ROOM TO SWING A CAT?

The Amount and Use of Space in New Dwellings in London & the South East

March 2010

HATC Limited

HATC Ltd is a housing consultancy specialising in property development issues, has a national client base and covers four main areas of activity:

- Project delivery
- Programme delivery (strategy development, good practice processes and procedures, standard design briefs, project financial evaluation, risk management)
- Research and policy development
- Training and professional development.

This study has been conducted as part of our programme of activities in research and policy development on housing standards.

HATC contributes to the www.swingacat.info website aimed at raising consumer awareness about the space needed for a home to work well.

Acknowledgements

This report was written by Andrew Drury and Eleanor Somers of HATC Ltd.

The fieldwork was undertaken by Eleanor Somers.

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ANDREW DRURY
HATC Ltd
Thursday, 04 March 2010

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Introduction

This dwelling size survey was conducted as part of a programme of research by the UK Space Standards group. The research programme has been prompted by concerns that dwelling sizes have been reducing in recent years; these concerns are based on anecdotal evidence.

This project was formulated in parallel with that of *Resident Satisfaction with Space in the Home* (HATC, 2009).

The objective of this research was to obtain information on the internal areas of new-build dwellings for sale. The fieldwork was undertaken in July – September 2008.

Research Methodology

The internal dwelling area was measured from the sales details provided by housebuilders, either from sales brochures obtained through the post or from housebuilder's websites.

Criteria used to select dwelling sample

The dwelling sample came from the sub-group of dwellings for sale that were:

- built by Britain's 20 biggest house-builders (as listed in 'Britain's biggest house builders' in *The House Builder*)
- within approximately 1-hour travel time of central London.

In addition, a target was set for 40% of the dwellings to come from within the Greater London area

This geographical target area and the target of 40% of the dwellings selected to come from within the Greater London area is the same sampling approach as that adopted for another piece of research under this programme, *Resident Satisfaction With Space In The Home*, HATC Ltd (2009), sponsored by CABE. The area is shown at Appendices 1 and 2.

Some house-builders had no developments in this geographic area and were therefore excluded. Approximately 6 dwellings were targeted from each builder. However, this was not always achieved, either because of difficulty in obtaining sales information or in order to fulfill other criteria (for instance achieving approximately 40% of the dwellings in London).

The criteria used to select individual properties were:

- Sale price was up to and including Council Tax Band D (see below for the explanation of how this was calculated);
- Approximately 40% of the sample to be from the Greater London area;
- Not more than 3 bedrooms;
- No detached houses.

These are the same criteria as those in the *Resident Satisfaction With Space In The Home* report.

The sample actually drew from developments by 17 housebuilders[1].

[1] Barratt, Bellway, Berkeley Group, Bloor Homes, Bovis Homes, Countryside Properties, Crest Nicholson, Fairview, Galliford Try, Gladedale, Kier Residential, Lovell, Miller, Morris Homes, Persimmon, Redrow, Wimpey

Council Tax Band

Council Tax bands are calculated with reference to property values in Quarter 2 of 1991. In order to select properties that are in Council Tax bands A – D inclusive, and exclude those in Band E and above, we had to make an assessment of where the boundary lies (at current values) between band D and band E

The Council Tax Band D upper limit was £88,000 in Q2 1991. Current equivalent values were calculated using the Nationwide House Price Index and the Halifax House Price Index. These two indices were used to provide current equivalent values in different price regions.

The figures produced by the two indices differed, as did their geographic regions. However, using the information provided by the indices, we have estimated the current price of properties that were worth £88,000 in 1991 for the different house price regions as follows:

- Greater London: £325,000
- Outer Metropolitan and Outer South East: £300,000
- East Anglia and East Midlands: £250,000

The sample did not include detached properties or those with more than 3 bedrooms as a these formed a small minority (approximately 15%) of the dwellings in the resident satisfaction survey.

Unusual property types, for example a penthouse 1-bed flat in London, were not included in the sample.

Sampling Method

Information on dwellings was obtained from sales details, either directly from the website of the house-builder or by the researcher acting as a potential buyer2 and obtaining sales information by post or email.

The data collected included:

- House-builder
- Name of the development
- Location (address)
- Name of individual property
- Property type and number of bedrooms
- Price
- Floor plan of the property (including room dimensions)

[2] This was to avoid the possibility that housebuilders may be reluctant to provide floor plans for research such as this.

The number of people it could accommodate (as indicated by the builder or where there is no indication, assessed from the sizes of the bedrooms)

Sample Size

The total sample obtained was 89 dwellings (from 17 housebuilders), 31 of which came from the Greater London area.

The sample did not draw evenly from all top-20 housebuilders for two reasons. Firstly, a number of house-builders did not have any developments in Greater London. Secondly, it was difficult to obtain all the required information on individual properties from some housebuilders and in a few circumstances the information was unusable because of inaccurate dimensions on floor plans.

Thus, some housebuilders have a higher degree of representation than other builders with the range of numbers of dwellings per housebuilder varying from 2 to 10.

No 3-bed flats outside London were included in the sample as they appears to be a very unusual property type. Only 2 out of 22 developments outside London had hard-copy marketing information referring to 3-bed flats.

Where marketing information was obtained from websites, we did not try to establish the scheme mix. The averages (whether means, modes or medians) therefore do not give an indication of the average size of dwellings produced in schemes. For example, the dataset includes only one studio/bedsit flat, but this dwelling type constituted 27 out of the 114 dwellings (24%) in the scheme from which it came.

Measurement Definitions, Method & Validation

Internal areas were calculated by manually measuring the floor plans of the property. The following areas were measured:

- Gross Internal Area (GIA);
- Net Internal Area (NIA);
- Storage space;
- Utility space;
- Kitchen area;
- 'Notional corridor' areas
- Habitable Areas

The measurements were validated (a 10% sample) by having the plans independently measured and calculated. The validations confirmed all the original calculations and measurements.

Definitions

The GIA and the NIA were measured in accordance with the definitions set out in the Royal Institute of Chartered Surveyors (RICS) 'Code of Measuring Practice' 6th Ed. (2007).

Gross Internal Area is the internal area of the dwelling measured to the internal face of the dwelling's perimeter walls.

Net Internal Area is the GIA, but excluding circulation areas, bathrooms, toilets and internal structural walls.

NB1: Internal non-structural walls were included in the NIA, but partitions between spaces that were not included in the NIA were not. For example, the walls of a store area surrounded by circulation area were not included in the NIA.

NB2: Areas of reduced head height (under sloping ceilings) were included but one third of this area was assumed to be too low to be fully useable, and so was counted as storage space.

Storage: The space inside wardrobes, storage cupboards, under-stairs cupboards (see below) and (in one dwelling) 1/3 of the floor area under a sloping ceiling. It also included Linen cupboards if there was another linen/airing cupboard in the dwelling but not otherwise (see below).

Utility: The space inside utility rooms, airing cupboards, isolated washing machine spaces, boilers, cylinders or any combination. Linen/airing cupboards were included in the Utility category. However if there were two or more linen cupboards, one was classified as Utility and other(s) as Storage (see above).

The area of under-stairs cupboards was taken to be the measured width of the cupboard and depth of 1 metre, which was the assumed area that would actually be usable by residents.

Kitchen: The space inside the kitchen. In cases where the exact size of the kitchen area was not clearly demarcated (most commonly in open plan flats) the area was calculated as the length of the kitchen multiplied by 1.6 metres (600mm for the depth of the kitchen units plus 1m clear working space in front of the kitchen units, as expected by the National Housing Federation's Guide to Standards & Quality in Development, 2008).

Notional Corridors: Areas in rooms / spaces that were unusable by residents as anything other than circulation areas i.e. areas that have to be kept clear to enable people to pass through one area to get to another 'primary' area in the dwelling when there was no other way to reach it. Such areas cannot be used for furniture, storage etc and so are effectively corridors.

'Primary' areas are those that are used by all occupants frequently (for example the kitchen or living areas).

The areas were calculated as the length of the notional corridor and an assumed width of 750mm as per guidance in the National Housing Federation's Guide to Standards and Quality in Development (2008).

A prudent view was taken of Notional Corridors. In a number of cases the notional corridor could have been assessed as significantly longer than was actually measured. For example, the options for the Notional Corridor for one dwelling type are shown in Figure 1. The shorter length (Figure 1A) was used in the analysis, even though it probably under-states the space that has to be used for circulation within rooms.

Figure 1A

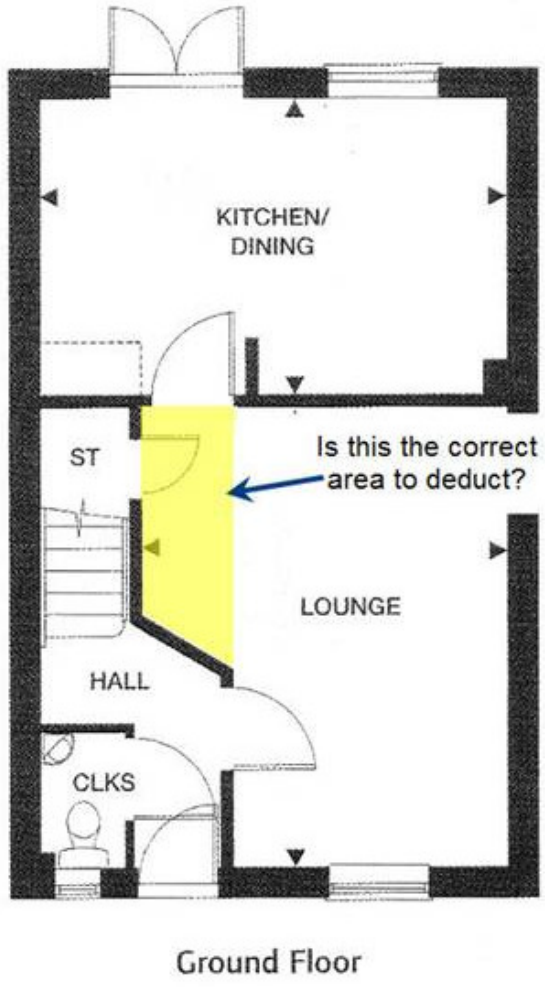
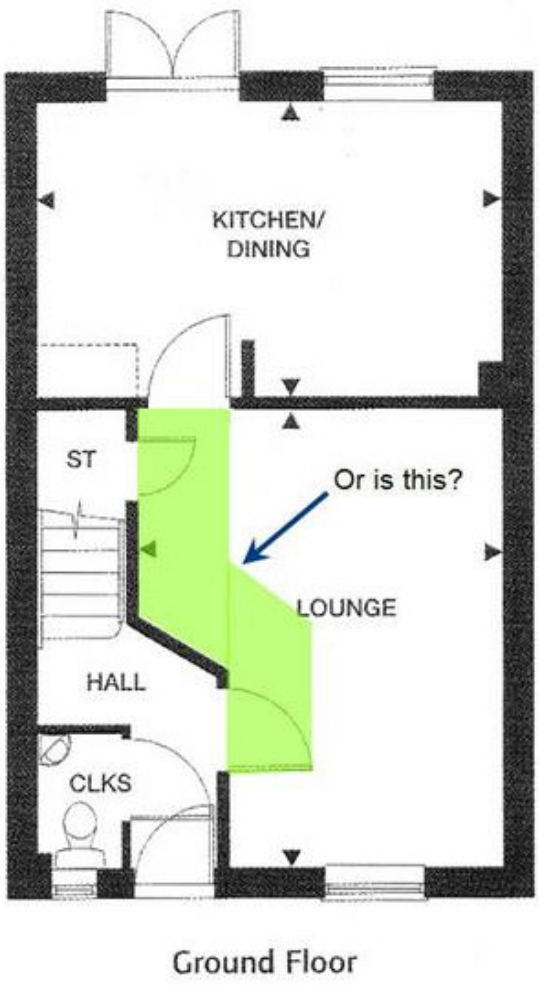


Figure 1B



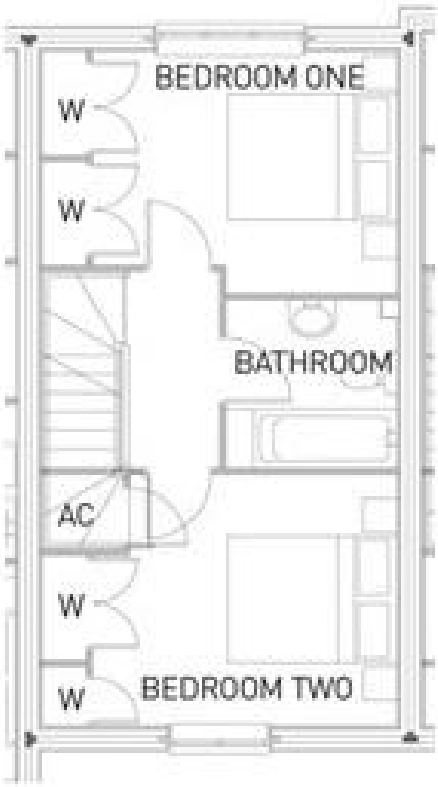
Habitable Area: (HA) is a statistic developed for this piece of research. It draws from the frequently used term "habitable room" but reflects the fact that many of the dwellings in this sample were open-plan and so had "areas" rather than "rooms". Furthermore, there is no generally agreed definition of the term "habitable room". Although often used in planning applications, there is no definition of this term in planning law. The 2010 Building Regulations use different definitions for "habitable room" in different Parts:

- *A room used, or intended to be used, for dwellinghouse purposes (including for the purposes of Part B, a kitchen but not a bathroom). (Part B);*
- *a room used for dwelling purposes but which is not solely a kitchen, utility room, bathroom, cellar or sanitary accommodation. (Part F);*
- *a room used, or intended to be used, for dwelling purposes including a kitchen but not a bathroom or utility room. (Part M)*

For the purposes of this research, therefore, Habitable Area is the Net Internal Area ***less*** Kitchen, Utility, Storage, and Notional Circulation areas. Habitable Area is therefore a measurement of the space that can be used by the residents for furniture and activities in living areas, dining areas and bedrooms.

Design Occupancy Level: persons per dwelling

Figure 2



This was calculated by logging the number of bedspaces in each dwelling. In most cases this was done by counting the number of bedspaces shown on the housebuilder's marketing details (Figure 2 provides an illustration of a 'declared' 4-person dwelling).

However, some of the marketing plans did not contain illustrative furniture layouts. We therefore derived a benchmark from all the layouts[3] by measuring all bedrooms with a "declared" occupancy level to determine the boundary between double / twin rooms and singles.

That boundary was approximately 8m². "Undeclared" bedrooms <8m² were therefore counted as single occupancy, and larger rooms as double occupancy. From this, the dwelling's designed occupancy level was scored.

[3] 22 dwellings from 6 of the 17 housebuilders.

Results and Analysis

Property Categories

All data recorded was entered into a spreadsheet which was used for the analysis.

Data was sorted by dwelling type, with most of the dwellings falling into 7 categories. These were:

- 1 bed flats in London
- 1 bed flats outside London
- 2 bed flats in London
- 2 bed flats outside London
- 2 bed houses outside London
- 3 bed flats in London
- 3 bed houses outside London

There were three dwellings that did not fall into one of these categories; one bedsit flat, one 2-bed house and one 3-bed house, all in Greater London. They were not included in the analysis.

