

4: The value of land and housing in London

4.1 Key points

- There is intense competition for land in London which results in some of the highest land and property prices in the UK and across other global cities. Land values vary significantly in the capital according to location, transport accessibility, planning status and many other factors.
- There are large differentials in land values between, and within, different land use classes. While it is difficult to obtain consistent data on land values, residential values in London are estimated to be on average 3.2 times higher than industrial land values. Within the residential sector, land values can range between £7.3 million per hectare in East London to £93.3 million per hectare in Westminster. In the industrial market, there is a narrower range of between £2.5 million per hectare in East London to £6.2 million per hectare in key industrial areas like Park Royal and around Heathrow, and up to £7.4 million in central London areas.
- There have been strong rises in London house prices which are far higher than the rest of the country. The gap in average house prices between London and the rest of the country has grown wider every year since 1995 with the exception of 2009. Average house prices in April 2016 ranged from £1.31 million in Kensington and Chelsea to £272,000 in Barking and Dagenham compared to the England average of £220,000. The relative costs of private renting have also risen sharply in London compared to other English regions.
- Demand for housing in London is driven by a number of different factors, including London's attractiveness as a place to work and live, rising incomes, access to credit, lower borrowing costs and the appeal of property as an investment class and store of value. There is limited evidence available on the exact impact of foreign ownership or the buy-to-let market on house prices in London.

- The supply of housing in London has not been keeping up with growth in the number of households. According to the Strategic Housing Market Assessment, an estimated 49,000 new homes are required each year in London to 2035 due to population growth and the existing backlog of need. Only around 30,000 homes were however added to London's total housing supply in 2014. A number of different hypotheses have been put forward to explain the lack of response in supply, which are explored in this chapter.
- There is a risk that high demand for housing may crowd out commercial uses of land. Evidence from the London Development Database suggests that Permitted Development Rights introduced in May 2013, which allow conversion of offices to housing without the normal planning procedures, are having a considerable impact on the stock of office space in some boroughs. In the period 2008 to 2013 the percentage of residential units completed on land classed previously as office use was around 12 per cent, but in 2014/15 this increased to 24 per cent.
- Population density - the number of people living (or working) in a given area – is an important factor in considering how to accommodate London's future growth. In the centre of London, there is some evidence to suggest that population density is relatively low compared to other major global cities around the world, despite London being smaller in terms of its geographical size. There is evidence of both overcrowding and under-occupation of the housing stock in different parts of London.

4.2 Housing and land use in London

Land and property are hugely important socially and economically to London. Having sufficient housing available to accommodate the population comfortably matters for living standards and labour supply, while decisions over whether to allocate land for business or residential use has implications for the structure of the economy. Within an urban environment, the location of commercial and residential buildings is driven by a range of factors including: topographical (like the river), the location of transport infrastructure, and also the city's inherited traditions of urban culture and development.

London's population has grown every year since 1988, even during the recessions of 1990-1991 and 2008-2009. The population increased from around 6.7 million in 1988 to 8.7 million in 2015¹, the highest it has ever been and above the previous peak in 1939 (see Chapter 8). Over this same period, the number of jobs (including employees and self-employed) increased from 4.28 million in 1988 to 5.54 million in 2015² (see Chapters 6 and 9). As a consequence of London's growth, competition for land for a variety of residential, commercial, social and community uses has intensified.

In economic theory, firms or individuals deriving the greatest economic value from a piece of land (in terms of the activities they undertake on it) will be the most willing and able to pay for it and can therefore outbid their rivals, thus determining how the land is used³. In practice, since the 1947 Town and Country Planning Act, the right to develop land or to change its use in the UK, has effectively been nationalised and is determined through the planning system⁴.

As in most cities, land prices in London tend to be highest in the centre and generally decline with distance from the core, reflecting the agglomeration benefits of central locations compared to peripheral ones. Typically, businesses generating the highest value output are able to outbid rivals including homeowners or landlords hence the clustering of firms in the centre. However, such is the value of residential property in London that commercial space in some parts of London faces growing competition from residential uses. Despite this competition, central London remains a prime location for businesses. It lies at the centre of the most populous region in the UK and is within easy reach for millions of people travelling by public transport.

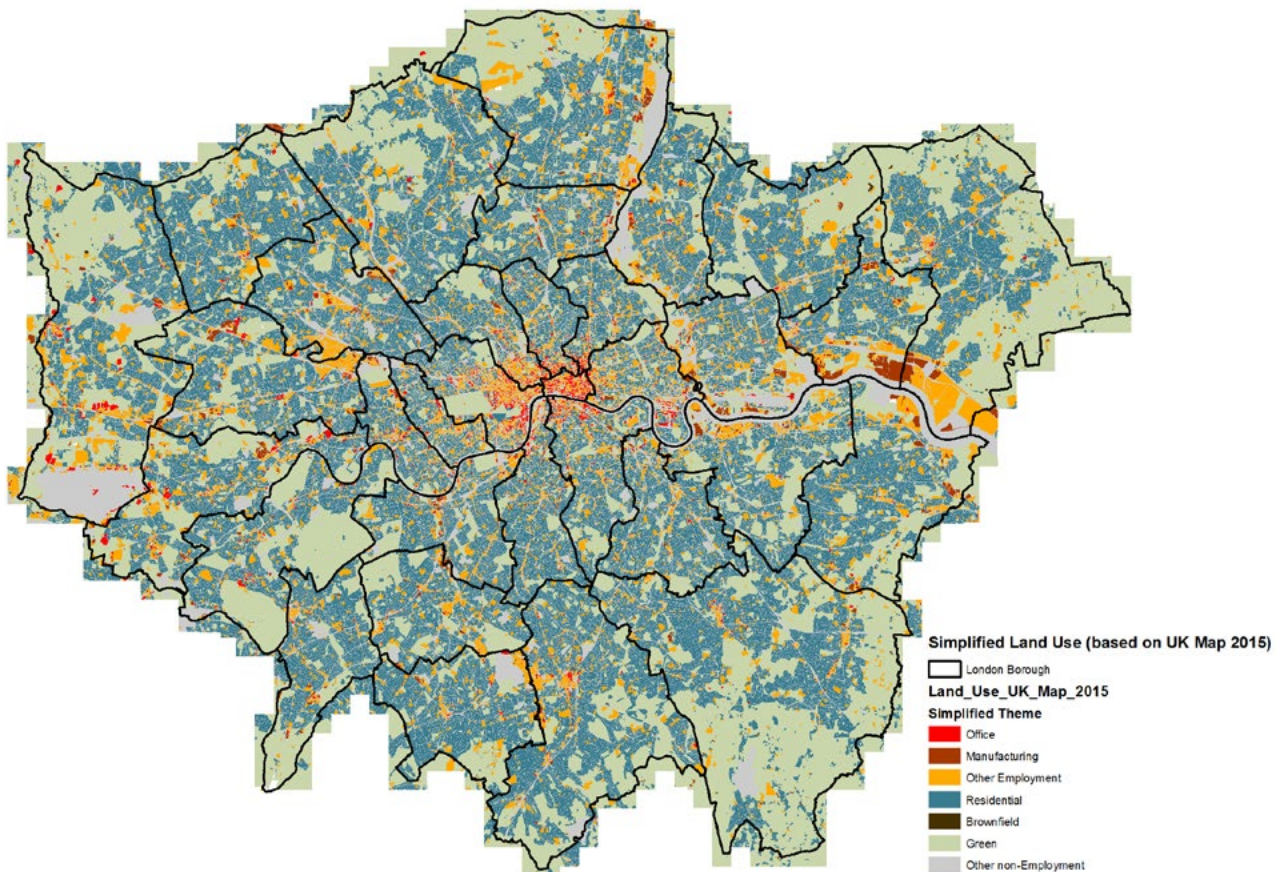
While businesses in London benefit from agglomeration economies, there exists a trade-off between these forces and the associated urban costs, such as congestion and more expensive housing. Urban costs can take a variety of forms. Some of these costs, like higher land costs, are monetary; others, like the disutility from longer commutes or the loss of green space, are less tangible and harder to measure. Mobility within and between cities however implies that urban (dis)-amenities and commuting costs will, at least to some extent, be reflected in land prices (as people 'vote with their feet'⁵). These urban costs are discussed further in Chapter 6, and the environmental costs are considered in Chapter 7.

The rest of this chapter is structured as follows: it begins by mapping land use across London by different uses before providing indicators of the value of land and the activities that take place upon it. The chapter goes on to consider how these price signals are, in part, influencing land use change in London. The housing market is then considered in further detail including the main drivers of demand and supply and their impact on prices. Finally the chapter considers evidence on population density in London with comparisons to other major global cities.

4.3 Mapping the use of land in London

London covers an area of approximately 160,000 hectares⁶ across its 32 boroughs and the City of London. Map 4.1 shows how this land is used based on a set of simplifying categories⁷. The map shows quite clearly the focus of employment land in the Central Activities Zone (CAZ) with other concentrations to the east through the Thames Gateway and to the west along the M4 Corridor and around Heathrow. Perhaps surprising is the quantity of land categorised as green space not just in outer London boroughs which include Green Belt but dispersed through the capital in its many parks and recreational spaces.

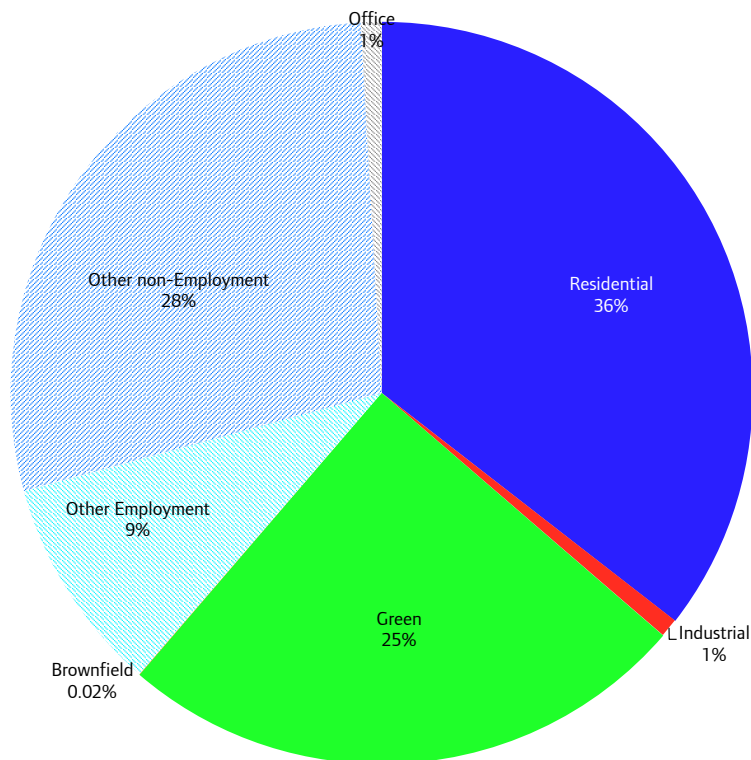
Map 4.1: Land use in London, 2015



Source: The GeoInformation Group, UK Map 2015

Figure 4.1 shows that of the 160,000 hectares of land in London, 57,000 hectares (36 per cent) is in residential use while 40,000 hectares (25 per cent) is 'green' including sports fields, parks, agricultural land, etc. but excluding residential gardens. Employment uses occupy 11 per cent of land in London with offices and general industrial sites (excluding warehousing) both accounting for just 1 per cent of the land area respectively, while other employment uses including retail, warehousing, and public services occupy 9 per cent of total land. Other non-employment uses including land for transport (roads, rail tracks, tunnels, etc.), waste disposal, electricity and gas substations, cemeteries and other uses occupy 28 per cent of the land.

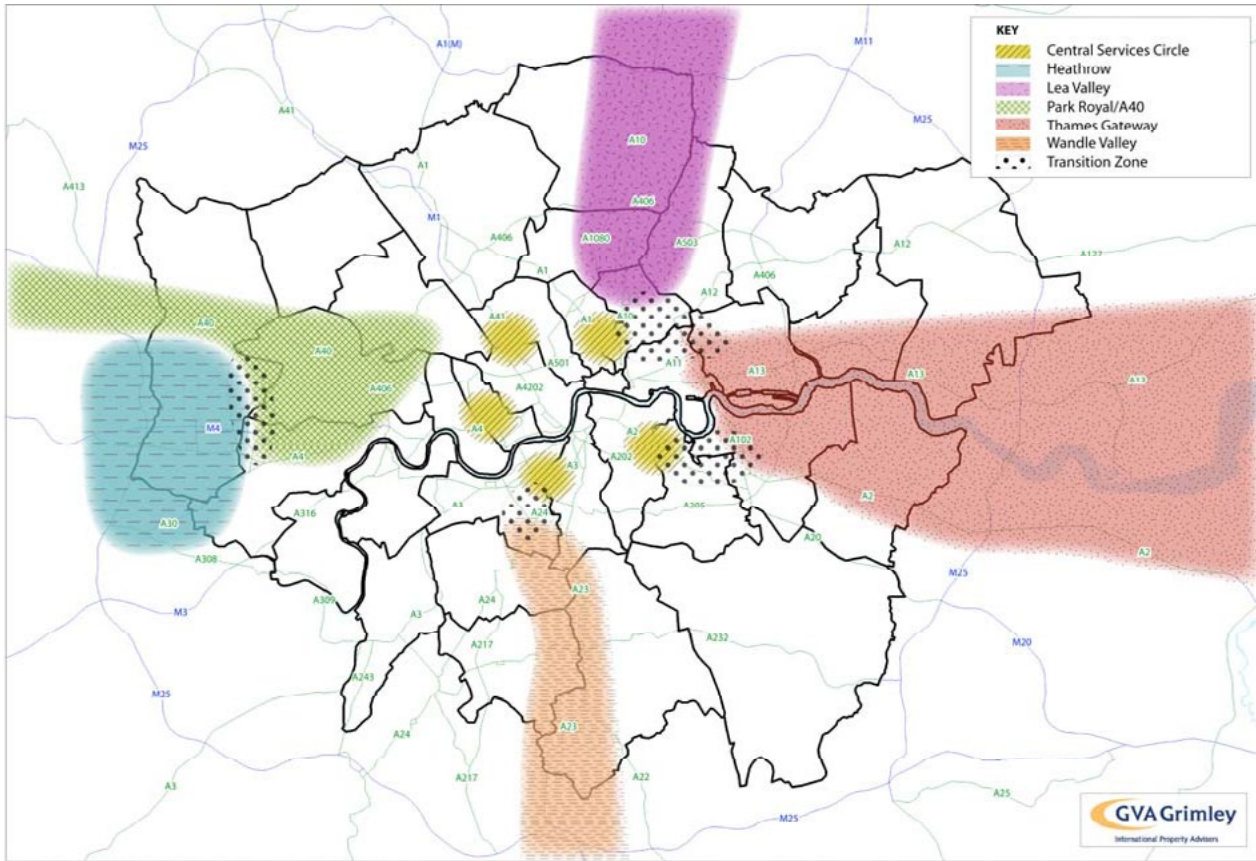
Figure 4.1: Land use in London, 2015 (%)



Source: GLA/the GeoInformation Group, UK Map 2015⁸

Unlike office and retail space which tends to cluster centrally, industrial and warehousing space in London tends to concentrate in particular ‘wedges’ or ‘pockets’ which afford easy access to markets in and out of London. Map 4.2 shows the principal industrial property markets in London. For more on the spatial distribution of firms in London, see Chapter 2.

Map 4.2: Principal property market areas for industrial and warehousing



Source: URS

4.4 Land values

In theory, the value of land in different uses should reflect the underlying demand for the property type built on it relative to the supply of land for that type of use. In practice, it is complicated by a range of factors including *inter alia*: discontinuities in the market (including those introduced by topographical factors), investment and lending patterns, transport accessibility, development potential, planning status and obligations, and many other factors, all of which contribute to a 'complex and irregular mosaic of property values'⁹.

Market information on land values per hectare is generally limited as land is traded relatively infrequently and there is little publicly available market information as those transactions that do take place are usually private. Evidence on land prices therefore tends to involve estimating the value from a hypothetical scheme in an area with assumptions made about plot ratios, number of dwellings or floorspace that could be developed, build costs, sales values and other considerations in a typical development appraisal¹⁰. Standardised estimates of this type for different land use classes by region are no longer published by the Valuation Office Agency (VOA)¹¹. For this reason estimates from third parties are used where available.

Residential land values and industrial land values per hectare in London are shown in the Industrial Land Supply and Economy Study¹² commissioned by the GLA to inform the London Plan. The average value of a hectare of residential land in 2015 was £15.7 million but this varies significantly across London from £7.3 million per hectare in Havering to £93.3million in Westminster. These values are reflected in house prices and rents, which are analysed later in this chapter.

Industrial land values are lower and average £4.9 million per hectare with a narrower range of between £2.5 million per hectare in East London up to £6.2 million per hectare in parts of the Park Royal/Heathrow/A40 sub region and £7.4 million a hectare in central areas where industrial land supply is more limited. Estimates of greenbelt/greenfield land values in London are not published but for context DCLG estimates the value of a typical agricultural site in the South East (outside London and excluding any 'hope' value) to be £22,000 per hectare¹³. This demonstrates starkly the value of securing planning permission to develop land and the type of use for which planning consent is granted.

Residential land values in London were estimated to be on average 3.2 times higher than industrial land values in London in 2015 ranging from a ratio of 1.3 in Brent to 15 in Westminster. The differential in land values highlighted in Table 4.1 also illustrates why there is significant pressure on industrial land in London to be converted for residential use. The loss of industrial land in London is discussed in further detail in Chapter 6.

Table 4.1: Industrial and residential land values per hectare and per square metre in London, 2015

	Industrial £m/ha	Residential £m/ha	Industrial £/per sq.m	Residential £/per sq.m	Ratio residential to industrial
London	4.9	15.7	490	1570	3.2
Central Services Circle	6.8	52.0	680	5200	7.6
Camden	6.2	33.3	620	3330	5.4
City of London	*	*	*	*	*
Hackney	2.5	20.7	250	2070	8.3
Islington	7.4	52.0	740	5200	7.0
Kensington & Chelsea	7.4	91.1	740	9110	12.3
Lambeth	6.2	25.4	620	2540	4.1
Lewisham	2.5	14.8	250	1480	5.9
Southwark	7.4	41.1	740	4110	5.6
Tower Hamlets	2.5	19.0	250	1900	7.6
Westminster	6.2	93.3	620	9330	15.0
Lea Valley	3.7	10.4	370	1040	2.8
Enfield	3.7	15.5	370	1550	4.2
Haringey	3.7	10.4	370	1040	2.8
Waltham Forest	2.5	9.4	250	935	3.7
Park Royal/A40/Heathrow	4.9	12.8	490	1280	2.6
Barnet	3.7	15.7	370	1570	4.2
Brent	6.2	8.0	620	800	1.3
Ealing	4.9	12.8	490	1280	2.6
Hammersmith & Fulham	6.2	56.8	620	5680	9.2
Harrow	6.2	14.8	620	1480	2.4
Hillingdon	4.9	11.6	490	1160	2.4
Hounslow	4.9	8.8	490	880	1.8
Richmond upon Thames	4.9	38.0	490	3800	7.8
Thames Gateway	2.5	9.0	250	895	3.6
Barking & Dagenham	2.5	8.0	250	800	3.2
Bexley	2.5	7.5	250	750	3.0
Bromley	6.2	10.1	620	1010	1.6
Greenwich	2.5	24.4	250	2440	9.8
Havering	2.5	7.3	250	730	2.9
Newham	2.5	10.2	250	1020	4.1
Redbridge	2.5	8.9	250	890	3.6
Wandle Valley	6.2	21.5	620	2150	3.5
Croydon	6.2	21.5	620	2150	3.5
Kingston upon Thames	6.2	22.8	620	2280	3.7
Merton	6.2	16.0	620	1600	2.6
Sutton	6.2	14.6	620	1460	2.4
Wandsworth	6.2	24.5	620	2450	4.0

Source: AECOM¹⁴ et al., March 2016

Savills' land development index, which mostly covers central London, shows that since 2008 the price of residential land has grown at a faster pace than land for offices and hotel developments. Land for residential development now exceeds its pre-crisis peak by more than 30 per cent. This further illustrates the increasing pressure on commercial space in central London areas as a result of rising residential land values.

