

Better Brownfield

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How we can banish Boxland and create popular, mixed-use neighbourhoods and streets without losing jobs

The logo for 'CREATE streets' features a stylized red building facade with a grid of windows above the text 'CREATE streets' in a red, sans-serif font.

CREATE
streets

Susan Emmett, Nicholas Boys Smith and
Alessandro Venerandi



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Create Streets is a social enterprise encouraging the creation of more homes in conventional terraced streets rather than complex multi-storey buildings. We do this via research, working with communities, arguing for policy change and consulting to developers, councils and landowners.

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Foreword

By Susan Emmett

Competition for space in London has never been fiercer. Vocal debate about the capital's housing crisis draws constant attention to the need to build 66,000 new homes a year. That's roughly the equivalent of adding the entire housing stock of Windsor and Maidenhead, the PM's constituency, every year up to 2030. But housing is only half the story.

With a population projected to grow by 70,000 a year up to 10.5 million by 2041, London also needs schools, shops, amenities and space for tens of thousands of new jobs. Workplaces must come in every shape and sizes to accommodate all manner of economic activity from small start-ups to big logistics and a spectrum of offices and light industrial in between.

To prepare for such levels of unprecedented growth, the Mayor has put forward an ambitious draft new London Plan. It is currently being scrutinized and is expected to replace the existing 2016 plan by 2019.

At the heart of the new plan, is the aim to make better use of London's land by intensifying development within the city's boundaries without encroaching on the Green Belt. London's individual boroughs are being challenged to meet demanding targets and find suitable sites to accommodate a variety of competing uses.

Under such pressure, the tendency is to build upwards. But while there is a place for tall buildings, the drive for higher density will only work if the public accept it. To encourage local communities to embrace life in a higher density environment, we must think laterally too and champion a more familiar London vernacular.

That means creating more mixed-use "London-like neighbourhoods", with terraced housing, mansion blocks and mid-rise blocks set within traditional street patterns and combined with shops, amenities and workplaces.

Done well, higher densities can be a force for good. A concentration of people means more economic activity to support better shops and amenities. It also means more council tax and business rates to support local services. A tighter knit urban fabric can be healthier by encouraging people to walk rather than rely on cars.

There is an opportunity to build these kinds of mixed-use traditional style neighbourhoods on a plethora of sites currently occupied inefficiently by single-story big box retail and industrial sheds.

By using OpenStreetMap we have identified 1,220 sites across London which we calculate could theoretically accommodate between 250,000

and 300,000 new homes alongside commercial uses.

As these neighbourhoods would be high density, it would be crucial to get local communities on board. This is why we are proposing that the Greater London Authority adopt the principle of “Community Codes” – design codes worked up with local residents to define standards of what is acceptable in terms of optimum land use, design and style at the outset.

None of this is easy. Building well-integrated mixed-use development is even harder if a site is operational and delivering high land values. But as we have demonstrated in Chapter 3 redesigning an existing site can work for both communities and investors.

Lastly, we need to consider what kind of city we would like to leave to our grandchildren and their grandchildren. London has evolved over the centuries into a complex network of streets; many of them residential, lined with tight-knit terraced housing, others accommodating offices big and small, industrial warehouses, squares and parks.

London’s popularity and success as a global city is in many ways a product of this built environment. As the city grows, the Mayor has made great play about instigating “good growth” which delivers a “more socially integrated and sustainable city, where people have more of a say and growth brings the best out of the existing places while providing opportunities to communities”.

Our proposals for Better Brownfield fit that brief by encouraging more housing that is built at human-scale, integrated with the fabric of the city and in a familiar vernacular.

Good growth needs good density. It’s time to banish Boxland.

Susan Emmett is Head of Housing and Urban Regeneration at Policy Exchange

Executive Summary

The new draft London Plan has set ambitious targets for councils to fulfil their part in providing the 66,000 new homes needed a year. This is roughly double the current rate of homebuilding and a near 35 per cent increase on the previous aim to build at least 49,000 homes a year.

As well as building more homes, London also needs to support employment growth by providing the right kind of space for businesses to flourish. We need workplaces, shops, cafes, restaurants and community areas. These new spaces must reflect the changing nature of retail, industrial work, technological advances and falling car use in the city.

It is therefore essential to maximise the use of valuable land in London and to combine uses within neighbourhoods. This means not only developing sites at higher residential densities but also delivering the shops, services, community amenities and workplaces that make neighbourhoods thrive.

There is an urgent need to think more creatively about land use and to deliver these homes in beautiful neighbourhoods where people want to live, work and socialise (and visit, stay and shop).

Intensifying land use inevitably means not only building at higher housing density but also retaining or expanding non-residential uses on the same land to make the best use of space. As the new draft London Plan drives forward that aim, it is essential that we put good design at the forefront of planning decisions rather than numbers alone. There are many different ways to measure density and the stark numbers do not necessarily reflect the look and feel of a place.

Done well, high densities can be a force for good, not only by making the best use of land but also by encouraging people to walk, thereby delivering public health benefits, by boosting local authority revenues (through more council tax and business rates) and by delivering greater incentives to developers.

Higher densities must be delivered in the shape of well-designed quality buildings that reflect London's character. A combination of terraced housing, mansion blocks and mid-rise apartments built along traditional street patterns in mixed-use neighbourhoods can deliver high densities in a form that is recognisably part of London and highly sought after by residents.

This is evident in the high density borough of Kensington and Chelsea, for example, where high house prices reflect high demand. We think there is great opportunity to build new but authentic 'London-like neighbourhoods' using the same sort of typologies but in more affordable parts of the city, hence pricing people in rather than out. This would mean thinking differently about land use on existing brownfield sites.

There are too many plots in London which are currently dominated by industrial and retail uses in the shape of ‘big box’, single storey sheds. We have dubbed this ‘Boxland’. Boxland could be used more efficiently by combining commercial and residential uses in a more efficient manner in traditional street patterns.