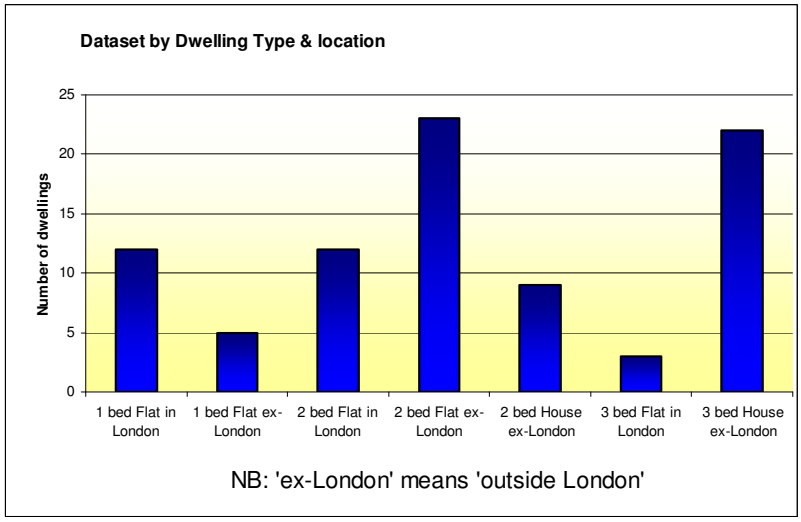
There were also two 1-bed 1-person flats (one in London and one outside London) that were excluded from the analysis as they were an unusual property type in this sample.

Numbers of each Dwelling Type

In total 86 individual dwellings were measured and included in this analysis. Figure 3 shows the number of each dwelling types in each location, ordered by bedroom size.

27 of the 86 dwellings included in this analysis were located within London, representing 31% of the total. This is less than the 40% target for the reasons noted earlier in this report.

Figure 3



Scope of Analysis

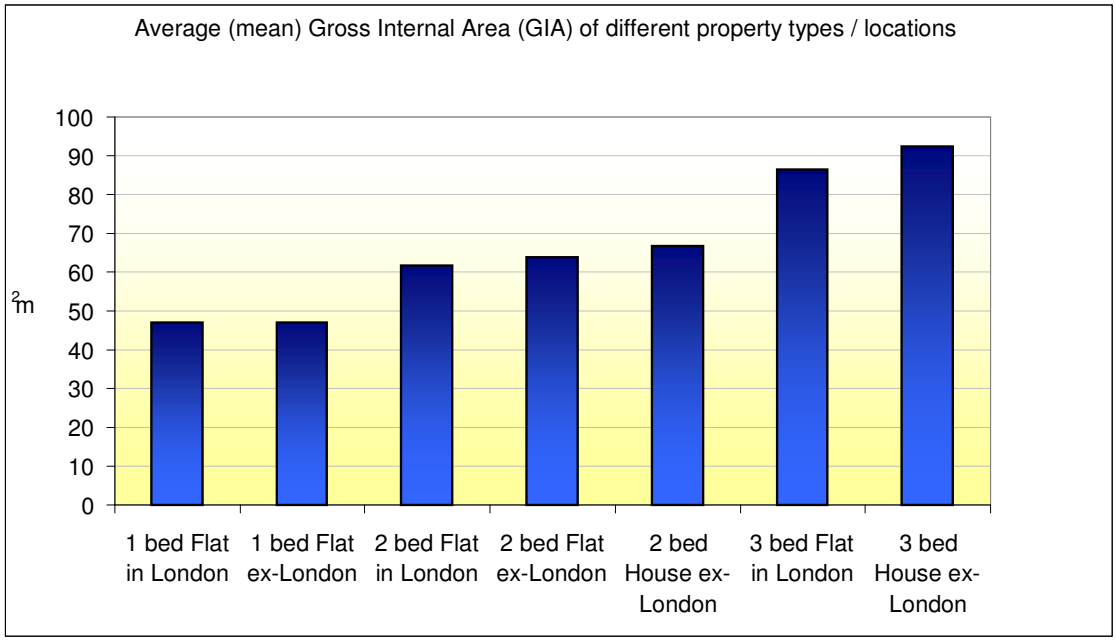
The analysis focused on producing the following statistics for each of the 7 property categories:

- The average Gross Internal Area (GIA) and frequency diagrams for GIA
- The proportion of the GIA that is taken up by these various sub-categories i.e. how the GIA is used;
- Habitable Area (HA)
- Average Habitable Area per person and frequency diagrams for HA per person
- Cost per m² & cost per square foot of GIA, NIA and HA

Gross Internal Areas (GIA)

Figure 4 shows the average Gross internal Area (GIA) for each of the seven main property types.

Figure 4



1 bed Flats

1–bedroom flats have an average GIA of 46.9m², both in London and outside London (see Fig 2).

The frequency distributions (Fig 5 and Fig 6) show that both in and outside London, the 1-bed flats mostly fall in the 40m² - 50m² band.

Figure 5

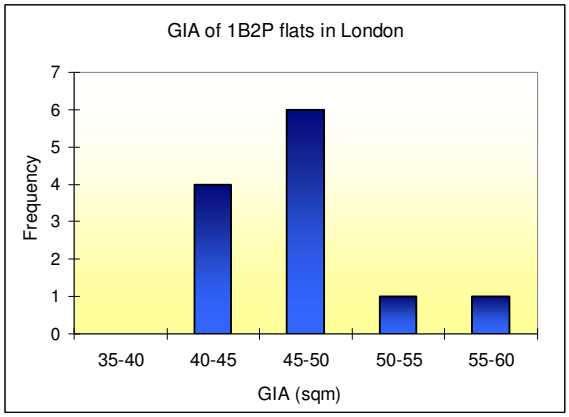
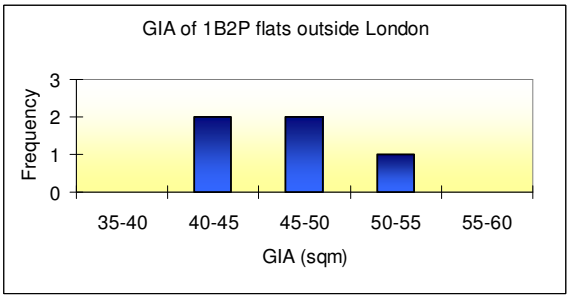


Figure 6



It is worth noting that there was one studio flat in the survey data (in London), with a GIA of 22.3m². There were also two 1-bedroom 1-person flats (one in London and one outside London) with GIAs of 37.6 m² and 33.5 m² respectively.

As previously noted these drawings were not included in the analysis.

2-bed Flats & Houses

The average GIA for 2-bed flats and houses were in the middle of the 60-70m² band. 2-bed flats outside London had a mean GIA of 64.0m², 2-bed flats in London had 61.7m² and 2-bed houses in London had 66.7m². This is shown in Figure 4

Figures 7 & 8 show how many 2-bed flats were in each different size category. Both in and outside London the most common site type was the 60m²-65m² band, but there is a long tail of larger flats outside London – the largest being 83m².

Figure 7

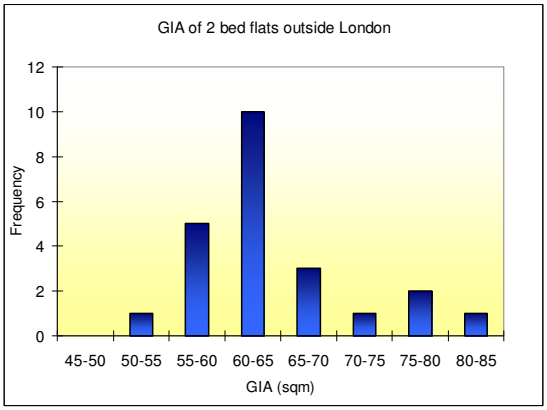
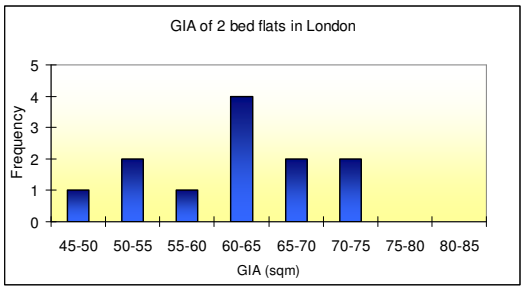


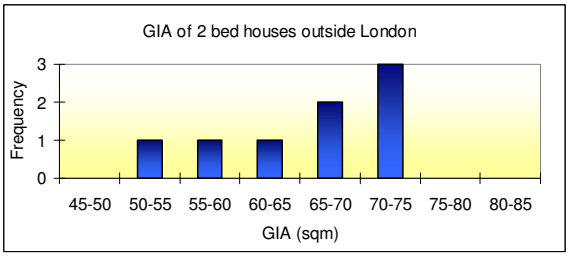
Figure 8



The 2-bed flats within London (Fig 8) start smaller than those outside London and do not include the larger sizes. Outside London, 2-bed flats start in the 50m² - 55m² band; in London they start in the 45m²-50m² band. None of the 2-bed flats in London fell into the two larger size categories.

Figure 9 shows the spread of GIAs for 2-bedroom houses outside London.

Figure 9



These houses cover a narrower range of sizes than the 2-bed flats, whether in London or outside London i.e. 50m² - 75m². The houses are weighted towards the upper end of this range (65m² - 75m²), while the flats are weighted towards the lower end (55m² - 65m²). However, as was noted earlier, the

average GIA of the 2-bed houses is only marginally higher than that of the 2-bed flats outside London (67m² and 64m² respectively).

Of the nine 2-bed houses included in this analysis, two were 2B3P and seven were 2B4P. The mean GIAs of these two dwelling types were 60.4 m^2 and 68.5 m^2 respectively. The median for the 2B4P houses was 70.4 m^2.

3 – Bed Flats & Houses

There were no 3-bed houses in London within this study's Council Tax Band criterion and so we have not reported on them. Only three 3-bed flats in London came within the Council Tax Band criterion. These are shown in Figure 10. With only three examples, little can be gleaned, although there is again an interestingly wide range of sizes, from 77m² - 92m².

Figure 10

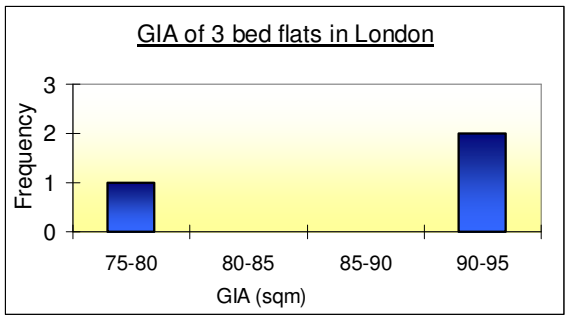
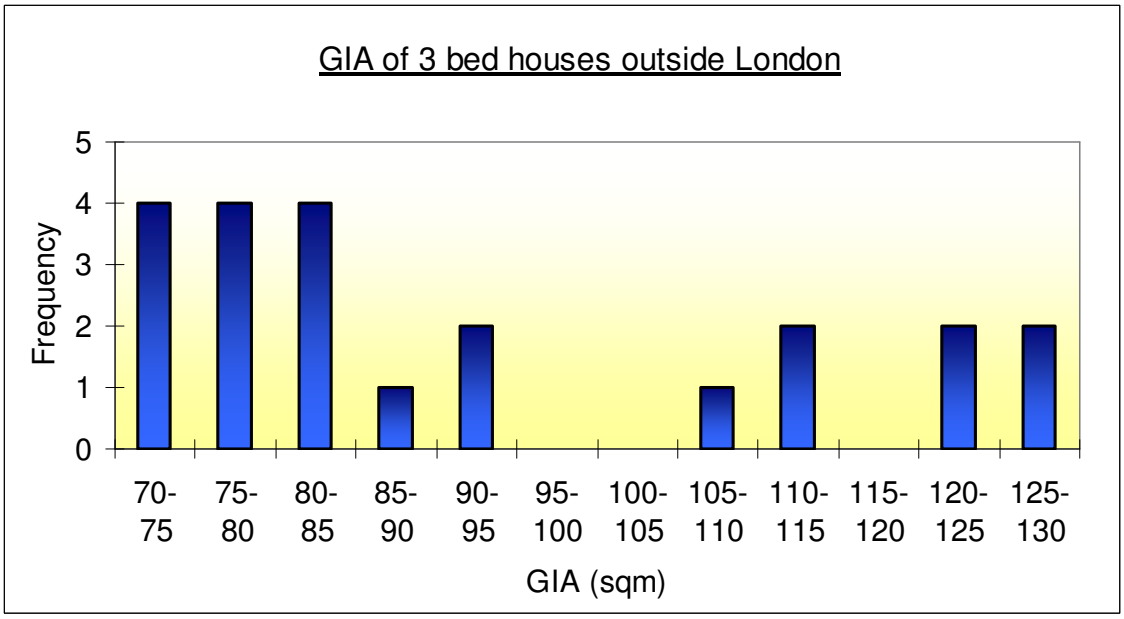


Figure 11 shows the distribution of dwelling sizes for 3-bed houses outside London.

Figure 11



This histogram shows that 3-bed houses come in a great variety of sizes – although there is a gap in the 95m² - 105m² range. The most common size groups, however, were the smallest i.e. 70m² - 85m². This highlights that the average of these dwellings (92.5m²) is a misleading statistic in this case. Other measures of central tendency for this data are:

- Median is 83.6m²;
- Modes (when assessed to the nearest whole m²) are 73m², 78m² and 79m²;
- Mode (when assessed in 10m² ranges) is 70m² - 80m² range.

Some of this variety can be accounted for by the different numbers of people from which the property is (apparently) designed. This group of houses contains dwellings designed for four persons (3-bed, 4-person dwellings, or '3B4P'), five persons (3B5P) and six persons (3B6P).

The average GIAs (means) for these three different types of three-bedroom houses are:

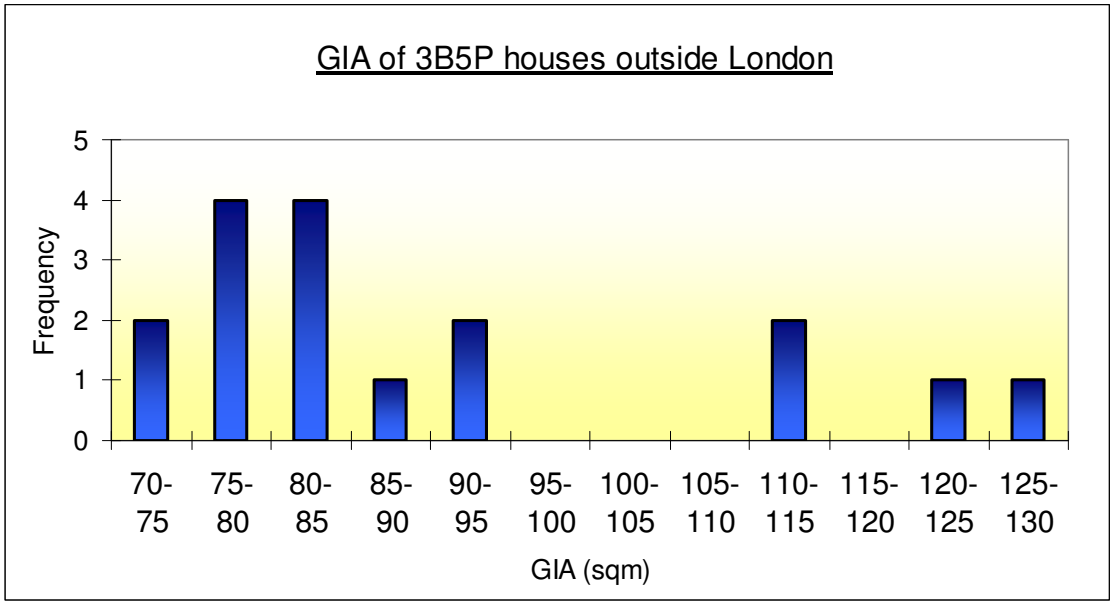
3B4P house (2 out of 22)	**73m²**,
3B5P house (18 out of 22)	**90m²**,
3B6P house (3 out of 22)	**118m²**.

Of the 3B5P houses, the measures of central tendency are:

Mean:	**90m²**;
Median	**82m²**;
Mode range	**75-80m²**.