Figure 4.2: Savills land development index, prime London

Source: Savills

4.4.1 Rateable values

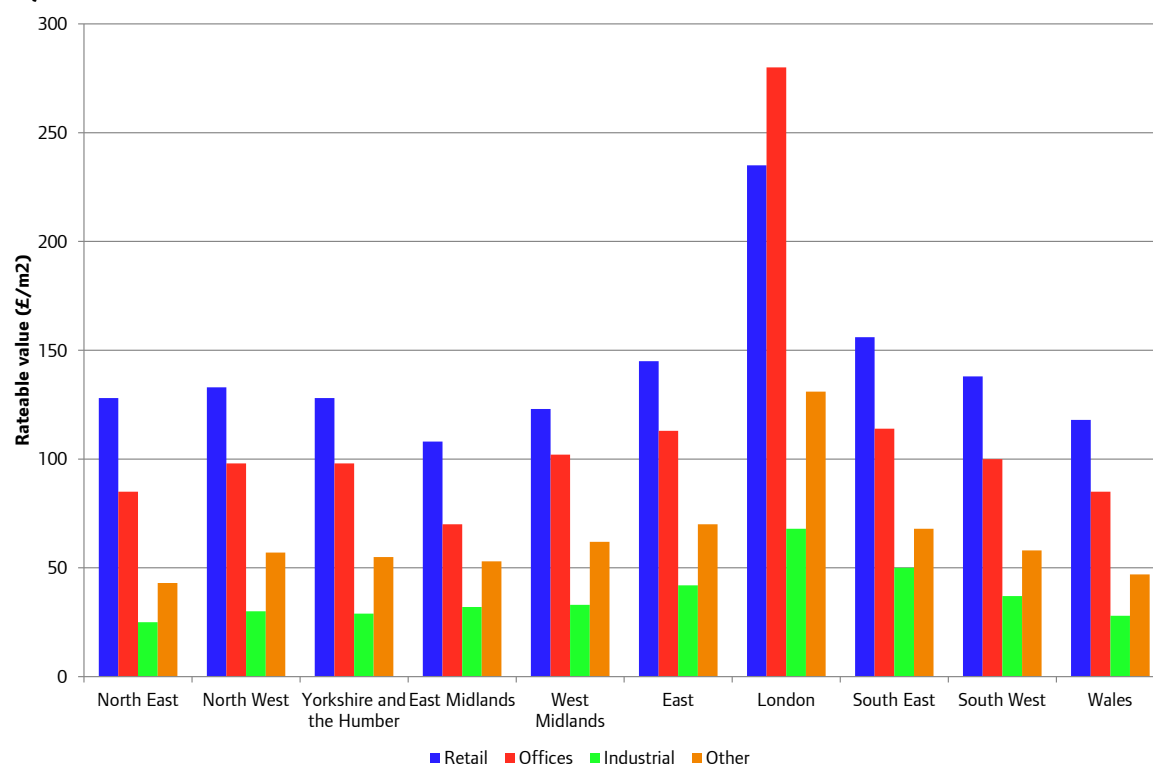
The value of commercial and industrial premises are calculated by the Valuation Office Agency (VOA) based on the notional annual rent that a non-domestic property could let for on the open market (the rateable value). Table 4.2 shows that the average rateable value for a property is highest in the office sector at £84,190 compared to £47,350 for warehouses and £20,634 for factories.

Table 4.2: Number of properties and rateable values in London, by property type

	Number of properties (000s)	Total rateable value (£ million)	Average rateable value (£)	London's share of total rateable value in England & Wales
Shops	93	3,364	36,270	25%
Offices	87	7,322	84,190	53%
Warehouses	27	1,255	47,350	15%
Factories	23	468	20,634	9%
Other properties	77	4,054	52,860	20%
All properties	306	16,545	54,028	27%

Source: HMRC, non-domestic ratings, 2010 rateable values as at April 2013

Figure 4.3 shows that per square metre the office and retail sectors in London have the highest rateable values of all regions nationally. Average rateable values in London for all types of land are substantially higher than those in the rest of the country with offices in the capital valued at more than 250 per cent more. London alone accounts for over a quarter of total rateable values in England and Wales.

Figure 4.3: Rateable values (per sq.m) by commercial land use class across England and Wales, 2012

Source: VOA rateable value statistics, 2012

4.4.2 Rental values

Rental values for different property types provide an indicator of the value of different types of activities taking place on land. This section provides rental values per annum across London's prime property markets, summarised as follows:

- Prime office rents¹⁵ range between £430 and £1,300 per square metre (£40 to £120 per square foot) in London (see Table 4.3)
- Prime industrial rents¹⁶ range between £118 and £172 per square metre (£11 to £16 per square foot) across London's different submarkets (see Table 4.4).
- Prime retail rents for 'Zone A' (shopfront) space range between £4,800 and £18,800 per square metre (£450-£1750 per square foot) in the main central London shopping areas (see Table 4.5).
- Average residential one bedroom flat rents range from under £194 per square metre (£18 per square foot) in outer London to more than £366 per square metre (£34 per square foot) in central London (see Map 4.3)

It should be noted that each indicator is measured very differently and covers different geographies so care should be taken when drawing comparisons between different markets.

Office rents

Looking first at the office market, prime rents in 2015 were highest in the Mayfair and St. James's areas at £1300 per square metre (£120 per square foot) compared to £750 per square metre (£70 per square foot) in the City and £485 per square metre (£45 per square foot) in the Docklands¹⁷. Total occupancy costs, which include service charges, business rates and other occupier costs, are also shown below.

Table 4.3: Office Rental Values and Occupancy Costs in London (£ per sq.ft/m per annum), 2015¹⁸

Location	Prime Rents (£ per square foot)	Occupancy Costs (£ per square foot)	Prime Rents (£ per square metre)	Occupancy Costs (£ per square metre)
Mayfair	£120	£179	£1,292	£1,927
St James's	£120	£179	£1,292	£1,927
North of Oxford Street	£95	£145	£1,023	£1,555
Soho	£88	£131	£942	£1,410
Belgravia & Knightsbridge	£85	£138	£915	£1,485
Fitzrovia	£85	£120	£915	£1,292
Covent Garden	£79	£117	£850	£1,254
Marylebone, Euston & King's Cross	£78	£106	£834	£1,136
Victoria	£80	£119	£861	£1,281
Bloomsbury	£75	£110	£807	£1,184
City - Core	£70	£101	£753	£1,082
Kensington and Chelsea	£65	£105	£700	£1,130
City - Midtown	£68	£102	£727	£1,098
City - Eastern	£68	£98	£727	£1,055
City - Northern	£70	£101	£753	£1,082
City - Southern	£68	£97	£727	£1,044
City - Western	£70	£100	£753	£1,076
Paddington	£65	£95	£700	£1,023
Clerkenwell	£68	£91	£727	£980
Shoreditch	£65	£86	£700	£926
Waterloo	£58	£82	£619	£883
Southbank	£63	£91	£673	£974
Aldgate	£60	£85	£646	£915
Hammersmith	£53	£79	£565	£845
Camden	£53	£78	£565	£834
Battersea	£48	£71	£511	£764
Vauxhall	£50	£74	£538	£797
Docklands	£45	£71	£484	£759
Stratford	£40	£57	£431	£614

Source: JLL Research, Central London Office Market Report Q4 2015

Industrial rents

Prime industrial rents are generally lower than office rents in London. As with office rents these vary across different parts of London reflecting the balance of demand and supply for space in different areas. In the principal industrial submarkets, they range from a high of £172 per square metre (£16 per square foot) in the Central Services Area and £162 per square metre (£15 per square foot) in Heathrow and Park Royal to lows of £118 per square metre (£11 per square foot) in parts of the Thames Gateway.

Table 4.4: Industrial rents in London (£ per sq.ft/m per annum), 2015

	Rental Value £ per sq.ft Mid	Rental Value £ per sq.ft Low	Rental Value £ per sq.ft: High	Rental Value £ per sq.m Mid	Rental Value £ per sq.m: Low	Rental Value £ per sq.m: High
London	£10.25	£5.00	£16.00	£110.25	£53.75	£172.25
Central Services Circle	£9.75	£8.00	£16.00	£105.00	£86.00	£172.25
Camden	£10.00	£8.00	16.00	£107.75	£86.00	£172.25
City of London	*	*	*	*	*	*
Hackney	£10.00	£5.00	11.50	£107.75	£53.75	£123.75
Islington	£12.00	£10.0	15.00	£129.25	£107.75	£161.50
Kensington and Chelsea	£10.00	*	*	£107.75	*	*
Lambeth	£10.00	£8.00	15.00	£107.75	£86.00	£161.50
Lewisham	£9.00	£7.00	10.00	£97.00	£75.25	£107.75
Southwark	£9.50	£8.00	13.00	£102.25	£86.00	£140.00
Tower Hamlets	£10.00	£7.00	15.00	£107.75	£75.25	£161.50
Westminster	£12.00	*	*	£129.25	*	*
Lea Valley	£9.50	£6.50	£12.50	£102.25	£70.00	£134.50
Enfield	£9.00	£7.00	£9.50	£97.00	£75.25	£102.25
Haringey	£8.00	£7.00	10.00	£86.00	£75.25	£107.75
Waltham Forest	£11.00	£7.50	13.50	£118.50	£80.75	£145.25
Park Royal/A40/Heathrow	£11.50	£7.00	£15.00	£123.75	£75.25	£161.50
Barnet	£10.00	£8.00	14.00	£107.75	£86.00	£150.75
Brent	£12.50	£8.50	14.00	£134.50	£91.50	£150.75
Ealing	£11.00	£7.50	13.00	£118.50	£80.75	£140.00
Hammersmith and Fulham	£14.00	£10.0	15.00	£150.75	£107.75	£161.50
Harrow	£11.00	£8.50	13.00	£118.50	£91.50	£140.00
Hillingdon	£11.00	£7.00	15.00	£118.50	£75.25	£161.50
Hounslow	£12.00	£8.00	15.00	£129.25	£86.00	£161.50
Richmond upon Thames	£9.00	£7.50	13.00	£97.00	£80.75	£140.00
Thames Gateway	£8.50	£5.00	£11.00	£91.50	£53.75	£118.50
Barking and Dagenham	£7.00	£5.00	£9.50	£75.25	£53.75	£102.25
Bexley	£7.50	£5.00	£9.00	£80.75	£53.75	£97.00
Bromley	£10.00	£6.00	11.00	£107.75	£64.50	£118.50
Greenwich	£10.00	£5.00	10.00	£107.75	£53.75	£107.75
Havering	£7.00	£6.50	£8.00	£75.25	£70.00	£86.00
Newham	£11.50	£6.50	12.50	£123.75	£70.00	£134.50
Redbridge	£9.00	£5.00	11.00	£97.00	£53.75	£118.50
Wandle Valley	£11.25	£6.00	£13.50	£121.00	£64.50	£145.25
Croydon	£10.25	£7.00	12.00	£110.25	£75.25	£129.25
Kingston upon Thames	£12.00	£7.00	13.00	£129.25	£75.25	£140.00
Merton	£10.50	£6.00	11.50	£113.00	£64.50	£123.75
Sutton	£11.75	£7.50	12.00	£126.50	£80.75	£129.25
Wandsworth	£13.00	£8.00	13.50	£140.00	£86.00	£145.25

Source: DTZ in AECOM, Cushman and Wakefield 2015. Note: * = insufficient data.

Retail rents

Retail rents also vary significantly across London's main shopping areas. Prime retail space in the luxury market can command the highest rents among all commercial land use classes as illustrated in Table 4.5. Research by BNP Paribas¹⁹ shows that in Bond Street's luxury market, a rent of £18,837 per square metre (£1,750 per square foot) was achieved in the first quarter of 2016. This is based on Zone A space, a classification used in the valuation of retail space which is equivalent to the shopfront area²⁰. Rents in Bond Street make it some of the most expensive retail real estate in Europe and are on a par with Hong Kong, Tokyo and New York²¹.

Table 4.5: Central London prime retail rents (£ per sq.ft/m per annum), Q1 2016

Location	Rents Zone A (£ per square foot)	Rents Zone A (£ per square metre)
Bond Street	1,750	18,837
Oxford Street	1,015	10,925
Knightsbridge	800	8,611
Covent Garden	700	7,535
Regent Street	650	6,997
Kings Road	450	4,844

Source: BNP Paribas. Note: Based on the highest rent achieved in the location for 'Zone A' (shopfront) space.

Town Centre Health Checks²² undertaken in 2013 by the GLA examined rents (and other indicators of performance) for a number of retail centres across London. Drawing on this research, rents for Zone A space in some of London's other main retail centres²³ are summarised in Table 4.6. While this data is from 2012, it can be seen that rents are considerably lower in these areas.

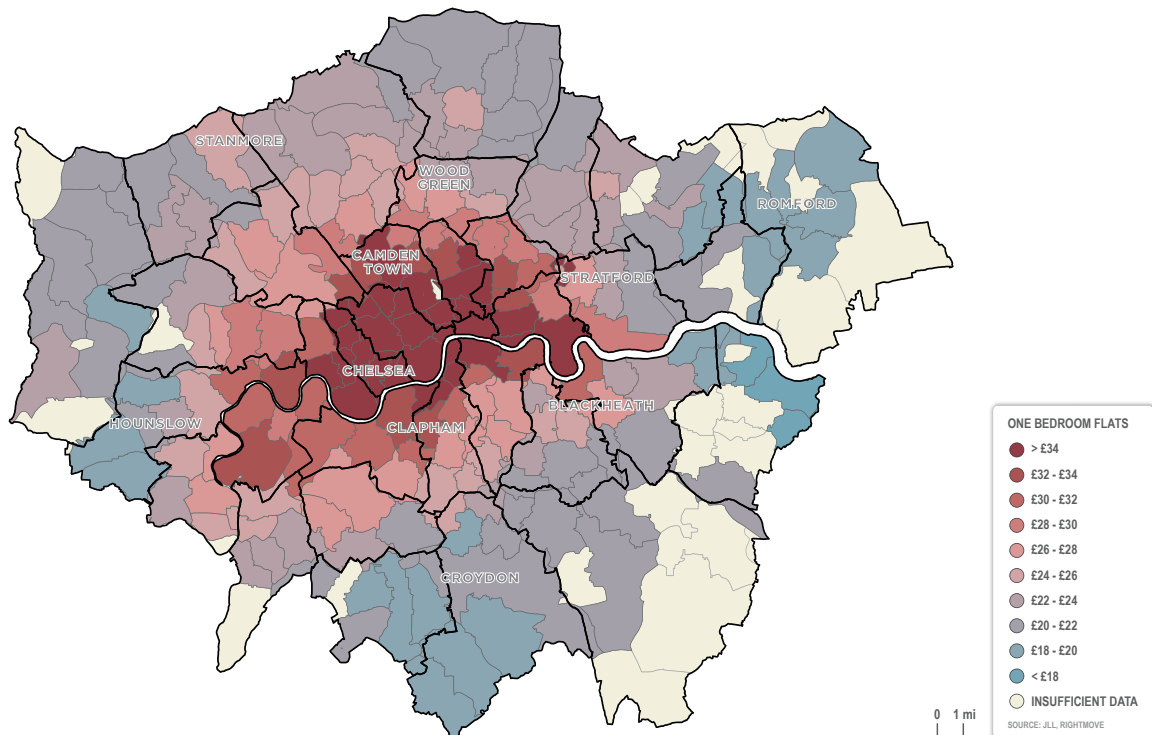
Table 4.6: Retail rents in centres across London (£ per sq.ft/m per annum), 2012

Location	Rents Zone A (£ per square foot)	Rents Zone A (£ per square metre)
West End	1,000	10,764
Knightsbridge	635	6,835
Croydon	220	2,368
Ealing	110	1,184
Shepherds Bush	325	3,498
Wood Green	110	1,184
Harrow	115	1,238
Romford	170	1,830
Kingston	300	3,229
Ilford	105	1,130
Sutton	75	807
Hounslow	75	807

Source: Colliers/GLA

Residential rents

In the residential lettings market, average advertised rents for one bedroom flats range from under £194 per square metre (£18 per square foot) in outer London to more than £366 per square metre (£34 per square foot) in central London²⁴. Rental and sales values in the residential market are discussed in further detail later in this chapter.

Map 4.3: Average rent for one bedroom flats (£ per sq.ft./per annum), 2015

Source: JLL/Rightmove, 2016

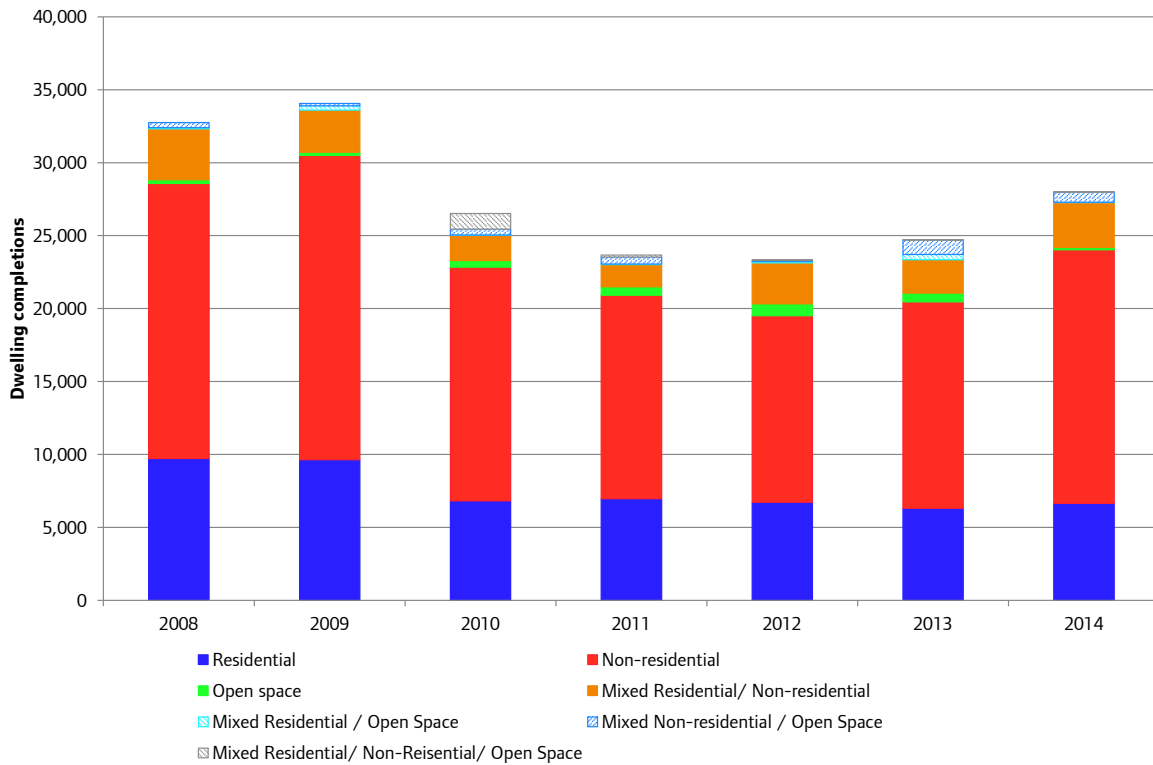
4.5 Land use change in London

The land values and rents discussed above are important drivers of land use change in London, acting as price signals in the market for land and property. The following section considers how land use is changing in London as a consequence of these price signals and other drivers of land use change.

4.5.1 Land changing to residential use

Figure 4.4 shows gross housing completions in London over the period 2008-2014 from the London Development Database, broken down according to the previous use of the land. In 2008 close to 30 per cent of new units were built on land that was residential but in 2014 this fell to 24 per cent suggesting a slight decline in the proportion of completions on residential land (the blue component of the bar chart). Conversely the proportion of homes built on non-residential land appears to have increased slightly. In 2008, 57.5 per cent of homes were built on non-residential land and by 2014 this increased to 62 per cent.

