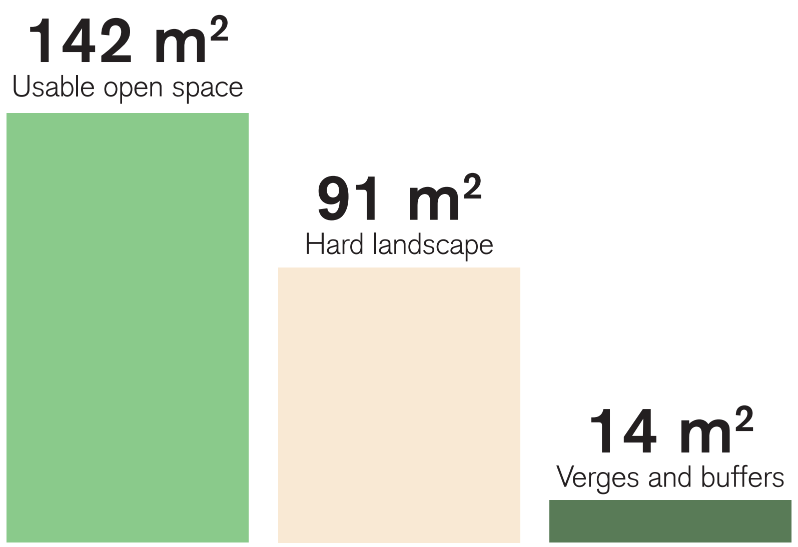


Fig. 41- Beaulieu Park block plan with infrastructure ratio

4.4.6 House and block typologies

Fig.42 - Typical block

Block size (centre of the road) - 60m x 108m
Back-to-back distances - 21m - 25m

The typical block has a mix of terraced and compact detached houses. The typologies include on-plot and off-street parking solutions (see Typologies 1-4). Vehicles parked in front yards and overcroft parking spaces tend to dominate the public realm. The car parking strategy complies with Policy GEN8 of the adopted located plan and SPG 'Vehicle Parking Standards', providing 2 spaces per 2-3 bedroom dwellings and 3 spaces for 4+bedroom dwellings.

Fig.43, 44 - Typology 1

Terraced house
4 bedrooms
3 parking spaces

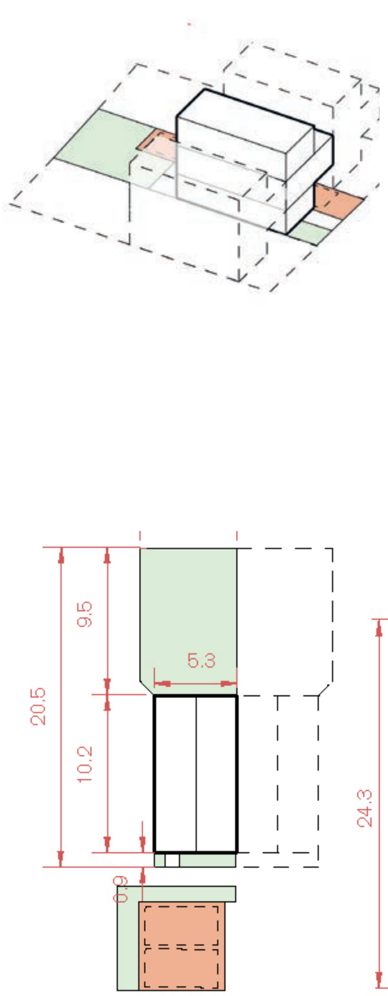


Fig.45, 46 - Typology 2

Semi-detached
2 bedrooms
2 parking spaces

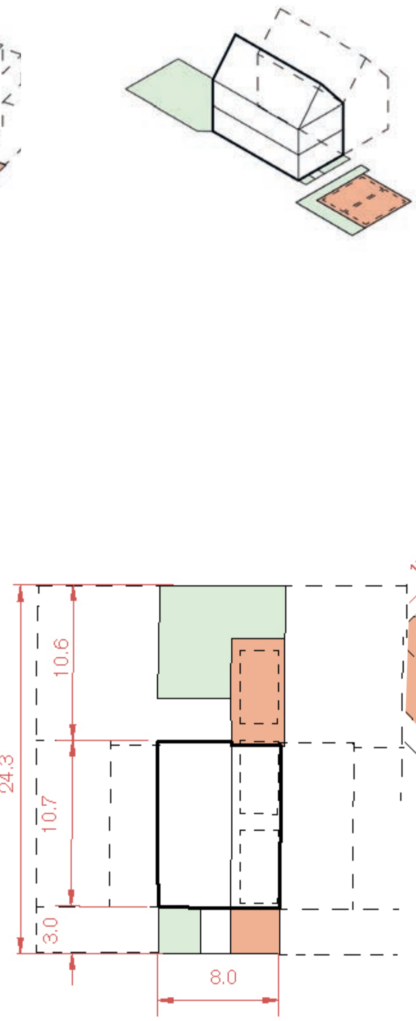


Fig.47, 48 - Typology 3

Detached
5 bedrooms
4 parking spaces

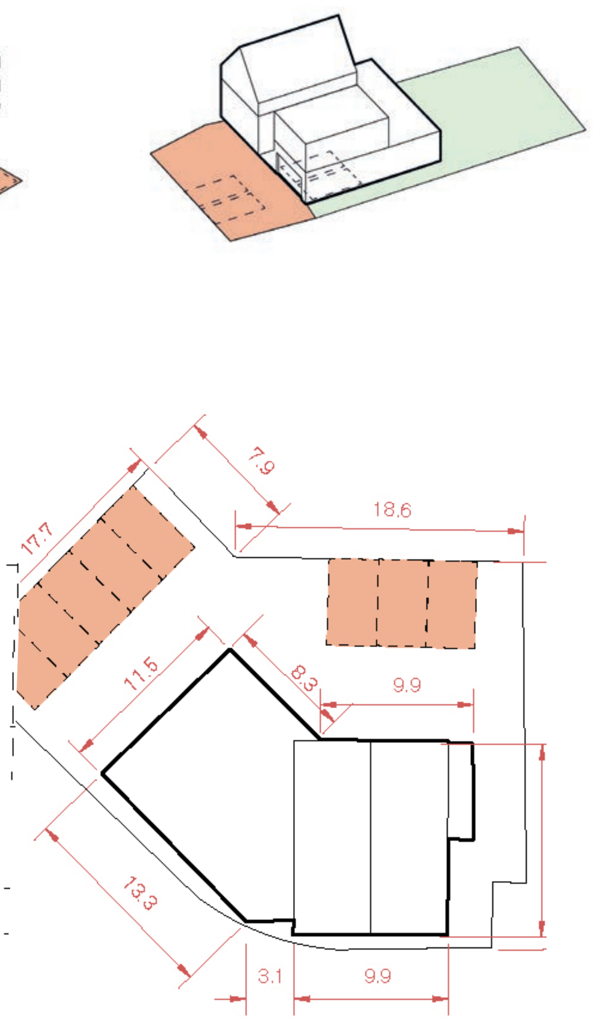
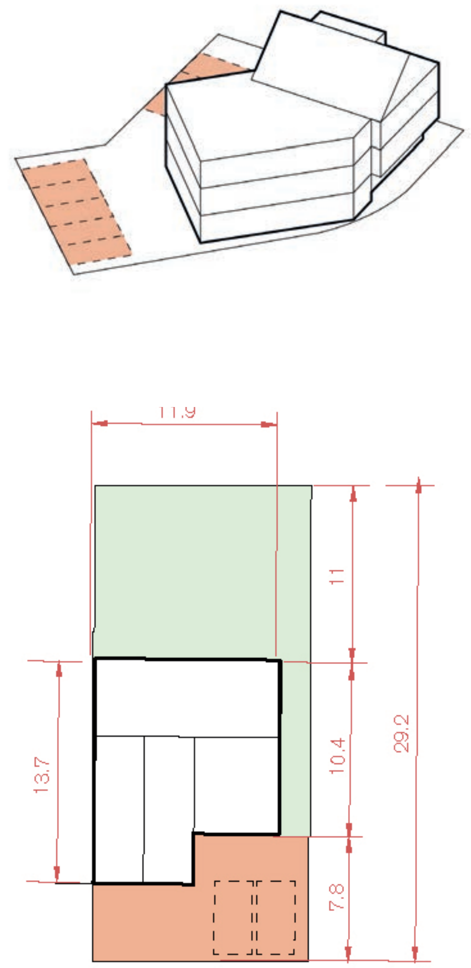


Fig.49, 50 - Typology 4

Flats
2 bedroom flat
2 parking spaces



Note - Diagrams not to scale and all dimensions are indicative only
Not all of the house types shown are located in the typical block

The comparison of the conventional development models in Essex, Fig. 51 shows the emerging patterns in land budget distribution. The analysis illustrates a consistent amount of hard landscape across all three settlements, including parking, roads and footpaths. The land budget average (Fig. 52) shows that over 1/5 of the development is dedicated to accommodating vehicles with an average of 13% used for roads and 9% used for car parking.

On average, nearly 1/3 of the typical conventional developments is dedicated to private amenity space and 14% of the land is occupied by buildings. Those two categories, together with on plot parking, represent land in private ownership.

The bar chart comparison shows significant variation in provision of verges and buffers and biodiversity. At Beaumont Park, the biodiversity exceeds 20% due to the pre-existing woodland located on site, whereas Great Bentley offers no space dedicated to biodiversity provision.

The verges and buffers in Great Bentley are triple the size of the other case studies; a result of the significant green buffer along the southern boundary which provides a set back from the adjacent railway line. The significant variation in green open space, verges and buffers and biodiversity areas highlights that these provisions are often highly site specific and vary from site to site.

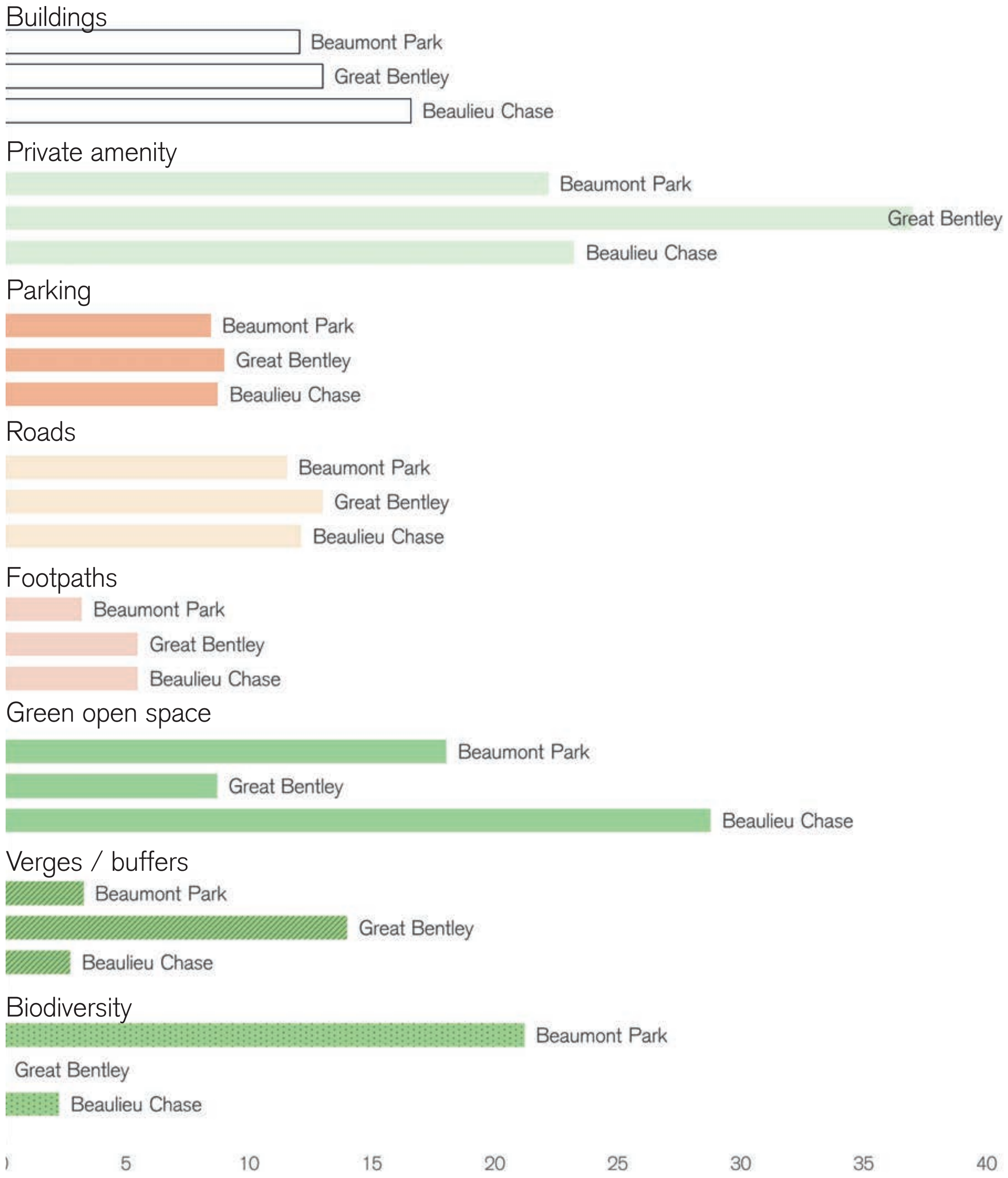


Fig. 51- Bar chart comparison of the conventional developments including: Beaumont Park, Great Bentley and Beaulieu Park

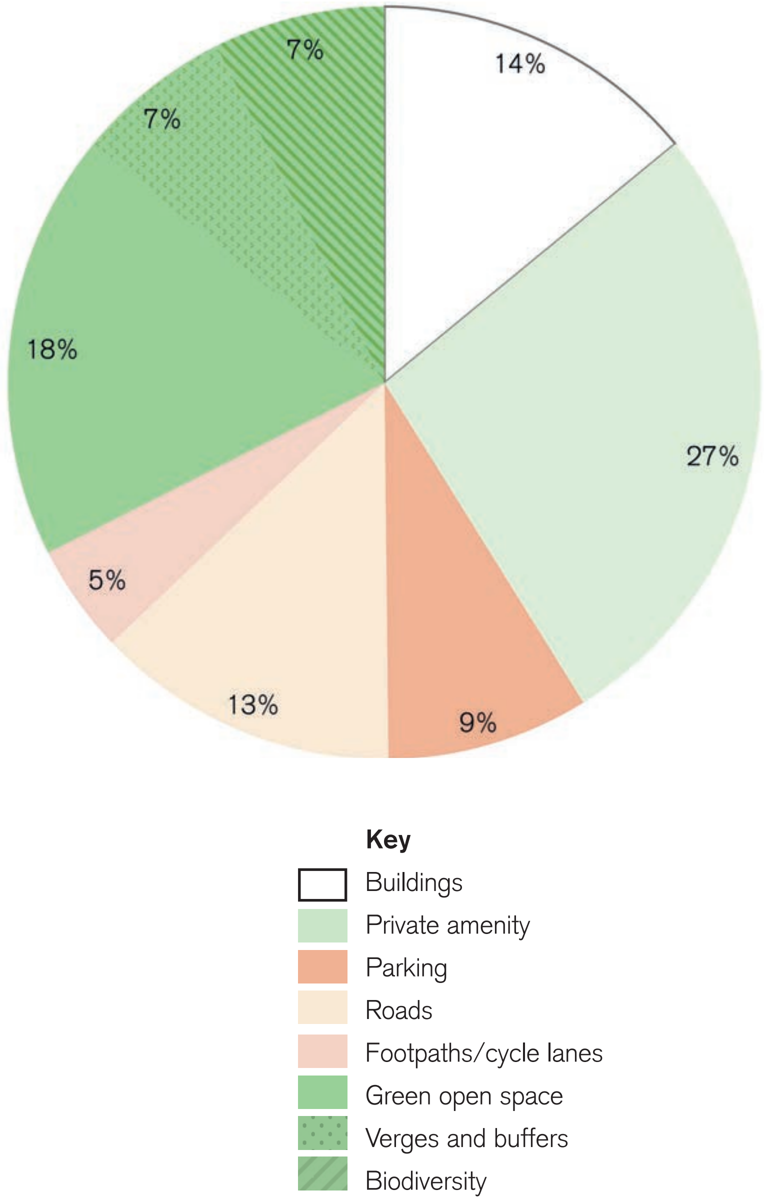


Fig. 52- Average land budget for conventional developments

Section 05
Alternative development models

5.0 Alternative development models

5.1 Introduction

The principal objective of this study is to make recommendations that can be widely adopted across Essex. New housing is likely to be brought forward by private sector developers who are generally reluctant to move away from long-standing development models with established sales rates. This is evidenced by limited innovation in the delivery of suburban housing at volume over the last 30 years across the UK.

The following pages collate a series of UK precedents that might constitute current best practice in suburban housing design, to draw conclusions that are directly relatable to sites across Essex. It must be stressed that no single case study presented represents "best practice" for Essex in its entirety; rather, different features should be selected from different case studies.

The case studies selected are not intended to be exhaustive, and have been broadly chosen using the following criteria:

- Are suburban in nature
- Contain a minimum of 50 residential units
- Have building heights that are predominantly between 2 and 3 storeys
- Deliver minimum densities of 35dph
- Have been completed in the last 10 years
- Have a degree of on-site car parking
- Utilise bespoke house typologies and landscape design
- Demonstrate design innovation in the integration of parking and/or private amenity
- Do not benefit from immediate access to a train station

The list above has been utilised to ensure case studies selected have a degree of resonance with the context of suburban development coming forward in Essex.

Fig. 53 Photograph of Abode, Great Kneighton (Image source: Proctor and Matthews Architects)

5.0 Alternative development models
5.2 Case Study 1 - Goldsmith Street

5.2.1 Context

Project	Goldsmith Street
Location	Norwich
Local Authority	Norwich City Council
Gross site area	1.7ha
Net site area	1.2ha
Developer	Norwich City Council
No dwellings	93 (out of 105)
Net density	78 dph
Parking ratio	0.8
Completion	2019

Goldsmith Street is a development for 105 dwellings located in Norwich, 93 of which are studied in the land budget analysis to follow. The immediate context benefits from good public transportation links, allowing for a reduced provision of car-parking spaces (the parking ratio is 0.8). The city centre is located 15 minutes' walk away.

5.2.2 Planning history

- March 2015 - Planning application consent for the redevelopment of the site to provide 105 dwellings with associated access, landscaping, and amenity spaces (15/00272/F).

5.2.3 Masterplan

The layout comprises a series of terrace blocks arranged in four lines based around east-west streets. Designed to passivhaus standards, the low-rise scheme achieves high density through compact blocks. The street width and back-to-back distances are compressed to 14m. Rear facades utilise offset windows to minimise overlooking, as asymmetric roofs ensure adequate daylight into streets and properties.

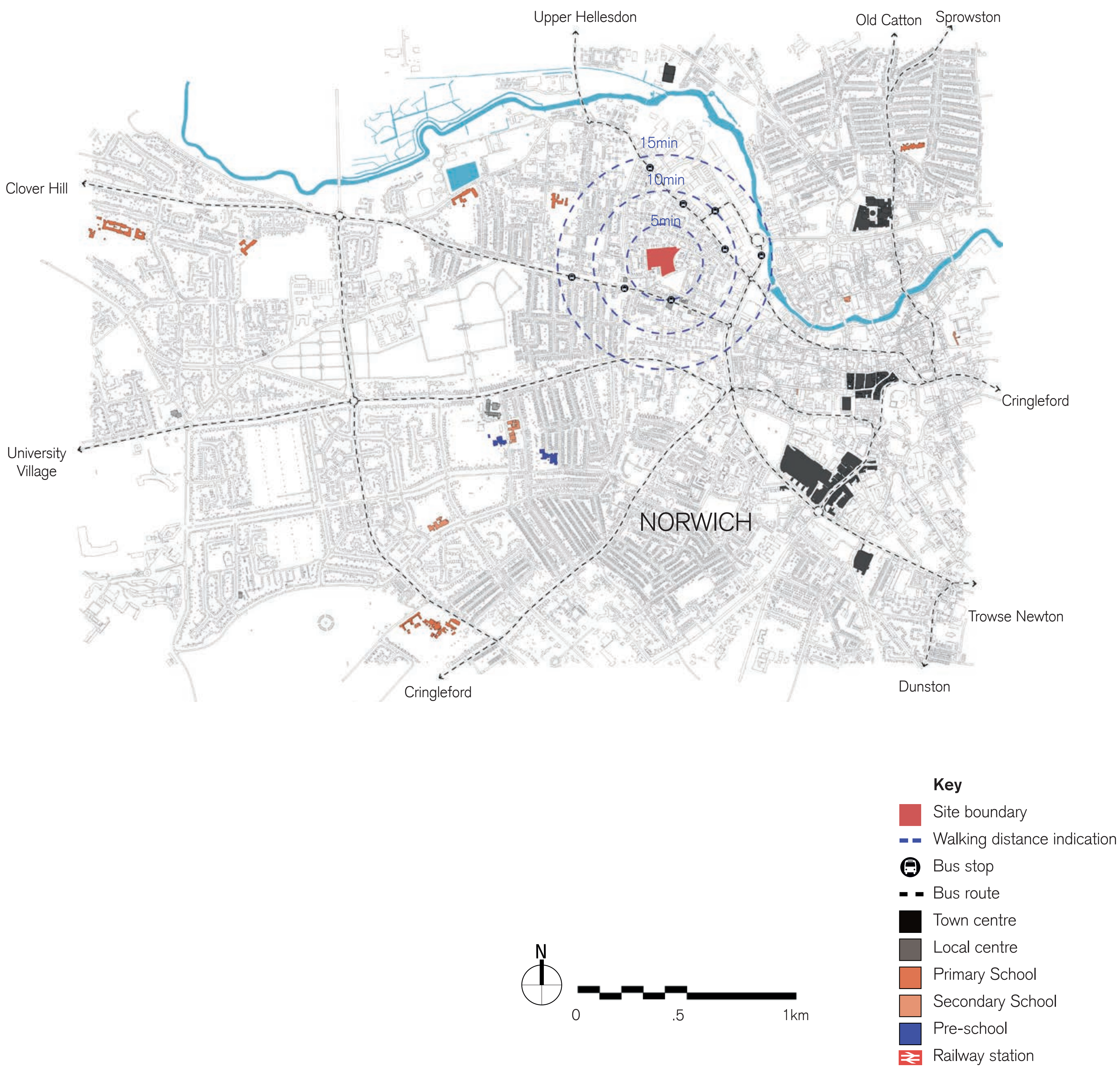
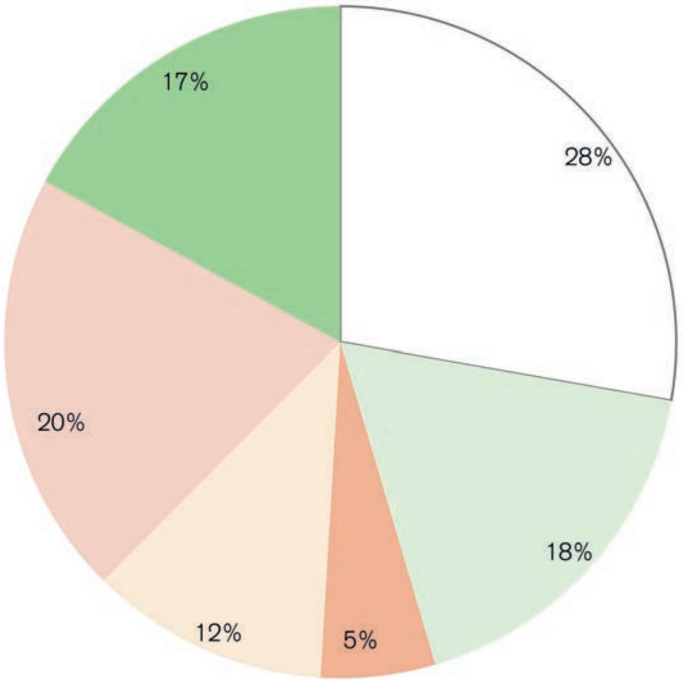


Fig.54- Goldsmith Street location plan

5.2.4 Land budget analysis

The land budget analysis of Goldsmith Street demonstrates that nearly one-third of the development is occupied by buildings. This ratio is significantly larger than the 14% average of the conventional development model. Rear gardens occupy 18% of the site, significantly less than the 27% average of the conventional development model. 1/5 of the site is occupied by footpaths, which is four times higher than the average conventional developments. This is a result of wide footpaths that are accessed from the rear gardens, which provide a form of public open space.



Key
- Buildings
- Private amenity
- Parking
- Roads
- Footpaths/cycle lanes
- Green open space
- Verges and buffers
- Biodiversity

Fig. 55- Goldsmith Street plan with budget data

5.2.5 Infrastructure ratio

In Goldsmith Street scheme (fig.56) the area in private ownership comprises 51% of the 1.7ha site (0.86ha).

The site does not contain any land unsuitable for residential development, or infrastructure that serves housing beyond the area selected for analysis.

The remaining 49% of the site (0.84ha) comprises the infrastructure required to service the 93 dwellings, and is broken down as follows:

Total hard landscape	**0.55ha**
Unallocated parking	0ha
Roads	0.2ha
Footpaths/Cycle lanes	0.35ha
Total verges and buffers	**negligible**
Total usable open space	**0.29ha**

As the study area comprises 93 dwellings, the infrastructure per dwelling is summarised below:

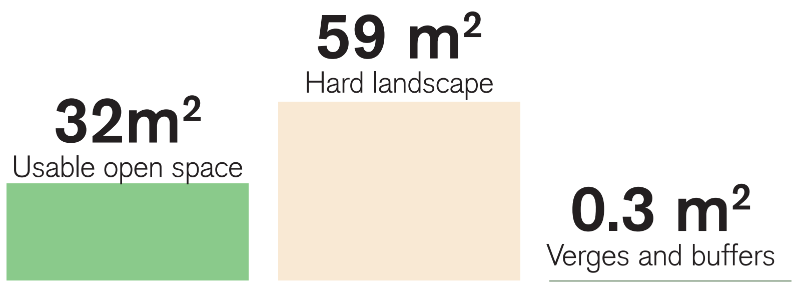
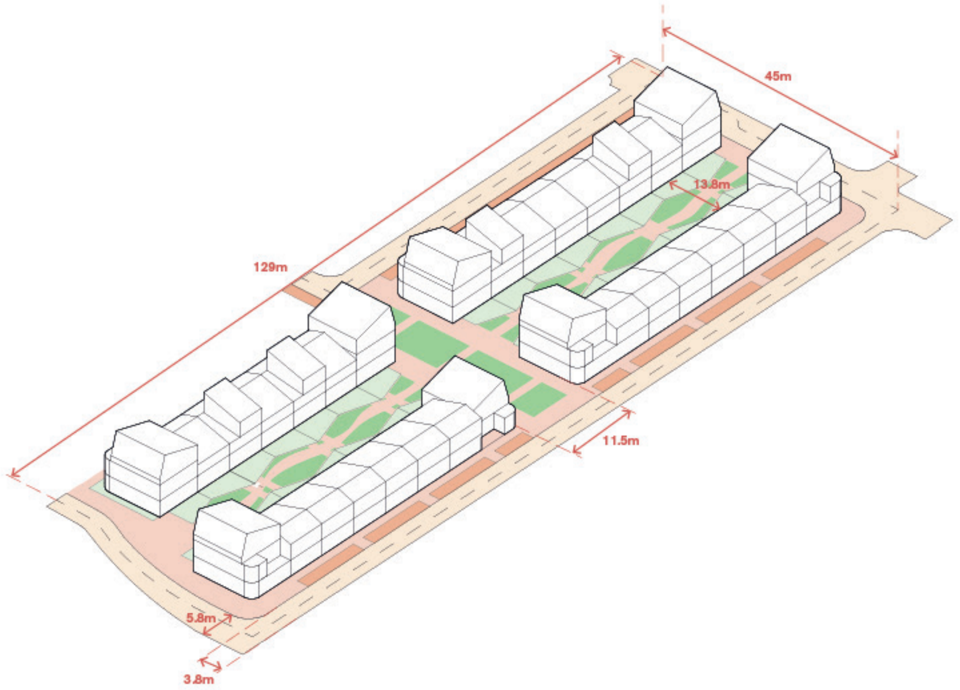


Fig. 56- Goldsmith Street block plan with infrastructure ratio

5.2.6 House and block typologies

Fig.57 - Typical block

Block size (centre of the road) - 129m x 45.0m
Back-to-back distance - 13.8m



The typical block in Goldsmith Street comprises back-to-back two-storey terraced houses orientated in an east-west direction. The corners are punctuated by a combination of three storey flats and town houses, which have several benefits including increasing density, improving townscape and legibility and creating active frontage onto the central green space. The typical block is 27m deep, with a back-to-back distance of 14m. The back-to-back terraced houses are separated by a linear incidental space which creates pedestrian connections to more formal green spaces. Rear gardens are generally highly compact, as the network of incidental green space provides additional amenity. Habitable rooms on the first floor are south-facing only, allowing the depths of back gardens to be compressed without compromising privacy.