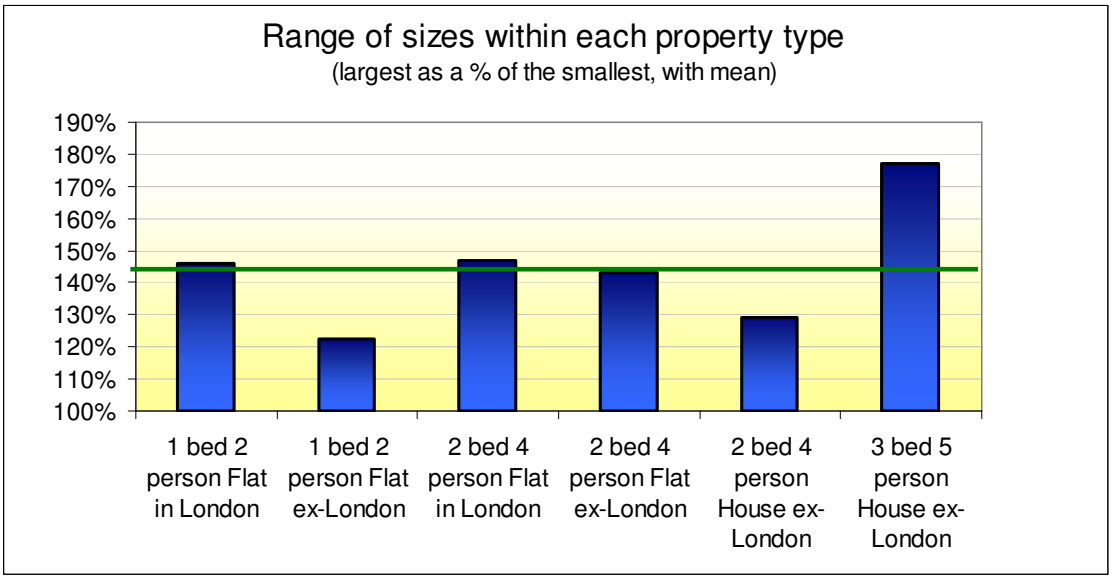
Figure 12 shows the frequency of the 3B5P houses i.e. excluding the 3B4P and the 3B6P dwellings that are included in figure 11.

Figure 12



The range of sizes of dwellings within each property type was examined by comparing the sizes of the largest and smallest. This range was expressed by the percentage that the biggest dwelling was larger than the smallest. The results are shown in Figure 13. The narrowest range of sizes was 22%, and the broadest was 77%. The average range in sizes of properties within a property type was 44%.

Figure 13



Observations

It is worth noting that the 1B2P flats both in and outside of London had an average (mean) GIA of 47m^2 (to the nearest m^2). The median inside London was 46m^2 and for the flats outside London was 48m^2. The modal 5-metre band was 45-50m^2. This sample therefore does not support the view that a move towards very small 1B2P flats (<30m^2 - 40m^2) stems from the major housebuilders represented in this study[4]. The smallest 1B2P flat in the sample had a GIA of 40.2m^2.

However, as previously noted there were three significantly smaller dwellings in the sample, but these appear to have been designed for single-person occupancy. These dwellings were:

Bedsit / studio (in London):	22 m^2
1B1P in London:	38 m^2
1B1P outside London:	34 m^2

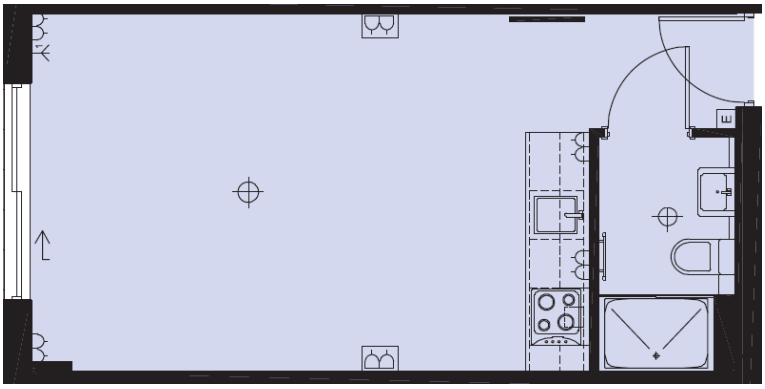
As previously noted the bedsit/studio represented 24% of all dwellings in the development from which it came. The 38m^2 1B1P flat represented 23% of the dwellings in the development from which it came. So

[4] The 1-bedroom flats analysed in this project were developed by Barratts, Countryside, Gladedale, Fairview, Crest Nicholson, Wimpey, Bellways, Berkeley Group, Miller Group & Persimmon.

although the major housebuilders may not be developing 1B2P dwellings that are particularly small, there is some evidence that some very small dwellings are being developed (albeit designed for single occupancy) and that these dwellings may form a very significant proportion of overall output.

Figure 14 shows the floor plan of the bedsit/studio

Figure 14: 22m² bedsit/studio



There is a significant range of sizes of two-bedroom flats both in London and outside London, with the largest example in the sample being approximately 50% greater than the smallest in both geographic areas. The flats in London tended to be one size-band smaller than those outside London, even though the modal band for both was 60-65 m^2 (see Figures 7 & 8).

The smallest of the 2B4P flats (which was in London) was the same size as the average (mean) of the 1B2P flats.

The two bed houses (outside London) started in the same size-band as the two bed flats outside London (i.e. 50-55 m^2). Given the space taken up by staircases and landings, one might expect that the Habitable Area (HA) would be significantly less in the house than the flats. In reality the Habitable Areas were (on average) 29m^2 and 32m^2 respectively i.e. the houses had only 10% less Habitable Area than the flats. This was because the flats had significant lengths of notional corridors to provide access from the hallway to the kitchen.

The three bed houses (all outside London) showed a very wide range of sizes, with the largest unit being 79% bigger than the smallest. The largest 3B5P house was 75% bigger than the smallest 3B5P house.

When considering only the 3B5P houses there are two distinct groupings in the 70-95m^2 band and the >110m^2band. Of the smaller dwelling types, the majority are in the 75-85 m^2 band.

Distribution of Gross Internal Area

This section looks at how the internal space in the dwellings is used i.e. how much is taken up by:

- storage,
- kitchen,
- utility, bathrooms, WCs, shower rooms and corridor
- notional corridor
- habitable area.

Not all bedrooms were measured, however it was noted that housebuilders appear to consider a bedroom >8m² as a double.

Single bedrooms were as small as 4.5m² (although some were over 7m²).

These compare to minimum sizes of 10.2m² for a double and 6.5m² for a single bedroom in legislation regarding over-crowding[5].

Average Distributions

How the overall space provided (Gross Internal Area) is distributed between the different uses is illustrated in this section. Pie charts illustrate this spatial distribution for some of the property types examined with a consolidated graph that summarises the position for all property types.

The charts have been produced by taking the average (mean) of the measured spaces for the relevant property type, and dividing it by the mean GIA for that property type and then expressing it as a percentage of the mean GIA for that property type.

Example pie charts for a selection property types is shown in Figures 15-17.

Figure 15

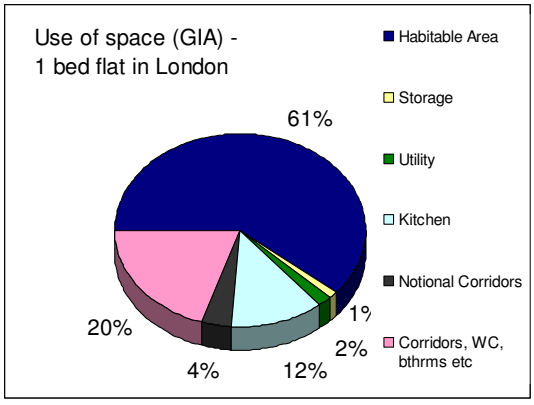
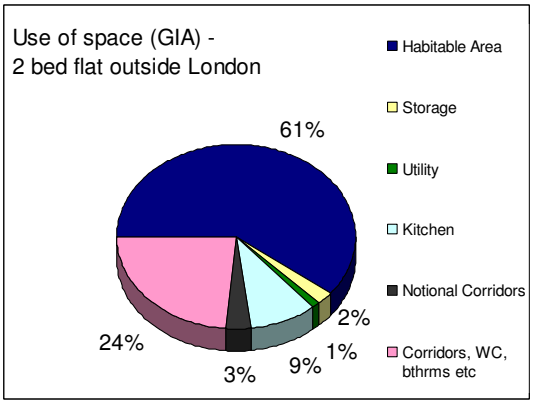


Figure 16



[5] Housing Act 1985 Part 10 S.326

Figure 17

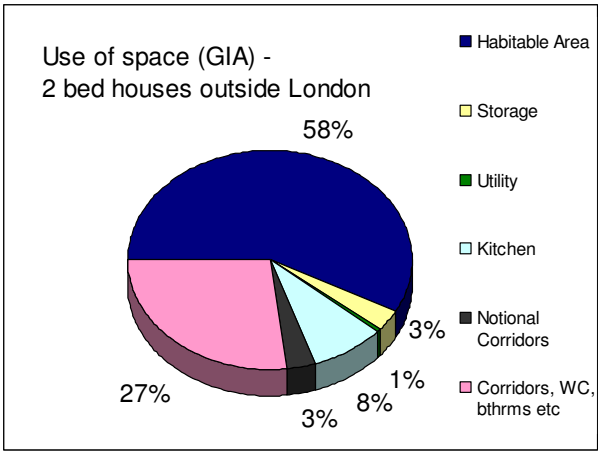


Figure 18 shows how space is used in the home (as a percentage of the GIA) for all different property types. There are a number of spaces / areas that account for only a few percentage points of the GIA – particularly the storage and utility areas.

Figure 18

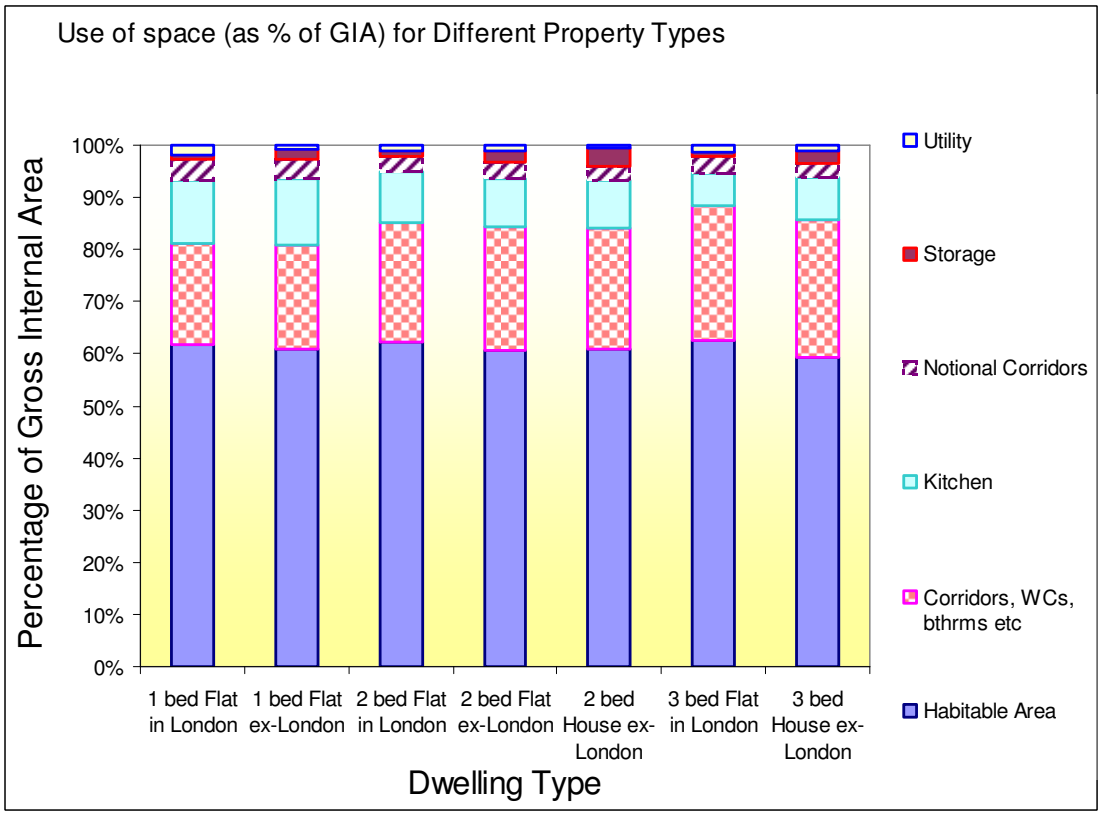
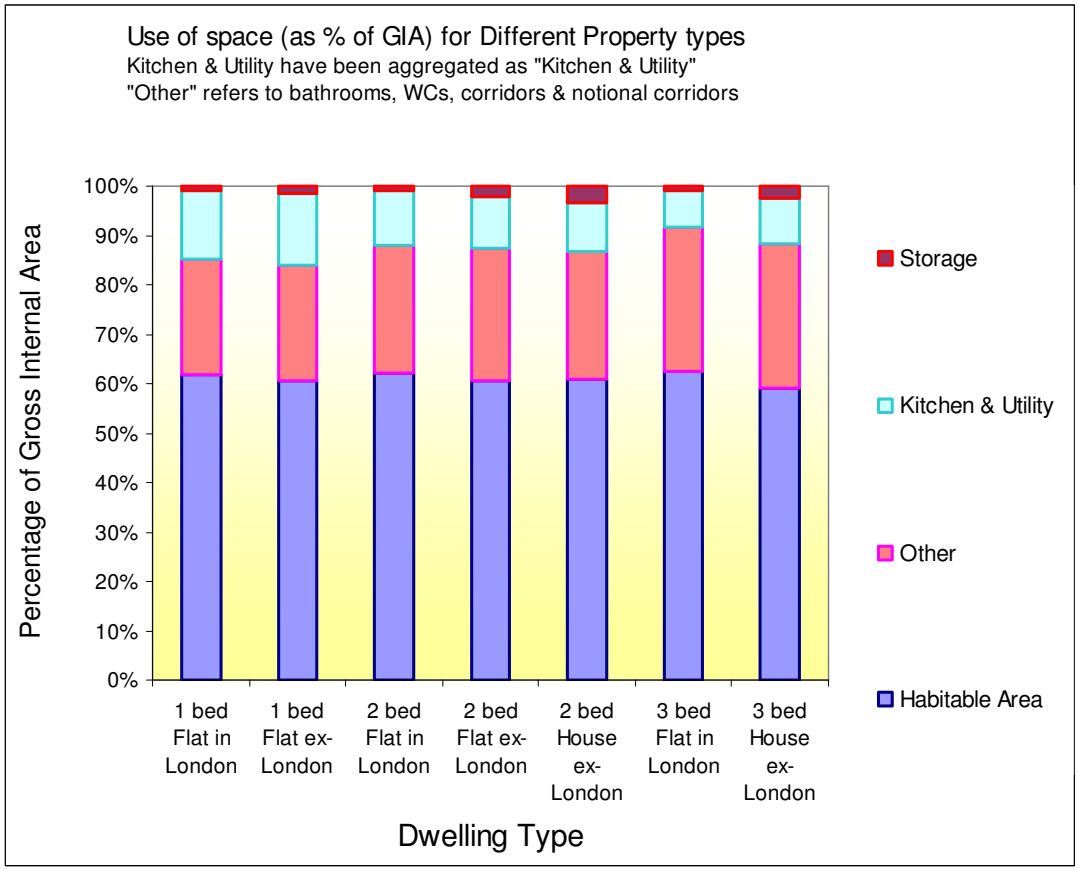


Figure 19 is a slightly consolidated version, aggregating the kitchen space with the utility space, and the notional corridors with the corridors, bathrooms and WC areas.

Figure 19



Storage Space

The average figures for storage were examined in more detail as it was noted that a number of the dwellings had no storage space at all. Figure 20 shows the percentage of each dwelling type that allowed no storage space.