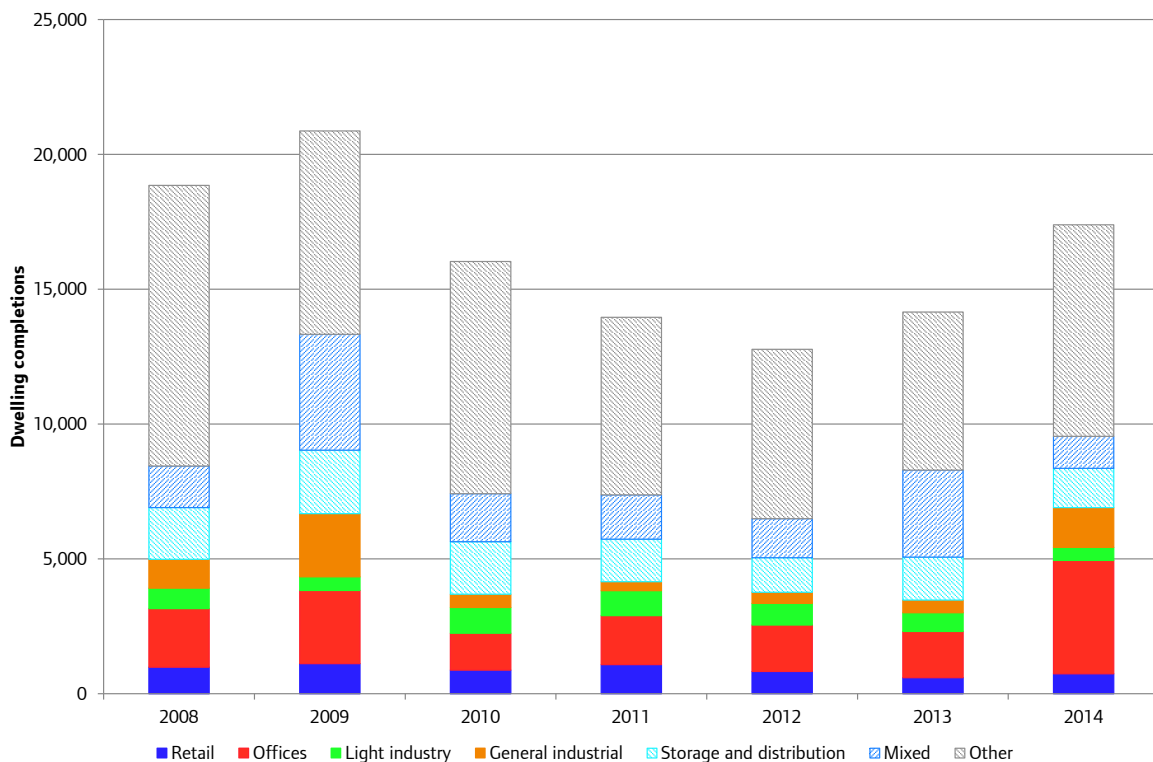
Figure 4.4: Gross housing completions in London by previous land use



Source: London Development Database

Figure 4.5 examines the non-residential component in Figure 4.4 in more detail. In 2014, around 24 per cent of dwellings created on non-residential land were formerly offices, an increase on previous years when closer to 12 per cent were created from office space. This may be due the impact of Permitted Development Rights (discussed below and in Chapter 6). The 'other' category in Figure 4.5 includes hotels, hostels, care homes, non-residential institutions, leisure uses and sui generis²⁵ uses.

Figure 4.5: Gross housing completions in London from previously non-residential land



Source: London Development Database

4.5.2 Office to residential conversions

Evidence from the London Development Database suggests that changes in land use between commercial and residential are translating into relatively large losses in the availability of commercial floorspace for some boroughs. The introduction of Permitted Development Rights (PDR) in May 2013 to fast-track the conversion of offices to homes has resulted in the following:

- At least 2,800 office-to-residential prior approval applications were made across London between May 2013 and April 2015, of which over 2,000 were approved.
- If all of the schemes that have been approved but not superseded were to be developed, they would provide around 18,000 new residential dwellings. Around 5,300 of these had either been started or completed by the end of March 2015.
- If all of the approved schemes were implemented, more than 1.1 million square metres of floorspace could be lost at an average of around 650 square metres per scheme. This is equivalent to a loss of around four per cent of London's stock of office floorspace.
- In terms of occupancy, 55 per cent of the schemes were either occupied or part occupied at the time of the application (of those schemes where data was available²⁶).
- A total of 310,000 square metres of office floorspace are estimated to have been lost through schemes that have started or completed as a result of permitted development rights. This is equivalent to a loss of around one per cent of London's stock of office floorspace.

Table 4.7 shows where in London the highest amount of floorspace was proposed for conversion to residential use under Permitted Development Rights to March 2015. The five boroughs with the highest amount of floorspace proposed for conversion were Croydon, Camden, Sutton, Richmond and Harrow.

Table 4.7: Office floorspace converted to residential use under Permitted Development Rights (PDR) to March 2015

Planning Authority	Number of prior approvals for which floorspace data is available	Potential office floorspace lost	Total office floorspace m ² 2012	% of stock potentially lost to PDR	Dwellings proposed
Croydon	97	137,632	640,000	22%	2,452
Camden	109	79,369	2,137,000	4%	934
Sutton	62	76,395	163,000	47%	1,080
Richmond upon Thames	203	70,421	300,000	23%	862
Harrow	62	69,160	224,000	31%	1,151
Barnet	87	66,195	356,000	19%	1,093
Wandsworth	117	52,734	310,000	17%	691
Hounslow	49	50,226	756,000	7%	820
Islington	79	48,650	1,455,000	3%	748
Hammersmith and Fulham	109	43,359	763,000	6%	495
Lambeth	82	40,085	290,000	14%	610
Brent	37	38,141	277,000	14%	621
Bromley	69	36,748	295,000	12%	619
Kingston upon Thames	65	36,333	485,000	7%	582
Hillingdon	30	34,648	664,000	5%	684
Lewisham	33	28,634	633,000	5%	503
Merton	66	26,277	266,000	10%	423
Tower Hamlets	29	24,464	2,458,000	1%	378
Ealing	59	21,634	442,000	5%	337
Enfield	25	18,866	202,000	9%	323
Redbridge	20	16,374	156,000	10%	304
Southwark	32	14,923	1,270,000	1%	203
Westminster	23	11,598	5,373,000	0%	111
Waltham Forest	33	9,229	101,000	9%	198
Barking and Dagenham	9	8,250	101,000	8%	124
Havering	14	7,271	154,000	5%	137
Newham	11	6,893	242,000	3%	138
Haringey	18	6,401	141,000	5%	129
Bexley	9	5,378	151,000	4%	93
Hackney	19	3,863	546,000	1%	67
Greenwich	11	3,844	155,000	2%	72
LLDC ²⁷	2	555	N/A	N/A	9
Total	1670	1,094,549	21,506,000	5%	16,991

Sources: London Development Database/VOA/GLA Economics. Notes: Only includes schemes for which office floorspace being lost through PDR was available - the total number of schemes with prior approval to March 2015 was 2,003 so the floorspace potentially lost will be higher than summed in this table. Boroughs wholly covered by exemptions to PDR are excluded so this does not represent total office floorspace stock in London (which was 26.7million square metres in 2012, the last year for which data is available from the Valuation Office Agency).

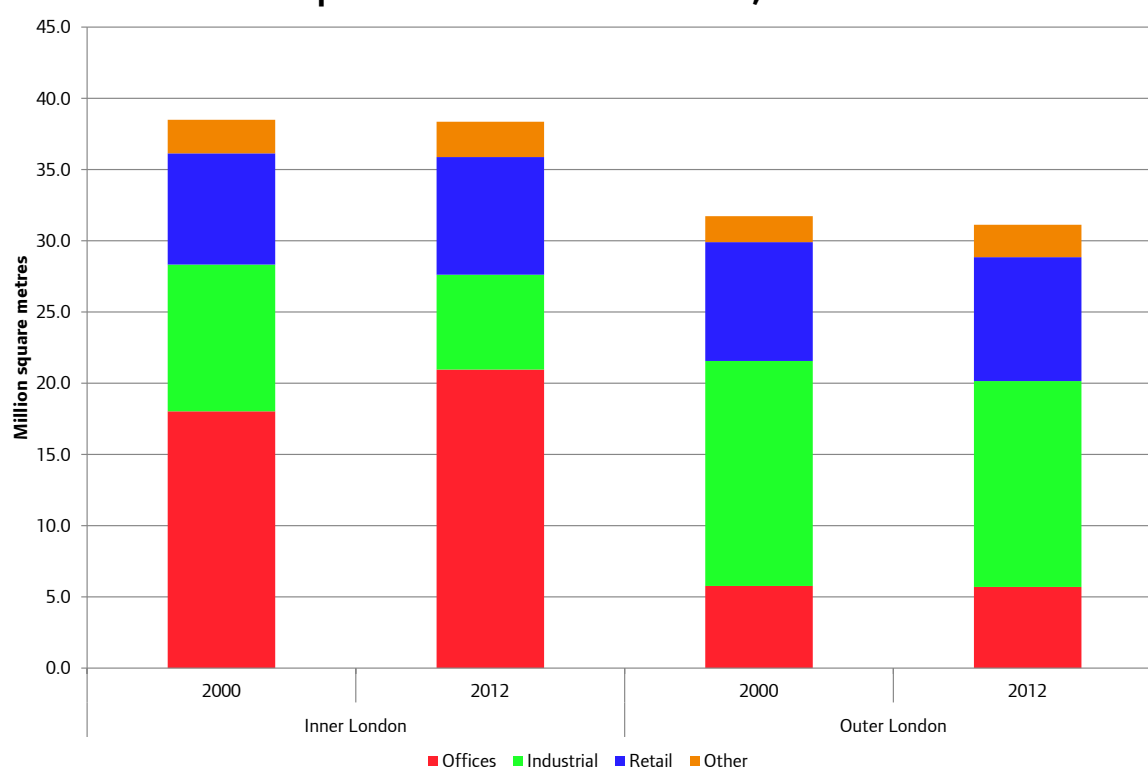
While the percentage of stock being lost remains relatively small in the context of London's total stock of office floorspace, it is clear that some boroughs are being affected more than others. The trends presented here provide early signs of the impact PDR is having in changing land from commercial to residential use. Chapter 6 considers the potential risks to the economy if commercial space were to be crowded out by the demand for housing. The GLA continues to monitor the impact of Permitted Development Rights and new data for the year 2015/16 will be published in due course.

4.5.3 Changes in business floorspace

The following examines changes in business floorspace using Valuation Office Agency (VOA) data. It should be noted that this data only covers the period 2000-2012. Across London there was 69.5 million square metres of business floorspace in 2012 (the latest available data). Offices were the most common use, making up over 38 per cent of the commercial floorspace in London, up from 34 per cent in 2000. Having fallen by seven percentage points between 2000 and 2012, industrial floorspace made up 30 per cent of the total, retail space accounted for 24 per cent (broadly similar to the 23 per cent in 2000), while 7 per cent of space was for other uses – an increase of 1 percentage point over the 12 year period.

The patterns of changes in business floorspace use over this period are different across inner London when compared to outer London. Total business floorspace in inner London remained broadly unchanged between 2000 and 2012, falling by 140,000 square metres (0.4 per cent) at an average of 12,000 square metres per year over this period. In outer London between 2000 and 2012 total business floorspace fell by 1.9 per cent or around 600,000 square metres – an average of 51,000 square metres per year.

Figure 4.6: Business floorspace in inner and outer London, 2000 and 2012



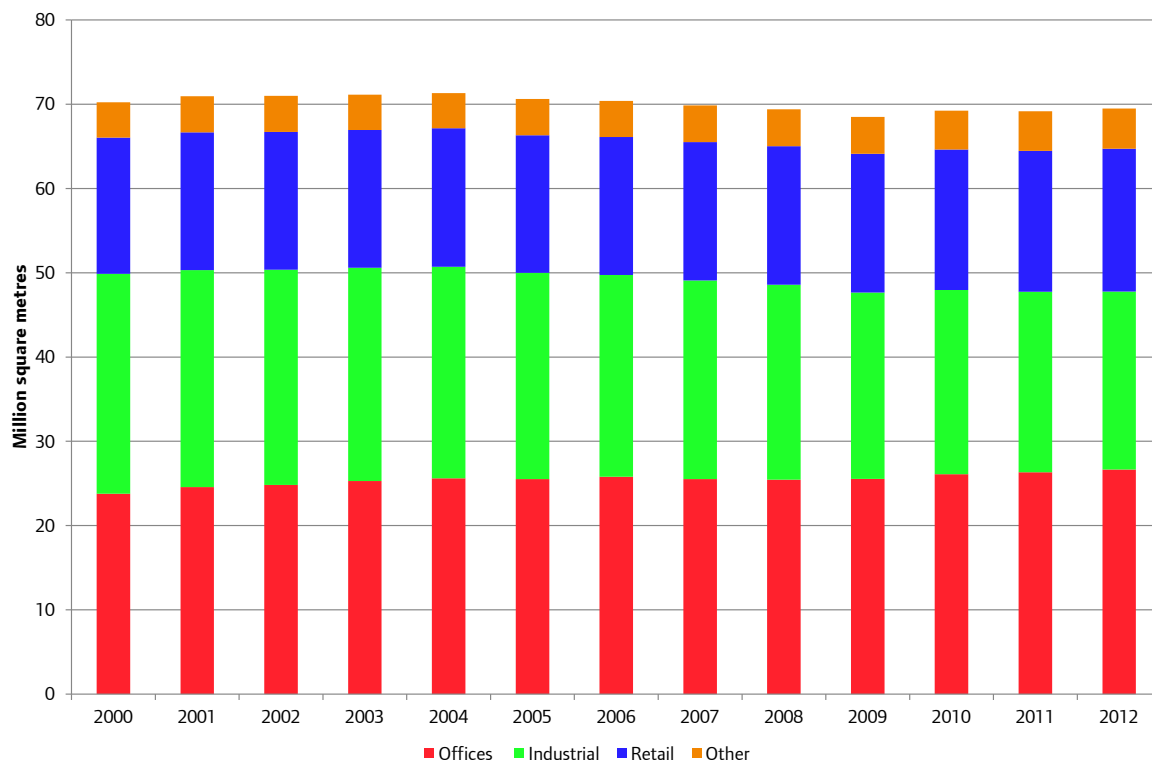
Source: VOA 2000-2012

Total office floorspace took up 26.7 million square metres of floorspace in 2012, up 12 per cent from 23.8 million square metres in 2000, an average increase of around 240,000 square metres per year. Almost 80 per cent of the office space was located in inner London, which increased by 2.9 million square metres between 2000 and 2012, an average of around 240,000 square metres per year. The change was primarily driven by increases in the City of London and Tower Hamlets, with these two boroughs accounting for almost two-thirds of the increase, adding 1.9 million square metres between them – or 160,000 square metres each year. These two boroughs, along with Westminster, account for almost half of the office floorspace across London (12.8 million square metres). In outer London, the total stock of office space remained relatively static, declining by 67,000 square metres or 6,000 square metres per year, to 5.7 million square metres.

Retail premises take up 17 million square metres of floorspace, and are spread widely across London, with 49 per cent located in inner London and 51 per cent in outer London. From 2000 to 2012 the total retail floorspace remained relatively constant, increasing by 5 per cent over this period – around 800,000 square metres in total, or 67,000 per year. Within London’s town centres, total occupied retail floorspace covered approximately 7.1 million square metres in 2012, up 140,000 square metres from 2007. Strong growth in convenience retail floorspace (+175,000 square metres, +14%) was counterbalanced by modest reductions in comparison retail floorspace of 13,000 square metres, and service retail floorspace of 22,000 square metres)²⁸. In inner London retail space increased by around 40,000 square metres per year (460,000 square metres in total) between 2000 and 2012. Meanwhile in outer London retail floorspace increased by around 350,000 square metres in total or 29,000 each year.

A further 21.1 million square metres are taken up by industrial uses including warehousing, reflecting a 19 per cent fall between 2000 to 2012, when industrial floorspace decreased by 5 million square metres or 415,000 square metres per year²⁹. Industrial floorspace fell by 35 per cent in inner London between 2000 and 2012, a 3.7 million square metre decline or an average of over 300,000 square metres per year. In outer London the falls in industrial space were slower at around 110,000 square metres per year, falling to 14.4 million in 2012 from 15.8 million in 2000.

Figure 4.7: Business floorspace in London, 2000-2012



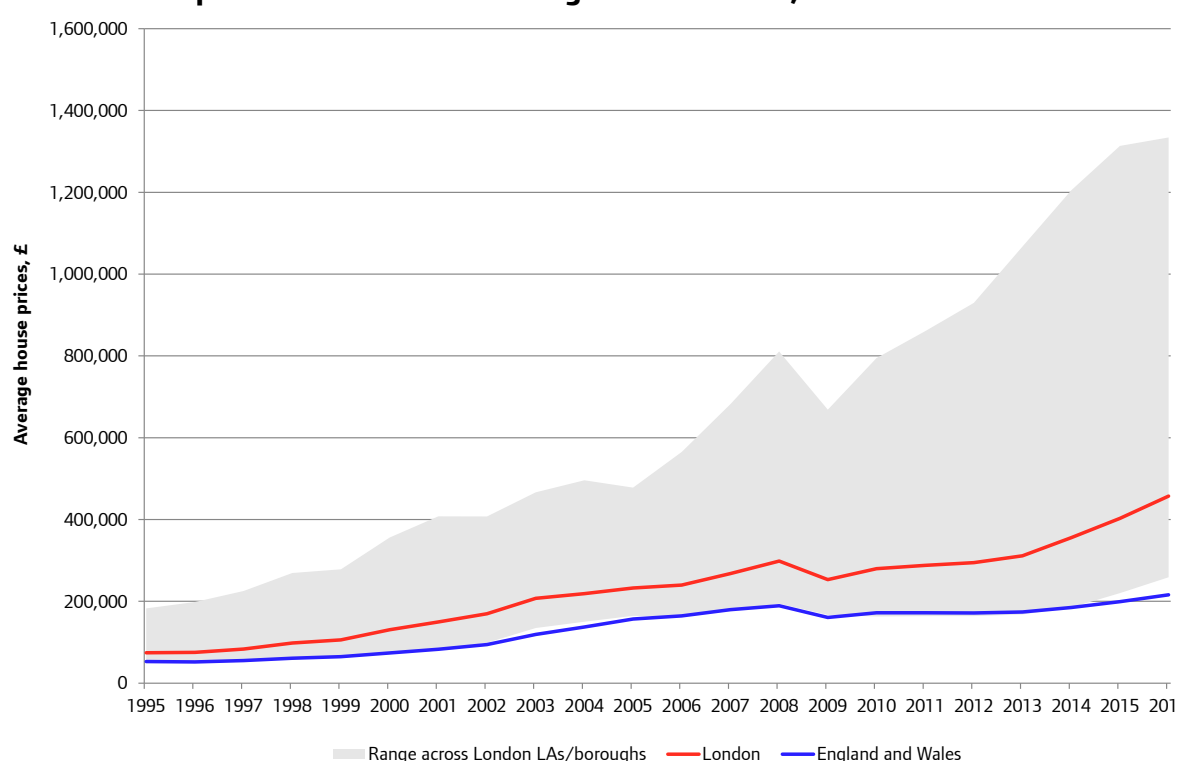
Source: VOA 2000-2012

4.6 House prices

The value of residential property in London has been increasing in recent years. London's house prices are considerably higher, and have been rising at a faster rate, than the country as a whole. In each year since Land Registry records began in 1995, the official house price index shows that average house prices in London³⁰ have exceeded the average for every other region in England and Wales. This gap in average house prices between London and the country as a whole has also grown larger in each year. The only exception to this was in 2009 when the average price paid for properties in London fell by £45,000 in 12 months to January 2009. This exceeded the fall in average prices in England and Wales of £29,000 over this recession period (see Figure 4.8).

In the period from 1995 to 2016 the gap between the average prices paid for housing across London boroughs has also grown bigger. This reflects the rapid increase in house prices in central areas, where house prices were relatively high at the start of the period.