Fig.58, 59 - Typology 1

Terraced house
3 bedrooms
On street parking

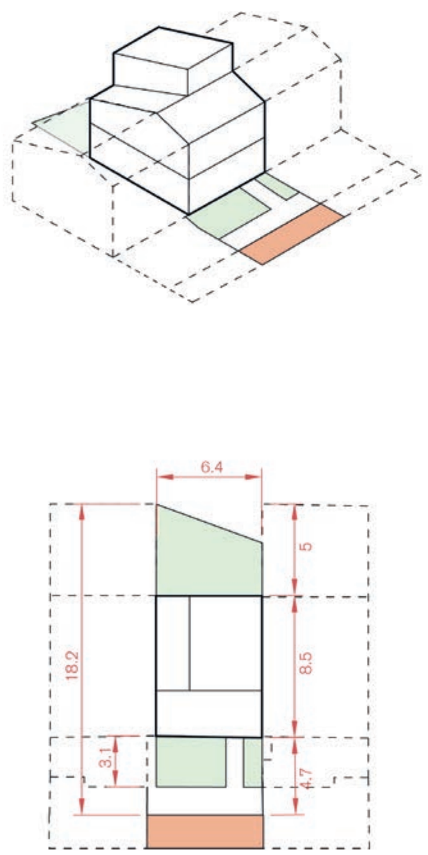


Fig.60, 61 - Typology 2

Flats
3 x 1 bedroom flat
On street parking

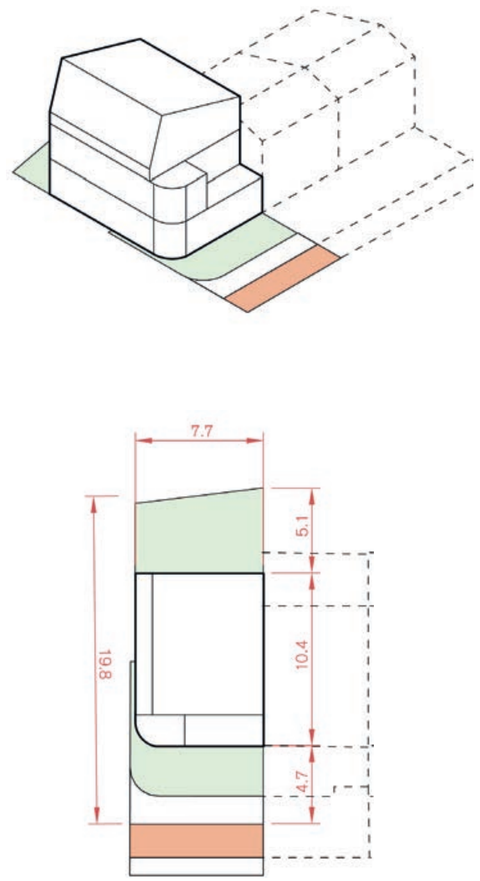
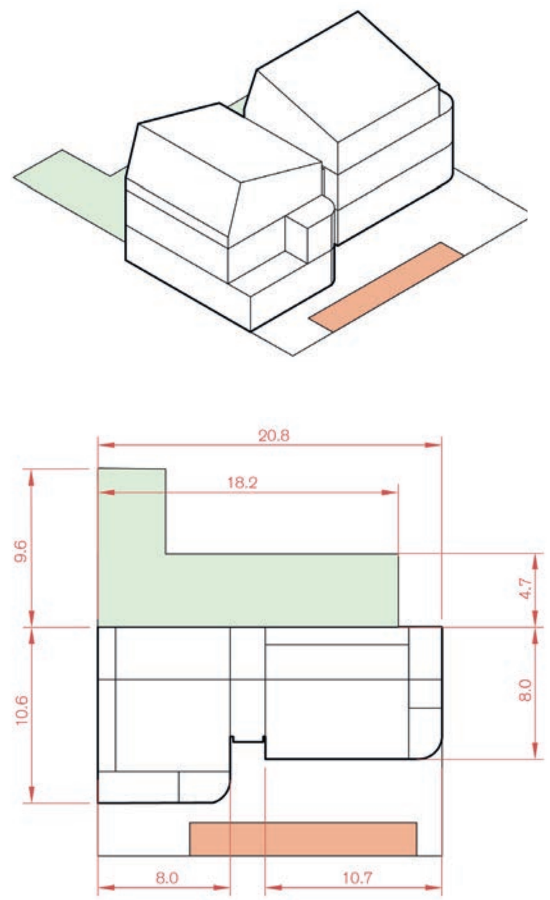


Fig.62, 63 - Typology 3

Flats
6 x 1-bedroom flat
On street parking



5.0 Alternative development models
5.3 Case Study 2 - Lime Tree Square

5.3.1 Context

Project	Lime Tree Square
Location	Street
Local Authority	Mendip District Council
Gross site area	12.3ha
Net site area	8.5ha
Developer	ICON I Crest Nicholson | Knightstone Housing Association I Barratts
No dwellings	408
Net density	48 dph
Parking ratio	1.5
Completion	2018
Typical sale price	£221,995 - 313,000

Lime Tree Square is a residential quarter in Street, Somerset, developed in 2018. The scheme is located off a local high street, as new residents benefit from town center facilities located within walking distance. The proximity to the A39 allows for a convenient connection to neighbouring settlements including Glastonbury and Bridgewater. The closest rail station Bridgewater, which is a 25min drive away.

5.3.2 Planning history

- March 2003 - Approved outline planning application for development of Houndwood site for housing (036277/016).
- June 2007 - Approved reserved matters application for Phase 1, 138 residential units (036277/018).
- September 2010 - Approved reserved matters application for Phase 2, 210 units (2010/1471).
- June 2011 - Approved reserved matters application for Phase 3, 56 residential units (2011/0680).

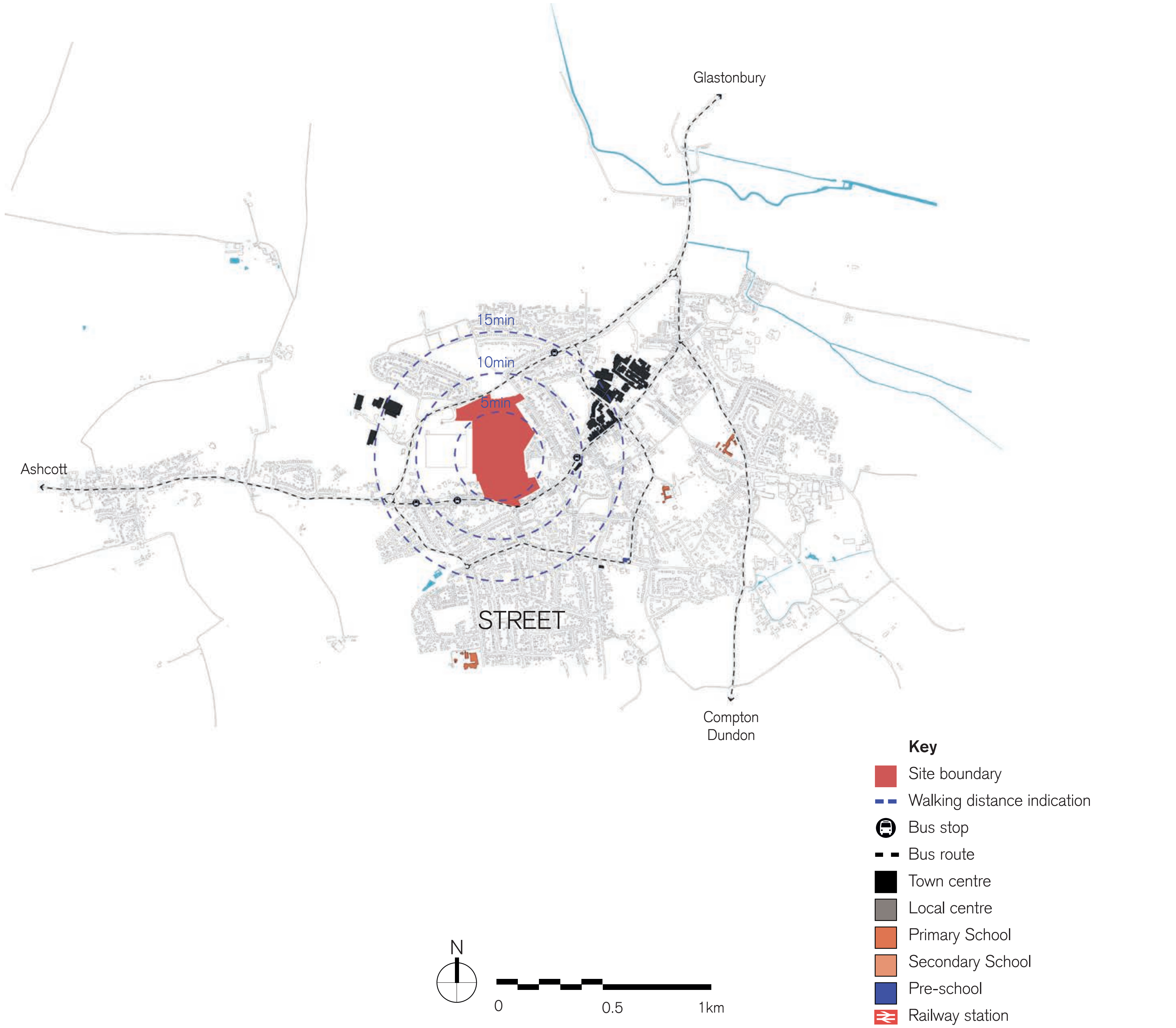
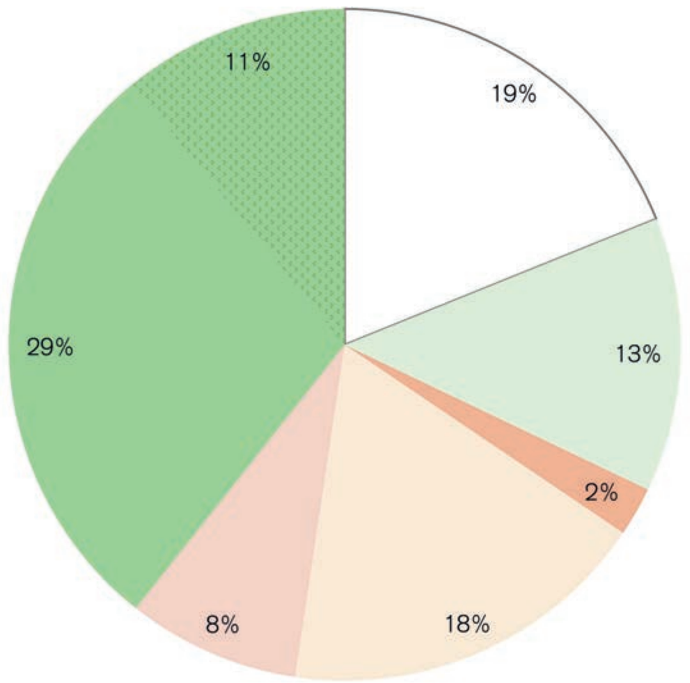


Fig.64- Lime Tree Square location plan

Photograph of Lime Street Square
Image source: FCBS

5.3.3 Land budget analysis

The land budget analysis of Lime Tree Square illustrates the benefits of compact urbanism on the provision of green space. 13% of the land is occupied by private amenity space, which is a significant reduction from the conventional development model average. Nearly one-third of the development is dedicated to green infrastructure, which is an 11% uplift from the conventional development model average, as seen in Section 04.



Key
- Buildings
- Private amenity
- Parking
- Roads
- Footpaths/cycle lanes
- Green open space
- Verges and buffers
- Biodiversity

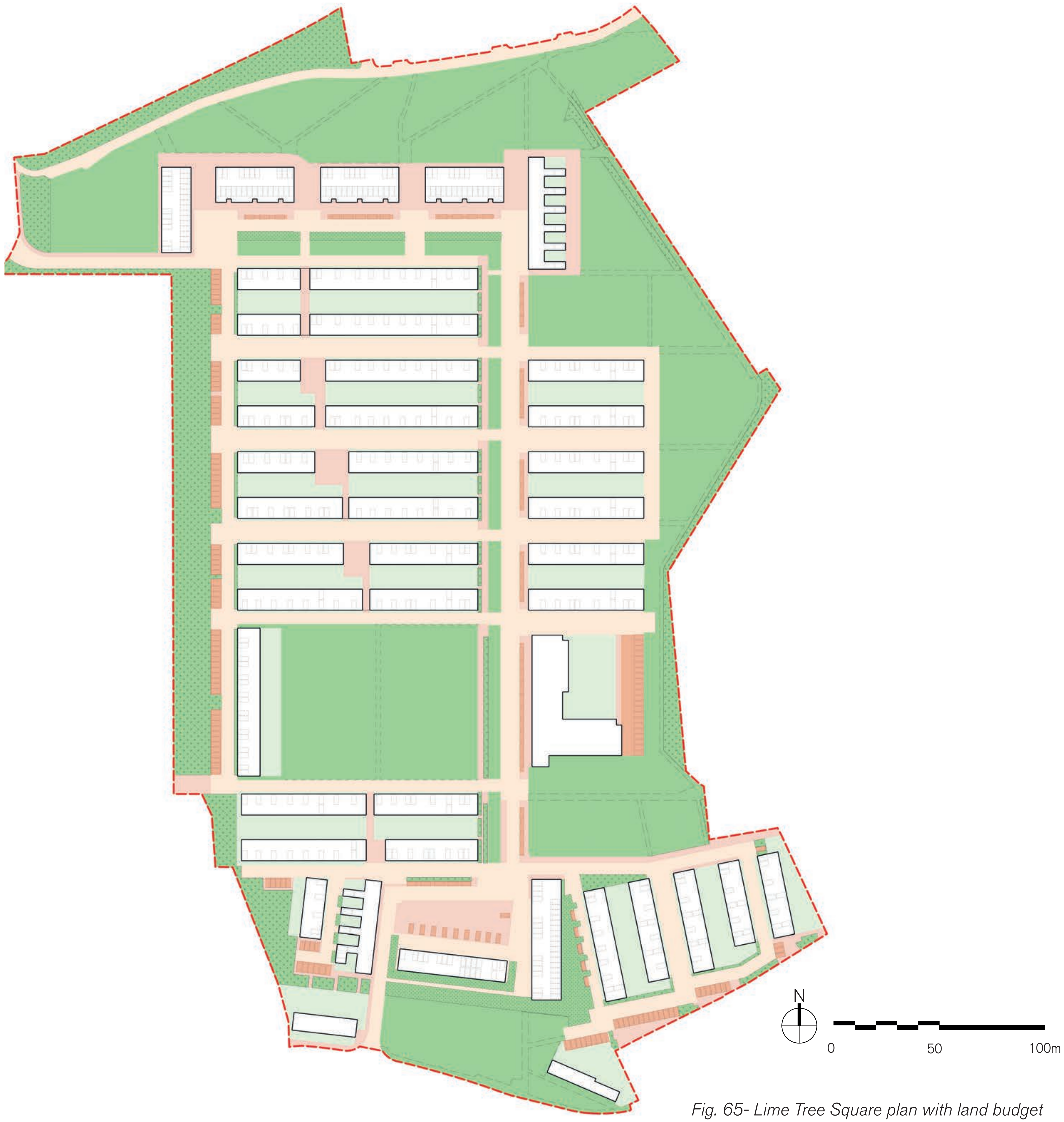


Fig. 65- Lime Tree Square plan with land budget

5.3.4 Infrastructure ratio

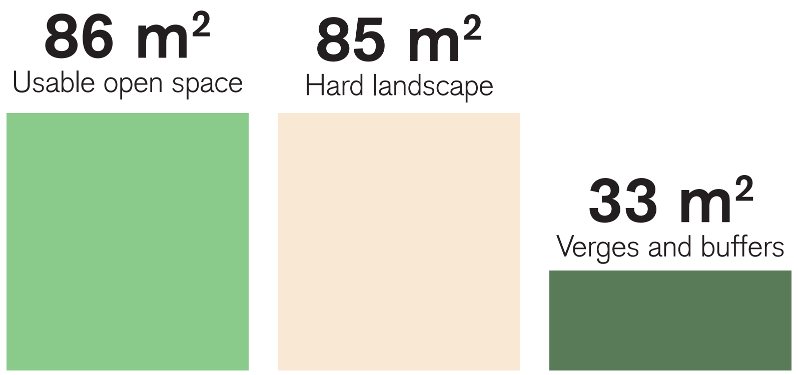
At Lime Street (Fig. 66) the area in private ownership comprises 32% of the 12.3ha site (3.99ha).

The site does not contain any land unsuitable for residential development, or infrastructure that serves housing beyond the area selected for analysis.

The remaining 68% of the site (8.31ha) comprises the infrastructure required to service the 408 dwellings, and is broken down as follows:

Total hard landscape	**3.48ha**
Unallocated parking	0.27ha
Roads	2.2ha
Footpaths/Cycle lanes	1.01ha
Total verges and buffers	**1.34ha**
Total usable open space	**3.49ha**

As the scheme comprises 408 dwellings, the infrastructure per dwelling is summarised below:



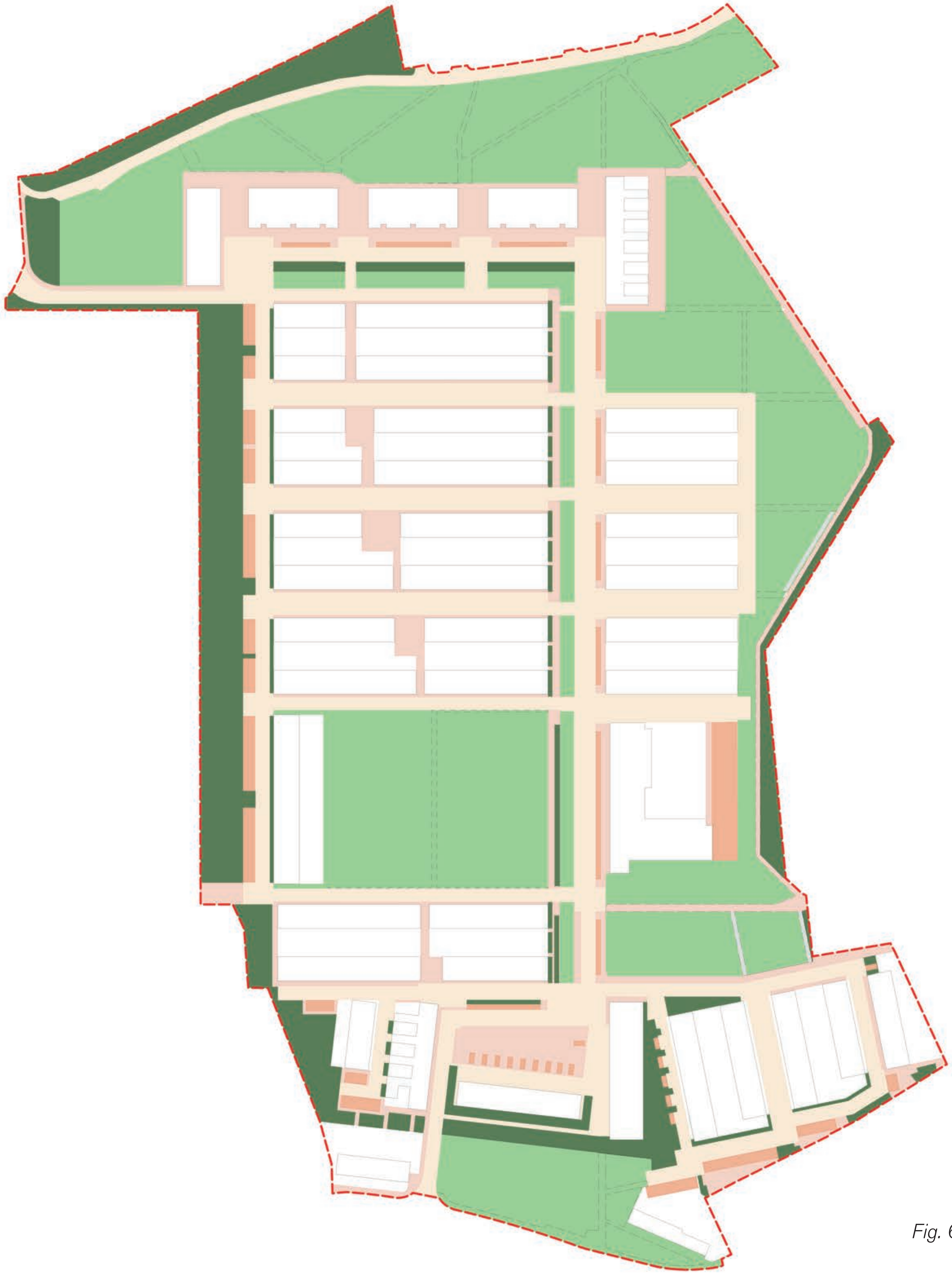


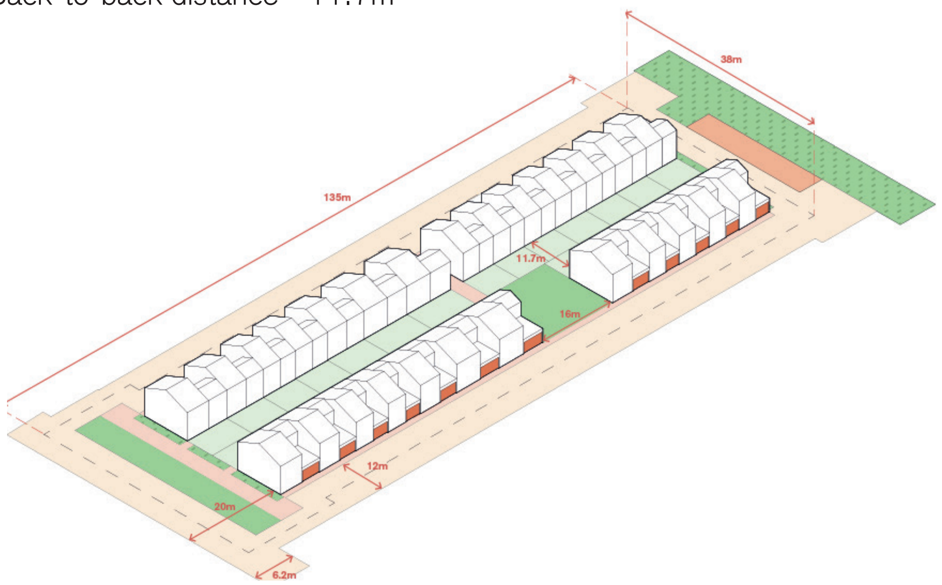
Fig. 66- Lime Tree Square block plan with infrastructure ratio

5.0 Alternative development models
5.3 Case Study 2 - Lime Tree Square

5.3.5 House and block typologies

Fig.67 - Typical block

Block size (centre of the road) - 135m x 38m
Back-to-back distance - 11.7m



The typical block of Lime Tree Square comprises rows of 3 or 4 bedroom terraced houses orientated east-west. Blocks tend to be 26m wide with a back-to-back distance of 11.7m. The compact gardens maintain rectangular proportions and form usable private amenity space. Long rows of terraced houses are interrupted by incidental spaces and green pockets which link a series of informal green spaces. As illustrated by the typology diagrams, parking is accommodated in integrated garages with habitable accommodation or additional private amenity space above, which creates an efficient use of land, as well as ensuring residents benefit from both north and south facing private amenity spaces.

Fig.68, 69 - Typology 1

Terraced house
3 bedrooms
1 parking space

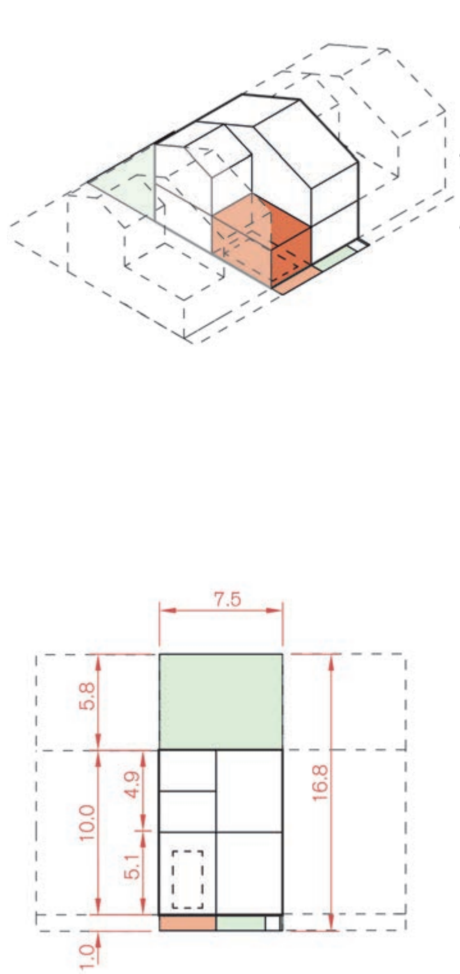


Fig.70, 71 - Typology 2

Terraced house
4 bedrooms
2 parking spaces

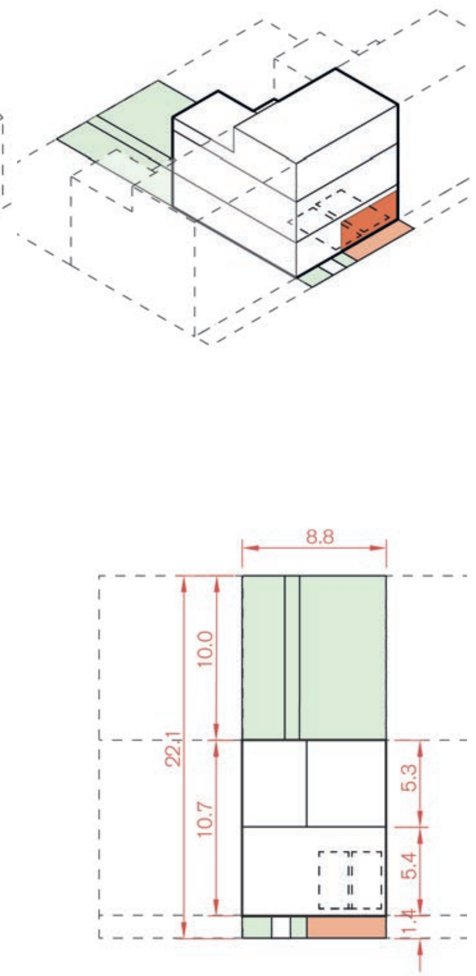


Fig.72, 73 - Typology 3

Terraced house
3 bedrooms
On-street parking spaces

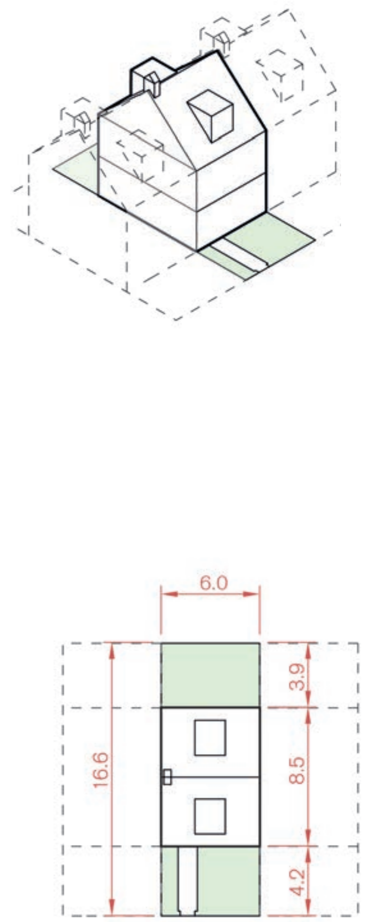
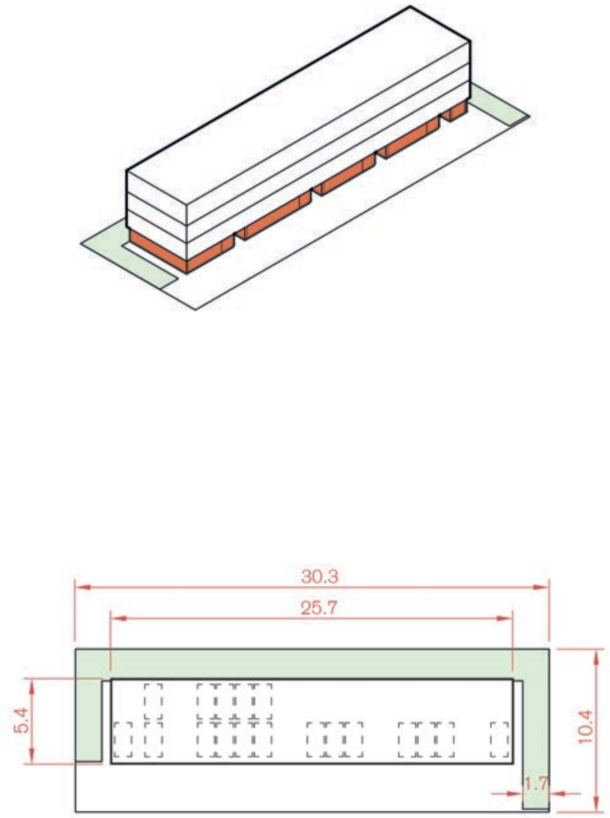


Fig.74, 75 - Typology 4

Block of flats
1-2 bedrooms
18 parking spaces



Note - Diagrams not to scale and all dimensions are indicative only
Not all of the house types shown are located in the typical block

5.0 Alternative development models
5.4 Case Study 3 - Abode

5.4.1 Context

Project	Abode
Location	Great Kneighton
Local Authority	Mendip District Council
Site	2ha (out of 42ha)
Developer	Countryside Properties
No dwellings	68 out of 306 (out of 2,300)
Net density	35 dph
Parking ratio	1.5
Completion	2014
Typical sale price	£503,244

Adobe is located in Great Kneighton, a new settlement for 2,300 homes in South Cambridge. The scheme is situated 3.7km from Cambridge City centre where the nearest railway station is located. The scheme is directly adjacent to Trumpington, a town which offers high street shops, cafés and other amenities including a large Waitrose with Park and Ride facilities. These facilities are accessible within a 5min walk from the development. Trumpington high street forms part of the A1309 which links Cambridge Ring Road to the M11.