Figure 20

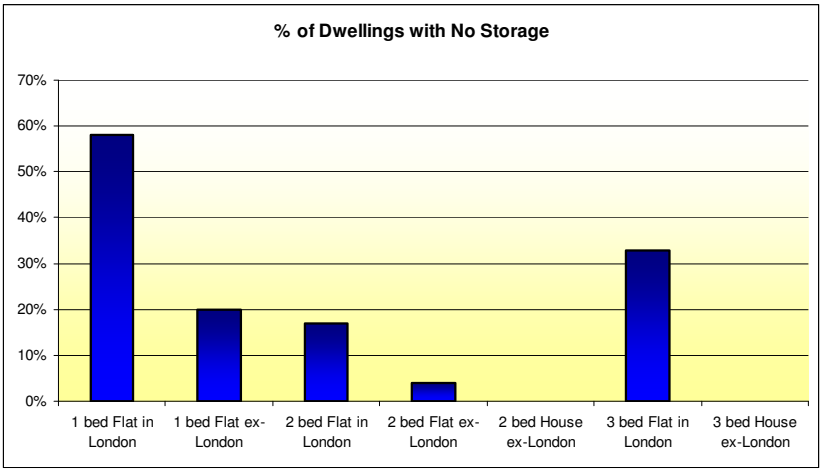
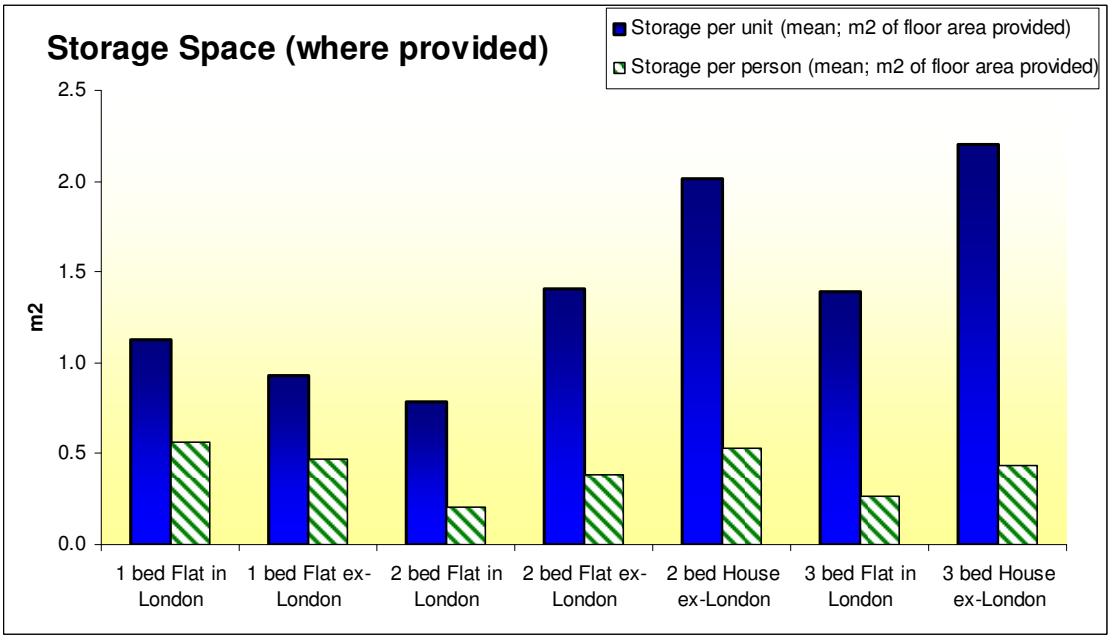


Figure 21 shows (for those dwellings were storage space is provided) the average amount of storage per unit and per person.

Figure 21



Observations

In almost all dwelling types approximately 60% of the Gross Internal Area is habitable. In the two-bedroom houses outside London the habitable area is 58% of the GIA.

Bathrooms and corridors take up approximately 25-30% of the dwelling area.

Kitchens and utility areas account for 10-15% of the space in the dwelling.

There is little apparent difference in the proportionate distribution of the space within the homes for the 1- or 2-bed flats either in London or outside London.

The kitchen falls as a percentage as the actual GIA increases, because the kitchens are all between 5.5m² and 6.0m² (apart from the 3-bed houses: 7.6m²).

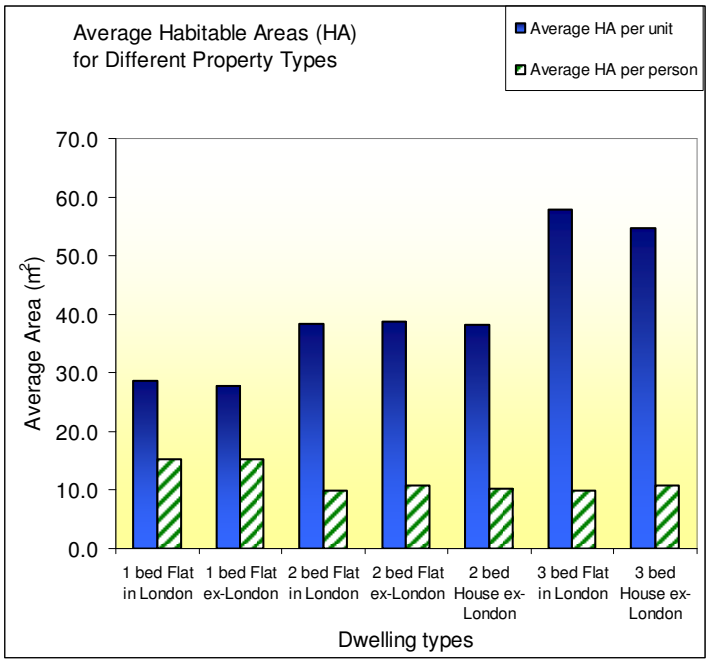
The space devoted to corridors and bathrooms increases slightly as a proportion of the GIA as the dwellings become larger. If the dwellings had only one bathroom and varying lengths of corridor, these areas would fall as a percentage of the GIA. However, the converse is true; in nominal terms theses areas increase significantly across the property types, from 9m² in the 1-bed flats, to 15m² for the 2-bed flats outside London, to 24.5m² in the 3-bed houses. Clearly the corridor area in houses is likely to be greater as a proportion, because of the need for the staircase, but the increase goes beyond that. It is probably the result of additional bathroom areas (such as en-suite bathrooms adjacent to master bedrooms). Bathroom areas were not measured separately, as that was beyond the scope of the brief (which was to measure the GIA and NIA of the dwellings), but it may well be worth while doing so, to disaggregate the corridors from bathrooms. The former do not add value, from the housebuilders perspective, but the latter do, and so should be clearly identifiable.

Seven of the twelve (58%) 1B2P flats in London had no built-in storage space at all. For the other dwellings there was no discernible relationship between dwelling size and the amount of storage space provided. Similarly, where storage space was provided the amount per person fluctuated between approximately 0.2 m^2 0.5 m^2.

Habitable Area

Figure 22 shows the Habitable Area per property type, and the Habitable Area per person. This latter statistic was produced by calculating the mean of the Habitable Area per person for each dwelling within each dwelling type.

Figure 22



However, these average figures obscure the ranges within each dwelling type. The following graphs (Figures 23-30) show the range of Habitable Area per person for each difference dwelling type using frequency diagrams with 5m2 categories.

