

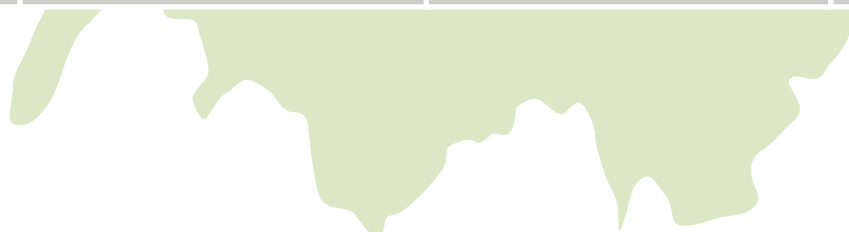
LONDON PLAN DENSITY RESEARCH

LESSONS FROM HIGHER DENSITY DEVELOPMENT

Report to the GLA

THREE DRAGONS with
DAVID LOCK ASSOCIATES
TRADERISKS
OPINION RESEARCH SERVICES
and JACKSON COLES

September 2016



Produced on behalf of the
GREATER LONDON AUTHORITY

GREATER
LONDON
AUTHORITY

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Contents

Executive Summary	4		
Purpose and scope of the study.....	5		
Who is living in the high density housing?.....	5		
Is London a high density city?.....	6		
Providing affordable housing in high density development.....	6		
Affordability and high density development.....	6		
Density and built form.....	7		
Building design and site layout	7		
Impact on the surrounding area	8		
The importance of scheme management.....	8		
Evidence of demand for high density living	9		
Economics of development and higher density schemes	9		
Potential solutions	9		
1 Introduction.....	12		
The study in context.....	12		
London Plan policy context	13		
Research tasks.....	15		
Limitations of the research.....	19		
Report structure	20		
2 Is London a high density city?.....	21		
International comparison of London's housing density	21		
Trends in scheme density and height of development.....	24		
Summary	28		
3 Affordable housing & affordability	29		
Affordable housing and development density - LDD overview.....	29		
Analysis of the affordable housing element of the case studies.....	32		
Affordability and demand.....	34		
Affordable housing.....	35		
Summary	37		
4 Density & development form.....	38		
Case study density characteristics.....	38		
Density and built form.....	40		
Types of built form.....	42		
Different built forms as a place to live	45		
Development density and size of units....	46		
Affordable housing - forms of provision..	48		
Previous uses	49		
Summary	49		
5 Building design, site layout & longevity.....	50		
Design specification.....	50		
Lifts and circulation space.....	53		
Managing waste.....	53		
Building fabric.....	55		
Microclimate.....	56		
Private amenity space	57		
Communal/Public amenity space.....	59		
Provision for cars and cycles.....	62		
Mix of uses.....	65		
The role of masterplanning.....	67		
Summary	67		

6 Impact on the surrounding area 69

Physical form of development	69
Views of the scheme managers and residents.....	72
As part of the wider community.....	72
Summary	73

7 Management of the site 74

The importance of management and high density development.....	74
Managing agents and their role	75
Management services provided.....	76
Management presence	76
Services, service charges and mixed tenure	77
Issues in managing schemes	77
Longer term management and maintenance.....	79
Management arrangements in mixed tenure schemes	79
Summary	80

8 Residents' attitudes to high density schemes... 81

High demand schemes	81
Views of residents	82
Summary	83

9 Density, development costs & viability 84

High Density/Tall Development Costs.....	84
Relationship between density/tall buildings and viability	86
Benchmark Land Values	88
Other Assumptions	90
Viability Testing Findings	90
Typology comparison within Borough Value Bands.....	92
Conclusions.....	99
Summary	102

10 Conclusions, issues & potential solutions ...104

Background to findings.....	104
Issue 1: Density, building height and policy.....	104
Issue 2: Design of building form.....	105
Issue 3: Relationship with the wider area.....	106
Issue 4: Management of schemes	107
Issue 5: Provision of affordable and family housing.....	108
Issue 6: Development costs and viability	109

Executive Summary

Headline

Development at densities above the London Plan density matrix is achieved through a wide variety of built form and layouts, with buildings of different heights. No systemic problems with high density schemes are identified, provided schemes are well planned from the outset. The key to successful high density buildings as places to live is in the quality of the internal design and the external space in which they sit. What also matters is the way they are managed day to day. As density and height increases, these factors become more important and greater scrutiny is needed to maintain the quality of high density and high rise living.

PURPOSE AND SCOPE OF THE STUDY

0.1 To inform the forthcoming review of the London Plan, the GLA has commissioned a suite of research studies to explore the twin objectives of the London Plan – maintaining the quality of housing output and making the most efficient use of land. This study assesses the performance of completed schemes that have densities above the top of the guidance range for their location, and the implications for the cost, affordability and viability of the completed market and affordable residential units.

0.2 The research undertaken for this study employed a combination of desk based analysis of various data (including the London Development Database – LDD), depth analysis of a number of case study schemes and a survey of residents living in those schemes (with a caveat that the survey results partially reflect the selection of the case studies). The 19 case studies examined are at the core of the research. 12 were selected for in-depth analysis (including desk top review and a site visit) and a further 7 for desk top analysis only. They were not intended to be the highest density schemes developed in recent years but were, in the main, schemes that were above the density range for their setting and PTAL (as in Table 3.2 of the London Plan). Case study schemes were granted planning permission between 2005 and 2012 and were also occupied for at least 2 years.

WHO IS LIVING IN THE HIGH DENSITY HOUSING?

0.3 The residents that took part in the residents' survey, can be broadly characterised as a mix of young mobile households in private rent (almost half of the residents surveyed) and older households – including families – in social/Affordable Rent, owner occupation or shared ownership. The address at which residents were living was almost always their main home.

0.4 60% of people surveyed were aged 16 to 35 years. This is a very different picture from the London average which (excluding children under 16) was 41% at the 2011 Census¹. The largest single group of households was two or more (related or unrelated) adults sharing accommodation. Overall, 30% of households in the survey were 'sharers'. Families with children also represented about a third of households surveyed, including families with 3 or more children (about 10% of all households in the survey).

0.5 The majority of residents were in part or full time employment (83%).

0.6 Residents were asked to describe their ethnic group. A wide range of groups were represented; the three groups with more than 10% of residents in the survey were 'White – English/Welsh/Scottish/Northern Irish/British' (36%), 'White – Any other White background' (19%) and 'Asian/Asian British – Bangladeshi' (12%).

¹ The Census age bands are from 15 to 34 so the comparison is not exact and should be treated as a guideline.

IS LONDON A HIGH DENSITY CITY?

0.7 In terms of land use for housing, London is not a dense city by world standards and the density of development (for schemes of 50+ dwellings) does not appear to have changed materially from 2007 to 2015. However, in the last five years, there has been an increase in the proportion of schemes that are above the SRQ density range for the scheme setting and PTAL, suggesting that it is the lower density parts of London where development densities are increasing.

0.8 The number of completed schemes with tall residential buildings has not increased over the last five years.

PROVIDING AFFORDABLE HOUSING IN HIGH DENSITY DEVELOPMENT

0.9 As a general rule, the percentage of affordable housing in larger schemes tends to decrease as density increases but the relationship is complex and there are many schemes providing similar levels of affordable housing at different densities. Related to this, taller buildings also tend to provide less affordable housing but again buildings of a range of heights can deliver the same amount of affordable housing. Where affordable and market housing are in the same tall building, the market units are usually located in the upper storeys where market values are greatest.

AFFORDABILITY AND HIGH DENSITY DEVELOPMENT

0.10 There is no evidence of higher prices for comparable units at different scheme densities but there is a premium on market values as building height increases. For affordable housing, the height of a building or scheme density does not influence rental levels but the costs for shared owners will be affected by market values. The shared ownership units in tall buildings are usually located at lower storeys to minimise this effect.

0.11 Service charges reflect the services provided and so there is no direct relationship between density and service charge. Service charges can vary within the same development if those living in different buildings, or different cores of the same building, receive different services. This is given as a strong affordability argument for locating different tenures separately.

0.12 On average, for the schemes in this study, service charges are in the range of £20 to £50 per week. While housing associations reported potential affordability problems for shared owners, residents did not raise particular concerns about service charges.

DENSITY AND BUILT FORM

0.13 As has been evidenced by earlier research, different scheme densities can be achieved through a variety of building heights and development types. Only the highest densities are associated with taller buildings and with the highest site coverage – with a large building floorplate with little or, in some cases, no shared amenity space or landscaped area at street level. This also illustrates one of the technical issues identified about measuring density – scheme density is influenced by the relationship between site size and building form and by other factors such as the size of dwellings alongside the basic metric of dwellings or (habitable or bed) rooms per area.

0.14 Some broad typologies of developments can be identified and, at the higher densities, schemes split into two major groups – ‘courtyard types’ and ‘single/multiple block’. As a place to live, the typologies are both highly rated by residents but courtyard style developments were more favoured. High rise living is relatively popular and residents in tall buildings are more likely to want to live at a higher storey than lower down.

0.15 The proportion of family sized housing (with 3 bedrooms or more) decreases as storey height increases and family housing is more likely to be found in Affordable/social rented housing than either market or intermediate housing, whatever the development density.

BUILDING DESIGN AND SITE LAYOUT

0.16 Increasing density (however this is achieved) does not automatically lead to design issues that indicate a systemic problem with higher densities. It is clear that there are successful developments at densities higher than those set out in the SRQ density matrix.

0.17 However, as development becomes denser and taller some of the issues that could affect any scheme – such as amenity spaces, quality of building design, scheme layout, scheme management – come under more pressure. The case studies identified issues that can affect higher density and taller buildings – including poor daylight in rooms, living spaces that were too hot or too cold, lack of privacy in flats, issues with storage of cycles, lack of or unsuitable private and public amenity space and noise from the use of outside amenity space.

0.18 Whilst not all schemes perform equally well in terms of circulation, privacy, active frontages and communal and private amenity space, adoption of the 2012 Housing Supplementary Planning Guidance (SPG) generally post-dates planning permission for the case studies and some were designed at a time when standards were under review. The majority of case studies are actually compliant with the GLA’s SPG, but there are exceptions. As scheme density increases, and with the March 2016 Housing SPG standards in mind, careful attention to all of the issues identified above will be key to ensuring that building design and site layout provide successful places to live.

0.19 Single aspect flats (more likely found in tall buildings with a central service core) may be associated with overheating and for a minority of residents this is a (serious) problem. However, keeping the home warm enough was more likely to be the main issue for residents.

0.20 Private amenity space is of importance to the majority of residents and was generally provided across all schemes. Overall, however, the quality and quantity of private amenity space was variable.

0.21 Communal amenity space also varies in quantity and quality across the schemes with less provided in tower schemes than in the low and mid-rise developments. Communal amenity space provided as residents’ lounges/meeting rooms have been found to be a potential alternative to external private amenity space, particularly for tall buildings where private balconies are small or physically constrained.

IMPACT ON THE SURROUNDING AREA

0.22 Many of the larger case study sites were part of more extensive redevelopment schemes which were quite isolated from neighbouring housing and therefore had little or no impact on any pre-existing residential areas around them. Other schemes, with very high headline densities, were relatively small scale or low rise developments on tightly drawn infill sites with the building footprint occupying nearly all the site. So, for many of the case studies and for quite differing reasons, new high density developments were having limited impact on surrounding areas. In design terms, a range of storey heights in a development can moderate the impact of a development overall, particularly where the height and density of the development is not typical of the surrounding area.

0.23 For residents, there is a very mixed picture of their sense of being part of the wider community. Those living in courtyard style developments and Affordable Rent were more likely to feel this than those living in taller buildings and in private rent. However, the social network of young mobile workers living in private rent may have little to do with their immediate neighbours and explain why they were less likely to feel part of the local community.

0.24 Providing successful active frontages with mixed uses is one way in which a high density development can benefit the vitality of an area, as demonstrated by those case studies where commercial units are occupied. Schemes that include mixed use and come forward as part of a master plan tend to be more successful in letting commercial units, having the critical mass to generate footfall, particularly where there is no immediate competing provision. Vacant commercial spaces at ground floor level detract from the local street scene and examples of this were found in the case studies. The GLA is currently researching vacant ground floor space in new mixed use developments and this research will provide more depth of analysis about this issue.

THE IMPORTANCE OF SCHEME MANAGEMENT

0.25 The research has confirmed the vital importance of effective management in all schemes with common areas, regardless of height and density. Management input is needed during the design of a building (so that it will work for residents once occupied) and thereafter, to ensure that the quality of the services residents receive are maintained.

0.26 There is no relationship between the height of buildings and the type of management required but as the number of people in a scheme increases, the level and type of management changes. Management can be provided by an on-site team or off-site and at around 500 units, on-site management becomes the norm.

0.27 The range of services provided depends on the scale and type of scheme although there is a typical core of services including, for instance, cleaning, security, lift maintenance. In mixed tenure schemes, the management is set up to deliver an appropriate level of service to different tenures which is reflected in the service charges to residents of those tenures.

0.28 Dealing with waste is a basic element of scheme design and management which requires a considered design response and can cause significant problems when it works poorly. This applies to all flatted developments although, as density increases, dealing with waste becomes more problematic and more attention is needed to achieving a successful solution. Management input at the design stage is important as is long term management input to finding successful solutions.

0.29 Effective management of mixed tenure schemes is evolving and a comprehensive service level agreement (which is kept under review) and regular dialogue between the private management company and the housing association are emerging as good practice, along with on-going consultation and communication with residents.

EVIDENCE OF DEMAND FOR HIGH DENSITY LIVING

0.30 The evidence from the case studies shows that whatever density or height, there is a very strong underlying demand for properties, exemplified by generally very low levels of voids and turnover rates. There is a higher rate of turnover with the private rented units, reflecting that they are typically occupied by young mobile households. But the strong demand for these units means that they do not remain empty for long.

ECONOMICS OF DEVELOPMENT AND HIGHER DENSITY SCHEMES

0.31 Unit build costs increase with the height of buildings and market values increase with higher storeys in tall buildings. Costs, and more significantly values, vary between different parts of London and the interaction between the two and differences in land values produce a complex picture of viability, density and building heights with implications for the delivery of general and affordable housing.

0.32 There are multiple value points where build costs make higher/denser buildings unviable. In simple terms, where the values are at their highest (in central London) then the tallest buildings are the most viable built form, and are able to provide general and affordable housing at very high densities. As values reduce then lower heights and densities are more likely to be the best option for maximising housing and affordable housing delivery. An economic analysis and financial viability test of a range of building types shows that a 25 storey tall tower and a 13–14 storey tower were most viable in boroughs such as Camden, Hammersmith and Fulham and Southwark and then as values fall, the 5-8 storey type becomes the most viable in boroughs such as Harrow, Haringey and Lewisham. These boroughs are purely indicative and, in practice, there is a more gentle gradation by borough values for viability by type.

POTENTIAL SOLUTIONS

0.33 The authors of this report put forward to the GLA fifteen potential solutions to address the issues raised in the study.

Potential solution one:

0.34 GLA continues with the underlying principle that there is a range of building types and heights that can achieve the same density; and that the GLA does not attempt to prescribe set formats for successful higher density/tall buildings.

Potential solution two:

0.35 The plot density of tall buildings should be recorded whether as one of many buildings within a consent or stand alone. 'Tall building' in this context will need to be defined and, as a starting point, 15 storeys could be used.

Potential solution three:

0.36 The heights (in storeys and metres) of buildings should become an integral element of the recording process for planning permissions and completions across London. This needs to include the height of all buildings in schemes with a mix of building types. The information should be recorded in the LDD.

Potential solution four:

0.37 The principles of appropriate development in different locations underlying the density matrix should be retained as part of the normal development management process. However, it is the absolute height/density of each building that should trigger additional scrutiny of design and management solutions. The exact density at which this should apply will always be somewhat arbitrary but a density of 500 dwellings per hectare (dph) or height of 15 storeys are put forward for consideration (see also solution seven).

Potential solution five:

0.38 The GLA considers promoting a review of how standards and policies have been applied at the planning stage to understand how well they are being used and whether they are having the intended impacts.

Potential solution six:

0.39 More detailed guidance should be provided on innovative design solutions to floorplan configurations to avoid north-facing single aspect units; and guidance should more actively promote smaller clusters of secured cycle storage areas in higher density developments to enhance the perceived sense of security.

Potential solution seven:

0.40 Evaluation criteria for higher density buildings (as defined in Potential solution four) should be extended to give more attention to:

- ensuring private amenity space is provided for each unit, (or failing that, there is compensatory shared amenity space internally or externally),
- securing privacy in all dwellings,
- maintaining temperature control in individual units and common spaces,
- providing storage for cycles that is secure,
- minimising noise from common areas to residents,
- minimising the impact on the surrounding area
 - » of taller buildings by “stepping” building heights, and
 - » of denser built forms by avoiding blank faces, or the potential for empty units, at ground level,
- design, location and layout solutions that increase the proportion of family sized dwellings in taller buildings.

0.41 The GLA can elaborate on the guidance in the SPG to deal with these points and work with the boroughs and other interested groups to strengthen the guidance in the SPG.

Potential solution eight:

0.42 The longer term role of masterplanning and strategic frameworks should be promoted more strongly to achieve successful integration of blocks or towers within their surrounding area, and to deliver wider benefits to residents, such as access to shared amenity space and high quality public realm.

Potential solution nine:

0.43 Active commercial or residential frontages should continue to be encouraged as a means of providing a safe and attractive built environment. However, insisting on the provision of commercial frontages if they will not be commercially viable will have a negative impact on the street scene. The aspiration for ground floor mixed use in residential developments should recognise that it may take time to find occupiers; particularly where demand is expected to increase over time. The amount and type of units provided should take account of the local market context and be flexible in terms of conversion to alternative uses in the longer term. There will be benefits from a flexible approach to use of these ground floor spaces in order to promote vitality. The forthcoming GLA research study of ground floor developments will provide more detailed analysis of this issue.

Potential solution ten:

0.44 Developers should be required to submit a costed management plan as part of any application for higher density and/or taller buildings detailing the affordability of running costs and service charges (by different types of occupiers) to enable developments to be properly managed. The costed plan should set out how management arrangements will work in mixed tenure schemes and the way in which residents' views will be taken into account in delivering affordable services. While the most detailed scrutiny of management arrangements is reserved for buildings above 500dph or 15 storeys, all developments which include common areas and provide for mixed tenures in the same building, should be required to demonstrate that they can provide affordable and sustainable management which is of a good quality. The GLA could put forward criteria which codifies this.

Potential solution eleven:

0.45 There is an opportunity for the GLA to develop policy guidance to ensure the quality of the management agreements and success of the crossover between housing association and management agents' responsibilities in mixed tenure schemes.

Potential solution twelve:

0.46 In assessing planning applications for high density schemes, the GLA and boroughs should ensure that there has been sufficient management input into the design of the scheme – especially in dealing with waste and parking arrangements/cycle storage.

Potential solution thirteen:

0.47 The GLA works with the boroughs to provide clear guidance on expectations for delivery of affordable and family housing in higher density developments and how viability is to be taken into account.

Potential solution fourteen:

0.48 The viability testing has shown how development density that is significantly above the density matrix range, and taller buildings, leads to improved financial viability in some parts of London, particularly in higher value areas. Given the pressure to deliver general and affordable housing in London, it is recommended that consideration is given to these higher or denser development types, where appropriate, if they can deliver more affordable housing.

Potential solution fifteen:

0.49 The viability testing shows that in many cases where lower height development (say 5–8 storeys) is viable, other higher and denser development is more viable and left to market forces is more likely to be proposed. Rejection of these schemes will reduce potential output of both market and affordable housing in unit terms but may be an appropriate trade-off if the priority is for a smaller number of larger dwellings better suited for family use.

1 Introduction

THE STUDY IN CONTEXT

1.1 The Greater London Authority (GLA) recently published Supplementary Planning Guidance for Housing² which states that:

“1.3.7 London’s constrained land supply means it is essential that the London Plan sets out strategic density policy to guide development in the capital in terms of ‘Sustainable Residential Quality’ (SRQ). This is a broad concept which includes density but integrates it with wider environmental, transport and social objectives ... As expressed in the London Plan the concept is particularly concerned to ensure that the quality of housing output is not compromised by the need to make the most efficient use of land.”

1.2 To inform the forthcoming review of the London Plan, the GLA has commissioned a suite of research studies to explore the twin objectives of the London Plan - maintaining the quality of housing output and making the most efficient use of land.

1.3 This report focuses on two interlinked themes from the suite of research:

- How schemes that exceed the density for their location, as set out in the London Plan, perform; what has worked and what has not for a range of densities and building typologies;
- Whether increasing density has implications for the cost, affordability, and viability of the completed market and affordable residential units in different types of location and what those implications are and the contribution these developments have made to the supply of affordable housing in London.

1.4 In order to establish what lessons can be learned for future development and policy from completed schemes that exceed the density matrix for their location, the key issues explored in this study are:

- **One** – Building design and layout for different densities of development and the relationship between density and building height and their settings;
- **Two** – The relationship between development density and the mix of uses and tenures that are delivered;
- **Three** – Residents’ views on the overall quality of life of different building types and density of development with issues about privacy, internal building temperature and daylight levels explored depth;
- **Four** – How higher density schemes are managed on a day to day basis and in the longer term;
- **Five** – Affordability of both ‘top-line’ costs of renting or buying and on-going costs (including service charges and energy costs);
- **Six** – Scheme viability and whether there is a relationship between density and viability: and, linked to this:
 - » Whether more dense development can provide more affordable housing than lower density schemes;
 - » Whether each scheme follows best practice in terms of urban design principles, site layout and building design and how well this relates to London Plan policies and objectives.

² Housing, Supplementary Planning Guidance, London Plan 2016, Implementation Framework, GLA, March 2016

1.5 The current research builds on the housing density study commissioned by the GLA in 2012³. The specification for the current study is set out in Annex I of the Technical Report. It also describes the other studies in the 2016 suite of research which are, in summary:

- **Measuring and defining density** which explores different approaches to defining and measuring density and is to recommend a preferred approach for the London context. The project also develops a definition for different categories of density which can be applied irrespective of a site's context to provide clarity to a significantly wide ranging debate;
- **Exploring character and development density** which investigates how an understanding of the level of services, jobs and social infrastructure could inform the options for the London Plan's density matrix;
- **Why else is density important** which reviews the strategic linkages between density policy and demographic and economic growth, employment creation and, in particular, productivity and considers how density policy might help manage these relationships.

LONDON PLAN POLICY CONTEXT

1.6 The key London Plan policy on density of development is Policy 3.4 – Optimising Housing Potential – and its associated sustainable residential quality (SRQ) density matrix (London Plan Table 3.2). Policy 3.4 states that

London Plan Policy 3.4

“Taking into account local context and character, the design principles in Chapter 7 and public transport capacity, development should optimise housing output for different types of location within the relevant density range shown in Table 3.2. Development proposals which compromise this policy should be resisted.”

1.7 Table 3.2 is important in making planning decisions and in implementing Policy 3.4 as it provides a series of density ranges relating to three broad types of urban setting and public transport accessibility level or PTAL. The three settings are suburban, urban and central and the PTALs range from 1 at the lowest level of accessibility to 6 at the upper level of accessibility. Table 3.2 is shown in full below with a fuller extract from the London Plan in Annex 2 of the Technical Report.

³ Maccreanor Lavington Architects, Emily Reeves Architects, Graham Harrington. Housing Density Study, GLA, 2012

Figure 1.1: Table 3.2 from the London Plan

Table 3.2 Sustainable residential quality (SRQ) density matrix (habitable rooms and dwellings per hectare)

Setting	Public Transport Accessibility Level (PTAL) 0 to 1	Public Transport Accessibility Level (PTAL) 2 to 3	Public Transport Accessibility Level (PTAL) 4 to 6
Suburban	150–200 hr/ha	150–250 hr/ha	200–350 hr/ha
3.8–4.6 hr/unit	35–55 u/ha	35–65 u/ha	45–90 u/ha
3.1–3.7 hr/unit	40–65 u/ha	40–80 u/ha	55–115 u/ha
2.7–3.0 hr/unit	50–75 u/ha	50–95 u/ha	70–130 u/ha
Urban	150–250 hr/ha	200–450 hr/ha	200–700 hr/ha
3.8–4.6 hr/unit	35–65 u/ha	45–120 u/ha	45–185 u/ha
3.1–3.7 hr/unit	40–80 u/ha	55–145 u/ha	55–225 u/ha
2.7–3.0 hr/unit	50–95 u/ha	70–170 u/ha	70–260 u/ha
Central	150–300 hr/ha	300–650 hr/ha	650–1100 hr/ha
3.8–4.6 hr/unit	35–80 u/ha	65–170 u/ha	140–290 u/ha
3.1–3.7 hr/unit	40–100 u/ha	80–210 u/ha	175–355 u/ha
2.7–3.0 hr/unit	50–110 u/hr	100–240 u/ha	215–405 u/ha

Notes to Table 3.2

Appropriate density ranges are related to setting in terms of location, existing building form and massing, and the index of public transport accessibility level (PTAL). The setting can be defined as:

- *central* – areas with very dense development, a mix of different uses, large building footprints and typically buildings of four to six storeys, located within 800 metres walking distance of an International, Metropolitan or Major town centre
- *urban* – areas with predominantly dense development such as, for example, terraced houses, mansion blocks, a mix of different uses, medium building footprints and typically buildings of two to four storeys, located within 800 metres walking distance of a District centre or, along main arterial routes
- *suburban* – areas with predominantly lower density development such as, for example, detached and semi-detached houses, predominantly residential, small building footprints and typically buildings of two to three storeys.

1.8 Using the SRQ Density Matrix, for example, a scheme in a suburban setting and with a PTAL of 0 to 1 (the lowest level of public transport accessibility) shows a density range of 35–75 units per hectare while, at the other end of the density matrix, a scheme in a central setting with a PTAL at 4–6 has a density range of 140 to 405 units per hectare.

1.9 The March 2016 Housing SPG makes the link between density and building height, explaining that, “...higher densities do not always have to necessitate tall buildings, particularly where a well-considered, design-led approach is taken...” and later that, “...Different forms of development can have similar densities. High density does not always have to mean higher rise development.” The current research has explored these relationships in detail and re-confirms the degree of variation in built form of comparable densities. At densities above 1,000 dwellings per hectare, there is less variation and schemes are commonly in the form of tall towers but even at these sorts of density, other styles of development can be found.

1.10 The SPG also states that, “...housing density in itself may be less significant to resident satisfaction than dwelling type and the neighbourhood characteristics.” The research for this study includes a survey of residents which provides further evidence on this aspect of density and development.

RESEARCH TASKS

Overview

1.11 This study draws on a number of inter-locking strands of research but with a focus on 19 case studies of different development schemes at different densities.

1.12 In addition to the case studies, two other research tasks have been undertaken:

- review of key indicators to provide a high level international city comparison;
- analysis of the London Development Database (LDD) – a database collected by the GLA using data provided by the London boroughs, which are responsible for providing details of the permissions and completions in their area.

Case study selection

1.13 20 case studies were selected, 12 for in-depth analysis (including desk top analysis and a site visit, hereon referred to as ‘depth case studies’) and a further 8 for desk top analysis only. In the event, one of the group of 8 case studies proved to be very similar to one of the depth case studies and it was decided not to take this case study forward.

1.14 The case studies selected were not intended to be the highest density schemes developed in recent years but were, in the main, schemes that were in excess of the density range for their setting and PTAL (as in Table 3.2 of the London Plan). The case studies were drawn from the LDD and were selected against a range of criteria. Annex 3 of the Technical Report describes the process in detail while below are summarised the main criteria by which the case studies were selected:

- With planning permission between 2005 and 2012 and completed at least 2 years ago (between 2010 and 2014) – reflecting recent planning policy and the Mayor’s housing standards whilst having been occupied for sufficient time such that any immediate post completion issues might emerge⁴;
- From three groups of Table 3.2 representing the highest, mid-range and lowest setting and PTALs of Central High (PTAL 4 to 6), Urban Medium (PTAL 2 to 3), Suburban Low (PTAL 0 to 1);
- For the majority, at a range of densities above those for their setting and PTAL;
- Three ‘controls’ were identified where schemes had been permitted within the relevant SRQ density range⁵;
- 17 of the case studies were schemes of 50 or more dwellings, but 2 were smaller schemes⁶;
- From different boroughs to include a spread of locations but also to ensure that areas of London with different market values were included;
- As required by the specification, in addition to the above criteria, the sample of case studies was checked so that it included a number of tall buildings within the following ranges:
 - » 30m to 60m (≈10 to 20 storeys)
 - » 61m to 150m (≈20 to 50 storeys)
 - » 150m+ (essentially 50+ storeys)

1.15 The agreed set of case studies is shown in the table below.

⁴ These are slightly different parameters from those used to select schemes for the analysis of the LDD. This uses completions between 2007 to 2015 generally and with a sub set of data for completions between 2010 and Dec 2015 when considering in detail more recent trends.

⁵ One each for Central High (PTAL 4 to 6), Urban Medium (PTAL 2 to 3), Suburban (PTAL 0 to 1).

⁶ These case studies were from the Central High and Suburban Low groups and were at c20 dwellings and ranged from 22% to 118% excess density over the range for their setting and PTAL.

Figure 1.2: Case study selection

Setting/PTAL	Depth case study		Desk top case study	Total	Of which buildings over 30 storeys
	'Excess'	'Control'			
Central High	5	1	4	10	5
Urban Medium	2	1	2	5	0
Suburban Low	2	1	1	4	0
Total	9	3	5	19	5

***Notes:**

Of the 'tall buildings' – 2 are 30m to 60m (=10 to 20 storeys), 2 are 61m to 150m (=20 to 50 storeys) and 1 is 150m+ (c50+storeys)

1.16 The case studies selected range from a redevelopment comprising traditional 2, 3 and 4 bedroom houses in a low density suburban setting, through to 5–8 storey residential buildings in central locations, often with retail units at ground floor, and up to 100% residential towers of up to and including 50 storeys. The case studies are shown below and also in Annex 4 of the Technical Report.

Figure 1.3: Case studies used

Depth case studies

Case study name	Borough
Ramsden Estate Phase 3, Orpington	Bromley
Lyon Court and 28–30 Pembroke Road	Hillingdon
66, Addison Road, Bromley	Bromley
98–106 High Road, Redbridge	Redbridge
Former St. Andrews Hospital	Tower Hamlets
Tower Site, 1 St. George Wharf	Lambeth
721–737 Commercial Road	Tower Hamlets
Beaufort Park	Barnet
194 Pitfield Street	Hackney
160–188 High Street, Stratford	Newham
Plot 09, north of Henrietta Street	Newham
Castle House, 20–20 Walworth Road	Southwark

Desk top only case studies

Case study name	Borough
Durand Close	Sutton
14–16 Kenworthy Road	Hackney
Depot, Gatliff Road, WCC	Westminster
Rathbone	Newham
Emanuel House	Westminster
77–33 Upper Richmond Road	Wandsworth
City Road	Islington

Case study research

1.17 The case study research included a significant element of original research as well as secondary analysis of the LDD and relevant planning documents.

1.18 For all 19 case studies a desk top analysis of the scheme was undertaken. This drew mainly on the LDD which provides the most comprehensive record of planning consents in London; reference was also made to additional information held on individual local authority websites where available including officer/committee reports. Scheme characteristics analysed included number and size of dwellings, site area, storey heights, previous uses etc. Annex 5 of the Technical Report lists the information collected.

1.19 The site visits conducted for the depth case studies enabled a more detailed assessment to be made of how development at high density (or very high density) has been realised and the way in which this has impacted on the street, the locality and the wider area. (See Annex 5 of the Technical Report for a schedule of the information collected).

1.20 Site visits were undertaken by two individuals; the observations and photographic record for each depth case study are documented in the case study summary sheets shown in Annex 6 of the Technical Report.

1.21 For the 12 depth case studies, following an introductory e mail from the GLA, interviews were arranged with the housing association which owned and/or managed stock in the scheme and with the managing agents that were responsible for managing the private element of the scheme or across all tenures.

1.22 Two of the depth case studies did not have on-site provision of affordable housing and so only 10 housing associations were involved in case study schemes and two schemes were owned by one association. Of the 9 housing associations from whom an interview was requested, 8 agreed to be interviewed and one provided partial information by e mail. Interviews were conducted face to face or by phone using a discussion agenda agreed with the GLA. Interviews lasted between 30 minutes and an hour. The discussion agenda used for the interviews is shown in the Technical Report at Annex 7.

1.23 A similar process was followed for the interviews with the managing agents (with the discussion agenda also set out in Annex 7 of the Technical Report). 5 interviews with managing agents were achieved. 4 of the case studies were wholly owned or managed by a housing association and 3 managing agents declined to take part.

Survey of residents

Method

1.24 The final element of the research was a survey of residents drawn from a selection of the depth case studies. Quota controls were used to take account of the balance between market housing and affordable housing at each scheme, the balance between houses and apartments, and the building floor for dwellings in apartment blocks.

1.25 Interviews were achieved with 221 residents and lasted between 4 and 32 minutes.

1.26 As for all surveys of this type, although the sample covered a representative cross-section of properties, the achieved sample was affected by survey response bias. This is caused by differing rates of non-contact and refusal for different socio-demographic groups. The sample was weighted to take account of differential selection and response rates at the different schemes. But because it is not

known what are the true characteristics of the population in the schemes selected for the survey, even with the weighting that was applied, it is important to recognise that the survey may not be truly representative of the entire population.

Key characteristics

1.27 Residents in the schemes surveyed were predominantly young people with 60% aged 16 to 35 years. This is a very different picture from the London average which (excluding children under 16) was 41% at the 2011 Census⁷.

1.28 Almost half lived in private rent (49%) with 28% in social/Affordable Rent, 12% were shared owners and 11% owner occupiers. There is an important relationship between the age of residents and tenure in the schemes which formed the resident survey with three quarters of private renters being aged under 35 years.

1.29 A similar relationship exists between age of resident and the height of the building they live in. This ties in with the relationship between age and tenure as private rented units are heavily represented in tall buildings. The survey found that 68% of residents in buildings of 8 to 14 storeys were aged under 35 years; this percentage rises to 87% of residents in buildings of 15+ storeys. These results need to be treated with caution as they will be strongly influenced by the tenure mix for the case study schemes the interviewers could gain access to; nevertheless the survey indicates that those living in tall buildings are likely to be younger people.

1.30 They are also more likely to be single or couple households and even more likely to be two or more (related or unrelated) adults sharing accommodation. Overall, 30% of households in the survey were 'sharers'. Nearly half of private renters (46%) were living in groups of adults and 49% of those living at 15 storeys or higher were adults sharing.