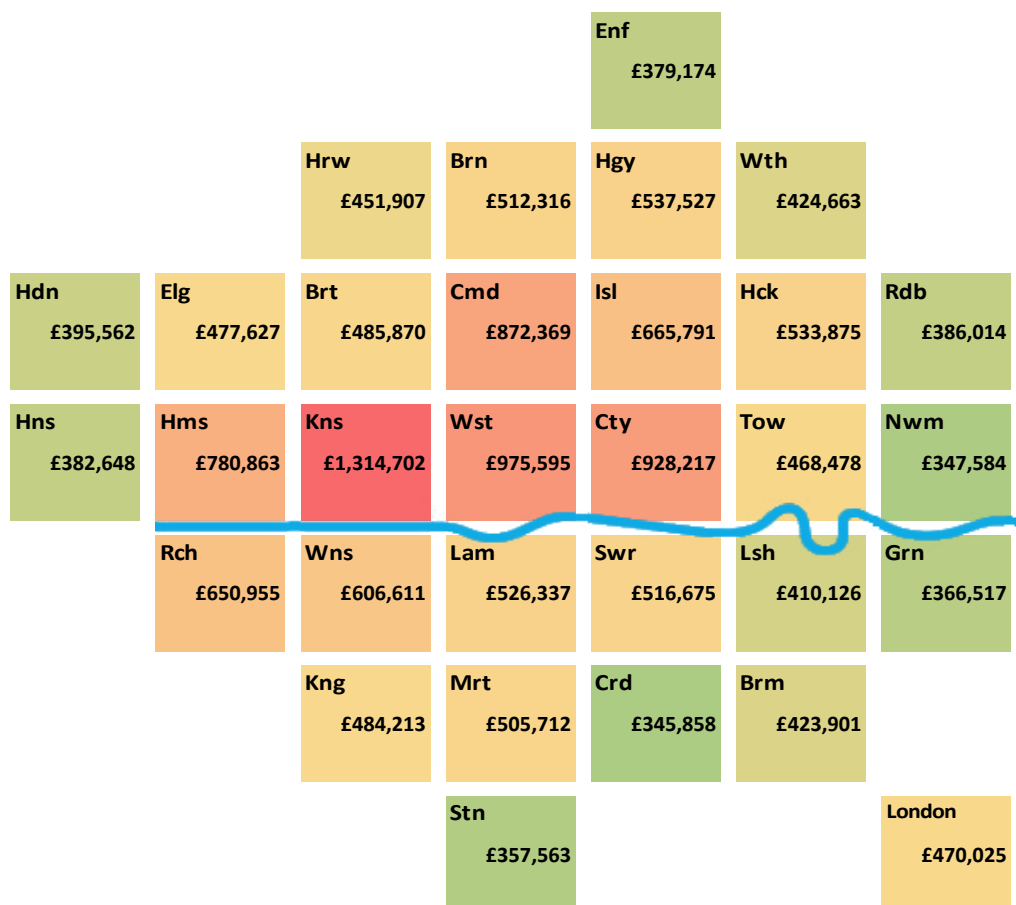
Figure 4.8: House prices in London and in England and Wales, 1995-2016



Source: ONS and Land Registry, official house prices index, average (geometric mean) prices as of January.

This is particularly true in desirable central London boroughs where average house prices in April 2016 were as high as £976,000 in Westminster, and £1.31 million in Kensington and Chelsea. This compares to a London borough low average house price of £272,000 in Barking and Dagenham. This is still higher than the national average for England of £220,000 (see Map 4.4).

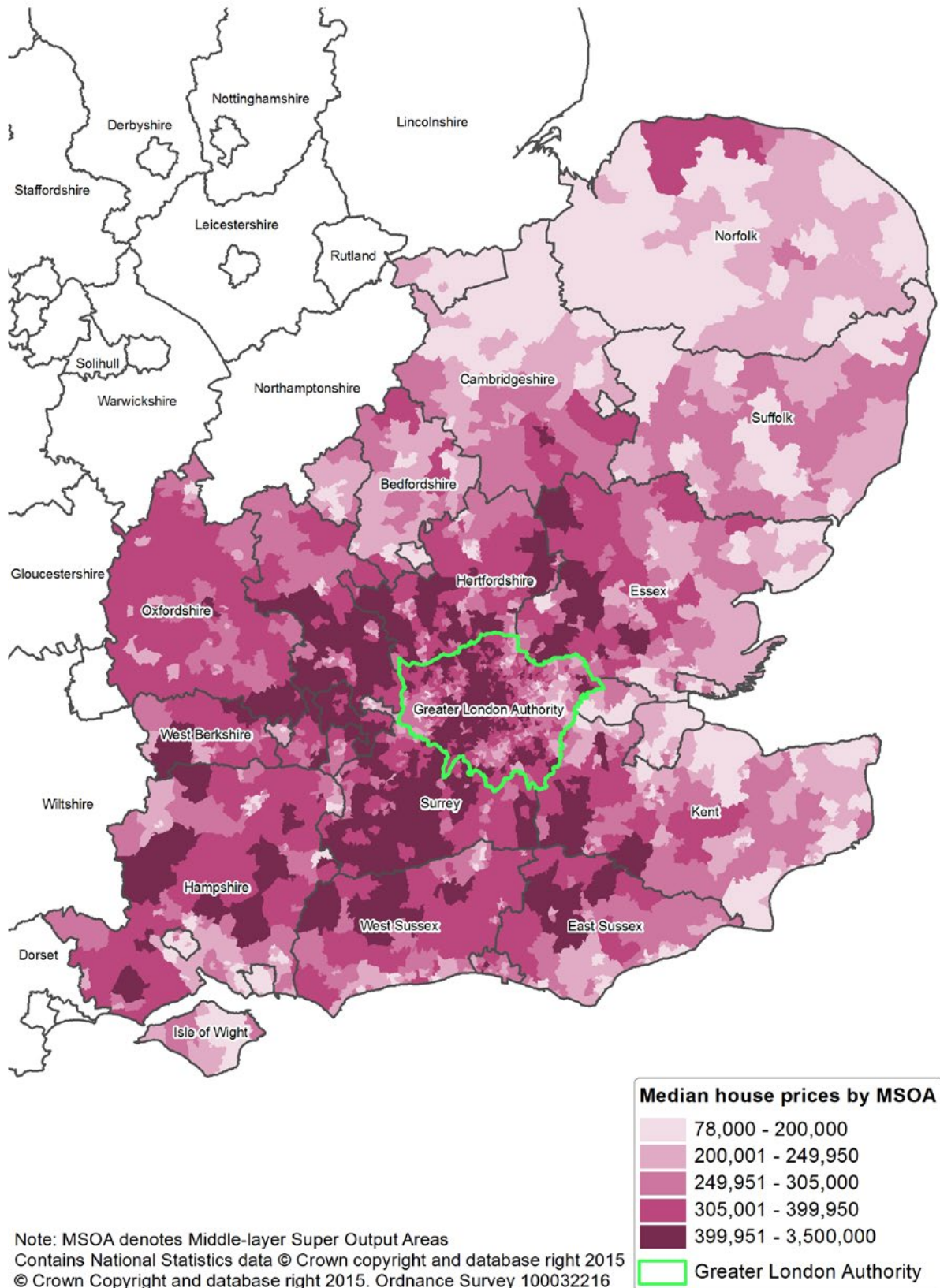
Map 4.4: Average house prices across London, April 2016



Source: ONS/Land Registry, Official House Price Index, April 2016

High house prices have also spread beyond London's borders. This may partly be a result of people living outside of the capital and commuting in for work (considered in chapters 2 and 9). Neighbouring counties such as Surrey, Essex, Kent, Buckinghamshire and Hertfordshire have areas where the median house price exceeds £400,000 (see Map 4.5).

Map 4.5: Median house prices in London and the Greater South East, 2015



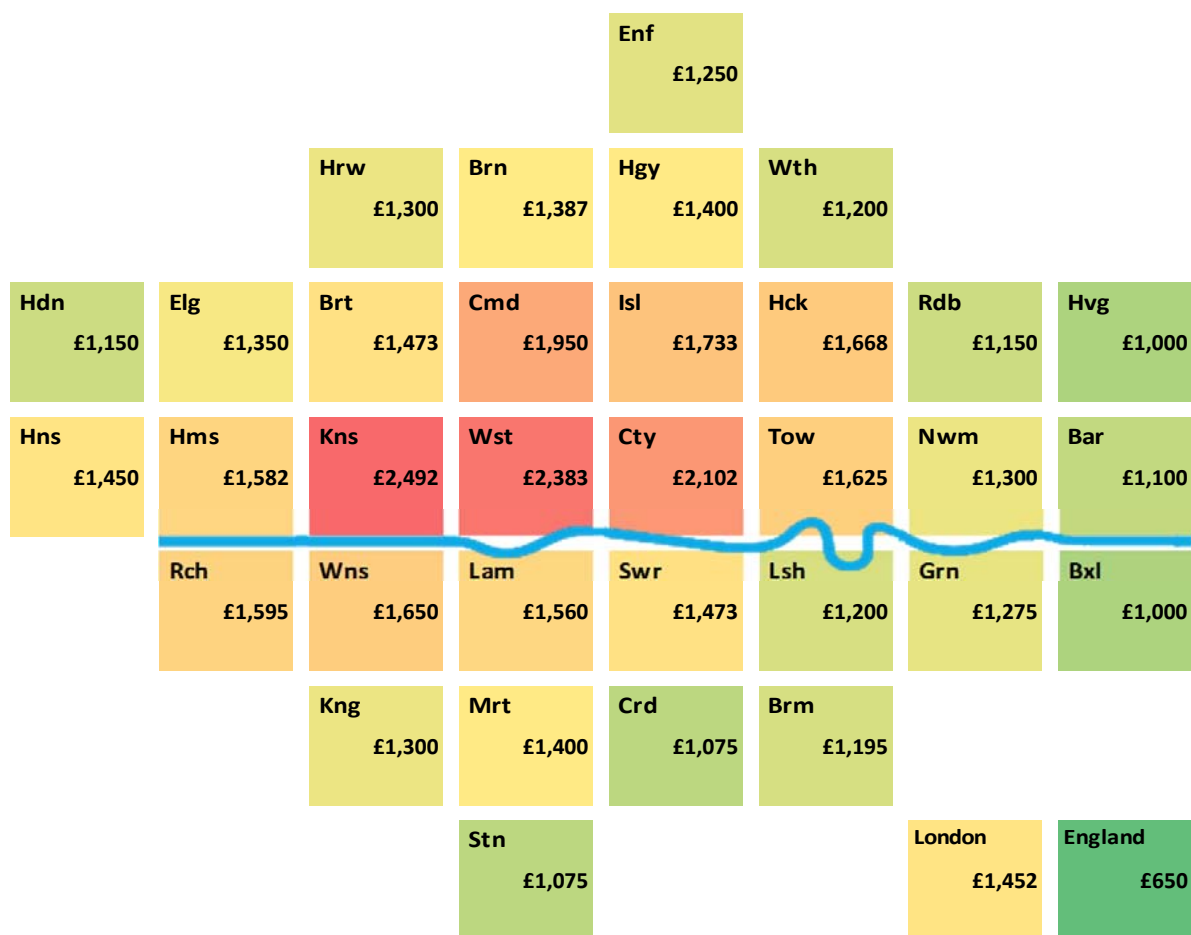
Source: ONS House price statistics for small areas, using Land Registry price paid data.

4.6.1 Private rents in London

As with the price of buying a home, the median price of private monthly rents in London is also considerably higher than in England as a whole. Based on data on private monthly rents from the VOA, median rents in London in 2015/16 were £1,452 per month, more than twice as high as median rents in England as a whole (£650 per month). The VOA data provides a ‘snapshot’ on the median value of private monthly rents, and although it cannot enable robust comparisons over time, it can be used to illustrate the differences in average rents across London³¹.

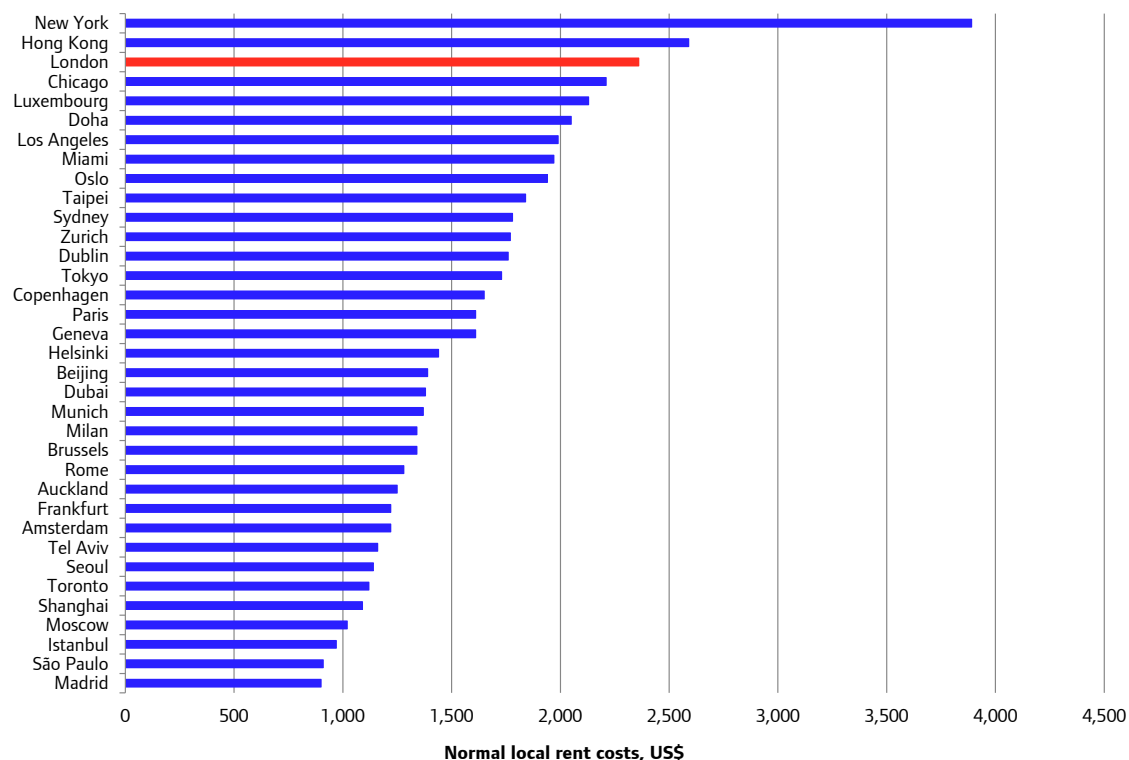
Map 4.6 shows that in the 12 months to March 2016, the median monthly private rent was highest in Kensington and Chelsea (£2,492) and Westminster (£2,383). While considerably lower, median rents recorded in the London Boroughs of Havering and Bexley were £1,000, 54 per cent above the national average.

Map 4.6: Median monthly private rents by local authority, 2015/16



Source: VOA private rental market statistics, 2015/16

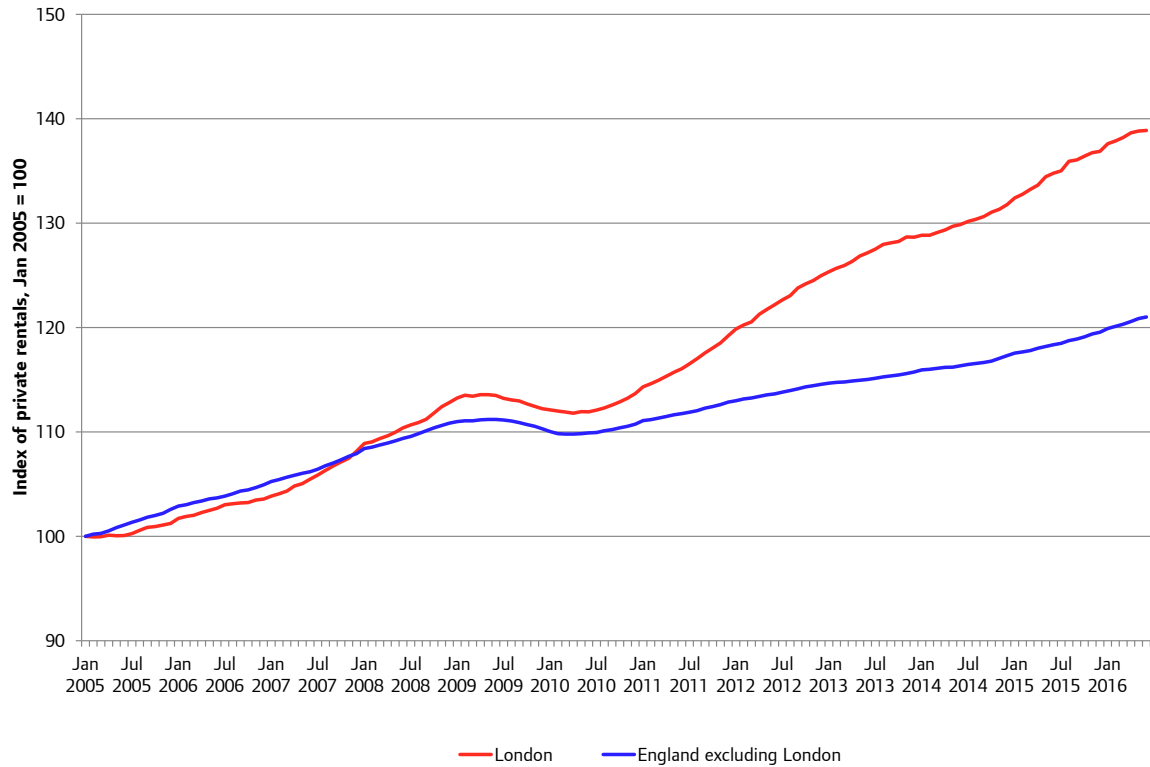
London’s private rental housing is also costly compared to other world cities. This can be observed from Figure 4.9, based on UBS data³², which shows that the medium normal local rent in London is high, with renting only costing more in New York, and Hong Kong.

Figure 4.9: Normal local rent³³ costs in selected world cities (US\$), 2015

Source: UBS, 2015

Within the UK, the relative costs of private renting have risen sharply in London compared to England (excluding London). Figure 4.10 provides experimental data from the ONS providing a quarterly index of housing rental prices, showing three distinct periods: rental price increases from January 2005 until February 2009, rental price decreases from July 2009 to February 2010, and increasing rental prices from May 2010 onwards. In each period, London shows a similar trend to the rest of England but with faster rent increases from around the end of 2010.

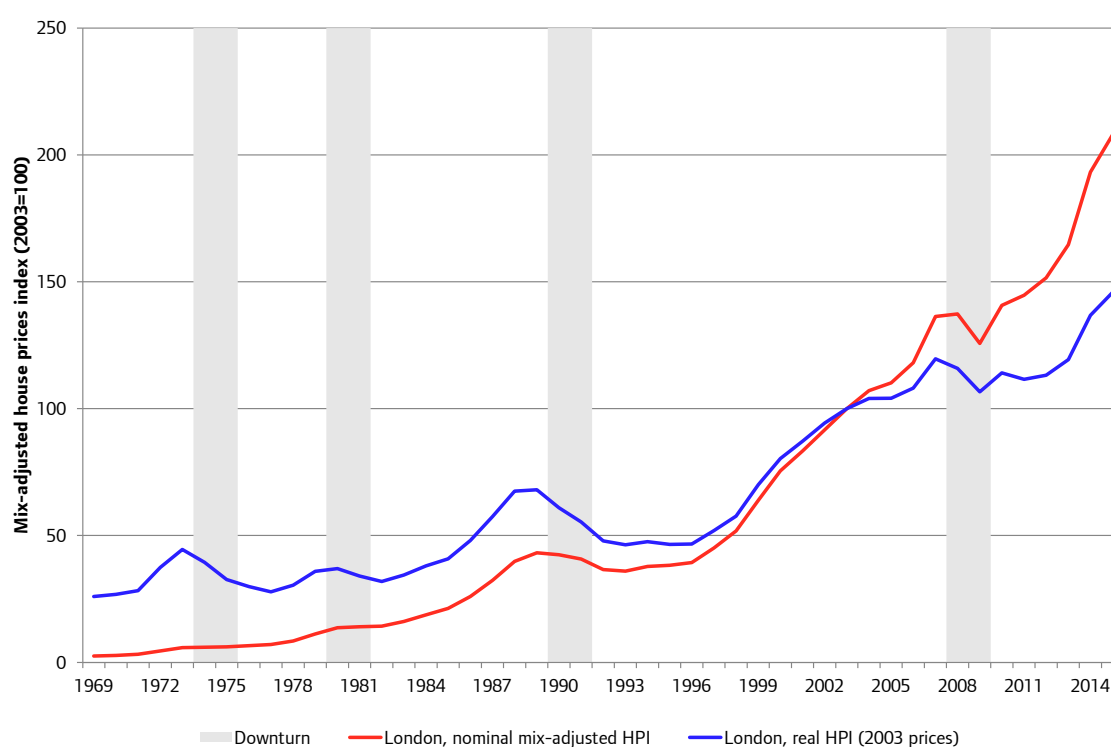
Figure 4.10: Private housing rental price index, London and England (excluding London) January 2005 – June 2016



Source: ONS, Index of Private Rental Prices, Notes: Index level, January 2005 = 100, not seasonally adjusted.