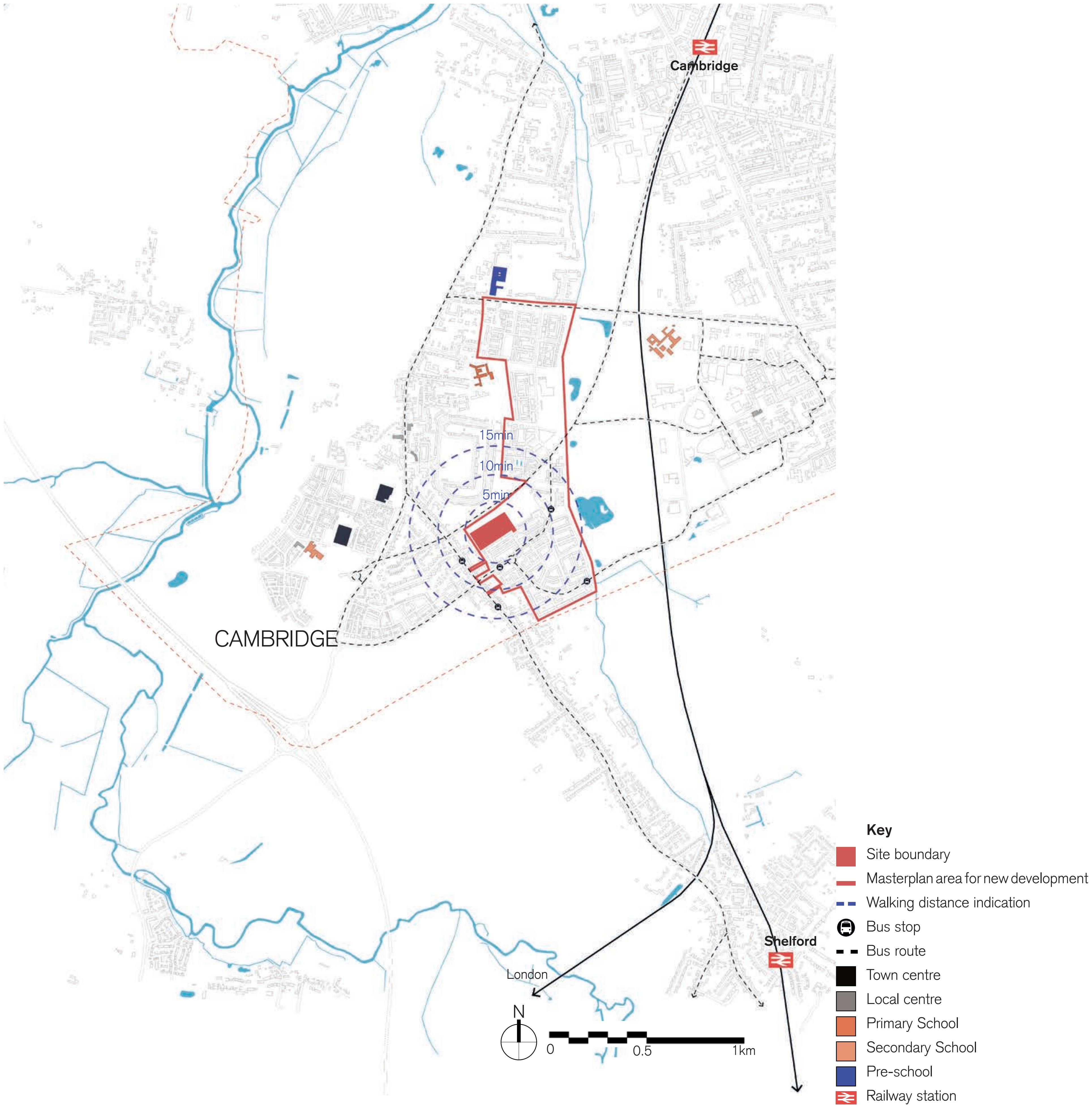


Fig. 76- Location plan - Adobe

Photograph of Abode, Great Kneighton
Image source: Proctor and Matthews Architects

5.4.2 Planning History

- August 2010 - Outline application consent (07/0620/OUT) for a new mixed use development including recreation, retail, educational facilities and 49ha of public open space.
- July 2011 - Reserved matters application consent for 306 homes on parcels 10, 11, 12b and 12c. (10/1296/REM)

5.4.3 Wider Masterplan

The studied site, Abode (Parcel 10), is part of the first phase of a new settlement, Great Kneighton. The scheme provides 120 acres of Country Park alongside its eastern boundary. The new settlement will eventually provide a new railway station at the heart of the development.

Fig. 77- Illustrative masterplan

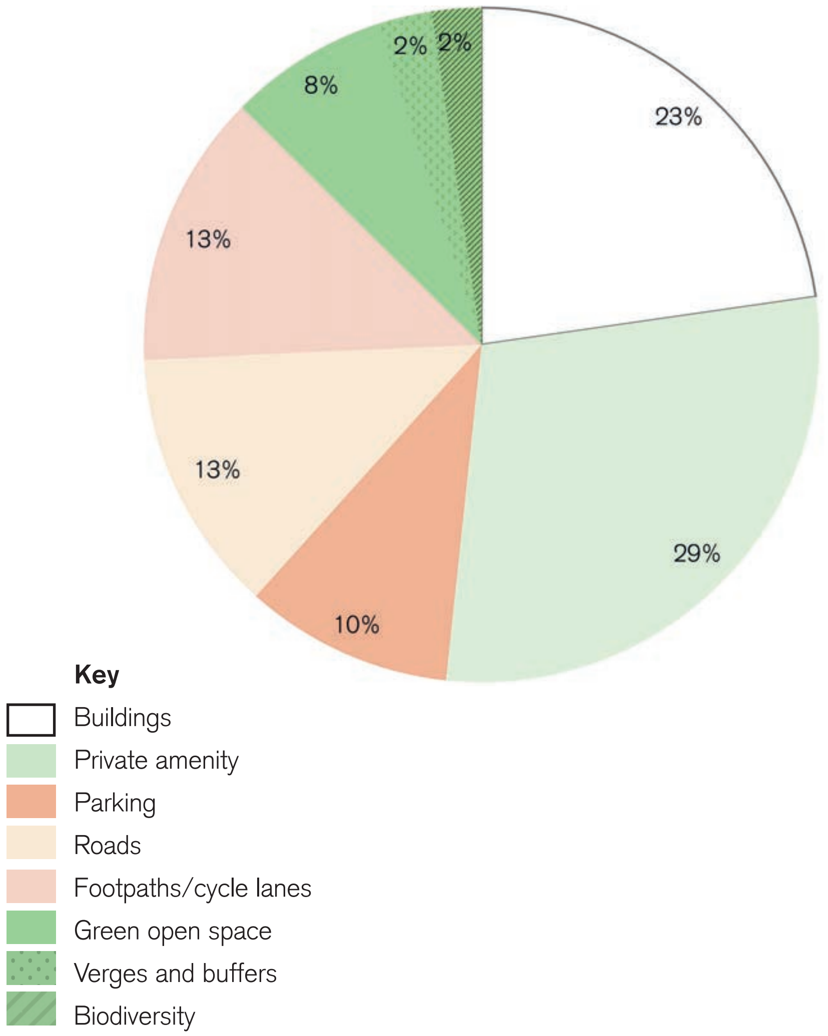
An extract from the planning application 07/0620/OUT

Fig. 78- Reserved matters layout

An extract from the planning application 10/1296/REM

5.4.4 Land budget analysis

In contrast with the other case studies in this section, the land budget analysis for Abode Parcel 10 shows that nearly 1/3 of land is dedicated to private amenity space. This result is influenced by the layout of parcel 10 which is characterised by detached and semi-detached family dwellings enclosed by garden walls. Overall, this development provides a limited amount of local green space when compared to masterplans of a similar size. The scheme relies on amenity provided by the large country park to the east (see fig.77)



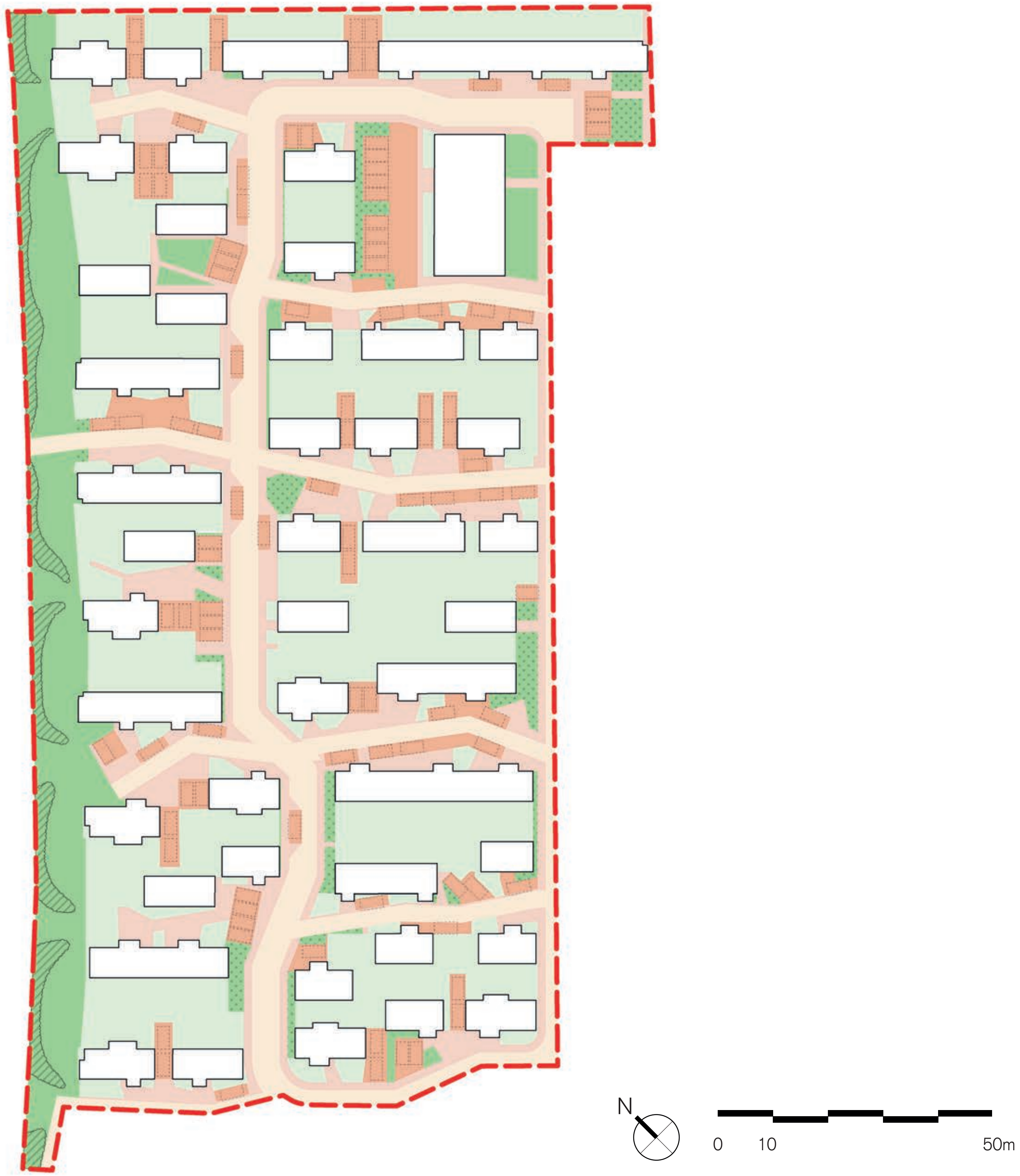


Fig. 79- Adobe plan with land budget data

5.4.5 Infrastructure ratio

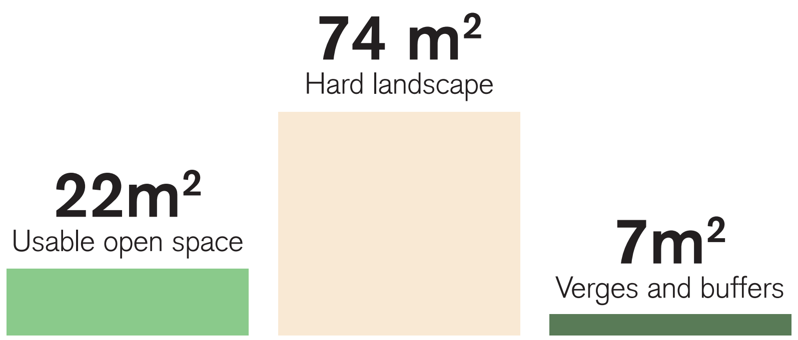
In Abode (fig.80) the area in private ownership comprises 62% of the 2ha site (1.24ha).

A further 2% of the site (0.05ha) is occupied by land not available for development.

The remaining 36% of the site (0.71ha) comprises the infrastructure required to service the 68 dwellings, and is broken down as follows:

Total hard landscape	**0.51ha**
Unallocated parking	0ha
Roads	0.25ha
Footpaths/Cycle lanes	0.26ha
Total verges and buffers	**0.05ha**
Total usable open space	**0.15ha**

As the scheme comprises 68 dwellings, the infrastructure per dwelling is summarised below:



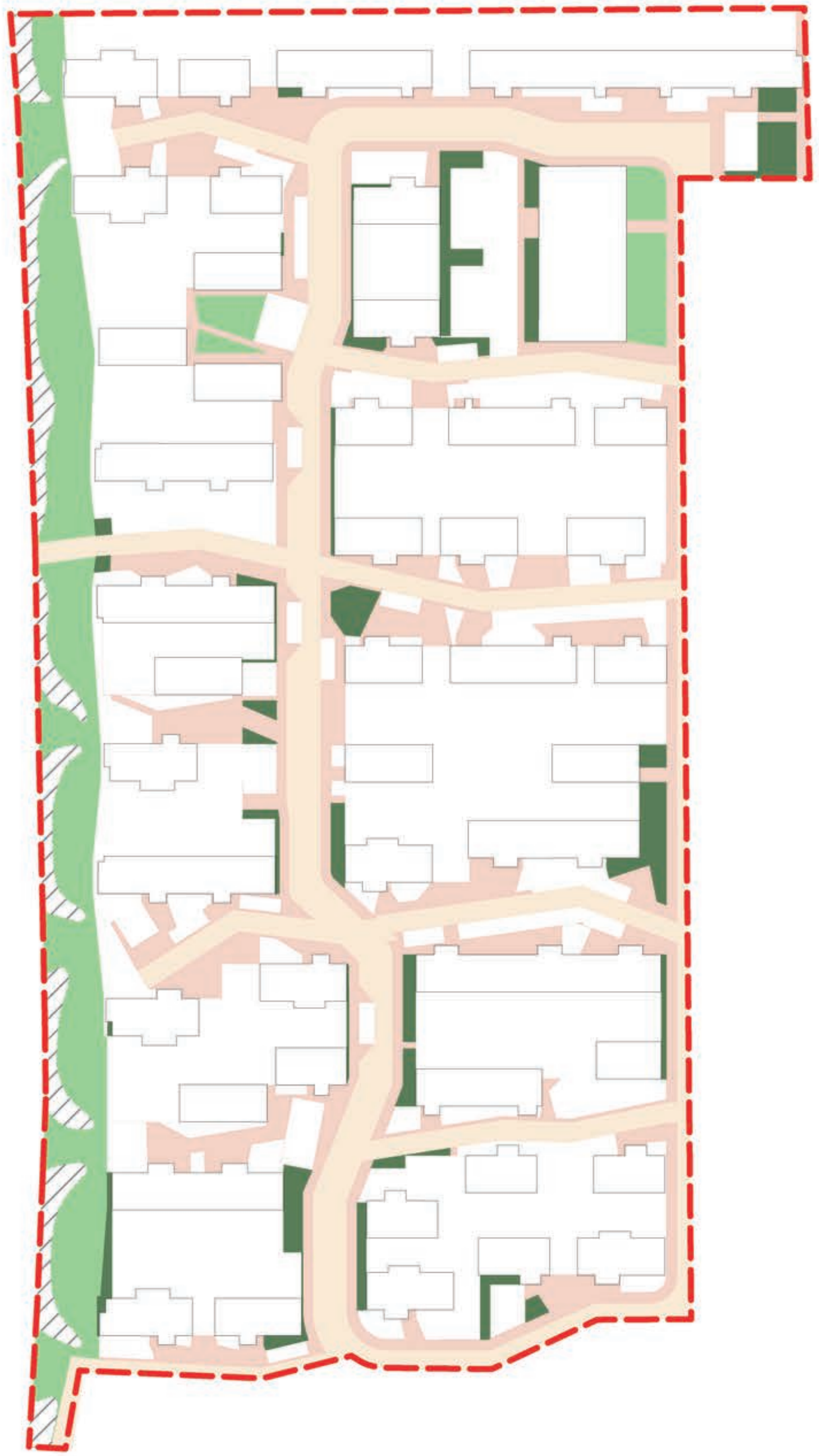


Fig. 80- Abode block plan with infrastructure ratio

5.4.6 House and block typologies

Fig.81 - Typical block

Block size (centre of the road) - 55m x 45m
Back-to-back distance - 9m / 20m

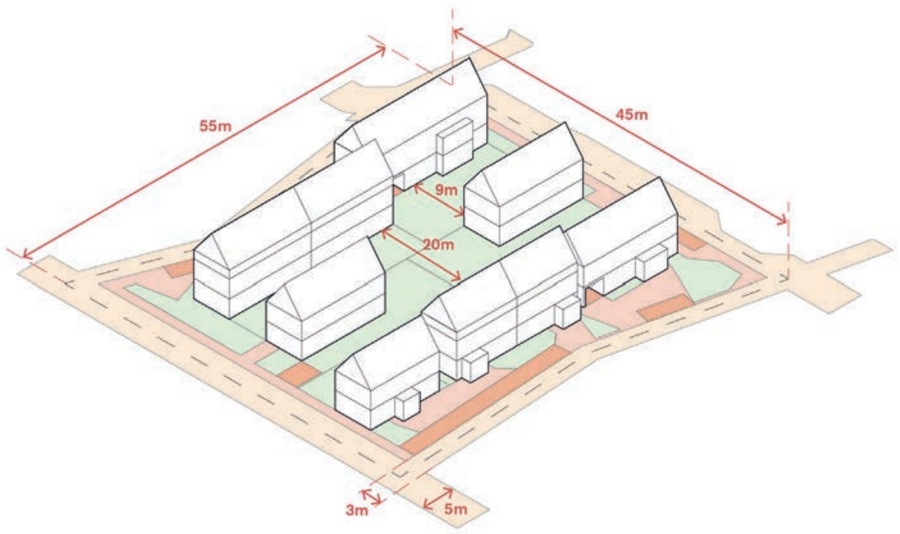


Fig.82, 83 - Typology 1

Detached house
4 bedrooms
2 parking spaces

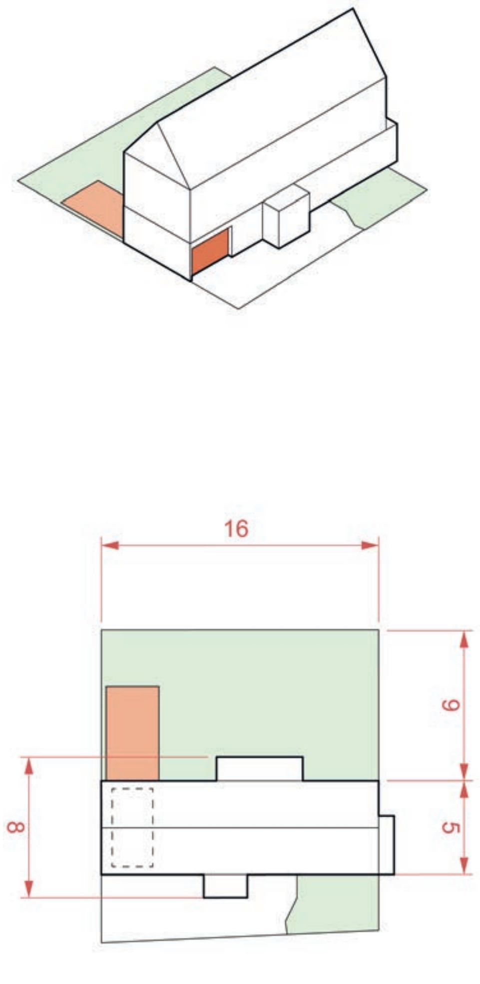


Fig.84, 85 - Typology 2

Terraced house
3 bedrooms
2 parking spaces for unit
1 parking space for adjacent flat

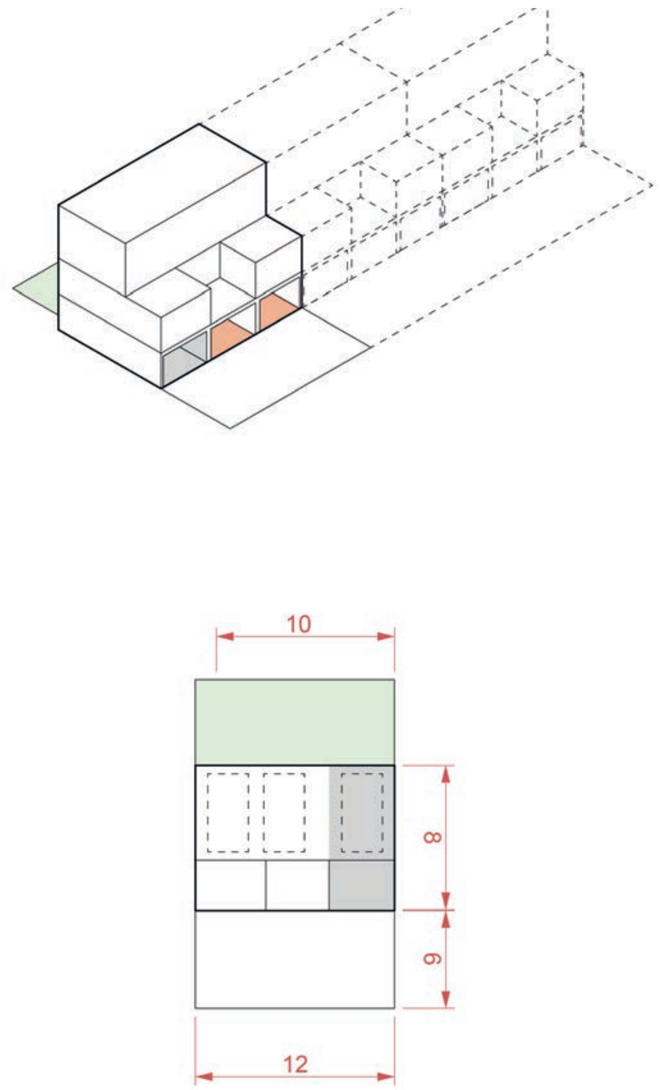
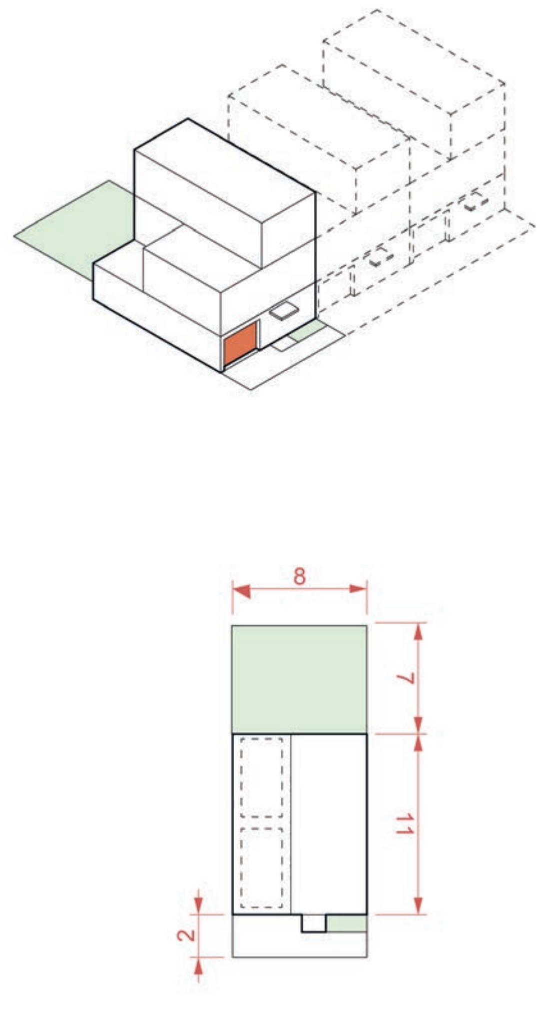


Fig.86, 87 - Typology 3

Terraced house
5 bedrooms
2 parking spaces



The typical block of the Abode Parcel 10 comprises a cluster of detached and semi-detached homes with generous private gardens. Whilst the density of the scheme is lower than other case studies, the typical block contains a rich mix of unit types, including terraces, that are arranged to accommodate fair amounts of on-plot parking without having a significantly adverse impact on the public realm. Units have been carefully calibrated to avoid blank gabled ends. Typology 1 includes entrances and window openings at gable ends to create passive surveillance and increase safety. Typology 2-3 are located beyond the sampled block above, however, have been included within the study as the terraced house typologies demonstrate the principles of compact urbanism, by placing parking spaces within the building footprint using under-croft parking and integrated garages with the habitable accommodation/terrace spaces above.

Note - Diagrams not to scale and all dimensions are indicative only
Not all of the house types shown are located in the typical block

5.5.1 Context

Project	Knights Park
Location	Eddington, Cambridge (3km)
Local Authority	Cambridge City Council/South Cambridge District Council
Gross site area	4.3ha (out of 140ha)
Net site area	4.1ha
Developer	Hill
No dwellings	240 (out of 5000)
Net density	58 dph
Parking ratio	1.7
Completion	2015 -
Typical sale price	£295,000 - 1,049,950

Knights Park is part of a masterplan by the University of Cambridge for 5,000 homes located in north-west Cambridge.

5.5.2 Planning History

- December 2015 - Approved Reserved Matters application for 240 residential units with access roads (including cycle and pedestrian routes) cycle parking car parking landscaping utilities and associated ancillary structures (S/2219/15/RM)
- 2013 - outline planning consent granted for development comprising up to 3,000 dwellings, 2,000 student bed-spaces and100,000m^2 employment area (11/114/OUT and S/1886/11)

5.5.3 Masterplan

The primary street within the studied site, Green Lane, is a fully pedestrianised street. This car-free zone is achieved as parking spaces are provided in an underground car park with a vehicular entrance located to the south of the site. The underground parking provides space for the apartment blocks and five rows of terraced houses (28 dwellings in total). The 12 units in the two most southern rows of terraces have direct private access to this basement. The remaining units are served by the two 'pop-up' entrances that are located at a maximum distance of 35m from all the front entrances.