By using OpenStreetMap, we estimate that there are 1,220 relevant sites with a total area of 6,122 hectares on which there are single storey big box ‘sheds’ accommodating a range of commercial uses. These could be redeveloped as mixed use, retaining all existing commercial uses (and perhaps adding more) whilst accommodating between 250,000 to 300,000 new homes, forming an urban pattern of largely medium-rise ‘London-like neighbourhoods’.

Better brownfield development means banishing Boxland while retaining the business space and ‘mixing up’ land use into traditional patterns of walkable, beautiful urban blocks with greenery spaced throughout. This is good for residents, for local businesses, for long-term values and for investors.

We tested our theory by redesigning a real site currently occupied by a single ‘big box’ retailer in an otherwise traditional, mixed-use, neighbourhood in zone 2. Our case study sets out how ‘big box’ retail sites can deliver high densities in a tight urban form while preserving all the existing jobs and shops within a popular street-based and high-density framework.

Using land for housing does not have to mean the loss of shops or jobs. Streets can, with elegance and beauty, accommodate high household densities as well as commercial properties. With the right investment model, our analysis also shows how this approach can create value.

However, there are technical, cultural and political barriers that make Boxland sites harder to develop. First, there have been few examples of this type of development historically so investors and developers lack experience. That is now changing. Second, current planning guidance and building rules make it hard to build traditional London-like neighbourhoods. Third, plans for any kind of new development must be accompanied by improved local infrastructure to support higher numbers of residents and workers.

We therefore recommend a series of changes and additions to policies in the new draft London Plan, borough plans and building rules:

- The Mayor should champion the need for mixed-use ‘London-like neighbourhoods’ on brownfield sites. The importance of re-developing sites dominated by Big Box single storey retail and industrial sheds into “London-like neighbourhoods” where different uses are integrated should be specifically defined in the new London Plan, if we are to make best possible use of land in the capital.
- The new London Plan should put even greater emphasis on bringing sites forward with ongoing industrial or retail use by mixing commercial and residential uses. It should make clear that uses should be as integrated as possible within the fabric of the city.

- Instead of the current emphasis on building up, the new London Plan should also seek to intensify land use by looking to accommodate homes, shops and workplaces along traditional street patterns.
- The draft new London Plan already emphasizes the need for the drive towards greater density to be design-led. But to win public support, new development must reflect the design, style and character of buildings that are popular. The GLA should extend the requirement for borough-wide design codes for small sites to development on Boxland sites. Such codes should be worked up with local residents as ‘Community Codes’.
- Government must support good density not just high density. Planning guidance must change to enable the kind of terraced housing and mansion blocks built by Victorian and Edwardian builders to be built again. Currently, national guidelines published by the Building Research Establishment (BRE) make high density but low-to-medium rise development difficult, particularly if you are mixing in shops and workplaces. The guidelines must be altered to distinguish between urban and suburban areas and encourage finer grain, mixed use and flexible buildings in close proximity along traditional street patterns. Developing specific guidance more suitable to urban areas would help local authorities support London-like neighbourhoods rather than car-orientated Boxland which is ill suited to 21st century living.

There is a great opportunity for the Mayor to set out a profoundly more inspirational vision not just about where our new development will be but what it will be. We suggest three unifying themes to capture the potential to banish Boxland and build ‘London-like neighbourhoods’:

- Elizabeth Towns: a popular programme for medium-rise, high density traditional mixed-use town centres on former Boxland along the new Elizabeth Line;
- Thames Towns: a popular programme for a series of low-rise, high density traditional mixed-use towns or neighbourhoods along the banks of the Thames Estuary; and
- Create Boulevards: a partially community-led programme for the popular beautification and intensification of London’s arterial roads with more trees and a range of attractive medium-rise new buildings.

The Evidence: London-like neighbourhoods are good for you

Terraced houses, mansion blocks and mid-rise buildings set along traditional street patterns can accommodate higher densities at a human scale

The Mayor has ambitious plans to build more homes in London. In order to meet the city's high housing need whilst preserving the Green Belt, the recently published draft new London Plan has placed huge emphasis on increasing housing density.

But pushing up housing densities is an emotive subject for local communities, particularly considering some of the current high-rise development dominating parts of the capital. If we are to obtain local support for housing and create a legacy of great new neighbourhoods for future generations to enjoy, then we need good density not just high density.

This report argues that the right approach is a traditional 'mixed-use' neighbourhood of 'fine-grained', beautiful, walkable terraced streets, homes, offices and shops in a conventional block structure. We call this urban form 'London-like neighbourhoods'. They benefit from the advantages of higher density, such as more walkability, and also profit from the advantages of lower density such as more personal space, access to greenery and not feeling overly stressed or crowded by the local environment.

Historic urban patterns can provide high density neighbourhoods without it feeling stressfully crowded and with no need for towers (though these may sometimes be appropriate).¹ High density need not mean high-rise. Very small areas such as the Centro district of Madrid achieve higher population density than Hong Kong Island— by combining mid and low-rise buildings (two to eight storeys). Streets, some tree-lined and very pleasant, are not just for cars but also used as public open space.²

This, or something like it, is the right route for London. Density should be provided through 'London-like neighbourhoods.' The new London Plan's Good Growth principles should reflect that London homes are expensive, above all, because there are such a limited number of the type of homes in neighbourhoods that meet the criteria that people most want in the locations that they most want them. The widest study ever carried

1 Ellard (2015) *Places of the Heart: The Psychogeography of Everyday Life*

2 Savills (2015), *The World and London*, p.9.

out on sales values and urban form in British cities found that London homes in traditional street patterns with a high proportion of pre-1900 buildings have a high value premium. In 2016 this amounted to about five times the new-build premium in equivalent circumstances.³

People place great value on the spatial and architectural character of the places they inhabit. But there are not enough truly ‘London-like neighbourhoods’ to meet the demand. London’s housing demand will not be met by the housing found in single-use, car reliant, housing estates. The shortage of housing in London’s desirable neighbourhoods is more important than the shortage of housing units per se. The London Plan should aim to fix this. It is trying, but it is only partway there.