1.31 Families with children were more likely to be found in Affordable Rented homes. 75% of households living in Affordable Rent were 'family' residents compared with 35% of homeowners and 14% in market/private rent. Most families (23% of all households) had 1 or 2 children but 10% of all households were larger families with three or more children.

⁷ The Census age bands are from 15 to 34 so the comparison is not exact and should be treated as a guideline.

1.32 The case studies used for the survey were all relatively new developments and so it was expected that residents would not have lived at their current address for more than 3 to 5 years. This was confirmed by the survey which found that almost a half (46%) had lived at their current address for less than 2 years. Length of residence varies significantly with tenure with 76% of private renters living at their current address for less than two years.

1.33 The majority of residents were in part or full time employment (83%). This tends to increase with building height but those living in the tallest buildings include a proportion of students.

1.34 Residents were asked to describe their ethnic group. A wide range of groups were represented and the three groups with more than 10% of residents in the survey were White – English/Welsh/Scottish/Northern Irish/British (36%), White – Any other White background (19%) and Asian/Asian British – Bangladeshi (12%).

1.35 The survey did not identify a high percentage of residents for whom the property they lived in was a second home – only 1% of residents said the address where they were living when surveyed was their second home.

1.36 The residents found in the survey can therefore be broadly characterised as a mix of young mobile households in private rent and older (35 years plus) households – including families – in social/Affordable Rent and as shared or owner occupiers. These broad patterns need to be borne in mind in considering the results of the resident survey that are referred to in the rest of the report.

1.37 A full description of the survey method is found in Annex 8 of the Technical Report; this includes the questionnaire used. Detailed results are found at Annex 9.

LIMITATIONS OF THE RESEARCH

1.38 The research has drawn on a number of research approaches, with original research including 19 case studies. These included 12 case studies investigated in depth which were selected to represent a range of settings, densities

and building forms to enable comparisons to be made on a qualitative and quantitative basis. Illustrated summaries for each of the 12 depth cases studies are included in the Technical Report at Appendix 6.

1.39 The desk top analysis of all 19 case studies has sometimes been hampered by limited availability of plans and documents on council websites and, in some cases, discrepancies between these documents and the LDD data; in these instances a judgement has been made about which information to record.

1.40 The other technical issue faced in the research has been that of defining scheme density. The study relies on two means of measuring density – dwellings per hectare and habitable rooms per hectare – with a focus on the former. Planning application boundaries are determined by the applicant and may be drawn very tightly (perhaps for reasons of land ownership) giving a ‘headline’ density which belies the real character of a scheme in comparison with others at a similar density. Alternatively, the application boundary may be drawn very generously so that a very tall building or buildings appear to be a relatively low density scheme while their physical form is more akin to schemes which have a much higher ‘headline’ density.

1.41 The definitions and measures of density used by planners in London are explored in a separate project undertaken by the LSE as part of the wider density research commissioned by the GLA⁸. The LSE’s research has highlighted that whilst the number of units may seem an easy measure “...it does not control for size or the number of habitable rooms it is limited in its use as a means of meeting housing requirements.”

1.42 A further issue has been identified where a case study forms part of a wider development undertaken in phases so that, for example, the case study includes no commercial units but these are provided in another part of the wider development. This also sometimes occurs with the provision of affordable housing. Wherever this is apparent, it has been commented on.

⁸ Defining, Measuring and Implementing Density Standards in London – London Plan Density Research Project 1, LSE, 2016.

REPORT STRUCTURE

1.43 The report draws together the research findings into a series of themed chapters reflecting the study specification.

The chapters are:

- **2 – Is London a high density city?** – which draws comparisons with other cities in the world and uses the LDD to describe overall trends in development density across London;
- **3 – Density and development form** – which explores the different types of development found in the case studies and how these relate to development density;
- **4 – Affordable housing and affordability** – which considers delivery of affordable housing and affordability issues;
- **5 – Building design, site layout and longevity** – reviewing different aspects of scheme design including privacy, parking, amenity space, mix of uses;
- **6 – Impact on the surrounding area** – which considers the physical, market and community impacts of high density development on its surroundings, as far as the available evidence allows;
- **7 – Scheme management** – describing how this is undertaken, what is provided and at what cost and the importance of high quality management in making high density development a success;
- **8 – Residents’ attitudes to high density schemes** – providing an overview of scheme demand and describing residents’ overall attitude to the schemes they live in;
- **9 – Density, development costs and viability** – reviewing the impact on scheme design (especially tall buildings) of development costs, values and scheme viability;
- **10 – Conclusions and recommendations from the research.**

There is a separate Technical Report providing supporting information.

2 Is London a high density city?

By comparison with cities with a developed economy and of similar size to London, London is middle order in terms of density. This chapter describes the comparison in more detail and identifies recent trends in development density in London, how this relates to the height of buildings completed in the last few years, and the relationship between development density and building height.

INTERNATIONAL COMPARISON OF LONDON'S HOUSING DENSITY

2.1 Comparison of housing densities across residential areas within London is problematic; with different built forms and a wide variety of site sizes. International comparisons are even harder. They bring in variables of culture, climate, topography, history, and different definitions of household, dwelling and administrative boundaries. Furthermore there are several ways to measure density. For example, the US Census Bureau has promoted the metric of the density experienced by the average person (population weighted density). That is useful as a measure of concentration of people when considering transport uses and economic effects. Here we are primarily concerned about land usage where widely understood measures of people per hectare, and dwellings per hectare, better serve our purpose.

2.2 We selected a sample of 14 cities for comparison. We avoided cities that are much larger than London, or very small. We choose cities with a developed economy and a Western or Westernised culture. Data was sourced, primarily, from national census results dated between 2010 and 2015. This was supplemented by visual characteristics and measurements from Google Earth.

2.3 Figure 2.1 shows the selected cities, population, dwelling numbers, area, topographical constraints, and the density metrics.

Figure 2.1: Comparison of selected cities

City	Country	Population	Inland area in km ²	Density in people per hectare	Dwellings	Density in dwellings per hectare	People per dwelling	Approx city radius km	Main topographical constraint	Constraint
Greater London	England	8,663,300	1,572	55	3,454,490	22	2.5	23	Rivers	4%
Inner London	England	3,439,700	319	108	1,460,840	46	2.4	10	Rivers	5%
Outer London	England	5,223,500	1,254	42	1,993,660	16	2.6			
Paris	France	2,229,621	105	212	1,336,209	127	1.7	8	Rivers	2%
Lyon	France	500,715	48	105	265,599	55	1.9	7	Rivers	5%
Berlin	Germany	3,469,849	892	39	1,892,000	21	1.8	16	Rivers	6%
Madrid (City)	Spain	3,141,991	606	52	1,320,531	22	2.4	13	Mountains	12%
Barcelona	Spain	1,604,555	98	163	684,078	70	2.3	6	Coast and mountains	75%
Sevilla	Spain	693,878	141	49	268,435	19	2.6	7	Rivers	3%
New York (City)	United States	8,491,079	784	108	3,371,062	43	2.5	14	Coast and rivers	40%
Chicago	United States	2,722,389	590	46	1,194,337	20	2.3	13	Lake	45%
Boston	United States	617,594	125	49	272,481	22	2.3	6	Coast	30%
Rio de Janeiro (Municipality)	Brazil	6,476,631	1,200	54	2,467,000	21	2.6	18	Coast and mountains	75%
Belo Horizonte (Municipality)	Brazil	2,375,151	331	76	762,075	23	3.1	10	Mountains	45%
Singapore	Singapore	3,902,710	666	59	1,225,300	18	3.2	14	Coast	95%
Tokyo (Special Wards Area)	Japan	9,272,565	627	148	6,437,000	103	1.4	14	Coast and mountains	70%
Osaka (City)	Japan	2,691,742	225	120	1,634,100	73	1.6	8	Coast	20%

2.4 Land area measurement excludes water. It includes all land uses, not just residential use. Constraints are natural features which would restrict a 50% growth in city area and the extent of restriction is estimated.

2.5 Census data tends to be published by administrative area. In some cases this is for the denser inner area of a wider metropolitan region. For example the Paris data is for a smaller inner part of a wider urban area. It is significantly denser than the Greater London or Inner London areas. If administrative districts with urban areas adjacent to Paris are included (Paris agglomeration) the average density in people per hectare is lower than Outer London, but this is for a land area nearly twice that of Greater London and a population only 20% greater. To aid analysis we have, where we can, used administrative areas which cover the main urban city area without significant rural areas, and we have shown the total inland area and the approximate radius of the city area for the population given.

2.6 The average number of people per dwelling shows major societal differences across the countries and cities. Tokyo and Osaka have a high proportion of single people of all ages. Paris and Berlin's single person households tend to be of working age, with most families and retired

households located in rural areas. Madrid has a similar average household size to London but a significant minority of Madrid's households also use another home in a rural area. Allowing for vacant dwellings and holiday homes Spain has over 20% more dwellings than households.

2.7 Greater London ranks 8th (Inner London 6th) in a descending order of density of dwellings per hectare for the 15 cities.

2.8 Within each city there is a range of densities and built types. We narrowed down the comparison by identifying residential boroughs or districts near to the city centre. The table below shows the data and density metrics for these areas. The comparison is with the London Borough of Camden. Across all the comparators, the areas selected are similar distances from the centre of their city and do not represent the densest areas of the city. For London, there were a number of candidate boroughs for comparison, each with its own particular characteristics. Camden was selected as an average density Inner London Borough (it is eighth densest of all London boroughs in terms of persons per hectare (pph)).

Figure 2.2: Comparison of densities for selected areas within cities - compared to LB Camden

District	City	Population	Area in km ²	Pph	Dwellings	Dph	Ppd	Distance from centre in km
Camden	London	237,400	22	109	101,650	47	2.3	4.5
15 th arrondissement	Paris	240,723	9	283	126,696	149	1.9	4.0
8 th arrondissement	Lyon	76,323	7	114	38,162	57	2.0	4.0
Friedrichshain-Kreuzberg	Berlin	251,226	20	125	162,081	80	1.6	4.3
Tetuan	Madrid	155,649	5	289	64,854	121	2.4	4.8
Sant Andreu	Barcelona	142,598	7	217	59,011	90	2.4	4.3
La Macarena	Sevilla	78,585	4	180	40,830	94	1.9	2.0
Manhattan CB7	New York	207,699	5	380	120,655	221	1.7	4.9
Lincoln Park	Chicago	64,116	8	78	33,745	41	1.9	4.2
South Boston	Boston	62,817	8	79	30,013	38	2.1	3.6
Bukit Merah	Singapore	155,840	14	109	51,885	36	3.0	4.0
Taito	Tokyo	187,078	14	136	112,730	82	1.7	4.0
Joto	Osaka	165,643	8	197	75,895	90	2.2	4.7

There was no data available for comparable districts within Rio de Janeiro and Belo Horizonte.

2.9 The London Borough of Camden ranks 10th out of these 13 comparable locations by dwellings per hectare. Non-residential land uses can distort these figures so we identified within each of the districts the predominant built type of residential accommodation by residential land area, i.e. ignoring non-residential land uses. The built type was categorised as either detached, terraced, slab block or courtyard block. Many of the detached buildings were very tightly built up against each other in some cities. We counted the storey heights in a 100 hectare area to determine the median number of storeys for this predominant built type, and measured gross built dimensions, and distances between front and rear elevations. From this we can calculate a gross plot ratio for the residential land use, strictly defined as gross external floor area of the built type (floor plate × storeys) in square metres, divided by gross plot area (distance from half road width to rear boundary × plot width) in square metres. The results are shown in the table below.

Figure 2.3: Gross plot ratios for selected areas within comparable cities

District	City	Predominant build type	Median storey	Frontage separation in m	Rear elevation separation in m	Block depth in m	Gross plot ratio	Rank
Camden	London	Terraced	4	22	30	13	1.3	13
15 th arrondissement	Paris	Courtyard block	6	13	8	12	3.2	5
8 th arrondissement	Lyon	Detached	2	17	30	11	0.6	15
Friedrichshain-Kreuzberg	Berlin	Courtyard block	6	20	20	13	2.4	7
Tetuan	Madrid	Courtyard block	4	8	6	11	2.4	6
Sant Andreu	Barcelona	Courtyard block	7	13	22	20	3.7	3
La Macarena	Sevilla	Slab block	6	12	18	18	3.3	4
Manhattan CB7	New York	Terraced	7	20	18	22	3.8	2
Lincoln Park	Chicago	Detached	3	30	32	22	1.2	14
South Boston	Boston	Detached	4	16	18	14	1.8	12
Andarai	Rio de Janeiro	Slab block	7	20	6	27	4.7	1
Barroca	Belo Horizonte	Detached	3	16	4	20	2.0	11
Bukit Merah	Singapore	Slab block	7	22	22	9	2.0	10
Taito	Tokyo	Detached	3	6	0	10	2.3	8
Joto	Osaka	Detached	3	5	1	10	2.3	8

2.10 Camden and Lincoln Park, Chicago had noticeably more rear garden space, and wider distance between frontages, than the comparable district in each other city. In Japan the predominant built type was not that high but each small detached block (of one to three dwellings) had no rear or side yards and fronted straight on to a narrow road, leading to a higher plot ratio. The highest plot ratios were in the districts in Rio de Janeiro, New York, and Barcelona.

2.11 On this density measure London was ranked 13th out of the 15 cities.

2.12 We can conclude, with recognition of the small sample sizes that, in terms of land use for housing, London is not a particularly dense city by world standards.

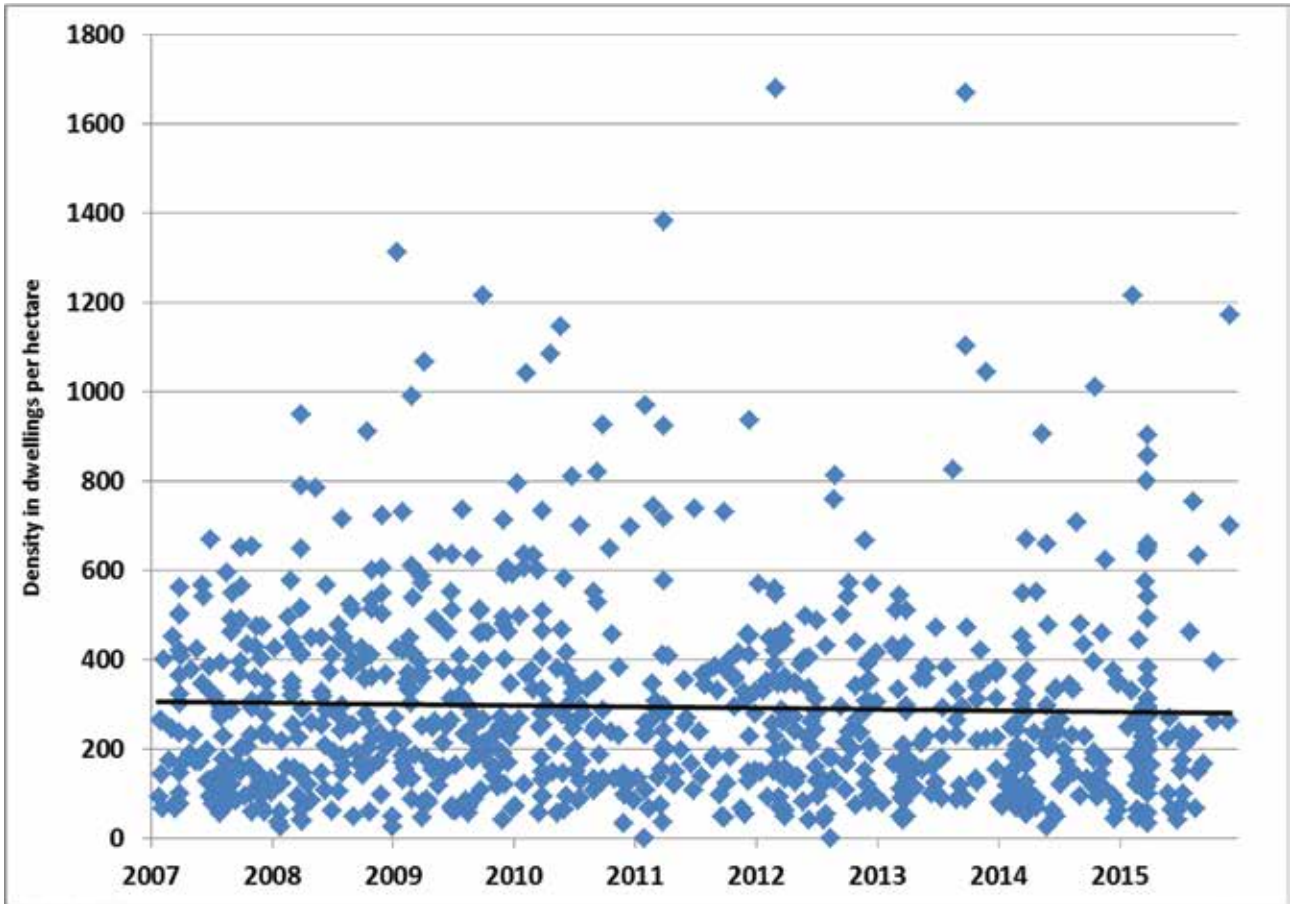
TRENDS IN SCHEME DENSITY AND HEIGHT OF DEVELOPMENT

2.13 Analysis of the London Development Database provided information about developments completed from January 2007 to December 2015 based on planning consents with 50 or more new dwellings. In aggregate these completions represent 75% of London's new housing supply. Where data is missing or was not collected, or to consider more recent trends, we look at completions from January 2010 within the same dataset. There are distinct improvements in LDD data collection and recording in the more recent period.

Scheme density

2.14 The first observation is that the density of these larger schemes (50+ dwellings) does not appear to have changed materially from 2007 to 2015 across the whole of London.

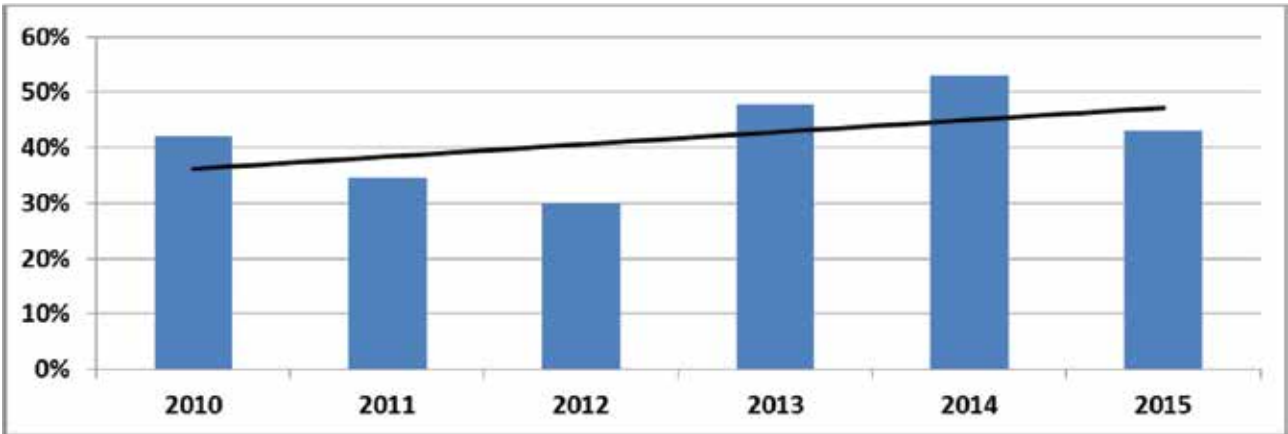
Figure 2.4: Residential density (dph) of schemes 2007 to 2015 (each diamond represents a scheme)



2.15 In this and in the following charts, where trend lines are shown these are lines of best fit with the data, they do not necessarily mean a good fit. Some strong correlations could be caused by variables not shown, and some weak correlations may indicate the possibility of some causality.

2.16 Figure 2.4 above shows the actual density (in dwellings per hectare). Figure 2.5 below shows the proportion of dwellings that are in schemes with a higher density than the range shown in the Sustainable Residential Quality matrix (SRQ), compared to the total of dwellings in all the larger schemes completed since January 2010.

Figure 2.5: Dwellings that exceed the SRQ as percentage of all dwellings - 2010 to 2015

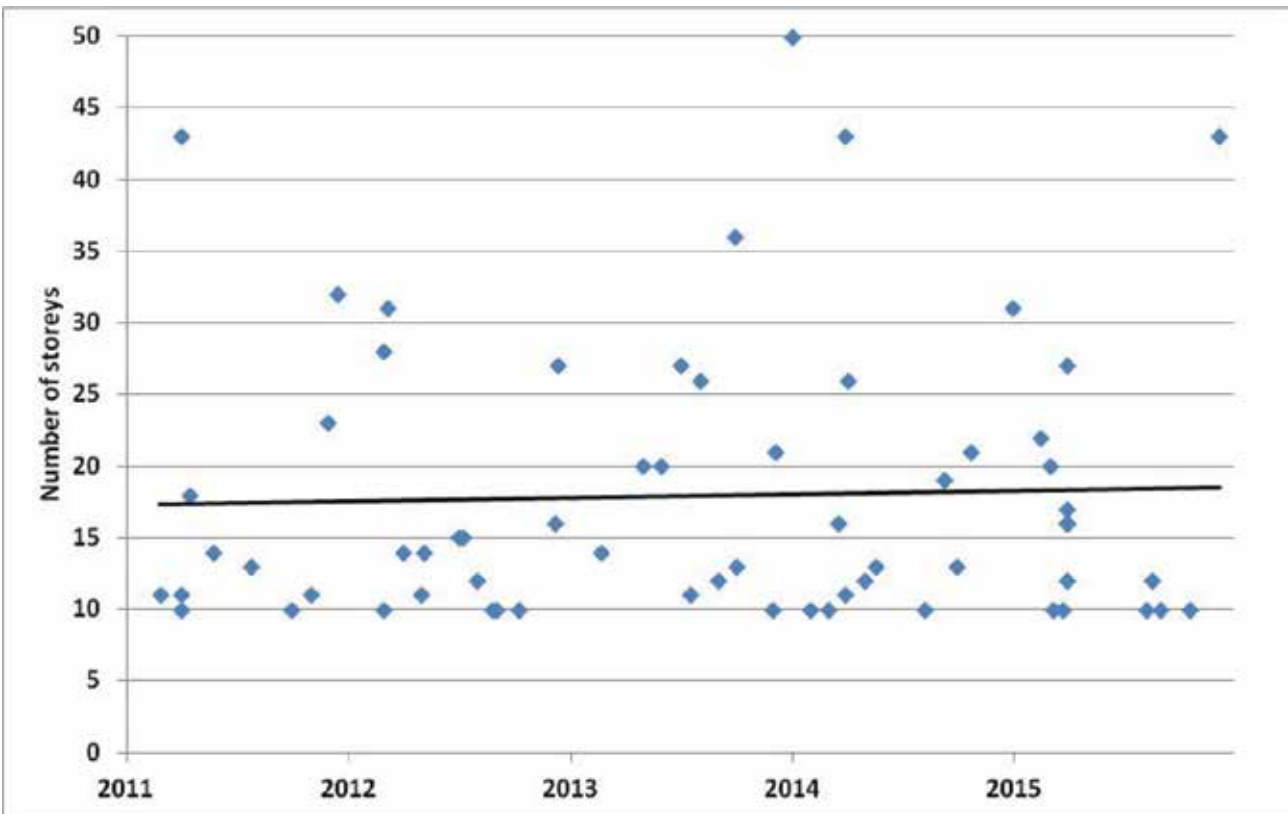


2.17 In the last five years there has been an increase from approximately 35% of dwellings to 45% that have a higher density than SRQ range for the scheme setting and PTAL score.

High rise residential

2.18 The trend in scheme completions with a tall residential building is shown below.

Figure 2.6: Number of schemes with a high rise of 10 or more storeys - 2011 to 2015 (each diamond represents a scheme)

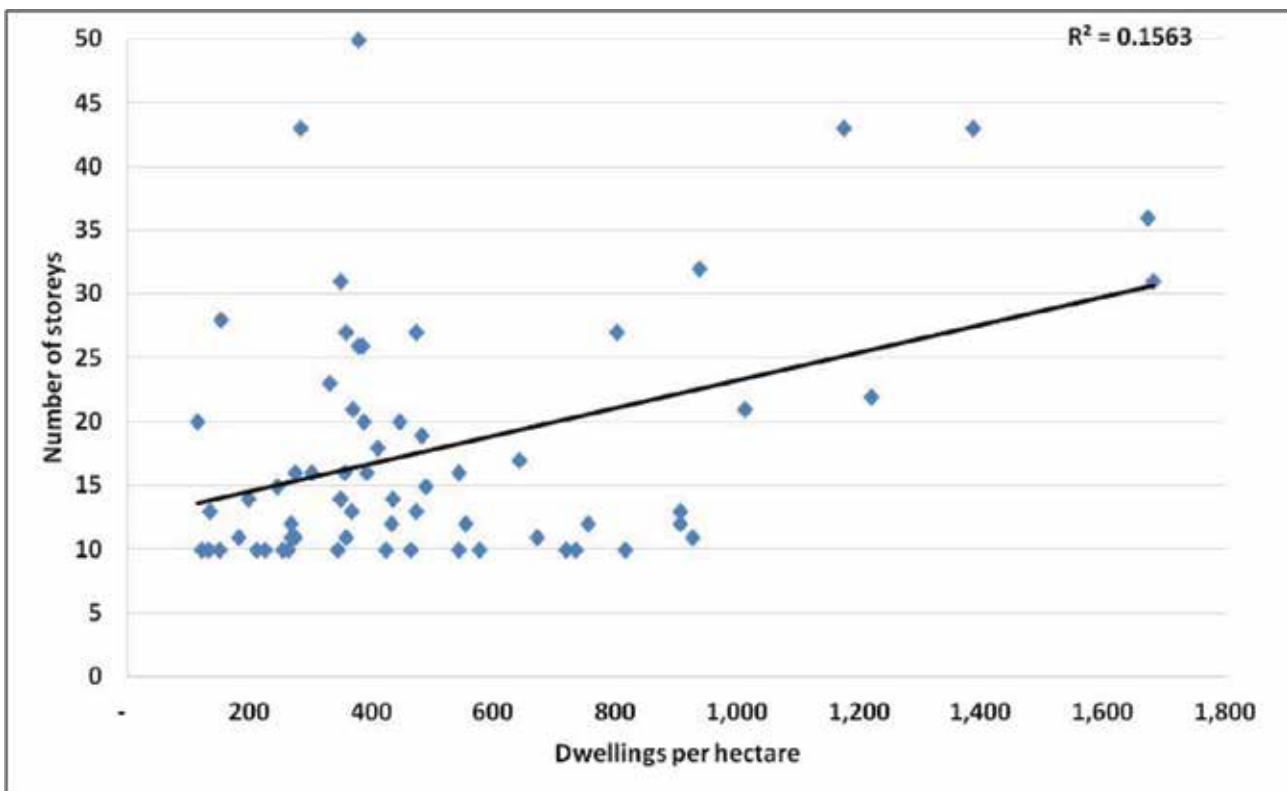


2.19 The number of completed schemes with tall residential buildings has remained steady over the last five years with little increase in number of storeys.

2.20 There is a correlation between schemes with a tall building and overall scheme density but it is not statistically strong, as illustrated in the following chart.

2.21 Filtering the dataset to smaller site sizes reduces the likelihood that the scheme includes other lower buildings. At the smallest site size analysed of 0.25 ha, or smaller, there were 15 schemes which together exceeded 80% correlation between height and density, which is to be expected as building footprint approaches total site area.

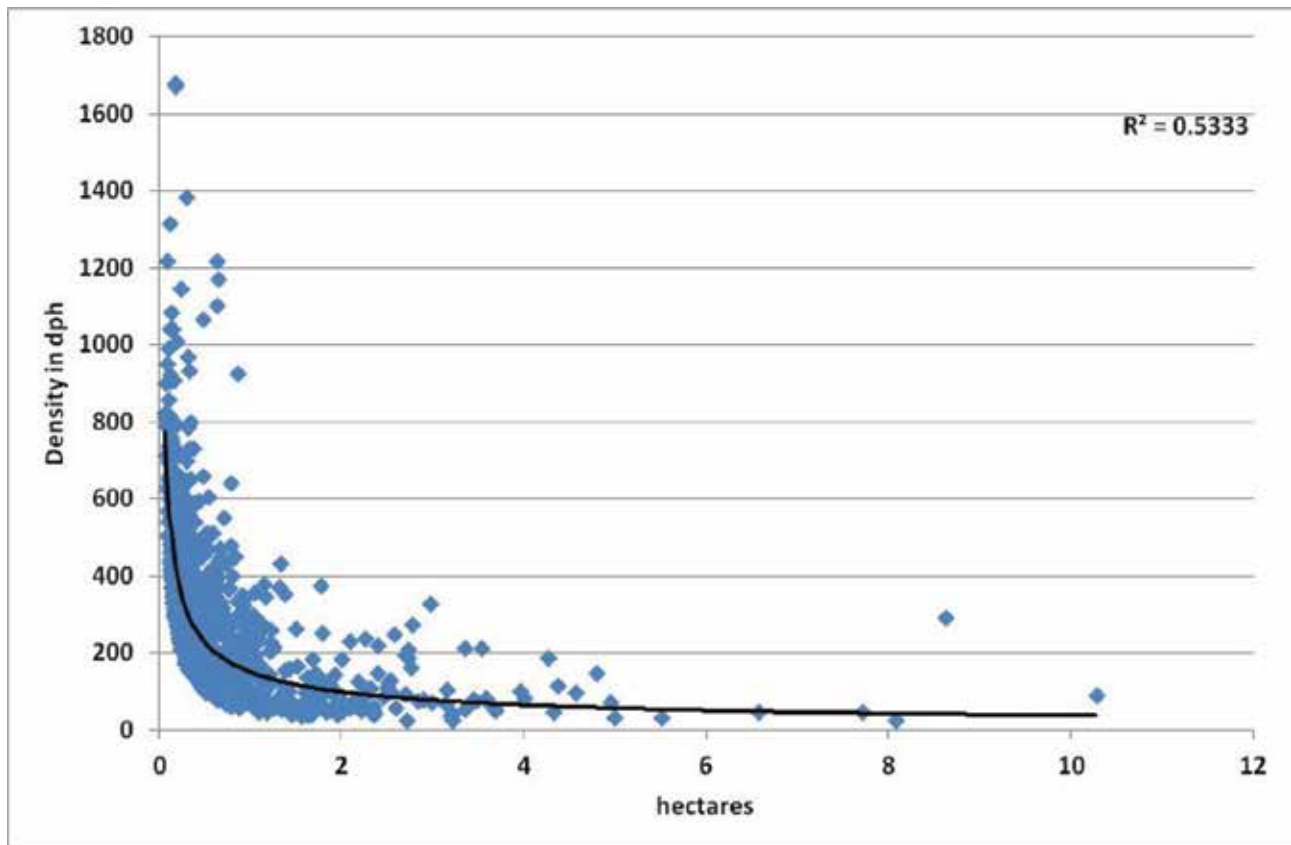
Figure 2.7: High rise (10 storey and above) by density in dph (each diamond represents a scheme)



Site size and Density

2.22 Figure 2.8 below, for all schemes of 50+ dwellings completed since January 2007, shows how closely the completed scheme density relates to site size.

Figure 2.8: Residential density in dph by site area in hectares (each diamond represents a scheme)



2.23 The standard measure of scheme density, of dwellings per hectare, is as much a descriptor of site size as of density of built form.

SUMMARY

- In terms of land use for housing, London is not a particularly dense city by world standards;
- Density of development (for schemes of 50+ dwellings) does not appear to have changed materially from 2007 to 2015. However, in the last five years, there has been an increase in the proportion of schemes that have a higher density than the 'maximum' SRQ range for the scheme setting and PTAL;
- The number of completed schemes with tall residential buildings has remained steady over the last five years;
- There is a correlation between schemes with a tall building and overall scheme density but it is not statistically strong.

3 Affordable housing & affordability

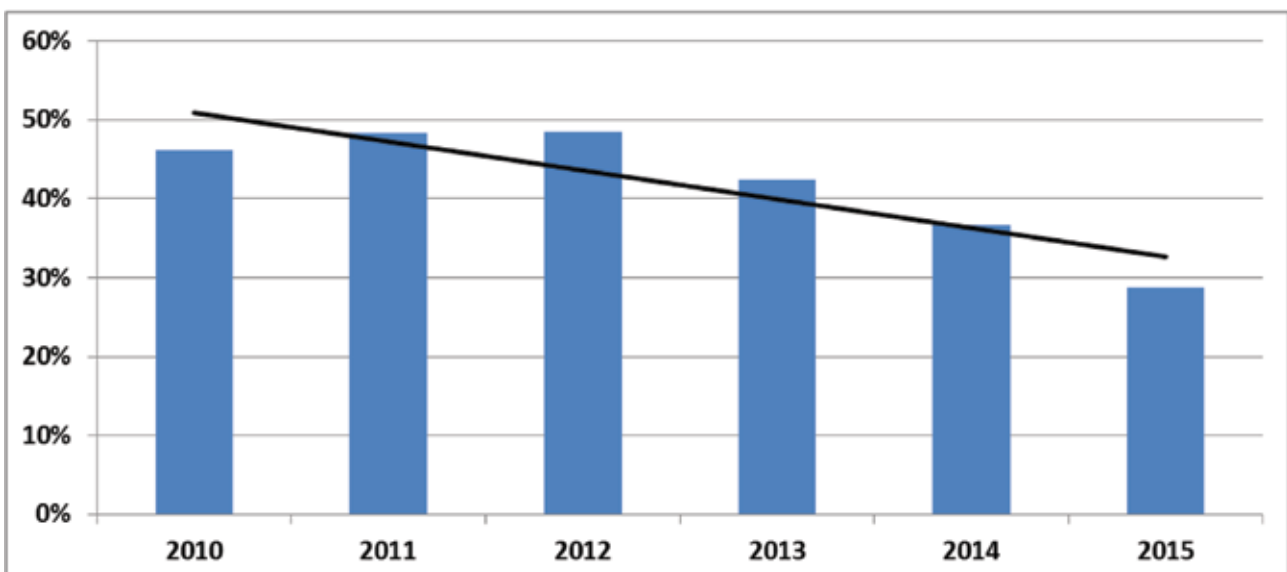
The amount and type of affordable housing in mixed tenure schemes will depend on the policy context and scheme deliverability, with scheme viability being central to this. This chapter considers delivery of affordable housing both in terms of the overall amount of affordable housing provided and the mix of tenures and whether there are discernible differences as scheme density varies. The affordability of higher density housing is also reviewed – especially the impact of service charges.