Figure 23

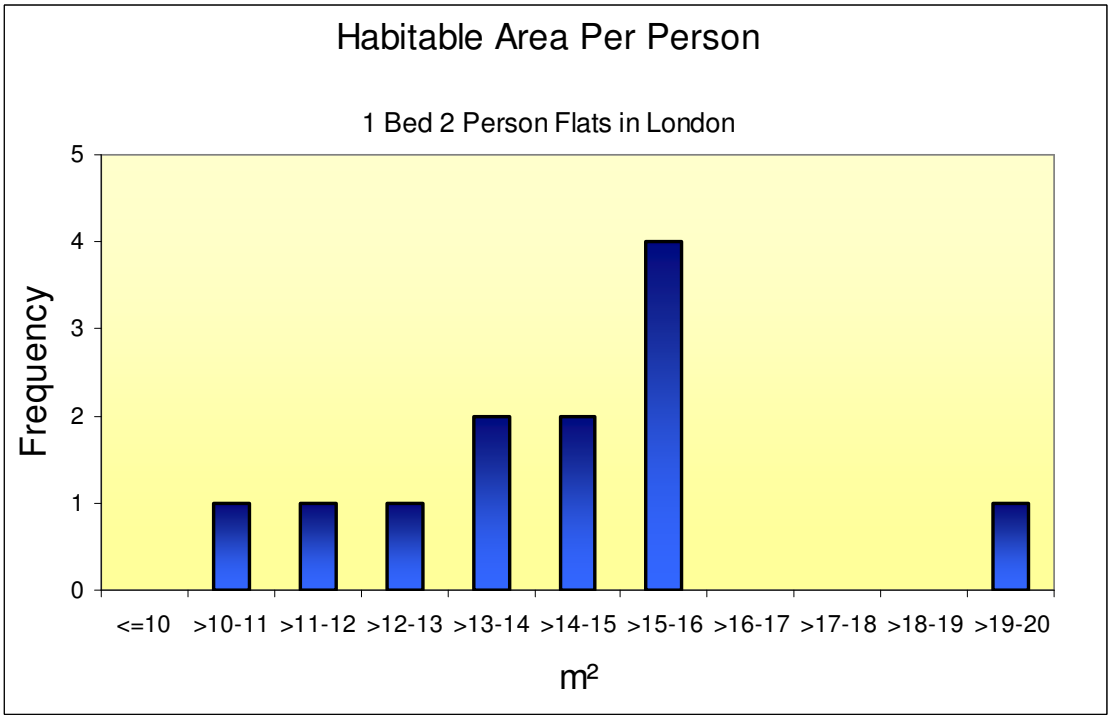


Figure 24

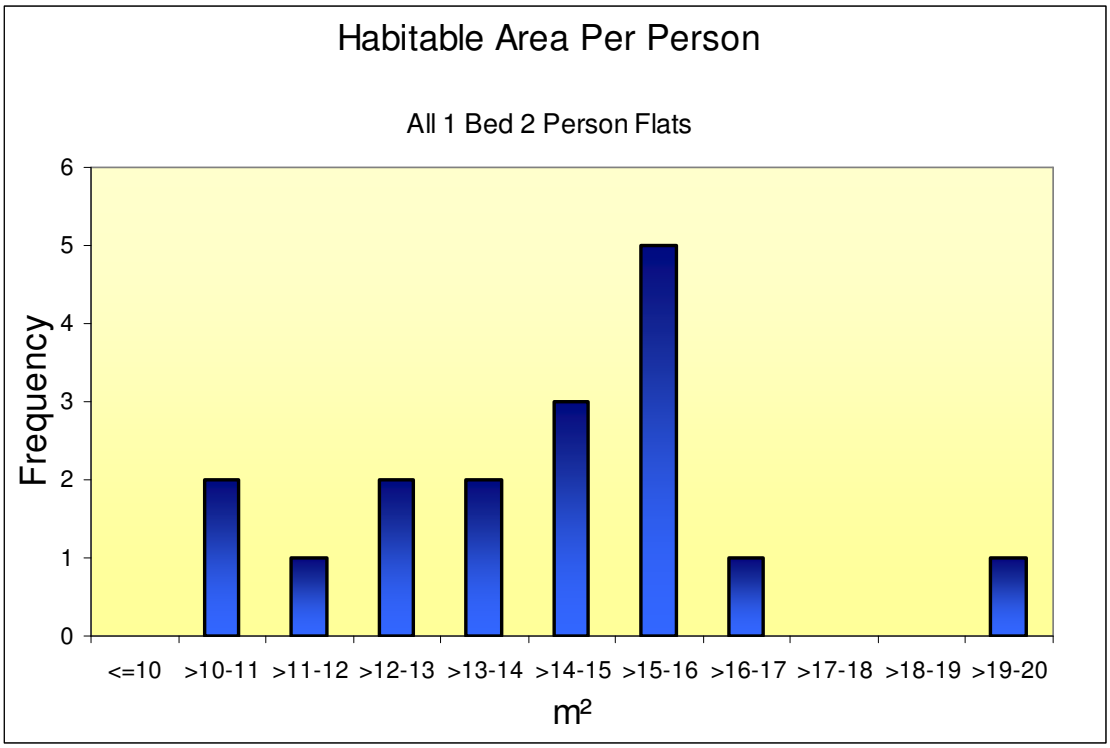


Figure 25

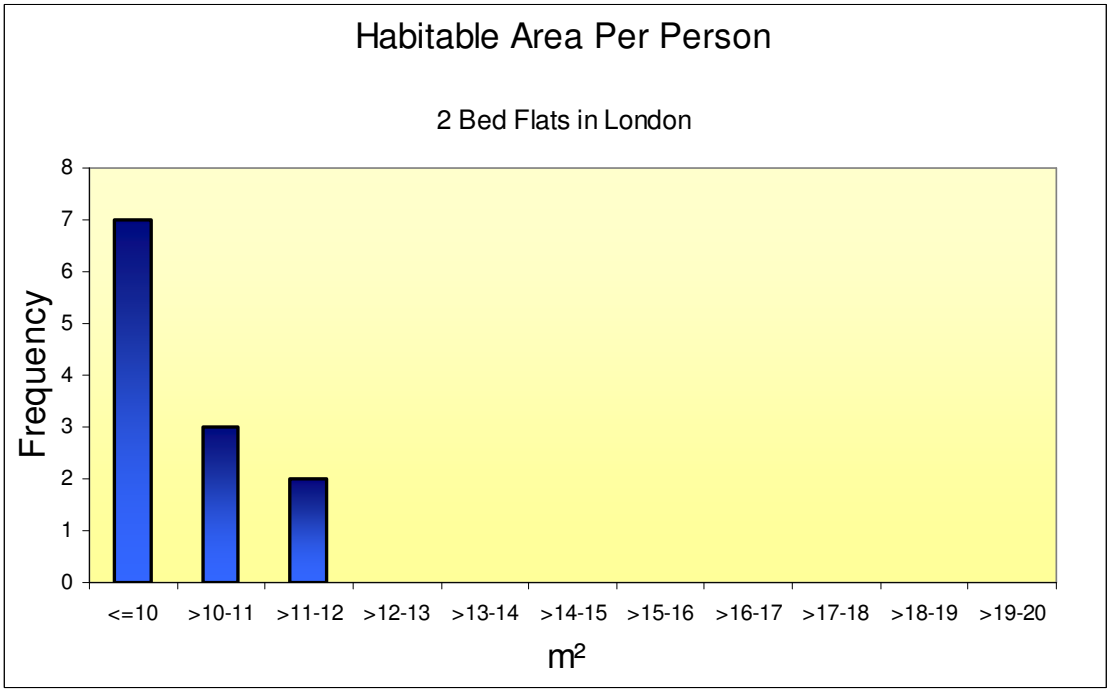


Figure 26

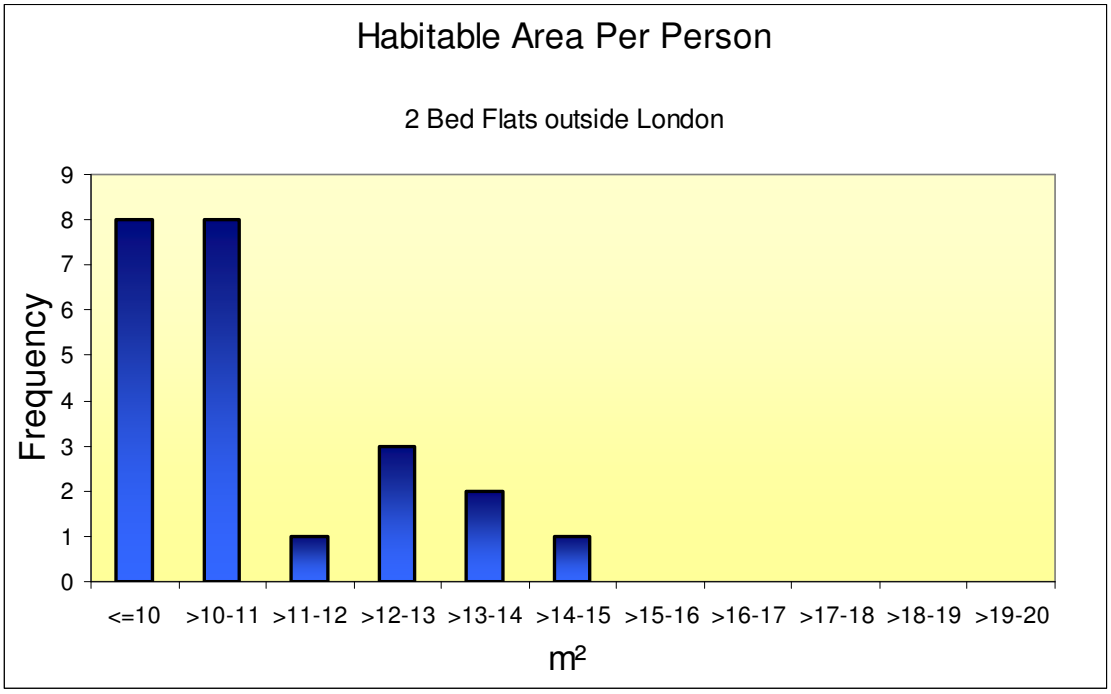


Figure 27

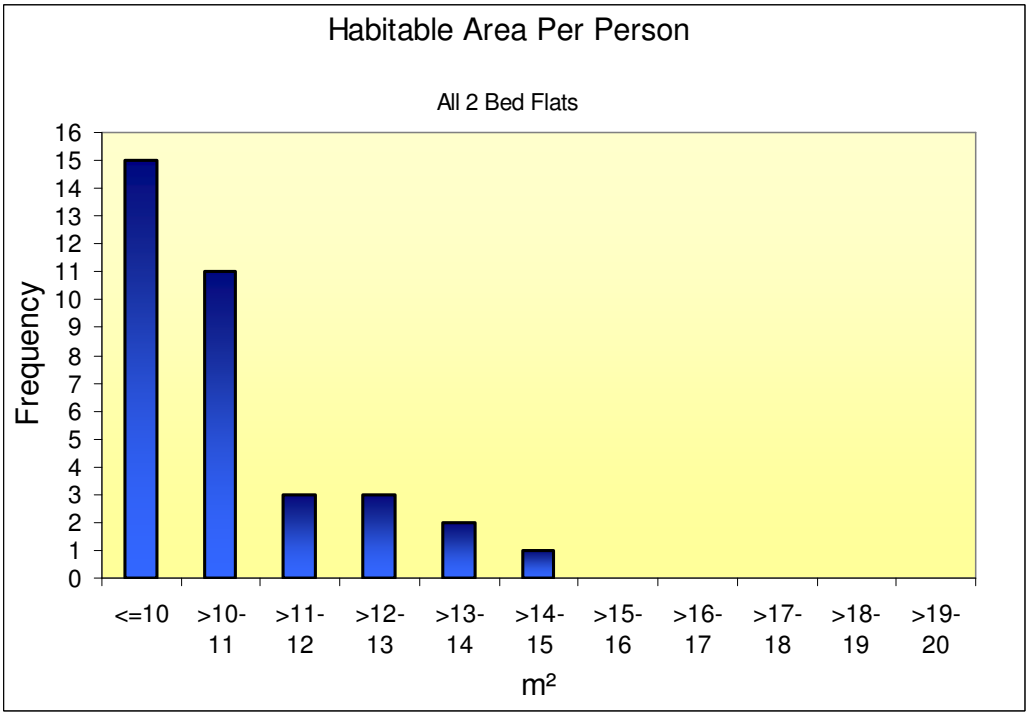


Figure 28

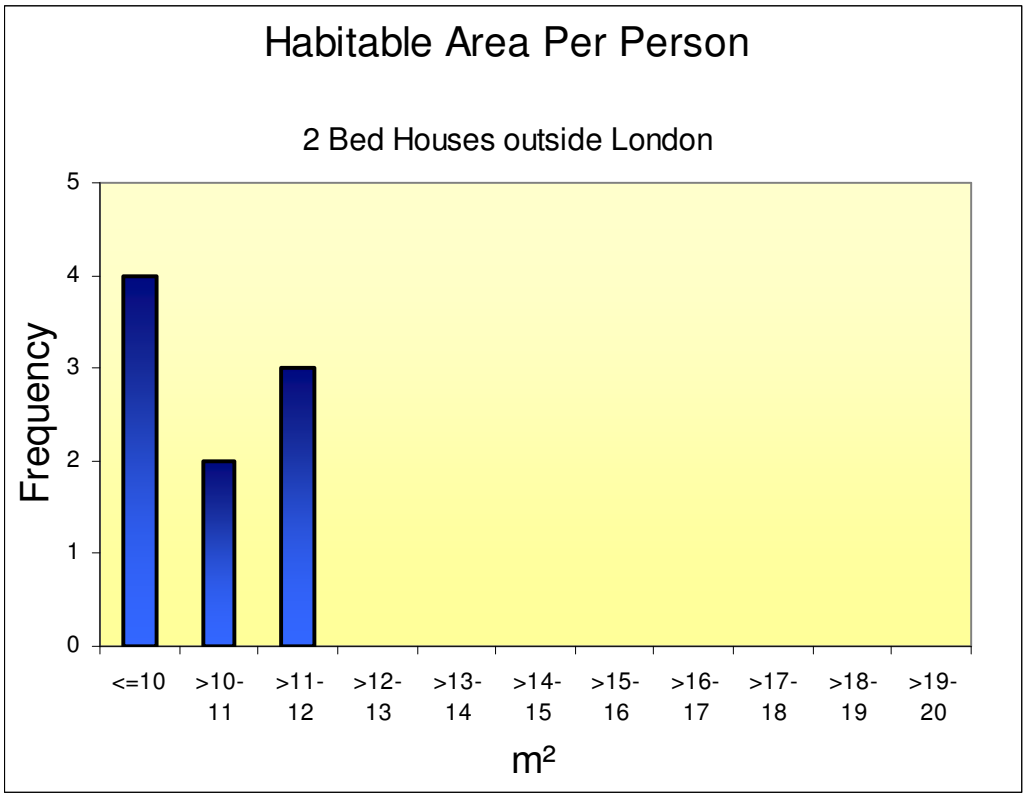


Figure 29

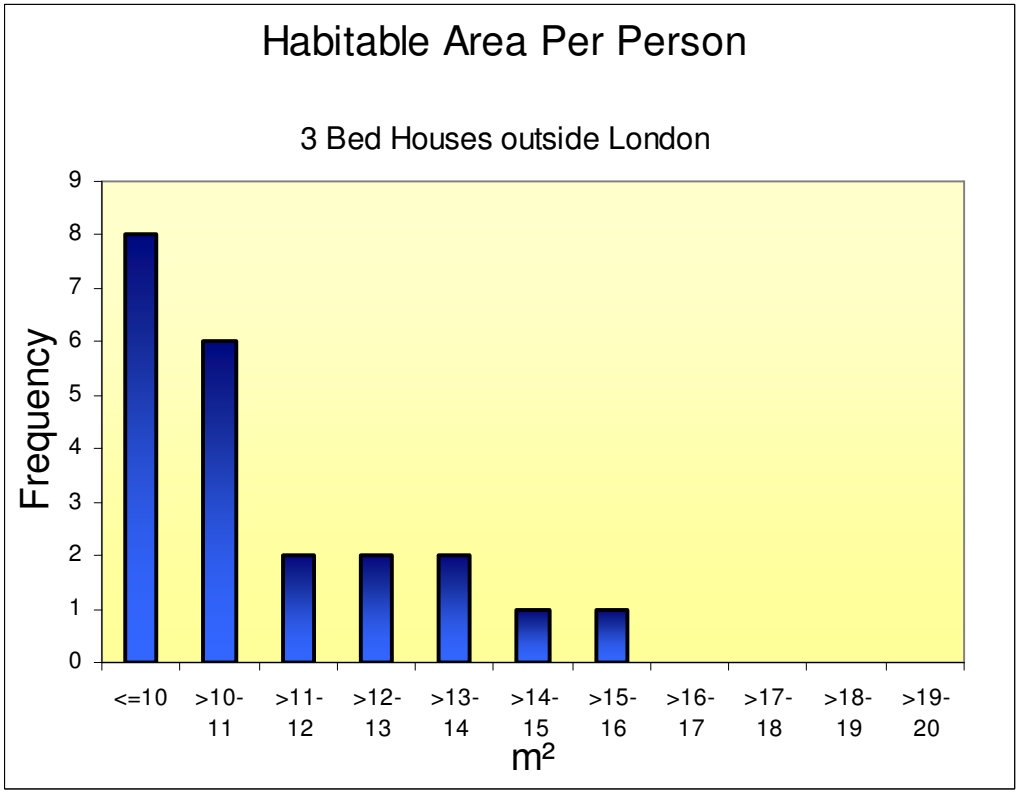
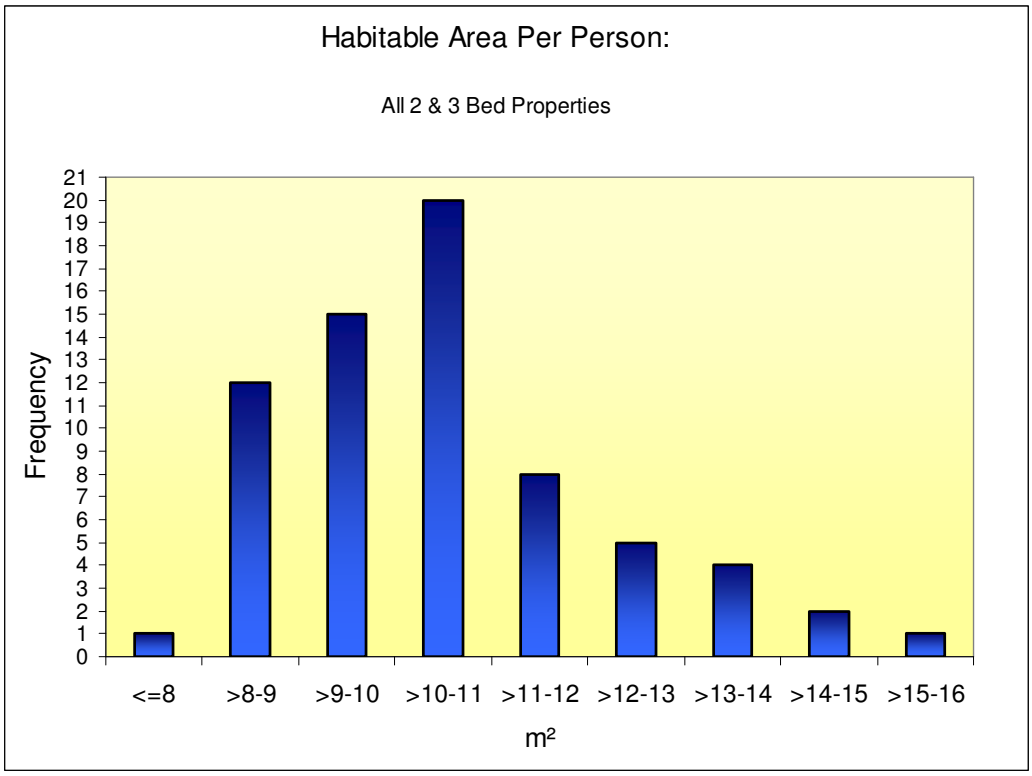


Figure 30



Observations

The average Habitable Area per person is remarkably consistent at 15m² per person in the 1-bed flats and 10m² per person in all other dwelling types, although there is a significant range between dwellings – see Figure 23. For the 2- & 3-bed dwellings the mean Habitable Area was 10.5m², the median was 10.3m² and the mode (when the areas were rounded to the nearest whole m²) was 10m². However, as Figure 30 shows, the greatest grouping across the 2-bed and 3-bed dwellings was in the 8.1m² - 10.9m² range. The 25th and 75th quartiles were 9.3m² and 11.3m². This suggests that one in four 2-bed and 3-bed dwellings may have an average habitable area per person of less than 9.3m².

There is no recent data on how much habitable area households need to undertake the normal functions and activities of using the dwelling as a home. The last significant piece of research to address those was undertaken by the Parker Morris Committee at the beginning of the 1960s.

However, dwellings need to have the space to accommodate a reasonable range of furniture, and for that furniture to be laid out in a manner which allows it to be reasonably conveniently used. The amount of space required to do this will depend, amongst other things, on the shape of the space provided. Examples are shown at Figures 31, 32 and 33.

Figure 31

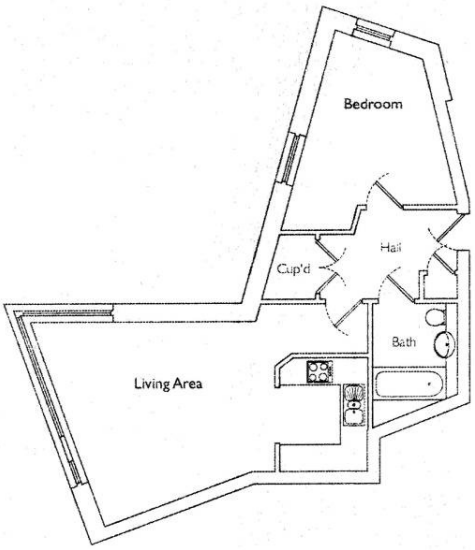
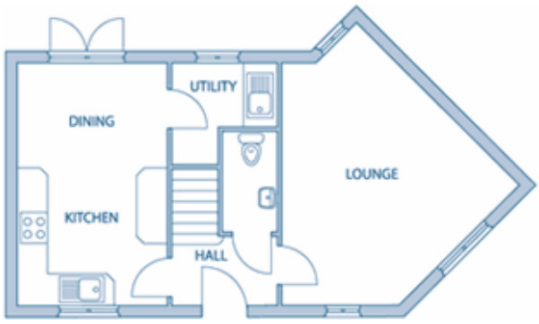


Figure 32

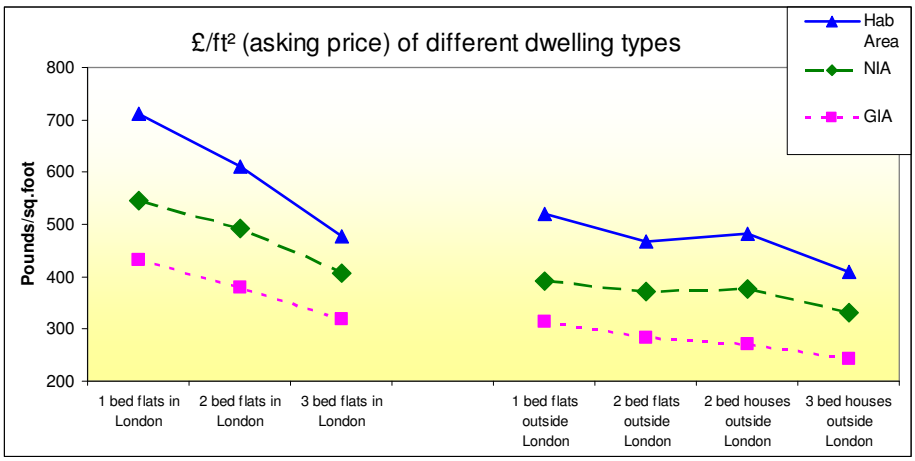
Figure 33



Price / Area Relationship

The average (mean) asking price for the different property types was calculated and divided by the average (mean) GIA, NIA and HA for that property type (expressed in square feet, not m^2) in order to calculate the £ per ft^2 of the different property types. These are shown at Figure 34

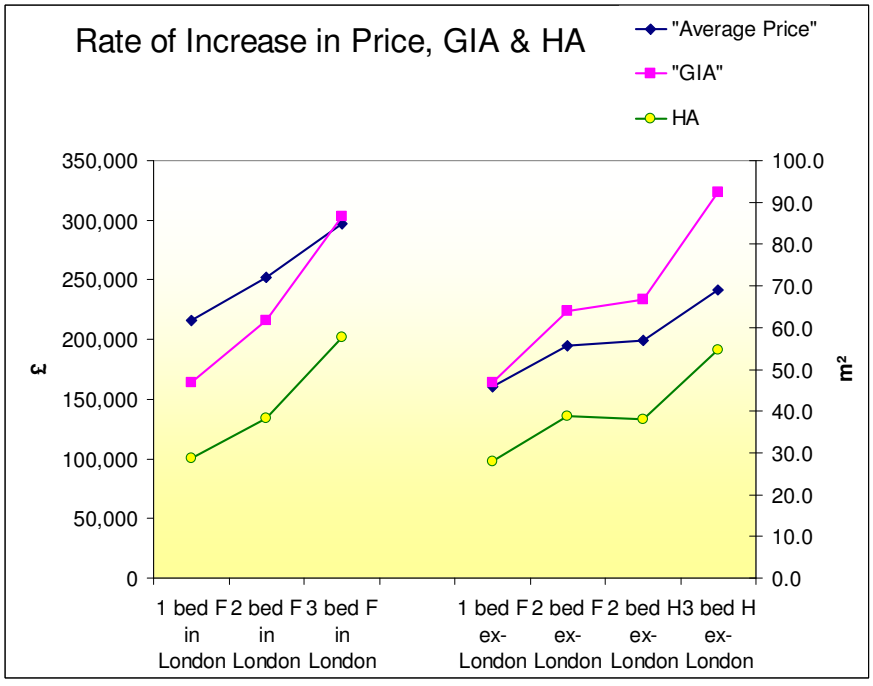
Figure 34



The property types have been grouped according to whether they are in London or not.