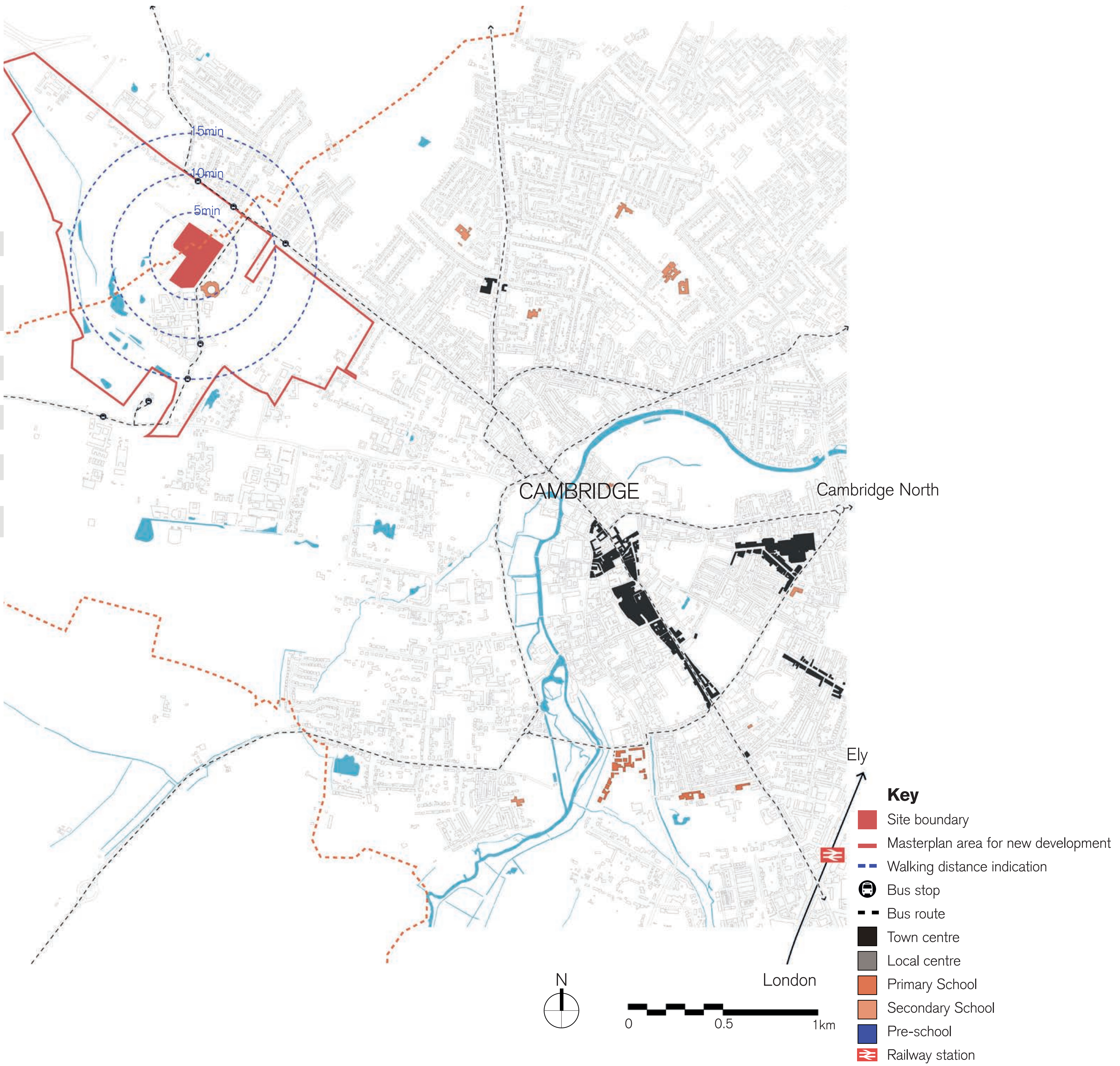
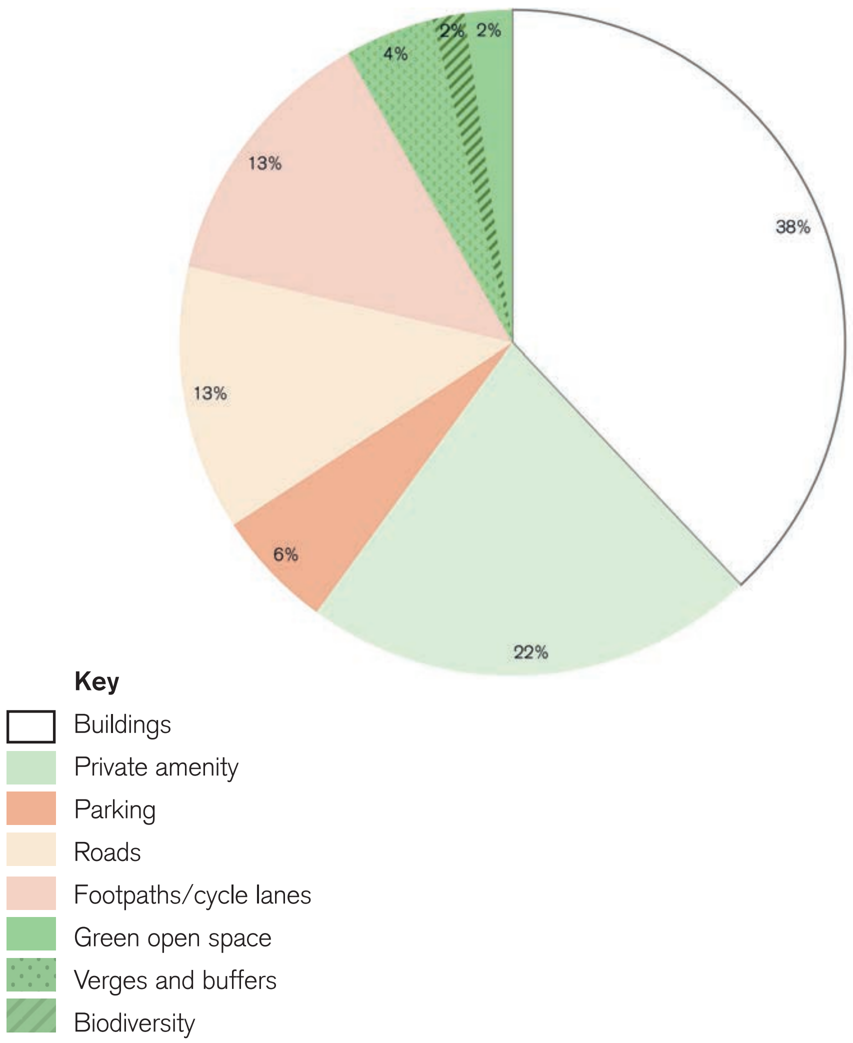


Fig. 88- Location plan - Knights Park

5.5.4 Land budget analysis

Over 1/3 of the development footprint is occupied by buildings, triple amount of the conventional developments' average. This is achieved by using predominant back-to-back terraced houses and a significant number of apartment buildings. The land budget data analysis shows that 22% of land is dedicated to private amenity space. As a whole, the development has a fairly generous parking ratio (1.7 spaces per unit) whilst maintaining a density of 58 dph. The scheme avoids creating a public realm dominated by car parking through the use of basements. This has only been possible because of the high land values, with individual homes on sale for over £1m.



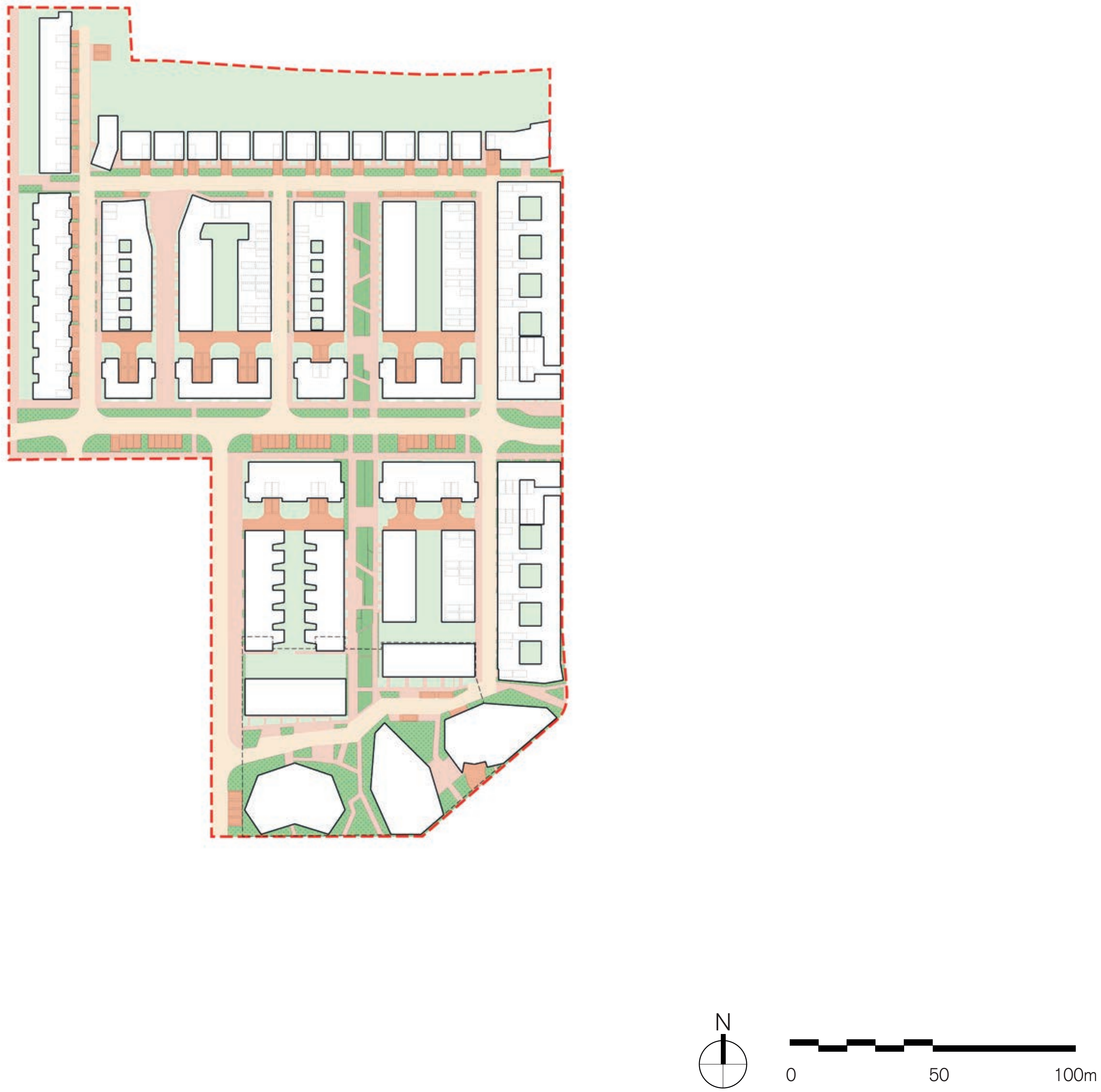


Fig. 89- Knights Park plan with land budget data

5.5.5 Infrastructure ratio

In Knights Park (fig.90) the area in private ownership comprises 64% of the 4.3ha site (2.77ha).

A further 2% of the site (0.07ha) is occupied by land not available for development.

The remaining 34% of the site (1.46ha) comprises the infrastructure required to service the 240 dwellings, and is broken down as follows:

Total hard landscape	**1.17ha**
Unallocated parking	0.06ha
Roads	0.55ha
Footpaths/Cycle lanes	0.56ha
Total verges and buffers	**0.19ha**
Total usable open space	**0.1ha**

As the scheme comprises 240 dwellings, the infrastructure per dwelling is summarised below:

48 m^2
Hard landscape

4m^2
Usable open space

8m^2
Verges and buffers

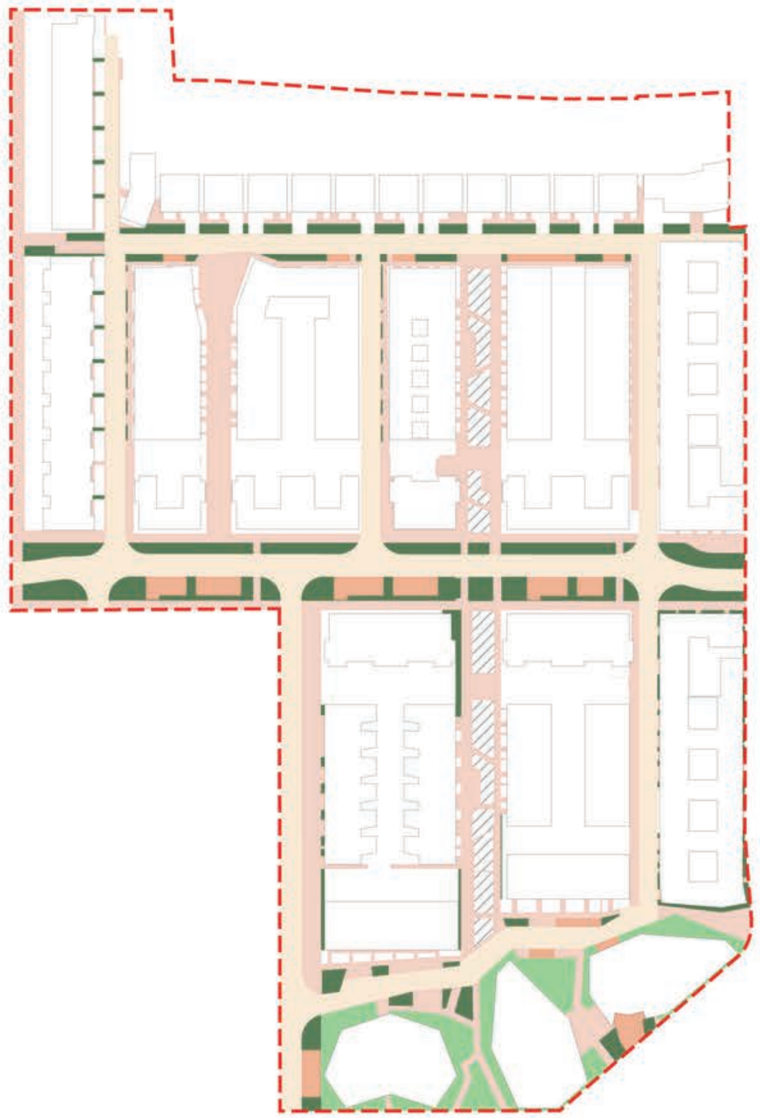
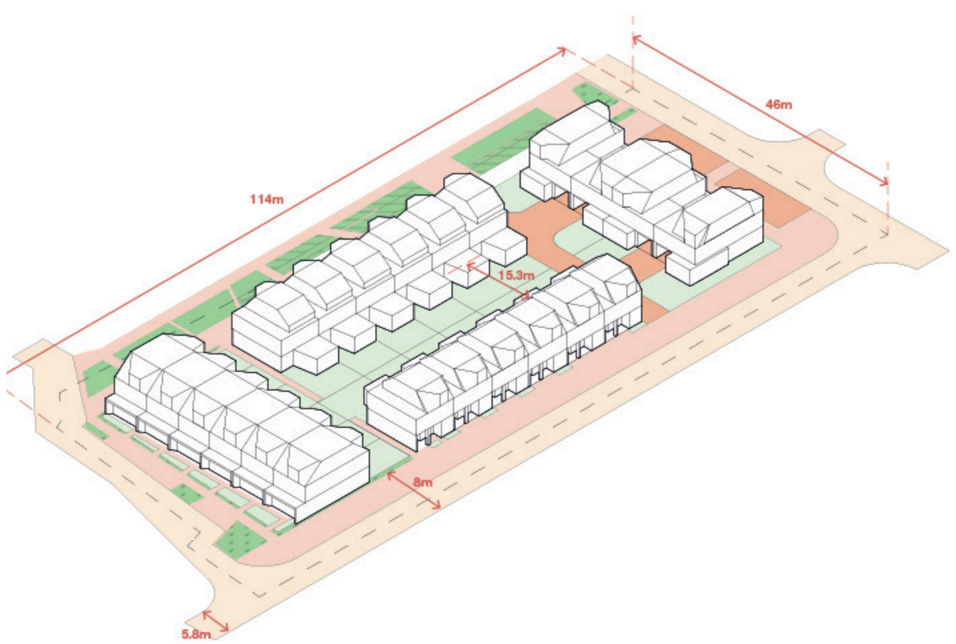


Fig. 90- Knights Park block plan with infrastructure ratio

5.5.6 House and block typologies

Fig.91 - Typical block

Block size (centre of the road) - 114m x 46m
Back-to-back distance - 7.2m at lower level, 15.3m at upper level



The typical block in Knights Park comprises rows of terraced houses enclosing private gardens. The scheme manages on-plot car parking through a range of design solutions including basements, undercroft car parking and integrated garages.

Typology 3 (Figures 96-97) are particularly innovative, as vehicular access and parking for the terrace house is via the property's rear allowing the front facade to face a car free street. The rear of the property adjoins a FOG (flat over garage) which ensures the rear street benefits from a degree of passive surveillance.

Fig.92, 93 - Typology 1

Terraced house
3 bedrooms
Basement parking spaces

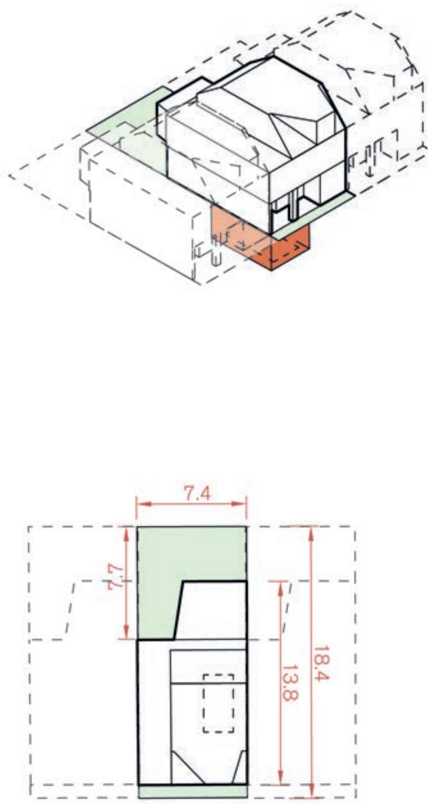


Fig.94, 95 - Typology 2

Terraced house
3 bedrooms
2 parking spaces

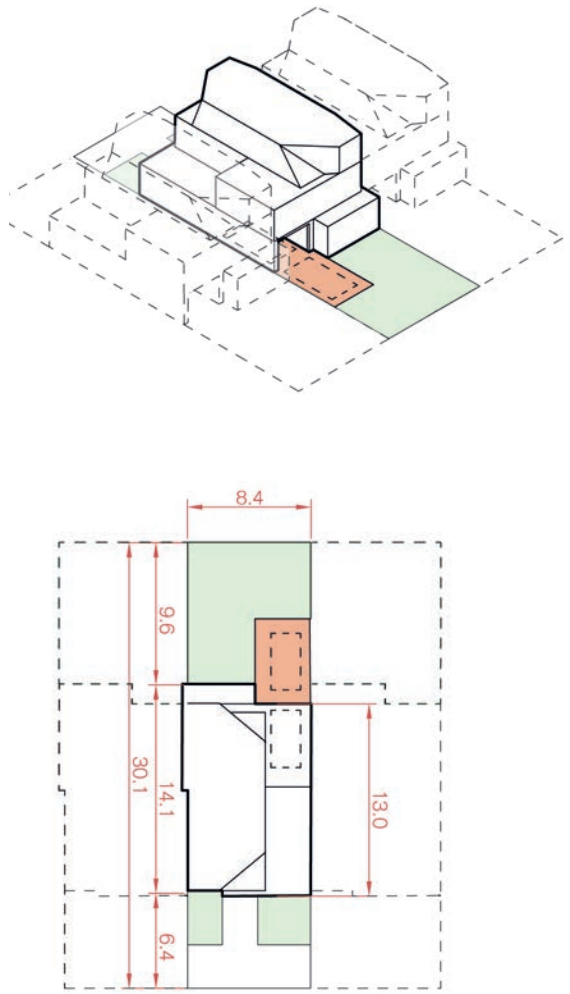
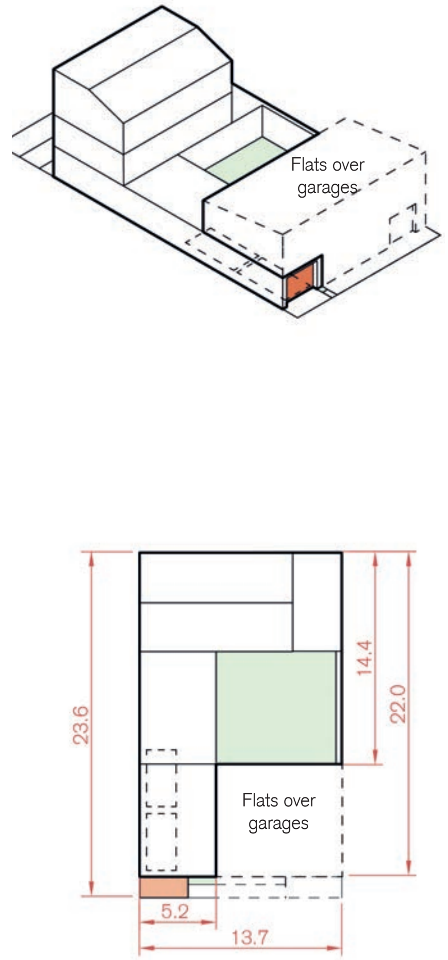


Fig.96, 97 - Typology 3

Terraced house with courtyard,
backing on to flats over garage
4 bedrooms
2 parking spaces



Note - Diagrams not to scale and all dimensions are indicative only
Not all of the house types shown are located in the typical block

5.0 Alternative development models
5.6 Case Study 5 - Newhall Be

5.6.1 Context

Project	Newhall Be
Location	Harlow (2.5km)
Local Authority	Harlow, Essex
Site	1.6ha
Developer	Linden Homes
No dwellings	85 (out of 440)
Net density	52 dph
Parking ratio	1.6 (135 parking spaces including 25 visitor)
Completion	2012
Typical sale price	£300,036

Newhall Be is part of the South Chase Phase 1 masterplan, a neighbourhood for 440 homes. The studied site is located at the southwest corner of the new settlement.

5.6.2 Planning history

- September 1998 - Approved planning permission granted for the residential development of 440 dwellings with associated amenities (HLW/96/00088)
- March 2008 - Approved reserved matters application for 85 residential units (HW/PL/07/00430)
- January 2011 - Approved planning application for construction of 4No. 3-Bedroom Houses on Plots 57-60, No's 35-38 Braggowens Ley (Revised House Type), Lot 3, South Chase. A Proposed Alteration to The Previously Approved Masterplan Scheme for Lot 3

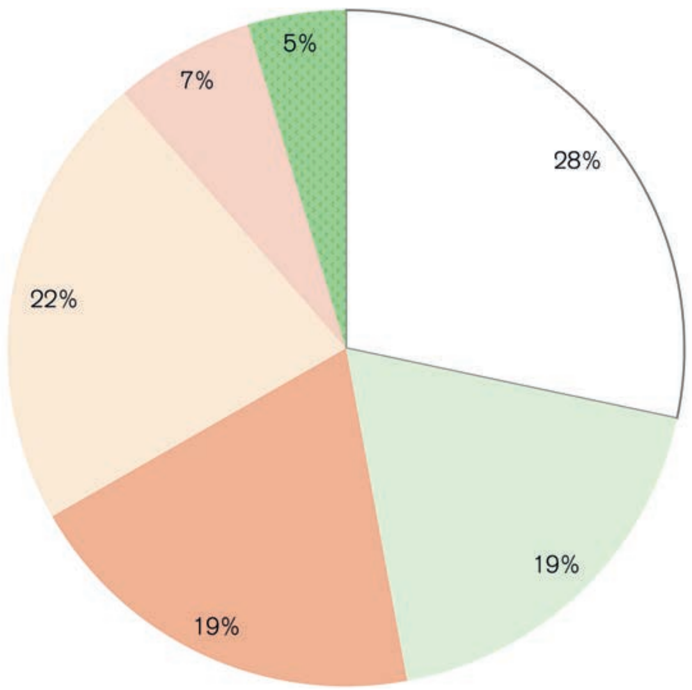
5.6.3 Masterplan

The masterplan is based on a layout of east-west shared streets. The compact layout consists of a courtyard typology with small front and back gardens. The sculpted roof of back-to-back terrace houses maximises light penetration to neighbouring gardens. The apartment buildings and villas hold important corner locations and form urban markers at street junctions.

Fig. 98- Location plan - Newhall Be

5.6.4 Land budget analysis

Nearly 1/3 of the development footprint is occupied by buildings. The high density of development is achieved by back-to-back terraced houses with amenity space at the upper levels. The land budget analysis shows that 19% of land is dedicated to private amenity space. Over 40% of the area is dedicated to vehicles and car parking space, with the latter dominating the streetscape.



Key

- Buildings
- Private amenity
- Parking
- Roads
- Footpaths/cycle lanes
- Green open space
- Verges and buffers
- Biodiversity

Fig. 99 - Newhall Be plan with land budget data

5.6.5 Infrastructure ratio

In Newhall Be (fig.100) the area in private ownership comprises 62% of the 1.6ha site (0.99ha).

The site does not contain any land unsuitable for residential development, or infrastructure that serves housing beyond the area selected for analysis.

The remaining 38% of the site (0.61ha) comprises the infrastructure required to service the 85 dwellings, and is broken down as follows:

Total hard landscape	**0.53ha**
Unallocated parking	0.06ha
Roads	0.36ha
Footpaths/Cycle lanes	0.11ha
Total verges and buffers	**0.08ha**
Total usable open space	**0ha**

As the scheme comprises of 85 dwellings, the vehicle infrastructure per dwelling is summarised below:

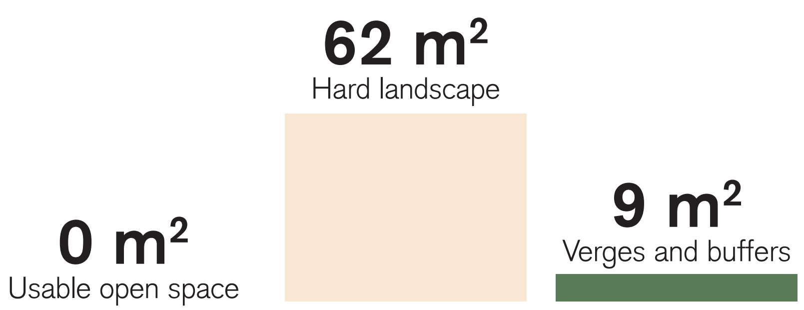
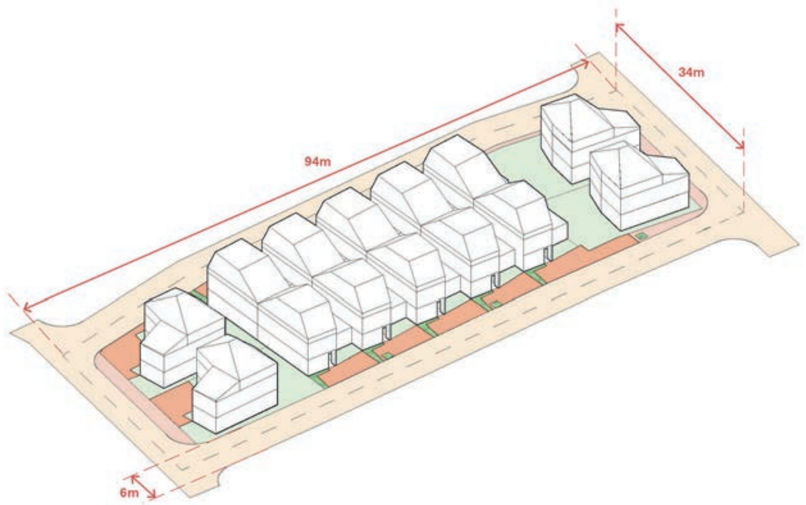


Fig. 100- Newhall Be block plan with infrastructure ratio

5.6.6 House and block typologies

Fig.101 - Typical block

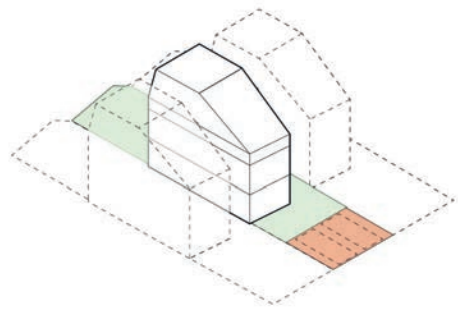
Block size (centre of the road) - 94m x 34m
Back-to-back distance - 0m/6.7m



The typical block in Newhall Be is very compact, due to the back-to-back house types. Parking ratios are fairly generous, and parked cars are a dominant feature of the public realm.