People’s preferences are not irrational. We can argue confidently that a traditional, beautiful ‘mixed-use’ neighbourhood is good for residents, the economy and investors.⁴ Improved data availability now permits analysis of the links between urban form and wellbeing. Among the key advantages are:

- **Less traffic and lower pollution.** In one study, ‘residents of mixed-use neighbourhoods took non-motorised modes of transport 12 per cent of the time compared to 4 per cent of trips in single-use neighbourhoods’.⁵
- **More walking, greater physical activity and better resident health.** Conventional walkable neighbourhoods are meaningfully correlated with lower rates of obesity, diabetes, heart disease and high blood pressure. One recent literature review found that 50 out of 64 relevant studies found associations between compact, walkable neighbourhoods and positive health outcomes. (The remainder were unclear and none showed a negative correlation.)⁶
- **Greater mental wellbeing and more positive social behaviour.** A 2011 survey of 27,000 respondents in ten US cities found strong correlations between the physical beauty of a place and people’s satisfaction with their communities. This counted more than any other attribute.⁷ Another study found people are measurably more likely to help their fellow citizens in front of attractive buildings with active facades than ugly ones with blank facades.⁸
- **Lower crime.** Traditional urban street segments of the right length have measurably less crime due to a variety of factors, including clearer ‘backs and fronts’ to homes, windows providing ‘many eyes’ on the street, human-scale, survey-able spaces and connectedness to ground level activity. Analysis (for example in Perth or London) has shown how traditional streetscapes typically suffer from less crime.⁹

3 Boys Smith, Venerandi, Toms (2017), *Beyond Location*, pp. 120-1

4 For the most up to date literature reviews see Boys Smith, Venerandi, Toms (2017), *Beyond Location*, section two and Boys Smith (2016), *Heart in the Right Street*, chapters three to ten.

5 Ewing R, Kreutzer R. (2006), *Understanding the Relationship between Public Health and the Built Environment*. LEED-ND Core Committee Report, pp. 20-3

6 Talen, E. & Koschinsky, J. (2014) ‘Compact, Walkable, Diverse Neighborhoods: Assessing Effects on Residents’, *Housing Policy Debate*, 24:4, pp. 717-50

7 Leyden, K. et al (2011), ‘Understanding the Pursuit of Happiness in Ten Major Cities’, *Urban Affairs Review*, vol. 47, pp.861-888.

8 Edible Urbanism Project, *Happy Seattle*, www.thehappycity.com/wp-content/uploads/2015/03/Editable-Urbanism-Report.pdf

9 For instance, see presentation made by Tim Stoner at 11 March 2014. Available at: www.slideshare.net/tstonor/tim-stonor-predictive-analytics-using-space-syntax-technology

Other benefits include:

- **More support for housing provision.** In one 2015 MORI poll, the in principle opposition to new housing halved for the most popular design.¹⁰
- **Better long term returns to investors and higher council tax receipts.** In addition to the city-wide data cited above, analysis of land values and property tax in the American city of Nashville, for example, showed that replacing an acre of ‘big box retail’ and parking with a finely grained, mixed-use, walkable city increased the number of residents per acre from 0 to 90 and jobs per acre from 5.9 to 73.7.¹¹ Consequently, there was an increase in sales and property tax. This rise was nearly tenfold with revenue per acre rising from \$6,500 to \$634,000.
- **Easier integration of market and affordable housing.** Street properties can be mixed at a fine-grain level and developed in a ‘tenure blind’ way. Ongoing maintenance and running costs should also be lower, regardless of whether they are owner occupied or owned by a social or private-sector landlord. This is because tower blocks or complex, off-street apartment blocks generate higher services charges than simple buildings on streets. Very big buildings tend to have higher management costs, especially as they age.¹² More finely grained density avoids this.

In addition to their mix of uses ‘London-like neighbourhoods’ have some key components:

- **Connectivity and streets.** Streets that ‘plug into’ the surrounding city. A well-connected, highly walkable, traditional street pattern of differing types and sizes with multiple junctions and route choices.
- **Greenery.** Frequent green spaces inter-woven into the neighbourhood either as private gardens, communal gardens or well-overlooked public spaces between blocks and where people really need, use and frequent them. Lots of street trees.
- **Density.** Enough density to be walkable but not to be overwhelming, stressful or to create high long-term maintenance costs.
- **Height.** Most buildings at human scale height. Sparing use of residential towers in well-connected locations for the small number of people who seek them and all towers built in such a way as not to disrupt the streetscape but fit into it.
- **Blocks and facades.** Blocks that are neither too deep nor long and appear to be composed of separate buildings rather than one gargantuan edifice with long blank walls or vast frontages. Instead, London streets are composed of narrow fronts with many doors and a strong ‘sense of the vertical’ in the design to break up the scale of terraced blocks. Some of the most popular traditional

10 Local polling and visual preference surveys are also near unanimous in their findings See Boys Smith (2016), *Heart in the Right Street*, pp.85-91. Also see Boys Smith (2016), *A Direct Planning Revolution for London?*, pp. 5-10.

11 Montgomery, C. (2013), *Happy City*, p.271.

12 Boys Smith (2016), *Heart in the Right Street*, pp.44-45

London neighbourhoods have clear fronts and backs with internal private or communal gardens in the centre of street blocks

- **Beauty and design.** Beauty really matters. Ignoring popular aesthetic appeal is missing a key trick. Good design must have a strong sense of place. People have chosen to live in London – at some expense. More housing is needed to help address affordability problems, but we should not compromise on quality, design and style if we want local support for development. Streets that bend and flex with contours of the landscape, a variety of street types, design and green spaces which obey a London scale and geography will help achieve this. Plus some surprises, not designed by committee.