AFFORDABLE HOUSING AND DEVELOPMENT DENSITY – LDD OVERVIEW

3.1 The LDD provides an overview of the amount of affordable housing provided in new developments – we use information about schemes completed 2010 to 2015.

3.2 The LDD shows that for larger schemes (50 + dwellings) the percentage of affordable housing experienced a significant downward trend in affordable housing output, as a percentage of all dwelling output.

Figure 3.1: Affordable housing as a percentage of all housing output



3.3 There are a number of reasons for this reduction that may override any effect of higher density on affordable housing output.

3.4 The first is that the Affordable Development Programme spans four years (2011 to 2015). Most of the completions in the early part of this programme will have had funding commitments from the earlier programme. We expect to see an increase in recorded completions for January to March 2016 but these will not show in our analysed data to December 2015, though this is unlikely to explain all of the overall trend. A significant increase in market housing development completions in 2015 may also have impacted on this ratio.

3.5 The second is that a number of approved schemes have had previously agreed Section 106 planning obligations revised on viability grounds and in most cases these revisions reduce the proportion of affordable housing.

3.6 The third reason might be because housing associations are developing fewer affordable housing schemes on their own. In the past there used to be many schemes that were 100% affordable housing but increasingly the larger associations are developing mixed market/affordable schemes to generate cross-subsidy and to achieve balanced neighbourhoods. This trend is illustrated in Figure 3.2.

3.7 The effect of the reduction in 100% affordable housing schemes is shown if we take them out of the data. Figure 3.3 shows the density trend data without 100% affordable housing schemes.

Figure 3.2: Affordable housing as a percentage of total housing 2007 to 2015 (each diamond represents a scheme)

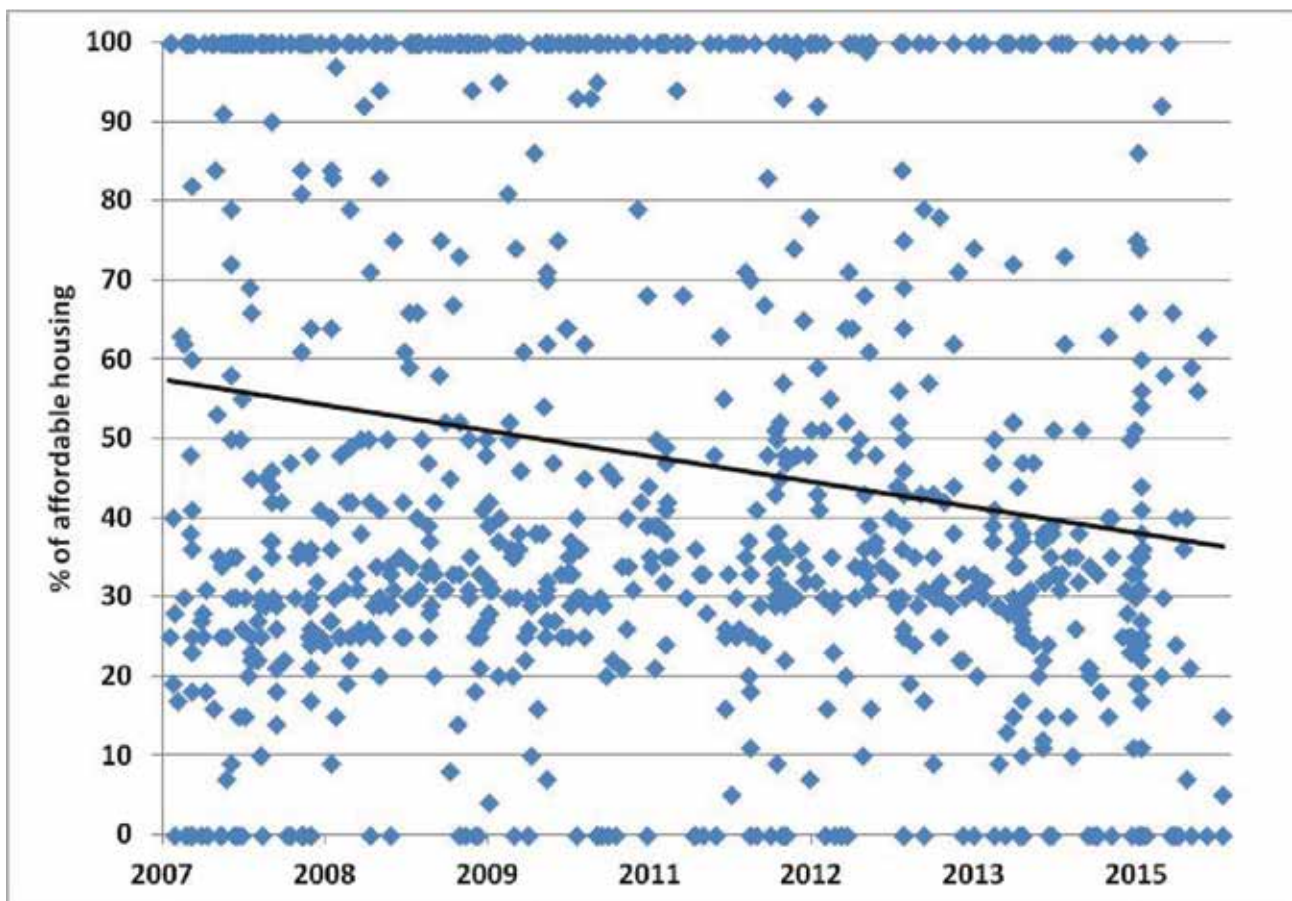
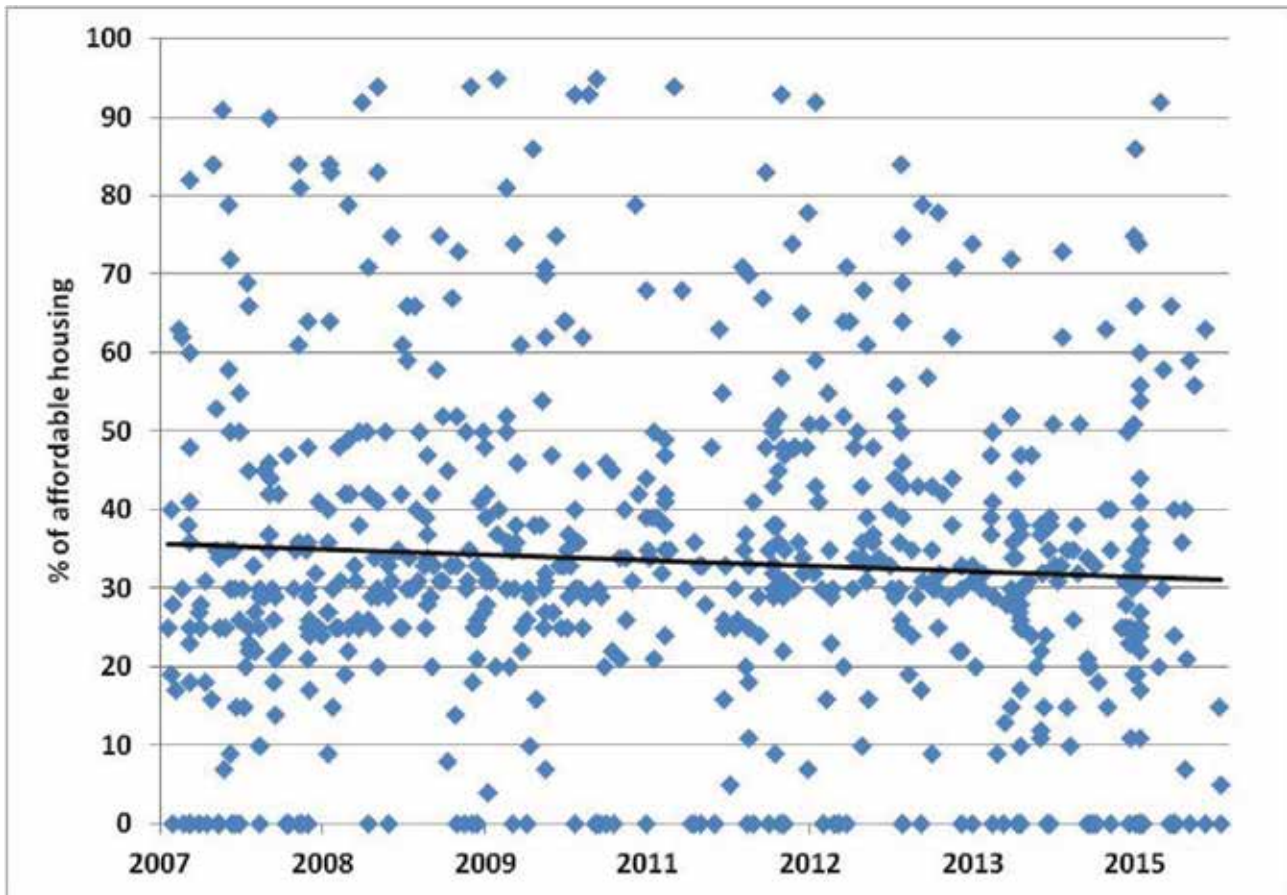


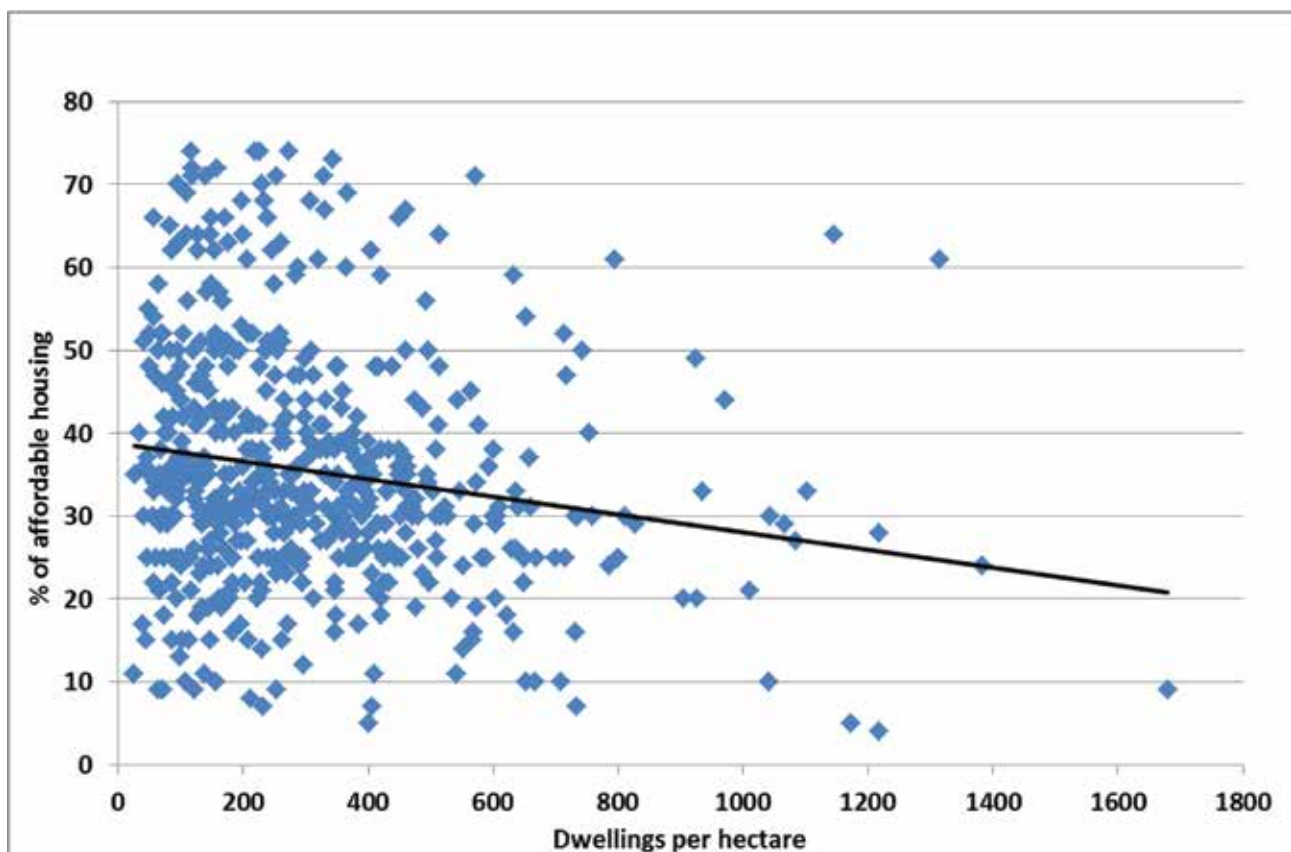
Figure 3.3: Affordable housing as a percentage of total housing (no 100% affordable housing schemes) 2007 to 2015 (each diamond represents a scheme)



3.8 It seems likely that one of the reasons for the overall reduction in affordable housing output is the reduction in 100% affordable housing scheme completions from 2012. When these schemes are removed from the data the downward trend is much less marked. There is an important proviso about this data. We know from the case studies that there will be schemes in the LDD which have no affordable housing provided on the site but the scheme is part of a wider development with affordable housing provided elsewhere in the development. We cannot tell from a desktop analysis of the LDD alone how often this occurs but the case study evidence indicates that a proportion of 0% affordable housing schemes will fall into this category.

3.9 The effect of density on Affordable Housing output might provide the remaining reason. Figure 3.4 shows the relationship between the % of affordable housing output and scheme density in mixed tenure schemes.

Figure 3.4: Affordable housing as a percentage of total housing by scheme density in dph 2007 to 2015 (each diamond represents a scheme)



3.10 The percentage of affordable housing provided on-site reduces as density increases, though the relationship is statistically weak and is almost entirely associated with densities over 400 dwellings per hectare. Off-site contributions might make up for the lower levels of on-site affordable housing but the LDD has limited information about off-site contributions making it difficult to comment further. Neither do the case studies help in exploring this issue further.

ANALYSIS OF THE AFFORDABLE HOUSING ELEMENT OF THE CASE STUDIES

3.11 The 19 case studies provide more detailed information about the provision of affordable housing in relation to the number of storeys in the scheme.

3.12 In three of the depth case studies, there is no provision for affordable housing on-site. One of the case studies is part of an area-wide regeneration scheme and affordable housing is provided elsewhere in the development (and included in a different planning permission), in another case (a scheme for 61 market units in north west London permitted in 2012) there was a payment of £40,000 in lieu of on-site provision⁹ and in the third case, the scheme

⁹ This figure was agreed by the borough following a viability assessment submitted by the applicant.

included a range of low cost market housing on-site but no affordable housing. In this example the borough accepted deferral of delivery of affordable housing to a later phase. In a fourth case study, there was reduced on-site provision as well as a financial contribution of over £1.0m, in lieu of the full on-site contribution required by policy.

3.13 The reasons for the differences in affordable housing achieved against policy are varied and, in our examples, include instances where affordable housing provision is across a wider development area, of which our case study is just one part. In only one case was the reduced affordable housing contribution found to be the direct result of developer concerns about viability, with an accompanying viability assessment reported to the planning committee to

justify the reduced level of affordable housing secured. It is not possible to assess the role that viability considerations may have had with the other schemes – for example, if there were discussions before a recommendation was taken to committee or where a scheme is within a wider area where the overall level of affordable housing was agreed at below policy because of evidence of viability concerns across the wider scheme. In the reports available for the case studies, we were not able to identify other reasons for sub policy delivery of affordable housing.

3.14 The relationship between affordable housing provided and building height is shown for the remaining 16 case studies, first for all affordable housing and then for social/ Affordable Rent.

Figure 3.5a: Case studies - affordable housing provision and building height (all affordable housing)

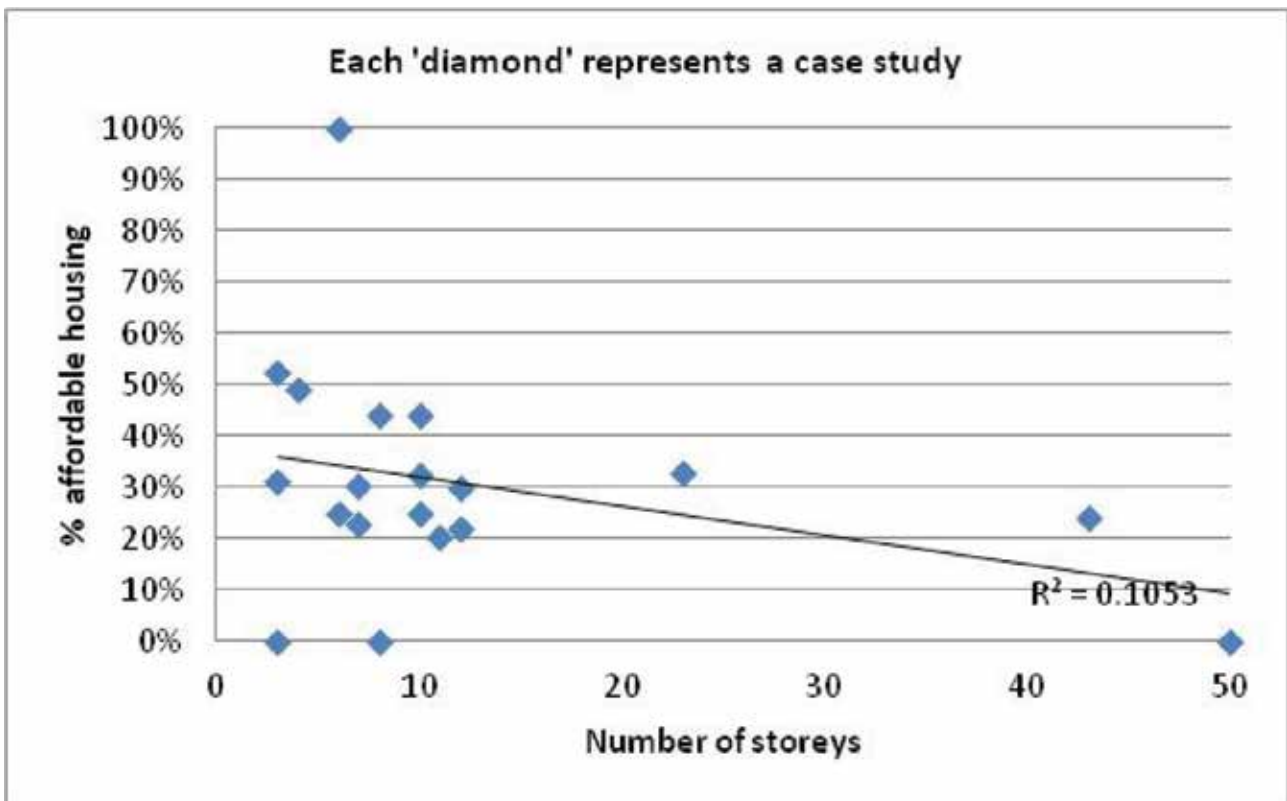
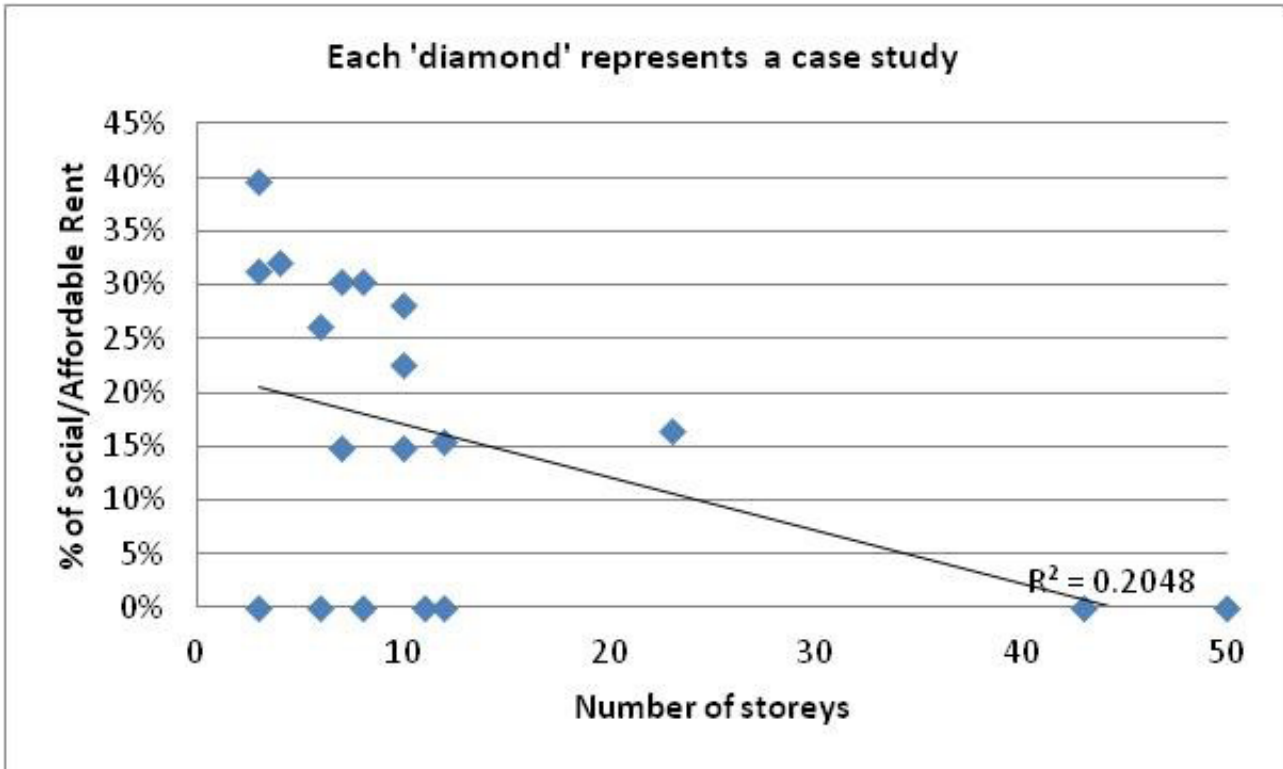


Figure 3.5b: Case studies - affordable housing provision and building height (social/Affordable Rent)



3.15 Taller buildings tend to provide less affordable housing but the relationship between building height and affordable housing is relatively weak and some tall buildings are providing as much affordable housing as much lower rise developments and some lower rise buildings are achieving low levels of affordable housing. The trend is slightly more marked for social/Affordable Rent but schemes providing none of this type of housing are found across the range of building heights.

AFFORDABILITY AND DEMAND

Market housing - sale and private rent

3.16 Of the many factors that affect sales values, there is no immediately apparent relationship between density and market value. However, there is evidence that tall buildings achieve a premium on value for apartments at the highest levels. This is discussed further in a later chapter.

3.17 Higher density development generally incurs higher construction cost. The increase is modest as denser buildings also have efficiencies in construction costs. For example structural and external fabric costs will be higher but can be shared across a greater internal floor area. Taller buildings have a much more marked increase in cost with height, especially for slim and very tall towers, as structures and external fabric have to be stronger, and foundations deeper, to accommodate greater static and dynamic loading.

3.18 Our case studies and an analysis of LDD have shown that sales values for denser buildings, in value per square metre, vary mostly by location rather than by density, except for taller buildings where a sales premium is evident with increasing height.

3.19 The densest and tallest buildings are only viable in the highest value locations (see Chapter 9). This in itself places a restriction on the extent to which very dense or tower development will take place across London. Two of the case studies showed that towers just outside the central prime areas had significantly slower sales rates and were dependent on a large proportion of shared ownership sales or marketing to the private rented sector (Strata Tower, Southwark and High Road, Stratford).

3.20 If London were to pursue a policy of increased proportion of highest density and of towers then there would be a skew in output to the highest value locations. This would cause an increase in (London-wide) average prices, and a reduction in affordability for the average buyer, but that assumes that there is no limit to the volume of highest value dwellings that the market can absorb. Recent price movements and slowing of development activity, apparent towards the end of the study period on high value dwellings in central London, show signs of market saturation, as well as the impact of changes in macroeconomic variables such as stamp duty changes. A combination of market forces and of planning policy can ensure a range of densities and heights across a range of locations, and this will continue to offer a range of price points for London's buyers.

3.21 At a more local level we considered the possibility of higher density or taller buildings impacting on the market for adjoining pre-existing market housing. We measured the proximity of pre-existing market housing, and identified the nature of the neighbouring land uses, for each of the case study schemes. Many were distant from pre-existing market housing, were surrounded by non-housing land use or even barriers such as major roads, or by contemporaneous residential developments of similar density. For 5 of the 19 case studies it was hard to conceive of the case study scheme having any connection with, let alone impact on, pre-existing market housing. For 5 other schemes it was possible that there might have been a small detrimental impact on values of dwellings bordering the scheme, though there were insufficient numbers affected within a reasonable timescale to evidence this through sales prices. Two of these schemes were small scale infill developments.

The remaining 9 case study schemes showed the possibility of having a positive impact on nearby residential values and in a few cases the schemes were in themselves, or as part of a wider development, creating a residential market in locations where before there had been little market activity at all.

AFFORDABLE HOUSING

3.22 For rented affordable housing (social and Affordable Rent) there should be no link between scheme density or building height and rental levels. None of the housing associations interviewed suggested the contrary.

3.23 For shared ownership, the position will be different and the cost of the option for the share owner will be affected by market value, the share size purchased and the rent charged on the unbought share.

3.24 Housing associations interviewed indicated share sizes ranging from 30% to nearer 60% but with 35/40% as the norm. Rental levels for the unbought share were either at 2.5% or 2.75% with the latter the more common (these rates reflect GLA guidance).

3.25 The cost of share owning is not deterring purchasers; the housing associations reported no problems in selling shared ownership units in new schemes at whatever density.

Demand

3.26 Demand for affordable housing in the case studies was described as 'very strong' with no issues about letting affordable (or PRS) properties. Turnover is generally low (although can be higher in areas where short term contracts are common amongst major local employers) and void periods for properties are minimal. The well connected locations of the case studies in the Urban and Central settings were highlighted as the reason for the strong demand (in addition to the quality of the schemes) – "*the location is awesome*". Chapter 8 discusses demand and resident attitudes in more detail.

Service charges

3.27 From the interviews undertaken, service charges appear to be common and are an additional cost for occupiers. They are paid by renters, shared owners and owner occupiers alike; but for those occupying affordable or market rent are generally included in the headline rent and so it is not always possible to identify the service charge component separately.

3.28 The scale of the service charge reflects the level of service provided to the occupiers and varying service charges can be applied in the same development if the service provided 'behind the entrance' is different. This distinction was one reason associations give for having separate cores for different tenures so that those occupying social/Affordable Rent properties face a lower service charge than other occupiers in the same development (but get less for this).

3.29 Therefore, in the same development a service charge of £15 pw for Affordable Rent tenants and £40 for shared owners would not be uncommon. In other developments, where all tenures share the same access and there is no distinction in the service provided across tenures, the charge will not vary between tenures.

3.30 Service charges can be much higher than the above figures, depending on the level of services provided.

3.31 None of the scheme managers interviewed commented that the service charges were causing tenants or shared owners any financial difficulties and they noted the role of Housing Benefit in supporting people on lower incomes faced with high service charges. However, there was some concern for shared owners where charges well in excess of £1,000 per annum are found.

3.32 The majority of residents in the resident survey, as expected, said they paid a service charge – 84% of those interviewed. However, the 16% that said they didn't, included a number of residents in tall buildings and/or private rent where we can be fairly certain there will be a service charge.

3.33 Of those that stated they paid a service charge and who provided information about the charge (noting this was a small sub set of total responses) payments are as follows:

Figure 3.6: Service charges reported by residents.

Service charge per month	% respondents
Less than £40 per month	7%
£40 or more but less than £80 per month	13%
£80 or more but less than £120 per month	26%
£120 or more but less than £200 per month	36%
£200 or more per month	18%

3.34 Consistent with the feedback from the scheme managers, the above figures indicate that most residents are paying between £20 and £50 per week as a service charge. However, most residents said they didn't know what they paid or that it was rolled up into their rent, suggesting that many residents do not make a connection between the services they receive and the charge for this.

3.35 Service charges, though, were not raised as an issue by residents e.g. when asked about anything they dislike about their home. This reinforces the impression that service charges, at the levels identified in the study, are generally not the cause of affordability difficulties for residents.

3.36 Where a scheme also provides some form of common energy system, there will be a fixed charge which can appear quite high, although running costs are lower. Housing association interviewees commented that this could cause difficulties for low income households, who are not in control of the (minimum) costs of the energy they use and this can lead to affordability problems

SUMMARY

- The relationship between scheme density and the overall percentage of affordable housing is complex but, overall, as density increases the percentage of affordable housing in larger schemes tends to decrease but there are many schemes providing similar levels of affordable housing at different densities;
- Taller buildings tend to provide less affordable housing but as with density, the relationship between building height and affordable housing is not universal and some tall buildings are providing as much affordable housing as lower rise developments;
- In larger schemes with a mix of different types and heights of buildings, the affordable housing may be found in a separate building with market units in the (upper parts of) a tall tower where market values are greatest;
- There is no evidence of higher prices for comparable units at different scheme densities but there is a premium on market values as building height increases;
- Service charges reflect the services provided and can therefore vary between schemes of similar density/ height. On average, for the schemes in this study, service charges are concentrated in the range of £20 to £50 per week. At higher levels, housing associations reported potential affordability problems for shared owners. However, residents did not raise particular concerns about service charges but there is evidence that not all residents make the connection between the services provided to them and the charge;
- Fixed charges for scheme based heating systems can make for budgeting problems for the lowest income households.

4 Density & development form

Different densities can be achieved with different built forms and different built forms can achieve similar densities. This chapter explores how density and physical form are related and the way schemes differ in terms of a range of issues including private and public amenity space, provision of car and cycle parking and privacy and daylight of individual properties.

CASE STUDY DENSITY CHARACTERISTICS

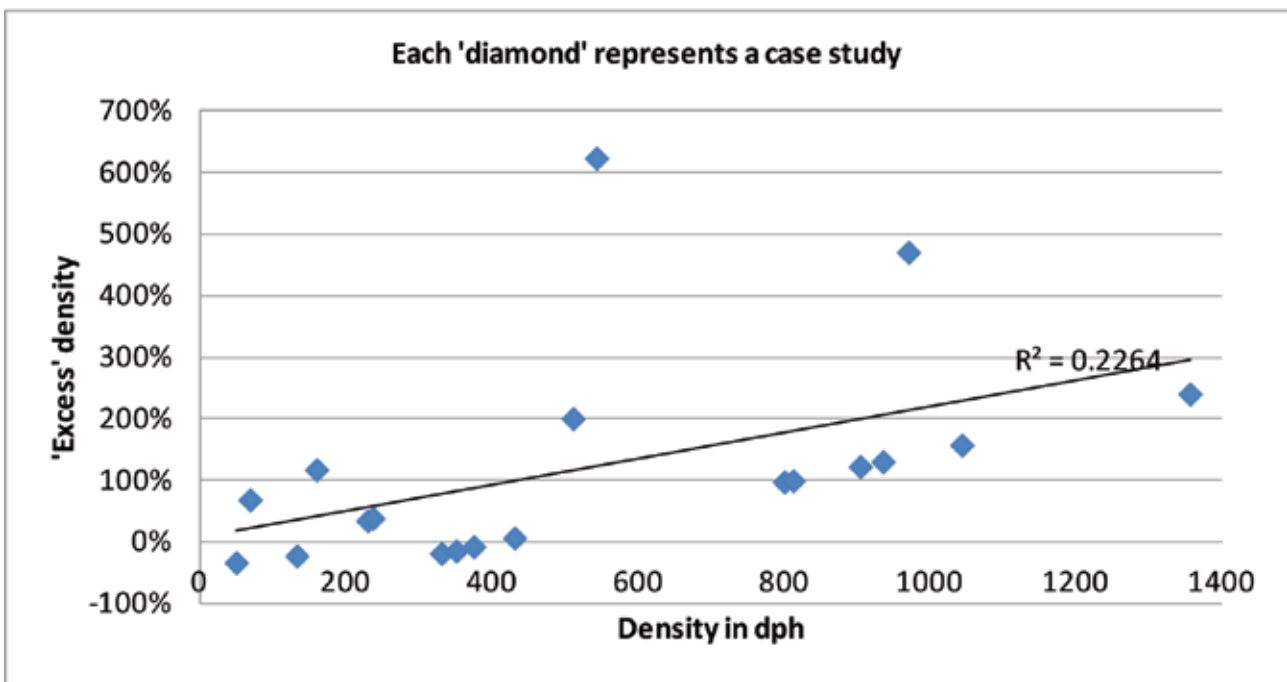
4.1 Densities of the case studies range from 55 dph¹⁰ to 1,355 dph. 10 of the 19 case studies are at densities which exceed the highest density set out in the London Plan Table 3.2 i.e. they are above the top of the range for the Central setting and PTAL 4–6 of 405 dph. Only 4 case studies are below 200 dph. Therefore, although the selection of case studies was on the basis of the relationship of their density to that of their setting and PTAL, the selection of schemes does mean that the research is focusing on some of the highest density developments that have been permitted in recent years. As noted in paragraph 1.14 all of the depth case studies were permitted between 2005 and 2012, with completions between 2010 and 2014¹¹.

4.2 The chart below illustrates the distribution of case study densities and relates this to the percentage above or below the maximum density for their setting and PTAL ('excess'). 'Excess' density tends to increase as density increases but the relationship is not particularly strong.

¹⁰ The scheme at 55 dph is a 'control' i.e. within the density range for its setting and PTAL.

¹¹ These are slightly different parameters from those used to select schemes for the analysis of the LDD. This uses completions between 2007 to 2015 generally and with a sub set of data for completions between 2010 and Dec 2015 when considering in detail more recent trends.