Fig. 102, 103- Typology 1

Terrace
3 bedrooms
2 parking spaces



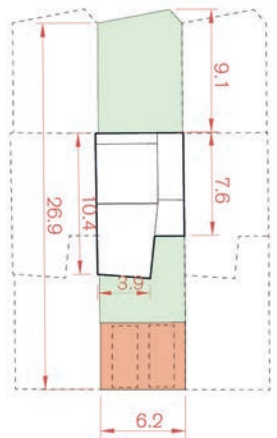
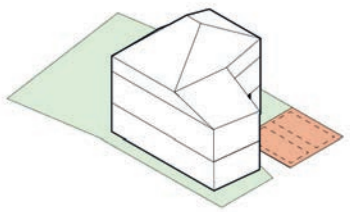


Fig. 104, 105- Typology 2

Detached
4 bedrooms
2 parking spaces



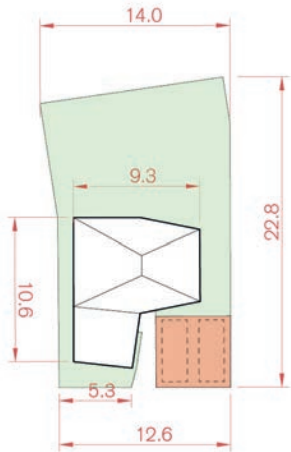


Fig. 106, 107- Typology 3

Terrace
2 bedrooms
1 parking space

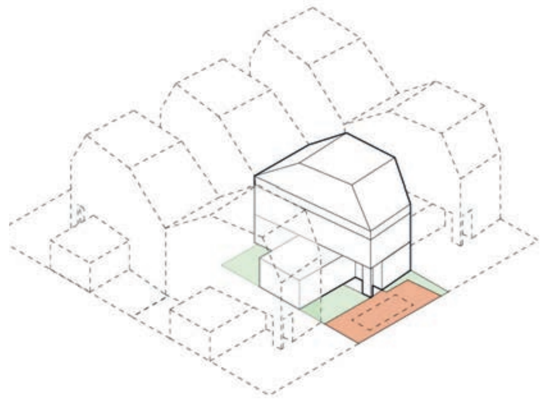
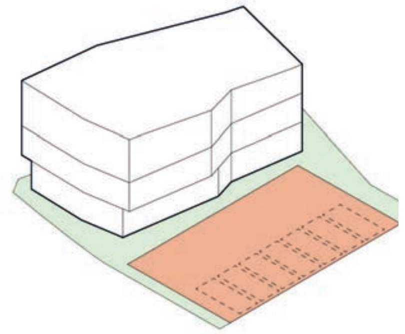
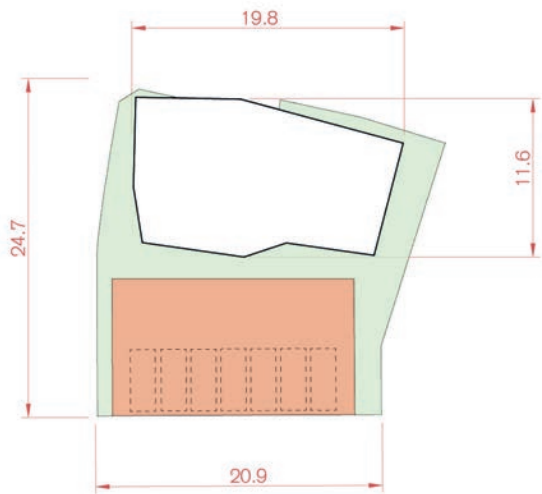


Fig. 108, 109- Typology 4

Block of Flats
2 bedrooms
1 parking space





Photograph of Newhall Be

Image source: Alison Brookes Architects

5.0 Alternative development models
5.7 Vauban, Freiburg

Whilst it was necessary to limit the scope of this study to examples of UK suburban housing, Fig.110-111 provides a summary of what is possible in a different context. Vauban, in Freiburg, Germany, is widely known for the way it promotes active travel. The project has leveraged a range of innovative design decisions to reduce car usage, including remote car parking, which allows the compact streets between buildings to be utilised primarily for walking, cycling, and play.

Although the urban context for the scheme (in terms of its density and height) differs significantly from site allocations in Essex, the alternative development models explored in this chapter demonstrate many of the underlying principles utilised in Vauban can inform suburban development across Essex.

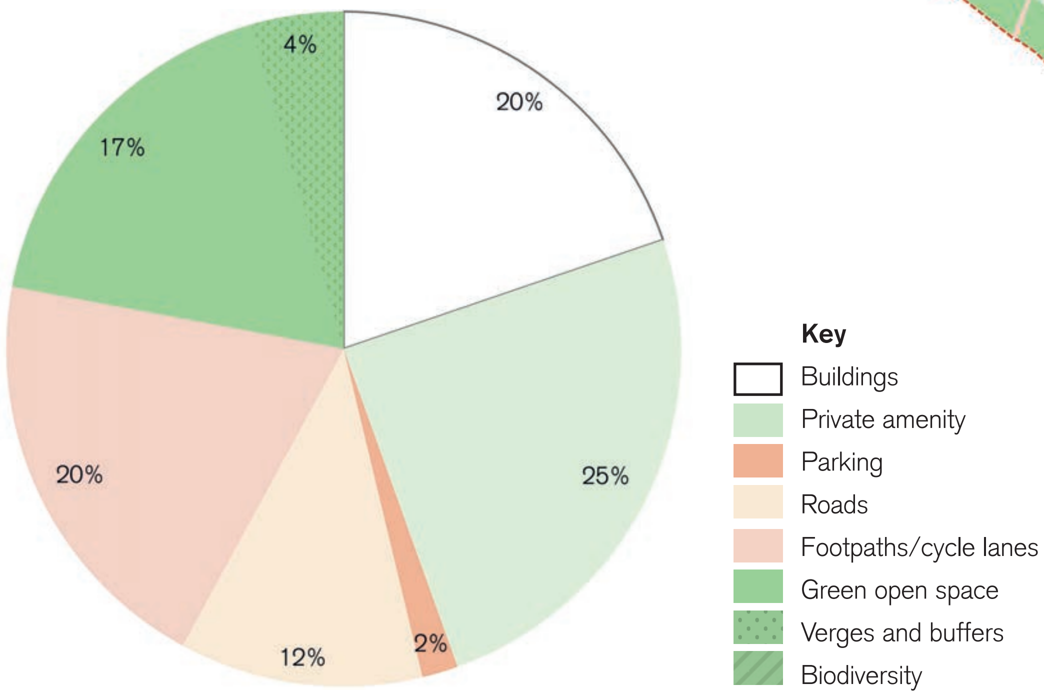


Fig. 110- Vauban Quarter plan
Fig. 111- Vauban Quarter land budget data

Section 06
Contrasting development models

6.1.1 Comparing the land budget analysis

The previous sections examined a range of "conventional" and "design-led"[1] residential projects in the UK, which are broadly distinguished by the amount of innovation deployed in relation to site specificity at the scale of the masterplan, block, and unit. The pie charts shown to the right contrast the average of the 3 "conventional" case studies (figure 112) against each of the alternative development case studies (figures 113 - 117). Key findings in relation to the amount of space occupied by each category in the land budget analysis are set out below:

Buildings

All of the alternative development case studies analysed give over significantly more space to buildings than their conventional counterparts, where buildings average only 14% of the total site. The use of compact terraced building typologies in the alternative case studies allows considerably more built development to come forward, which could have positive implications on project viability. Promoting higher densities of development in certain parts of a site could alternatively allow for other parts of the site to be given over to open space, biodiversity, and nature.

Gardens

Aside from Abode, all of the alternative case studies utilise much more compact gardens, with Lime Street, Goldsmith Street, and Newhall Be utilising amenity space above ground level to compensate for less space at ground floor for gardens. This form of innovation is only possible if Local Authorities look to relax the requirement for 22mm back-to-back distances which prohibits more compact development forms. There is potential to place greater emphasis on the quality of private gardens, rather than quantitative measures alone.

1 - Definitions for "conventional" and "design led" development models provided on pages 19 and 39 respectively.

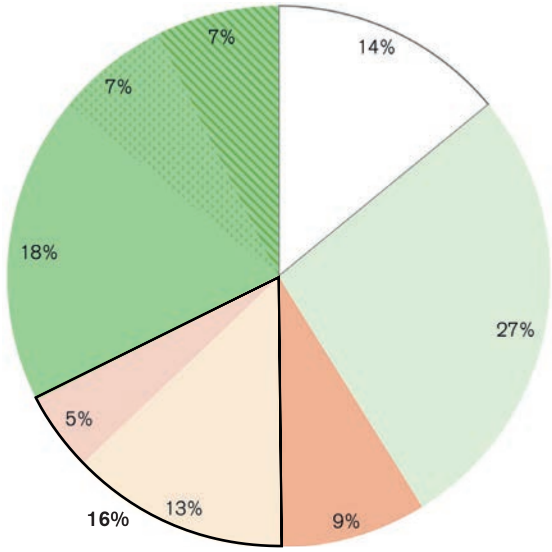


Fig. 112- Average conventional development land budget data

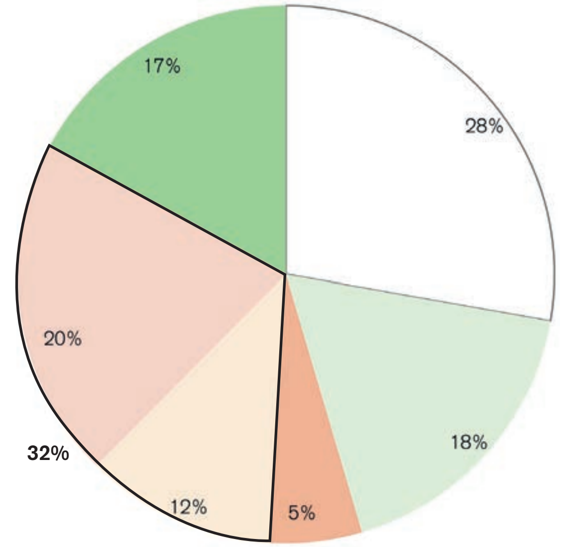


Fig. 113- Goldsmith Street land budget data

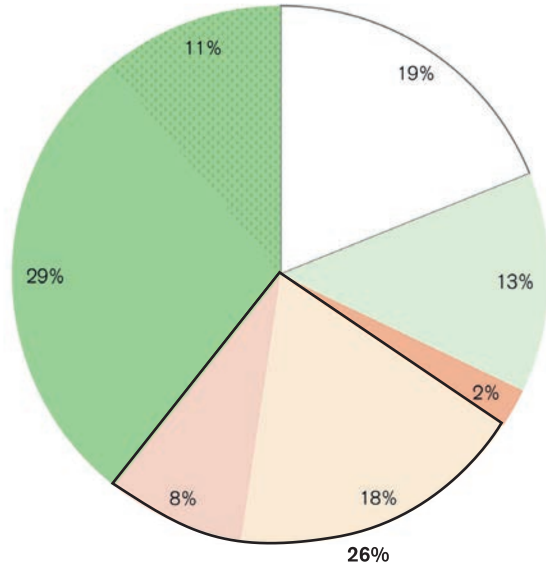


Fig. 114- Lime Tree Square land budget data

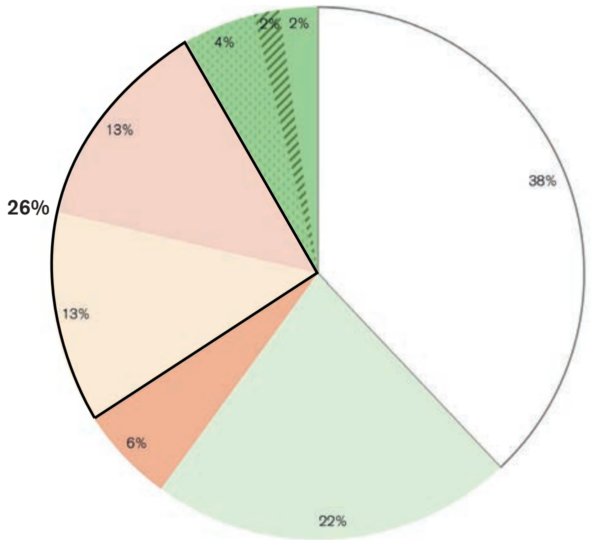


Fig. 115- Knights Park land budget data

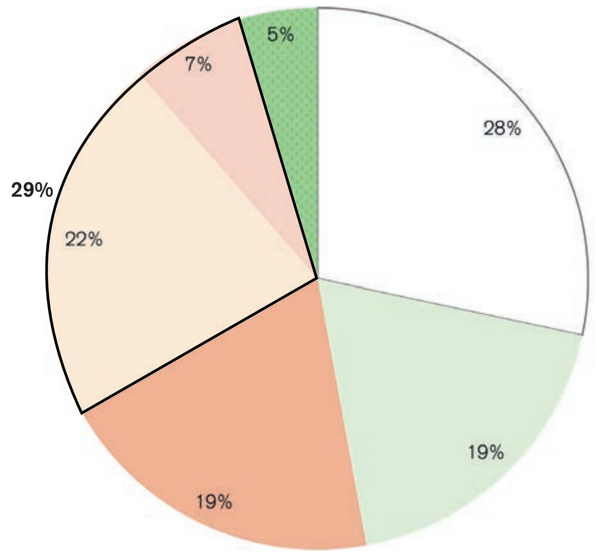


Fig. 116- Newhall Be land budget data

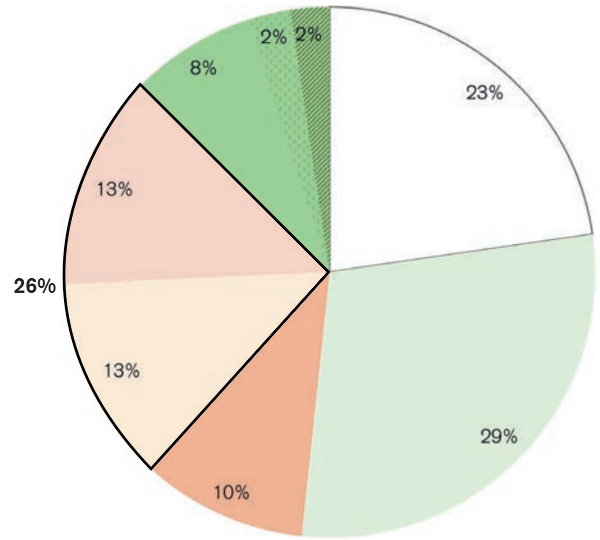


Fig. 117- Adobe land budget data

Key

- Buildings
- Private amenity
- Parking
- Roads
- Footpaths/cycle lanes
- Green space
- Green verges
- Biodiversity

6.0 Contrasting Development Models
6.1 Key findings of analysis

Roads, footpaths and cycleways
One of the most noteworthy findings from the land budget analysis is the lack of deviation in space occupied by roads, in both alternative and conventional case studies. In the majority of schemes, roads account for between 12-13% of the total land. The two significant deviations from this are Lime Street and Newhall Be, both of which utilise extensive areas of shared surfaces, and so the higher percentages associated with road infrastructure serves cars, pedestrians and cyclists.

This consistency reflects the fact that space given over to road infrastructure is largely dictated by highways design standards, which limit the amount of potential design innovation in promoting more compact development.

Another notable finding is the considerable increase in the amount of space the alternative schemes give over to footpaths and cycleways. By contrast the conventional case studies tend to provide footpaths in line with minimum design standards set out by the relevant highways' authority (typically 1.8m in width). More generous and better designed footpaths and cycleways are a vital ingredient of enabling more walkability. Goldsmith Street is an excellent example of this, where footpaths double up as pocket spaces enabling doorstep play.

Parking
Whilst the amount of space allotted to car parking on the conventional schemes is remarkably similar (8-9%), the space on the alternative case studies varies considerably. This finding reflects the range of different solutions employed across the schemes. Whilst Newhall Be and Abode provide more space to parked cars than the conventional schemes, the other alternative development models provide less.

At Knights Park this is achieved using underground car parking, which facilitates a fairly generous parking ratio without compromising the public realm. As discussed previously this strategy reflects the higher land value associated with this specific site and is unlikely to be viable across Essex. Goldsmith Street has a parking ratio of less than 1 unit per car, which is again unlikely to be viable throughout suburban Essex, until perhaps, car share schemes become more widespread.

The extremely low percentage at Lime Street reflects the widespread use of integrated garages with habitable accommodation / terraced spaces above, which successfully integrates 1.5 spaces per unit. This is comparable to average levels across Essex, warranting further exploration of this model.

Green Open Space, Verges, and Biodiversity
These later categories have the greatest level of deviation, as the allotted spaces to all three is largely dictated by site specific issues, such as pre-existing areas of biodiversity (Great Bentley), or lower than expected amounts of open space due to a reliance on public spaces provided elsewhere as part of a wider masterplan (Abode)

A key distinction between the conventional and alternative schemes was the quality of green spaces provided; Great Dunmow and Great Bentley utilised extensive areas of mown lawn, whilst schemes like Abode and Knights Park contain a broad of planting that fulfils a variety of functions, including creating recreational spaces, managing storm water run off and increasing biodiversity.

The absence of mono-functional grassed verges in the alternative schemes significantly increases the overall quality of the landscape. Creating landscape and green infrastructure that provides multiple, overlapping functions is a key distinguishing feature of the design-led schemes.

Generous shared surfaces at Lime Street enable doorstep play
Image source: FCBS

All car parking is accommodated on street at Goldsmith Street, which facilitates high density terraced housing with shallow back gardens
Image source: Passivhaus Trust

Heavily planted verges at Abode provide biodiversity benefits
Image source: Proctor Matthews Architects

6.0 Contrasting Development Models
6.1 Key findings of analysis

6.1.2 Comparing different infrastructure ratios

Figures 118 and 119 highlight how the infrastructure ratio varies across the conventional and alternative development models, clearly illustrating how the latter group are more space and cost efficient, as each dwelling carries less overhead cost.

The comparison of the verges and hard landscape areas against the development density shows that the amount of verges and buffers per unit decreases as the density increases, reinforcing the fact that compact and efficient layouts have potential to reduce the cost overhead per dwelling.

The efficiency in cost could be utilised to provide higher quality materials in the public realm, more diverse planting, or increases in the provision of affordable housing.

Fig. 118 - summary bar charts of the infrastructure ratio for conventional and alternative case studies, illustrating the latter require less infrastructure per unit

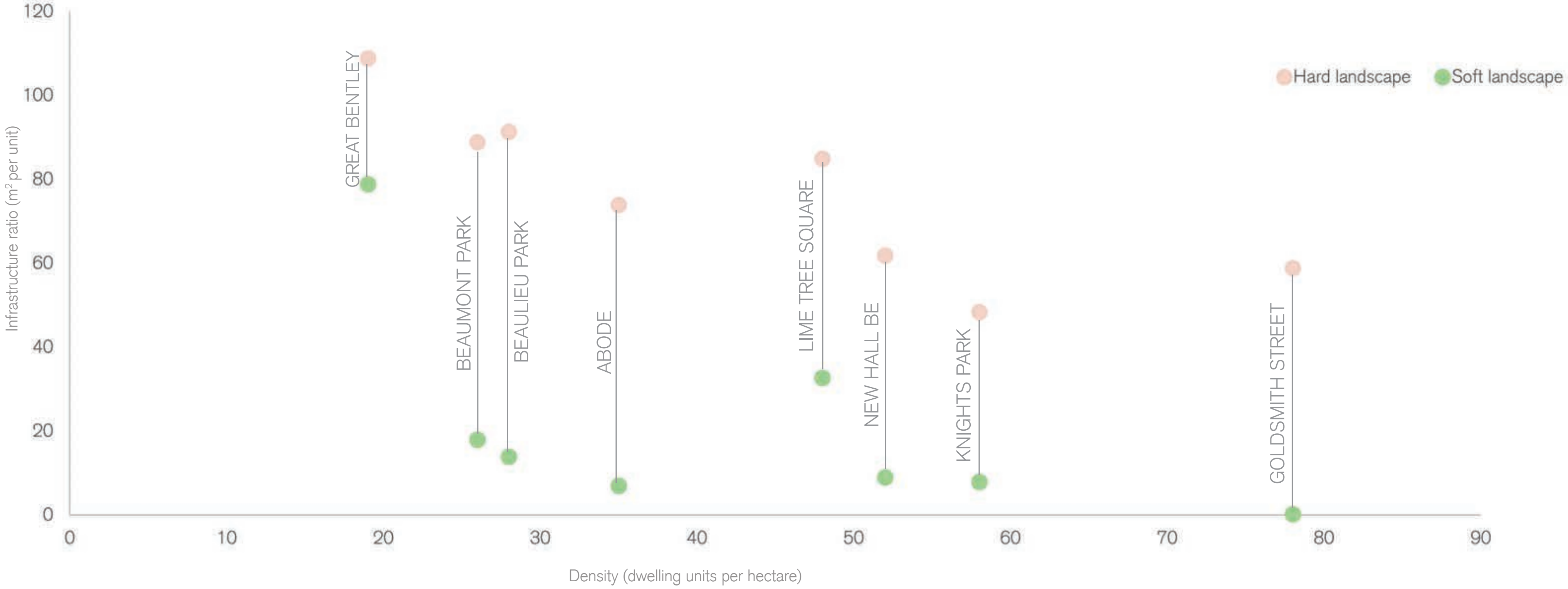


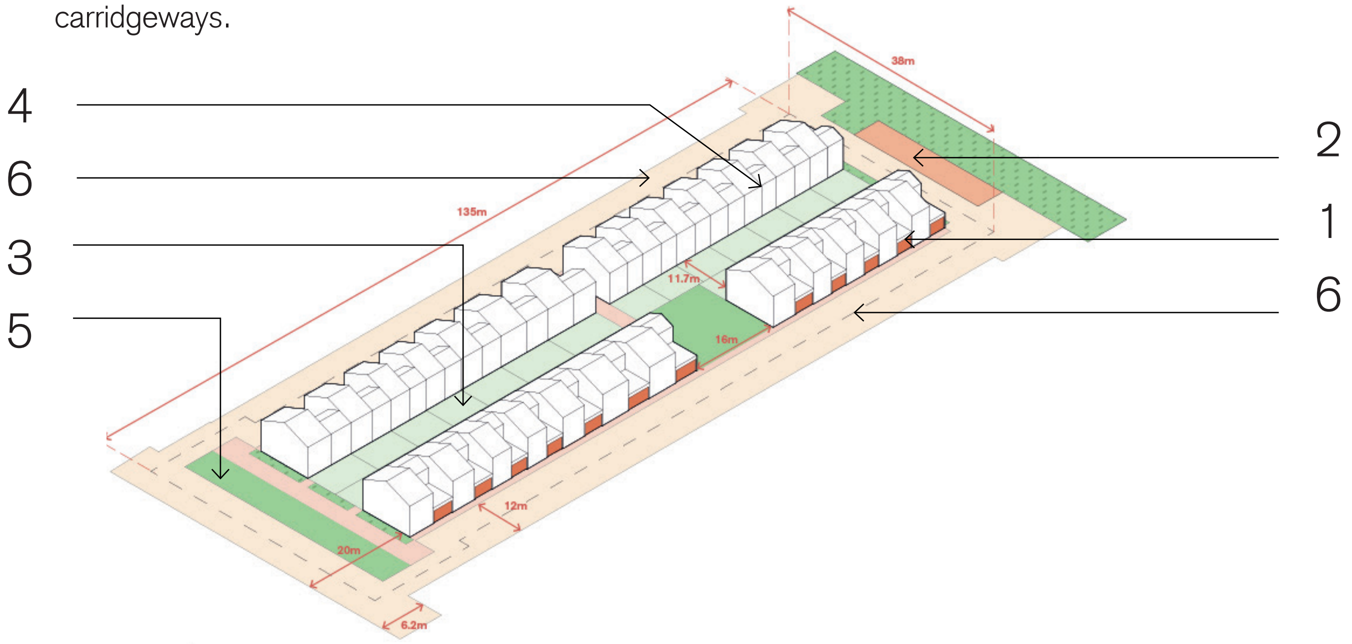
Fig. 119 - scatter graph illustrating how the infrastructure ratio of each scheme relates to the overall density; there is a clear correlation between higher densities and lower infrastructure ratios, which demonstrates the potential financial and viability benefits of more compact development

6.0 Contrasting development models
6.2 The potential for greater density and efficiency

Building on the precedent research presented in sections 04 and 05 of this document, the following exercise aims to illustrate how alternative development models could facilitate greater densities. This has the potential to deliver a broad range of benefits, from improving walkability, design quality in the public realm, biodiversity, the amount and quality of green space, and of course, project viability.

Using one of the conventional case study sites as a starting point (Beaumont Park), this high level exercise demonstrates how the scheme could be reworked using the block and parking principles from an alternative precedent study (Lime Street Square). The scheme has been reworked using the following principles:

1. Typical blocks redesigned to comprise terrace houses with an integrated garage
2. Greater amounts of unallocated parking located on the verges of the development and the primary road, allowing for the second parking space for residents to be shared and reducing the overall parking ratio to 1.5 car parking spaces per unit once unallocated parking has been accounted for
3. Reduced back-to-back distances to 11.7m, with additional amenity space provided in a terrace at first floor, ensuring each unit has a south facing and north facing amenity space
4. East - west building orientation to embed passivhaus principles within the masterplan
5. Primary streets include a linear public space to promote local biodiversity and doorstep play
6. All secondary streets are shared surfaces to promote walking, cycling and doorstep play. Careful calibration of these uses would also reduce vehicular speeds along longer, straight carridgeways.



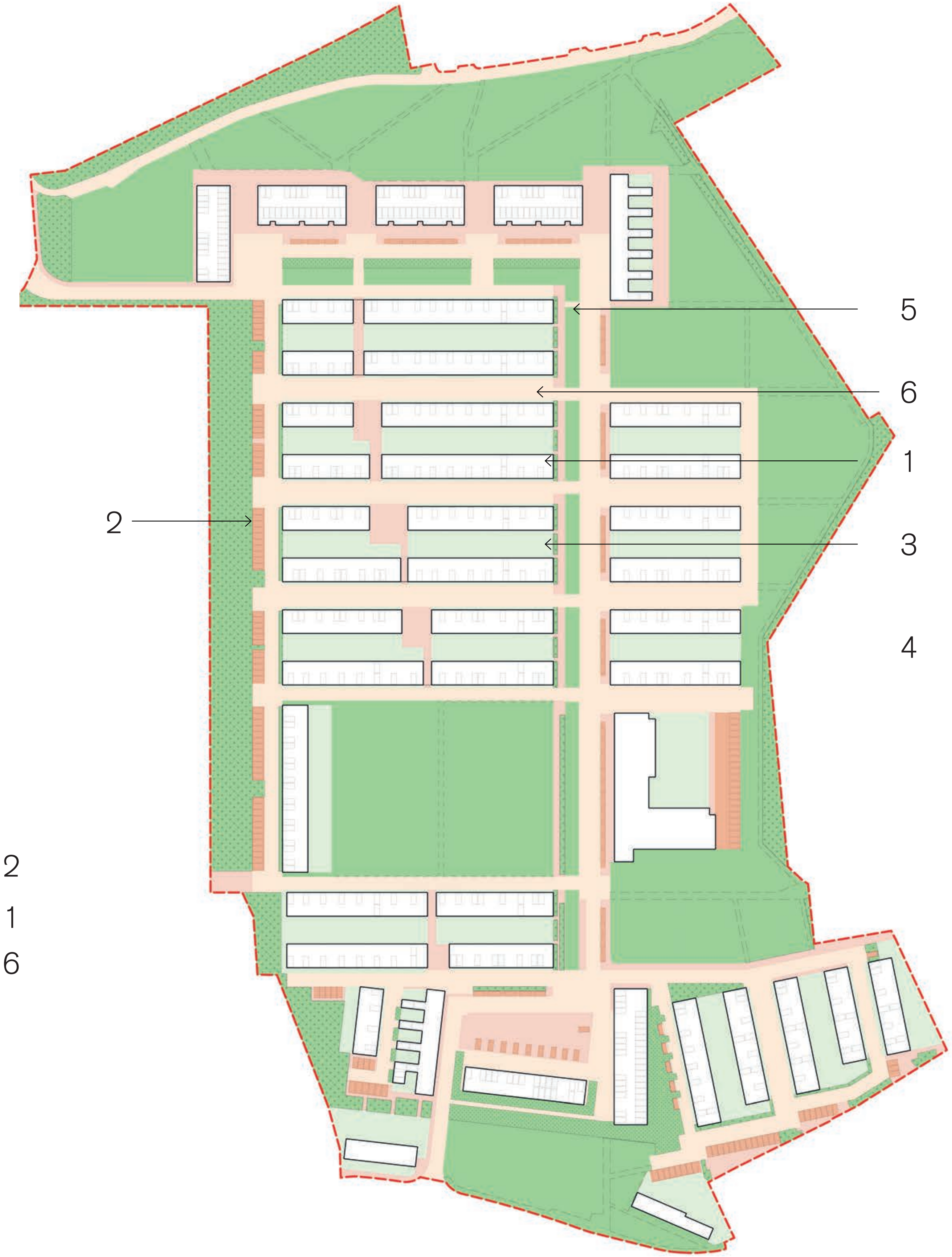


Fig. 120 -Typical block plan and site layout at Lime Tree Square

This comparative land budget analysis is based on applying the design principles from Lime Tree Square to the Beaumont Park site in Essex.