From Hammersmith to Islington and Bermondsey to Hackney, these are the defining components of the most popular, valued and valuable parts of London and of the most successful city neighbourhoods worldwide.

The London Plan

The London Plan has set a target for 649,350 homes over ten years following the GLA's Strategic Housing Market Assessment (SHMA) of a need for 66,000 additional homes per year.¹³ This is ambitious.

The target is a 55 per cent increase on the last London Plan but that is not the only change. There is more focus on small sites, with just under 40 per cent of housing delivery targeted from this source. There is more focus on outer London, with 55 per cent of identified capacity in this area. There is less focus on Local Authority housing estate regeneration. There is rather more emphasis on other types of brownfield land. In tension with this, there is also an unambiguous statement of the need for increased commercial, logistical and industrial land use.¹⁵

Resolving these tensions won't be easy. The Plan suggests two main ways:

- First, by supporting much higher-density development. The London density matrix, which provided guidance on optimum density levels according to location and connectivity, is gone. The tall buildings policy is largely pushed down to boroughs. There will probably be far more pressure to deliver very high density or very high-rise development – particularly in well-connected parts of the suburbs.¹⁶
- Second, by focusing on more 'mixed-use' development with

What is mixed use?

In this document, the term 'mixed use' is used to emphasise the integrated and flexible nature of urban uses across a neighbourhood. It includes but is not limited to 'co-location' whereby housing and commercial uses are placed next to each other. Our approach also incorporates multi-use buildings which host different use classes either vertically or horizontally ie homes above shops.

¹³ Mayor of London (2017), *The London Plan*, p.146-9

¹⁴ Mayor of London (2017), *The London Plan*, p.146-9. Mayor of London (2017), *The London Strategic Housing Land Availability Assessment 2017*, p.1.

¹⁵ Policy E4 states that 'a sufficient supply of land and premises in different parts of London to meet current and future demands for industrial and related functions should be maintained.' The explanatory text continues that 'research for the GLA indicates that there will be positive net demand for industrial land in London over the period 2016 to 2041.'

¹⁶ See discussion at GLA Planning Committee on 22 January 2018.

residential and other land uses intermingled.¹⁷ The first chapter of the London Plan, 'Good Growth Policies', partly justifies this. It sets out the undoubted 'agglomeration' advantages of 'high-density mixed-use places' encouraging more walking and cycling.¹⁸

The approach to density, urban form and mixed-use development advocated in the London Plan is laudable but incomplete. It stresses the advantages of high density but has very little to say on the contrasting advantages of more space and lower density in certain locations. It says very little on the importance of urban form and nothing on the importance of beauty in making high density acceptable, livable and desirable.¹⁹ But this is critical for building good places and for obtaining local consent.

¹⁷ See discussion at GLA Planning Committee on 22 January 2018.

¹⁸ See discussion at GLA Planning Committee on 22 January 2018.

¹⁹ Policy D1 London's form and characteristics is the most explicit on what should be built but our strong concern is that this will normally be trumped by the Plan's wider pressure for density, other policies, land values and the development process. Mayor of London (2017), *The London Plan*, p.98.

The Opportunity: 250,000 – 300,000 new homes by banishing boxland

We can make better use of London's land by combining homes with shops and workplaces

To build the homes that London needs in a style that is consistent with the city's vernacular, we must make better use of land. We have identified sites, the equivalent of 43 Hyde Parks, which could accommodate between 250,000 and 300,000 new homes as well as existing uses if they were better designed.

By using open data sources we found 1,220 sites across Greater London covering 6,122 hectares which could be used more efficiently. These sites, dominated by large, single story, low-quality industrial or retail buildings, are sometimes in highly accessible and potentially valuable locations.

Often surrounded by car parks and neglected open spaces, these single story 'sheds' which can accommodate retail, industrial or other commercial uses, deliver a very low ratio of build up to land area. We call these sites Boxland.

The high parking provision of Boxland is not always needed, even for current use. Both the inner and outer suburbs of London are scattered with such sites which provide valuable employment opportunities - but at a very high land cost. This type of land is usually outside public ownership and control but often has the advantage of just a single, commercial, albeit private sector, owner.

However, there is a not unreasonable fear that changing the use of these sites from commercial and 'employment generating' to purely residential would damage the economy of London by making workspace scarce and potentially pushing up commercial rents.

The answer is not to replace one with another but to strive towards a more efficient way of combining uses which is attractive to both residents and businesses.

How much Boxland does London have?

The London Strategic Housing Land Availability Assessment 2017 (SHLAA) has done extensive analysis on what land is available for development within London over the next ten years and beyond. However, because of

confidentiality on unallocated sites and due to the way the data is presented, it is not completely straightforward to allocate these to different types of land. Above all, we cannot tell from the official data where all the industrial and big box retail sites actually are. This makes it hard to calculate the potential for housing on Boxland based on location and accessibility.

We have therefore used open data sources and done our own analysis to identify the number of Boxland sites and their potential for mixed-use development.²⁰ Our analysis permits detailed modelling of potential housing capacity on a site by site basis.²¹

We have found 1,220 sites across Greater London, covering 6,122 hectares. (This is the equivalent of 43 Hyde Parks). Of these sites, 1,120 were industrial (5,555 hectares); while 100 were 'big box retail' (567 hectares). The 5,554 hectares of industrial land is within 7 per cent (393 hectares) of the most comparable GLA figure available (5,162 hectares) in the 'Core industrial uses' category.²²



Typical Boxland on Old Kent Road, London, in Willowbrook Estate²³

Where are the sites?