4.6.2 House prices and the business cycle

Over a longer-time horizon, housing markets in London have witnessed a number of ups and downs, with volatile house prices in London tending to amplify changes in national house prices. Although falls in the actual (nominal) value of the average home are relatively rare, London has experienced several episodes of real house price deflation since the ONS data series began in 1969. From the patterns of previous cycles, no clear trends can be observed from price data alone that suggest whether London house prices are approaching a new peak, and whether this will entail a levelling off, or a more exceptional downward adjustment.

Figure 4.11: Nominal and real house price levels in London and the business cycle, 1969-2015

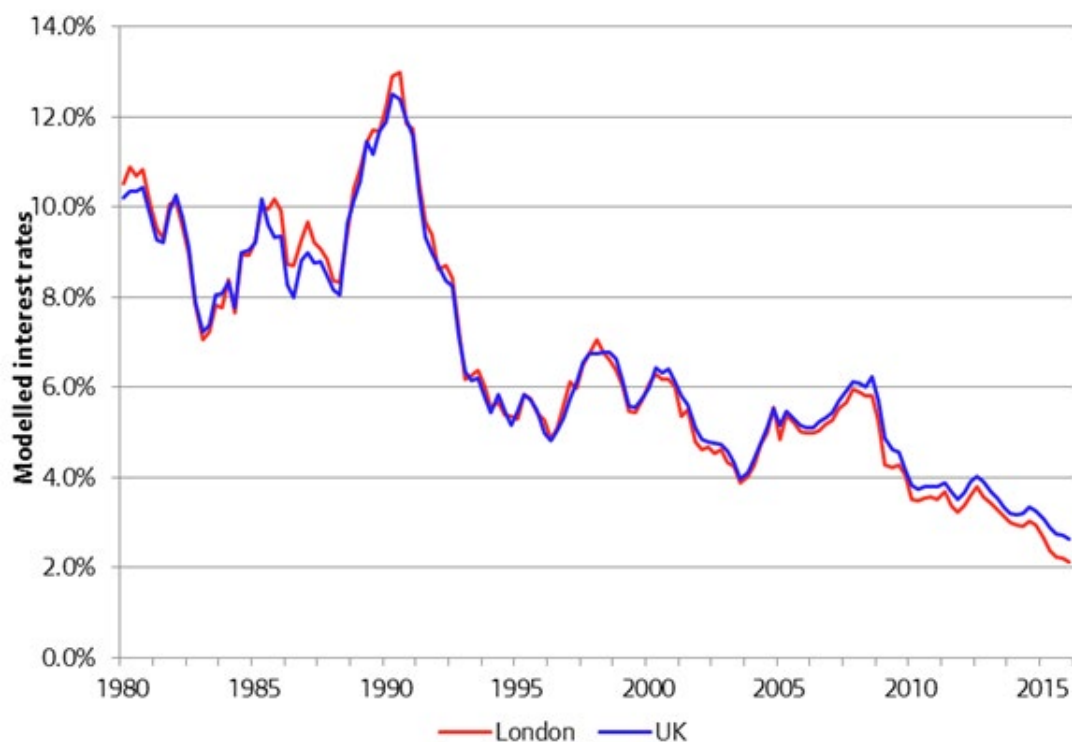
Source: ONS House Price Index reference table 33

4.6.3 Drivers of demand for housing

London is a particularly desirable place to live and work, with people attracted to the city for a number of reasons including the variety of career opportunities, the openness to different cultures, as well as the vast array of leisure and cultural offerings (see Chapter 5). In economic terms, effective demand is this desire backed up by an ability to pay. Important factors in driving demand therefore include changes in incomes, access to credit and the cost of mortgages.

In terms of income, evidence suggests that the 'income elasticity of demand' for housing in the UK is positive, meaning that market demand for housing does indeed grow as people become better off. In certain highly desirable London sub-markets and for specific types of home, it is possible that demand for housing is particularly sensitive to changes in incomes. Research by Cheshire and Sheppard³⁴, for example, finds evidence that the demand for housing space (both the internal space and garden space) increases at around twice the rate of increases in household incomes. In the past two decades, workers' median earnings in London have increased by an average of 3.8 per cent, compared to a 9.8 per cent annual increase in the price paid for housing. Measures of the affordability of housing are considered in Chapter 10.

Borrowing costs for home buyers are also important – and these costs are at historically low levels. Figure 4.12 shows that interest rates on regulated mortgages secured on properties in London were 2.1 per cent in the first quarter of 2016, down from an estimated high of 13.0 per cent in 1990. Such historically low mortgage interest rates have reduced the nominal debt repayment burden and increased households' borrowing power. It is also notable that while Bank of England base rates have been set at 0.5 per cent for most of the period since March 2009, the average mortgage interest rate faced by homebuyers has fallen by around 2 percentage points in this period.

Figure 4.12: Mortgage interest rates in London and the UK, 1980-2015

Source: Greater London Authority, *An Economic Analysis of London's Housing Market* (November 2015), updated using revised data from the Council for Mortgage Lenders to Q1 2016.

A 2005 OECD paper³⁵ suggested that financial deregulation since the 1980s and more recent lending innovations (such as offset mortgages which allow borrowers to offset their savings against the mortgage balance) have significantly reduced household costs of borrowing³⁶. The relaxation of borrowing constraints, and the reduced cost of mortgages, in turn may have positively fed back to house prices.

It has also been argued that two other changes in London's housing markets, related to the use of property as an investment, have fed into overall increases in house prices: increasing foreign ownership of housing, and growth in the buy-to-let market.

There is limited available evidence quantifying the exact impact on house prices of these two factors. Indeed, although increasingly supported by buy-to-let mortgages – and so, arguably, a recent addition to credit markets – the share of the private rental market in London remains lower than it was in the 1960s and 1970s. However, it is arguable that the strong long-run performance of London housing relative to alternative investments may have contributed to London's housing stock being increasingly seen as a vehicle in which to hold money, acting as a possible further incentive towards property ownership.

Similarly, with regard to foreign ownership, there is also little available evidence on the exact quantitative impact on house prices in London overall. While there is no accurate or timely data that tracks foreign investment in residential property in England, industry estimates suggest that foreign demand has been strongest in prime central areas³⁷, and it is therefore in these markets that the impacts are likely to be greatest. However, putting this in the context of all residential property transactions, the Bank of England has estimated that foreign inflows accounted for around only 3 per cent of total property transactions in London³⁸. There is also some evidence to suggest that following the economic crisis, the additional demand for new build properties from overseas may have to some extent lessened the negative impact of credit constraints on construction activity³⁹.

4.7 The supply of homes in London

While the pull factors draw in aspiring home owners from the rest of the UK and overseas, London's population growth is also partly a product of high levels of natural growth in terms of births and deaths associated with its relatively youthful population (see Chapter 8). At its most fundamental level, the overall 'need' for housing in London can therefore be seen as a product of the impacts of these socio-economic and demographic drivers on the size of the capital's population, and trends in the size of households.

4.7.1 Housing London's growing population

While the net supply of homes in London has increased since the turn of the century, this has been accompanied by strong rates of population growth, which has not always been the case. Between 1961 and 1991 London's population decreased by over 1.6 million people, while over the same period the dwelling stock increased by over half a million homes.

More recently, between 1991 and 1998 the housing stock increased by 4.4 per cent, compared to a 3.5 per cent increase in population, adding over 18,000 homes per year while the population increased annually by almost 34,000. This was a period when real house prices were stable, rising on average by 1 per cent per annum. However, between 1998 and 2015 real house prices grew by over 9 per cent per annum. This was a period when increases in population exceeded that of housing supply, with London's population rising by 21.1 per cent at an average of over 93,000 people each year. The rise in the dwelling stock was much lower, increasing at an average of just over 24,000 homes a year, a total increase of 12.7 per cent over the period.

For growth of the dwelling stock to have kept pace with population growth over this period, over 250,000 extra homes needed to be added to the housing stock – an average of almost 16,000 each year – on top of the 24,000 per year that were added during this period. As the supply of additional homes did not keep pace with demand, the number of people per dwelling increased from 2.32 in 1998 to 2.49 in 2014.

Looking forward, GLA population projections show that between 2014 and 2041 London's population is projected to increase by between 72,600 (long-term migration assumptions) and 87,100 people per year (short-term migration assumptions). The total rise in population projected is between 23.0 per cent and 27.5 per cent – an aggregate increase of between 1.96 million and 2.35 million people⁴⁰. According to the Strategic Housing Market Assessment, it is projected that London requires around 49,000 new homes each year between 2015 and 2035⁴¹, due to rapid population growth and the existing backlog of need. This is 63 per cent more than the 30,000 homes that were added to London's total housing supply in 2014⁴². These estimates reflect an expectation that household formation rates will fall to levels similar to the 1990s, with an average household size of 2.34 projected by 2035. This change is driven by a population that is expected to become older, which will result in the formation of smaller households.

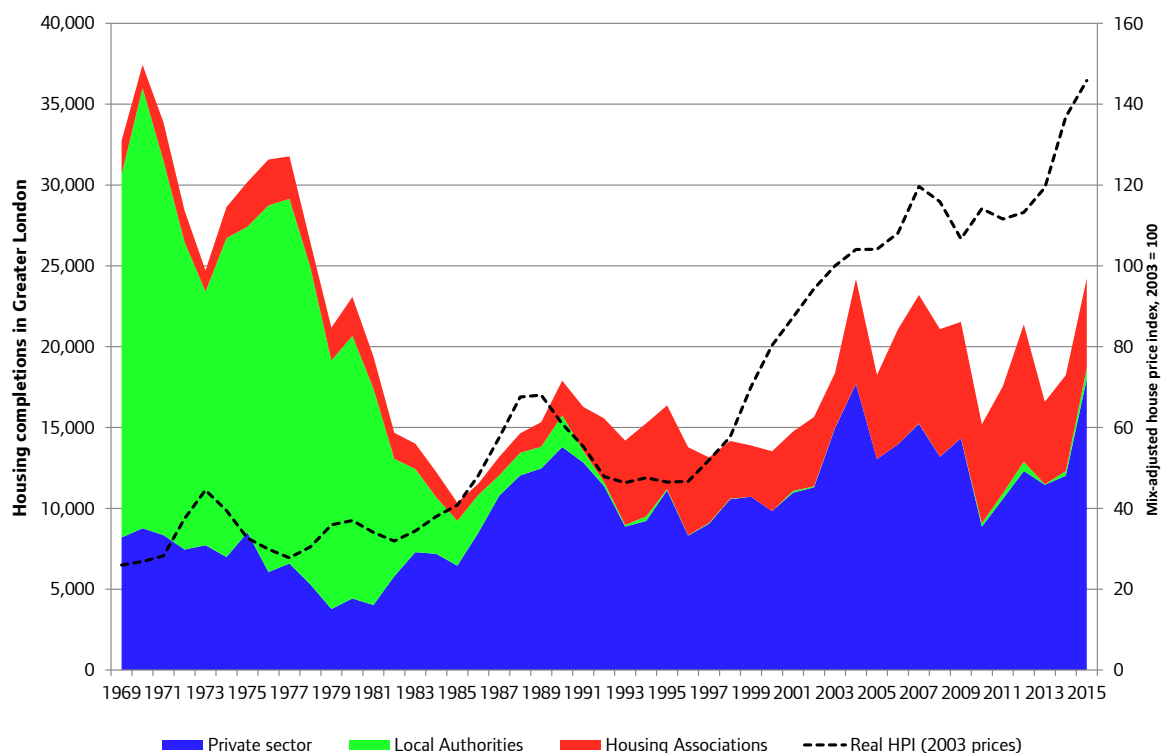
4.7.2 House building in response to higher prices

In a well-functioning housing market, rising prices act as a signal of increased demand in London, and will be met, to the extent possible, with an increase in the quantity of housing supplied; as the value of land rises there is an incentive to build on it or, if the land is already occupied, to increase the intensity of its use. The housing market is however imperfect and evidence suggests that housing supply and construction activity are either slow or unable to respond.

While house building has tended to fall following a drop in house prices, there is not always a corresponding increase during periods of rising prices. Although modest increases in the supply of private completed houses did however take place at the time of the previous two house price booms in the late 1980s and early 2000s, the levels of house-building in London have not kept pace with changes in house prices or the population.

As a result, gross house building levels in London have remained stubbornly below the levels seen in the 1970s, at which time the majority of new builds were developed by the public sector (see Figure 4.13).

Figure 4.13: New house building and house prices in London, 1969-2015



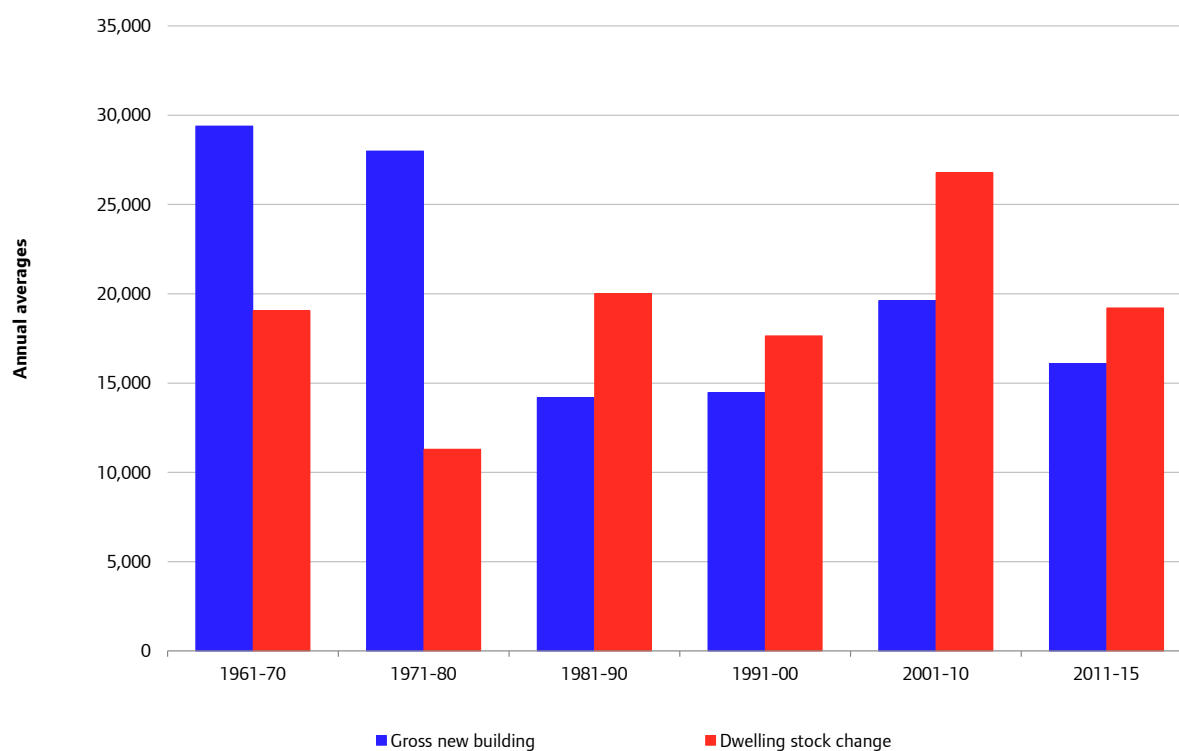
Sources: 1969 to 1989 data provided to GLA by DCLG; 1990-2015: DCLG house building statistics tables 217, 255 and 255a. ONS mix-adjusted house price index reference table 33.

This construction data however only applies to new buildings (in effect, a gross measure) and does not take account of other possible changes to the dwelling stock as a result of conversions, changes of use and/or demolitions.

In each of the last five years for which data are available, overall net changes were 6 to 11 per cent higher than the number of new builds in London alone, adding almost 10,000 additional dwellings to the overall housing stock⁴³.

This notwithstanding, new build remains the primary driver of an increasing housing stock and the additional 10 per cent increase realised from conversions and other changes is still far from being responsive to the levels that recent trends in house prices would suggest are necessary to meet demand.

Looking back over a longer time period, Census estimates of the number of dwellings allow us to infer the net change across each decade. Figure 4.14 suggests that in contrast to recent trends, net additions to the housing stock were considerably less than gross levels of new building in the 1960s and 1970s. This is consistent with many of the new buildings at the time simply replacing existing stock following slum clearances and other post-war demolitions. On an annual average basis, gross new builds and net additions to the housing stock have been slightly lower in the four years between 2011 and 2015 than in the previous decade, at a time of rising house prices.

Figure 4.14: Gross new house building and change in dwelling stock in London, annual averages

Sources: DCLG house building statistics, and Census data from 1961 to 2011

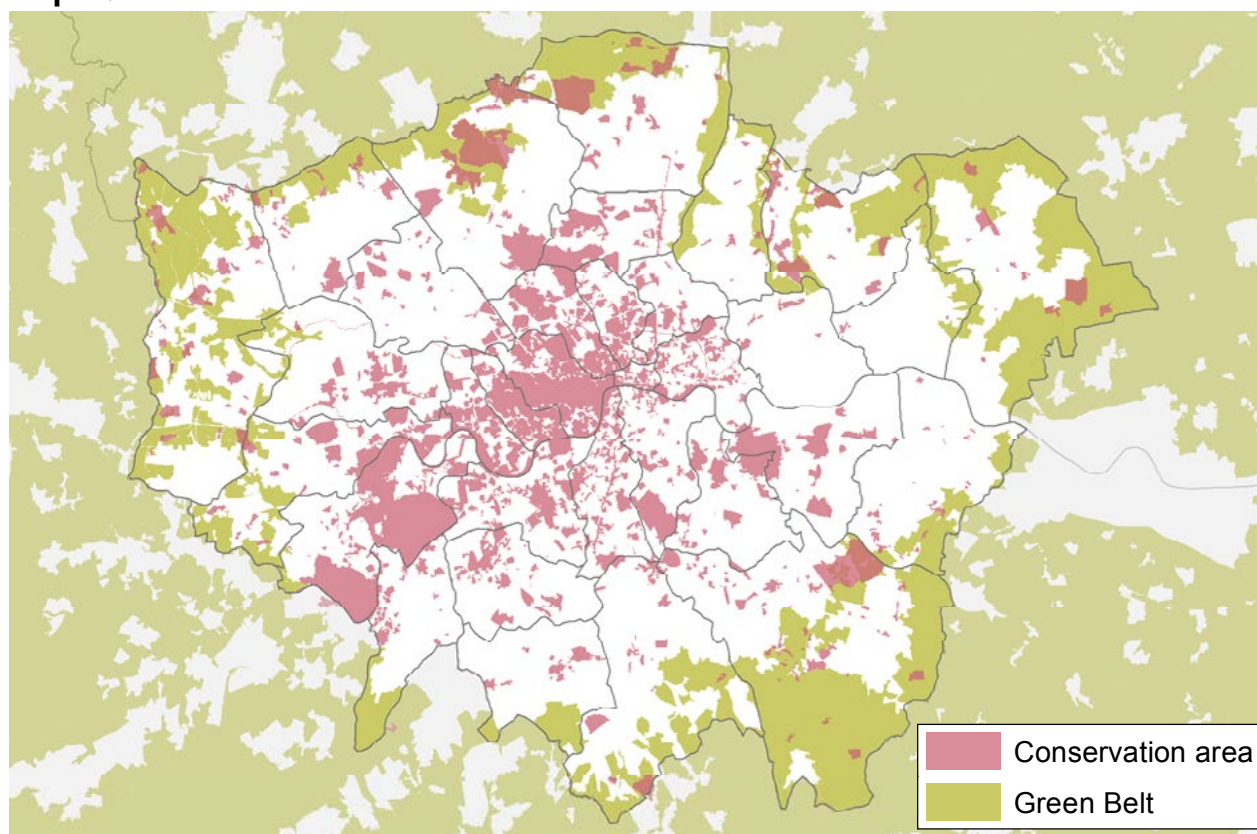
4.7.3 Market frictions and physical constraints on housing supply

A number of possible market frictions and inefficiencies have been put forward in the literature to explain why housing is slow to respond to market signals⁴⁴. These include: difficulties for house-builders to access commercial finance; risk aversion or perverse incentives that lead to stock-piling of land; shortages of staff and construction materials; as well as imperfect competition in the market for residential development (relative to other land uses).