Figure 35 plots the rate of price increase alongside the rate of size increase, in terms of both GIA and Habitable Area.

Figure 35



Figures 36 and 37 take the same data but show the price per square foot from all dwellings rather than using averages (means). To help with interpreting this scatter graph, linear trend lines have been inserted for each of the different dwelling types/locations.

Figure 36

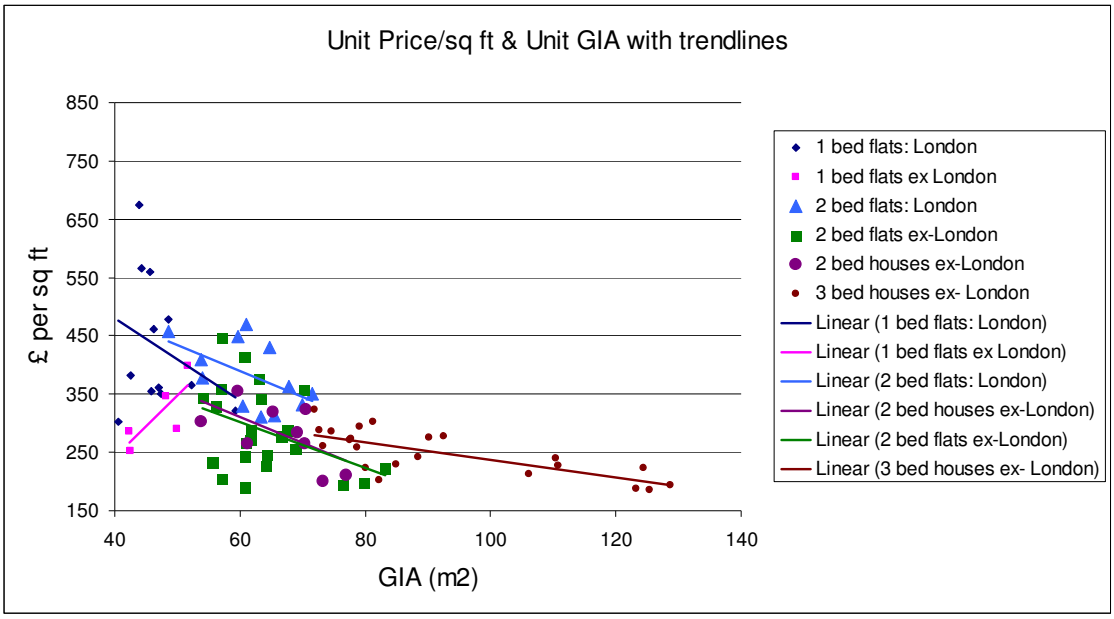
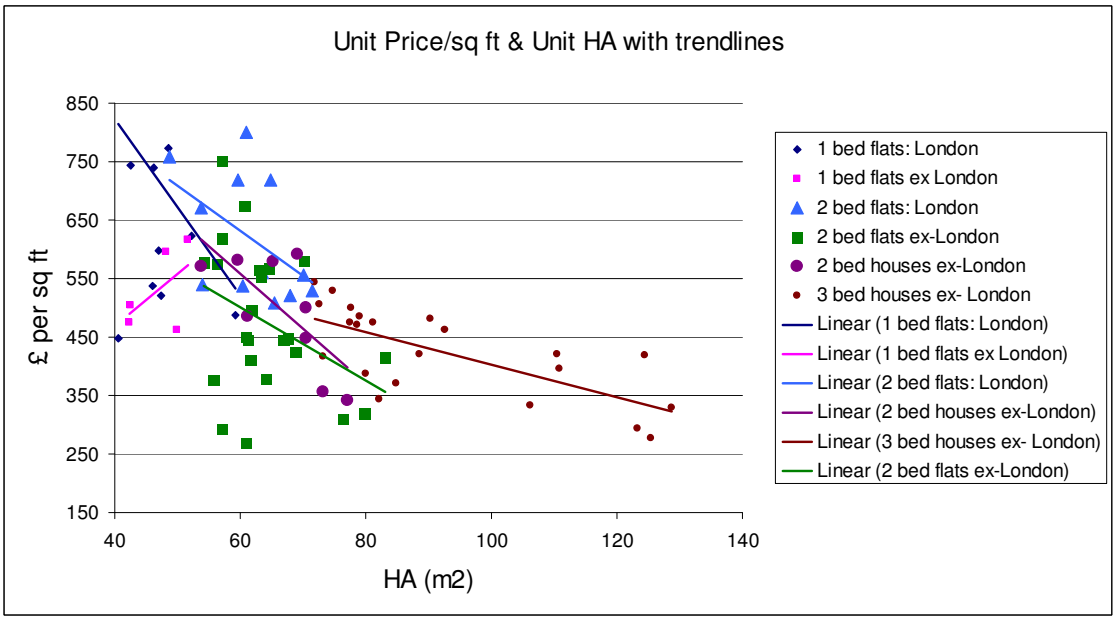


Figure 37



Observations

From Figures 34 and 35 it appears that the rate of increase of the Average Price is similar to that of the Habitable Area, whilst the gradient for the Gross Internal Area is steeper. This might indicate that Habitable Area might provide a higher marginal rate of return than Gross Internal Area i.e. An increase in the Habitable Area may result in a proportionate increase in the Average Price. Increasing Gross Internal Area may result in a price increase that is less than pro-rata. If so, this would suggest that marginal increases in Habitable Area of higher value than marginal increases in Gross Internal Area.

The trendlines associated with Figures 36 and 37 suggest a different marginal price effect of differences in Gross Internal Area and Habitable Area. For all dwelling types (except one) the trend line shows that the income per square foot reduces as the dwelling size increases. The only exception is the 1-bed flats outside London where larger dwellings appear to generate real additional value i.e. £ per square foot increases as dwelling size increases. However, this may be a spurious result from the small sample.

It is also noticeable that the gradients of the trendlines in Figures 36 and 37 are lower when £per square foot is plotted against Habitable Area than when plotted against Gross Internal Area. This suggests that each extra m^2 of Habitable Area is less valuable than Gross Internal Area. In other words, using the extra space to provide bathrooms and corridors etc may be more commercially valuable than using it to increase the amount of space in a bedroom living or dining area.

This may be an effect of how UK purchasers asses the sizes of homes – by the number of bedrooms, not the size of the bedrooms and other habitable areas. A home with two bedrooms and two bathrooms therefore appears more valuable than a home with two bedrooms and one bathroom, even though the dwellings may have the same Gross Internal Area – and consequently cramped bedrooms.

Figure 34 suggests that Outside London the cost pressures are less (easier gradients), but there is still a significant higher level of sales receipts per sq.ft from smaller dwellings.

These Figures all illustrate the financial pressure on housebuilders to build smaller dwellings: Figure 34 suggests that their income in £psq.ft is, on average, almost 50% higher in London if they develop 1-bed flats instead of 3-bed flats (it is 28% higher for the dwellings outside London). Figure 36 reinforces this for variation in dwelling size within any one dwelling category.

In other words, on a site that can accommodate 10,000sq.ft of residential development, it is clear from Figures 33 & 35 that there will be an incentive to develop that site as small dwellings (i.e. one bedroom flats, as small as possible).

The financial pressure to follow this route appears to be less severe outside London

There may also be a financial incentive to allocate extra space to bathrooms rather than Habitable Area. Certainly, that has been a noticeable trend over recent decades.

Set against that is the lower cost of constructing each marginal sq.ft of accommodation, particularly Habitable Areas. The construction costs per sq.ft of Habitable Areas may be considered to be typically

30% - 50% the cost per m^2 (GIA) of 1-bed flats, as the extra space provided will not include relatively expensive items such as services, drainage, kitchen and bathroom fittings. This means that the average construction cost per sq.ft of larger dwellings may be lower than for smaller dwellings. If the reduction in sales income per sq.ft is more than offset by the average reduction in construction costs per sq.ft, then larger properties would be more profitable.

This data draws from a relatively small sample that is geographically widespread. The relationship between changing marginal value for changing marginal size should be examined more closely by drawing a sample of dwellings of different sizes from a more geographically focused area where property values (per square foot) will be more consistent than has been the case in this sample. If that study could also gather information about average and marginal cost of construction then the marginal profitability of increasing the Gross Internal Area and/or the Habitable Area could be ascertained.

These results also reflect market conditions in the late summer of 2008. In the current altered market conditions and the relationship between sales price per square foot and the size of dwelling may have changed.

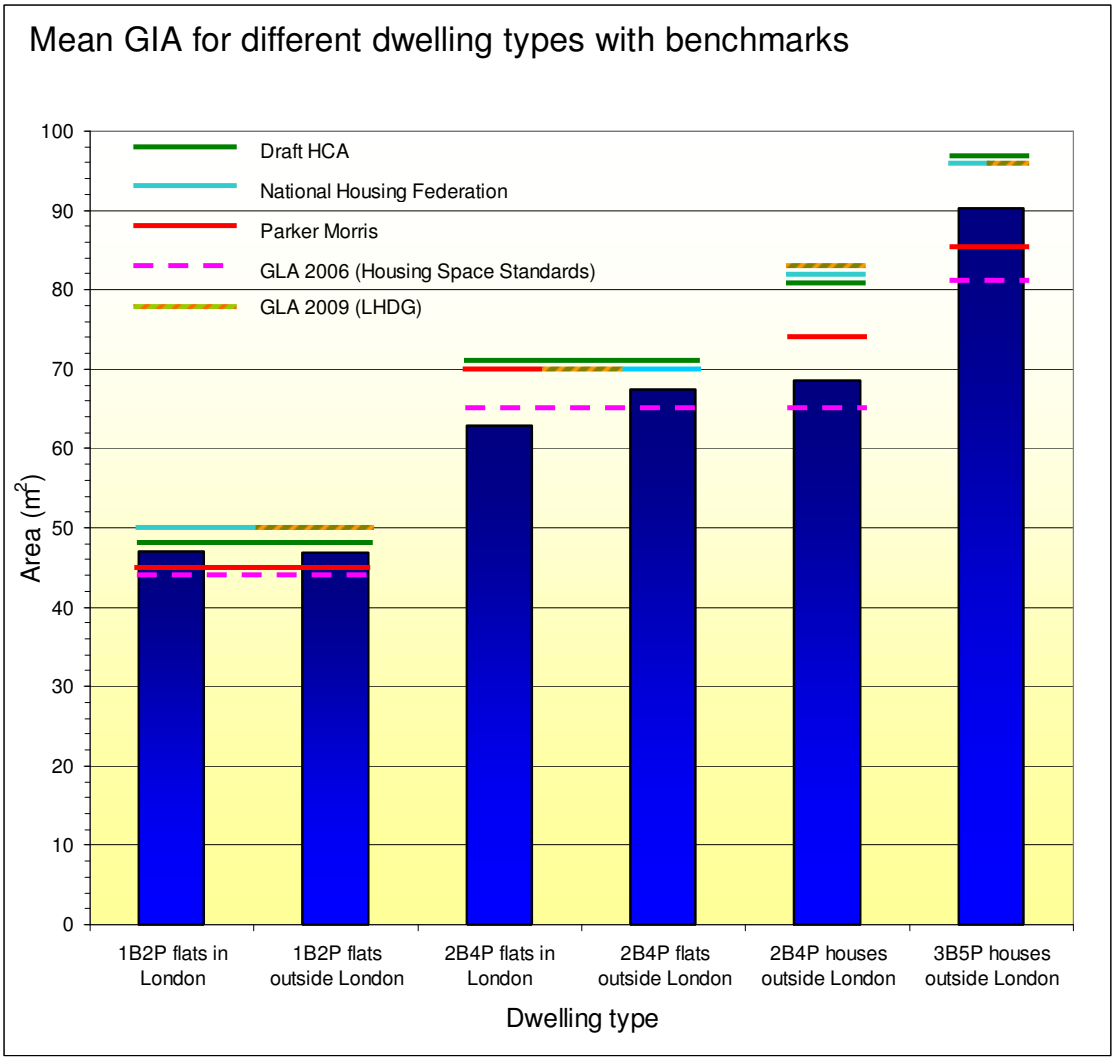
Comparisons With Benchmarks.

The main benchmarks for residential space standards are:

- Ministry of Housing *Homes for Today & Tomorrow* (1961) (aka the Parker Morris standards)
- National Housing Federation's *Guide to Standards & Quality in* Development (2008)
- Greater London Authority *Housing Space Standards* (2006)
- Greater London Authority *London Housing Design Guide* (2009)
- Homes & Communities Agency draft standards (consultation paper March 2010)

These benchmark standards are shown in Figure 38 against the average GIA for the dwelling types shown.

Figure 38



The Parker Morris standards were published in 1961. The National Housing Federation standards were developed in 1998 and updated in 2008, reflecting the ergonomic and activity-based approach of the Parker Morris report, with slightly updated furniture schedules. The GLA's London Housing Design Guide standards were similarly developed from an activity-based approach. Both these and the Homes & Communities Agency standards were designed to set reasonable minima. The GLA's 2006 standards ("*Housing Space Standards*") were described by the reports authors as "safety-net" standards.

It is also worth noting that the GLA safety-net standards are set per person, regardless of property type. They were produced for an environment where 80% of the housing output was flats. They are therefore not designed to provide even safety-net standards for houses.

Figure 39 tabulates the mean GIAs of the different property types in the sample against the proposed Homes & Communities Agency space standards to highlight the variance between what was being sold on

the private market and the proposed new standards for the main property types that were being developed. The unusual property types have been part-shaded.

As well as showing the variance between the average dwelling size of each property type from the good-practice benchmark, it shows the difference between that benchmark and the smallest dwelling in each property type, both in terms of floor area (m^2) and as a percentage of the benchmark figure.