Industrial and retail Boxland sites are mainly located within suburban London but can be found in all boroughs: Ealing (with the highest number of industrial sites), Brent, Hillingdon and Hounslow in the West; Greenwich, Bexley, Newham, Barking and Dagenham and Havering in the East; Waltham Forest, Barnet and Enfield in the North and Sutton, Merton and Croydon in the South. Central urban areas with stretches of Boxland include Southwark, Lambeth, Camden, Islington, Hackney, Wandsworth, Lewisham and Tower Hamlets. Boxland can also be found in Richmond, Kingston, Hammersmith & Fullham and Bromley.

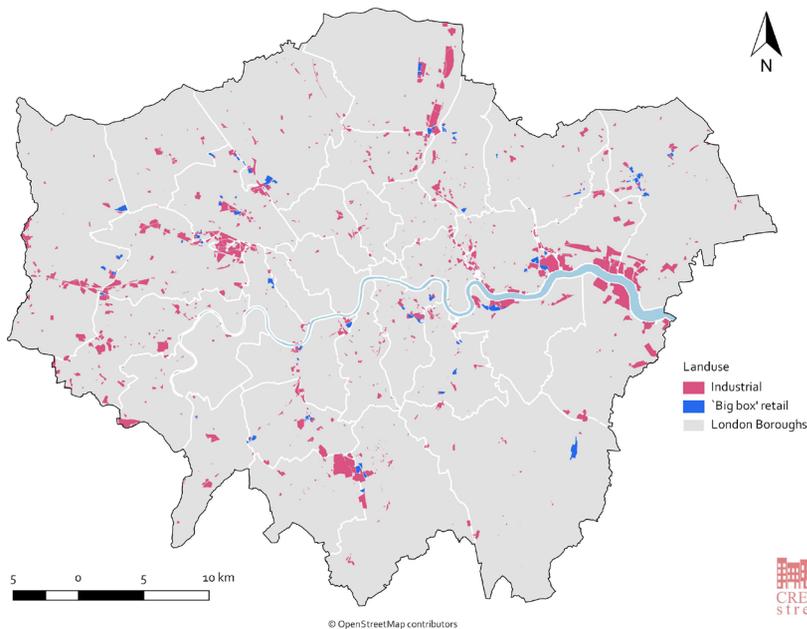
The borough of Barking and Dagenham has the highest proportion (14 per cent) of industrial and big-box retail sites compared to its total area.

²⁰ For a full explanation of our data, technique and assumptions please see Appendix one.

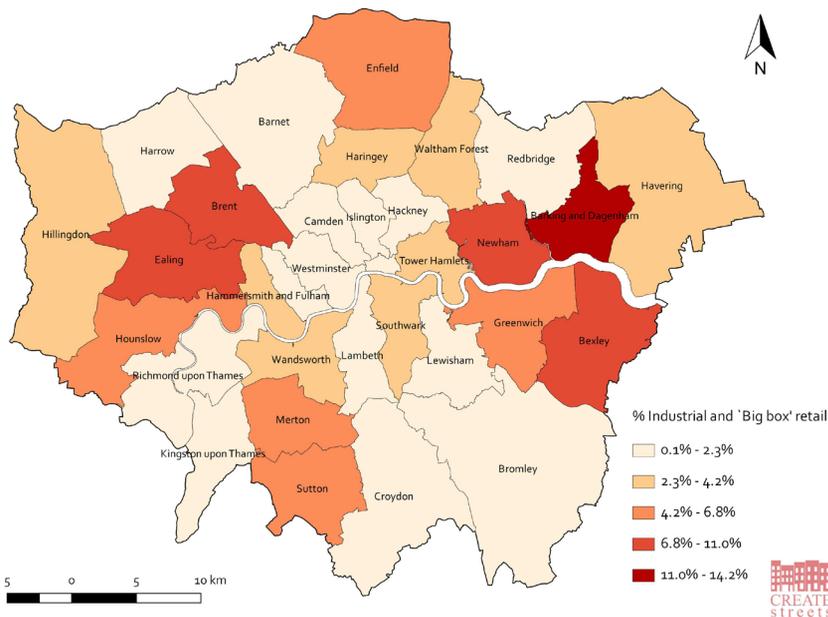
²¹ For a full explanation of our data, technique and assumptions please see Appendix one.

²² 5,162 hectares is the total for all industrial sites not including utilities, waste management and transport uses. For reference, see: AECOM (2016). *London Industrial Land Supply & Economy Study*. Appendices.

²³ Google Maps, Street view. This example is within the Old Kent Road Opportunity Area.



Industrial and 'Big box' retail sites in London



Boroughs with the greatest potential from Boxland redevelopment

These are mainly located in the southern part of the borough, along the river Thames.

Second is Newham with 11 per cent. Most of its industrial and big box retail sites are located along the river Thames, in the south-eastern part of the borough, near the boundary with Barking and Dagenham.

Third is Ealing with just under 9 per cent. In this borough, most industrial and big box retail sites are along the Grand Union Canal's Paddington Arm.

Many (though by no means all) of these sites are identified within the London Strategic Housing Land Availability Assessment (SHLAA) 2017 and the draft London Plan. However, our land-use map of identified Boxland sites differs from that of the SHLAA. The SHLAA is a best efforts estimate of which sites will come forward within the next ten years. Sites may have been excluded for a wide range of reasons including, for example, fragmented ownership. Our analysis assesses the overall potential from Boxland. We recognise that some sites can be developed far more easily than others. Our list includes, but also goes beyond the Opportunity Areas set out in the new draft London Plan (Policy SD1).

All change in retail

London's need to intensify land use comes at a time of big changes in retailing. The advantages of big 'out-of-town' style stores are being eroded by e-commerce. Businesses such as Amazon can offer a wider selection than even the largest bricks and mortar store. And they can deliver it quickly and conveniently.