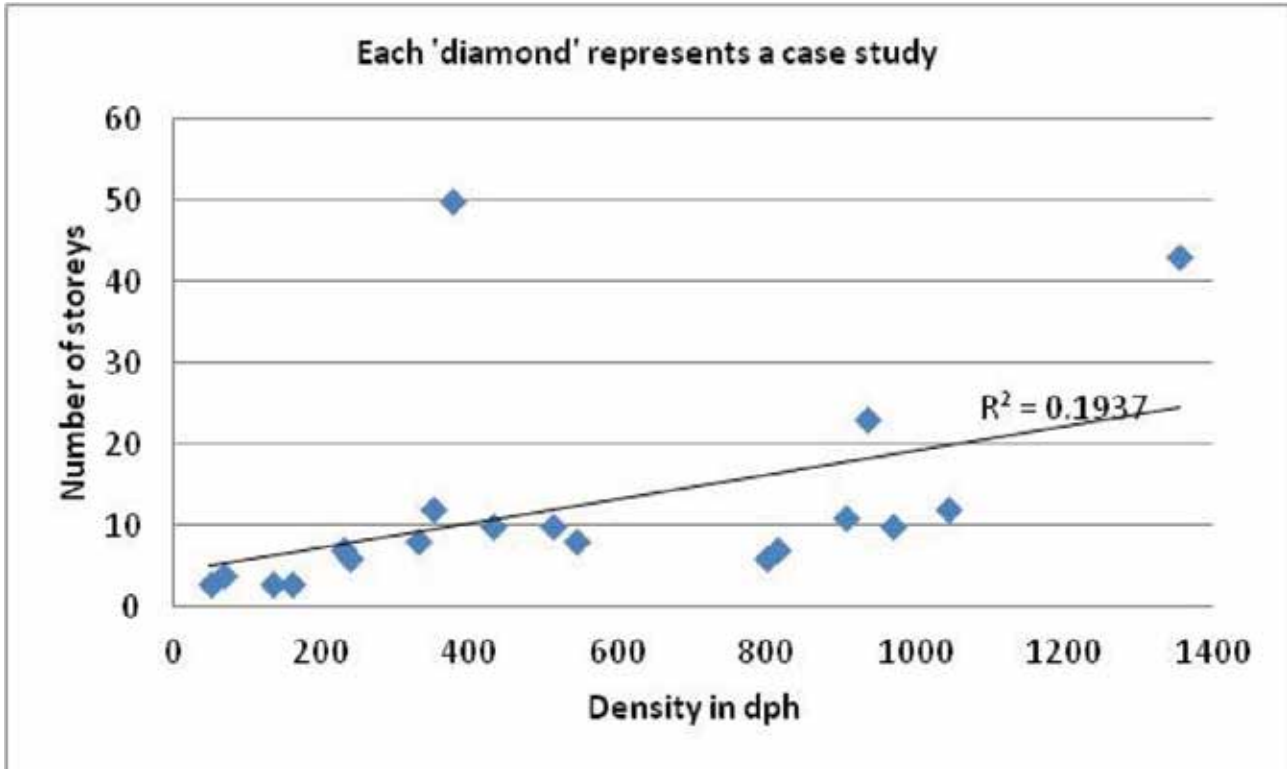
Figure 4.1: Case studies - relationship between density and 'excess' density



4.3 The average number of units in the case studies is just over 200 (203) with the smallest scheme of 16 units and the largest of 482 units. However, case studies relate to the scale of development found in a planning permission and some case studies may be a phase of a larger development. As mentioned in paragraph 1.28 this needs to be borne in mind in interpreting the case study findings.

4.4 The relationship between scheme density and height of development is not, as the recent March 2016 Housing SPG sets out, a simple one. The next chart illustrates this. Where there is more than one block in a case study we have needed to take a view about the 'average' height of the scheme for this analysis and also note that for the 7 case studies where there was no site visit, the planning documents available have not been entirely clear on the point. The following chart should be viewed with these caveats in mind.

Figure 4.2: Case studies - relationship between density and number of storeys



4.5 As is expected, as density increases so does the height of the development, especially at lower densities. But what is apparent is the clustering of schemes at around 10 storeys with a wide range of densities. The earlier comment that we have made judgements about the ‘average’ number of storeys in some developments may have affected this analysis; nevertheless, the above chart highlights that density is not a simple function of building height. We explore the impact of this phenomenon on built form in the next section.

4.6 Most of the case studies incorporate a mix of building heights with only 6 being of one height. These are not necessarily the tallest or highest density schemes. Schemes of mixed heights include lower density schemes of 2 to 4 storeys but with the make-up of the other case studies being very varied and including a scheme with blocks at 10 and 14 storeys, another at 5, 8, 9, 10, 13 and 22 storeys and another between 6 and 28 storeys.

DENSITY AND BUILT FORM

4.7 Many factors (size and mix of units, car parking, provision of shared amenity space, size of plot etc.) determine density; our interpretation of the evidence recognises the wide variations between outwardly similar built forms and massing which can arise as a result.

4.8 Analysis of the 12 depth case studies shows that, densities of up to circa 550 dwellings per hectare are achieved across a range of built form typologies but are found predominantly in buildings of up to 15 storeys in height. Some of the case studies include (or comprise) taller elements within a larger scheme. A significant overlap exists between the densities achieved by the mid-rise blocks of 4 – 9 storeys and those achieved by single blocks of between 10 and 20 storeys and over.

4.9 Densities in excess of this level also show a range of built forms; whilst taller buildings are more strongly represented in the upper end of the excess density group, many of the case study schemes achieve higher densities by means of higher site coverage, sometimes with stepped building heights, sometimes with little or no “set-back”

from the back of pavement and/or shared amenity space. One case study achieves a density of circa 800 dwellings per hectare (circa 2,300 habitable rooms/hectare) with a height of 6 storeys in a free-standing small block; another much larger mixed height scheme achieves a density of 970 dwellings per hectare with elements varying from 6 to 10 storeys and incorporates a corner tower of 28 storeys.

4.10 The case study of 6 storeys described above, comprises 16 units on a total site area of 0.3 hectares in a central setting, and provides amenity space in the form of balconies to 38% of units (6 balconies), and private terraces to 13% of units (2 private terraces). An occupied commercial unit is provided to the ground floor comprising 96 m². The built form is low rise; yet this scheme delivers the highest density from a low rise block of all of the schemes amongst the depth case studies. However, the context is important: occupying a site of 0.02 hectares, the block in question provides only 1 disabled car parking space and 16 cycle spaces; there is no shared amenity space for residents, although there is an area of nearby public open space to the south of the site.

4.11 The second case study referred to in paragraph 4.9 as a mixed height scheme includes a tower element of 28 storeys. This tower has 298 units on a total site area of 0.33 hectares, and provides amenity space to approximately 90% of units in the form of balconies and a small number of private rear gardens. Two (unoccupied) commercial units are provided to the ground floor comprising 1,130 m². The built form typology ranges from low rise (under 10 storeys) to medium – high rise (21 – 50 storeys)¹². In this case the 28 storey tower which forms the taller element of the building has been let as 100% private rented accommodation; the affordable housing is confined to the low rise phases of the larger scheme which are no more than 10 storeys. Shared amenity space is provided in the form of a communal courtyard including a small equipped play area; there is also a shared meeting space/living room area within the building and a roof terrace (not open when visited in March 2016). The external courtyard area is below the Housing Standards guidance for the number of residents in the scheme as a whole. Perhaps more significant is the fact that 273 of the total 298 units in

this block are one and two bedroom units, allowing a higher density to be achieved on this site than would normally be expected. The analysis of the case studies suggests that even at very high densities (800 dwellings per hectare and above) there are wide variations in building height from 6 storeys upwards to 50 storeys. Of the four depth case studies with densities in excess of 800 dwellings per hectare, all are located in central settings and three also have high PTALs (Levels 4-6). In these locations there is an acceptance that higher densities are generally acceptable in policy, such that proposals for even denser development (i.e. at levels above the SRQ matrix range) may also be seen by planning officers as acceptable in the local context.

4.12 The highest density case study within the research is a building of 43 storeys with a density of 1,355 dwellings per hectare; this building was completed in 2010 and is considerably taller than the adjacent mid to high rise buildings of up to 25 storeys. However, the building in question was the first tall building to be completed in this area and was permitted in the context of an overarching master plan which provided the detailed policy framework for development in this area. By contrast, the depth case study at the second highest density is represented by a 12 storey block enclosing a central atrium which delivers 1,043 dwellings per hectare. The latter scheme provides an example of a development on a tightly constrained site which nevertheless responds well to its neighbours in terms of its height, scale and massing. Shared amenity space comprises a private play area located in an adjoining pedestrianised street at ground floor level and a green roof terrace; the majority of units (113 out of a total of 120 units) have generous balconies. This may in part reflect the location of this case study within a designated “Opportunity Area” which is the focus of an important strategic regeneration initiative. Development in this part of north east London is being guided by an overarching vision and master plan for the area as a whole, providing a contextual framework against which individual proposals are considered. The importance of a strong master plan or regeneration framework when building at densities above the SRQ Matrix is discussed further in sections 5 and 6 of this report.

¹² The building typologies considered in this research are defined for the purposes of this research as follows: Low = under 10 storeys Medium = 10 – 20 storeys Medium – High rise = 21 – 50 storeys Tall building = 51 plus storeys.

4.13 The tallest building in the sample is a 50 storey block containing circa 220 residential units (roughly equivalent to 4.5 units per floor). This building was approved at a residential density of 375 dwellings per hectare (just below the top end of the range for its setting and PTAL). The planning application site area in the LDD is 3.59 hectares with a residential site area of 0.594 hectares. The density is calculated using the proposed residential site area (223 units/0.594 ha) which results in a density of 375 dwellings per hectare. However, this density is misleading as the site area covers the wider St George Wharf development which includes five large buildings in addition to the tower. The LDD does not include a figure for habitable rooms within the record for this scheme and, although this can be estimated the results are not always reliable. There is no affordable housing within the tower itself, (this is provided elsewhere within the wider scheme) and some very large units, including a five-storey penthouse unit, on the upper floors. The calculation of site area varies from scheme to scheme; this largely explains why, on paper, the tallest of the case studies has a relatively low residential density and is an illustration of why the headline density may not always be a guide to the form or height of building, and vice versa.

4.14 The case studies confirm a very broad general relationship between height and density but that the relationship is not linear and there is no direct link between the specific height of a building and its density, as measured in the London Plan context. However, the data should be interpreted with caution, in part because of the inconsistent approach to site measurement and density calculation referred to in paragraph 4.13 above and elsewhere in this report. Our findings reflect the metrics of the particular cases in our sample, which are typical in demonstrating that application-site boundaries may go beyond the immediate setting of the proposed block. This is especially so where the scheme is part of a wider development delivered in phases. However, the general finding is consistent with previous studies which concluded that the relationship between scheme density and building height is complex¹³.

4.15 Density achieved for each scheme represents a composite of metrics and a comparison of density between completed blocks becomes even more complex where blocks and towers are mixed on the same site. Setting this aside, it is clear that where the floor area of individual flats in a scheme is larger than average (as in the case of the 50 storey tower described in paragraph 4.13) tall buildings will not deliver the high numbers typically associated with this built form, illustrating further that there is no simple correlation between increased height and increased density.

TYPES OF BUILT FORM

4.16 Looking across the 12 depth case studies a number of broad built form typologies emerge, although some schemes are somewhat of a hybrid. The typologies are described below with sketch plans to illustrate typical layouts.

4.17 Terraced housing with gardens, of a traditional suburban style and layout; mainly 2 storeys but incorporating some 3 storey elements (1 case study).

4.18 Low rise blocks of 2–4 storey apartments with surface parking (2 case studies). Retro-fitting higher density residential development within a typical low rise, low density suburban setting is not always easy and can result in some uncomfortable juxtapositions between old and new. The extent to which this can be mitigated will vary according to each site and the adjacent uses and the detailed design and layout of the development itself. A typical low rise suburban infill block is illustrated below.

¹³ Maccreeor Lavington Architects, Emily Reeves Architects, Graham Harrington. Housing Density Study. GLA, 2012.

Figure 4.3: Low rise development - suburban setting



4.19 Medium rise blocks of up to 10 storeys, including “perimeter” blocks (4 case studies) with shared courtyards, sometimes incorporating a taller element of between 10 and 15 storeys. Height and volume typically vary between blocks of between 5 and 9 storeys, creating a stepped appearance, typically arranged in a formal layout around the perimeter of an internal private amenity space or courtyard which is shared by residents but not publicly accessible; 3 case studies provide examples of this type of built form and

layout. In a fourth case study a similar density is achieved by clustering blocks around a less formal area of shared space or hard landscaping.

4.20 The case studies show that a perimeter block arrangement typically delivers a density of up to circa 500 dwellings per hectare. One of the four schemes in this built form grouping slightly exceeds this. The sketches below illustrate two typical layouts.

Figure 4.4: Medium rise development with taller elements - central setting



Figure 4.5: Medium rise development with taller elements - urban setting



4.21 Single or multiple blocks (5 case studies) Three of the case studies represent single or multiple blocks located in a mix of settings. The smaller single blocks within this group are infill developments which generally respond well to their context, although this does vary depending on a range of considerations, including the size and built form of the previous building which is being replaced and the character of the surrounding area.

4.22 Two case studies are examples of developments which have introduced tall buildings of between 40 and 50 storeys which are by definition on a very different scale to the adjacent buildings, such that they tend to become a dominant landmark feature in that area and in more distant views. This is illustrated in the sketch below.

Figure 4.6: Tall tower in a central setting



4.23 The following table summarises the built form and storey height of the 12 depth case studies.

Figure 4.7: Summary of development form and setting for the depth case studies

Setting	Density habitable rooms/ha	Units	Density dwellings/ha	Development height and form
Suburban	196	111	50	2-3 storeys – terraced housing
	500	16	160	2-3 storeys – low rise corner block
	1,551	190	543	5, 8 and 9 storey development – linked blocks with shared private space
Urban	360	61	133	2 and 3 storeys – two low rise blocks
	644	482	230	5 storeys and 9 storeys – 3 blocks (1 × 5 and 2 × 9)
	2,671	298	970	Mix of storeys levels – 28/10/9/6 – mid-rise blocks linked to corner tower
Central	766	227	331	8 storeys - perimeter blocks enclosing shared courtyard
	1,269	223	375	50 storey tower – (larger scheme includes blocks up to 20 storeys)
	929	319	431	Range of buildings from 14, 6 and 5 storeys – blocks and maisonettes linked to stepped tower
	2,300	16	800	6 storeys – single block
	2,713	120	1,043	12 storey block – single block with internal atrium
	1,277	408	1,355	43 storey tower – linked to 5 storey pavilion

DIFFERENT BUILT FORMS AS A PLACE TO LIVE

4.24 The residents’ survey asked residents about satisfaction/dissatisfaction with the ‘development as a whole’ and 79% of residents interviewed were very or fairly satisfied. However, residents in the tallest buildings are less satisfied with the development as a whole than those living in lower rise developments¹⁴. The limitations of the survey need to be taken into account here but there is a clear signal that, although residents in the tall buildings surveyed like their home, they are less satisfied with the development they live in.

4.25 Levels of satisfaction with the development varied with tenure (with those in social/Affordable Rent having the lowest rating – down to 73% compared with c80/85% across the other tenures) but also varied with development

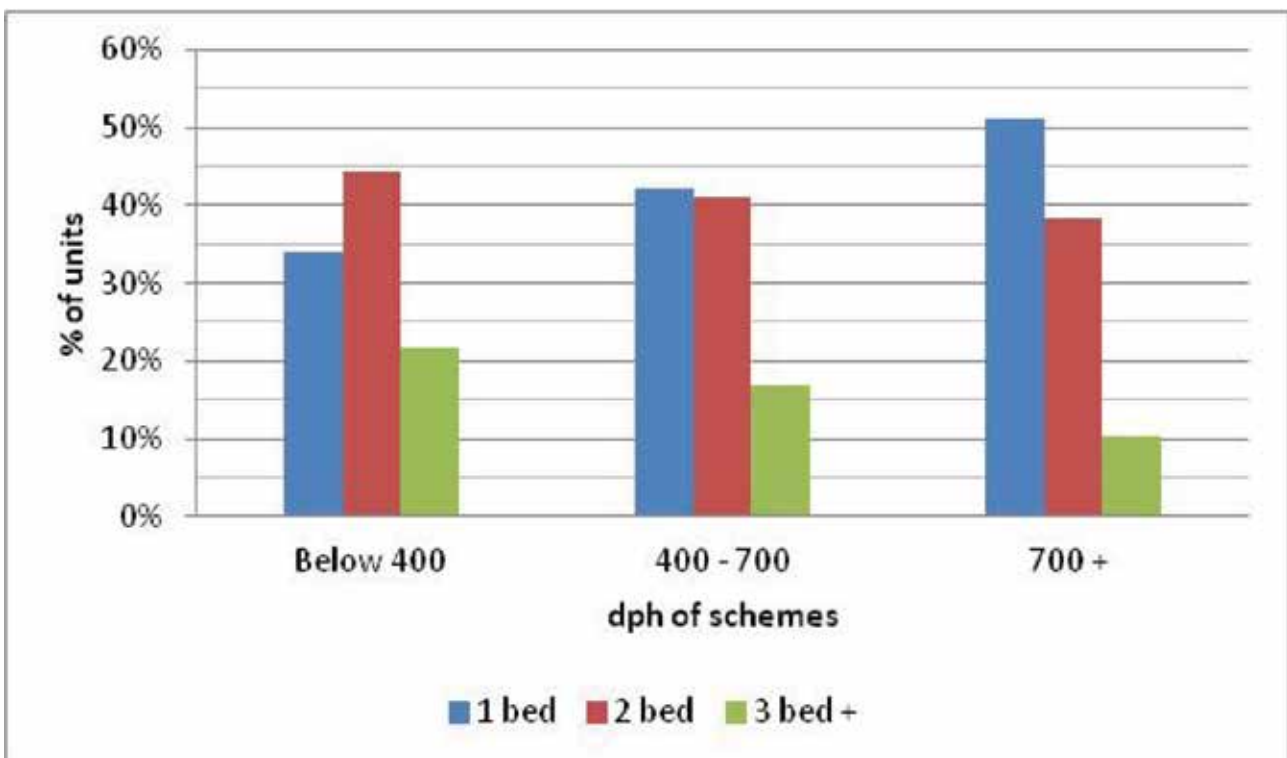
typologies as described above. ‘Courtyard’ style developments had the highest percentage of residents that were fairly/very satisfied (86%).

4.26 Residents living in flats were also asked, “Is your apartment on your preferred floor, or would you rather have lived on a higher floor or on a lower floor?” The majority of residents (77%) were satisfied with the floor they were located on. If residents wanted an alternative, it was more likely to be at a higher storey (18%). Only 5% wanted to live on a lower floor. At face value, this finding appears to contradict the earlier finding that taller buildings (15+ storeys) are less well liked as developments as a whole, than other forms of high density development. The survey was not designed to explore these views in any more detail. One explanation for this apparent contradiction could be

¹⁴ 40% of all residents in the survey said they were very satisfied with the, ‘development as a whole’ compared with 19% of residents living in buildings of 15 or more storeys. The difference is less marked when the percentage of those stating they were either ‘satisfied’ or ‘very satisfied’ is combined – 79% compared with 70% respectively.

that there is a group of residents who particularly like living 'high up'. The other conclusion that can be drawn from the evidence is that high rise living is not unpopular with residents, even if other forms of high density types might be somewhat better liked generally.

Figure 4.8: LDD data - relationship between density and types of units for three density bands



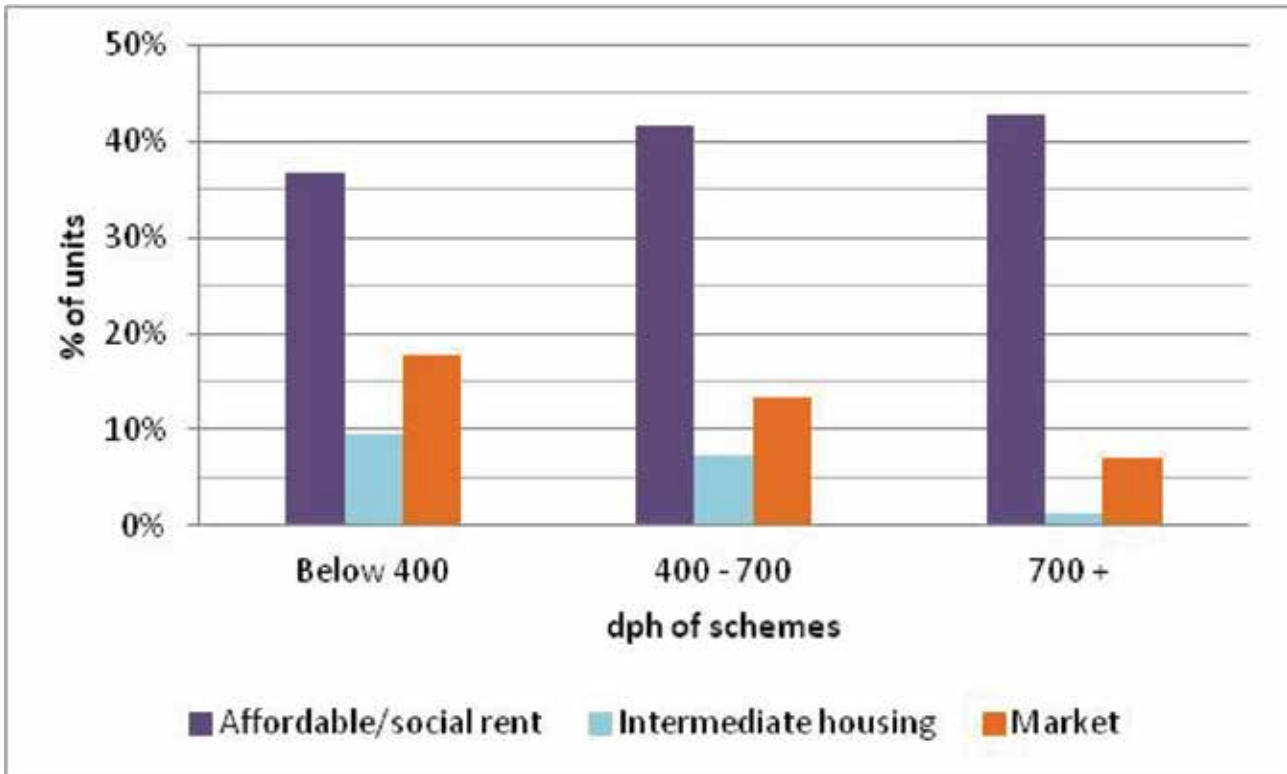
DEVELOPMENT DENSITY AND SIZE OF UNITS

4.27 As development density increases, it would be anticipated that the proportion of larger units in a scheme decreases and the LDD¹⁵ confirms this showing that schemes of over 700 dph achieved only 10% of family housing (i.e. units with 3 bedrooms and over).

4.28 There are differences in provision of family housing with different tenures, for schemes in the same density band and clearly affordable/social rent provides significantly more family housing than other tenures (in schemes of similar densities).

¹⁵ Based on planning permissions for schemes of 50 dwellings or more, for the last 5 years 2010 to 2015.

Figure 4.9: LDD data - percentage of each tenure that is family housing (3+ bedrooms) for three density ranges

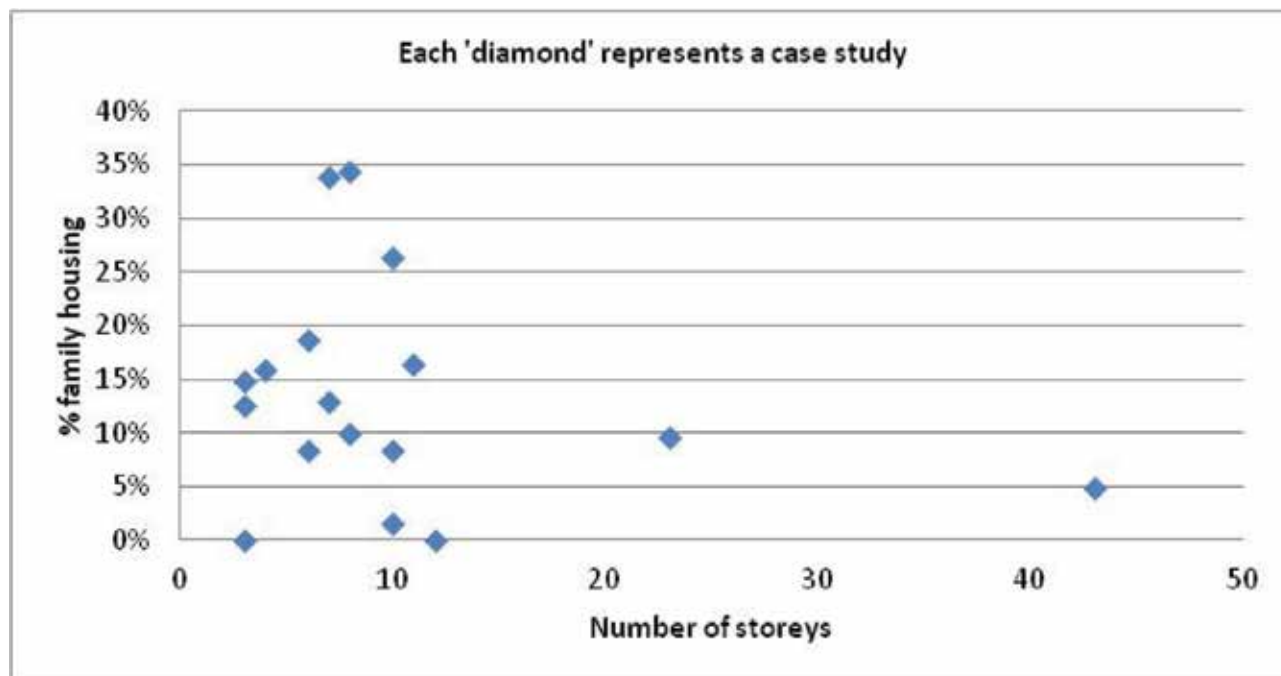


4.29 Using the much smaller database of the 19 case¹⁶ study schemes, it is possible to consider how building height relates to the amount of family housing provided. As with the LDD data, the case studies show that as the number of storeys increases, the proportion of family housing tends to decline. The relationship is not a simple one and there are examples of developments with, for example, an average height of 10 storeys¹⁷ and minimal family accommodation and another scheme of a similar height with about a quarter of accommodation that is 3 bedrooms or more. Borough policies that either encourage or discourage housing mixes in tall buildings will have an influence on this relationship. Nevertheless, the findings demonstrate that tall buildings are generally less likely to provide ‘family’ accommodation than those with fewer storeys.

¹⁶ Information on mix of units is only available for 16 of the case studies.

¹⁷ This is an ‘average’ height for a scheme with blocks of flats between 5 and 14 storeys.

Figure 4.10: Case studies - relationship between number of storeys and percentage family housing



AFFORDABLE HOUSING - FORMS OF PROVISION

4.30 In 3 of the depth case studies, there is no provision for affordable housing on-site. The other case studies demonstrate a variety of approaches to the delivery of affordable housing on-site. For 5 of the case studies, tenures are in separate blocks with separate entrances – this includes an example of a development with gated access to the market housing and street entrances for the other tenures. Another 3 schemes provide housing across all tenures in the same buildings (and are designed to be ‘tenure blind’ in appearance) but have separate cores for different tenures. In 2 case studies, both high density schemes of one or more tall buildings (over 10 storeys), all tenures use the same entrances and common areas.

4.31 Separate entrances for tenures, even in the same building, can be different in appearance. This is illustrated by one case study where the circulation space and entrance to the block containing market units (with a foyer and concierge service) is noticeably different to the block containing the affordable units.

4.32 From the perspective of the housing associations, separate access for different tenures helps manage service charges.



Residential entrance to a block containing market units comprising a foyer and concierge service

PREVIOUS USES

4.33 The case study schemes have all been brownfield sites and have replaced a mix of institutional, commercial, light industrial, residential and non-residential uses and this applies across all settings and PTALs. Two (lower density) case studies involved the redevelopment of part of a mainly low rise 1960s residential estate; one of which comprised part of a phased redevelopment programme to replace poor quality housing which had become hard to let. Otherwise, given the limitations of the sample, it is not possible to identify any pattern or common elements within the different density ranges in respect of previous uses. The previous uses for the case studies are summarised below.

Figure 4.11: Case study previous uses

Previous Use	Number of Case Studies
Residential C3	3
Institution (Hospital, College) C2	2
Light industrial and Storage B1/B8	2
Mixed use buildings, car parking etc.	5
Vacant and under-used buildings, derelict land	4
Recycling	1
Unknown	2

SUMMARY

- The case studies do not demonstrate a simple relationship between building height and density. Different scheme densities can be achieved through a variety of building heights and development types. Only the highest densities are associated with taller buildings;
- The case studies with the highest densities generally show highest site coverage – this is associated with a large building floorplate with little or, in some cases, no shared amenity space or landscaped area at street level;
- Some broad typologies of developments can be identified and at the higher densities schemes split into two very broad groups – ‘courtyard types’ and ‘single/multiple block’.

- As a place to live, the typologies are both highly rated by residents but courtyard style development was more favoured. High rise living is relatively popular and more residents are likely to want to live at a higher storey than those wanting to live lower down;
- In mixed tenure schemes, especially single towers, all tenures may share the same building and accesses. More often though, different tenures are found in separate buildings in the same development or separate cores in the same building. One reason given for this is that it allows different levels of service for different tenures and thus lower service charges for affordable units;
- The proportion of family sized housing (with 3 bedrooms or more) decreases as storey height increases and family housing is more likely to be found in affordable/social rented housing than either market or intermediate housing, whatever the development density;
- The case studies indicate that densities in excess of circa 900 dwellings per hectare are associated with medium rise (11–20 storeys) and medium to high rise (21–50 storeys) building typologies; however, many other factors, such as unit size and tenure, influence density and taller buildings are not always associated with highest residential densities;
- Estimates of dwellings per hectare provide an approximate indicator of density, but they can be misleading because there are wide variations in planning application red-line boundaries; this means that the approach to the density calculation varies on a site by site basis. As a measure of density, dwellings per hectare do not necessarily represent a reliable measure of the occupancy of the building and hence demand for services in the area; the number of habitable rooms per hectare is a more helpful measure in this context. However, the desktop analysis suggests that information on habitable rooms per hectare is not always seen as a priority in the decision making process.

5 Building design, site layout & longevity

This chapter explores differences between schemes of different densities and types for a range of factors that will impact on residents' quality of life and, potentially, ease of scheme management and the longevity of the development. The factors include privacy, temperature in the building, microclimate, parking provision, private and public amenity space.

DESIGN SPECIFICATION

Aspect

5.1 The London Plan November 2012 Supplementary Planning Guidance (SPG) and the March 2016 update provide guidance and a range of standards on the approach to design of individual developments and shared spaces within buildings. We have referred to the adopted 2016 Housing SPG throughout section 5.0. However, the case study planning consents pre-date this SPG and many schemes also pre-date the 2010 Interim SPG; which means that comparison with the adopted 2016 SPG is not always possible. The desk top analysis of the case studies indicated that the information available on aspect of units is not consistent and that the issue was not discussed at all in some officer reports.

5.2 Of the depth case studies, most schemes included some single aspect units, and the amount depended on the type of development, and largely complied with SPG Standard 29. Two of the case studies that include north facing single aspect units are taller buildings of between 25 and 50 storeys, where construction of a central service core means that single aspect units are more or less a standard feature of the design of such buildings; a proportion of

these units will receive limited natural sunlight. This can be reduced through more innovative design, for example through the use of corner units in an "H" form or triangular block. With the sample size in this study (and security restrictions on access to buildings), it is not possible to say definitively whether towers with a central service core inevitably lead to a high proportion of single aspect units. Our sample is typical in showing that site configuration and built form, combined with internal design approach, are all factors in influencing the proportion of single aspect units in a block.

5.3 Information was available on 9 of the twelve depth case studies which showed that all 9 included some single aspect units:

- Single aspect units appear to account for a fair proportion of all units within the case studies of medium rise to medium to high rise development within a central setting;
- Two of the schemes containing north facing single aspect units are taller buildings of between 43 and 50 storeys, within a central setting comprising medium to high rise development. The first case study relates to a 43 storey tower with approximately 8% of units having

a north-facing single aspect. The second case study relates to a 50 storey tower with approximately 19% of units having a north-facing single aspect;

- One of the taller buildings provided variation to the configuration of units at different storey heights which ensured that units on certain floors were north east and north west facing in order to provide some natural sunlight.

5.4 None of the housing association and managing agent interviewees mentioned any concerns with single aspect units and this did not get mentioned by residents in the survey.

Overheating and underheating

5.5 One concern about single aspect dwellings is that they are, *“...more difficult to ventilate naturally and more likely to overheat ... This is an increasing concern in London due to anticipated temperature increases related to climate change, coupled with the urban heat island effect that is experienced in high density areas of the city.”* (London Plan Housing SPG – para 2.3.39). Visits to the case study sites did not allow the temperature in flats to be checked directly but scheme managers were asked about any issues with overheating or keeping homes warm. This was not raised as an issue for individual flats but where over-heating was raised as a problem was in the corridors of flats where services (heating pipes) were located and there was no natural ventilation).

5.6 The resident survey suggests over-heating is more of an issue for residents who were asked, *“Thinking about your property to what extent do you experience problems with ... Being able to keep your home cool enough?”*. Over a quarter of residents (28%) said it was a problem and for 8% this was a ‘serious’.

5.7 The most likely group to say they had a problem/serious problem were living in the tallest buildings (15+ storeys) with 43% stating this was a (serious) problem for them.

5.8 Residents described the problem they faced with over-heating in these sorts of terms e.g.

“...too warm being high up, humidity...”

“...greenhouse effect ... windows don't open, too high, due to safety.”

5.9 A few residents (6 in total) mentioned the need for air conditioning in their flats and another couple explained that they could not open their windows wide enough – because of safety considerations given the storey height of their flat.

5.10 Concerns about keeping flats cool enough were less marked than those about keeping homes warm enough with 17% saying that it was a problem but not serious and 15% that it was a serious problem.

5.11 The most likely group to say they had a problem/serious problem were living in Affordable Rent (49%) or in schemes of 8 to 14 storeys (54%). The data suggests that keeping the home warm enough is related to affordability as much as being about building type.

5.12 Those residents who said they had a problem/serious problem keeping their home warm were asked to state the nature of the problem – 16 respondents restated the problem faced, e.g.

“...it's always cold, cold air, cold walls.”

“...it gets very cold during winter.”

5.13 Poor quality/draughty windows (8 mentions) and cost of the heating (5 mentions) were the two other set of more common reasons for lack of warmth in their accommodation.

Privacy

5.14 The London Plan Housing SPG Standard 28 requires that design proposals should demonstrate how habitable rooms within each dwelling are provided with an adequate

level of privacy in relation to neighbouring properties. There is no set distance for visual privacy though the guidance refers to a minimum distance of 18–21m as a useful yardstick. The case studies fared well in this regard (only one case study was below this standard, which involved a low rise development in a central location). In the one case study where overlooking distances between adjacent buildings are constrained to around 8.8 metres, it appears that an adequate level of privacy is achieved through the design of the development. Upper floors are stepped back from the nearest neighbouring property, and the development has been designed with aspect in mind to ensure that habitable rooms do not directly face each other.

5.15 However, there may also be privacy issues arising which do not directly relate to the yardstick. The photo-illustration below shows additional screening provided by an occupier around a balcony. The use of semi-opaque balcony materials from the outset in three of the in-depth schemes, in the form of metal paneling or obscured glazing panels, appeared from the site visits to have resulted in less frequent use of balconies for storage purposes. It is not known from the data available whether residents with semi-opaque balconies felt that they had greater privacy and as a result used the balconies more frequently for amenity space, or whether other factors were at play. The issues with lack of privacy to balconies were observed in case studies which comprised single blocks and mixed-use schemes providing a range of building typologies from low-rise up to mid to high rise.