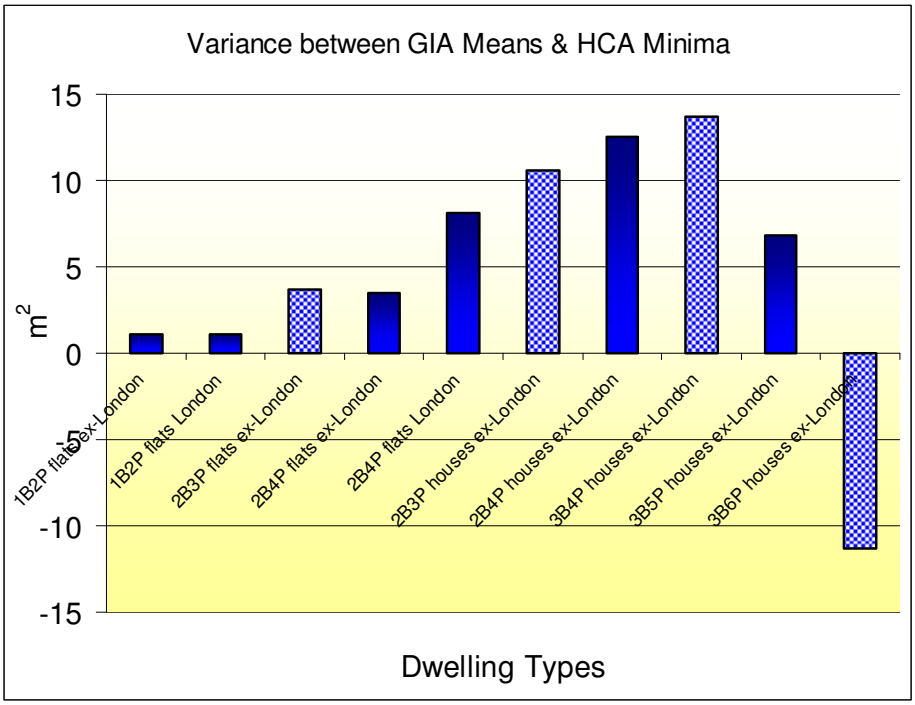
Figure 39

	A	B	C	D		E	F
Dwelling Type	**Mean GIA m^2**	**Smallest GIA m^2**	**HCA Minima m^2**	**Var from Mean (C-A) m^2**	**Var from mean (D/C) %**	**Var Smallest (C-B) m^2**	**Var Smallest (E/C) %**
1B2P flats ex-London	47	42	48	1	2%	6	12%
1B2P flats London	47	41	48	1	2%	7	16%
2B3P flats ex-London	63	54	61	-2	-3%	7	11%
2B4P flats ex-London	65	56	71	6	9%	15	22%
2B4P flats London	62	49	71	9	12%	22	31%
2B3P houses ex-London	60	54	71	11	15%	17	24%
2B4P houses ex-London	68	60	81	13	15%	21	26%
3B4P houses ex-London	73	72	87	14	16%	15	17%
3B5P houses ex-London	90	73	97	7	7%	24	25%
3B6P houses ex-London	118	106	107	-11	-11%	1	1%

As shown in the Figure 39, the variance between the average size of each property type in the sample and the benchmark ranged from -11m^2 to 14m^2 per. The most noticeable variance, however, was in the 2-bedroom flats in and outside of London and particularly the 2-bedroomed houses outside London. These were 9%, 12% and 15% below the benchmark, on average. The smallest example of each of these different dwelling types were respectively 22%, 31% and 26% below the benchmark.

The variance of the average GIAs against the HCA benchmarks is graphed in Figure 40

Figure 40



It should be noted that the graphs and tables show the position in relation to the average size of dwellings that were developed, not the minimum sizes. The following Figures, therefore, show the histograms of the property types with the draft HCA standards shown.

Figure 41

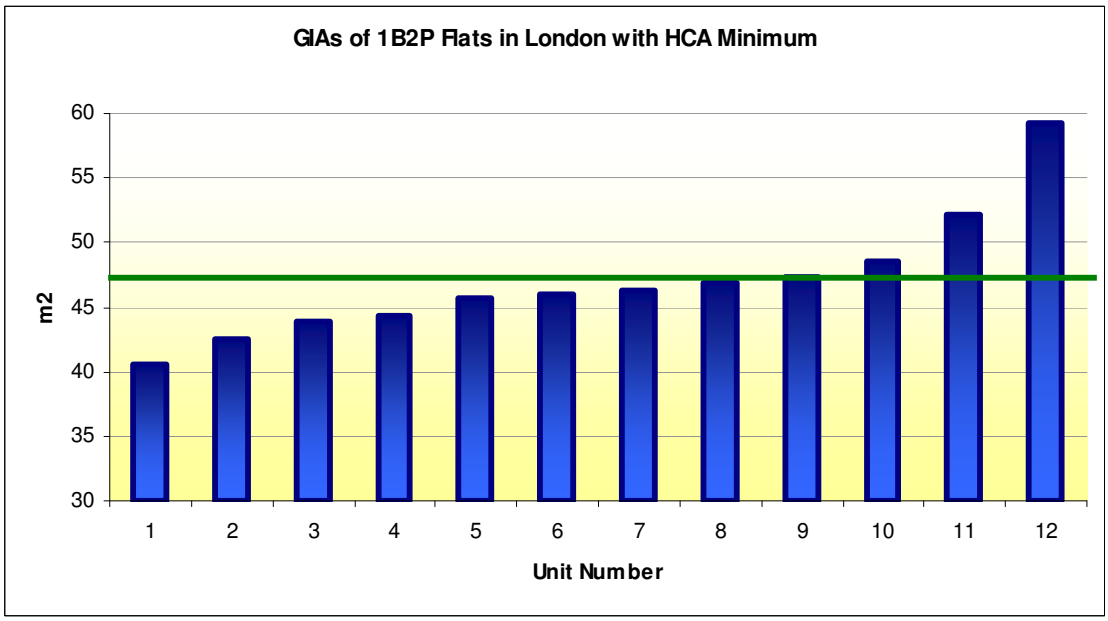


Figure 42

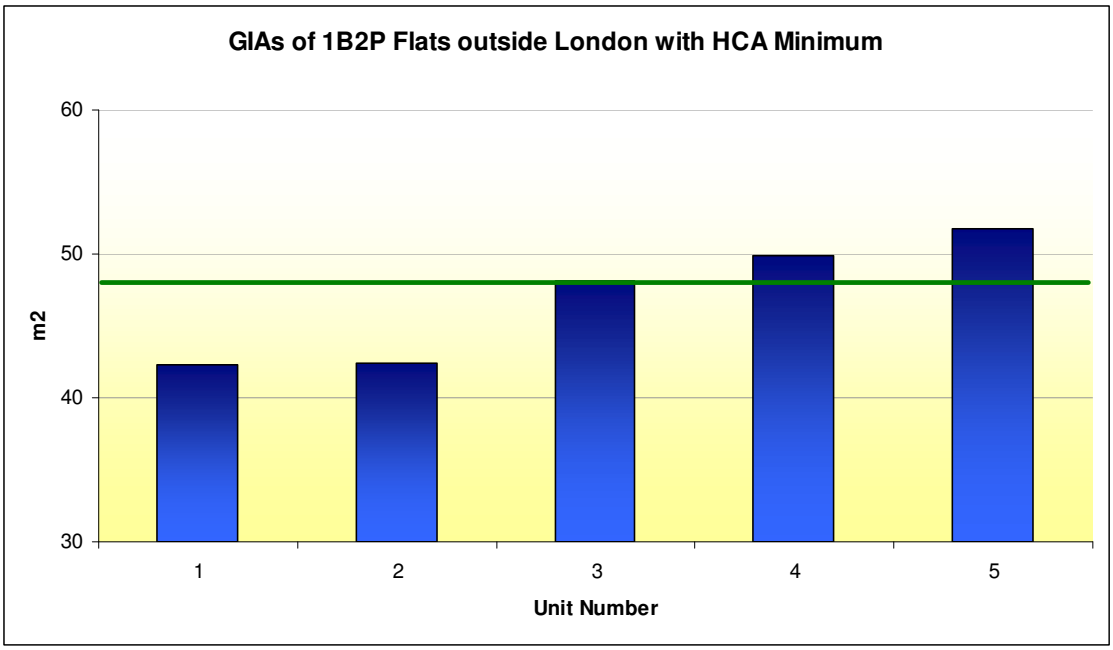


Figure 43

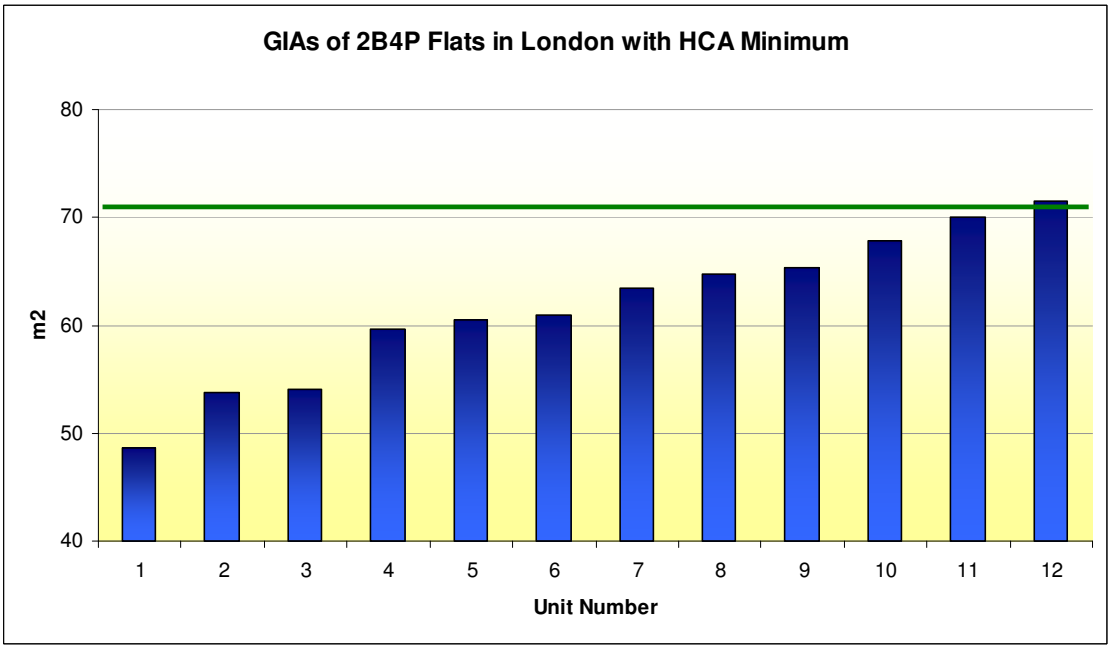


Figure 44

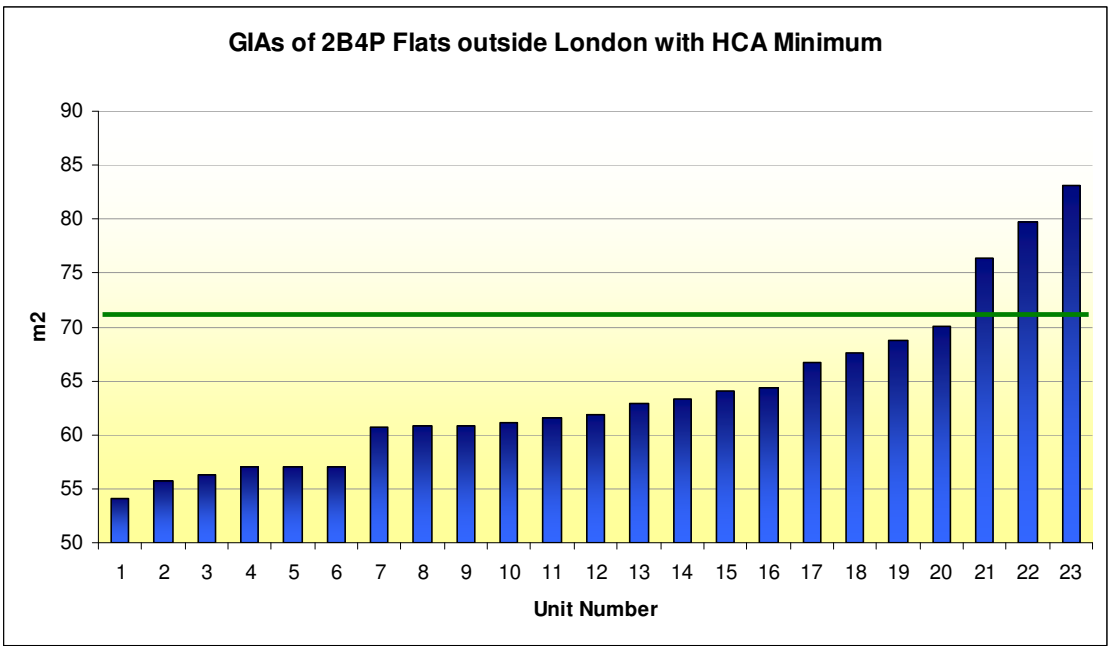


Figure 45

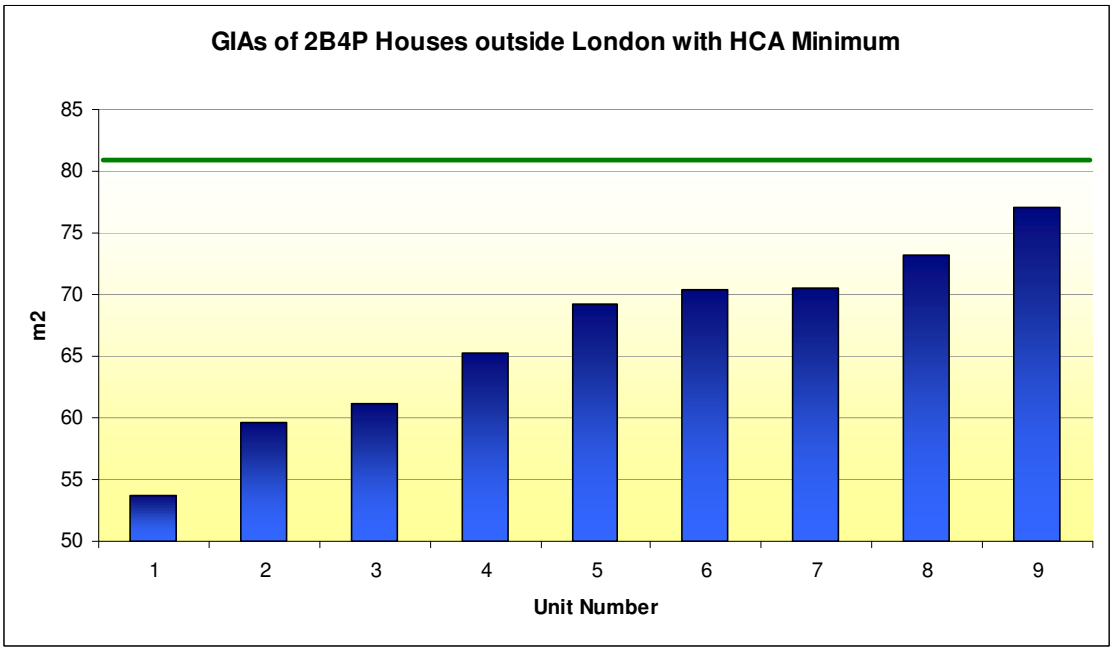


Figure 46

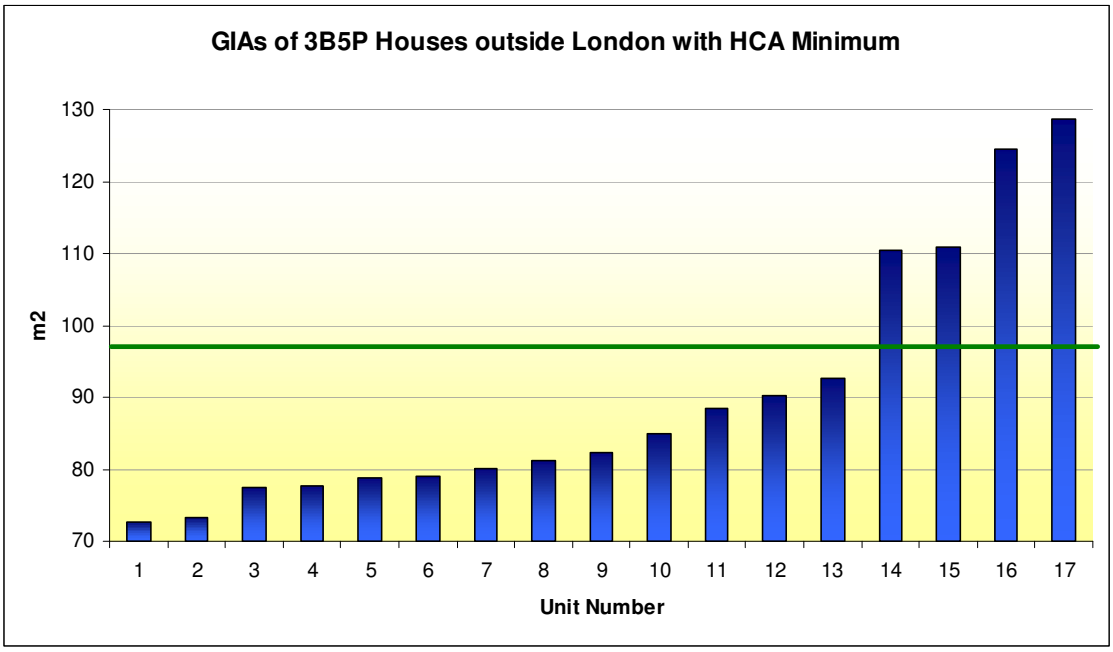


Figure 47 summarises the extent to which the dwellings of each different property type exceeded or fell short of the draft HCA Standards.