In parallel, many shoppers' expectations are changing to one of 'experiential retail' where goods are examined in-store but delivered through logistics networks rather than the conventional 'take it home with you' model. If this continues, then even less parking and better urban environments will be required to maximise the quality of customer experience. This favours the 'London-like neighbourhoods' approach.

As a result of these trends many traditional stores have begun to consolidate and change their model. Some are trying to offer more niche products which cannot readily be sold by e-commerce. Some 'out of town' style stores such as Topps Tiles, Carpetright, Ikea and DFS have been exploring smaller stores in more central locations within urban and suburban neighbourhoods in order to reach new audiences who do not drive or do not wish to travel to a retail park.

Other Boxland retail models are facing major commercial pressure at least in part due to failing sales at their traditional 'big box' sites. In February 2018, for example, Toys R Us UK went into administration and, unable to sell it, 100 Boxland stores were forced to shut in March. The administrator told the BBC, 'The newer, smaller, more interactive stores in the portfolio have been outperforming the older warehouse-style stores that were opened in the 1980s and 1990s.'

The changing nature of retail and the growth of internet shopping does bring a greater reliance on logistics with ongoing need for warehouses and distribution within and near cities.

Increasingly, the needs of logistics occupiers are going to be fundamental to how we configure mixed-use sites and indeed how London works, particularly near arterial routes.

Within more central boroughs, however, we should seek to intensify land use on a finer grain along traditional street patterns.

How many homes could be built on Boxland while preserving jobs and shops?

There are several factors that must be considered when calculating the number of homes that could be built by transforming Boxland into London-like neighbourhoods. Every site is unique. The likelihood of a site coming forward for development depends on a series of issues such as the strength of the local economy, local demand for housing, land ownership, the nature of the existing use on the site and local politics.

Surrounding infrastructure such as schools, doctor's surgeries and public transport accessibility will also play a large part in planning decisions and the density of housing allowed. Depending on the site and its surrounding neighbourhood, developers may be required to make contributions towards improving local infrastructure to support the additional housing. This is already common practice.

The scope of our calculations for new housing on the identified sites is limited to estimating densities according to public transport and vehicular accessibility. We then applied a range of housing density scenarios depending on how well connected a site is. This is summarised briefly below and full details are set out in Appendix one. The main steps of this were:

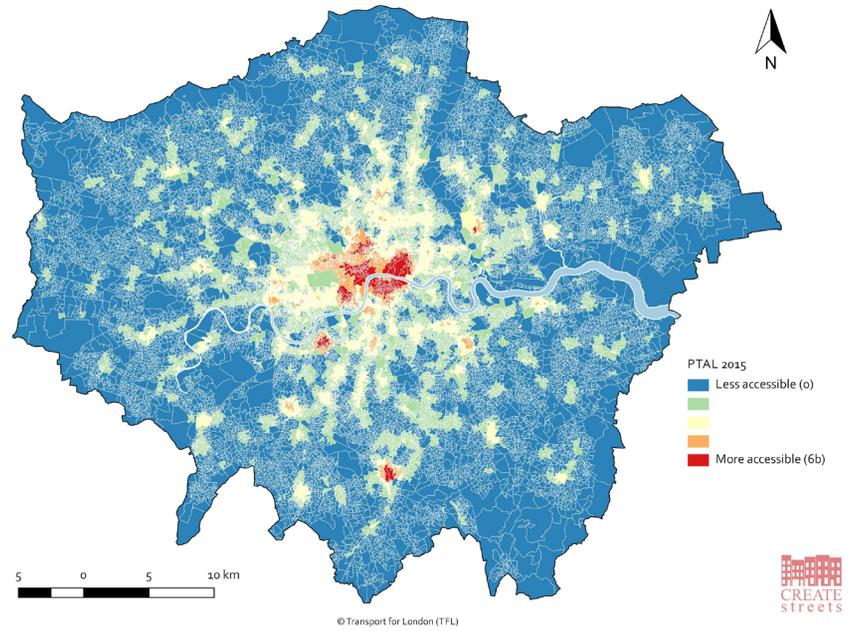
- First, we took account of both public transport and road network accessibility levels for each site. These are shown below.
- Second, we characterized each site based on its location as suburban, urban and central.
- Third, we developed five scenarios for estimating achievable densities on each site based on these criteria and taking into account the existing uses on each site. The first of these was based on matching the density of surrounding streets whilst maintaining existing use. The second was based on our case study in Zone 2 (see chapter three). The third was based on the standard density assumptions set out in the SHLAA (which are, in turn, based on the 2016 density matrix). The fourth and fifth scenarios have overlays based on higher density assumptions (scenario 4) within the SHLAA for Opportunity Areas and (scenario 5) observed trends in density actually delivered on Opportunity Areas between 2004 and 2016.²⁴

Why we need good density

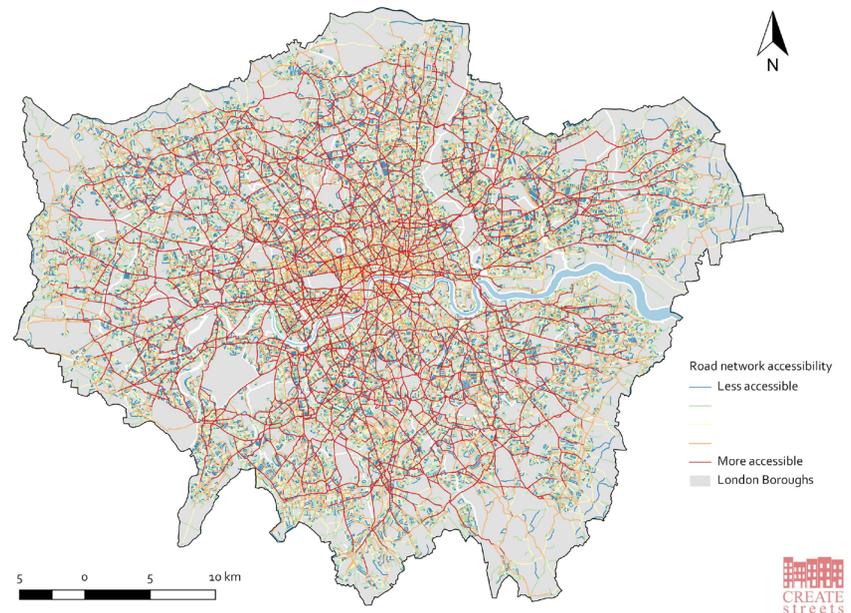
The huge discrepancy between scenario one (based on current surroundings) and all the other scenarios demonstrates eloquently both how much potential there is for densification and the ambition of the London Plan. Based on these scenarios we strongly suspect that it would be theoretically possible to build between 250,000 and (at the very most) 300,000 new homes on Boxland in the form of 'London-like neighbourhoods' while maintaining existing use. The upper end of that range implies many towers within the urban framework. This could work