To ensure the two layouts are comparable, the alternative development exercise retains key urban design decisions established in the “as approved” scheme, including access points and the distribution of public open space.

This exercise is not intended to provide an alternative vision or masterplan approach for the site; its aim is to demonstrate the potential quantitative benefits of compact development, central of which is an increase in dwelling numbers from 197 homes to 230 homes.

These quantitative benefits are illustrated in further detail on the next page, and supplemented with an extensive range of potential qualitative benefits which are set out in the concluding chapter of this report.

Fig. 121 - Beaumont Park ‘As approved’ block plan - 197 dwellings

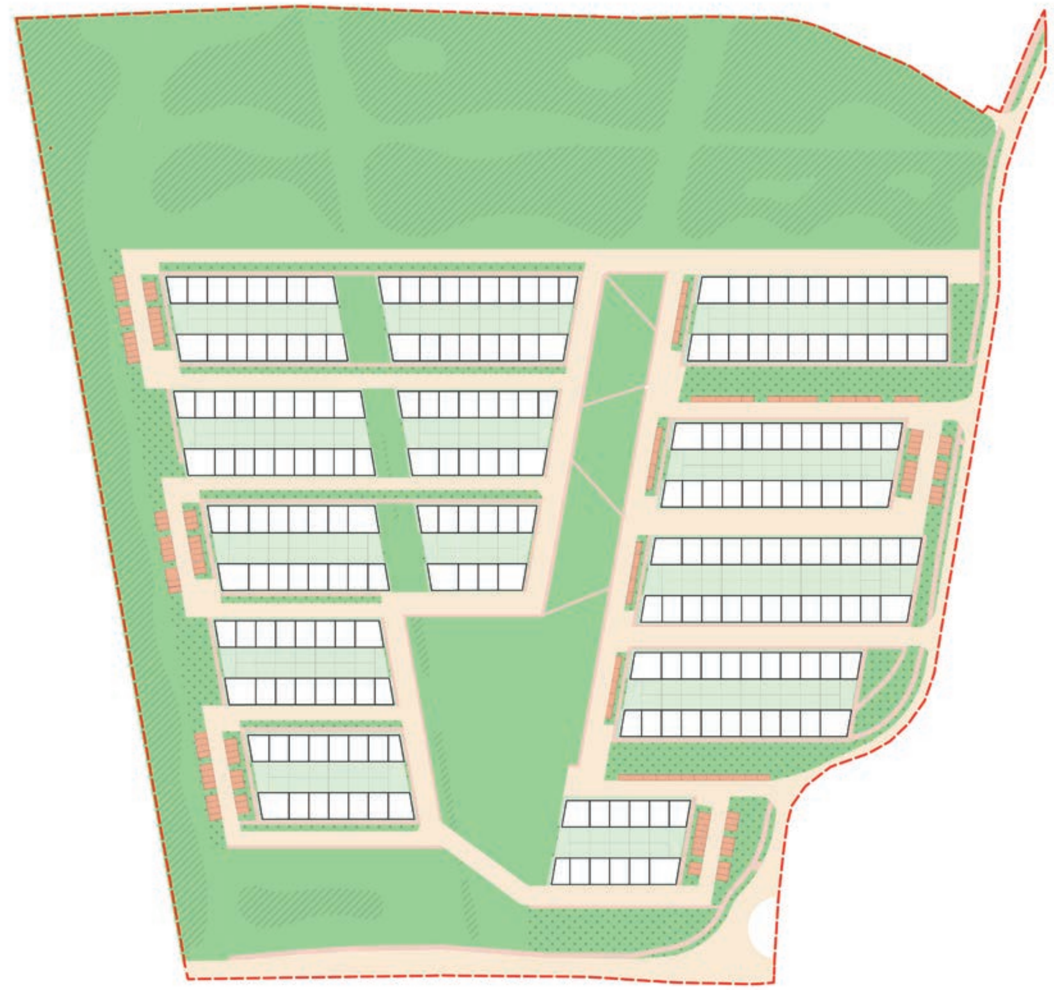


Fig. 122 - Beaumont Park ‘Alternative development exercise’ land budget data - 230 dwellings

In addition to a 17% increase in dwelling numbers, the comparative land budgets at Beaumont Park demonstrate a significant reduction of surface car parking from 8% to 2%. This is the result of using the typology with an integrated garage which provides one on-plot parking space in place of the detached garages, rear parking courts and front gardens. This parking space is absorbed into the footprint of the building.

The replacement of the Beaumont Park typical block with a Lime Tree Square typical block resulted in the increase of buildings from 12% to 16% and reduction of the private amenity space nearly by half. This figure, however, does not account for the integration of a deck or terrace at level 01, which would ensure each dwelling benefits from 2 x smaller private amenity spaces, as opposed to a single rear garden.

Although the surface parking was significantly reduced, the proportion of roads in the scheme has increased due to the increased density of blocks. Another reason this figure is higher is the prevalence of additional shared surfaces, which increases the amount of road area and reduces the amount of footpaths. This analysis suggests in order to further reduce the amount of space occupied by roads, revisions to highways design standards are required.

The application of compact blocks allowed for a significant uplift of usable green space which can be used to increase biodiversity and create a quality recreational space. The amount of verges / buffers also increased, which could be used to incorporate sustainable urban drainage or rain gardens.

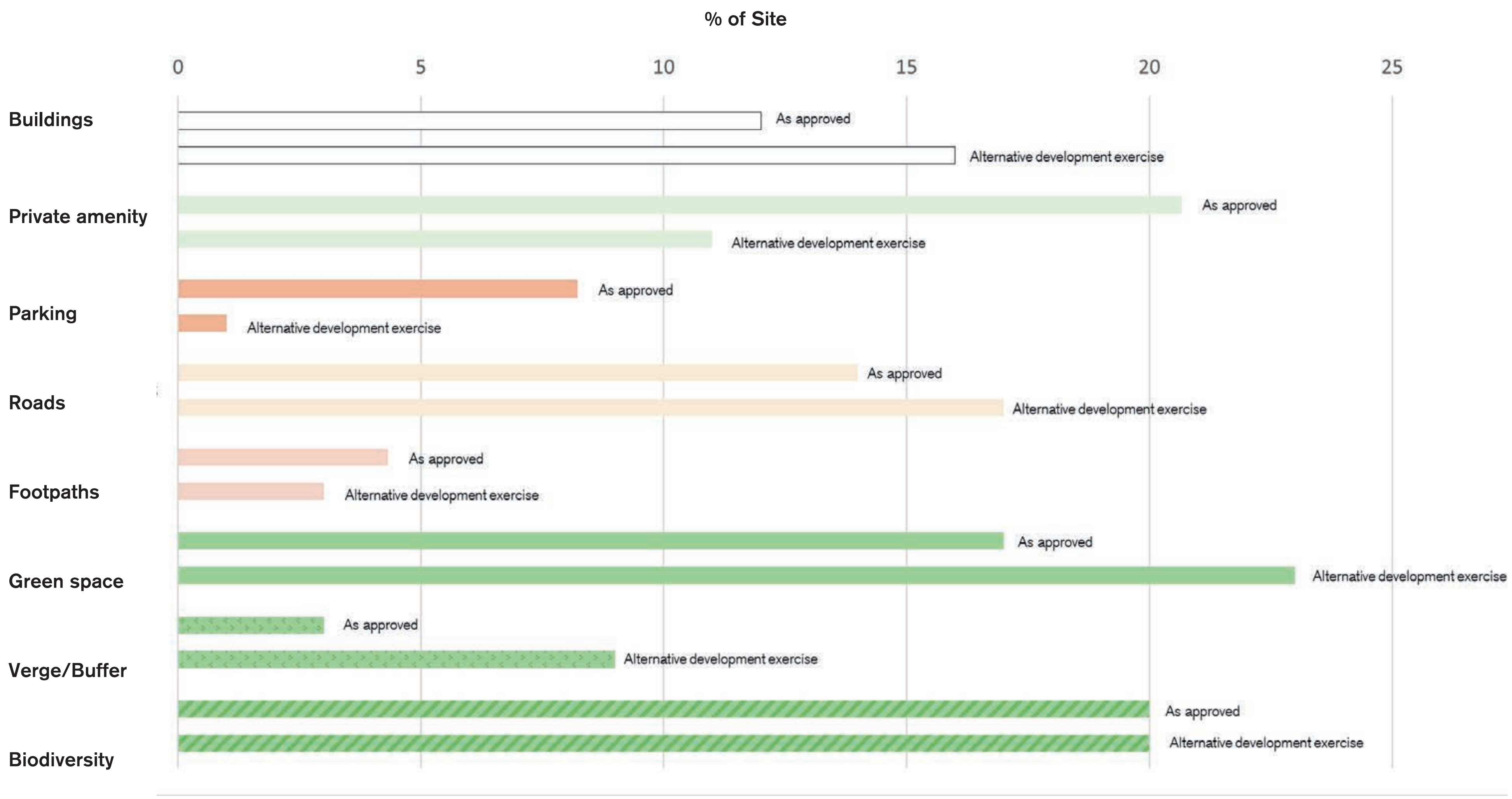


Fig. 123 - Bar chart comparison of the land budget analysis of Beaumont Park 'As approved' vs 'Alternative development exercise'.

6.4 The potential financial benefits of compact development

	As Approved				Alternative redesign				Alternative redesign with higher quality public realm				
	Percentage	Area (m2)	Assumed cost per sqm	Total cost	Percentage	Area	Assumed cost per sqm	Total cost	Percentage	Area	Assumed cost per sqm	Total cost	Value of increase of cost per sqm
Homes	12%	9240	Excluded from calculation		16%	12320	Excluded from calculation		16%	12320	Excluded from calculation		
Private amenity	21%	16170			11%	8470			11%	8470			
Parking	8%	6160	£82.23	£506,536.80	1%	770	£82.23	£63,317.10	1%	770	£150.00	£115,500.00	182%
Roads	14%	10780	£178.54	£1,924,661.20	17%	13090	£178.00	£2,330,020.00	17%	13090	£195.00	£2,552,550.00	110%
Footpaths	4%	3080	£202.69	£624,285.20	3%	2310	£202.69	£468,213.90	3%	2310	£219.00	£505,890.00	108%
Green space (inc trees and play)	17%	13090	£52.00	£680,680.00	23%	17710	£52.00	£920,920.00	23%	17710	£55.00	£974,050.00	106%
Verge buffer	4%	3080	£41.00	£126,280.00	9%	6930	£41.00	£284,130.00	9%	6930	£52.00	£360,360.00	127%
Existing woodland (biodiversity)	20%	15400	Excluded from calculation		20%	15400	Excluded from calculation		20%	15400	Excluded from calculation		
Total	100%	77000		£3,862,443.20	100%	77000		£4,066,601.00	100%	77000		£4,508,350.00	
Total number of homes				197				230				230	
Approx infrastructure cost per unit				£19,606.31				£17,680.87				£19,601.52	

The table presented above provides a high level estimate of the landscape and infrastructure costs for the following three scenarios:

1. Beaumont Park, as approved
2. Beaumont Park, as redesigned
3. Beaumont Park, as redesigned with higher quality materials in the public realm

High level costs for each component of the land budget analysis (parking, roads, footpaths, green spaces and verge / buffers) were derived using costs ratios per square meter obtained from Spon's Price Guide, 2023.

Whilst the redesigned scenario does yield a higher total cost of landscape infrastructure, this is significant offset by the higher number of homes provided, yielding a lower "approximate infrastructure cost per unit". This indicates the redesigned scheme could provide more financial viability, which could then in turn be invested in higher quality materials used in the public realm, as set out by the third set of figures in the table above.

A scheme with higher quality materials used in the public realm is likely to generate higher sales values, which could result in increased profitability.

The figures above are not intended to constitute an accurate cost plan and are highly illustrative only. The cost rates per sqm have been based on the following high level assumptions:

Roads

- 0.5m excavation required for all carriageways, with waste taken off site
- 350mm type 1 base
- 75% of carriageway surfaced in Bitumen, 25% surfaced in Natratex (note the higher quality landscape alternative assumes a higher proportion of alternatives to bitumen)
- Concrete kerbs between road and footpaths

Footways

- 0.25m excavation required with waste taken off site
- 150mm type 1 base
- Surfaced in a mixture of resin bound gravel and reconstituted stone paving

Parking

- 0.3m excavation required with waste taken off site
- 250mm type 1 base
- Surfaced in asphalt (note the higher quality landscape alternative assumes the use of paved slabs)

Green spaces

- Incorporation of a LEAP area for children between 3-8, with an approximate activity zone of 400m2, with 5 types of play equipment
- Landscaped area incorporates 70% turf and trees, with imported topsoil to turf areas. 30% planting includes trees and shrubs

Verges

- Turf with some planting to mitigate internal roads
- Higher quality landscape alternative assumes integration of SUDs

Section 07

Conclusions and emerging recommendations

7.0 Conclusions and emerging recommendations

7.1 Introduction

The alternative development models explored in Section 05 of this study are not revolutionary in their own right, nor does any single case study provide a comprehensive template upon which to base a more alternative development model.

However, by extracting relevant elements from each of the case studies examined it is possible to construct a comprehensive framework for how best to promote development in Essex that delivers for both people and planet.

As set out in sections 01 and 02 of this document, understanding the opportunities and constraints of development at different scales is crucial to creating a strategy that can be implemented. Similar forms of design guidance that seek to reduce the dominance of the private car have concentrated on the possibilities of new settlements. Whilst these endeavours are valid, attention must also be given to the hundreds of smaller applications coming froward across the County, which collectively make up the majority of growth in Essex.

In response to this, the study suggests two forms of emerging recommendations:

1. A series of **universal design principles** that can be applied to all new development across Essex, regardless of scale, typology or location. Whilst the ideas set out by these universal design principles are all interlinked and should be read together; they have been categorised into three distinct groups:
    - Built form
    - Landscape and open space
    - Highways and movement
2. A series of **scale specific design principles** that should be embedded on development sites of certain sizes. It's important to acknowledge that whilst the critical mass of larger scale new garden communities presents a wider array of potential solutions, many solutions remain untested and have yet to be realised

Separating emerging recommendations in this way seeks to de-risk the delivery of more alternative forms of development, by ensuring potential solutions are not contingent upon a single type or scale of development.

Fig. 124 - Accordia, in Cambridge. Is it possible to make this quality of housing development the standard across Essex, rather than the exception?

Image source: Grant Associates

7.2.1 Promoting compact built form

The analysis in Section 06 demonstrates higher density schemes are crucial to improved environmental outcomes, promoting walkability and improving project viability. This section sets out how greater density and more compact built form might be achieved.

7.2.1.1 Revision of back-to-back distance requirement and promotion of more varied forms of private and semi private amenity

The 22m/25m back-to-back distance is enshrined within the Essex Design Guide and is well-established within the English planning system. This guidance is underpinned by principles on density and privacy established in the decades following the Second World War to liberate communities from inner-city pollution and overcrowding. It's widely adopted in suburban development throughout the UK and forms a bedrock of the "conventional development model". Whilst it can be effective at maintaining privacy and ensuring each resident has access to private amenity, the strict adherence to this rule has a number of other significant consequences, including limiting densities which in turn promotes car based urbanism.

Rather than using long-established back-to-back distances as a fixed rule, policy makers should consider whether deeper private gardens constitute the most appropriate design configuration in the context of limited land supply, the ongoing housing crises and climate breakdown.

The exploration of alternative case studies demonstrates alternative design solutions are available, and compact development is capable of providing high quality private amenity spaces. Greater emphasis should be placed on the usability of private amenity spaces, rather than depth alone. The depth and quality of amenity space are not directly correlated, especially given emerging trends to convert areas of grass to hard standing or artificial turf, both of which have negative effects on biodiversity, surface water flooding, and urban heat island effects.

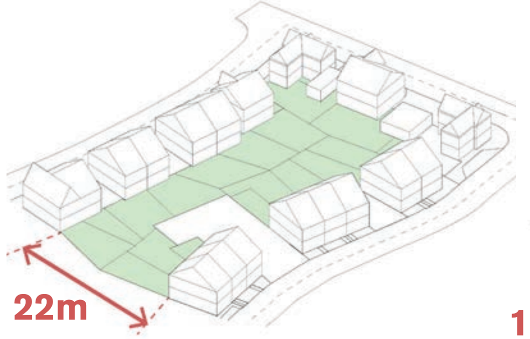


Fig. 125- Extract from Beaumont Park typical block

Back-to-back dimension: 22m
Average garden depth:11m

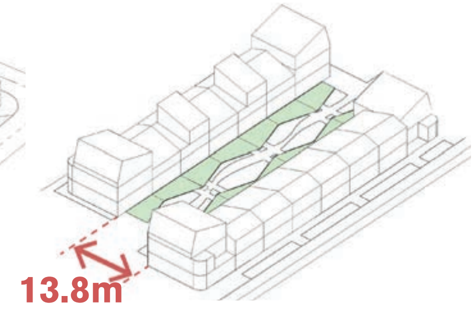


Fig. 126- Extract from Goldsmith Street typical block

Back-to-back dimension: 13.8m
Average garden depth: 4.7m

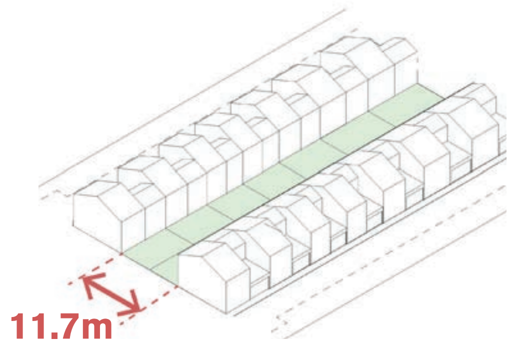


Fig. 127- Extract from Lime Tree Square typical block

Back-to-back dimension: 11.7m
Average garden depth: 6.5m

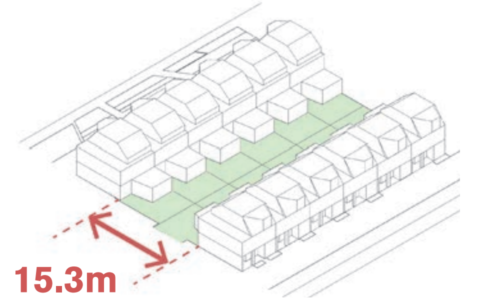


Fig. 128- Extract from Knights Park typical block

Back-to-back dimension: 15.3m
Average garden depth: 8m

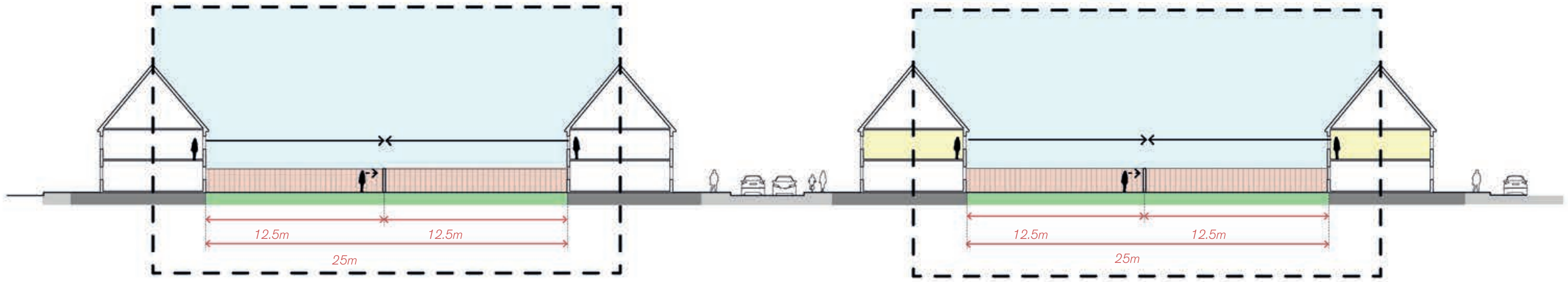


Fig. 129- Diagram of the development model based on back-to-back distances in Essex Design Guide - not to scale

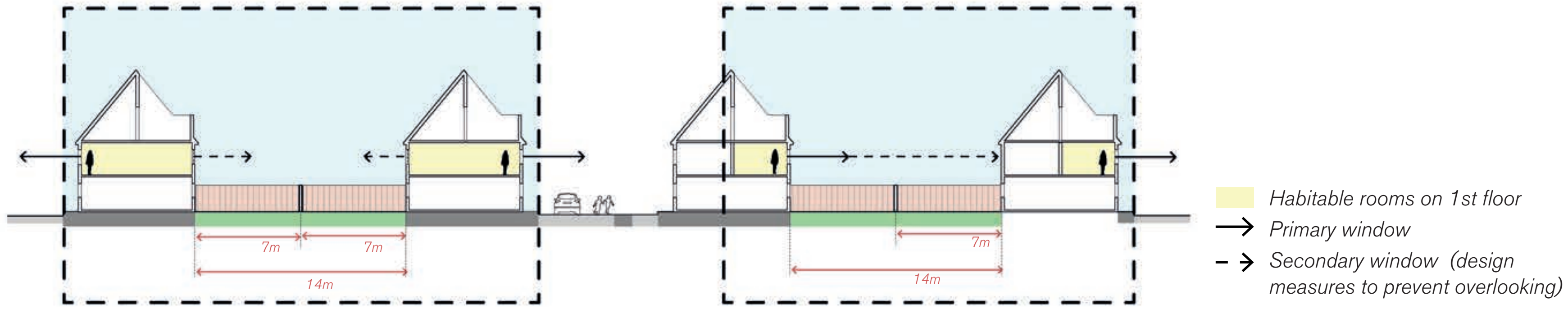
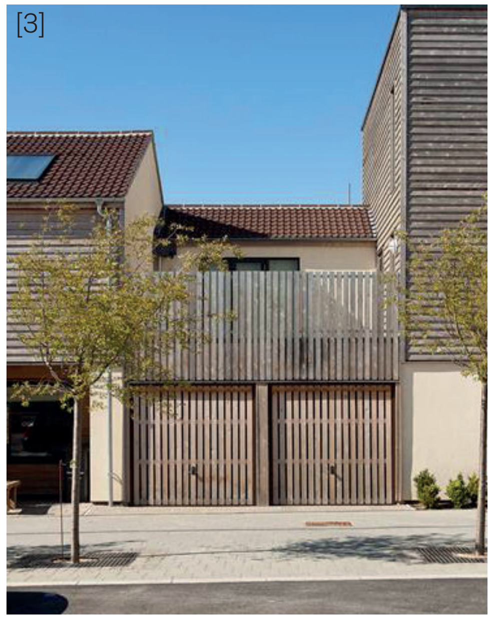


Fig. 130- Diagram of the development model based on back-to-back distances and amenity terraces in Goldsmith street and Lime Tree Square. The section illustrates how facades might be calibrated to maintain privacy, how first floor terraces could compensate for smaller garden sizes, and how south facing only habitable rooms at first floor allow more compact gardens - illustrative only, not to scale

Fig. 131- When combined with narrow frontages and the need to provide multiple on plot car parking spaces, the privacy distance requirement often results in long and narrow gardens. These configurations are widespread in new development and do not necessarily provide spaces that lend themselves to a wide array of functions such as growing food or play.

Images source: Twitter



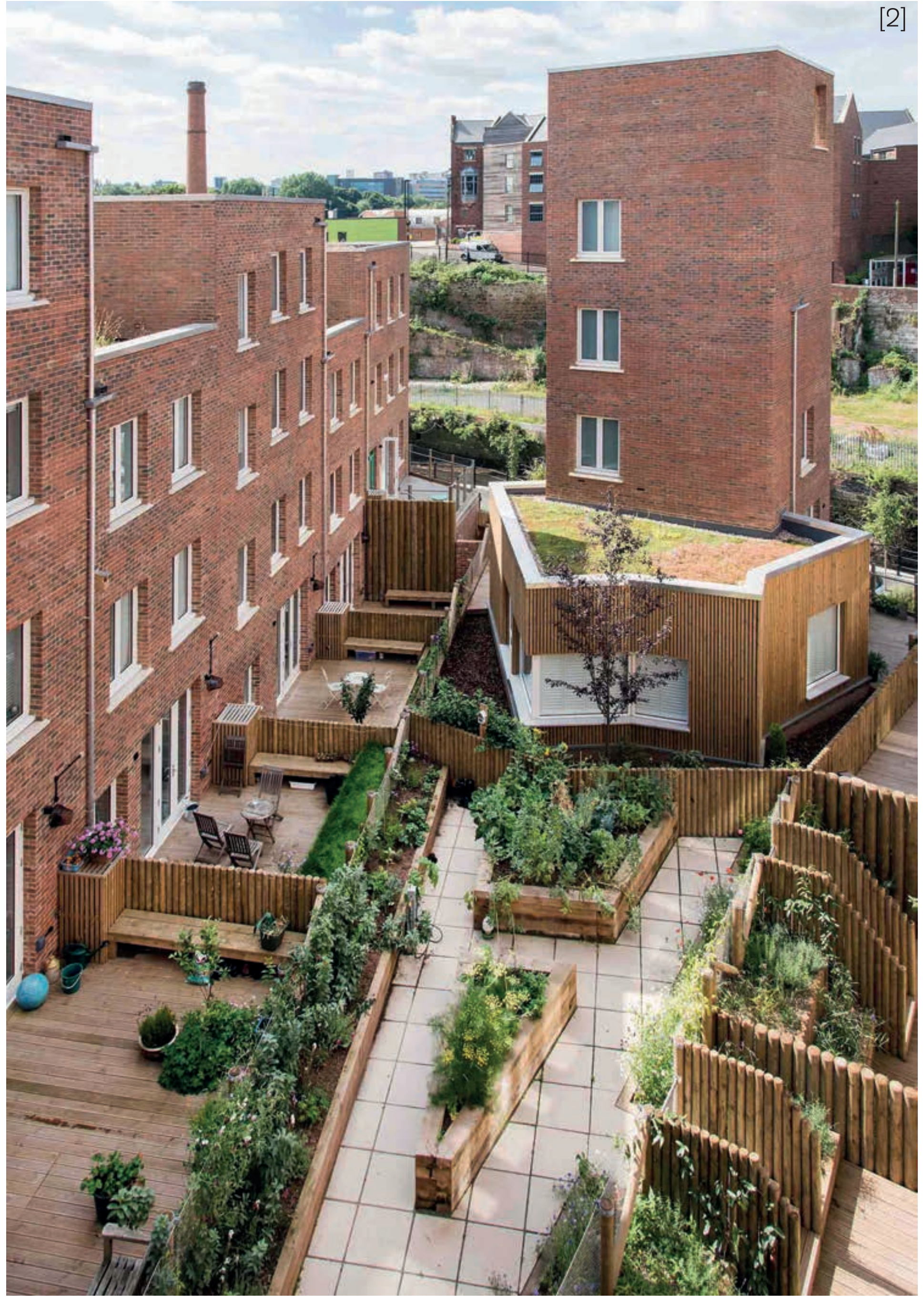


Fig. 132-135 - A selection of alternative ways of providing private and semi private amenity spaces. 1 - a series of courtyards and terraces at Moray Mews, by Peter Barber Architects. 2 - modest gardens with a shared courtyard which could be used for growing food, at the Malings by Ash Sakula Architects. 3 - first floor terraces that front the street, at Lime Street Square by FCB Studios, ensuring every resident has access to north and south facing amenity spaces.

Images sources: Peter Barber Architects [1], Ash Sakula Architects [2], FCBS [3]

7.2.1.2 Distribute amenity, play and parking from the plot to the street

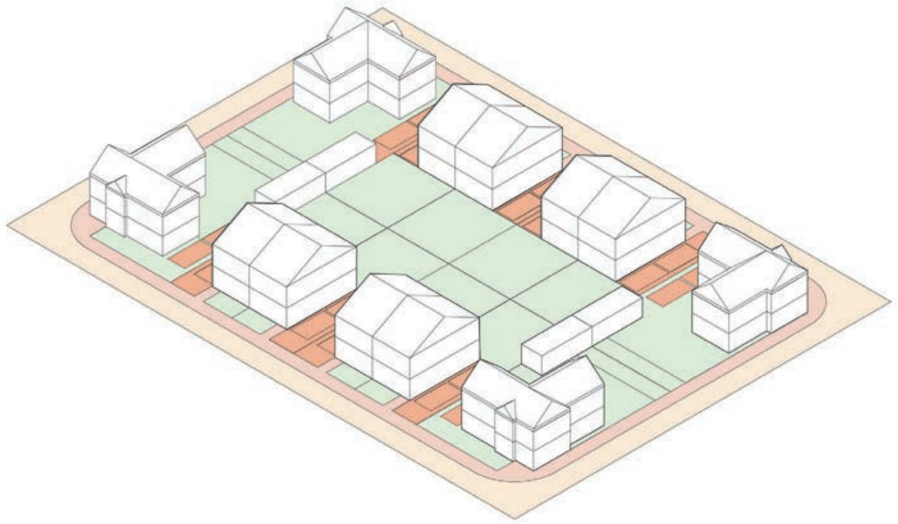
The conventional development model is underpinned by a binary demarcation between the private plot and public street, as provisions for amenity, play and parking are all accommodated in private land. This approach leads to sub-optimal provisions, as rear gardens meet no quality threshold and allocated parking dominates the plot and streetscape. By placing more emphasis on shared resources at the street, block and neighbourhood levels, new housing taking more compact forms can provide greater quantities and higher quality shared amenity spaces with additional benefits for biodiversity. This would help facilitate door-step play in the public realm, whilst compact urban forms improve density and viability.