Figure 47

Dwelling Type	*% exceeding HCA Standards*	*% falling short of HCA Standards*
1B2P flats in London	25%	75%
1B2P flats outside London	60%	40%
2B4P flats in London	9%	91%
2B4P flats outside London	20%	80%
2B4P houses outside London	0%	100%
3B5P houses outside London	24%	76%

Observations

The 1B2P flats and the 3B5P houses exceeded the GLA's "safety-net" and the Parker Morris standards, but fell short of the more recent standards from the National Housing Federation, GLA and HCA. But the greatest shortfall, however, was in the two-bed dwellings. All of the non-"safety net" standards for the two-bedroom flats are set as a very similar level (70 m² or 71 m²). The GLA's "safety net" standards for these type of properties was lower, but the two-bed flats in London were (on average) smaller than even the safety-net benchmark. This would probably have been true also of the two-bed houses outside London had the GLA's safety-net standards reflected storey height not just designed occupancy level. The two-bed houses were on average significantly smaller than Parker Morris, and over 10m² smaller than the remaining standards which are all clustered at just above 80m².

The three-bed houses outside London were larger than GLA's safety-net and Parker Morris, but smaller than the remaining standards.

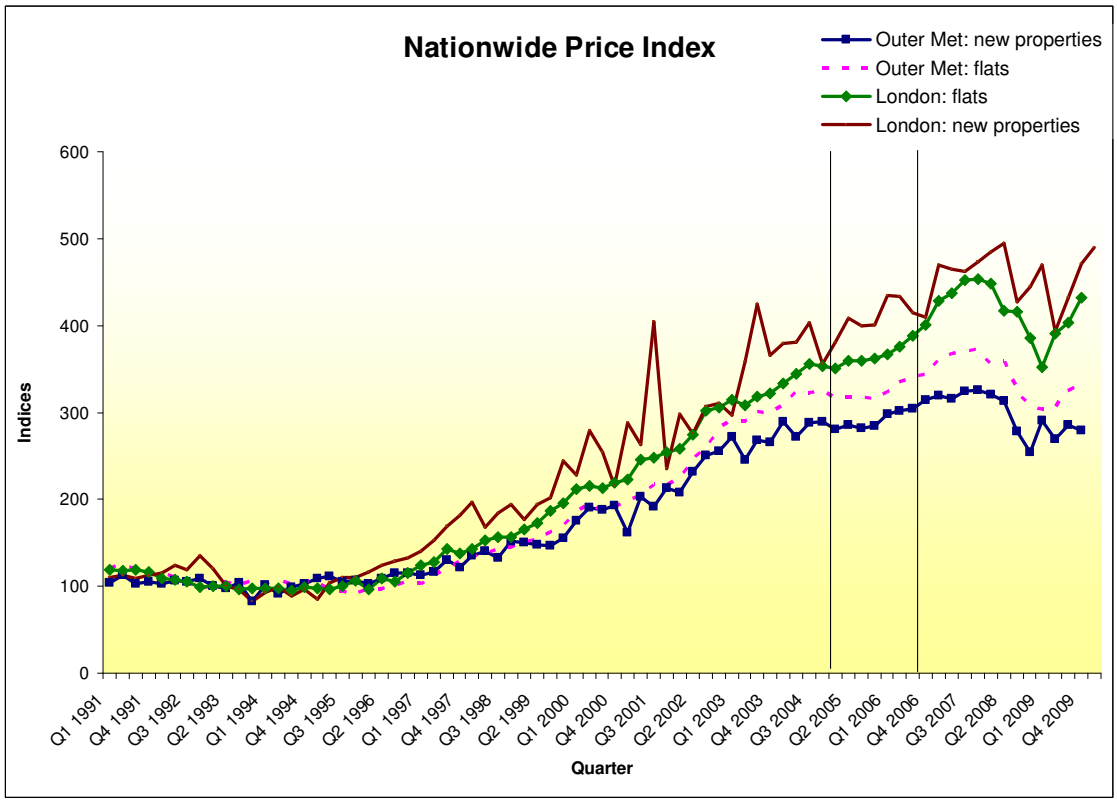
This pattern is confirmed when looking at the percentage of dwellings within any one property type that exceeded or fell short of the draft HCA standards (Figure 47). Only a minority of the 1B2P flats outside London fell below the proposed minimum HCA standards. Whilst this rose to 75% for the same flats in London, this means that 25% of the London 1B2P flats exceeded the draft HCA standards. However, the two-bedroom dwellings perform much worse against this benchmark, particularly the 2B4P flats in London (91% falling short), and the 2B4P houses outside London (100% fall short).

Conclusions

This research looked at the amount of space provided in dwellings of different types in London and southeast that were being sold in the late summer of 2008. It does not look at the prevalence of the different dwelling types in the schemes that were being marketed. For example, only one bedsit/studio dwelling was included in the sample, but it constituted 24% of the dwellings on the scheme from which it came.

Schemes that were being marketed in the late summer of 2008 would probably have been designed in 2005/2006, when the curve on the Nationwide property price index was approaching its steepest – see Figure 48.

Figure 48



On average, 20% - 30% of the Gross Internal Area is taken up by corridors, bathrooms (and WCs, shower rooms etc) and internal non-structural partitions. Most of this space will be bathrooms and toilets.

This is a high proportion, and represents the increased provision of bathing areas (see Figure 49 as an example). This may have been driven by the growth of the Buy to Let market aimed at renting dwellings to individuals who are willing to house-share, rather than letting to single households. This suggests that GIA has become a poor indicator of habitable space, which is (mostly) what prospective purchasers will be buying. Whilst Habitable Area is, on average, 60% of GIA, that figure can vary considerably, depending upon the space taken up by bathrooms etc.

Figure 49 - three bathrooms for three bedrooms

Highlighting Habitable Area as one of the key indicators – or *the* key indicator - of the size of dwellings is likely to be of considerable assistance to people purchasing or renting housing.

Room shape is, of course, a major determinant of the usefulness of the Habitable Area. Oddly-shaped rooms will render some of the Habitable Area unusable for anything other than (perhaps) storage.

Overall, most dwelling types fall short, on average, of both good-practice and safety-net standards. However, there is a wide range of dwelling sizes within any one category of an X-bed dwelling. Even where average GIAs exceed safety-net standards, there are many cases of dwellings which fall below even that standard.

There appear to be financial incentives on housebuilders to develop smaller rather than larger dwellings in London (based on Q2 2008 London process), but outside London the position is less clear, depending upon the effect on sales prices of ensuite bathrooms as opposed to simply more space. There may also be financial incentives which mitigate against extra space being used as Habitable Area; we recommend that further research investigates the marginal profitability of using space for different purposes in a more geographically-focused study.

There is a high degree of consistency in the average Habitable Area per person across dwelling types: 15m² in 1-bed dwellings and 10m² in all other types, although there is a significant range around those average figures: 8m² - 11m² per person in the 2 and 3-bed properties.

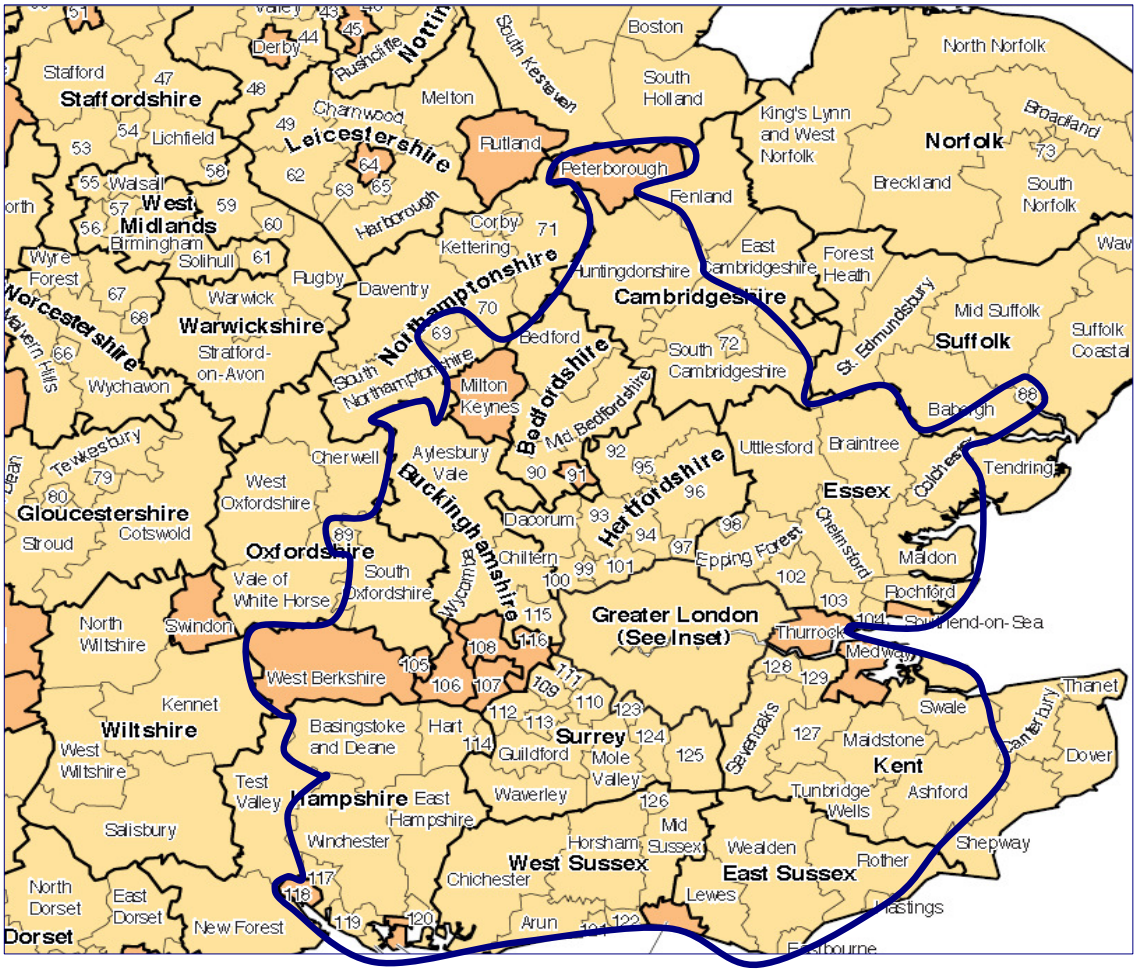
If the bedroom part of the personal Habitable Area accounts for (say) 4-5m², this leaves approximately another 4-6m² of personal Habitable Area in the home for the furniture and space needed for living and eating in. This is a circle of diameter 1600mm or approximately the size of a wheelchair turning circle.

If dwellings provide inadequate space for people to be able to be reasonably comfortable these dwellings may not function effectively as homes, making them less useful and popular over the long term. This has implications for their longevity and consequently for future costs of early redevelopment, which will be payable in both monetary and environmental currencies, such as CO_2.

Appendix 1 – Targeted Geographical Area of Postal Survey by LAs

County	Local Authority
Bedfordshire	Bedford
Bedfordshire	Luton
Bedfordshire	Mid Bedfordshire
Bedfordshire	South Bedfordshire
Berks	Bracknell Forest
Berks	Reading
Berks	Slough
Berks	West Berkshire
Berks	Windsor and Maidenhead
Berks	Wokingham
Bucks	Aylesbury Vale
Bucks	Chiltern
Bucks	Milton Keynes
Bucks	South Bucks
Bucks	Wycombe
Cambs	Cambridge
Cambs	Huntingdonshire
Cambs	Peterborough
Cambs	South Cambridgeshire
East Sussex	Brighton and Hove
East Sussex	Eastbourne
East Sussex	Hastings
East Sussex	Lewes
East Sussex	Rother
East Sussex	Wealden
Essex	Basildon
Essex	Braintree
Essex	Brentwood
Essex	Castle Point
Essex	Chelmsford
Essex	Colchester
Essex	Epping Forest
Essex	Harlow
Essex	Maldon
Essex	Rochford
Essex	Uttlesford
Essex	Southend-on-Sea
Essex	Thurrock
Hampshire	Basingstoke and Deane
Hampshire	East Hampshire
Hampshire	Eastleigh
Hampshire	Fareham
Hampshire	Gosport
Hampshire	Hart
Hampshire	Havant
Hampshire	Portsmouth
Hampshire	Rushmoor
Hampshire	Southampton
Hampshire	Winchester
Inner London	Camden
Inner London	City of London
Inner London	Hackney
Inner London	Hammersmith and Fulham
Inner London	Haringey
Inner London	Islington
Inner London	Kensington and Chelsea
Inner London	Lambeth
Inner London	Lewisham
Inner London	Newham
Inner London	Southwark
Inner London	Tower Hamlets
Inner London	Wandsworth
Inner London	Westminster
Kent	Ashford
Kent	Dartford
Kent	Gravesham
Kent	Maidstone
Kent	Medway
Kent	Sevenoaks
Kent	Swale
Kent	Tonbridge and Malling
Kent	Tunbridge Wells
Northants	Northampton
Northants	Wellingborough
Outer London	Barking and Dagenham
Outer London	Barnet
Outer London	Bexley
Outer London	Brent
Outer London	Bromley
Outer London	Croydon
Outer London	Ealing
Outer London	Enfield
Outer London	Greenwich
Outer London	Harrow
Outer London	Havering
Outer London	Hillingdon
Outer London	Hounslow
Outer London	Kingston upon Thames
Outer London	Merton
Outer London	Redbridge
Outer London	Richmond upon Thames
Outer London	Sutton
Outer London	Waltham Forest
Oxfordshire	Oxford
Oxfordshire	South Oxfordshire
Suffolk	Ipswich
Surrey	Elmbridge
Surrey	Epsom and Ewell
Surrey	Guildford
Surrey	Mole Valley
Surrey	Reigate and Banstead
Surrey	Runnymede
Surrey	Spelthorne
Surrey	Surrey Heath
Surrey	Tandridge
Surrey	Waverley
Surrey	Woking
West Sussex	Adur
West Sussex	Arun
West Sussex	Chichester
West Sussex	Crawley
West Sussex	Horsham
West Sussex	Mid Sussex
West Sussex	Worthing

Appendix 2 - Map of Targeted Area



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