²⁴ More detail on these scenarios are set out in Appendix One.

on some sites though not on others. Going beyond these numbers could make it hard to achieve neighbourhoods that are equitable, popular and sustainable in the long term.



Public Transport Accessibility Levels (PTAL) 2016



Road Network Accessibility²⁵

25 OS Meridian2 Map (2016)

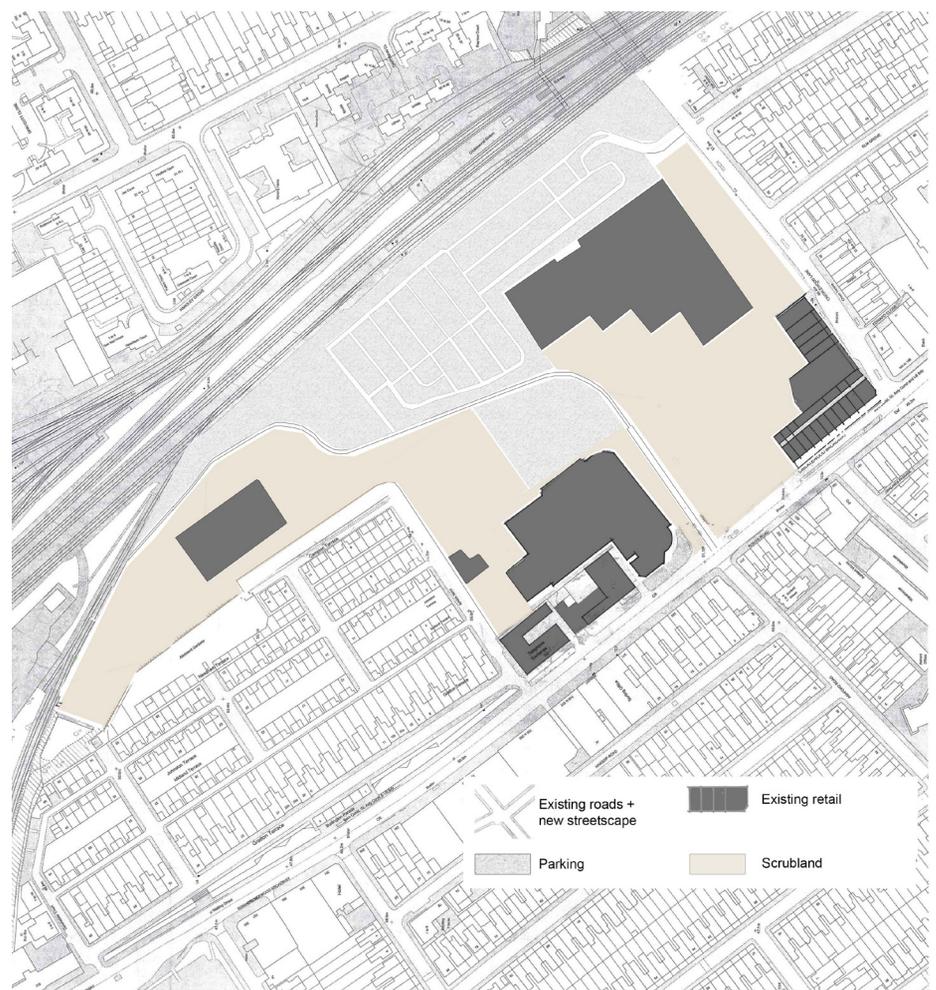
Potential new homes on Boxland whilst maintaining existing employment and retail use

Scenario	One Based on densities in current surroundings	Two Based on densities in Zone 2 case study	Three Based on average London-wide densities	Four Based on higher densities encouraged in the Mayor's Opportunity Areas	Five Based on the higher density levels currently being delivered
Homes from suburban sites	11,425	47,734	51,097	52,558	54,024
Homes from urban sites	1,803	43,997	47,097	57,519	60,064
Homes from central sites	3,919	166,830	178,585	192,515	193,935
Total	17,100	258,600	277,800	303,600	308,000

A Worked Example: Creating streets in Zone 2

We tested the theory by redesigning a real site dominated by big-box retail

To demonstrate how Boxland can be reimagined as a London-like neighbourhood a joint team of urban designers (Paul Murrain, the Urban Engineering Studio and Create Streets), together with the Savills World Research team and Space Syntax redesigned one of the 1,222 brownfield sites we identified, then modelled and analysed possible densities, values and levels of connectivity.



The site within its wider location

The selected site is a suburban 5 hectare (12 acre) site in Zone 2 adjacent to a train station from which central London can be reached within 30 minutes on public transport. The site scores well on the Public Transport Accessibility Level (PTAL) ratings, the most widely recognised measure of connectivity to the public transport network in London, with a mix of 4 and 5. The highest level of connectivity has a score of 6b and lowest 0.