A greater proportion of shared, unallocated parking would provide more efficient use of scarce land. Appropriate parking ratios need to be carefully considered on a site by site basis, to ensure residents do not end up parking illegally as there is insufficient access to shared spaces, or preferably, a car share scheme. Effective control and management is crucial in creating a successful scheme. To reduce the demand for private cars, active modes of transport should be promoted above the storage and movement of motor vehicles.

Fig. 136 - Door step play integrated within planted spaces outside terraced housing in Elephant Park

Image source: National Design Guide

Conventional development model



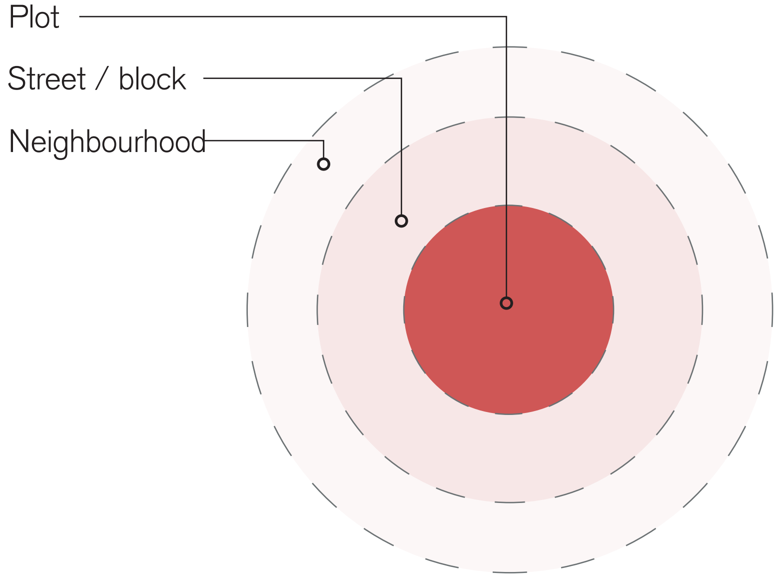
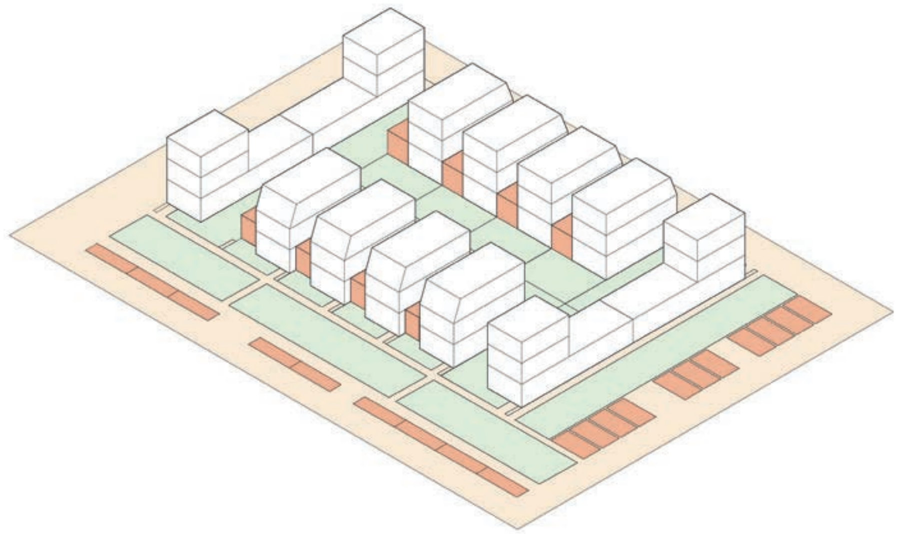


Fig. 137: Conventional development model: Play, amenity and parking are all contained within the plot, with no provisions at the street or block

Alternative development model



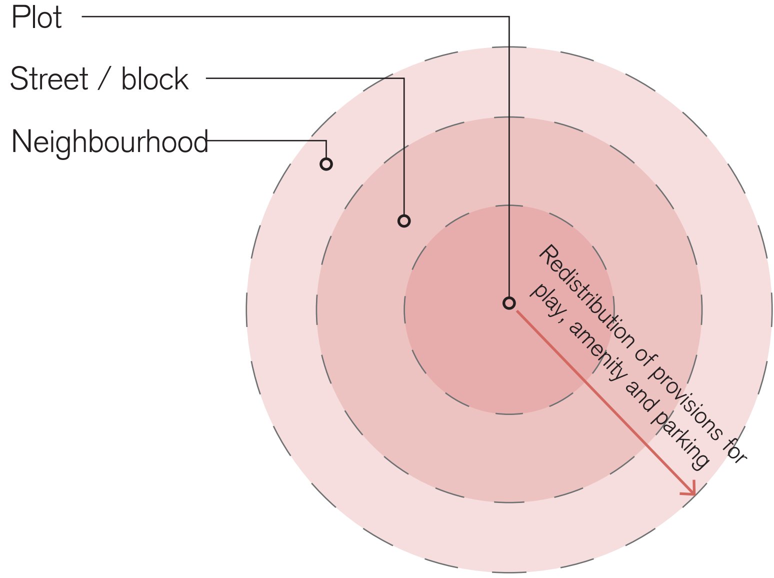


Fig 138: Alternative development model: Play, amenity and parking are distributed between plot, street and neighbourhood, providing higher quality and quantities of play and amenity spaces

7.2.1.3 Require a maximum "Form Factor"

Compact development has the potential to improve the energy efficiency of housing stock as terraced houses have the lowest form factor in the context of single-family dwelling typologies. Form factor is a comparison of the efficiency of the building from (the external surface area) relative to the useful floor area.

Compact development form can be encouraged among developers by introducing a maximum form factor requirement as part of the Essex Design Guide. This would help embed Passivhaus design principles at the earliest stage of the design process.

To address the issue of the dominance of cars within the streetscape, the provision of high-density terraced housing needs to be dovetailed with alternative mechanisms for accommodating the car, as set out later in this chapter. Controlling form factor has the potential to encourage housebuilders to move away from the conventional development standard that promotes tandem parking on either side of two semi detached units (as shown below).

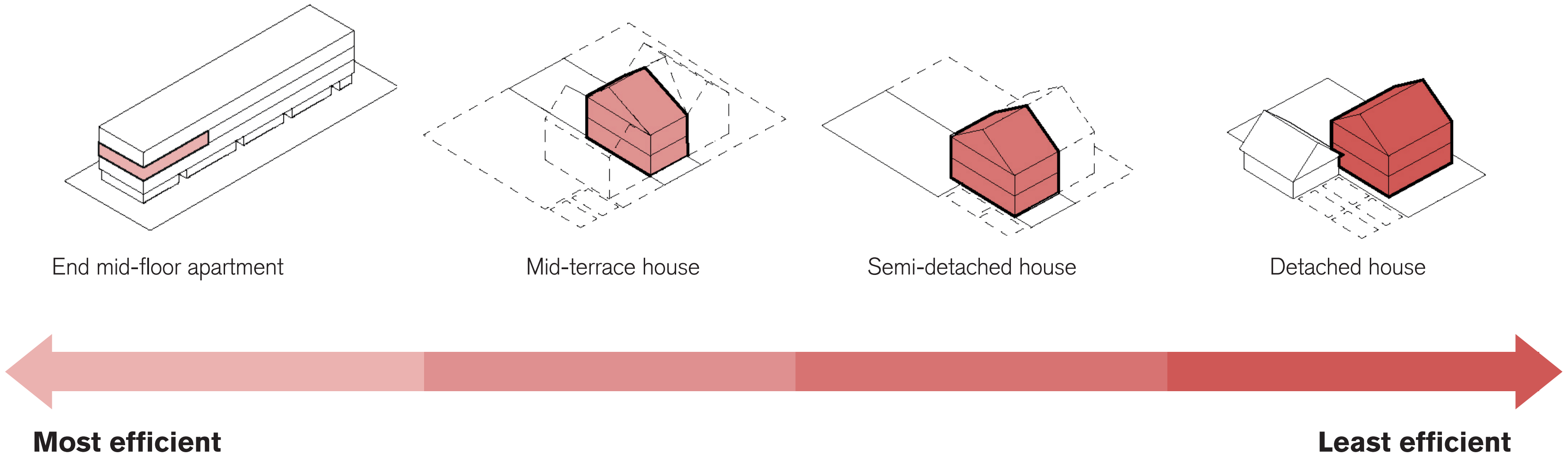


Figure 139 - The predilection of semi detached housing flanked by stacked parking limits densities and efficient form factors, as well as breaking up street frontage

Image source: Google streetview

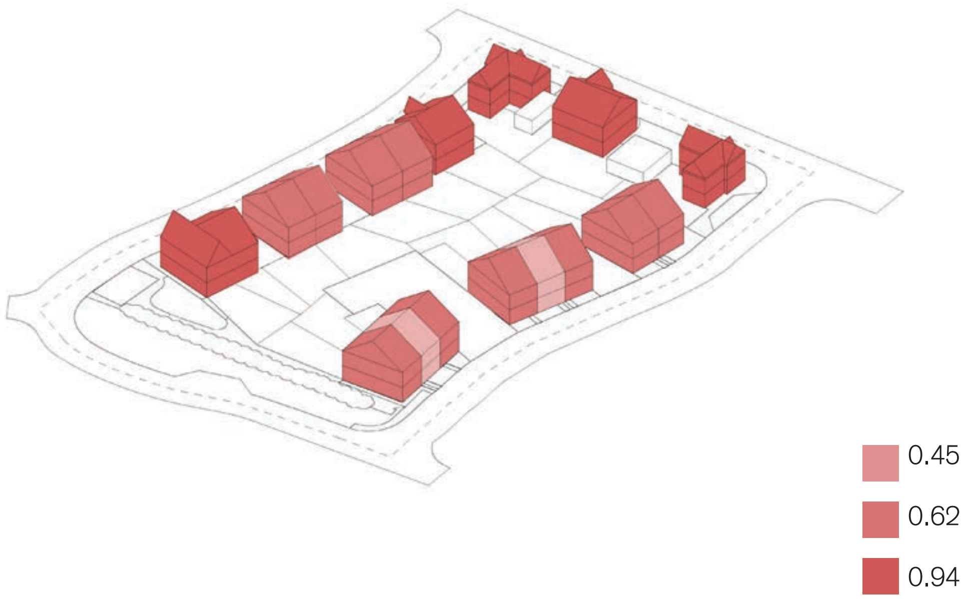


Fig. 140 - Estimated form factor of the semi-detached, detached and mid terrace typology in a typical block of Beaumont Park.

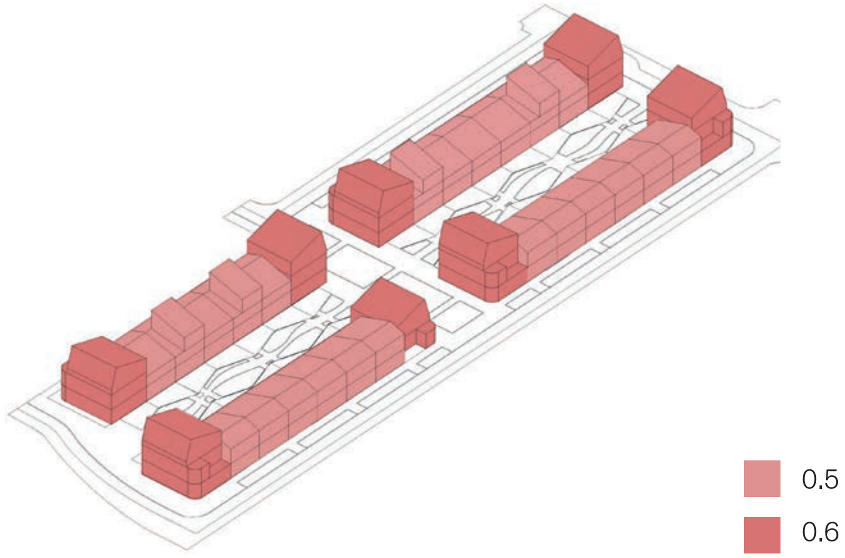


Fig. 141 - Estimated form factor of the typical mid-terrace and corner terrace house in a typical block of Goldsmith Street, which meets Passivhaus standards

7.2.1.4 Promote development orientated for optimum solar aspect

There is a tendency in the conventional urban design "best practice" to view the orientation of building form to optimize solar aspect as being at odds with a townscape-led approach. Goldsmith Street - a Stirling prize winning project - demonstrates that these two aims are not contradictory. East-west orientation prioritises solar aspect, whilst accentuated corners create a varied and interesting townscape.

In the context of climate change and predictions of frequent extreme heat waves, the management of the of overheating should be a crucial consideration for new development.

The section drawing below produced by Mikhail Riches Architects for the Goldsmith Street project (Fig. 144) demonstrates the potential of the deep window revealed in the new developments providing shading from the summer sun, whilst roof pitches can be formed to allow warming winter sun. Emerging design guidance should embed Passivhaus principles at the earliest possible stage, including site planning and orientation.

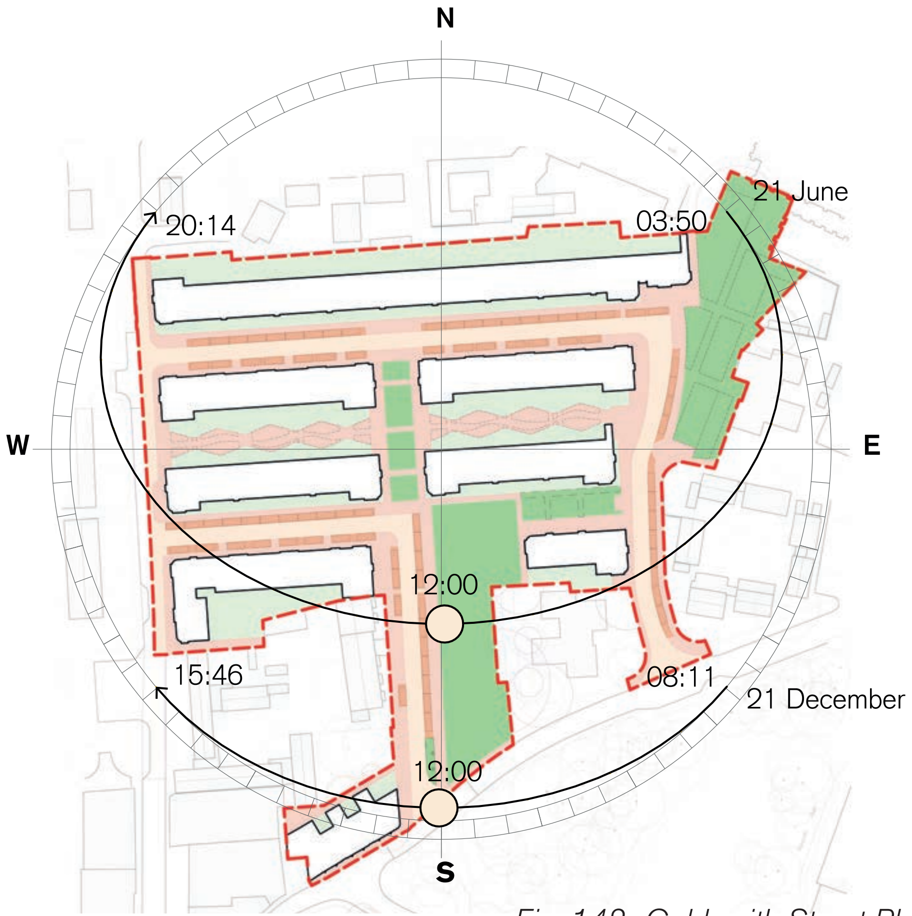


Fig. 142- Goldsmith Street Plan

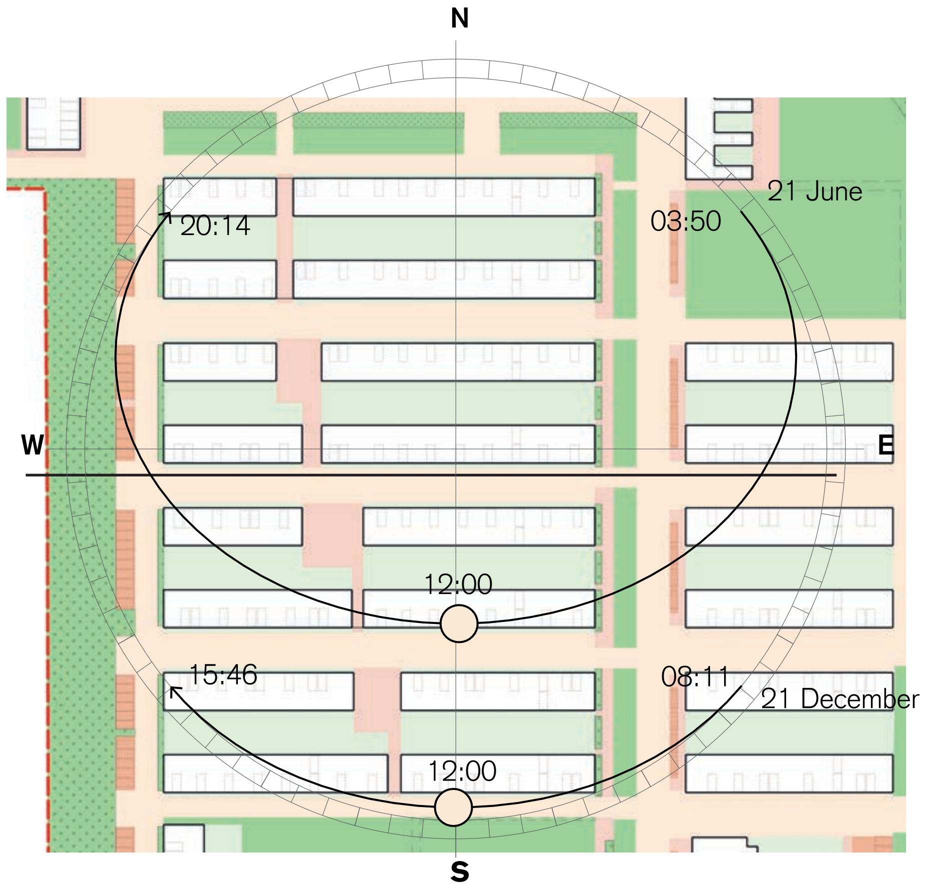


Fig. 143- Lime Tree Square block plan

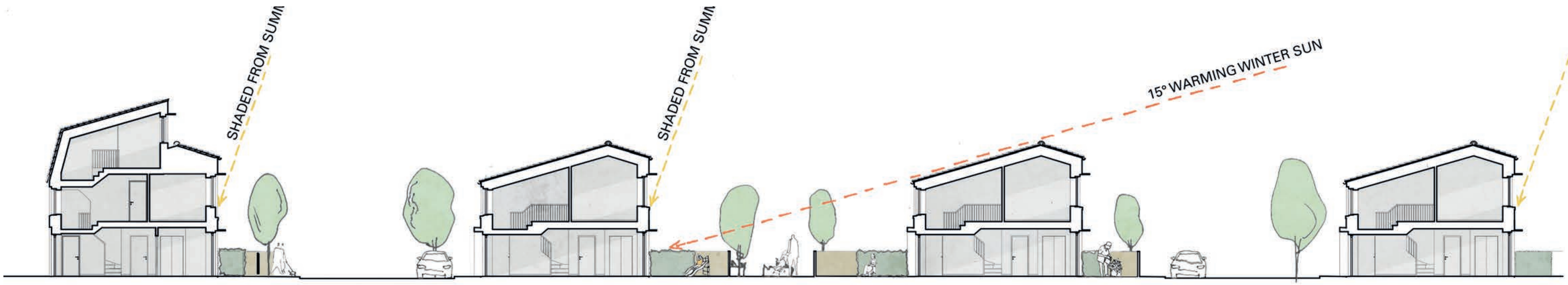


Fig. 144 Goldsmith Street Section by Mikhail Riches Architects

Image source: Mikhail Riches Architects

7.2.2 Landscape and open space

7.2.2.1 Recognise larger private gardens do not guarantee an increase in biodiversity

As set out previously, the Essex Design Guide focuses on the quantum of private amenity space, with very limited control over the quality of space provided. Private gardens are often characterised by mown lawns, artificial turf and closed panel timber fences which do not offer significant biodiversity value at the point of practical completion.

Additionally, as the space is in private ownership, Local Authorities have no mechanism to maintain quality or performance standards and are not able to prevent residents from modifying spaces in ways that harm biodiversity (e.g., using artificial turf to replace grass or plants). Given the limited biodiversity value and lack of control over the rear gardens, the Design Guide should place more emphasis on the role of public green infrastructure in meeting biodiversity targets.

The proposed compact development model aims to increase the overall provision of public green open space, in part by providing more modest private gardens, to increase the overall levels of biodiversity and the quality of recreational space. The emerging policy should differentiate between biodiversity values within public and private ownership and encourage the retention of the existing green infrastructure or provision of new trees and hedgerows in the public realm so that these assets can be maintained and enhanced.

Fig. 145 - aerial views of a newly completed scheme in Essex which illustrates every single rear garden is devoid of mature vegetation

Image source: Google Maps

7.2.2.2 Illustrate how compact development can help achieve biodiversity net gain

Through an amendment to the Town and Country Planning Act 1990, the Environment Act - which received Royal Assent in November 2021 - will introduce a mandatory requirement for all planning permissions to be conditional upon the submission of a Biodiversity Gain Plan for approval by the relevant Local Planning Authority. The Plan will need to demonstrate a net gain of at least 10% in the biodiversity value of the development site.

Biodiversity Net Gain seeks to leave the biodiversity of a site in a better state than before development started. Where development has an impact on biodiversity it encourages developers to provide an increase in appropriate natural habitats and ecological features over and above that being affected.

Although these provisions are expected to come into force in November 2023, the promotion of an alternative, compact, development model for Essex presents several opportunities to deliver greater biodiversity benefits. Specific guidance on the delivery of BNG would need to be the subject of a separate, focused study that explores the best practice and is underpinned by research. The high-level objectives for this study and guidance could include:

- Shifting the focus of historic policy guidance that has concentrated on the quantum of open space, with relatively limited attention given to quality, and specifically, biodiversity value
- Exploring the potential for greater investment into natural and semi-natural open spaces, delivered as a result of higher development densities and more compact development footprints
- Assuming all biodiversity uplift should be provided on-site, with off-site mitigation a fall-back
- Investigating the benefits of overlapping landscape functions, where SUDs provisions that provide an uplift in biodiversity also act as play and amenity spaces (with sufficient provisions for safety)
- Promoting the use of features that promote biodiversity within buildings, such as green roofs and bird and bee boxes
- Ensuring any proposals for biodiversity are comprehensively costed and accompanied by a maintenance plan (where appropriate)

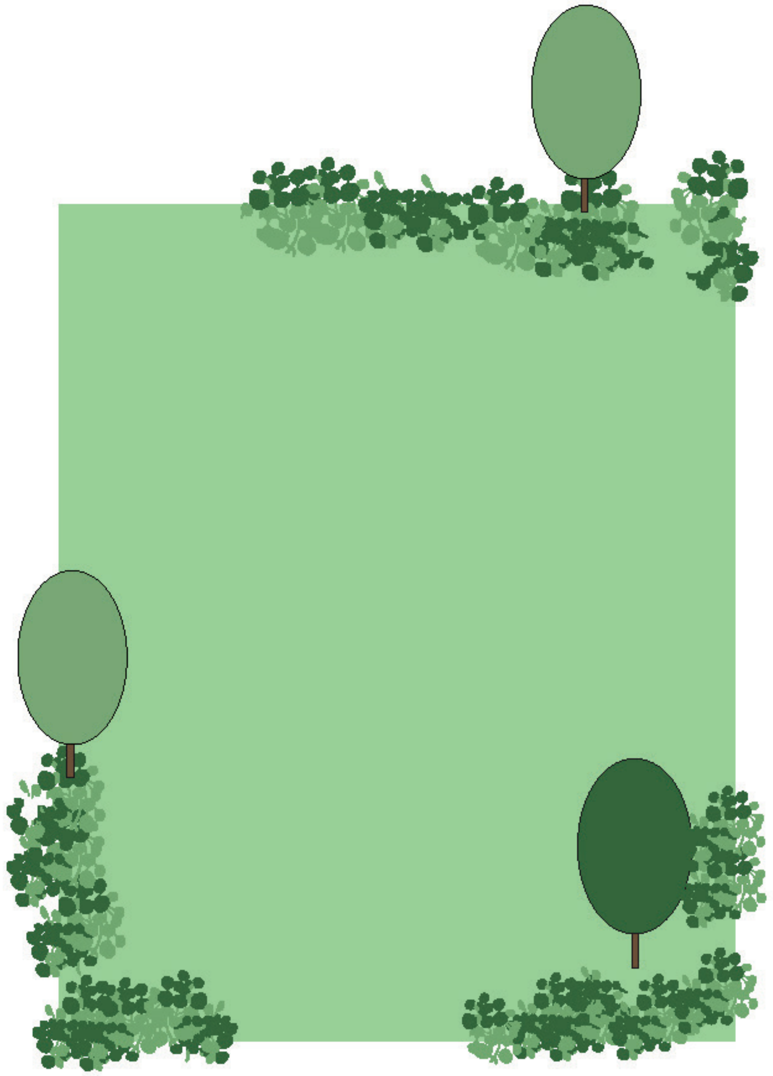


Fig.146- Biodiversity before development

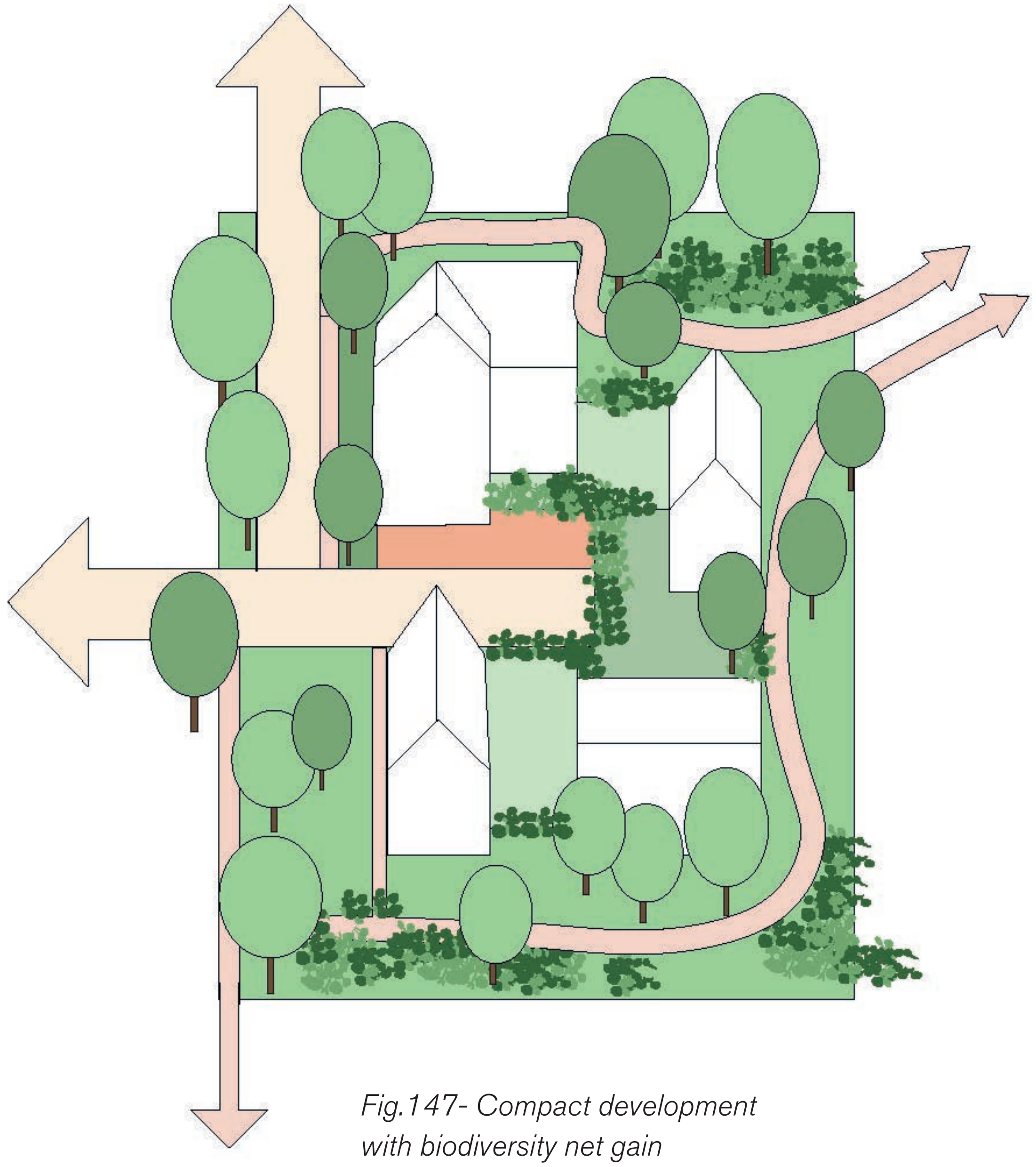


Fig.147- Compact development with biodiversity net gain

7.2.2.3 Require a minimum Urban Greening Factor (UGF) to promote more green infrastructure

Compact development creates an opportunity to replace surface parking with green infrastructure. As part of revisions to the Essex Design Guide, Urban Greening Factor (UGF) could be used as a tool to set minimum green infrastructure targets for proposed development.