Additional screening provided by an occupier around a balcony.

5.16 Based on this analysis there may be some privacy issues arising in high density buildings where interpretation of the yardstick for overlooking distances is interpreted as a minimum requirement.

5.17 Again, none of the housing association and managing agent interviewees mentioned any concerns with this aspect of the developments.

5.18 Residents of lower rise developments are more likely to complain about lack of privacy in their home than those in higher density schemes/tall buildings although all building types generally are well thought of with regards to issues of privacy.

5.19 The resident survey asked, “Thinking about your home to what extent do you agree or disagree that ... your home has a sense of privacy away from the other properties?”

- 93% strongly or tend to agree with the statement;
- Percentage falls to 88% and 89% respectively for those living in lower rise development (4 or fewer storeys) and those living in Affordable Rent;
- Highest levels of satisfaction were found with residents in taller buildings (over 15 storeys) at 100%.

Ceiling height and daylight

5.20 Our analysis of the floor to ceiling height (London Plan Housing SPG Standard 31) of the case studies has been limited by the availability of data. For ten of the twelve depth case studies no information on floor levels was available in the Committee reports and elevation plans did not always specify floor to ceiling heights. Of the two case studies where information was available, one development comprised a two storey corner block in a suburban setting with units at second floor in which the floor to ceiling height was 2.4 m rather than the 2.8 m achieved for ground floor and first floor units. The planning application for this particular development was refused by the local planning authority, (although floor to ceiling heights were not a determining factor) and subsequently allowed on appeal. In the other case study where information was available, the development comprised a 12 storey block where each floor was 3m in height. From the limited information available, including interviews with residents, there is no evidence to suggest that there is a strong link between reduced floor to

ceiling heights and increased density. Further work to review a full set of approved floorplans and sections would enable this issue to be explored in greater detail.

5.21 Similarly, the desktop research revealed no obvious issues with regard to the compliance of schemes with daylight and sunlight standards (London Plan Housing SPG Standard 32), but again it is noted that in seven of the depth case studies, no information was available. Applications for the remaining five schemes were supported by daylight and sunlight reports which showed that:

- In four case studies the proposals would comply with the BRE guidelines with regard to permanent overshadowing;
- In a medium rise development within a central setting the standards would be exceeded;
- In a low rise to medium rise development within a central setting, the site's layout has been carefully orientated in order to maintain good access to both solar energy and daylight;
- In a low rise development within a central setting, there would be only one instance in which there would be an adverse effect to the daylight received by neighbouring residential dwellings, although it was acknowledged by BRE that this outcome was inevitable and that the results satisfied BRE criteria in all other respects.

5.22 From the limited information available, it does not appear that, for higher density schemes, there are significant issues in terms of policy or that adverse impacts relating to daylight and sunlight were of sufficient a concern to warrant refusal of planning permission.

5.23 However, the resident survey shows that lack of daylight in the home is of serious concern for a minority of residents. Although 91% of residents surveyed agreed overall with the statement, *“Thinking about your home to what extent do you agree or disagree that ... there is sufficient daylight in your home?”* for those that did not agree with the statement, the issue was of sufficient concern that 95% stated they regularly need to turn on lights in living rooms/ kitchen/bedroom during the day. Survey sample sizes are

very small to draw definitive conclusions on this point but the results indicate that the problem of lack of daylight is more of a concern in lower rise developments¹⁹.

LIFTS AND CIRCULATION SPACE

5.24 Only two of the 12 depth case studies do not provide lifts; one is a development of low rise terraced housing and the other is a 3 storey block with two upper storeys which are accessible only by stairs. The remaining 10 depth case studies provide lifts in the communal areas of buildings.

5.25 The London Plan requires each core to be accessible to no more than eight units on each floor (London Plan Housing SPG Standard 12). The case studies generally met this requirement but with some exceptions:

- One case study is just over the eight-unit requirement with 10 units per floor, and another case study has up to 11 units per floor;
- Two case studies significantly exceed the standard with up to 20 and up to 24 units per floor. These were both higher density schemes (at around 400/500 dph) but not the highest density of the case studies or of the tallest buildings in the sample – one was an example of a ‘courtyard’ style development and the other a single block²⁰.

5.26 The information available from the site visits in relation to circulation space was inconclusive as access to some of the ‘gated’ buildings for research purposes was restricted.

MANAGING WASTE

5.27 Dealing with waste emerges as a key issue for scheme management and can be the source of friction between neighbours and the cause of litter in common areas and amenity spaces, as these two comments from housing association interviewees indicate:

“Getting rid of waste is always a challenge ... do you put bin stores at block entrances or try to conceal them a bit.”

“How to deal with waste effectively – big issue with high density flatted developments ... residents leaving rubbish outside their front door...”

¹⁹ It is not possible to say whether residents expressing a significant problem with daylight in their accommodation are living in single aspect flats.

²⁰ It is worth pointing out that the residents’ survey did not highlight specific concerns amongst occupiers about the number of flats per floor. However, this may not have been a named complaint but might have emerged in terms of a general lack of satisfaction with the home or the development as a whole but this cannot be concluded from the evidence available.

5.28 In flatted schemes, the location and ease of access of waste bins for residents and for ease of cleaning is a very important detail of design with different solutions for different schemes.

5.29 The research does not indicate that managing waste becomes more of an issue simply because a building is taller and/or a scheme is more dense. Solutions relate to the number of facilities required in relation to the flats they serve, how they are accessed and how they are cleaned. We did not identify a 'pattern book' of ideal design solutions but scheme managers spoke of the importance of engaging with them during the design process so that design solutions are workable.

5.30 Effective waste management is also about the cleaning regime that is adopted. There is a trade-off to be made between the amount of cleaning undertaken and service charges.

5.31 Within the majority of the depth case studies, refuse storage areas are incorporated within the building. An innovative example of refuse storage provision found is where a number of household waste units are provided across the site, which sit comfortably within the public realm and are easily accessible to residents.

5.32 One of the schemes of a medium to high rise development within a central setting has been configured to allow for good management and maintenance, with a servicing road provided to the rear of the development to provide easy access to refuse storage areas. This allows refuse vehicles to readily stop and access the refuse areas without compromising road user and pedestrian safety.

5.33 Refuse storage areas that front onto the street can create an inactive frontage.

5.34 In smaller schemes, refuse storage can be tucked away to the rear of the site to ensure it does not adversely impact the visual appearance of the scheme from the road frontage, whilst also being accessible to residents.



Refuse storage areas can result in a blank street frontage if positioned at the front of the building.



Managing waste also depends on good management practices within each building.

BUILDING FABRIC

5.35 All 19 of the case studies have been completed very recently, the majority within the last five years (as is the case for all the depth case studies). Relying on a visual inspection from the site visits, the building fabric of the depth case studies appeared in good order with no evidence at any of the 12 depth case studies of significant deterioration to the building fabric.

5.36 However, some superficial signs of deterioration were noted at a number of the case studies:

- The oldest scheme is a low-rise development located in an urban setting, which was completed in November 2010. There is some minimal staining to render on parts of the exterior of the building;
- One of the suburban case studies comprising a low rise development showed some signs of weather staining to brickwork, and was completed more recently in March 2013;
- One of the central case studies comprising a low rise to medium rise development showed some discoloration to a wooden clad façade, was completed in February 2011.



Issues with weathering can occur across all density ranges depending on the materials used and their maintenance.

5.37 Two other case studies completed in June and October 2011 respectively provided no evidence of deterioration.



The fabric of the building remains in good order following completion.

5.38 From the evidence of the depth case studies, there is no clear link between the age of a development, scheme density and the level of deterioration. The use of different materials of perhaps varying quality could be one determining factor in this.

5.39 Findings from the site inspections were confirmed by the housing associations and managing agents who were generally of the view that the schemes are 'lasting well'. The one exception was an interviewee who commented on a number of post completion defects but these had been dealt with and now the scheme is, "...running very well".

5.40 None of the interviewees indicated that there may be longer term maintenance issues with the buildings although it was noted that 'very fancy façades' could be more expensive to maintain in the longer term. However, interviewees may not be qualified to comment on this and, given the relative newness of the buildings, it is too early to tell. Where maintenance and building performance issues are raised by managing agents or residents this could be monitored over time, along with any associated burden of maintenance costs.

MICROCLIMATE

5.41 There is limited evidence from the case studies to draw any inferences about the microclimate associated with the type and density of development. At none of the site visits

were problems of wind tunnelling noted. The 'courtyard' developments are likely to experience suntrap conditions in summer but equally this layout can produce areas of shading.

5.42 Similarly the 'courtyard' developments were reported by one housing association interviewee to be the cause of noise problems for residents – especially where children were playing, as the noise ricochets around the courtyard. However, the commentator also noted that courtyard designs could overcome this potential problem by having 'gaps' around the courtyard where noise could escape from. The resident survey did not highlight 'noise' as an issue generally for residents – across the whole survey, it was only mentioned by 4 residents and, as noted earlier, courtyard style schemes were generally well liked by residents (with 86% being either fairly/very satisfied with the development/ this development typology).

5.43 The importance of the location of communal amenity spaces became apparent from a site visit to one case study involving a low to medium rise development in a central location. In this instance, whilst the communal space was well equipped with gym equipment and play equipment, the space was north-east facing which would mean that this enclosed communal area would largely be in shade throughout the day, which could result in poor level of usage by residents who might prefer to make use of alternative public spaces in the surrounding area which benefit from a sunny disposition. Further commentary on the relationship between density and private and communal spaces is provided in the following sections.



North-east facing communal space largely in shade throughout the day.

PRIVATE AMENITY SPACE

Importance of private amenity space

5.44 The resident survey highlights the availability and importance of private amenity space – even in the highest density schemes.

5.45 When asked about the amenity space available to them (for sole use or shared), 95% of residents in the taller buildings (8+ storeys and including 15+ storeys) said they had their own balcony. It was actually residents of lower rise developments who were more likely to say they had no private amenity space – including 43% of those living in buildings of 4 or fewer storeys (but this may be a reflection of the particular schemes in this group used for the residents' survey).

5.46 Residents were asked about the importance to 'you and your household' of the 'property's **private** outside space'. Overall, 78% said it was very or fairly important and the remainder (22%) that it was not (particularly) important. Younger residents (34 and under), those living in private rent and those living in taller buildings (15+ storeys) attached the least importance to private amenity. Nevertheless, even amongst these three groups, around 70/75% said it was important.



Provision of private amenity space

5.47 The majority of the case studies provide some form of private amenity space although the amount and quality of this space is variable, suggesting considerable flexibility with regard to how the guidance provided in the London Plan Housing SPG (Standards 26 and 27) is being interpreted and applied. This variation occurs across the range of physical settings (Suburban, Urban and Central) and applies to developments both within and exceeding the London Plan density range for their location and setting.



Balconies provide private amenity space for residents, although their design and quality is variable.

5.48 The single blocks and towers which represent the upper end of the density spectrum, generally provided little or no communal amenity space or landscaped areas for use by residents; one 12 storey block of 120 units (with a density of over 1,000 dwellings per hectare) has provided a children's play area in a pedestrianised street for use by residents.

5.49 In the majority of case studies private amenity space is provided by means of balconies; these are most prevalent in low and medium-rise buildings, although one of the taller buildings (a 20+ storey tower) provides balconies at all levels. Examples of two approaches towards provision of private amenity space are discussed below:

- A scheme at a density of over 300 dph comprising a residential block subdivided into “cores” of between 5 and 9 storeys provides all units with access to private amenity space in the form of balconies (projecting or recessed) or small enclosed patio areas at entrances to ground floor units. The building is a perimeter block and encloses a further area of central shared space. A children's play area and a landscaped garden with raised beds and seating is provided to the north of the block for the wider development. In this example all of the objectives of the Mayor's policy guidance appear to have been met;
- An example of a high density block where 113 out of 120 units (94%) have balconies; the block is designed such that these are of generous proportions. The building encloses an atrium space and a private (gated) children's play area is located nearby at ground floor level for use by residents. A green roof terrace is also provided.

5.50 By contrast not all low rise schemes provide useable private amenity space. For example:

- A low rise development of between 3 and 4 storeys in a suburban setting has limited private amenity space; most ground floor units have patios and “front gardens” are provided for units facing the main road, but upper floors have “Juliet” balconies, providing no private amenity space for these residents. A communal courtyard garden is provided for residents which includes a children's play area; all parking and communal areas are accessed via electronic gates.



Generous sized balconies for each unit – a scheme of c250 dph.

5.51 Only one of the three tallest buildings in the case studies provides useable private amenity space in the form of projecting or recessed balconies space for all units. The other two tallest towers do not provide private amenity space (although verification has been limited due to access restrictions). However, whilst this suggests that there may be an issue with the provision of private amenity space at very high densities, particularly in tall buildings, it is difficult to draw any firm conclusions on the provision of private amenity space and density based upon the relatively small sample of case studies. It is relevant to note that safety, cost and maintenance issues with regard to the provision of external balconies in tall buildings are likely to influence design solutions.

5.52 Further work on the location of balconies could be undertaken to investigate whether recessed balconies with greater enclosure and privacy are perceived as more useable at higher densities than protruding balconies which are often more exposed.

Use made of private amenity space

5.53 Observations made on the site visits suggest that in some locations balconies have been provided without reference to the need for adequate screening with examples found of residents providing their own additional screening in the form of bamboo matting, which weathers rapidly and can look unsightly. Visits were made during February and early March and it was not possible to assess how well either balconies (or in some cases roof terraces) are being used by residents.

COMMUNAL/PUBLIC AMENITY SPACE

5.54 Residents who had access to some form of **shared space** were also asked about the importance to 'you and your household' of this. A very different picture emerges from that found with the private amenity space. Overall, only 42% of residents with access to shared space said it was fairly or very important to them and 58% said it was not. It was of least importance to those living in private rent, those living in taller buildings (15+ storeys) and those living in single/multiple blocks – with relative percentages for these groups being 75%, 69% and 76%. We might have expected that shared space would be more important to those living in 'courtyard type' developments (with ready access to this type of space) and the survey confirms this with 65% saying it was fairly/very important to them but again it must be recognised that the sample size is too small to be entirely reliable here.

5.55 Where communal amenity space is provided (in accordance with London Plan Housing Standard 4), and despite the relative lack of importance for residents, the housing association and management agency interviewees reported that the space provided is mostly well used, especially when it is for use by residents only and not the general public. Communal amenity space was reported as being less well used in schemes where properties had their own gardens (lower density schemes) or where residents had alternatives they preferred (e.g. roof terraces within the scheme, local park) and the communal space was more 'public' in character e.g. as a through walkway.

5.56 The site visits showed that five of the 12 depth case study schemes provide communal amenity space. This may be in an area with secure access for residents only; it is a particular feature of courtyard layouts but in other schemes, can be provided in other ways e.g. as a roof terrace, internal garden space, square or dedicated green spaces for specific blocks. Communal amenity space can include exercise equipment but may simply be informal open space for residents to enjoy.

5.57 Other case studies relied on a shared space between blocks (comprising hard and/or soft landscaping), or alongside a pedestrian route. Of the larger mid-rise developments which included shared amenity space four also provided well equipped play areas as illustrated in the examples below.



A play area provided for use by residents and the local community.



Well-equipped communal play area.



For smaller schemes, the absence of any shared amenity space may not be an issue if there is good provision nearby.

5.58 Some of the case studies include an area of central landscaping between blocks which is open to the public being on a pedestrian route. Investment in good quality public realm supports long term regeneration objectives. Within the 12 depth case studies there was some evidence that this is more likely to be achieved where there is an over-arching master plan or regeneration framework, as is the case for the two case studies located within designated Opportunity Areas.



Examples of high quality public realm which is being well maintained

5.59 The provision of public amenity space may not always serve an obvious purpose or be well used. Some of the depth case studies showed that whilst external amenity space had been provided, in these cases it was mainly in the form of hard landscaping which could appear bleak and uninviting. These spaces were not always well used, as the example below illustrates.



Public square – being used for rubbish



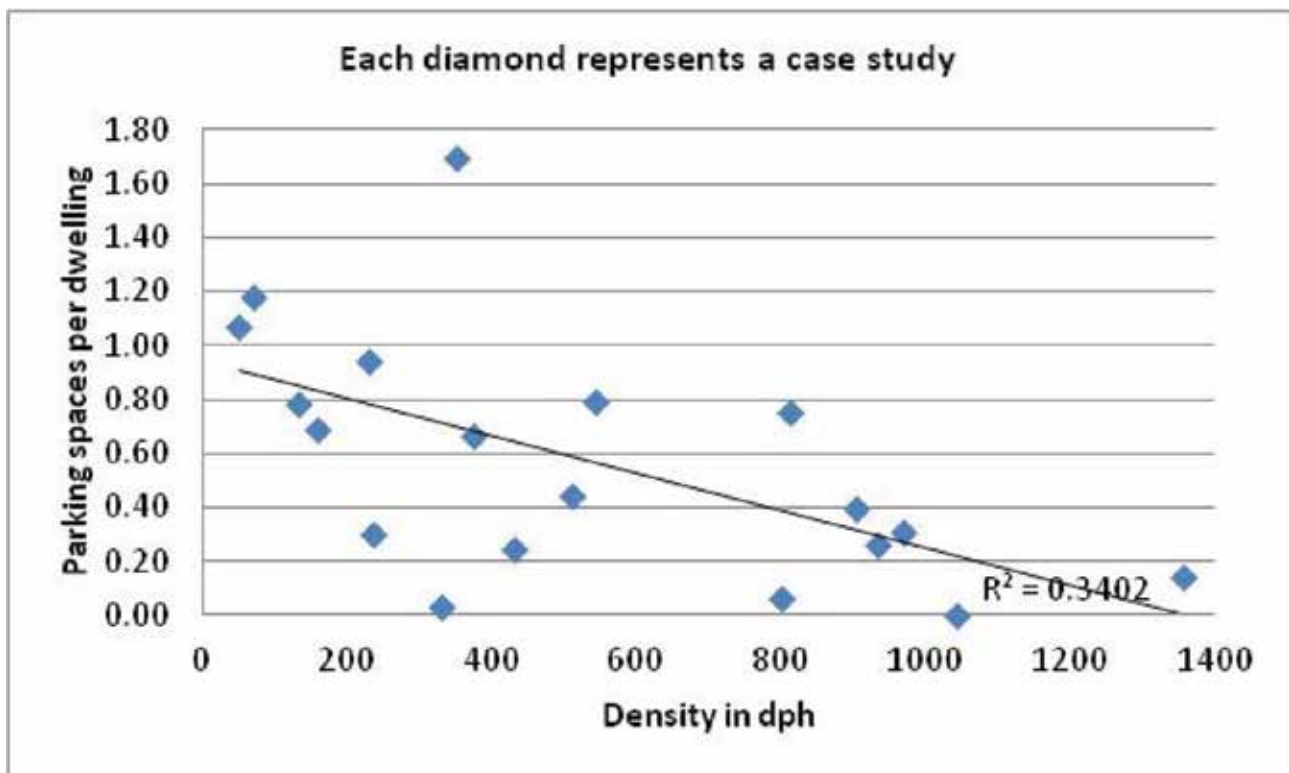
Landscaped communal space provides little amenity space for use by residents at one of the towers.

PROVISION FOR CARS AND CYCLES

Car parking

5.60 Reflecting London Plan policy, as scheme density increases, the provision of on-scheme car parking falls away. The chart below illustrates this and shows a number of schemes with minimal or zero provision (disabled spaces are included in the count of parking spaces).

Figure 5.1: Case studies parking provision - 19 case studies



5.61 Schemes of up to 350 dph provide all or most car parking at ground level – in one case towards the top of this range, provision is minimal. Thereafter, parking is provided in a variety of ways including undercroft, underground/ basement or at first floor but even at densities as high as 550 dph some parking at ground level may be provided. The highest density schemes (at around 800 dph and above) do not have street level parking – however, as noted above, the amount of parking being catered for in these schemes falls away significantly and the underground/basement provision that is made will be limited relative to the number of units.



Covered car parking spaces located at ground floor level

5.62 Lack of on-site parking is expected in the very high density case studies which, by the way they were selected, are in locations which are the most accessible and where occupiers do not expect on-scheme parking to be generally available: *"This is a car free scheme ... location is very central ... not really an issue..."* (Housing association interviewee)



Car club schemes operate in some developments located in central locations.

5.63 Where parking is provided, after provision is made for disabled spaces, parking spaces are 'rationed' on the basis of costs (with figures of £1,000–£1,200 per annum quoted during the research) although housing associations which have some control over this, can give priority to families.

5.64 In lower density more suburban settings, there is a greater expectation that car parking will be provided on-site for residents and this can be a cause of difficulties when spaces are insufficient for all residents who want a space.

5.65 The resident survey did not ask specifically about parking provision but residents interviewed had the opportunity to raise concerns about parking, when asked for reasons for any dissatisfaction with their home – only one resident mentioned parking. However, scheme managers did report that managing on-site parking can be a major management issue – especially where the scheme is essentially a no parking development but residents want to park on-site. But at the most centrally located/highest density schemes parking seems to be less of an issue as residents don't expect/want their car near their home.

Provision for cycles

5.66 Information about provision for cycles has not been found for all the case studies and the picture on cycle provision is somewhat patchy. However, it is apparent that cycle parking is mainly being provided at around 1 space per unit – and as high as 2.8 spaces per unit. In the lowest density schemes (with houses and street entrances) separate provision for cycles is not made.

5.67 In higher density schemes, provision is generally in secure locations (such as in building cores or undercroft parking) and in ‘locked’ storage facilities. There is then a very mixed picture about the level of use of the facilities. Observations from the site visits, where cycle parking was provided in small clusters, and in locations visible to the casual visitor, indicate that cycle stores are well used.



Secure cycle storage well used by residents

5.68 However, some housing associations reported that cycle provision, even in secured and locked facilities, was poorly used as cycle owners were still concerned about security and preferred to keep their cycles in their own flats. The casual cycle user can ‘hire’ a bike whenever they need to while the regular cyclist wants to keep their higher spec cycle in a location they know to be secure. From a housing associations/developers’ viewpoint, including areas for cycle storage which are then not used, can be seen as a waste of space in a building and is an issue that requires innovative solutions.



Cycles stored on balconies – a sign of under provision or owner concerns about security?

MIX OF USES

5.69 Of the 19 case studies:

- 6 were residential schemes without any other uses;
- 4 had at least one commercial/retail unit;
- 6 had at least one commercial/retail unit and another use e.g. cafe, nursery;
- 3 had at least one commercial/retail unit and office space.

5.70 There is no particular relationship between the scale and/or density of the scheme and presence of other uses. For example, the case study with the most extensive mix of other uses (3 commercial spaces and an office) has just over 100 residential units while three schemes in excess of 200 dwellings had no non-residential uses. Non-residential uses were typically provided at ground floor level.

5.71 However, these findings could be misleading. Some of the case studies, without commercial uses within the site, are part of a wider development guided by an overarching master plan which includes a wider mix of uses. A scheme which includes successful mixed use development is illustrated below.



Commercial space provided to the ground floor.



Ground floor commercial units successfully let and contributing to a more vibrant place.



Successful mixed use in a high density block.

5.72 Examples of other mixed use developments from the depth case studies include:

- A 12 storey residential block which has been delivered at a density of over 1,000 dph and which incorporates commercial units at the ground floor, occupied by specialist uses (hairdresser and restaurant). One further unit remains vacant;
- Two of the larger case studies (at over 400 units and c 1,000 units) had provided a significant amount of retail and/or commercial floorspace at street frontage which appears to have remained vacant since completion.

5.73 Some commercial spaces appear to remain vacant for some time after the residential part of the scheme has been completed for a wide range of interrelated factors. One such scheme is a low rise to medium rise development located within a central setting which contains four

vacant commercial units comprising 675 m²; these units appear to have remained vacant since the completion of the development in 2013. This may reflect insufficient footfall and/or strong competing supply locally, as in many traditional “high street” locations and finding occupiers for the commercial units appears to have been problematic. This was the case with four of the case studies.

5.74 But other reasons were given for vacant space including the importance attached by the landlord to getting the right mix of uses on-site:

“Retailers are independent and handpicked so it is taking longer to get them up and running.” (Private management company interviewee)

The forthcoming GLA research study of vacant ground floors in new mixed-use developments will provide more detailed analysis of this issue.



Mixed-use developments may not always provide an active frontage, depending on how the space is designed and used.

THE ROLE OF MASTERPLANNING

5.75 Our analysis highlights the importance of a policy framework and/or master plan in achieving successful integration of blocks or towers within their surrounding area and in maximising active frontages in accordance with London Plan Housing SPG Standard 10.

5.76 Masterplanning provides the ability to phase developments, including the release of commercial space alongside residential development. One of the case studies which has had the benefit of a master plan has seen development phased in this way and involves a low rise development in a suburban location. Initial phases of development have provided a range of uses alongside residential dwellings. Recently completed phases contain commercial space and one of the four units was unoccupied when this research took place. As future phases of development come forward the resident population of the area will gradually increase and this could increase confidence in the local commercial market sufficiently to attract occupiers to units which are currently vacant. The importance of achieving a “critical mass” in terms of footfall is well established as a driver of demand for retail floor-space; mixed use is therefore more likely to succeed in catchments where the local population is expected to increase and/or competing provision is limited.

5.77 The benefits of a master plan apply to a range of objectives, e.g. provision of quality public realm and improvements to the street scene, maximising active frontages, including mixed use and securing occupiers for these units. One case study appeared to have successfully met all of these policy objectives. However, some of the case studies which provided commercial mixed use units did not deliver active frontages and instead offered mainly blank elevations to the public realm. In this sense, our limited sample would suggest that it may be more beneficial to deliver mixed use within high density in the context of local policy guidance which is evidence based, having regard to the existing provision of retail and commercial floor-space within and beyond the immediate catchment. In the schemes where some commercial units were occupied the tenants included a hairdresser, an independent pizza restaurant, café and a convenience store, successfully increasing the range of local services available.

5.78 From observation on-site, those site blocks or towers with direct frontage to the public realm which present blank ground floor frontages onto public roads and footpaths sometimes create an uncomfortable relationship between the building in question and the adjoining area. However, this can be moderated where buildings are set back from the road or footpath and provided with good quality landscaping in the public realm.

SUMMARY

- From the depth case studies a mixed picture has emerged of compliance across the building design standards for aspect, circulation, privacy, active frontages and communal and private amenity space;
- Whilst the case studies pre-date standards in the 2012 and 2016 Housing SPGs, most do comply, but with some exceptions; for example, in two of the case studies the number of units served from a central core exceeds the SPG Standard. Due to the large number of policies and standards in the SPG, there will inevitably be compromises at the decision-making level;
- A central service core within tower schemes of medium to high rise development makes the provision of dual aspect units more difficult;
- Single aspect windows may be associated with over-heating in flats and for a minority of residents this is a (serious) problem. However, keeping the home warm enough was more likely to be a problem and was reported by a third of residents, some of whom explained that the issue was with the cost of heating their home;
- Analysis of the floor to ceiling height of the depth case studies has been limited by the availability of data;
- Private amenity space is of importance to the majority of residents and was generally provided across all schemes but the quality and quantity was variable, suggesting considerable flexibility with regard to how the SPG guidance is being applied. The taller buildings in our sample demonstrated a lack of provision of outdoor open private amenity space;
- Communal amenity space also varies in quantity and quality across the schemes. Tower schemes notably do not have these areas in the same quantities as the low and mid-rise developments;

- Dealing with waste is an issue which requires a considered design response. This applies to all flatted developments; although as density increases, more thought is needed in achieving a successful solution. Management input at the design stage is important in finding successful solutions. Effective waste management also relies on a responsive cleaning regime but there is trade-off between the amount of cleaning provided and the service charge;
- Schemes that come forward as part of a master plan tend to be more successful in letting commercial units in mixed use developments where there is the critical mass to generate footfall and where there is no immediate competing provision in the site's catchment.

6 Impact on the surrounding area

The case studies used in the research are, in the main, likely to be at a density in excess of their surroundings and may also be much taller structures than neighbouring developments. This might have a range of impacts on the surrounding area and the wider community which are discussed in this chapter.

PHYSICAL FORM OF DEVELOPMENT

6.1 The analysis in this report focuses on how the absolute density and/or height of a scheme affects its design and performance. However, the selection of the case studies was mainly of schemes with a density in excess of the density range for its setting and PTAL. This implies the schemes are more likely to be at a higher density than development in the surrounding area – although this is not definitive. The 12 depth case studies provide a relatively small sample of data from which to draw conclusions and this research has not included any monitoring of impacts over time. The single site visits therefore offer a snapshot picture of the case studies and how the spaces around buildings are utilised by residents during the working day in winter/early spring.

6.2 As a general rule, the depth case studies at ‘excess density’ are taller than their surroundings (e.g. comprising a mix of 5 to 9 storeys in an area of predominately 4 storey buildings).

6.3 Some low rise developments within the case studies are of similar height and massing generally to adjacent buildings and within the matrix density range for their setting. Where developments are gated, provision of



Suburban scheme of 2 to 4 storeys – follows the existing building line – so does not appear over-bearing

communal amenity space is inaccessible to residents in the surrounding area, and does not encourage social cohesion in a community. For the low rise case studies, building design and overall quality considerations were generally identified as more important in terms of impact on surrounding area than density (as reflected in officer reports).

6.4 For the larger schemes with mixed building typologies including elements which are significantly taller than their immediate surroundings, the physical and social impacts on the surrounding area are more significant. The detail of the scheme design, layout and quality of materials used are all key factors which influence (or possibly determine) whether the difference in the scale of development has been achieved comfortably, without adverse impacts on the surrounding area, although it must be emphasised that design issues are a matter of both knowledge and judgement and we have not commented in detail on the specific merits of individual schemes.

6.5 Providing a range of storey heights within a single scheme is one way in which this impact is reduced, e.g. by mitigating issues around overlooking of neighbouring properties and potential loss of daylight. This approach was adopted in several of the larger case studies considered.



High density scheme using a range of storey heights.



An area of public space provides a 'green' setting to neighbouring uses, and also serves to connect existing and new development.



Servicing area provides a less active frontage overlooking a car park and the rear of neighbouring buildings.

6.6 Single very tall towers make their own impact, whether they are part of a wider development or are free-standing. They will over-shadow lower neighbouring development and may not respond well to local context, but this study cannot provide any view on the design implications of this or whether such schemes are a 'success' in their locality. Where a tower forms part of a wider comprehensively designed development they can sit comfortably alongside neighbouring uses. Their impact can also depend on aspect and on the direction from which they are approached; for example, in one case study, the tower sits within a regeneration area alongside larger developments and new towers when facing north, but south of the tower, the built form is predominantly low-rise.



Tower sits within a regeneration area alongside larger developments as well as low-rise development.

6.7 The London Plan Policy 3.5 (Quality and Design of Housing Developments) applies at both the neighbourhood and individual dwelling scales and stresses the importance of new housing development taking account of its physical context and local character. The London Plan Housing SPG echoes this point: *“where the character of the place is ill-defined or of poor quality, new housing development should seek to improve both the physical context and local character”*.

6.8 Housing Standards 1–7 are relevant to the neighbourhood scale. The 12 depth case studies as a group (including those within the density matrix ranges for their settings and PTALs), show that responding positively to the local context, providing a legible and secure environment and contributing to an enhanced public realm is an art rather than a science and the results are predictably mixed. As evidenced from several of the in-depth case studies, where management and maintenance arrangements for servicing and refuse storage are not considered from the outset, new developments can have a negative impact at street level in their locality. Buildings which do not have a clear 'front' and 'back', present difficulties in accommodating servicing needs, with refuse storage areas fronting the street and providing a poor interface to the public realm. This contributes to blank elevations which can harm the character of a place, and reduce the level of surveillance on the street for residents and passers-by.



Vacant commercial units make for blank frontages to the street.

6.9 Two case studies included a significant amount of unlet retail and commercial floorspace; long term vacant commercial units make for blank frontages to the street which can give rise to problems due to lack of surveillance and raises questions about the scale of demand for mixed use in these areas. However, successful mixed use which is attractive to occupiers can benefit the locality, bringing vitality as well as creating active frontages to the street.

VIEWS OF THE SCHEME MANAGERS AND RESIDENTS

6.10 Interviews with both the housing associations and managing agents included a question about any perceived impact on the surrounding area – from their perspective.

6.11 The overwhelming view of both groups is that the case study schemes fit well in their surroundings and make a positive impact. In many cases, the development is part of a wider regeneration scheme and this has been recognised as such, as these comments illustrate:

“This is a new development however we think the development is a 1,000% improvement on what was previously here.”

“House values in the area have increased as the development has made the area more desirable to live in.”

“...it was the first stage in a big regeneration of the area. It was a good stake in the ground that things were going to change.”

“...Fitted well with surroundings and well related to local facilities.”

6.12 Again, reflecting the location of the case studies within a larger regeneration scheme, there may be a sense that the surrounding areas have ‘caught up’ with the tall building represented by the case study, where it sat in isolation when first built.

6.13 The research has not been able to establish the views of the wider community on the case study developments (but noting that many of these are either away from other residential areas or part of a wider regeneration scheme). But where views on this have been expressed, they indicate a positive response from neighbouring areas, such that, as one managing agent stated:

“...several people have asked about whether they can get a flat here. We’ve had positive comments from locals”.

AS PART OF THE WIDER COMMUNITY

6.14 Housing association and managing agent interviewees were also asked for their views on whether residents feel themselves to be ‘part of the wider community’. In the main, interviewees did not feel able to comment on this. Those that expressed a view were divided. Some commented that residents did not see themselves as part of a locally based community while other interviewees commented that there is, for example, *“lots of interactions and sense of community”*.

6.15 No-one described an uneasy relationship between the case study scheme and its surrounding community (where these existed) although two examples were given of anti-social behavior affecting the case study but emanating from outside the scheme.

6.16 The resident survey asked residents whether they felt part of the community within the wider area. Residents have very mixed views about this with 53% strongly or tending to agree and 35% disagreeing. There are marked differences in views between residents living in different tenures; two thirds of residents living in Affordable Rent feel part of the wider community compared with less than half (47%) of those living in private rent.

6.17 The type of scheme also impacts on residents’ sense of connection with the wider community. Those least likely to feel a part of the community within the wider area were living in the taller buildings (15+ storeys) where the percentage **not** feeling part of the wider community was at 68%. Residents with the strongest sense of community with the wider community were living in the courtyard style development type (72% feeling part of the wider community).