One of the most commonly cited constraints in the literature is the planning system and the view that it restricts the supply of land thereby inflating prices. The 1947 Town and Country Planning Act introduced a requirement on local authorities to develop forward looking policy documents which exist today as Local Plans. Local Plans outline what kind of development is permitted where and identify restrictions on development such as Conservation Areas and Green Belt designations⁴⁵. Local Planning Authorities have a duty 'to ensure that their Local Plan meets the full, objectively assessed needs for market and affordable housing in the housing market area, as far as is consistent with the policies set out in this National Planning Policy Framework, including identifying key sites which are critical to the delivery of the housing strategy over the plan period'⁴⁶.

The first conservation areas in London were designated in 1967 and there are now over a thousand in total. An estimated 15 per cent of the land in London is within a designated conservation area, a proportion which ranges from one per cent in Barking and Dagenham to 72 per cent in Kensington and Chelsea and 77 per cent in Westminster.

Twenty-two per cent of London's land (341 km²) lies within the metropolitan Green Belt, only a small amount of which overlaps conservation areas. While 14 boroughs have no Green Belt land, in Havering and Bromley the Green Belt comprises just over half of the total land area⁴⁷. Ninety-four per cent of the metropolitan Green Belt lies outside of London.

Map 4.7: London conservation areas and Green Belt

Source: English Heritage, Conservation area boundaries provided to GLA

It is necessary to weigh up the costs and benefits of any such restrictions in order to assess whether the (often intangible) value of protections in terms of amenity benefits (and the offsetting disamenities) are worth the additional monetary costs that result from the upward pressure that this places on the price of land. In the case of protected green areas, in line with the ‘theory of the commons’⁴⁸, Helm argues that it may be necessary to consider the system benefits and the value of the natural capital endowments as a whole, as well as the potential benefits that could be derived if greater efforts were made to maximise the value of green space by, for example, increasing their amenity value by improving public access⁴⁹. See Chapter 7 for more on this issue.

A range of evidence exists which looks into the role of planning constraints on land prices. In the case of commercial property, analysis by academics at the London School of Economics⁵⁰ finds that regulatory limits on the height and density of buildings in the West End inflate the price of office space by an estimated 800 per cent, compared to a comparable price effect of around 300 per cent in Paris and Milan.

Similarly, in an assessment of the determinants of house prices in England, Hilber and Vermeulen⁵¹ estimated that around 35 per cent of the price of a house in England is directly attributable to the regulatory restrictiveness of land use planning in that area. This was measured by the average refusal rate of major residential projects which the authors find to be highest in London and the South East.

In a separate paper on the relationship between planning and housing, Hilber (2012)⁵² however notes that house prices in London would still be fairly high by world standards even “...if the planning system was reformed and various regulatory constraints relaxed. Moreover, such reforms would be likely only to lower price pressures gradually and over longer time periods”. This is because the supply (or flow) of new homes in any period will only have a marginal effect on the overall supply (or stock) of homes available.

Data on planning permission approvals also shows that the slow pace of house building is not only a question of planning restrictions. Typically, planning approvals are given for roughly 1.5 to 2 times the actual number of homes finally built, and this gap has been broadly consistent over the past 10 years – so although the level of approvals indicate a capacity for more homes, something else is preventing these from actually being built.

In interviews with the firms behind London planning permissions in 2014, Molior finds that whilst funding is no longer a widespread issue, shortages of staff and materials may be delaying activity⁵³. In a 2012 report, Molior⁵⁴ highlighted that 45 per cent of schemes of 20 or more private homes in the Greater London area were in the control of firms that were not builders, although a 2014 update showed that this had since been reduced to around 30 per cent⁵⁵. The Outer London Commission also highlights concerns with the market for homebuilding, noting that the ‘established business model operated by developers and house builders, [which] requires them to maintain sales values in order to satisfy shareholders and hedge against market risk’ leads to slower build out rates than are otherwise ‘technically’ possible, particularly on very large sites⁵⁶.

4.8 Population density of London

With the constraints on land that exist in London, how efficiently this land is used to meet the demands of a growing population is an issue that currently faces the capital. Increasing the population density would be one way to allow London to house at least some of its growing population within its current boundaries. Whilst population density in inner London is significantly higher than outer London, central London’s population density is lower compared to other global cities. This suggests that there might be scope for London to increase its population density centrally towards that of other major cities, but also in the outer areas of the city by increasing densities towards those of areas in inner London.

4.8.1 The impacts of higher population density

The findings of research into the impact of higher population densities are mixed. A key challenge when identifying the advantages and disadvantages of higher density living is that different people experience the impacts of density in different ways, which results in the findings of the research being very much open to debate. The concentration of population density can have economic, environmental, health and social impacts amongst others, which have been summarised by Boyko and Cooper⁵⁷.

Economic advantages from higher density development include improving a city’s economic efficiency and employment opportunities through agglomeration, thereby increasing productivity levels. According to a study in the USA by Ciccone and Hall⁵⁸ a doubling of employment density increases average labour productivity by around six per cent, promoting the critical mass necessary to support local retail and service areas, whilst transit also becomes more viable and efficient, and existing infrastructure is used more efficiently. This is broadly reflected in cities that have higher levels of agglomeration also tend to have higher GDP per capita and higher productivity levels⁵⁹.

Disadvantages attributed to higher density include greater costs to build and maintain higher density projects, increasing the relative price of dwellings; restricting access to undeveloped land, and negatively impacting the economic development of surrounding rural areas. Increases in traffic congestion are also cited as a disadvantage, whilst some studies have found that the returns from higher density diminish beyond a certain point. The costs of higher densities can exceed the benefits of agglomeration under certain conditions, where there is an under-investment in transport and infrastructure, and insufficient planning, which results in increases in congestion, crowding and pollution (see Chapter 6)⁶⁰.

Benefits for the environment attributed to higher densities can include reducing carbon emissions and pollution due to lower rates of vehicle use, and making better use of natural resources. For example, there is a 10-fold difference in transport related carbon emissions between energy-intensive sprawling cities and compact cities that are more energy efficient⁶¹. The densest areas of London have greater shares of trips made by public transport, walking and cycling, with evidence of a shift away from cars as the means of travel to work in areas experiencing an increase in population density⁶². However, other studies suggest emissions in high density cities are higher overall. One study finds that individuals' desire to travel to distant locations, which alongside increased congestion and travel time associated with higher densities, mean that overall emissions are higher⁶³. Other disadvantages identified in research include exacerbating pollution due to reduced space for trees and shrubs; reducing the capacity to cope with domestic waste and recycling; and using more energy during the construction of high density buildings.

Boyko and Cooper also found in their research that the health benefits from density include increasing exercise by enabling more walkable and bicycle friendly neighbourhoods, whilst other research suggests that higher density living can result in mental health issues. Findings on the social impacts of higher density are also mixed, with research finding that it can significantly improve housing choice, and create a more liveable and sustainable urban environment. However other studies revealed higher densities can lead to cramped living environments, a loss of privacy, increases in noise and nuisance, and contribute to a lower overall sense of community.

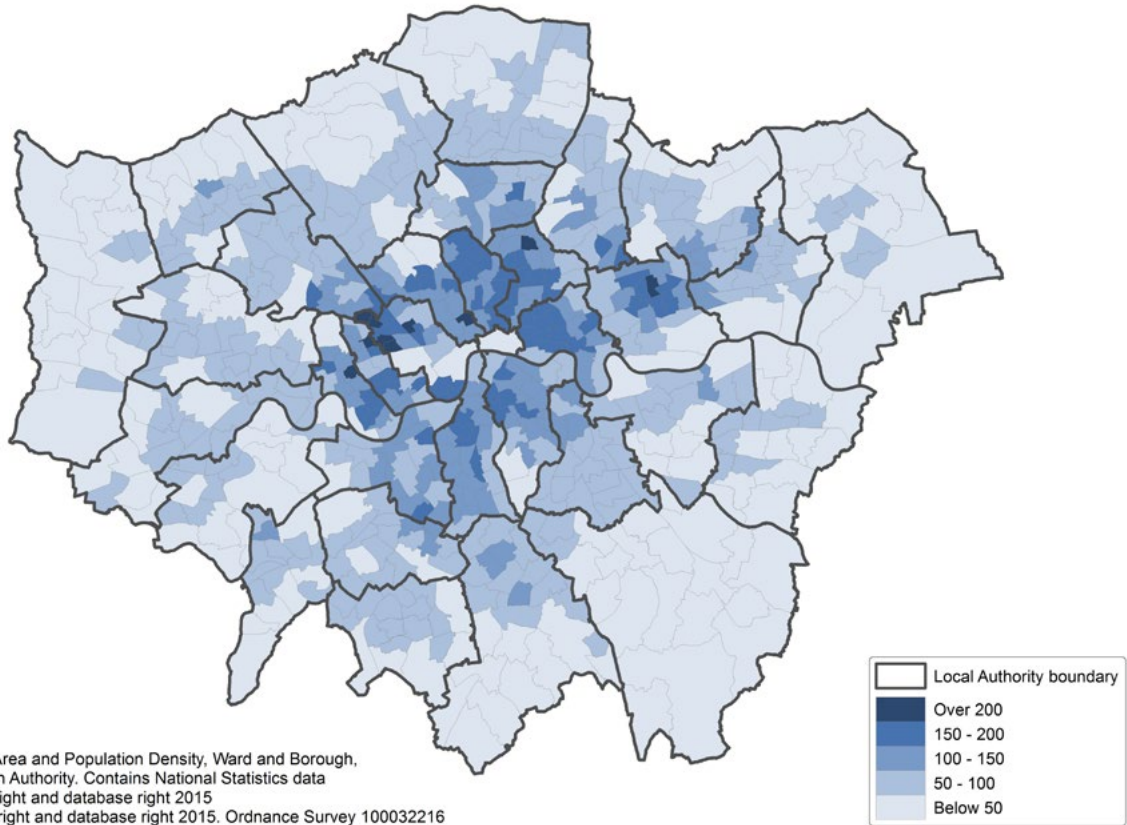
Overall, there is no clear consensus on the costs and benefits that arise from higher densities. This underlines the importance of planning and design when increasing population density. Increases in development density that are well planned and designed can ensure that the benefits from population density are maximised, whilst minimising the costs associated with it.

4.8.2 Current levels of density in London

Overall it is estimated there are 5,510 people per square kilometre in London as a whole, with inner London boroughs more concentrated at 10,773 people per square kilometre, and density even higher in the central London boroughs at 11,565 people per square kilometre⁶⁴. There are some small areas in London which have particularly high population densities. Islington is the borough with the highest population density of 15,118 people per square kilometre, whilst there are five wards in Westminster, and single wards in Newham, Hackney, Kensington and Chelsea, Camden, and Hammersmith and Fulham, that have population densities of over 20,000 people per square kilometre.

In outer London density is much lower with 4,165 people per square kilometre, with the lowest density in Bromley at 2,162 people per square kilometre⁶⁵. Higher population densities in inner London can be attributed to its proximity to higher concentrations of employment, and the historical development of the city when transport was more costly.

Map 4.8: Population density in London, 2015 (person per hectare)

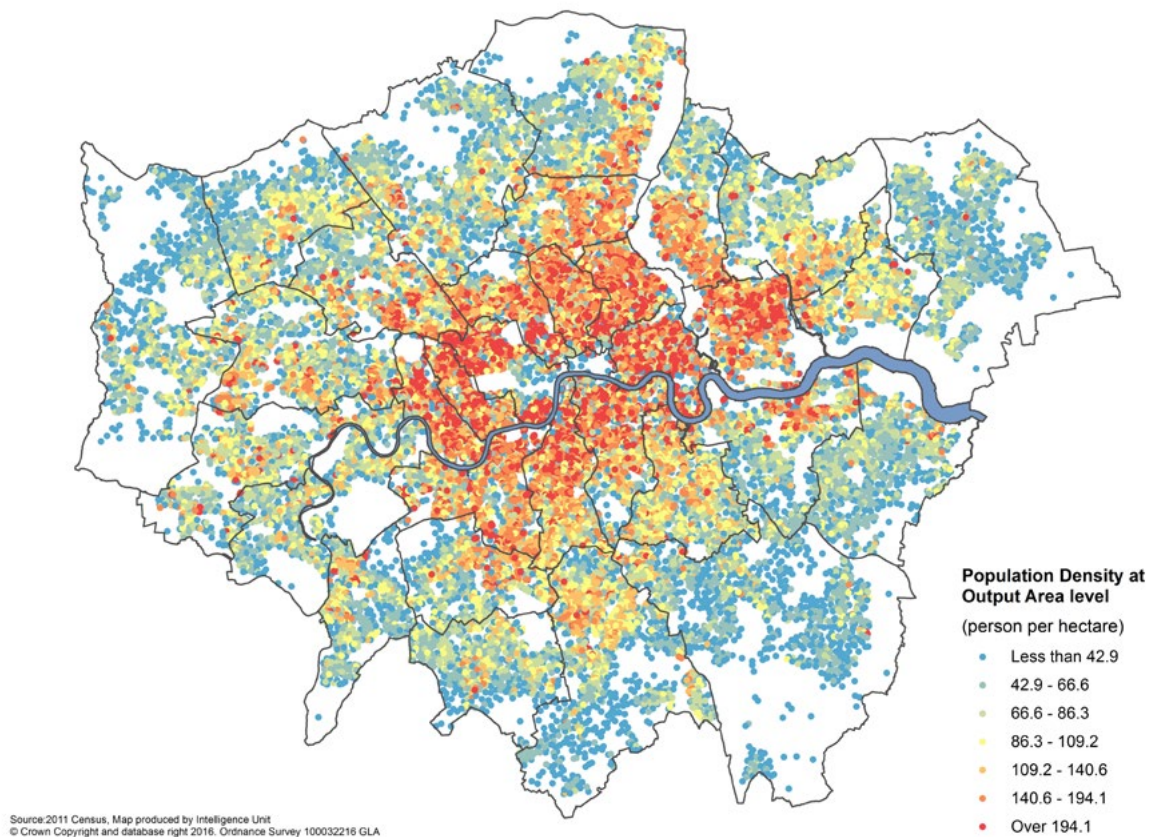


Source: Land Area and Population Density, Ward and Borough, Greater London Authority. Contains National Statistics data
 © Crown copyright and database right 2015
 © Crown Copyright and database right 2015. Ordnance Survey 100032216

Source: Greater London Authority

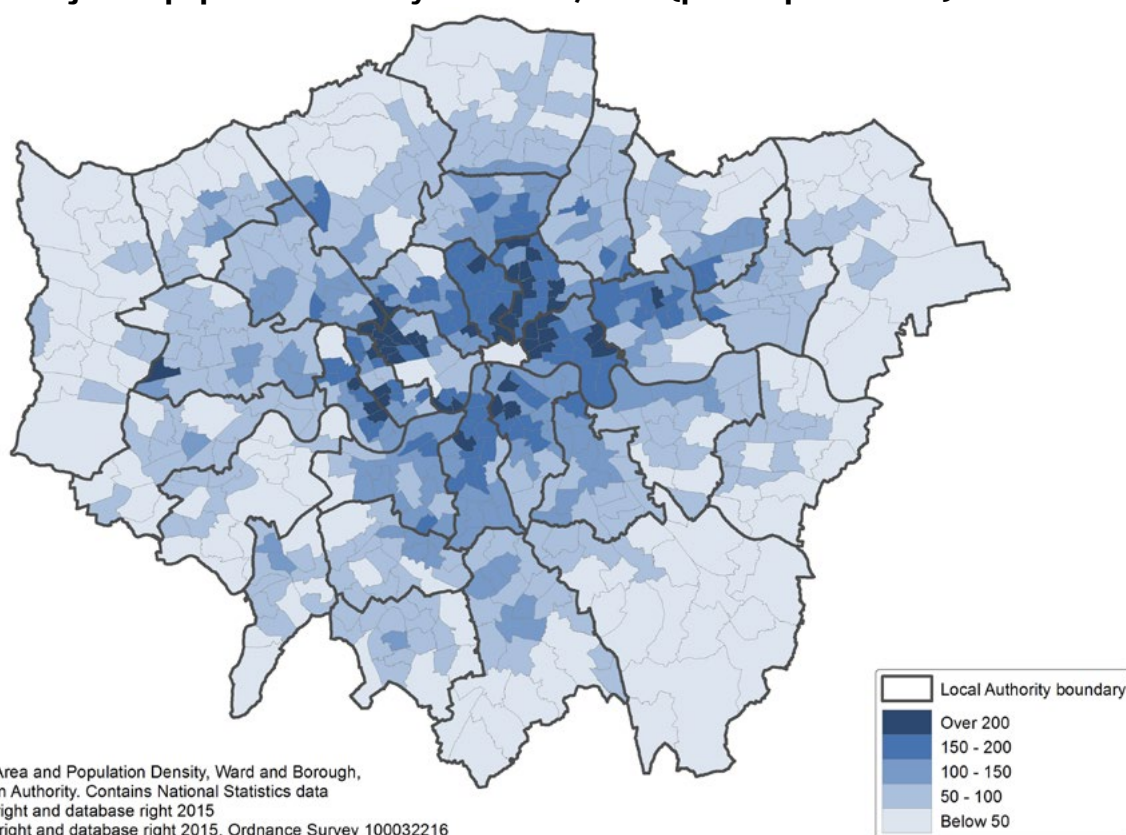
Looking more closely at where Londoners live across different output areas using the 2011 Census, we see those areas of employment land, parks and green space where fewer residents live marked in white. The pattern of higher density of residents in inner London is also clear to see from the concentration of red dots in central areas (Map 4.9).

Map 4.9: Population density in London by output area, 2011



Source: 2011 Census

Current population projections estimate that the total population density of the city will increase to 6,586 people per square kilometre by 2041, a rise of 19.5 per cent. Inner London boroughs are expected to increase in density by 23 per cent, whilst outer London boroughs are projected to increase their density by 17.2 per cent over the next 25 years (Map 4.10).

Map 4.10: Projected population density in London, 2041 (person per hectare)

Source: Greater London Authority

Box 4.1: More Residents/More Jobs?

It often makes sense to think about demographic and employment trends separately. Population increase is affected by birth and death rates and by migration patterns, all of which are only indirectly the result of economic pressures. Jobs, however, are the result of business investment, public spending and economic opportunities which may not have much to do with population trends.

However, some important dynamics are missing from this brief summary. It is obvious that where there are more residents there will be more employment opportunities, to cover greater demand for health centres to gyms to schools to estate agents etc.; so more economic activity is associated with areas with more people. Moreover, local residents setting up in business may prefer to establish their business near their home, even if their customers are in a different part of the country (or abroad).

Identifying the job-population association is a complicated task. A prescriptive approach (e.g. how many estate agents a residential development will require) should, arguably, be avoided. Furthermore, the approach needs to capture investments by residents that are not for local consumption.

Impact assessment studies for residential and commercial developments can often be used to estimate changes to employment and population levels in the local area. This will typically be based on the ratio of employment to population in the surrounding region, a method that works better for discrete and well defined smaller urban areas, than for London.

Therefore, due to the size and nature of London, levels of both public transport and highway accessibility influence the location of employment and population. Most London workers expect to commute to work; principally by either car or public transport⁶⁶.

Recent research by GLA Economics⁶⁷ has examined this issue in detail and finds the following:

Areas within London with low levels of accessibility exhibit a strong relationship between employment and population density. These predominantly outer London areas have a higher proportion of employment that serves the local population.