UGF measures the quality and quantity of green infrastructure. Calculations are based on a factor score assigned to a surface, which is derived from its potential for rainwater infiltration (UGF does not indicate biodiversity benefits - this is provided by BNG calculations as set out by the previous page). Sealed surfaces and permeable paving commonly used for roads, parking spaces and private drives have a UGF factor ranging from 0-0.1. The partial replacement of that space with alternative surfaces, such as grassland, ground cover planting or hedges has the potential to increase the factor to 0.4-0.6.

UGF calculations have been integrated into the new London Plan (2021), setting minimum targets for all major developments.

New development should look to enhance existing green infrastructure, as part of a landscape led approach to masterplanning. As well as limiting the amount of sealed surfaces, measures could include planting new street trees and hedgerows, and integrating SUDs. High UGFs created as part of a wider green infrastructure strategy have the potential to contribute to residents' well-being and promote a healthy lifestyle by encouraging active transport, cycling, and walking.

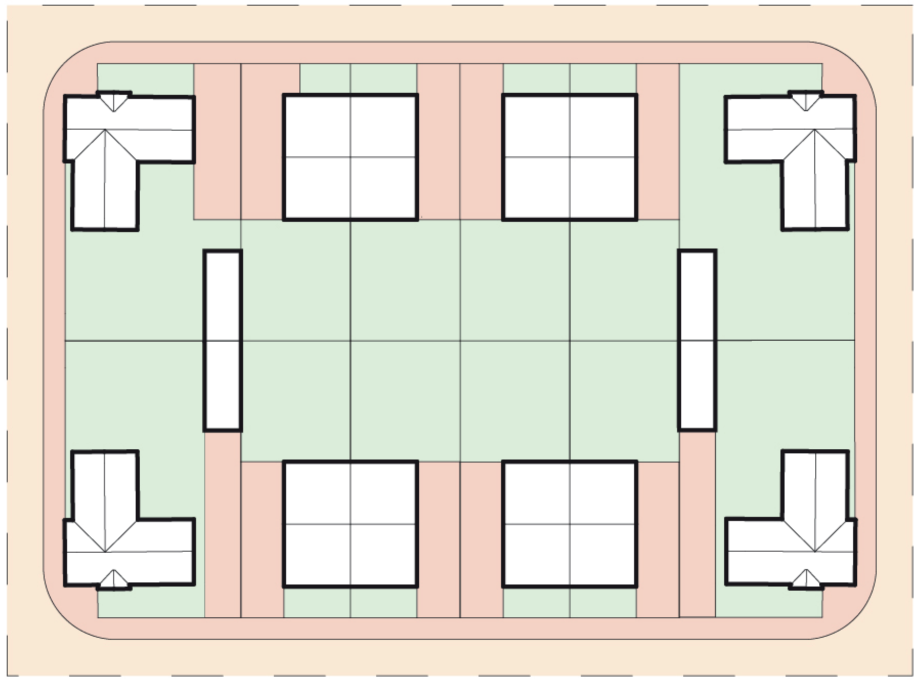


Fig. 148 - Urban Green Factors in conventional development (not to scale)

- Sealed surface
- Permeable paving
- Amenity grassland
- Wild-flower meadow
- Intensive green roof
- Proposed tree

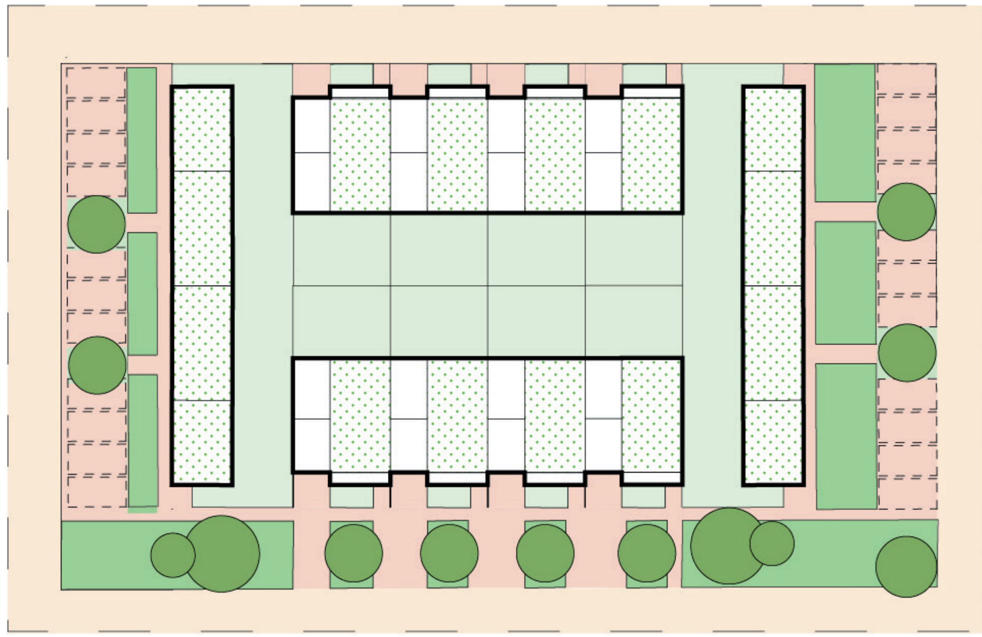


Fig. 149 - Potential Urban Green Factors in alternative development, which has a more compact footprint (not to scale)

7.2.3 Highways and movement

7.2.3.1 Promoting walkable streets and neighbourhoods

Fig. 150 - Illustrative diagram of cul-de-sac development (circa 1970-1990)

In the decades that followed the Second World War, new suburban development was designed around cul-de-sacs which promoted low density, car based urbanism. This form of development makes walking and cycling circuitous, and often unpleasant and unsafe.

Fig. 151 - Illustrative diagram of perimeter block development (circa 1990 - present)

Towards the end of the 20th century greater emphasis was placed on permeable block structures. However, because these block structures utilised high parking ratios and low densities, integrating non-residential uses within residential neighbourhoods is often unviable. Although walking routes are more direct, the quality and safety of journeys by foot or by cycle remains poor, as streets are poorly enclosed and environments are principally designed around the needs of the motor vehicle.

Fig 152 - Illustrative diagram of compact development (circa 2010 onwards)

The compact development model set out in this document presents a break from previous models. Walking and cycling is embedded into the plan through a comprehensive green infrastructure network, as pedestrian only routes benefit from continuous urban frontage (a configuration that is difficult to achieve in with the conventional development model). Higher densities create new opportunities for non-residential uses to be embedded within neighbourhoods, as more space can be given over to green amenity.

Indicates non-residential amenity

7.2.3.2 Integrating car-free streets whilst facilitating access for emergency services

Maintaining access for both blue badge parking and blue-light services is often presented as a barrier to developing innovative road layouts, as set out by the conventional development models explored to date. There are multiple examples of how streets can be developed for people and door-step play, with vehicular access limited to emergency vehicles and blue badge holders only.

The examples shown on the next page are from higher density urban schemes which are often car-free. One approach to facilitating this form of street in Essex is to utilise housing typologies that do not rely upon vehicular access at the front. This could be enabled by remote parking with limited parking on street for blue badge holders only, or parking to the rear as shown in the block plan below from Knights Park by Alison Brooks / PTEa Architects.

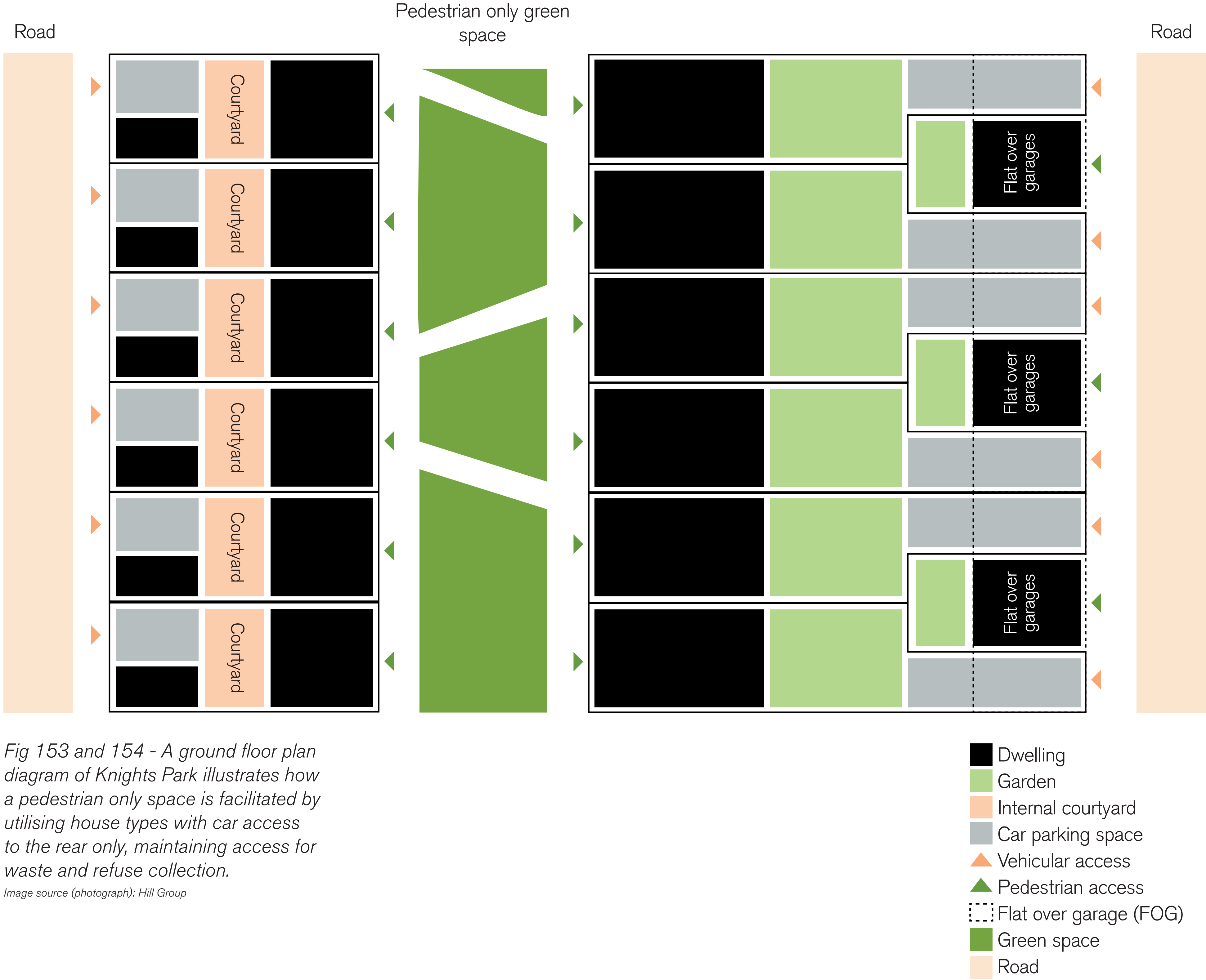


Fig 153 and 154 - A ground floor plan diagram of Knights Park illustrates how a pedestrian only space is facilitated by utilising house types with car access to the rear only, maintaining access for waste and refuse collection.

Image source (photograph): Hill Group

7.0 Conclusions and emerging recommendations

7.2 Universal design principles for a new development model

Fig. 155 - 157 - Murray Lane at Kings Crescent Estate (images 1 and 2) removes cars from the road enabling streets to be utilised as play spaces. Blue light services retain access by lowering bollards when required, as play equipment is easily moveable. At Marmalade Lane (image 3) road layouts have been configured to give pedestrian priority as vehicles have to move at very slow speeds. Pavilion Lane [4] utilises high quality materials and demountable planters to restrict road traffic, as movable bollards maintain emergency access.

Image sources: [1] -The Developer [2] -Karakusevic Carson Architects [3] -Mole Architects [4] -Google Street View

Marmalade Lane built by developers TOWN (designed by Mole Architects) incorporates a pedestrian friendly street, which has become the main play space for the resident children of the development.
The kerb-free surface and lack of fences to the back gardens creates a place which disrupts the typical hierarchy of a street. Benches as well as utilitarian elements such as bike and bin stores are used to organise the space, encroaching on the territory which may typically be designated for cars.

Where you might usually find parked cars is instead an open, pedestrianised lane where children's chalk doodles cover the tarmac, along with a 'swingball' pole and football goalposts, emphatically claiming the street as a place for play. Access for cars and service vehicles was planned for because the local planning authority requested a high level of visitor car parking spaces, however the resident community were committed to the design of a car free street, and have themselves managed vehicle access, using outdoor furniture and planters to restrict access.

Fig. 158 - Marmalade Lane co-housing development

Image source: Mole Architects / Jim Stephenson

Fig. 159 - Marmalade Lane co-housing development.

Image source: Mole Architects / David Butler

7.2.3.3 Revision of highways standards

The land budget analysis demonstrates that alternative development case studies do not necessarily reduce the proportion of the site dedicated to roads. As all development models are constrained by highway requirements such as turning heads and corner radii, significant deviation from long established rules remains challenging.

To maximise the benefits of the compact development model, including biodiversity net gain, Urban Greening Factor and financial viability, the spatial requirements for vehicular movement in the Highways Technical Manual should be reconsidered and revised accordingly.

The current guidance on street typologies is based on two-way vehicular roads and does not prioritise pedestrian movement. The street typologies include Minor Road (type F) - a 6m-shared surface for pedestrians and vehicles, and a local distributor (type A) – which includes segregated bicycles and pedestrian lanes. The emerging policies should consider a review of the standards in favour of more alternative typologies that give priority to pedestrians and cyclists, in a similar fashion to the precedents shown on the previous pages. The use of more one-way streets would reduce the amount of space occupied by roads, lowering embodied carbon and giving over more space to biodiversity.

Revised highways standards could be used to promote lower vehicular speeds in established residential roads, which could in turn reduce visibility splays allowing for more compact turning radii.

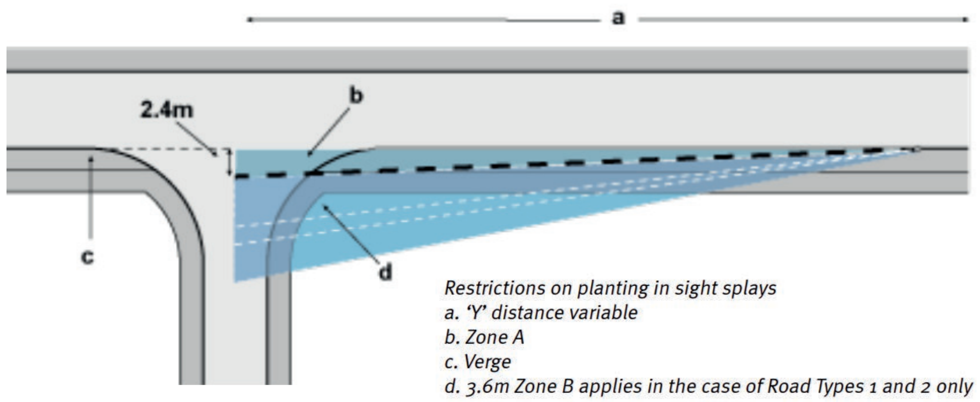


Fig. 160 - Faster vehicular speeds create a significant constraint on building frontages

Image source: Essex Design Guide

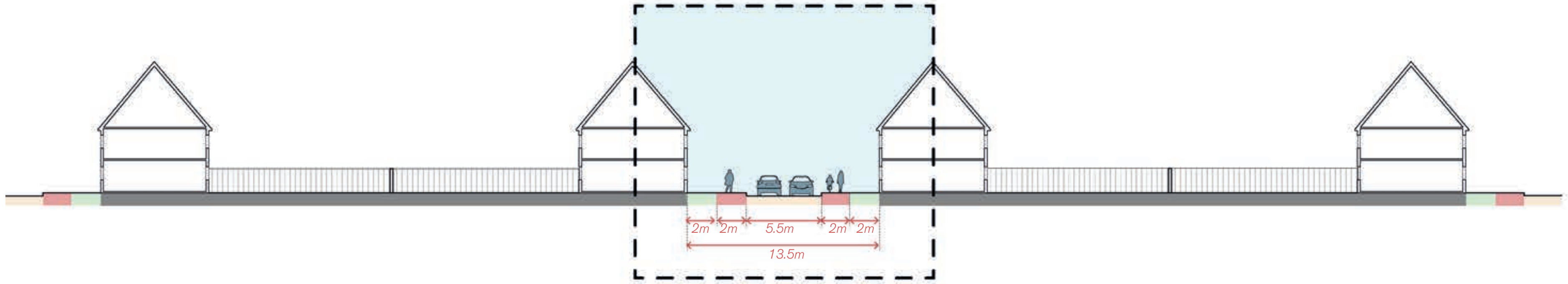


Fig. 161- Illustrative street section diagram based on the Conventional Development model which is compliant with current Essex Design Guide requirements (not to scale)

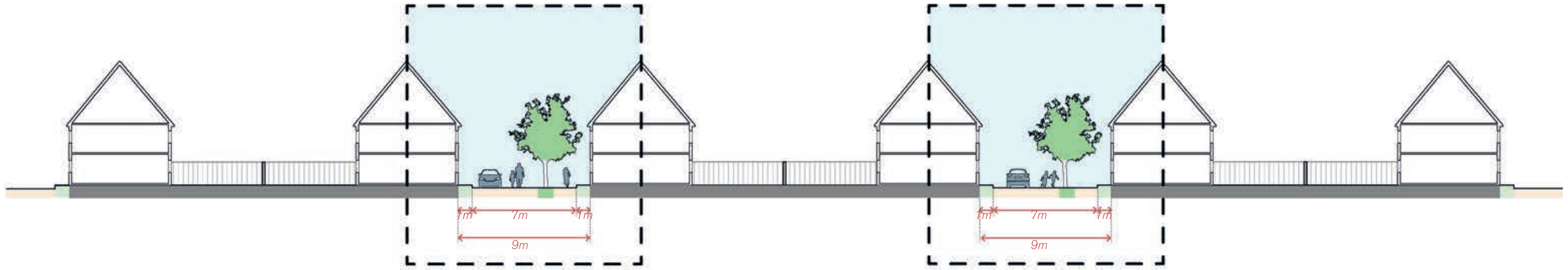


Fig. 162 - Illustrative street section diagram through scheme through the alternative development model which integrates blue and green infrastructure into shared surface streets with reduced vehicular movements (not to scale)

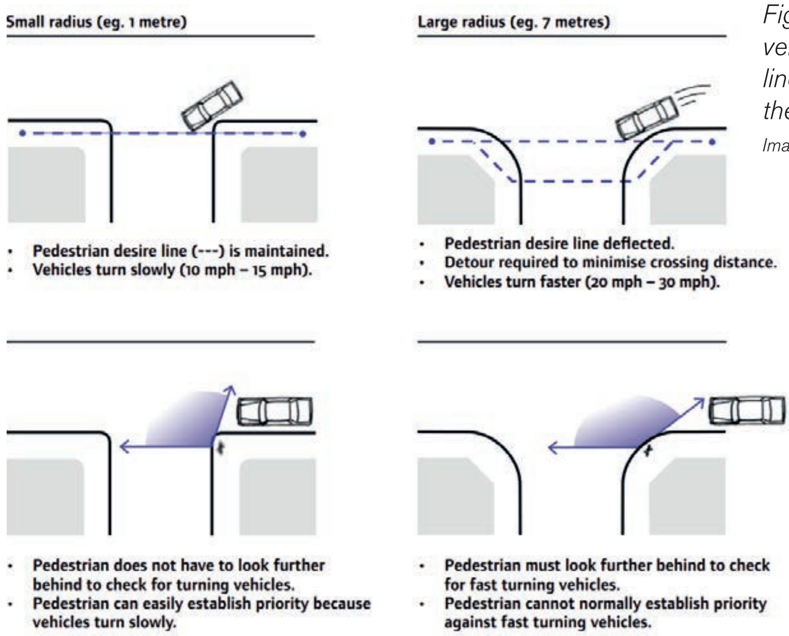
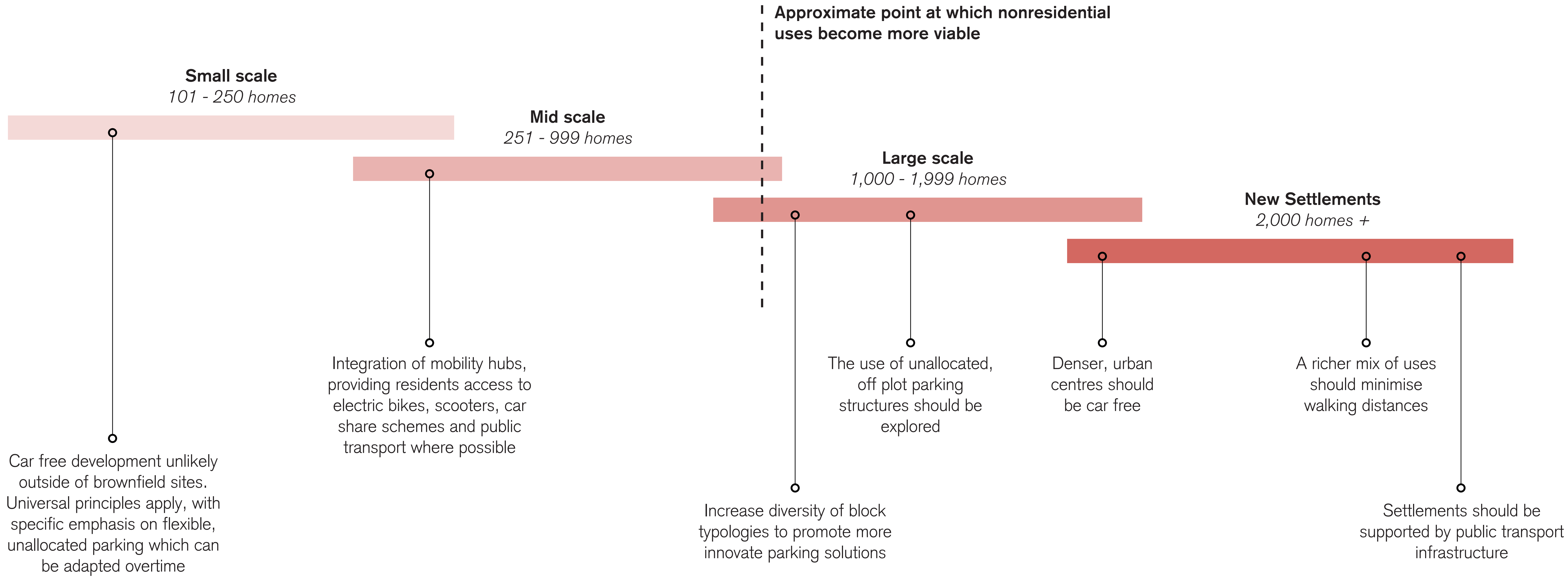


Fig. 163 - Larger turning radii and higher vehicular speeds effect pedestrian desire lines, requiring people to take detours as they cross roads

Image source: Manual for Streets / Devon County Council

There is scope to supplement the universal design principles set out previously with scale specific guidance that can be incorporated with development of specific quantum.

It must be emphasized that many solutions suggested below are speculative and remain untested. There is scope to incorporate them with emerging garden communities, particularly those at the earlier stages of development such as Tendring / Colchester or Dunton Hills.



7.0 Conclusions and emerging recommendations
7.4 The wider benefits of compact, walkable development model

This document sets out the immediate benefits of compact development, such as improving viability, walkability, biodiversity and development value.

Beyond this, however, there are a number of further, wider reaching potential benefits such as:

Lowering embodied carbon by reducing the amount of area for roads and hard standing within new housing development

Improved health and well-being for new residents by promoting active travel along green routes

Increased flexibility in the public realm, as areas for unallocated parking could be given over to green space if parking requirements where to be reduced in future

Greater adaptability of dwellings as integrated garages could be converted into habitable accommodate in line with a particular resident's needs

Reinforcing the viability of non-residential uses, as greater densities could create sustained demand for amenities and services such as "work-near-home" facilities

Integrating specialist housing into blocks and typologies that are more easily configured to the specific needs of a particular user group, such as the elderly or vulnerable users

Promoting active travel amongst children, by ensuring walking and cycling is the easiest, safest and most convenient way to get to school

As set out in the introduction, this document is not intended to inform formal design guidance or policy. Rather, it should form the basis of ongoing consultation with a range of public and private sector organisations to establish and overcome the barriers to compact, walkable development.

Fig. 164 - Photograph of Abode, Great Kneighton, where new homes are embedded within new green infrastructure

Image source: Proctor Matthews Architects

7.0 Conclusions and emerging recommendations
7.5 Next steps and further investigation

This evidence base Report has provided an introductory review, as well as overview of some examples of typical conventional development found across Essex, and explored how this development may be reimagined to be more walkable, legible and sustainable, contributing to climate change goals, place making and housing delivery.

The Report demonstrates how delivering more walkable neighbourhoods also have additional, wider place-making benefits that go beyond the immediate value of reducing car use, such as increased biodiversity, more usable public open space, better air quality, lowering embodied carbon as well as revealing commercial viability benefits through the potential to increase the number of dwellings within a well-planned, legible and cohesive development.

This work lays the foundation and principles of an alternative, re-imagined approach to conventional major development. There is now opportunity to build on this first stage research and explore in further detail the themes and ideas outlined, and to produce, alongside further evidence, an implementation guidance document that would help to ensure that new development in Essex is as sustainable as possible from a movement and transport perspective supporting the important and necessary transition to net zero carbon, improving public health, air quality, safety and community cohesion.

An implementation guidance document could, among other things, provide a 'how to' practical approach around the practical delivery of Walkable Neighbourhoods focusing on the use of specific design elements to achieve tangible outcomes against key principles and objectives of the perceived benefits of this type of approach to development.

Aspects that could warrant further enquiry and investigation as part of a further stage of study, and potential guidance document include:

- Clarity around the terminology setting out how appropriate Walkable Neighbourhoods are for the Essex context in relation to scale and walkable distances.
- Identify the characteristics of successful compact neighbourhoods, such as density, public transport access, land uses, street hierarchy and layout, etc and their inter-relationships with a view to application in Essex.
- Develop movement & place frameworks and street typologies to demonstrate visually how walkable neighbourhoods can be implemented within new developments.
- Provide guidance on distances to non-residential uses (schools, commercial, retail etc.) from all new dwellings within a development for different scales of development.
- Consider how the local highway network can be redesigned to reduce car orientated development whilst also facilitating access to properties by blue light vehicles, delivery vehicles for delivery of large/ heavy goods and people with disabilities.
- Consider how the street network and open space can be designed to provide more innovative forms of waste collection, given this is a key determinate of the current approach to road layout
- Consider in more detail how remote parking and mobility hubs could be practically and safely implemented.
- Develop key model policy template requirements for walkable neighbourhoods for local plans and relevant transport and highway policy documents.
- Consider how current key services and facilities may be redesigned or re-imagined to work practically in a car free environment (remote parking approach) to allow a scheme to fulfil all the functions to support a community
- Consider what the wider benefits and values are of a walkable neighbourhood approach, particularly in respect of re-purposing of land and land uses as well as exploring the wider social, health and environmental gains – in essence the added value to society of this type of approach to a development

Fig. 165 - Streets designed for active travel at Vauban, Freiburg
Image source: Cycling in Christchurch

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