6.18 Residents expressed similarly mixed views when asked whether they felt, *“...part of the community within the development”* (58% agreeing and 31% disagreeing). Again people living in courtyard style developments and Affordable Rent were more likely to feel part of the community within the development than those living in taller buildings and in private rent. Explanations for this could include the use made of communal amenity space and the greater concentration of family accommodation in this style of development.

6.19 The survey did not go on to investigate whether a lack of sense of community was a concern for those not feeling this connection. As some scheme managers pointed out, those living in private rented accommodation (and therefore more likely in taller buildings) tend to be young and mobile households, whose social connections are not in their immediate neighbourhood:

“In these schemes ... residents’ community is more virtual than immediate ... community is not the people living next door!”
(Housing association interviewee)

“Lots of opportunities to meet neighbours in (the wider area) – restaurants, bars etc. for those in 20s and 30s...” (Housing association interviewee)

“People do meet but this is a scheme for city workers – not 9 to 5 types.” (Housing association interviewee)

SUMMARY

- The case study site visits provided an opportunity to comment on the physical/design impact of the case studies on their surroundings but these are necessarily subjective views and rely on a single ‘snapshot’ view of the development in its context. Where high density involves a large scale and/or tall building the individual scheme design and layout largely determines how well the development has responded to its neighbours and the locality;
- Communal amenity space in gated developments can create a sense of exclusiveness because it is not accessible to non-residents, particularly where amenity areas are close to public paths and highways and clearly visible;
- A range of storey heights in a development can reduce the impact of a development overall, to respond to neighbouring uses.
- Scheme managers believe the schemes fit well into their surroundings and, where they are part of wider regeneration schemes, have made a positive contribution to the quality of their locality;
- There is a very mixed picture on how much residents are and feel part of the wider community. Those living in courtyard style developments and Affordable Rent were more likely to feel this than those living in taller buildings and in private rent. However, the social network of young mobile workers living in private rent may have little to do with their immediate neighbourhood;
- Providing successful active frontages with mixed uses is one way in which a high density development can benefit the vitality of an area, as demonstrated by those case studies where units are occupied;
- It has not been possible to assess the impact of the case studies on market values in the adjacent areas. A key reason for this is that most of the depth case study schemes either have very little residential development around them or that they are surrounded by residential development of a similar age.

7 Management of the site

The quality of the management of high density schemes has proven to be an important factor in making high density living successful. Management of schemes can be undertaken by private companies, housing associations or a combination of the two. This chapter explores how developments are managed, the issues faced by those managing schemes and the views of residents.

THE IMPORTANCE OF MANAGEMENT AND HIGH DENSITY DEVELOPMENT

7.1 A common theme in the research is the importance of the way the day to day management of schemes is undertaken. Some form of management will be provided where there are common areas in the development (internal or external) regardless of the density and/or height of building. The importance of quality management in new developments is already recognised in the Housing SPG:

*“Ensuring high density housing is sustainable and successful depends on a complex range of factors including location, **management**, occupancy and tenure of a development, and all should be taken into account when schemes are designed”* (London Plan Housing SPGSPG Para 1.3.2, our emphasis).

7.2 The level of management that is provided will reflect a number of factors including the scale and style of development and, in market schemes, the expectations of residents – building height is not the determining factor:

“With more people in one building you get more management issues (which) can also include anti-social behaviour inside and immediately outside the property...” (Housing association interviewee)

But,

“... the height of the building is not the issue...” (Housing association interviewee).

7.3 So, two buildings of the same density/building height can have very different management regimes (and associated service costs).

7.4 Ensuring a high standard of building management and maintenance has been identified by those managing purely PRS schemes, as a way of attracting and retaining tenants.

MANAGING AGENTS AND THEIR ROLE

Type of manager and tenure

7.5 All of the flatted developments depth case studies are managed, the type and extent of management depends on the tenure and size of the development but generally private management companies are engaged by developers to manage market housing. Housing associations may undertake the management of their own housing, whether this is solely affordable housing or includes market rent.

7.6 In mixed tenure schemes where a private landlord and housing association both have an interest in the development, it is more usual for the private sector managing agent to provide a management service for all residents. In these cases, how the relationship is organised between the management agent and housing association is on a case by case basis. The relationship is discussed further later in this chapter.

Changes in management arrangements

7.7 In a small number of the case studies, the organisation managing the scheme has changed since the scheme was first occupied – said to be to provide a better service. In other cases, the scheme manager is the same but management arrangements have been altered – for example, to introduce on-site management of ‘24/7’, replacing an initial presence of 2 days a week.

7.8 These incidences reflect the relative newness of managing high density mixed tenure schemes and that management practice is evolving with experience:

“We’re still learning about the site” (Private management company interviewee)

“Relationship between the managing agent (and the housing association) is still work in progress.” (Housing association interviewee).

Management and resident attitudes

7.9 The scale and quality of on-site management emerges as being important in the success of high density development:

“By being on-site 5 days a week and providing a 24 hour concierge, the running of the building has improved.” (Private management company interviewee)

7.10 Scheme managers can play an active role in building a ‘sense of community’ in large developments with examples given of managers organising social activities, such as toddler groups, outdoor fitness classes, Christmas events, and barbeques. As one private management company interviewee mentioned:

“Events are run throughout the year which helps to foster a sense of community as people get to meet each other.”

7.11 The residents’ survey did not ask specifically about the quality of scheme management but did ask for reasons for satisfaction/dissatisfaction with the scheme as a place to live. 12 positive comments were mentioned about scheme management, such as:

“The service, the front desk, whole experiences of people being helpful.”

“It’s a nice building and facilities are being maintained.”

7.12 Negative comments from the resident survey are fewer in number but the largest single group (9) relate to complaints about building management and, more often, its maintenance – for example,

“...the management is poor and non-responsive...”

“...the door is not working as it should...”

“...everything is OK but sometimes maintenance is a big issue...”

7.13 From the point of view of those managing the schemes, resident expectations of what scheme management should deliver may exceed what is possible, within an acceptable service charge. This tension between services provided/expected and cost can be difficult to manage and the use of residents' handbooks and agreements is good practice and is already employed by many landlords.

7.14 Maintaining effective communications with residents generally is being achieved in a number of ways including meetings with residents associations, information evenings, social media so that, as one private management company interviewee put it, "...Ensuring people know who to come to if there is a problem".

MANAGEMENT SERVICES PROVIDED

7.15 Scheme managers provide a range of services which will vary from scheme to scheme but are likely to include some or all of:

- Lifts maintenance
- Water treatment
- Fire protection
- Lighting
- Repairs
- Grounds maintenance
- Insurance
- CCTV
- Pest control
- Decoration
- Cleaning
- Security
- Waste management
- Security

7.16 Building insurance and repairs will be included in the service charge for shared owners, those in private rent and owner occupiers but is met within the rent for social or Affordable Rent tenants. This often explains the lower service charges for the latter.

7.17 The range of services provided does not relate to scheme density or building height (other than obvious distinctions e.g. lift maintenance where lifts are provided). The more important criteria shaping what is provided are the number of units in a scheme and its market 'position'.

MANAGEMENT PRESENCE

7.18 Larger schemes are more likely to have a dedicated on-site management team for example, representatives of the management agent, a concierge and maintenance and cleaning staff. In some instances, security staff are also employed.

7.19 There is no 'rule' about scheme type and size where on-site management is or is not provided but schemes of, say, 20 units are unlikely to have on-site managements while schemes of 500+ are more likely to – but the break point between these two will depend on a large number of factors, and not just scheme size. Locally based management may be provided across a number of smaller schemes in close proximity.

7.20 On-site management may operate for a limited number of hours on, say, 5 days a week or 24 hours every day.

7.21 On-site management deal directly with the day to day maintenance of the site, including cleaning of common areas and landscaping of external amenity areas, alongside repairs. They will also liaise with the residents. For larger schemes, and depending on the market for the development, there can also be a 24 hour concierge service (which appears to be increasingly common) and delivery storage.

7.22 Private management companies can also be responsible for on-site facilities for residents such as residents' lounges and gyms and, in the more exclusive market developments, there can be additional facilities which require management and maintenance, such as spa/pool areas, cinemas and private dining rooms.

7.23 Where 'unlawful' parking is an issue, the scheme manager can supplement the usual management activities with additional parking wardens.

7.24 Residents' lounges and other indoor communal space were identified as being particularly well-used by both residents and managing agents for recreational purposes. They are used by residents for events such as children's birthday parties, resident association meetings and dinner parties.

7.25 The importance of indoor communal amenity space was highlighted in taller buildings without private outdoor amenity space. This fits with the findings of the residents' survey which indicates that taller buildings tend to be occupied by single people and couples, where outdoor amenity space was not particularly sought after. Managing agents reported that indoor amenity space was well used by residents and was said to be a good way for people to meet their neighbours informally.

7.26 Scheme managers explained that facilities may have been introduced post occupation with experience of managing the scheme occupation. Examples of these include residents' lounges, communal amenity space, barbeque areas, and table tennis areas.

SERVICES, SERVICE CHARGES AND MIXED TENURE

7.27 The service charge for individual developments reflects the services provided on-site, including if and how much on-site management is provided: put simply, the more services provided for residents, the higher the service charge.

7.28 Where schemes have separate blocks for different tenures this can be readily managed. In mixed tenure buildings, separate cores for different tenures can serve a similar function. This allows a different set of services to be provided for different tenures, for example, the affordable housing having less expensive furnishings, without the concierge service and use of facilities e.g. gyms. Use of separate block and cores for different tenures can be criticised as establishing tenure segregation and designing-in 'poor doors' but the contrary argument is that this a pragmatic approach which minimises housing costs for those on lower incomes.

7.29 The overall costs of services reflect earlier design decisions and good practice is for scheme managers to be closely involved in the design process, so that the details of good design are built in from the start:

"There have been no unexpected issues arising since first occupation. (X developer) worked closely with us to develop the services proposed and estimate management costs, which were very accurate." (Managing agent interviewee)

"...must get the detailed design right – access controls, CCTV, lighting. Importance of detailed design ... important that management team involved in the design..." (Housing association interviewee).

7.30 This echoes findings from earlier reports which have also emphasised the importance of management input in the design process. The following extract is from the 2015 report, Super Density, The Sequel²¹:

"High-rise or superdense developments need responsive maintenance, concierge and caretakers and an adequate sinking fund to cover future repairs, as a minimum.

Increasingly management teams in both RPs and commercial managing agents argue for the need to be engaged in the early stages of design in order to influence these future management arrangements and costs."

ISSUES IN MANAGING SCHEMES

Post occupation faults

7.31 Scheme managers will face different issues in different schemes but some emerge as common themes.

7.32 Some related to issues with the design and construction of the buildings, and had to be resolved post occupation (although these were few in number), for example:

"Some blocks have had air conditioning issues while others have had issues in relation to windows and doors, we are still learning about the development."

Lifts

7.33 The most common problem mentioned in the research is dealing with broken lifts (but even so, was not highlighted as a frequent problem by scheme managers and was only mentioned by two residents as a 'dislike' in the residents' survey). Lift maintenance is usually contracted out to external contractors.

Waste

7.34 Disposal of waste is an on-going concern for scheme management:

"... this is the big issue with high density flatted development..." (Housing association interviewee)

²¹ Levitt Bernstein, Pollard Thomas Edwards, Super Density, The Sequel, 2015

7.35 Waste has to be removed from individual flats to common waste units which need to be accessibly located but not in places which will detract from the building's appearance. The design needs also to allow for ease of emptying and cleaning:

"...do you put bin stores at block entrances or try to conceal them a bit?" (Housing association interviewee)

"...how to cope with waste is very important - there are various solutions re design of bin stores - important that management team involved in the design..." (Housing association interviewee).

7.36 There will be a compromise between technically ideal solutions (e.g. rubbish chutes for each unit) and the additional cost to be met through the service charge.

7.37 The issue of waste management was also recognised in Super Density, the Sequel:

"A significant challenge for management of superdense development relates to refuse storage and recycling facilities. The mode of storage and frequency of collection can have a significant impact at ground and below ground levels and will require specific management resources."

7.38 It is essential that the refuse collection vehicles can access the scheme safely and efficiently. Getting this right relies on detailed design solutions but there can still be issues that are simply about living in a big city:

"The only issue relates to traffic having to queue behind the refuse trucks, but this happens on any street in London." (Managing agent interviewee).

7.39 Design and dealing with waste were considered in more detail in an earlier chapter. Discussion with housing association and private management companies highlighted the importance of involving scheme managers in the design process to identify solutions which work effectively for residents and managers and which fit into the overall scheme design.

Parking

7.40 The study's exploration of parking arrangements and management in high density development has been limited by difficulties in gaining access to a number

of the depth case study schemes. Nevertheless, from interviews with scheme managers and other case study evidence, managing parking in schemes (especially car-free developments) can be an issue for scheme management.

7.41 However, in 'car free' schemes in highly accessible locations, car parking is much less of an issue than in lower density, less central locations where there is a greater expectation that parking of private cars will be accommodated:

"This is a car free scheme ... the location is very central ... it (parking) is not really an issue." (Housing association interviewee)

7.42 In schemes with limited parking, 'rationing' of available spaces will be based on different criteria – housing associations tending to make spaces available for disabled people and those with (larger) families while provision in the market sector is for those willing to pay the cost of the parking provided and then on a first come first served basis. Parking costs quoted during the research were c£1,000/£1,500 per annum per space.

7.43 Parking problems that do arise are usually when residents without an on-site space bring their vehicles and park somewhere in the scheme. This can happen with schemes that are essentially 'car free' but where there is access from the highway into pedestrianised 'streets'. This results in an enforcement issue for scheme managers, with the scheme's own parking patrols there to deal with wrongly parked vehicles, including imposing fines on owners. It was said that some residents carry on parking 'illegally' and simply pay the fine imposed, often on a regular basis – almost as an additional charge for living in the scheme. Although this will apply to a minority of residents it does have the consequence of pushing up service charges.

7.44 Despite these issues with managing parking in high density schemes, only one resident in the resident survey raised parking as a concern (when asked about 'dislikes' with their home). The survey did not explore parking issues in any more detail and if the GLA wants to learn more about residents' attitudes to parking, a separate exercise will be needed.

Different lifestyles

7.45 In higher density schemes, a management approach that deals successfully with residents who have different lifestyles may be needed. Where developments have family accommodation, its location is important, with the most appropriate locations identified as being at ground floor level, or at the top floor of medium rise developments.

7.46 Children playing in courtyard developments can cause a 'noise nuisance' for other residents, as can parties on roof terraces late into the night. How these issues are resolved will be for the local management presence but the strength of the working relationship between the private manager and the housing association involved was brought out as being important in dealing effectively with such issues.

LONGER TERM MANAGEMENT AND MAINTENANCE

7.47 We were unable to gather robust data on management costs and maintenance costs. The small case study sample and the wide range of built forms, coupled with unrepresentative data in the first 5 years from completion or less, make it un-realistic to draw conclusions other than the need for higher quality, and often on-site, management in the denser and/or taller buildings. There is also a pattern of reluctance by landlords and building agents in the private sector to share operating costs, perhaps for commercial reasons.

7.48 The most recent large scale survey of management and maintenance costs was a survey, on behalf of the then Office of Deputy Prime Minister, of a wide range of council housing built forms undertaken by Arthur Andersen: *The costs of local authority housing management, 1999*. Whilst the costs and standards are not applicable today the relative costs between build types, before adjustment for location factors give an indication of the different operating costs for different build types:

- For housing management (of all landlord functions) the densest build types and taller buildings were 1.25 times the management costs per dwelling associated with houses and low-rise flat;
- For responsive repairs and regular planned maintenance denser and/or taller buildings were 1.24 times the costs associated with houses and low-rise flats. Some items were more expensive each such as window repairs but others, though many expensive individual items, such as

roof repairs and repairs to common entrance areas, are shared across more dwellings reducing the average cost per dwelling;

- For long term renewal of fabric and services the denser and/or taller buildings were 1.47 times more expensive per dwelling and this included large items such as roof replacement, recladding, and lift renewal.

7.49 The management costs recognised the additional costs of supervising and cleaning communal areas. The maintenance costs are partly a reflection of the higher construction costs associated with denser or taller built forms.

7.50 These costs will be reflected in leaseholder service charges though in many cases the annual charges do not meet the full future costs of major repairs and renewals. These large items can be 40 to 60 years after construction and the costs are often met by one-off additions to the service charge.

MANAGEMENT ARRANGEMENTS IN MIXED TENURE SCHEMES

7.51 Other factors affecting the approach to scheme management are particularly relevant to mixed tenure schemes – irrespective of density or height of buildings. These reflect the difference in incomes but also in lifestyles:

(Issues faced include...) *“Managing schemes with people from a variety of backgrounds and different values and ways of behaving – differences are brought out where we have communal space to manage.”* (Housing association interviewee)

“(Private) renters are a younger and more transient group – are different from social rented tenants who are going to be here for a long time – social renters can feel marginalised from ‘smart cafe set’.” (Housing association interviewee)

7.52 In mixed tenure schemes (where the housing association does not have an interest in the market units) it is common for the housing association to pass over the day to day management of its part of the scheme to the private management company which oversees the whole development.

7.53 While providing scheme management through a single organisation is the logical solution, this can be challenging for the management company which is, as put by one housing association interviewee, managing schemes with people from a variety of backgrounds and different priorities. On the one hand, housing associations seeking to minimise service charges for tenants may ask for more modest standards than the management company might think appropriate for private renters (e.g. the necessity of cleaning entrance lobbies on a daily basis). On the other hand, when the management company offers a concierge service to the private renters but not those in affordable housing, it may be appropriate for them to assist a housing association tenant in the scheme in an emergency.

7.54 The case studies indicated that delivering effective scheme management in mixed tenure development is still evolving. Putting in place a realistic and grounded service level agreement is a baseline requirement (recognising that the agreement may have to be amended over time). The second aspect of good practice is the dialogue set up between the parties e.g. frequency of meetings to resolve any emerging management issues. This also relates to the mechanisms in place to obtain resident feedback so new management issues are picked up early.

7.55 The use of resident handbooks setting out the way the scheme is managed and resident responsibilities is also seen to contribute to the overall success of scheme management.

SUMMARY

- The research has confirmed the importance of effective management in all schemes with common areas, regardless of height and density. The research has not identified a relationship between the height of buildings and the level of management required. Rather, a link between the overall number of people on-site and the level of management required has been highlighted with increased staffing numbers needed to deal with the more complex issues that arise from having more people on a single site;
- Management can be provided by an on-site team or off-site – again, how this is arranged, depends on the type and scale of the scheme. There is no maximum number of units above which on-site management is automatically required but at around 500 units, on-site management becomes the norm;
- The range of services provided depends on the scale and type of scheme although there is a typical core of services including, for instance, cleaning, management of waste, security, lift maintenance. In mixed tenure schemes, scheme management is set up to deliver an appropriate level of service to different tenures without resulting in higher and/or unnecessary service charges generally and specifically for those in affordable housing;
- Good practice is evolving in management of mixed tenure schemes and a comprehensive service level agreement (which is kept under review) and regular dialogue between private management company and the housing association are emerging as good practice;
- On-going consultation and communication with residents, responding to their requests and ensuring the development maintains the right mix of facilities is likely to be key to ensuring the long term success of such developments;
- Getting design details right requires input by scheme managers – this is particularly important in dealing with the management of waste;
- Communal internal amenity space/residents' lounges/ meeting rooms have been found to be a potential alternative to external private amenity space, particularly for tall buildings where private balconies are impractical.

8 Residents' attitudes to high density schemes

Residents' views on specific aspects of the case study schemes have been described in earlier chapters of the report. This chapter provides an overview of scheme demand as evidenced by turnover rates and empty units and describes residents' views about the quality of the schemes they live in.

HIGH DEMAND SCHEMES

Turnover rates and empty properties

8.1 Across all the depth case studies, both housing associations and management agents reported strong demand for properties with very low levels of voids:

"...No voids at present – residents well connected in the area – want to stay – units easy to let..."

"Very low – not hard to let..."

8.2 The housing associations reported that the case study schemes were either easier to let than their stock generally or were certainly no more difficult. Where they had also been involved in sale of units (generally as shared ownership) demand was also reported to be very strong, for example:

"(The scheme was) ...fantastically popular and sold easily..."

8.3 Turnover is more variable. Some PRS schemes in highly accessible locations, attracting one and two person households and sharers, will turn over more quickly than other schemes. This effect can be exacerbated where local employment patterns include a significant number of jobs on short term contracts. Despite the relatively high turnover, demand is such that flats vacated by one tenant are quickly let to the next.

8.4 Other depth case study schemes, both housing association and private rent, reported low levels of turnover and very stable communities, for example:

"Turnover is very low, there are the usual 1 or 2 vacant units, reflecting natural turnover."

"Good development, good location, very stable"

"Very stable scheme and only one change of tenant since opened..."

8.5 A very approximate estimate across all the depth case studies (for which evidence was available) suggests a turnover rate of about 3–4%.

8.6 The type of demand does vary between schemes depending primarily on location with a predominately single person/couples market in the most accessible locations, with scheme layout and mix of residential units and other uses tailored to this market.

8.7 The only difficulty in letting reported was of larger family units and this was on grounds of affordability for those paying Affordable Rents.

8.8 Scheme managers highlighted quality of the units and scheme location, across all tenures, as key reasons explaining the high levels of demand:

“Largely residential area with good access to local shops and buses – is a quality building with good levels of insulation etc. Residents seem happy as a place to live.”

“Quality of homes is very good, well connected location with good transport links and local services.”

“Location – good sized units – but there is a price of living where this is.”

8.9 Design quality across the development was also identified as a factor in maintaining the attractiveness of a scheme for (existing and potential) residents;

“The scheme doesn’t feel like a high density development, when you look up you’re surprised at how many flats there are. I don’t think residents realise how many properties exist on-site as it never seems crowded.”

IEWS OF RESIDENTS

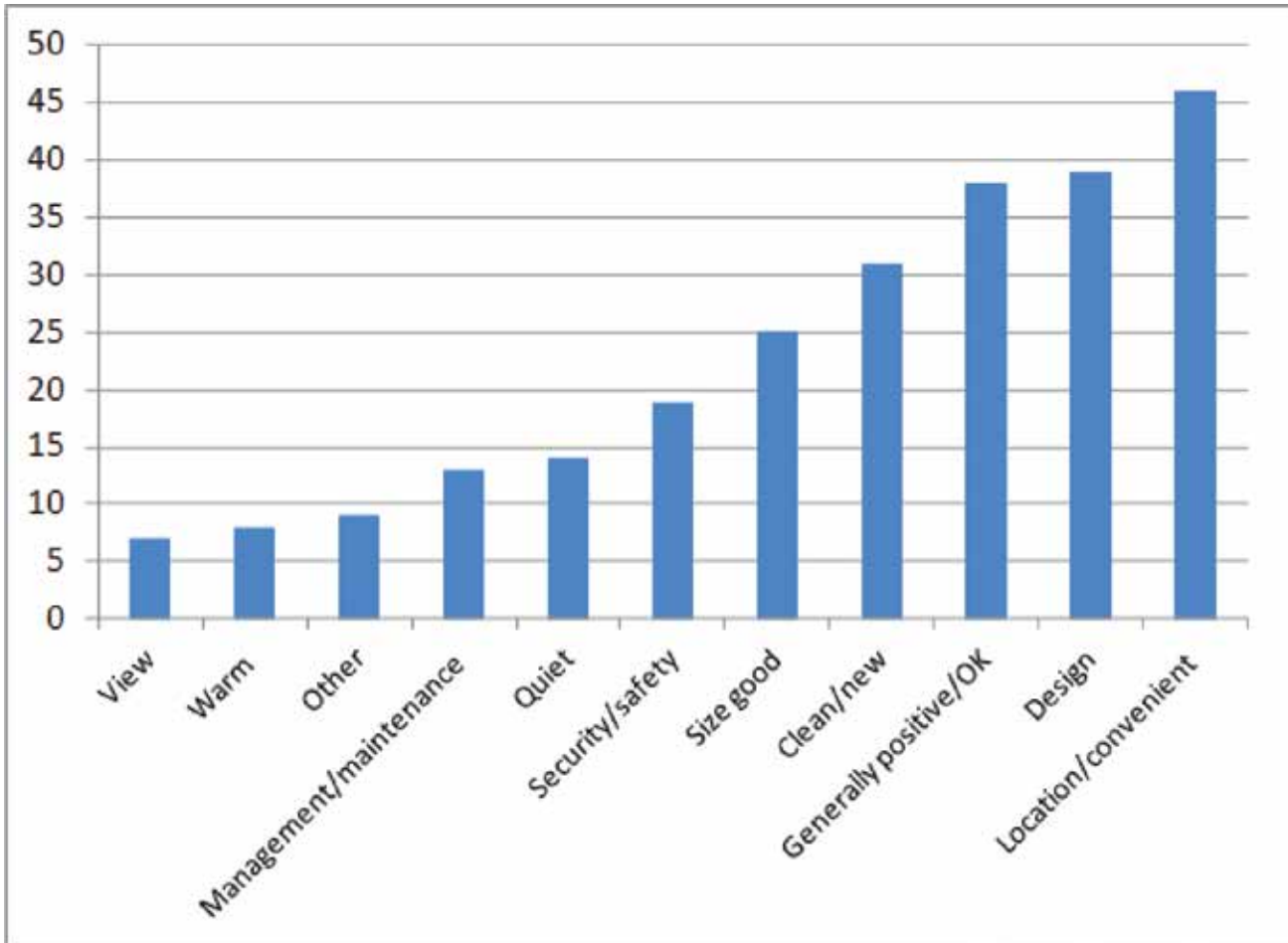
8.10 The resident survey confirms the importance of scheme location and design as aspects of their home that residents particularly rate. Residents were asked how satisfied or dissatisfied they were with their home as a place to live. 80% were very or fairly satisfied.

8.11 Younger residents (34 and under) are more likely to be satisfied with their home than older people – 85% being fairly/very satisfied compared with 72% of those aged 35+. The most significant variation in satisfaction was between residents in different tenures. Those living in Affordable Rent were the least likely group to be fairly/very satisfied – down to 59% compared with c85/90% across the other tenures.

8.12 Residents were asked to give more details about what they liked and disliked about their home. 170 of those surveyed gave a reason for being ‘satisfied with your home’ (some giving more than one reason and 257 separate comments were recorded). The chart below shows the main groups of ‘likes’²², highlighting the importance attached to location and design but also that features such as size of home and security/safety received 20 to 25 separate mentions.

²² The groups were derived by the research team from the verbatim comments made by residents.

Figure 8.1: Reasons for being satisfied with home (reasons with more than 5 mentions)



8.13 Reasons for being dissatisfied with the home were mentioned much less often – with 37 mentions in total.

8.14 No single item was mentioned by more than 9 residents. The most frequent issue (with 9 mentions) was maintenance related. Security was also a concern with 6 mentions, with issues here being a mix of a general sense of insecurity about the area and specific comments about burglary (from vehicles, of cycles or the property itself). None of the comments made indicated a concern about the density of the development with no mention of words such as ‘cramped’ being found.

SUMMARY

- For the depth case studies, of whatever density or height, scheme managers reported a strong demand for properties with very low levels of voids;
- Turnover rates reflect the tenure and scheme location and type – so there is a much higher rate of turnover of private rented units typically occupied by young mobile households but this does not lead to high void levels as demand for these units is so strong. However, high turnover does increase maintenance and management costs which will be reflected in rental levels;
- Location, design and size of units are key factors in residents’ satisfaction with schemes and will help to explain why younger residents and those in private rent are more positive towards their home than others.

9 Density, development costs & viability

Development costs and values vary with different building heights and in different locations across London – development density per se has a smaller effect on costs and values. As part of this study, these differences have been modelled and their impact on scheme viability assessed. The analysis indicates that in high value areas the tallest buildings have the strongest viability but, elsewhere, there is a more mixed picture of scheme viability across different scheme density and building height.

HIGH DENSITY/TALL DEVELOPMENT COSTS

9.1 The main factors influencing development costs relate to height and include issues in project development, fees, construction and programme/risk. Density is related to height, particularly for the highest and lowest densities, although as the discussion about the case studies earlier in this report shows, density can be delivered in different ways.

9.2 The specification for tall buildings increases construction costs because:

- Cooling equipment requirements increase costs and reduce space efficiencies.
- The need for additional lift shafts to service upper floors, with consequent space and cost implications; or costly super-fast lifts.
- Intermediate plant floors and plant.
- More expensive high pressure radiators may be required.
- A sprinkler system will be required in lieu of a dry riser over 60m.
- Environmental factors will increase costs (e.g. wind, heat gain).
- Provision of shared facilities such as concierge, spas and gyms etc., which relate to the number of dwellings in the building.

- Height will dictate construction techniques and result in higher costs for taller buildings:
 - » Increased amounts of hi-performance, self-compacting concrete.
 - » Use of post tensioning for a more flexible structural form and to minimise floor thickness and therefore reduce floor-floor heights; and blade columns in party walls to increase stability.
 - » Logistics (crane strategy, welfare on/off-site, and vertical movement of labour/materials).
- More expensive cladding will be required on higher buildings, e.g. brick cladding cannot be used over a certain height; more expensive glazed façades to optimise view from the apartments; requirement to withstand the higher wind loads.

9.3 It is likely that there will be higher professional fees for taller buildings²³:

- Additional impact assessments and planning work may be needed to address acceptability issues.
- There may be a need for additional expertise in relation to building specification.
- The tallest buildings will often make use of a branded architect, which brings additional costs.

²³ Although some of these additional costs are not exclusive to tall buildings – some may apply to other forms of high density development.

- Taller buildings are more likely to require one-off designs compared to lower buildings which are more likely to be able to take advantage of traditional/existing design.

9.4 Programme and risk are also affected by height, with a greater lag between incurring costs and receiving revenue for a taller building. This compares with lower height development where it is more likely that earlier phases will complete and sell while later phases are being constructed. The programme impacts from height will have some steps (e.g. every extra storey height is one more week concrete pour etc.) as well as the expected additional time taken to construct additional storeys. The longer construction period brings risks of changing finance, market value and build cost factors.

9.5 For a given height, there are also cost efficiency factors that particularly affect tall buildings such as:

- Shape
 - » Structural design, which affects slenderness, wind loads etc.
 - » Wall to floor ratio – the façade is a major cost driver and different designs can have a significant impact on the quantity and quality of the façade.
 - » Design, where repetition of floors is cheaper but more desirable designs will increase costs, for example duplex apartments at high level, higher ceiling heights for penthouse suites, and higher quality finishes.
 - » The visual impact of taller buildings on the cityscape may mean that a more expensive design is required.
- Durability
 - » Tall buildings require a high standard of materials and finishes in circulation areas, and in particular reception areas where traffic is concentrated.

- » Tall buildings require a longer life in use for external cladding, fenestration and roofing as access costs make more frequent renewal costly.

9.6 As a result of these specification requirements the cost of higher buildings may be considerably more than lower development, although this is mitigated by higher sales values on upper floors. As a result of the additional costs, it is likely that the highest buildings are likely to be developed in locations where there is the potential to achieve higher values and a significant amount of pre-sales.

9.7 Net to gross floor area is critically affected by height, with taller buildings requiring more unsaleable space. A review of the floor plans for a subset of the case studies has confirmed the net to gross ratios used in the earlier Building Standards and SHLAA viability work²⁴, which showed that 1–5 storeys required approximately 15% circulation/non-saleable space; 6–15 storeys required approximately 20%; and 16 or more storeys 25%.

9.8 As part of this study Jackson Coles have provided estimated build costs for the generic types. These have been developed through an assessment of the case studies used to derive the typologies. The build costs in the modelling take into account the cost differences between different parts of London²⁵ and include an allowance for external works.

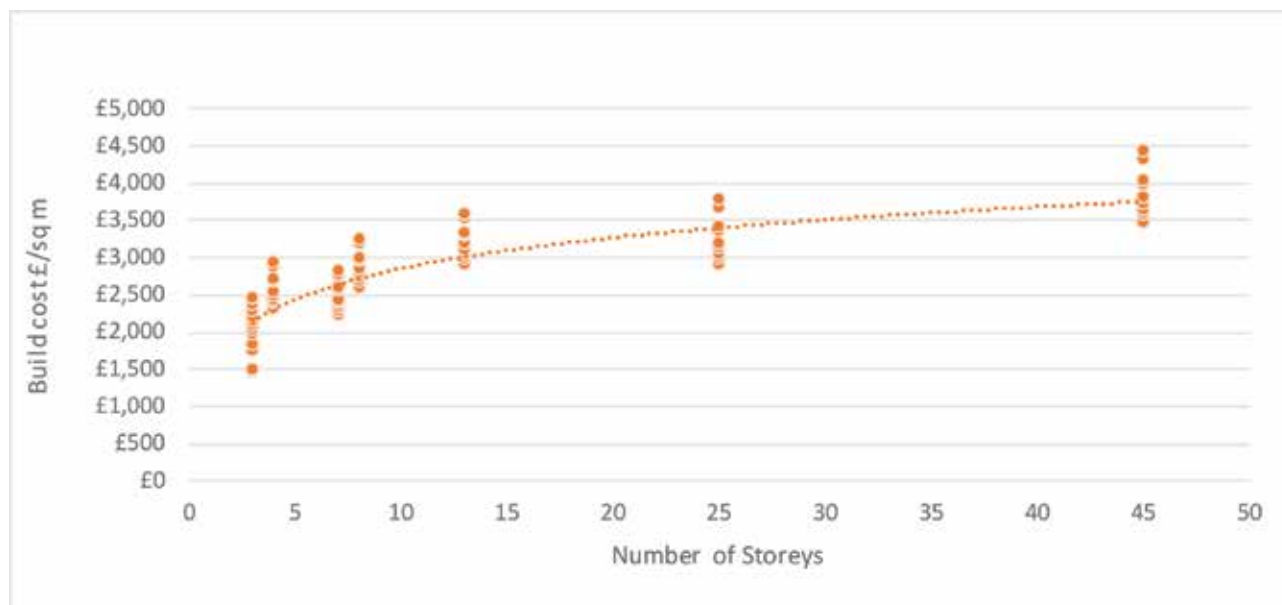
9.9 The results of this exercise show that there is a clear relationship between height and cost. Figure 9.1 below illustrates the different build cost per sq m for each case study typology in the different borough value zones²⁶, with the trend line showing how costs increase with the number of storeys (see below for further discussion about the typologies and value bands).

²⁴ GLA Housing Standards Review Viability Assessment, 2015; and GLA 2013 SHLAA Viability Assessment, 2014. Note that there may be substantial case by case variation and that the lowest and highest floors tend to have the most variance.

²⁵ Using BCIS location cost indices.

²⁶ Each vertical cluster represents the build costs in different locations for one of the case studies.