For areas of high public transport accessibility, above 0.7 million people, the relationship between population density and employment density breaks down. Here instead, accessibility itself becomes a stronger determinant of employment density. In these areas of high accessibility, a lower proportion of employment exists to serve the local population. In its place, more specialised and higher paid employment is found, access for which is predominantly gained by public transport.

Despite finding a significant relationship for areas of London with low public transport accessibility, there is still a large margin of variation around the employment to population density ratio.

Nevertheless, there is reasonable evidence to suggest that land turned over for housing in areas of low transport accessibility could be associated with employment growth in the local economy. Taking the coefficient of employment density regressed alone on population density in areas of low accessibility, it can be deduced that an increase to the resident population of 1,000 will on average have the potential to give rise to a further 171 jobs in the locality.

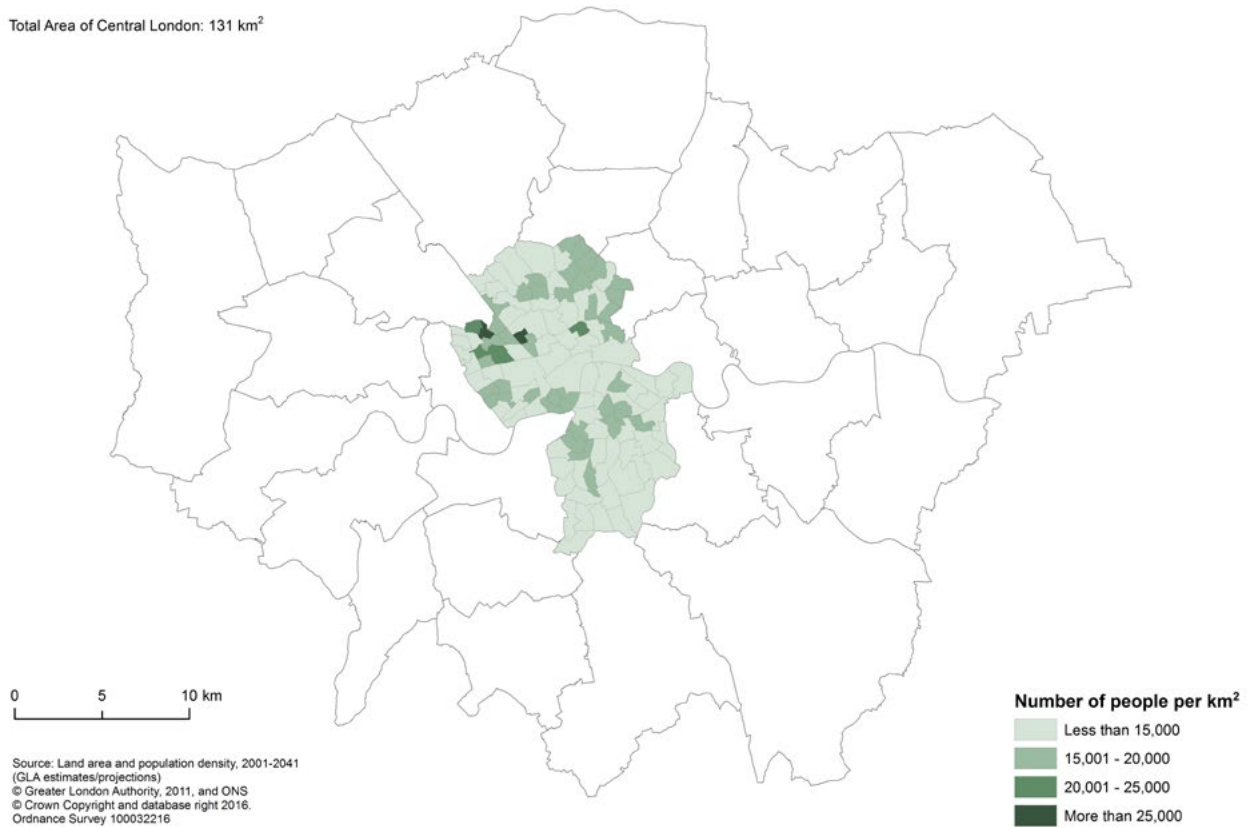
4.8.3 Density of London compared to other cities

Given the projections of higher population density in London, it is useful to analyse how current densities compare to other cities. Three other 'global' cities – Paris, New York, and Tokyo – have been chosen for this comparison.

Overall, Tokyo has the highest population density of the four cities with over 6,000 people per square kilometre. London is second, followed by Paris and then New York based on the wider definitions of these city boundaries. Looking at the central areas of these cities however, the population density of central Paris is 1.8 times that of central London. In New York, Manhattan and the Bronx are 1.6 times the density, while the central wards of Tokyo are 1.4 times dense, with London having the lowest population density in the central area of all these cities.

Map 4.11: Population densities of central areas in selected global cities: Central London 2015

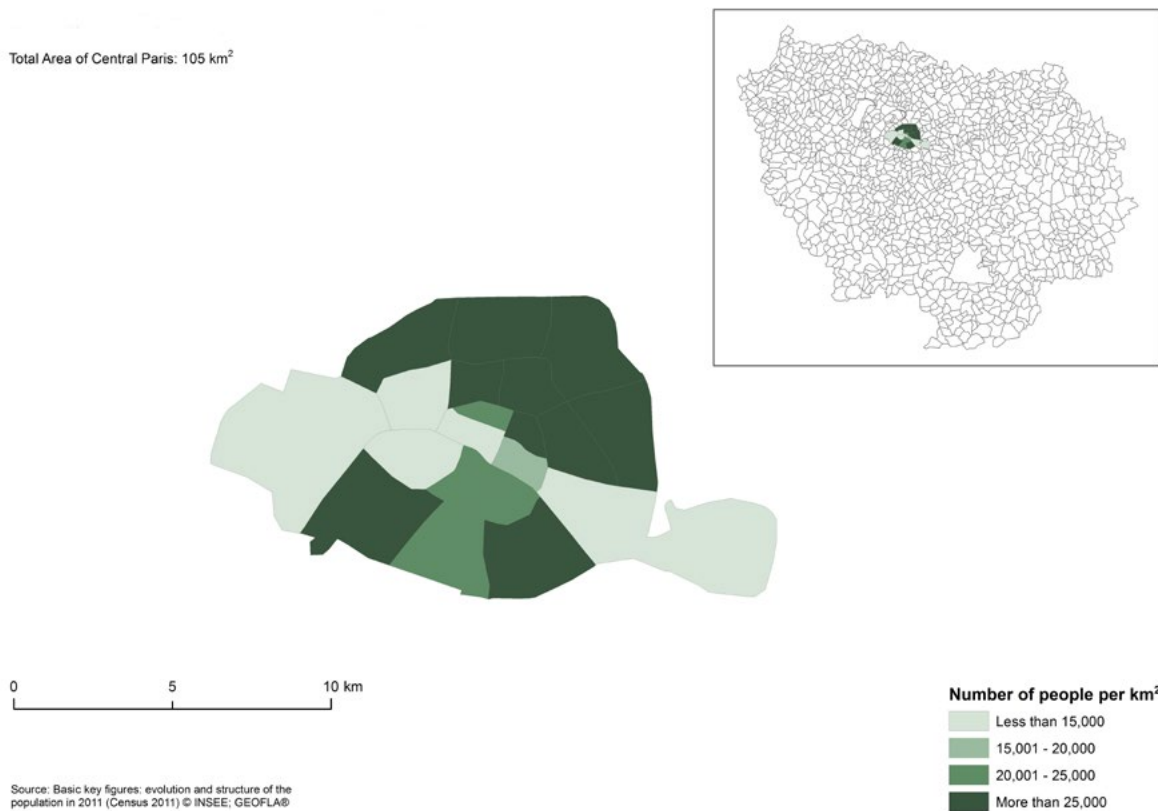
Total Area of Central London: 131 km²



Source: GLA

Map 4.12: Population densities of central areas in selected global cities: Central Paris 2011

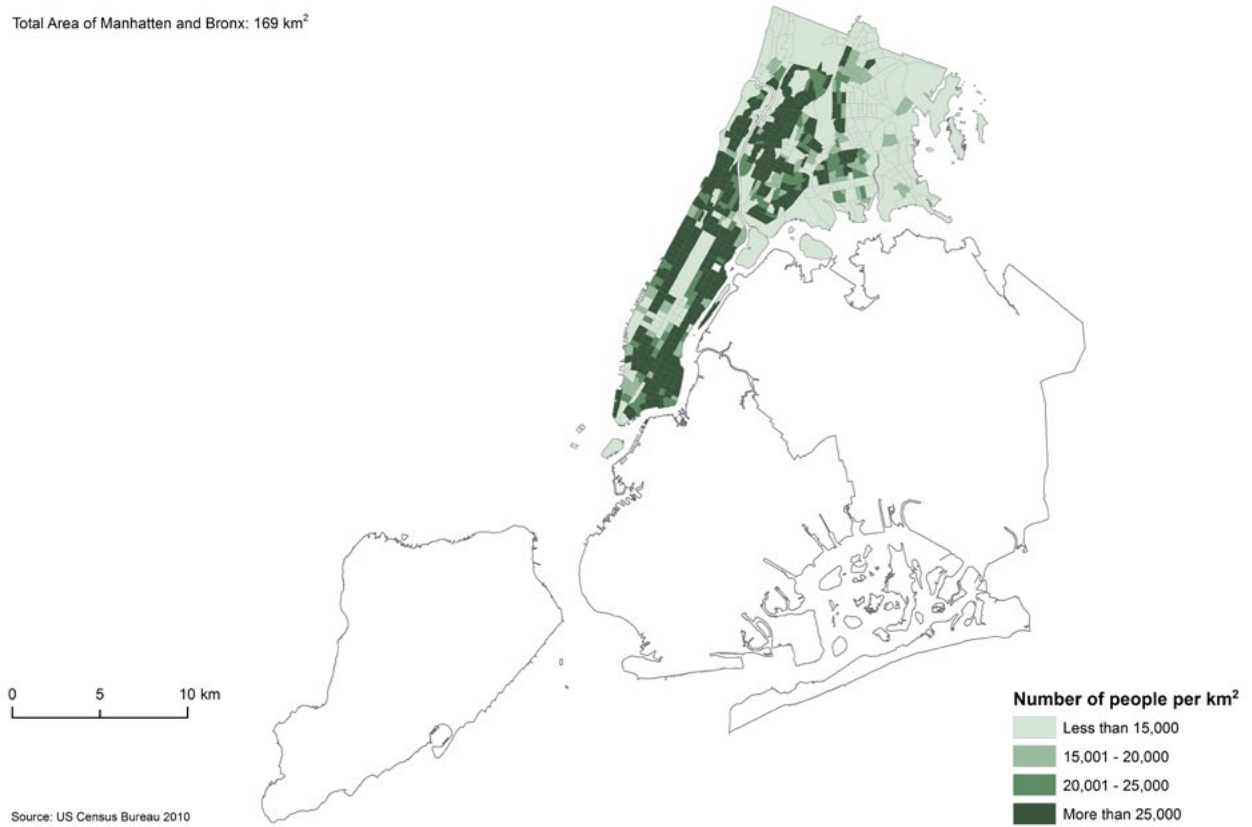
Total Area of Central Paris: 105 km²



Source: Census 2011 by Arrondissement/GLA

Map 4.13: Population densities of central areas in selected global cities: New York 2010

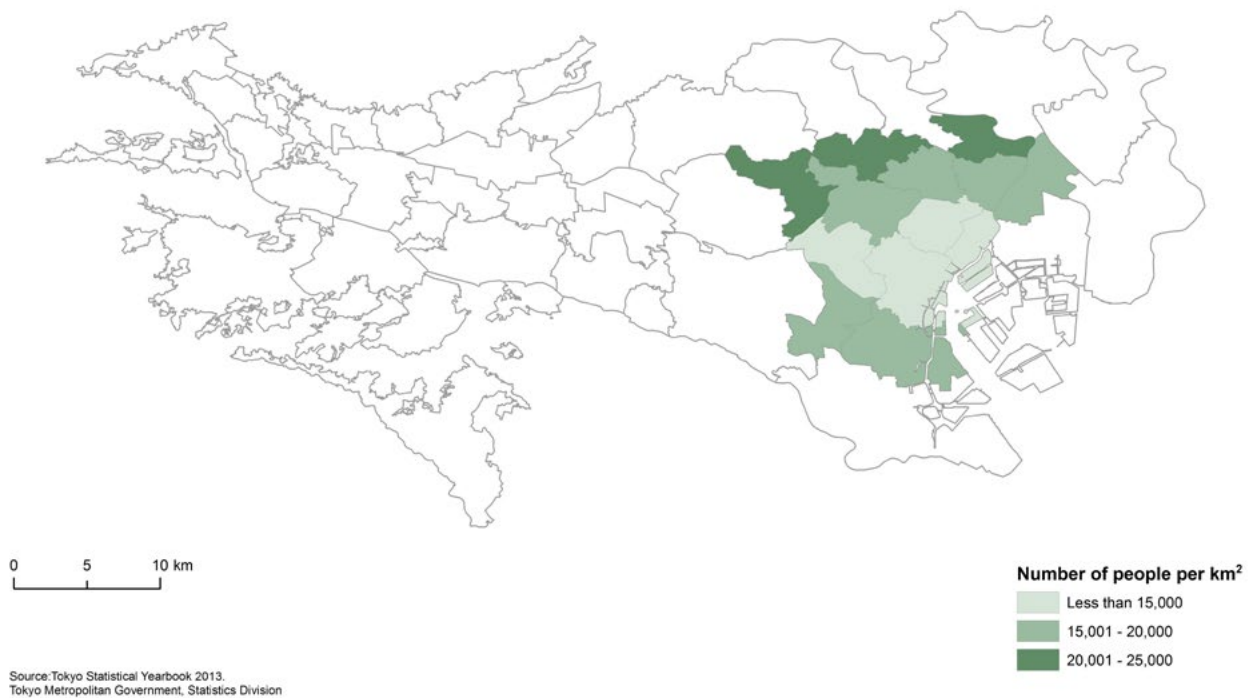
Total Area of Manhattan and Bronx: 169 km²



Source: United States Census Bureau 2010/GLA

Map 4.14: Population densities of central areas in selected global cities: Tokyo 2013

Total Area of Central Tokyo: 187 km²



Source: Tokyo Statistical Yearbook 2013/GLA

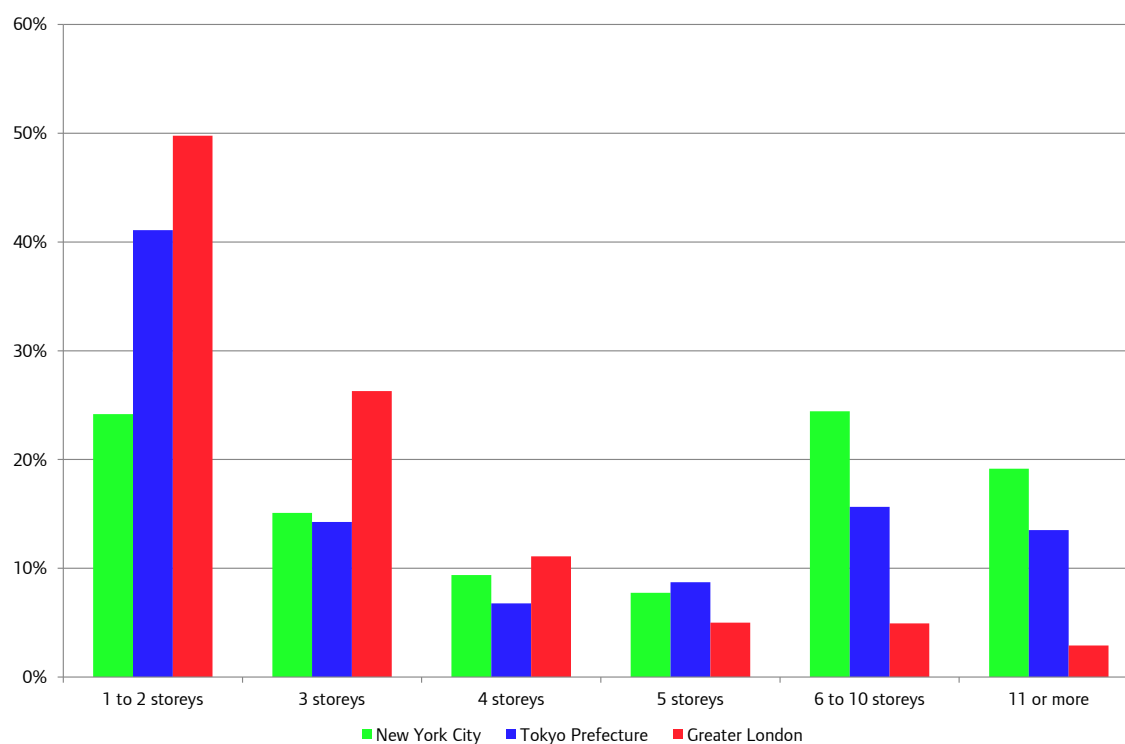
Table 4.8: Density of selected global cities

City	Population (millions)	Area (km ²)	Density (per km ²)
London	8.7	1,597	5,448
<i>Central London</i>	1.5	129	11,565
Paris ⁶⁸	11.9	12,012	991
<i>Central Paris</i> ⁶⁹	2.2	105	21,264
Tokyo	13.5	2,191	6,162
<i>Central Tokyo</i> ⁷⁰	3.1	187	16,533
New York City	8.5	786	10,756
<i>Manhattan and The Bronx</i>	3.1	168	18,300

Source: GLA Estimates, Eurostat, US Census, citypopulation.de

Furthermore, particular areas within the centre of these cities have even higher densities. Manhattan alone has a population density of over 27,000 people per square kilometre, while the Toshima ward in Tokyo has a density of almost 23,000 people per square kilometre. These densities are much higher than the 15,000 people per square kilometre in Islington, suggesting that, by international standards, London has the scope to further increase its population density in the central part of the city.

The relatively low density in central London is reflected in the lower number of tall buildings compared to Tokyo and New York City. In London, three quarters of buildings are three storeys or fewer, compared to 55 per cent in Tokyo and 39 per cent in New York City⁷¹; while buildings of eleven storeys or more are much less common in London, at just 3 per cent, compared to 14 per cent in Tokyo, and 19 per cent in New York City.

Figure 4.15: Building height in selected cities

Sources: English Housing Survey, Japan Housing and Land Survey, New York Housing and Vacancy Survey

Whether or not these tall buildings in London are predominantly residential also has an impact on population density. Whilst London has 15 towers taller than 150 metres, only one of these towers is residential. By contrast, New York has 188 towers of which 66 are residential, and Tokyo has 118 towers of which 46 are residential. However, if all the currently planned towers in London are built, by 2025 it is estimated that London could have 44 towers, of which 25 would be residential⁷².

Moving further out from the centre, New York City has the highest density of the four cities at 8,765 people per square kilometre, followed by London with a density of 4,165. This is higher than the Tama area in Tokyo by around 15 per cent, but around eight times the density of outer Paris. However, geographically, London is larger than New York City, but smaller than Tokyo and significantly smaller than Paris. London covers an area of 1,572 square kilometres; Tokyo is 1.4 times this size, Paris over seven times the size. New York City is just half the size of London, but the wider New York Metropolitan area, which expands beyond New York City, is much larger covering over 30,000 square kilometres and is home to over 22 million people, at a much lower overall population density than New York City itself.

Comparing the density of London to other global cities, London's population density of almost 5,500 people per square kilometre is above that of Berlin (3,900/sq.km), Shanghai (3,800/sq.km) and Dubai (600/sq.km) but below that of Hong Kong (6,500/sq.km) and Singapore (7,600/sq.km).

Table 4.9: Population density of other global cities

City	Definition	Population ⁷³ (millions)	Area (km ²)	Density (per km ²)
London	London NUTS 1 region	8.7	1,597	5,448
Berlin	Berlin NUTS 1 region	3.5	892	3,924
Dubai	Emirate of Dubai	2.4	3,885	618
Singapore	State of Singapore	5.5	719	7,650
Hong Kong	Hong Kong SAR	7.2	1,104	6,522
Shanghai	Shanghai province	24.2	6,334	3,821

Source: GLA Intelligence⁷⁴, Statistik Berlin-Brandenburg, SingStat, HK Census and Statistics Department, National Bureau of Statistics of China, Dubai Statistics Centre

Another manner in which to consider the density of the city is by measuring its population weighted density. This attempts to measure the density at which the average resident lives, rather than dividing the total population by the entire city area, by using a weighted average of parcels of land based on their population. Based on this measure, compared to other cities in Europe, London has a population density of around 80 people per hectare, similar to that of Berlin with 83 people per hectare, and lower than Madrid (186 people per hectare), Paris (133 people per hectare) and Rome (89 people per hectare). Of the cities measured in Europe, Barcelona had the highest density of 246 people per hectare⁷⁵.

4.8.4 Capacity of the existing stock

Another potential way to house the growing population of London would be to increase the use of the existing housing stock. There were 3.27 million households in London at the time of the last Census in March 2011. Of this number, 1.62 million (49.5 per cent) were owner occupied including those with a mortgage and shared ownership, and 1.65 million (50.5 per cent) were rented⁷⁶. Owner occupied homes however tend to have more bedrooms per household – with three bedrooms the most common arrangement. Among private and socially rented accommodation, one or two bedroom homes were more common, accounting for 71 per cent of households living in this sector.

For each household, we can subtract the notional, number of bedrooms recommended by the bedroom standard⁷⁷ to house the people living there from the number of bedrooms actually available to derive what is known as a 'bedroom occupancy rating'. This rating could indicate overcrowding or under-occupation within a household as follows:

- Occupancy rating of zero: implies that a household has the precise notional number of bedrooms recommended by the bedroom standard, for the number and composition of people living within the household.
- Occupancy rating of -1 or less: indicates that a household has at least one bedroom too few for the number and composition of people living in the household and is considered 'overcrowded' by the bedroom standard.
- Occupancy rating of +1: indicates that a household has one bedroom more than is recommended for the number and composition of people living in the household.
- Occupancy rating of +2 or more: indicates that a household has two or more bedrooms more than is recommended for the number and composition of people living in the household and is considered 'under-occupied' by the bedroom standard (though this does not necessarily mean that the bedrooms are unused).

Table 4.10 shows that at least 1 in 3 households had two or more spare bedrooms across all English regions and Wales, except for London, where just over 1 in 5 (21.1 per cent) of households were under-occupied. This may partly reflect London's relatively low percentage of owner occupied households (50 per cent), which are more likely to have spare bedrooms⁷⁸. London also had the highest percentage (11.3 per cent) of households that are overcrowded (with an occupancy rating of -1 or less). The relatively higher house prices and rents in London, and higher population density, could encourage more sharing among families and individuals.

Table 4.10 Percentage of households by occupancy rating for bedrooms, 2011

Country/ Region	Occupancy rating (bedrooms) of +2 or more	Occupancy rating (bedrooms) of +1	Occupancy rating (bedrooms) of 0	Occupancy rating (bedrooms) of -1 or less
England and Wales	34.6	34.5	26.4	4.5
North East	33.5	39.3	24.3	2.9
North West	34.5	37.1	24.8	3.6
Yorkshire	35.3	36.9	24.3	3.6
East Midlands	38.8	36.1	22.0	3.1
West Midlands	36.0	34.5	25.1	4.5
East of England	37.7	34.5	24.4	3.4
London	21.1	28.3	39.3	11.3
South East	37.1	33.6	25.7	3.6
South West	38.7	34.7	23.9	2.8
Wales	39.8	35.5	21.7	2.9

Source: ONS 2011 Census. Note: some rows do not sum to 100 due to rounding.

Historic trends of this measure of occupancy are not available as the 2011 Census was the first to ask questions about the number of bedrooms. Instead, it is possible to identify whether households have more than one person per room (including bedrooms, kitchens and living rooms but not bathrooms, toilets, storage rooms, halls or landings). By this measure, around a quarter of households in London were overcrowded in 1931, falling to 4 per cent in 1991. It then rose to 6 per cent in 2011, compared to 1.5 per cent in the rest of England⁷⁹. This suggests that while overcrowding rates are rising in London, they remain far below the levels seen in previous decades.

In terms of long-term trends in under-occupation, in a recent book Dorling⁸⁰ presents analysis that suggests that the ratio of people to rooms across England as a whole has ‘never been lower’. Looking at data on households with less than or equal to 0.5 rooms per person from the Census data, it shows that 58 per cent of London households were under-occupied by this measure in 2011, down from 63 per cent in 2001, and compared to a figure of 71 per cent for England as a whole.

4.8.4.1 Overcrowding

The English Housing Survey can provide further estimates and more detailed information on overcrowding in London. This shows that around three-quarters of the increase in overcrowding seen in recent years was in the private rented sector. This is consistent with the expected behavioural response to the undersupply of homes and increased cost of housing over this period (seen earlier in this chapter). It may also partly result from the increases in international migrants from poorer countries between 2001 and 2011, who tend to live at much higher densities in terms of people per room⁸¹.

The English Housing Survey data presented in table 4.11 gives the breakdown of overcrowding by tenure and the age of the household reference person (HRP), which replaced the traditional concept of the ‘head of the household’ in 2001. This shows that young people in rented households are most likely to be among the roughly 254,000 households that are defined as overcrowded.

Table 4.11: Percentage of households with overcrowding by age of HRP and tenure

Age of household reference person	Own with mortgage	Own outright	Private renter	Rent from local authority	Rent from housing association	Total
16-24	0%	0%	9%	37%	11%	12%
25-34	4%	9%	11%	18%	13%	10%
35-44	4%	7%	15%	22%	21%	12%
45-54	5%	4%	8%	13%	14%	8%
55-64	4%	3%	4%	6%	7%	4%
65 or over	2%	1%	3%	3%	2%	1%
Total	4%	2%	11%	14%	12%	8%

Source: English Housing Survey, three-year average 2012/13 to 2014/15

4.8.4.2 Under-occupation

Based on the three-year averages from the English Housing Survey⁸², there are an estimated 791,000 households defined as under-occupying in London, equivalent to 24 per cent of all households in the capital. In contrast to the incidence of overcrowding seen above, Table 4.12 shows that under-occupation is concentrated among households that are older, and which own their home.

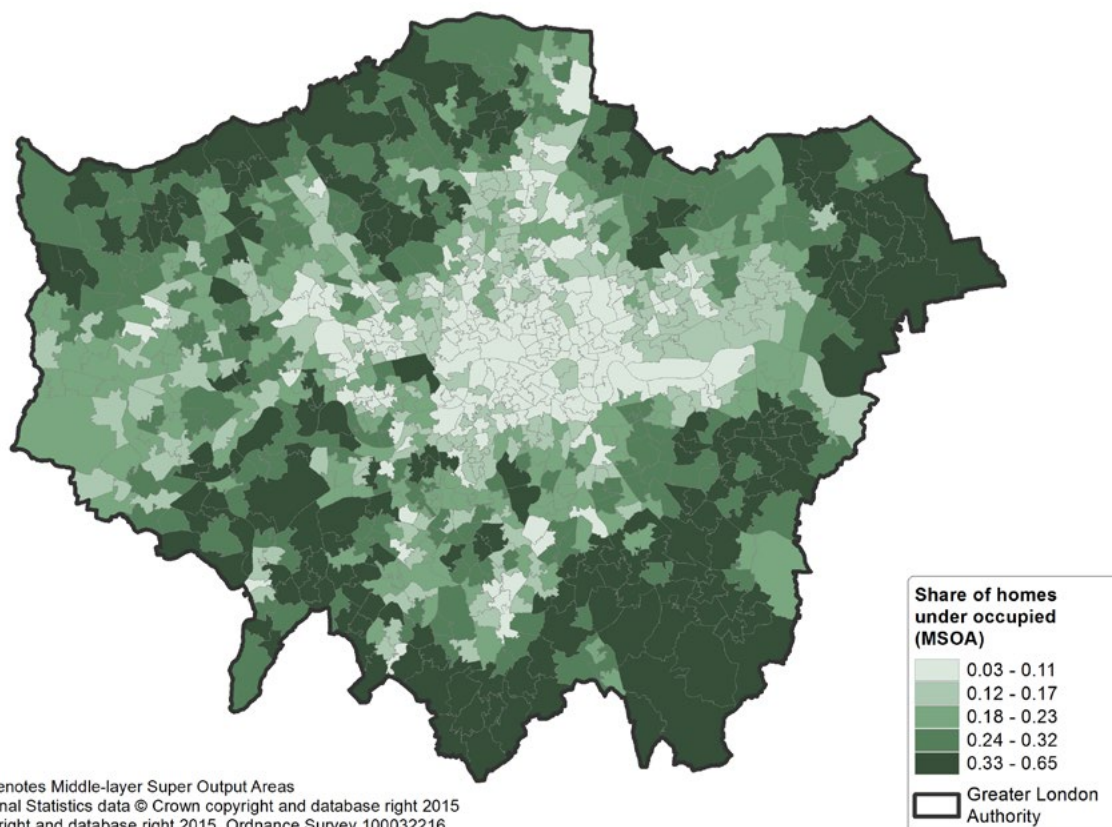
Table 4.12: Percentage of households with under-occupation by age of HRP and tenure

Age of household reference person	Own with mortgage	Own outright	Private renter	Rent from local authority	Rent from housing association	Total
16-24	22%	0%	4%	3%	2%	4%
25-34	20%	26%	3%	0%	3%	7%
35-44	24%	38%	6%	3%	0%	14%
45-54	31%	46%	18%	4%	6%	23%
55-64	37%	53%	13%	19%	13%	36%
65 or over	63%	62%	33%	17%	18%	50%
Total	29%	55%	8%	8%	7%	24%

Source: English Housing Survey, three-year average 2012/13 to 2014/15

Map 4.15 uses the 2011 Census data to map patterns of under-occupied homes across London. This shows that under-occupation tends to be more common in outer London areas than it is in inner London, with the outer south-eastern part of the city being where rates of under-occupation are highest. Closer to the city centre, under-occupation appears to be more common in the southern and western parts of the city, compared to the northern and eastern areas which make better utilisation of the existing housing stock. In terms of density, this is important as those areas with lower population densities tend to also underutilise the current housing stock to a greater extent.

Map 4.15: Share of homes under occupied in London



Source: Census 2011

Dorling⁸³ highlights that across England, as people have tried to solve the housing problems themselves, a large number of extensions and extra rooms may have been built – when the family is getting to its maximum size. That the children have since then moved away, he suggests, may be part of the reason why there is now so much under-used stock.

Whilst there are a number of factors that influence how the housing stock is consumed, one consideration is the cost of moving home. Various studies have found that taxes such as Stamp Duty Land Tax can reduce household mobility⁸⁴. Furthermore, characteristics of the current tax system have been found to encourage inefficient use of the housing stock, for example, discounts on council tax that are offered for single occupants, as well as second and empty homes that encourage under-occupation⁸⁵. Well-designed taxes could influence the incentives of under-occupation and encourage a more efficient use of the housing stock.

Chapter 4 endnotes

- 1 ONS mid-year population estimates.
- 2 ONS Workforce Jobs estimates as at March 2016.
- 3 Henderson, J., 2009, 'Cities and Development', Journal of Regional Science, 50th Anniversary issue.
- 4 National planning policy is set out in the National Planning Policy Framework (NPPF) while in London, planning is undertaken at strategic level through the London Plan which cascades down to borough-level Local Plans.
- 5 Tiebout, C. M., 1956, 'A pure theory of local expenditures', The Journal of Political Economy, Vol. 64, No. 5, (Oct., 1956), pp. 416-424, cited in: Fujita and Thisse (2002), "Economics of agglomeration: cities, industrial location and regional growth", Cambridge University Press, May 2002.
- 6 1 hectare = 10,000 square metres, broadly equivalent to the interior area of an Olympic athletics track.
- 7 GLA analysis of GeoInformation Group data. Categories do not necessarily match standard land use categories used in planning due to the source data. The difficulties in categorising land, especially mixed use developments, should be noted here.
- 8 GLA analysis of GeoInformation Group UK Map data.
- 9 Jones, C. and Watkins, C., 2009, 'Housing Markets and Planning Policy', Oxford: Wiley-Blackwell.
- 10 See DCLG, December 2015, '[Land value estimates for policy appraisal](#)'
- 11 See Paul Cheshire's LSE blog post from January 14th 2014, '[Having no public data on land prices is a real problem if we are to make sensible decisions about land release or scarcity](#)'
- 12 AECOM, Cushman & Wakefield, in association with We Made That and Maddison Graphics, March 2016, '[Industrial Land Supply and Economy Study 2015](#)'
- 13 See DCLG, December 2015, '[Land value estimates for policy appraisal](#)'
- 14 AECOM, Cushman & Wakefield, in association with We Made That and Maddison Graphics, March 2016,
- 15 Prime office space here is defined as Grade A office space - new or newly refurbished office space where the building specification includes suspended ceilings and fully accessible raised floors for data/telecommunications cable management, passenger lift and air conditioning facilities.
- 16 Prime industrial is defined here as the 'high' end of industrial rents presented in Table 4.4.
- 17 JLL Research, 2016, '[The Central London Market Report Q4 2015](#)'.
- 18 Prime rents reflect the rents paid at the high end of the market, whilst the occupancy costs include the other costs of renting office space such as business rates.
- 19 BNP Paribas, 2016, '[Central London Office & Retail Market Q1 2016](#)'
- 20 UK retail rents are often expressed as a 'Zone A' per square foot / per square metre. This relates to the established UK method of valuation, 'zoning', which adopts the theory that the front of a shop – the part seen by passers by – is worth more than the rear of a shop. Therefore, a shop with a width of 30ft and depth of 20ft is worth more than a shop with a width of 20ft and depth of 30ft. Both shops in this example comprise the same overall floor area – 600 sq. ft – but by using the zoning method of valuation the shop with the wider frontage is worth more (Source: [BNP Paribas](#)).
- 21 Colliers International, July 2015, 'Midsummer Retail Report 2015'.
- 22 For more on Town Centre Health Checks, see the [London Plan technical and research reports pages](#) of the GLA website.
- 23 These are the 'International' and 'Metropolitan' centres as defined in the London Plan 2011 but there are a large number of other 'Major' and 'District' centres in London.
- 24 JLL, May 2016, '[London Residential Heatmaps 2016](#)'
- 25 Sui generis uses are land uses that do not fall within the typical use classes. Such uses include: betting offices/shops, pay day loan shops, theatres, larger houses in multiple occupation, hostels providing no significant element of care, scrap yards, petrol filling stations and shops selling and/or displaying motor vehicles, retail warehouse clubs, nightclubs, launderettes, taxi businesses, amusement centres and casinos.
- 26 Occupancy levels were known for 804 of the schemes with prior approval.
- 27 The London Legacy Development Corporation (LLDC) acts as the planning authority for the area around and including the Queen Elizabeth Olympic Park.
- 28 GLA, [London town centre health check analysis report 2013](#)
- 29 Valuation Office Agency (VOA), commercial and industrial floorspace

- 30 The new UK HPI uses a geometric mean as opposed to the arithmetic mean used in the old ONS HPI, or median used in the Land Registry price paid series. The geometric mean is less sensitive to extreme, high property values that may otherwise skew average prices upwards, while it continues to represent them in the calculation process.
- 31 Further information on the VOA methodology for calculating private rents can be found at: <https://www.gov.uk/government/publications/private-rental-market-statistics-england-only/release-notes-10-june-2014#methodology>
- 32 UBS, September 2015. '[Prices and earnings – Edition 2015: Do I earn enough for the life I want?](#)'.
- 33 In order to estimate the worldwide costs of housing, UBS considered the prices for three different types of apartments, standardised to Western preferences. To capture local standards, the survey asked for the price of an apartment of typical size, location, and amenities for the respective city. Prices included utilities (energy and water taxes), but not the use of a garage. All three housing options were weighted equally.
- 34 Cheshire, P and S. Sheppard (1998) 'Estimating the demand for housing, land and neighbourhood characteristics', Oxford Bulletin of Economics and Statistics, 60, 3, 357-82.
- 35 OECD, 'Recent house price developments: the role of fundamentals', OECD Economic Outlook, 78, pp. 123-154.
- 36 Based on its analysis of the demand and supply of housing finance, the Office for Budget Responsibility (OBR) also finds evidence on much higher levels of credit rationing prior to 1981. Source: Auterson, T., '[Forecasting house prices](#)', OBR Working paper 6, July 2014.
- 37 Research by Knight Frank for example finds that those buyers who are resident overseas (irrespective of nationality), represented 28 per cent of buyers of prime central London homes in the 12 months to June 2013 (rising to 49 per cent when considering only those properties that were new build developments). Source: Knight Frank, '[International buyers in London](#)', October 2013
- 38 The Bank's 3 per cent estimate is based on estimates by Knight Frank and Savills of the size and scale of foreign purchases, and assumptions about the scale of foreign purchases in the secondary market outside of what is considered 'prime' central London. Source: Bank of England, November 2014, '[Financial Stability Report](#)'.
- 39 Holman, N., Fernández-Arriagoitia, M., Scanlon, K. and Whitehead, C. '[Housing in London: addressing the supply crisis](#)', LSE London 2015
- 40 GLA Intelligence, '[GLA 2015 round population projections](#)', July 2016.
- 41 Greater London Authority, The London Strategic Housing Market Assessment (2013)
- 42 This counts the absolute increase in stock one year to the next, including self-contained homes from new build, as well as other losses and gains (such as demolitions, conversions and changes of use). It also includes non-self-contained housing based on the number of bedrooms in communal accommodation (such as student halls). Source: Greater London Authority, 12th London Plan Annual Monitoring Report
- 43 Source: London development database, extracted on 06/08/15. Note: as above, this counts the absolute increase in stock one year to the next. This data does not however include additions of non-self-contained homes in communal accommodation.
- 44 For a discussion, see HM Government (2006), '[Barker Review of Land Use Planning](#)', December 2006.
- 45 While there is a constant review of Green Belt land in England, land can only be removed from the Green Belt through local authorities adopting new Local Plans which must satisfy tests for protecting Green Belt land set out in the National Planning Policy Framework. Green Belt land is a mix of previously developed and non-previously developed land. It can cover villages comprising a mixture of residential, retail, industrial and recreational land, as well as fields and forests. In this context, it is helpful to make a distinction between land use and designation. Land use describes the main activity taking place on an area of land, for example residential or agriculture, whereas the land designation describes an area of land (with perhaps many land uses) with a special characteristic such as National Parks, Urban Areas, Areas of Outstanding Natural Beauty and Green Belt.
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- 49 For further evidence on the costs and benefits of the Green Belt and London's green spaces, see Chapter 7.
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- 58 Ciccone, A. and Hall, R.E., 1996, [‘Productivity and the density of economic activity’](#)
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- 63 Gleeson, B., 2011, ‘Make No Little Plans’: Anatomy of Planning Ambition and Prospect. Geographical Research.
- 64 For the rest of this section, ‘Central London’ includes Camden, City of London, Islington, Kensington and Chelsea, Lambeth, Southwark and Westminster. This is consistent with the central London sub-region as defined in the [London Plan \(March 2015\)](#)
- 65 Greater London Authority, [‘Land Area and Population Density, Ward and Borough’](#).
- 66 According to GLA Intelligence, based on an analysis of the Census 2011, people living in London tend to have shorter distances to commute than those living in England and Wales, are more likely than others to travel to work by using public transport, and less likely than others to travel by either driving or being a passenger in a car or van. More detailed analysis and figures are reported in the following reports: GLA Intelligence, 2014, [‘2011 Census Snapshot: Method of Travel to work in London’](#), CIS 2014-06 Census Information Scheme.
- 67 GLA Economics, October 2015, [‘Working Paper 71: More residents, more jobs? 2015 update – The relationship between population, employment and accessibility in London’](#).
- 68 Île-de-France is the NUTS 1 level region for Paris.
- 69 Based on the department: ‘Ville de Paris’.
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- 71 English Housing Survey, Japan Housing and Land Survey, New York Housing and Vacancy Survey.
- 72 JLL, September 2015, [‘Raising the Roof’](#).
- 73 All populations for 2015, except Hong Kong which is for 2014.
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- 76 Housing tenure is considered further in Chapter 10.
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- 84 Hilber, C. 2015, '[UK Housing and planning policies: the evidence from the economic research](#)', LSE Centre for Economic Performance.
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