Figure 9.1: Case Study Build Cost £/sq m



RELATIONSHIP BETWEEN DENSITY/TALL BUILDINGS AND VIABILITY

9.10 Work has been undertaken in this study to determine the relationship between scheme viability, density/height and location, using a set of residual value viability tests. Annex 10 in the Technical Report provides further information about assumptions used and testing results with the key information set out in the remainder of this chapter.

Approach to the viability testing

9.11 In order to understand the viability of different development density and height and the variation across London a series of generic typologies have been tested. These have been developed from the 19 case studies used in the research. This approach overcomes some of the idiosyncrasies within the real schemes, in order to produce findings that may have application in a wider set of circumstances across London.

9.12 The choice of the generic typologies is designed to reflect the different density and height of development apparent through the actual case studies. In this way the viability implications of developing different density and height schemes can be explored, along with the implications about developing schemes in different parts of London.

9.13 From the case studies the following 7 generic typologies have been developed. While there are some examples of absolute high density, the generic typologies also include some types of development that have provided relatively high density within their given context. The generic categories are:

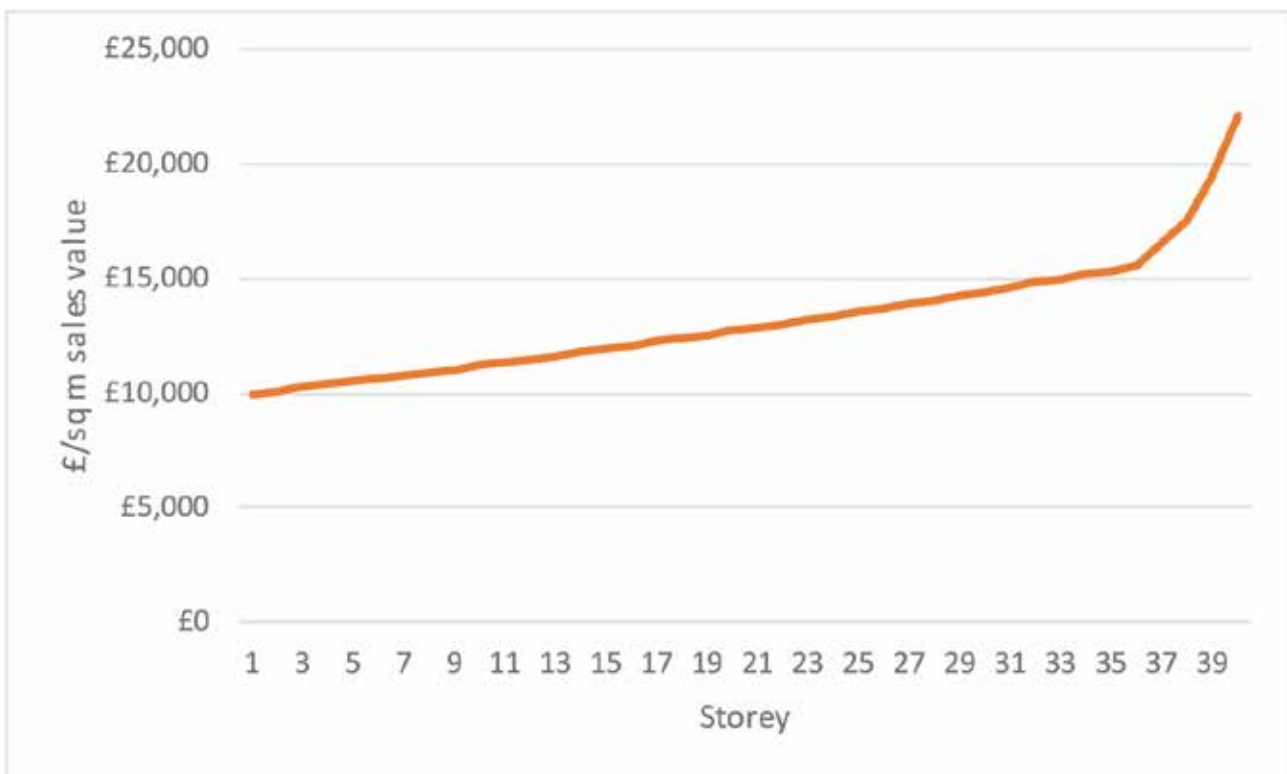
- **One – High tower** – a generic high tower typology, with 300 dwellings over 45 storeys and a density of 1,200 units per ha.
- **Two – Tall tower** – a tall tower typology, with 300 dwellings over 25 floors and a density of 900 units per ha.
- **Three – 13-14 storey** – a 13-14 storey typology with 150 dwellings over 13 storeys and a density of 1,000 units per ha.
- **Four – High density infill** – a generic high density infill typology with 20 dwellings over 7 storeys and a density of 800 units per ha. In some respects, this case study is a small scale version of the 5-8 storey case study below.
- **Five – 5-8 storey** – a 5-8 storey typology with 200 dwellings over 8 storeys and a density of 800 units per ha.
- **Six – Low rise high density** – a generic low rise high density typology, with 50 dwellings over 4 storeys and a density of 150 units per ha. This is relatively high density for this height of development.
- **Seven – Low rise low density** – a generic low rise low density typology, with 100 dwellings over 2-3 storeys and a density of 50 units per ha.

9.14 One of the key aspects that the generic typologies seek to overcome is the variation in density observed in the study cases studies for similar scales of development. These variations stem from a number of reasons including the number and type of blocks in a scheme and amounts of open space between blocks. However, one other reason identified is differences in how the site areas are defined within the consents recorded on the LDD and although these differences may have quite legitimate reasons (such as being a part of a wider scheme etc.) they obscure some of the viability implications pertinent to this research.

9.16 This is further illustrated by the difference in values within one of the actual tall tower case studies (as opposed to one of our generic types), which has market units starting on the 11th storey:

- Storeys 13–19 are about 112% of 11th storey values
- Storeys 22–25 are about 130% of 11th storey values
- Storeys 26–34 are about 140% of 11th storey values
- Storeys 35+ are about 150% of 11th storey values

Figure 9.2: High tower sales values/sq m by storey for a 40 storey building



Values

9.15 The assessment of values undertaken as part of this study shows that in itself, height is associated with higher values. The graph below illustrates this using the £/sq m values by storey taken from a review of the four tall case studies. This includes a ‘penthouse effect’ and within this, some of the additional values in the higher floors may be related to finishes. However, the underlying conclusion is that height can provide additional value. The overall effect is to increase the £/sq m average for the whole building by a 25% to 35% uplift compared to the lowest floor level sales value.

9.17 The development typologies have been applied to different value areas in London. To do this we have grouped boroughs into seven value bands based on the average and upper quartile sales values for new build flats and then applied each of the generic case studies to a range of these bands. The testing starts in the most likely value bands for each generic case study and then extends across the value bands. In this way most case studies are tested in most value bands, except those value bands where it is clear that the case study would be unviable.

9.18 Within each borough value band, a new build flat value has been estimated taking the average of the individual boroughs' values. In order to extend the range of values to include lowest parts of weak market boroughs to highest of the most expensive boroughs, additional stretch values have been added at each end of the scale (see additional sales values in Bands 1 and 7 in Figure 9.3). The grid below shows the average and upper quartile borough values (as of October 2015), the 'stretch values', the value to be applied to flats in that band and the application of the typologies within the value bands²⁷.

BENCHMARK LAND VALUES

9.19 Residual values derived from the viability tests are compared to benchmark land values, and if the residual value is above the benchmark the scheme can be considered viable. We have taken benchmark land values from the various CIL viability studies which have been carried out by individual boroughs since 2010²⁸. CIL viability studies typically give more than one benchmark land value based either by area (e.g. high value or low value area) or by existing use (e.g. office or industrial land). Where there is more than one benchmark land value we show the range of benchmark land values and compare these with the viability residual land values achieved from residential development. In addition to the CIL viability study benchmarks, we also refer to DCLG's land value estimates²⁹. These estimates are higher than the CIL benchmarks as they assume no affordable housing, CIL or other planning obligations, but they could be considered as loose proxies for sites in the highest value areas.

9.20 The CIL viability study benchmarks and the DCLG values are grouped in the same way as the dwelling values, in order to provide estimates for each of our seven borough value bands.

²⁷ Note that the low rise low density generic typology includes some houses. A similar approach to values using average new build terraced houses in the borough bands has been used.

²⁸ This approach was also used in the GLA Housing Standards Review Viability Assessment, 2015; and GLA 2013 SHLAA Viability Assessment, 2014.

²⁹ DCLG, 2015, Land value estimates for policy appraisal.

Figure 9.3 Borough Value Bands

Band	Oct 15 New Build Flat market sales	Oct 15 Top Quartile	Borough	Generic types and assumed new build flat value							
				High tower	Tall tower	13-14 storey	5-8 storey	High density infill	Low rise high density	Low rise low density	
7	£4,500,000										
7	£2,750,000										
7	£2,026,517	£4,696,280	Westminster	£2,750,000	£2,750,000	£2,750,000	£2,750,000	£2,750,000	£2,750,000	£2,750,000	£2,750,000
7	£1,878,755	£4,075,500	Kensington								
6	£1,090,892	£1,821,020	City								
6	£1,004,730	£1,998,358	Camden	£975,000	£975,000	£975,000	£975,000	£975,000	£975,000	£975,000	£975,000
6	£831,225	£1,534,770	Hammersmith								
5	£660,856	£1,252,921	Southwark								
5	£633,310	£1,379,496	Lambeth								
5	£621,822	£1,056,848	Wandsworth	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000
5	£555,460	£1,140,546	Barnet								
5	£526,666	£789,817	Islington								
5	£525,468	£904,185	Kingston								
4	£514,316	£870,497	Hounslow								
4	£507,432	£858,420	Ealing								
4	£499,613	£736,793	Hackney	£500,000	£500,000	£500,000	£500,000	£500,000	£500,000	£500,000	£500,000
4	£497,374	£784,602	Richmond								
4	£476,978	£806,156	Tower								
4	£465,860	£719,288	Greenwich								
4	£412,466	£851,348	Harrow								
3	£410,323	£649,772	Merton								
3	£401,800	£639,107	Haringey								
3	£386,346	£636,599	Enfield		£400,000	£400,000	£400,000	£400,000	£400,000	£400,000	£400,000
3	£382,130	£528,670	Lewisham								
3	£377,342	£578,090	Brent								
3	£355,388	£510,084	Hillingdon								
3	£340,649	£458,027	Newham								
2	£326,910	£448,513	Waltham								
2	£308,263	£466,400	Bromley								
2	£301,920	£433,848	Croydon		£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000
2	£287,805	£431,323	Redbridge								
2	£276,863	£349,647	Sutton								
1	£224,927	£292,515	Havering								
1	£202,213	£252,532	Bexley								
1	£189,670	£216,644	Barking				£175,000	£175,000	£175,000	£175,000	£175,000
1	£160,000										
1	£150,000										

 Case study applied

OTHER ASSUMPTIONS

9.21 Part of a development scheme value is made up of the affordable housing. Again this will have location specific variations but the majority of borough affordable housing policy targets are at 50% (19 boroughs), with another grouping at 40% (6 boroughs) and at 35% (4 boroughs), with the balance at 33% and 30%³⁰. A review of the affordable housing delivery in the LDD for schemes of 50+ dwellings shows a year on year fall, with 35% delivery in 2014. The testing of the generic typologies is therefore undertaken at both 50% and 35% affordable housing in order to cover a reasonable range of affordable housing policy requirements. The affordable housing tenure used in the testing of the generic typologies is Affordable Rent 60% and Shared Ownership 40%.

9.22 It is assumed that the schemes will make borough and mayoral CIL payments and an allowance based on the borough value band averages has been assumed. In addition, we have also assumed that there will be a £2,000 per dwelling s106/278 allowance to address the site specific issues that may be necessary to make the development acceptable in planning terms³¹.

9.23 Details about the other testing assumptions can be found in the Technical Report.

VIABILITY TESTING FINDINGS

9.24 The findings from the viability tests are discussed below, with further detail in the Technical Report. Each typology is considered first across the borough value bands; and then there is an assessment comparing the different typologies in the same borough value band. The positioning of each typology in the borough value bands can be seen in the table above.

High Tower

9.25 The 45 storey high tower is modelled at 1,200 units per ha, in borough value bands 4 to 7 (the highest).

- The high tower typology produces very high residual values in the highest borough value band but these reduce considerably in value band 6 and again in value bands 5 and 4, where the type begins to produce a negative residual value;
- The main finding from the modelling of the high tower typology is that where values are particularly high it is viable and can support policy compliant affordable housing provisions and still be able to afford high prices for sites. However, as soon as values fall the viability weakens quickly to the extent that even in some of the relatively valuable parts of London (borough value band 5) the affordable housing provision has to be reduced to maintain viability.

Tall tower

9.26 The 25 storey high tower is modelled at 900 units per ha, in borough value bands 2 to 7.

- The tall tower typology is viable in borough value bands 4 to 7, but in band 3 the proportion of affordable housing has to fall and in band 2 the residual value is negative;
- The overall findings from the viability modelling of this typology are that where values are high, this development height is viable and can support policy compliant affordable housing provision and still be able to afford high prices for sites. However, as values decrease the 'headroom' is reduced. This pattern is not dissimilar to the high tower typology, although the tall tower is viable across a broader range of values.

³⁰ GLA, 2016, London Plan Annual Monitoring Report 12

³¹ The £2,000/dwelling residual s106/278 allowance follows the approach used in the GLA Housing Standards Review Viability Assessment, 2015; and GLA 2013 SHLAA Viability Assessment, 2014. Note that it is likely that this varies considerably in practice.

13-14 storey

9.27 The 13-14 storey typology is modelled at 1,000 units per ha, in borough value bands 2 to 7.

- The 13-14 storey typology has a positive residual value in borough value bands 3 to 7, but has a negative residual value in borough value band 2;
- These residual values are comfortably above the benchmarks in borough value band 4 to 7, but in borough band 3 the residual value with 50% affordable housing is between the DCLG benchmark and the CIL viability benchmarks. This pattern of diminishing viability as values drop shares the same characteristics as the high tower and tall tower typologies, but for this lower built form of development the pattern happens further down the borough value bands.

5-8 storey

9.28 The 5-8 storey typology is modelled at 500 units per ha, in borough value bands 1 (the lowest value) to 7 (the highest value).

- The 5-8 storey typology has positive residual values in borough value bands 3 to 7. The residual values are comfortably above the highest benchmarks;
- However, in borough value bands 2 and 1 this typology has a negative residual value, even with affordable housing reduced to 35% – following the same broad pattern as the high tower, tall tower and 13-14 storey typologies.

High density infill

9.29 The high density infill 7 storey typology is modelled at 800 units per ha, in all of the borough value bands 1 to 7.

- The high density infill typology is viable in all of the borough value bands tested, except for borough value band 1;
- Where the case study has a positive residual value, these are comfortably in excess of the higher value benchmarks.

Low rise high density

9.30 The low rise high density 4 storey typology is modelled at 150 units per ha (relatively high density for this height), in all borough value bands.

- The low rise high density typology produces a positive residual value in all of the borough value bands tested except band 1.
- In most of the borough value bands where the type is viable, the values exceed the higher CIL benchmarks although none of these reach the higher DCLG land value benchmark;
- In borough value band 2 the typology exceeds the lower CIL viability benchmark at 35% affordable housing, making it one of the few development types that displays viability in this borough value band.

Low rise low density

9.31 The low rise low density 2-3 storey typology is modelled at 50 units per ha, in all borough value bands.

- The low rise low density typology produces a positive residual value in all of the borough value bands. The positive residual values are above the lower CIL viability benchmark but in most cases below the higher CIL and the DCLG benchmarks;
- Although the viability for this typology may appear weak compared to some of the other typologies in the higher value areas, it is one of the few forms of development tested here that produces a residual value above a benchmark in borough value band 2 and the only type to produce any positive residual value in borough value band 1 (albeit below the lower CIL benchmarks).

TYPOLOGY COMPARISON WITHIN BOROUGH VALUE BANDS

9.32 As well as considering the viability performance of the individual typologies in different borough value bands, it is useful to compare the typologies within the value bands.

These are:

- Band 7 (highest value) – All case studies
- Band 6 – All case studies
- Band 5 – All case studies
- Band 4 – All case studies
- Band 3 – All case studies except High Tower
- Band 2 – All case studies except High Tower
- Band 1 – (lowest value) All case studies except High Tower and Tall Tower

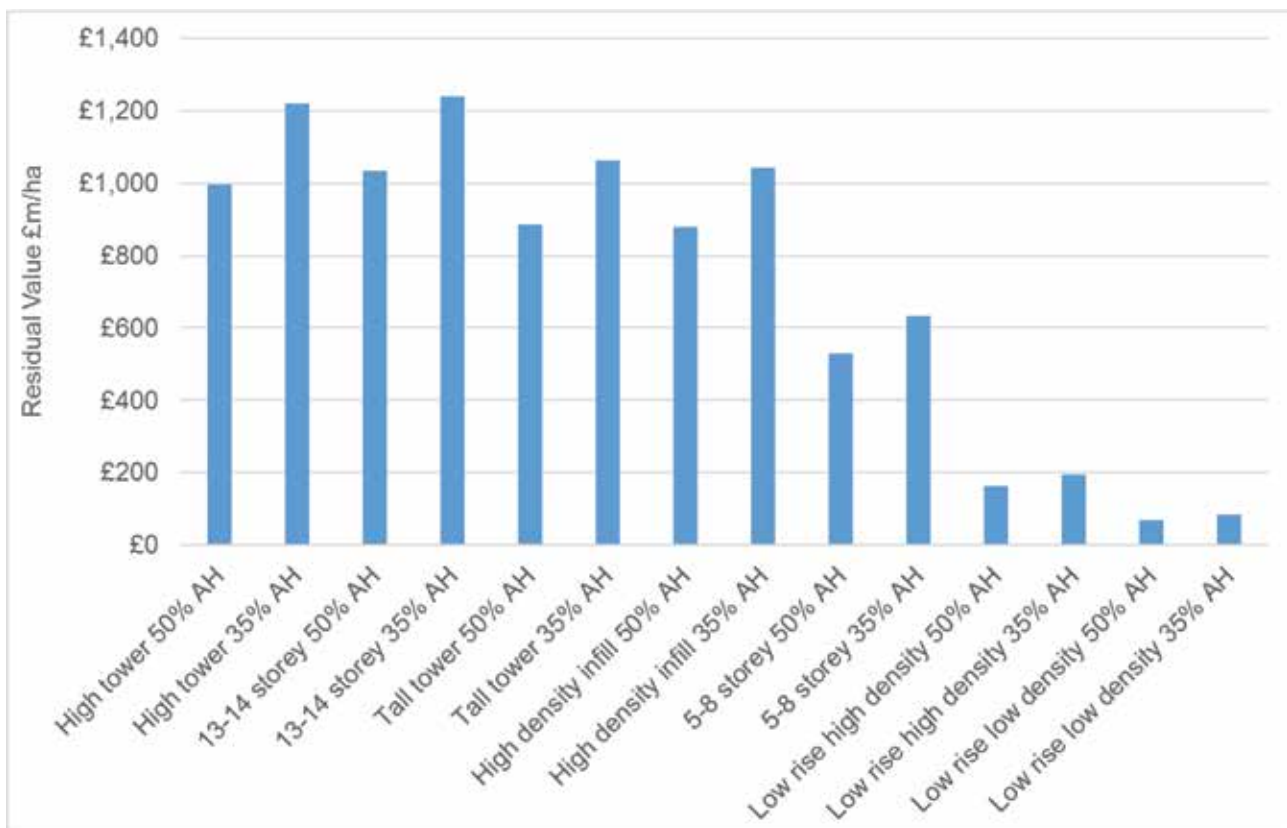
9.33 Everything else being equal, typologies with the highest residual values are most likely to be able to meet affordable housing requirements within a given value area.

Commentary

- All of the types show a positive residual value in borough value band 7.
- The highest residual values are achieved by the high tower (45 storeys) and 13-14 storey types. This is followed by the tall tower (25 storeys) and high density infill types.
- There is a clear picture that the highest densities achieve the highest residual values in this borough value band, even when the build costs for the highest densities are considerably more than the lower densities.
- Logically these forms of development with the highest residual values are most likely to be able to pay the most for sites in the highest value areas, and subject to other constraints they may therefore be the most likely to come forward as a result.

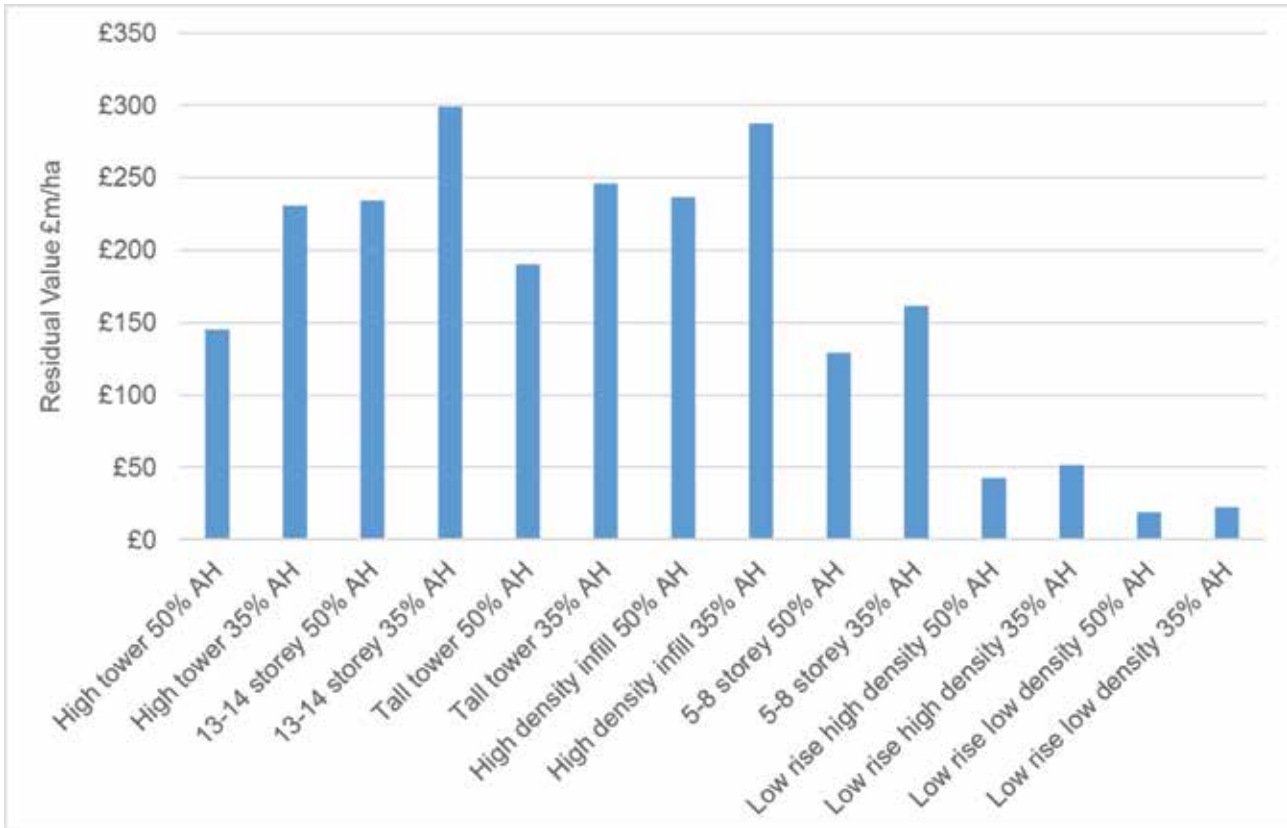
BAND 7

Figure 9.4: Residual values in Borough Value Band 7



BAND 6

Figure 9.5: Residual values in Borough Value Band 6

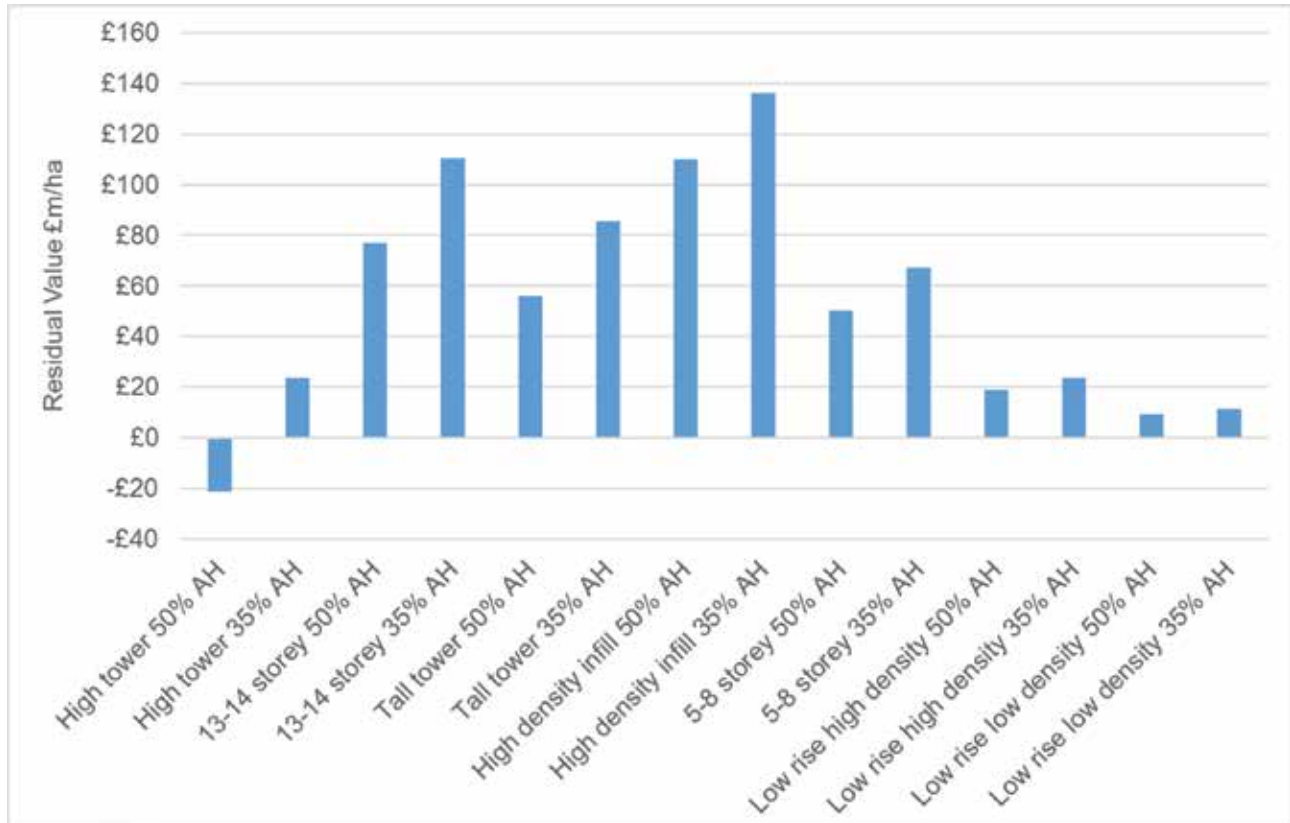


Commentary

- All of the types show a positive residual value in borough value band 6.
- Although the earlier discussion shows how the high tower (45 storeys) has the potential to achieve a very substantial residual in borough value band 7, in value band 6 the 13-14 storey, the tall tower (25 storeys) and high density infill produce a higher residual value.
- Again, it is likely that the types producing the highest residual values are the most likely to come forwards as they will be able to secure sites. For borough value band 6 this means that the low rise development is less likely to come forward.
- This also applies to the highest density development in the high tower, where the impact of higher build costs is offset less by higher revenues as the values drop compared to band 7.

BAND 5

Figure 9.6: Residual values in Borough Value Band 5

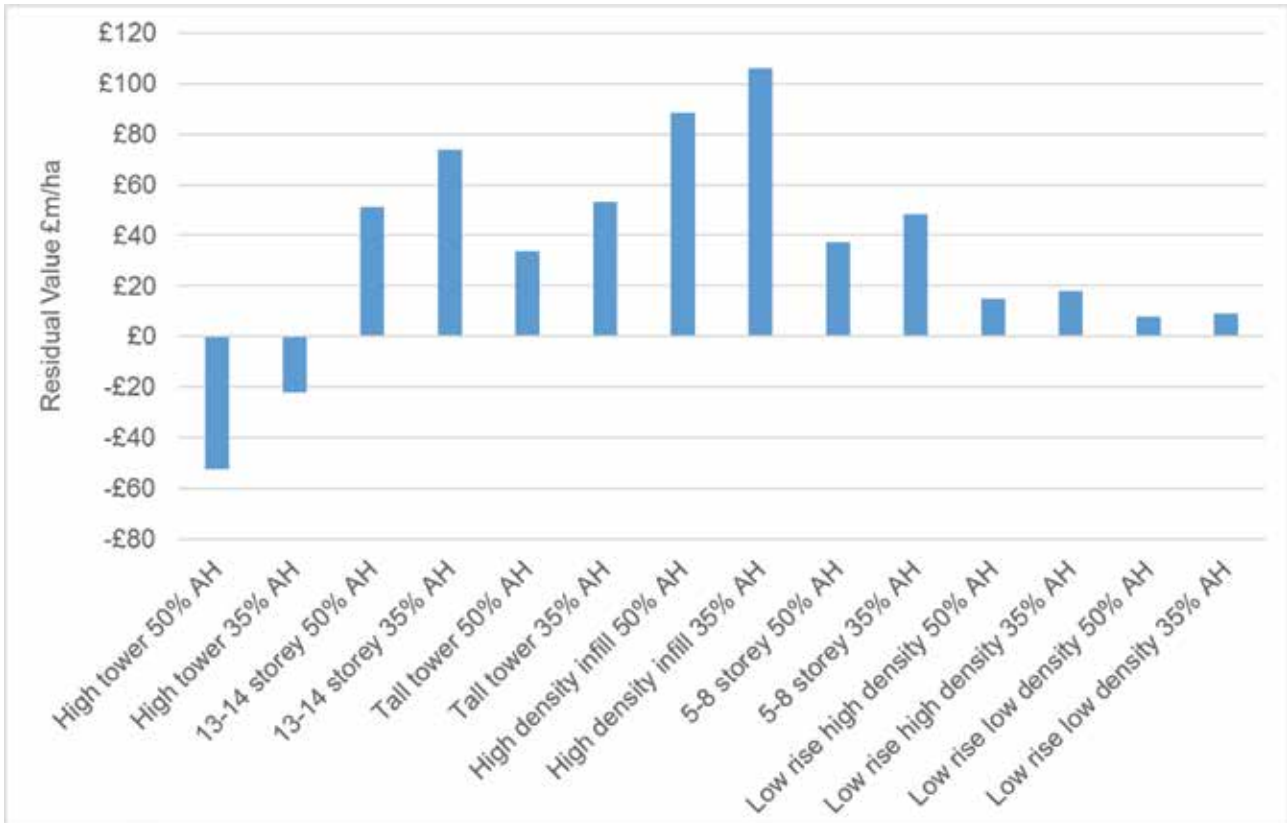


Commentary

- Within borough value band 5 the highest residual values are achieved by the 13-14 storey and the high density infill development.
- Of the remainder, the tall tower (25 storeys) is more viable than the 5-8 storey development and the high tower (45 storeys) has the weakest viability at this value point (depending on the affordable housing required).

BAND 4

Figure 9.7: Residual values in Borough Value Band 4

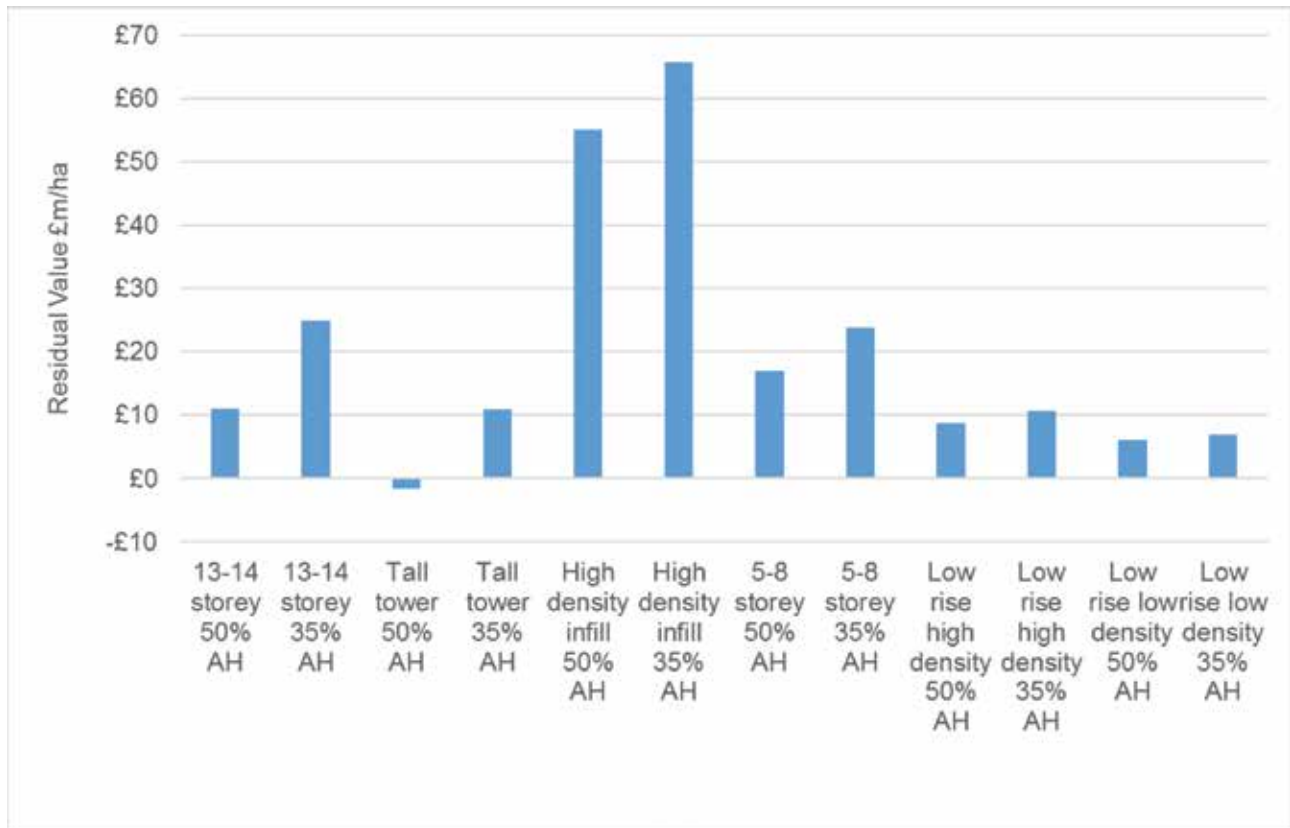


Commentary

- In borough value band 4 the high density infill is the most viable, followed by the 13-14 storey development and the tall tower (25 storeys) and the 5-8 storey development.
- The 5-8 storey development and the tall tower (25 storeys) are quite close in viability terms – at 50% affordable housing the 5-8 storey development has a higher residual but at 35% affordable housing the tall tower has the higher residual.
- The low rise high density development (4 storeys) and the low rise low density type both have a considerably lower residual value than the other taller typologies at this value point (except the high tower, which is not viable).

BAND 3

Figure 9.8: Residual values in Borough Value Band 3

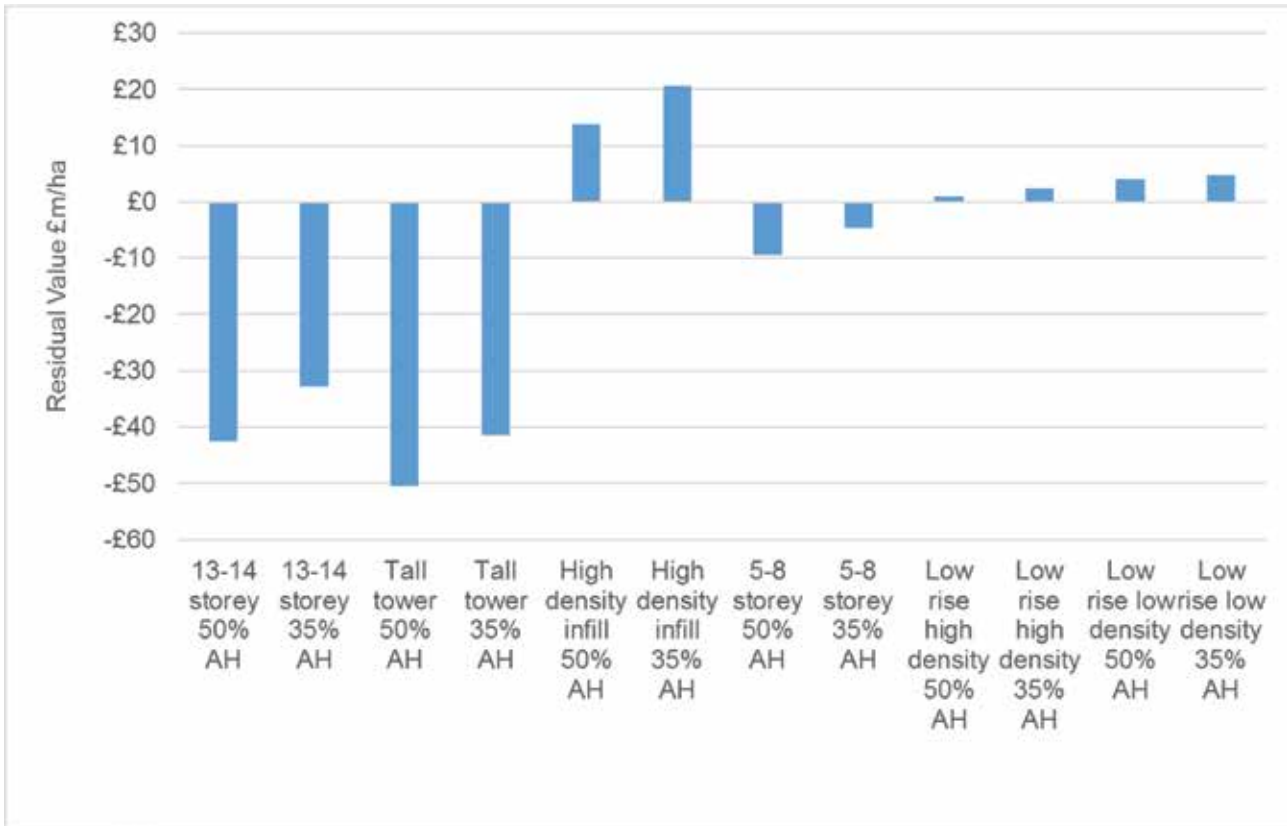


Commentary

- In borough value band 3 the high density infill remains the most viable form of development, by some margin.
- The next most viable development is jointly the 13-14 storey and 5-8 storey developments.
- The low rise high density development and the low rise low density development have much lower residual values by comparison, although still positive.
- The tall tower only has a positive residual with 35% affordable housing in this borough value band.

BAND 2

Figure 9.9: Residual values in Borough Value Band 2

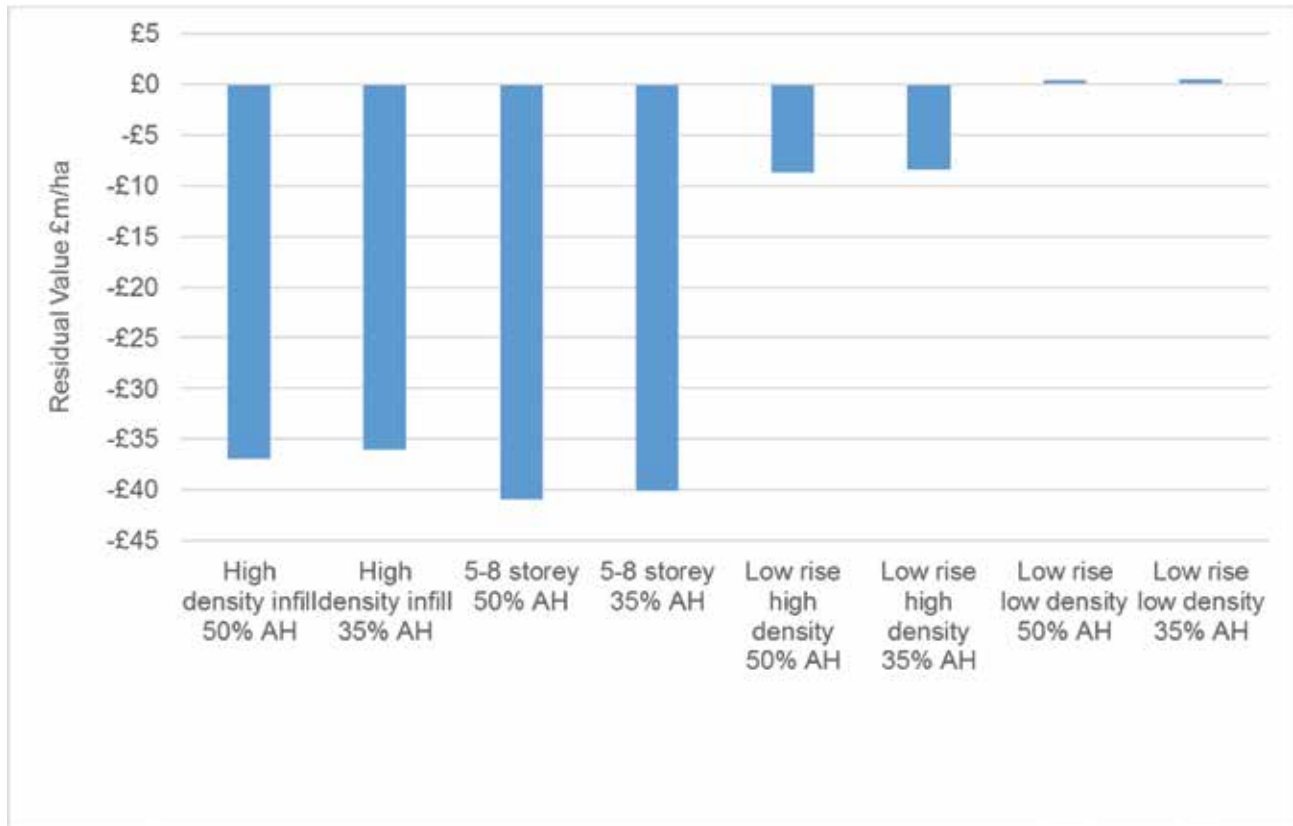


Commentary

- In borough value band 2 the high density infill has the highest residual value.
- The only other types with positive residual values in this band are the low rise low density and the low rise high density types. The low rise low density is more viable than the low rise high density case study.
- The 5-8 storey type is not viable, and nor are the 13-14 storey or tall tower types.

BAND 1

Figure 9.10: Residual values in Borough Value Band 1



Commentary

- The only type with a positive residual value in borough value band 1 is the low rise low density type.
- Neither the high density infill, 5-8 storey development or the low rise high density development are viable in borough value band 1.
- However, the viability issues for the low rise low density development are less profound at this value point than for the 5-8 storey or high density infill development.

CONCLUSIONS

9.34 In the highest value areas, the tallest buildings demonstrate the strongest viability. However, this strength fades away very quickly as values drop so that the tallest towers are not viable even in relatively valuable parts of London (borough value band 5). In reality it seems likely that there will only be a limited set of opportunities where the necessary appropriate site and value conditions arise for the highest developments (45 storeys in our model), and even here we suspect that there will be additional cost factors that mitigate some of the very high residual values indicated by the modelling. By comparison, other relatively tall development (25 storeys in our model) is more resilient to changes in value but even this sees viability weaken as values drop. Therefore, tall buildings in high value boroughs should be able to provide affordable housing and then as sales prices drop off slightly this form of development will then be less able to provide affordable housing as the viability weakens. The higher the building, the narrower the viability 'window'. Furthermore, because the higher buildings are only viable in more expensive areas, it is likely that the market dwellings in them will therefore be correspondingly expensive, and as a result less affordable than in other forms of development in lower value areas.

9.35 13-14 storey development and 5-8 storey development is viable through the middle range of value points used in this testing. In the higher part (borough value band 5) of this middle range, the 13-14 story development has a stronger residual value than the 5-8 storey development but in the lower part of the middle range (borough value band 3) the 5-8 storey development is more viable. However, when tested in the two lower value points the 5-8 storey development was unviable.

9.36 The high density infill development is relatively viable at all of the value points tested. We tested relatively small scale infill development and it seems likely that there will be a good availability of small sites suitable for this type of development. However, by definition this is not a suitable typology for larger sites.

9.37 Although the two low rise types showed lower residuals generally when compared to the other case studies, they were among the only case studies with positive residuals in the lowest value areas.

9.38 At the lowest value point only the low rise low density case study showed a positive residual value.

9.39 Figure 9.11 below charts all of the seven types across all of the seven borough value bands. This illustrates the very high residuals from the densest development and how they fall away quickly as values decrease; compared to the much lower peak residual values for the less dense development that fall away less dramatically in lower value areas.

9.40 Figure 9.12 then illustrates which types have a positive residual value in each borough value zone (green), which ones have the highest residual value in each borough value zone (top 2 or 3 if close – darker green) and which have a negative residual value (red).

Figure 9.11 Residual Values/ha for all case study testing

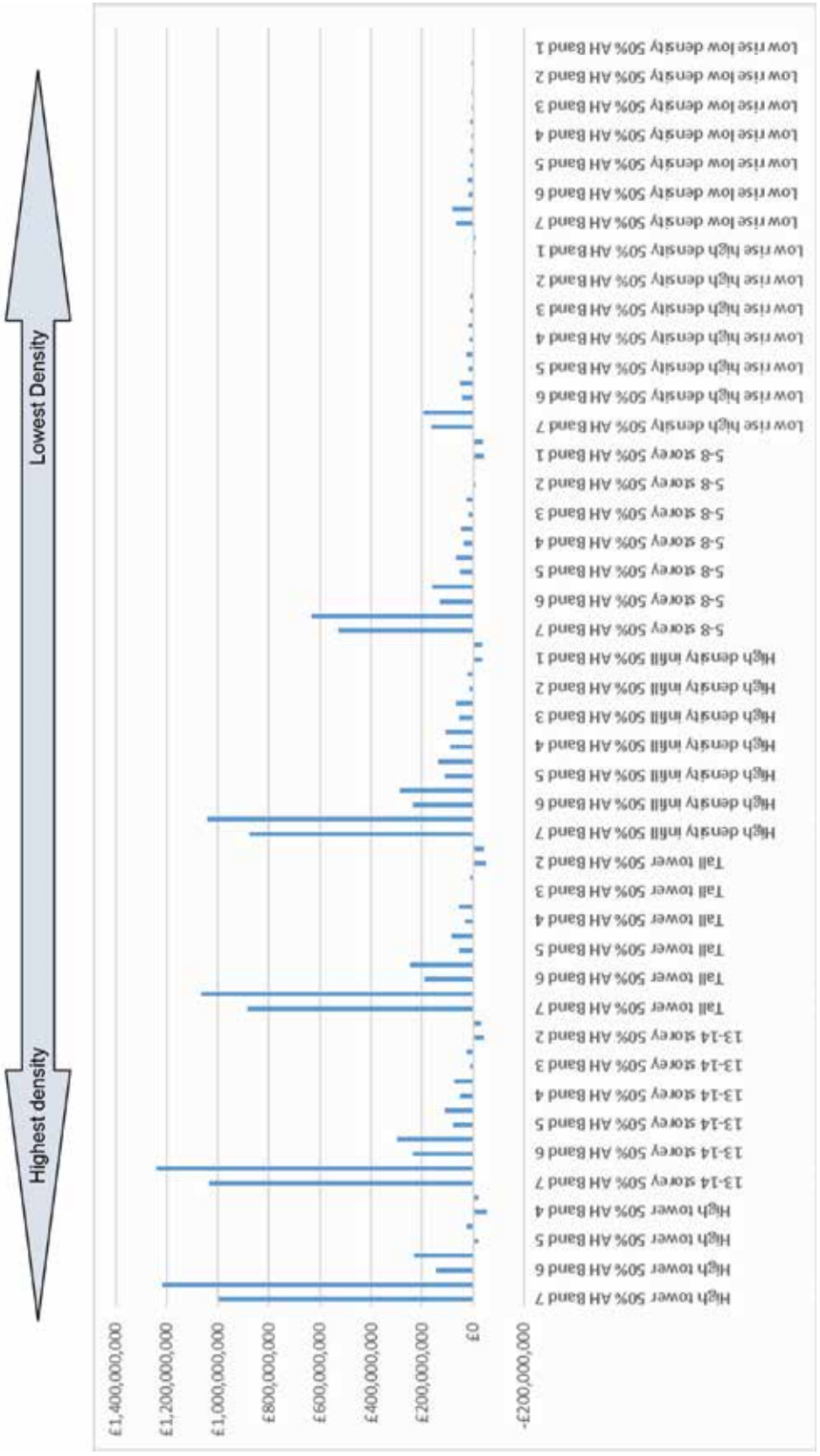


Figure 9.12 Case Study Residual Values in Borough Value Bands

Band	Borough	Assumed new build price	Generic types and assumed new build flat value						
			High tower	Tall tower	13-14 storey	5-8 storey	High density infill	Low rise high density	Low rise low density
7		£2,750,000							
7									
7	Westminster								
7	Kensington								
6	City	£975,000							
6	Camden								
6	Hammersmith								
5	Southwark	£600,000							
5	Lambeth								
5	Wandsworth								
5	Barnet								
5	Islington								
4	Kingston	£500,000							
4	Hounslow								
4	Ealing								
4	Hackney								
4	Richmond								
4	Tower								
4	Greenwich								
3	Harrow	£400,000							
3	Merton								
3	Haringey								
3	Enfield								
3	Lewisham								
3	Brent								
3	Hillingdon								
2	Newham	£300,000							
2	Waltham								
2	Bromley								
2	Croydon								
2	Redbridge								
2	Sutton								
1	Havering	£175,000							
1	Bexley								
1	Barking								
1									
1									

Highest residual value in value band
 Positive residual value
 Negative residual value

SUMMARY

9.41 The viability testing shows that at various value points, different heights (and to a lesser extent densities) have different viabilities. This has implications for delivery of general and affordable housing.

9.42 Where the values are at their highest then the tallest buildings are able to provide general and affordable housing at very high density. In terms of maximising housing delivery then these heights have a role to play. From a financial viability point of view, however, it is likely that this type of development will particularly need to rely on suitable sites and it may be difficult to achieve widespread development of the tallest buildings. There are other reasons why the tallest building types may not be acceptable, for example impact on adjacent residential developments or because of protected views. We looked at the affordability aspects in Chapter 3.

9.43 As values come down then the other taller and high density development becomes the best option for maximising housing and affordable housing delivery; starting with the 25 storey tall tower and then as values fall, the 13–14 storey towers and then 5–8 storeys. However, in viability terms, maximising delivery in borough value bands 4 and above requires taller/denser development than 5–8 storeys (as modelled here) can provide.

9.44 It is notable that the small scale high density infill development is viable in most locations, is likely to have a wide selection of sites across many parts of London and can achieve good general and affordable housing delivery.

9.45 *Is there a point at which the build costs make building any i) denser, ii) higher, financially unviable, and how does this vary across London?*

There are multiple value points where build costs make higher/denser buildings unviable. In simple terms, it is only at the highest values where the tallest buildings/highest densities are achievable. Then, in locations where values are lower there is a gradual process of the taller and denser developments becoming less viable and the relative viability of the lower and less dense buildings becoming stronger.

The viability testing has aggregated the London boroughs into the seven borough value bands to aid the analysis. The findings from this viability testing can be related back to the specific boroughs using the table at Figure 9.12 above, which shows how different boroughs fit into the value bands, and which case studies have a positive residual value in those value bands. Note that the table also includes upper quartile values, which can be taken as a proxy for high value localities within the borough averages. These may mean that in specific localities within a borough, the viability characteristics are akin to higher value boroughs.

9.46 *Impact on delivery of affordable housing of high density or high building built form and implications for population/child density in high density development*

It is likely that the development form with the strongest viability at any given value point stands the best chance of maximising the affordable housing delivery. Based on the viability testing this means that where the values are highest (and subject to site suitability), the tallest buildings should deliver the most affordable housing whether within the scheme, adjacent or off-site. However, the value opportunity range for these buildings is slim and as values fall the need to consider lower buildings in order to maximise delivery is imperative. The same situation is repeated with other relatively high buildings as values decrease, albeit with a slightly broader value base, until it is the lower buildings that will provide the affordable housing in the lowest value areas.

9.47 Can lower height (5–7 storeys) buildings deliver high density development without increasing costs?

Testing indicates that this height of development is viable from the highest borough value band 7 down to band 3. On this basis it is able to deliver high density development across the majority of London boroughs. However, in most of the value bands where this type of development is viable, other taller and denser development produces a higher residual value and on this basis may be more likely to come forward (because it will compete for sites), as well as producing more general and affordable housing:

- In borough value bands 7, 6, 5 and 4 both the 13–14 storey development and the 25 storey development produce higher residual values.
- Only in borough value band 3 does lower height produce better residual values than the taller development.
- In the lower value bands (2 and 1) the 13–14 storey type is generally not viable.

Therefore, lower height development can provide a suitable approach to deliver density, but not in all areas. Where values are high then taller buildings will theoretically deliver more general and affordable housing, and in the lowest value areas it is likely that low rise and low density development is most appropriate in terms of viable delivery.

10 Conclusions, issues & potential solutions

BACKGROUND TO FINDINGS

10.1 The density of residential development in London is not out of keeping with its international comparators - London is not a particularly dense city by world standards. Neither has density of development in London changed materially since 2007 although the proportion of schemes that have a higher density than the top of the SRQ density range for their setting and PTAL has increased. One inference is that higher densities are being achieved in areas which sit within the lower SRQ density ranges but very high density schemes, in absolute terms, have not been increasing proportionately.

10.2 Through the study process we have identified a set of **issues** and **potential solutions** which are described in the remainder of this chapter.

ISSUE 1: DENSITY, BUILDING HEIGHT AND POLICY

10.3 London Plan policy is to optimise rather than maximise density and it is well recognised that, *“Ensuring high density housing is sustainable and successful depends on a complex range of factors including location, management, occupancy...”*³²

10.4 This study has again found that although development density is related to building height, the relationship is not linear and schemes of similar densities can be achieved through a variety of built forms and building heights which all work well for residents. The case studies indicate that densities in excess of circa 900 dwellings per hectare are associated with medium rise (11–20 storeys) and medium to high rise (21–50 storeys) building typologies; however, many other factors, such as unit size and tenure, influence density and taller buildings are not always associated with highest residential densities.

10.5 There are examples of single tall buildings at high density in the case studies but larger high density schemes are more usually a mix of buildings of different heights set together with amenity space between. This reflects the make-up of the case studies, many of which have been developed on large previously-used sites with the development guided by an overarching vision and master plan.

10.6 No one development type was universally better liked by residents and high rise living was relatively popular. But there is a distinction in residents' attitudes depending on age and the tenure occupied. At a very simplistic level, 'Courtyard' style developments had the highest percentage of residents that were fairly/very satisfied and this style of development accommodated more family households and more households living in social/Affordable Rent. Young single people and couples (and multi adult households) tend to be the occupiers of the tallest buildings (with more limited amenity space), usually as private renters and this form of development works well for them.

10.7 Through the SRQ density matrix, the London Plan gives guidelines for a range of densities for different settings and PTALs. The Plan is clear that the SRQ density matrix should not be applied mechanistically, without being qualified by consideration of other factors and planning policy requirements. The SPG sets out these factors³³ which emphasise the overall form of the building and its contribution to the area in which it sits. This study has demonstrated the importance of good design and management in creating successful higher density developments.

³² GLA, Housing SPG, March 2016

³³ At 1.3.8 and 13.51

Potential solution one:

GLA continues with the underlying principle that there is a range of building types and heights that can achieve the same density; and that the GLA does not attempt to prescribe set formats for successful higher density/tall buildings.

10.8 Density is important in characterising new development. Comparing the density of development between schemes has proved, in itself, to be technically problematic. Site coverage varies significantly between schemes so that very tall buildings occupying a large plot have a headline density in dwellings or bed spaces per hectare below those of much lower rise development occupying (nearly) all of its plot. The reasons for these differences will vary but are likely to include the pattern of land ownership as well as the form and density of adjacent development which falls within a larger scheme. Subtle differences in density were also found between buildings of similar form which had very different internal layouts (for example, a building with larger than average dwelling sizes would have a lower headline density than the same building with 'average' sized units).

10.9 Therefore, plot density can be a more accurate metric by which to compare the built form of development. This is particularly true for tall buildings sitting on large sites. The review of the LDD shows that approximately 7.5% of large (50+ dwelling) schemes have buildings that are 15 storeys or more which would mean that the introduction of additional metrics would not be an onerous task. If useful, the approach could be extended subsequently to lower buildings.

Potential solution two:

The plot density of tall buildings should be recorded whether as one of many buildings within a consent or stand alone. 'Tall building' in this context will need to be defined and, as a starting point, 15 storeys could be used.

10.10 There can be an impression that making best use of available land will lead to an increased emphasis on development of tall 'towers' (say over 25 storeys). This argument is challenged by the range of development types identified that achieve the same densities and by the study finding that tall towers often sit within a wider development scheme with a mix of lower buildings. However, our analysis

of this point was hampered by the limitations of what is being recorded in planning applications (and hence the LDD) and the GLA should take action to remedy this as an aid to longer term monitoring of trends in higher density development.

Potential solution three:

The heights (in storeys and metres) of buildings should become an integral element of the recording process for planning permissions and completions across London. This needs to include the height of all buildings in schemes with a mix of building types. The information should be recorded in the LDD.

ISSUES 2: DESIGN OF BUILDING FORM

10.11 Increasing density (however this is achieved) does not automatically lead to design issues that indicate a systemic problem with higher densities. It is clear that there are successful developments at densities higher than those set out in the SRQ density matrix.

10.12 However, as development becomes denser and taller some of the issues that could affect any scheme – such as amenity spaces, quality of building design, scheme layout, scheme management – come under more pressure. The case studies identified issues that can affect higher density development – including poor daylight in rooms, living spaces that were too hot or too cold, lack of privacy in flats, issues with storage of cycles, lack of or unsuitable private and public amenity space, noise from use of outside amenity space.

10.13 While the standards used by the GLA are generally being achieved with different solutions applying to different buildings, it has not always been clear that scrutiny of proposed higher density development at planning application stage has been consistent. However, our analysis has applied to schemes consented between 2005 and 2012, pre-dating the adopted Housing SPG; this may largely explain apparent variations.

10.14 It is acknowledged that all new development has to be considered in its setting as part of the normal development management process, but it is the absolute density of buildings that should trigger the additional scrutiny that we consider should be put in place.

10.15 GLA will need to consider what the threshold for density/height of buildings should be and the mechanisms for the additional scrutiny. We recognise that identifying a suitable threshold is necessarily arbitrary but we put forward 500 dph as an initial proposal for consideration. This is based on schemes that we found at densities above 500 dph and the design issues that they needed to be addressed. 500 dph would identify 15% of total dwelling output for all schemes over 50 dwellings built out between January 2007 and December 2015.

10.16 Our preference would be to set a density 'trigger point' in terms of a metric determined by the building's footprint but this is unlikely to be realistic in the foreseeable future so the simpler metric of units per hectare provides a practical alternative. The qualifying factors shown in the SPG remain relevant for the added scrutiny (whether a development is small and free-standing or part of a larger comprehensive development scheme).

Potential solution four:

The principles of appropriate development in different locations underlying the density matrix should be retained as part of the normal development management process. However, it is the absolute height/density of each building that should trigger additional scrutiny of design and management solutions. The exact density at which this should apply will always be somewhat arbitrary but a density of 500 dph or height of 15 storeys are put forward for consideration (see also solution seven).

Potential solution five:

The GLA considers promoting a review of how standards and policies have been applied at the planning stage to understand how well they are being used and whether they are having the intended impacts.

Potential solution six:

More detailed guidance should be provided on innovative design solutions to floorplan configurations to avoid north-facing single aspect units; and guidance should more actively promote smaller clusters of secured cycle storage areas in higher density developments to enhance the perceived sense of security.

Amenity space

10.17 Private amenity space is important to the majority of residents and was generally provided across all schemes but the quality and quantity was variable, suggesting considerable flexibility in the way SPG guidance is being applied.

10.18 Communal amenity space also varies in quantity and quality across the schemes. Tower schemes notably do not have as much amenity space as the low and mid-rise developments but communal amenity space does not have to be 'outside space' and the right type of internal spaces will provide a focus for residents to meet and socialise.

Potential solution seven:

Evaluation criteria for higher density buildings (as defined in Potential solution four) should be extended to give more attention to:

- *ensuring private amenity space is provided for each unit, (or failing that, there is compensatory shared amenity space internally or externally),*
- *securing privacy in all dwellings,*
- *maintaining temperature control in individual units and common spaces,*
- *providing storage for cycles that is secure,*
- *minimising noise from common areas to residents,*
- *minimising the impact on the surrounding area*
 - » *of taller buildings by "stepping" building heights, and*
 - » *of denser built forms by avoiding blank faces, or the potential for empty units, at ground level,*
- *design, location and layout solutions that increase the proportion of family sized dwellings in taller buildings.*

The GLA can elaborate on the guidance in the SPG to deal with these points and work with the boroughs and other interested groups to strengthen the guidance in the SPG.

ISSUE 3: RELATIONSHIP WITH THE WIDER AREA

10.19 Large-scale high density schemes (be they also tall buildings or not) can have a significant impact on the surrounding area. Generally, the case study schemes were regarded by scheme managers as fitting well into their surroundings and, where they are part of wider regeneration schemes, having made a positive contribution to the quality of their locality.

10.20 There is a much more mixed picture on how much residents are, and feel, part of the wider community. Those living in Courtyard style developments and in Affordable Rent were more likely to say that they felt part of the wider area, than those living in taller buildings and in private rent. But these differences may reflect the predominant household types living in the different built forms; with the social network of young mobile workers living in private rent in taller buildings being beyond their immediate neighbourhood.

10.21 The case studies showed that schemes that come forward as part of master plan tend to be more successful on key design measures, (e.g. provision of good quality private and shared amenity spaces, and treatment of both buildings and spaces). Where there is a range of storey heights in a development, this can reduce the impact of a development overall, and respond better to neighbouring uses.

Potential solution eight:

The longer term role of masterplanning and strategic frameworks should be promoted more strongly to achieve successful integration of blocks or towers within their surrounding area, and to deliver wider benefits to residents, such as access to shared amenity space and high quality public realm.

10.22 Providing successful active frontages with mixed uses (including commercial space) is one way in which a high density development can benefit the vitality of an area. However blank street frontages and street frontages with unsympathetic uses (e.g. for waste collection) can have a negative impact on how the street is perceived and used.

10.23 There is evidence that provision for commercial uses is promoted by planning authorities, but that in some locations the space has remained unoccupied for some years, possibly because the rental levels sought are not commercially realistic and/or demand is weak. In these circumstances street level commercial units remain 'blank' and are potentially left to deteriorate.

Potential solution nine:

Active commercial or residential frontages should continue to be encouraged as a means of providing a safe and attractive built environment. However, insisting on the provision of commercial frontages if they will not be commercially viable will have a negative impact on the street scene. The aspiration for ground floor mixed use in residential developments should recognise that it may take time to find occupiers; particularly where demand is expected to increase over time. The amount and type of units provided should take account of the local market context and be flexible in terms of conversion to alternative uses in the longer term. There will be benefits from a flexible approach to use of these ground floor spaces in order to promote vitality. The forthcoming GLA research study of ground floor developments will provide more detailed analysis of this issue.

ISSUE 4: MANAGEMENT OF SCHEMES

10.24 Complementing design considerations for higher density development is the importance of good quality management. Scheme management will provide facilities and services, from a range of 'typical' or 'core' services e.g. lift maintenance, cleaning, insurance, maintenance to other services that may or may not be provided depending on the type of scheme and the market it services e.g. 24-hour concierge, parking wardens and security staff, gyms, meeting places, restaurants, spa facilities. The range and type of services provided directly relates to the level of service charges and residents have to pay 'fairly' for the services they are provided with and cannot be cross subsidised by other residents. This is the central reason put forward for locating affordable housing in mixed tenure schemes either in separate buildings or different cores within the same building; so that services can be tailored to the tenures and service charges will reflect this.

10.25 Mixed tenure schemes face specific management issues that require additional attention. Good practice combines establishing robust service level agreements and maintaining open and regular dialogue between housing associations and scheme managers, where one organisation manages the whole of a mixed tenure scheme.

10.26 Securing good quality management in higher density development is not easy to 'write in' to planning policies or identify at planning application stage. One option the GLA could pursue is to use its policy vehicles e.g. the Housing SPG, to require developers to submit a costed management plan as part of any application with higher density buildings (and/or the 15 storey threshold discussed above).

Potential solution ten:

Developers should be required to submit a costed management plan as part of any application for higher density development detailing the affordability of running costs and service charges (by different types of occupiers) to enable developments to be properly managed. The costed plan should set out how management arrangements will work in mixed tenure schemes and the way in which residents' views will be taken into account in delivering affordable services. While the most detailed scrutiny of management arrangements is reserved for buildings above 500 dph or 15 storeys, all developments which include common areas and provide for mixed tenures in the same building, should be required to demonstrate that they can provide affordable and sustainable management which is of a good quality. The GLA could put forward criteria which codifies this.

Potential solution eleven:

There is an opportunity for the GLA to develop policy guidance to ensure the quality of the management agreements and success of the crossover between housing association and management agents' responsibilities in mixed tenure schemes.

10.27 Dealing with waste is a particular issue for high density developments and requires a considered design response. This applies to all flatted developments; although as density increases, more thought is needed in achieving a successful solution. Management input at the design stage is important in achieving this. This point applies to other aspects of design e.g. cycle storage, location of children's play equipment.

Potential solution twelve:

In assessing planning applications for high density schemes, the GLA and boroughs should ensure that there has been sufficient management input into the design of the scheme – especially in dealing with waste and parking arrangements/ cycle storage.

ISSUE 5: PROVISION OF AFFORDABLE AND FAMILY HOUSING

10.28 The relationship between scheme density and building height and the overall percentage of affordable housing is complex. Overall, as density and height increase the percentage of affordable housing in larger schemes tends to decrease but there are many schemes providing similar levels of affordable housing at different densities. However, these findings mask the overall delivery of affordable housing in larger multi building schemes where the affordable and market housing may be found in a separate building or part of a different planning consent for an adjacent site. In tall towers with a mix of tenures, the market units are often found in the upper parts of the tower, where market values are greatest.

10.29 If more higher density/tall buildings are to be permitted in future, the implications for affordable housing delivery will need to be scrutinised. The viability evidence collected for this study (see below) does not show that higher density development should lead to a general downward pressure on delivery of affordable housing.

10.30 The proportion of family sized housing (with 3 bedrooms or more) similarly decreases as storey height increases and family housing is more likely to be found in Affordable Rent/social rent housing than either market or intermediate housing, whatever the development density. This suggests that positive action will be required to ensure family housing is not 'squeezed out' of the most accessible locations where highest density development is allowed – providing the location/scheme is, in other respects, suitable for family housing.

Potential solution thirteen:

The GLA works with the boroughs to provide clear guidance on expectations for delivery of affordable and family housing in higher density developments and how viability is to be taken into account.

ISSUE 6: DEVELOPMENT COSTS AND VIABILITY

10.31 Taller buildings tend to have higher development costs but this can be mitigated by higher values. In locations with the highest market values then the tallest buildings are able to provide general and affordable housing at very high density, which is important in terms of maximising delivery. However, in other locations with lower values mid-height, and then lower forms of development, tend to have better viability and are more likely to deliver general and affordable housing – although inevitably the densities are likely to be reduced as well. Where a given built form is delivered outside its value zone ‘sweet spot’ then it is likely that there will be sub-optimal housing delivery.

10.32 Part of the brief for this work was to consider how lower forms of high density development (5–8 storeys) may provide general and affordable housing in London. The viability testing suggests that this form of development is viable in most of London except the lowest value areas (here less dense development is generally more viable). However, where the 5–8 storey development is viable, other denser and higher development is likely to have a stronger residual value and therefore more likely to be able to compete for sites. Of course, in any given situation there will be other considerations beyond just viability that may have an impact on the most appropriate development form.

Potential solution fourteen:

The viability testing has shown how development density that is significantly above the density matrix range, and taller buildings, lead to improved financial viability in some parts of London, particularly in higher value areas. Given the pressure to deliver general and affordable housing in London it is recommended that consideration is given to these higher or denser development types, where appropriate, if they can deliver more affordable housing.

Potential solution fifteen:

The viability testing shows that in many cases where lower height development (say 5–8 storeys) is viable, other higher and denser development is more viable and left to market forces is more likely to be proposed. Rejection of these schemes will reduce potential output of both market and affordable housing in unit terms but may be an appropriate trade-off if the priority is for a smaller number of larger dwellings better suited for family use.



by
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