It is currently in mixed use with industrial, retail, hotel and offices plus an area of existing, but disconnected, streets of low rise terraced houses in very narrow streets. (These were not impacted by the theoretical regeneration other than by the improvement in their surroundings).

The site contains a few Boxland, single storey, retail or industrial buildings on a lot of otherwise unused land. This study sought to investigate whether the same floorspace of all the existing employment-uses could be retained while also using the land for housing. This would be housing of many different types but always including 35 per cent social rented housing. We wanted to see if a piece of land currently used at low intensity or sub-optimal density can provide more homes for Londoners and become a better neighbourhood - without the loss of commercial activity. Although we based our theoretical redevelopment design on a real site, this is a hypothetical exercise and no landowner, retailer or business associated with the site has been involved.

The London-like neighbourhood version of this site is a redesign which combines the reopening of old streets and the creation of pedestrian and cycle-friendly routes which open up access to and increase the permeability of the neighbourhood. It aims for high density but achieves this through a mixture of medium rise apartments, mansion blocks and terraced houses.

We looked at the full potential the site could achieve in terms of both housing and employment densities and end asset values. Full value assessments were made on the assumption that regeneration changed the quality of place to the extent that it was similar to other successful neighbourhoods of equal distance from central London and with similar physical characteristics. Some of these were found to be neighbouring local areas, adjacent to the site area.

We applied two different scenarios. The aim was to retain all existing employment uses and not to decrease the amount of work or retail space available. This site was modelled as having been redeveloped in two different ways both of which either maintained or increased the amount of commercial space.

Both scenarios take into account the site's physical location; backing onto a railway line and within easy reach of a station accessible to the central London network. This means that very high levels of car parking provision are not required on the site and existing car parks can be modestly reduced. This creates more space for housing people rather than unnecessarily using space for housing cars.

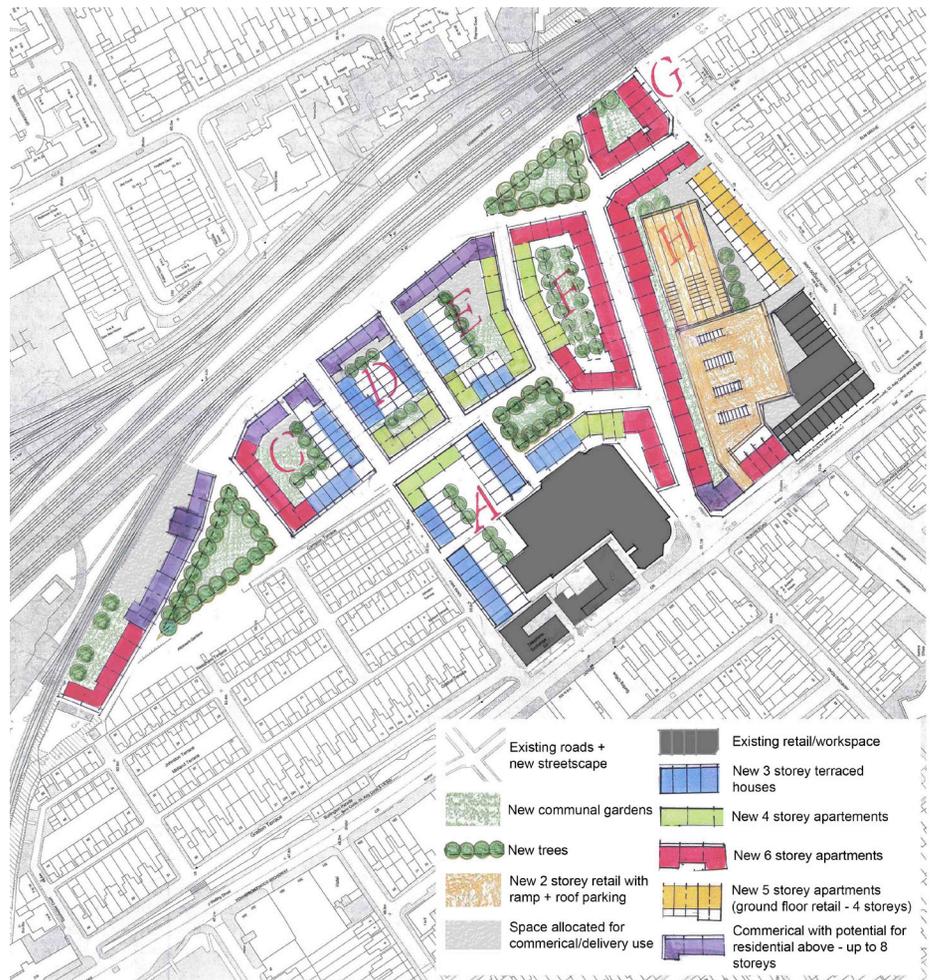
Scenario One: urbanising Retail Boxland

First, we redesigned and reconfigured the site so that the ‘out of town’ style of the retail space was replaced with a more intense, urban form while retaining an identical retail floorspace. This created a more rational and ‘urban’ configuration of the existing retail and trade units.

In practice, this would mean that the existing retail ‘shed’ is demolished but the same amount of retail floor space is then built over 2 floors, using a smaller land footprint with some parking above. A small but highly visible street frontage is created and provision made for the servicing of deliveries. Where needed, provision should be made for rooftop parking.

The whole new retail unit is then bounded by traditional streets and ‘wrapped’ on two sides of the triangular site created with a combination of terraced houses, apartments above shops and 21st century style ‘mansion block’ apartments with active street frontages.

The exact treatment of retail Boxland on sites across London would differ in practice according to site characteristics and location, but the basic principle is to re-use the unused scrub or grassland and at least some of the parking that surrounds these big ‘sheds’ for housing and other neighbourhood uses. In some circumstances, it might be appropriate to build more over the top of the store as well.



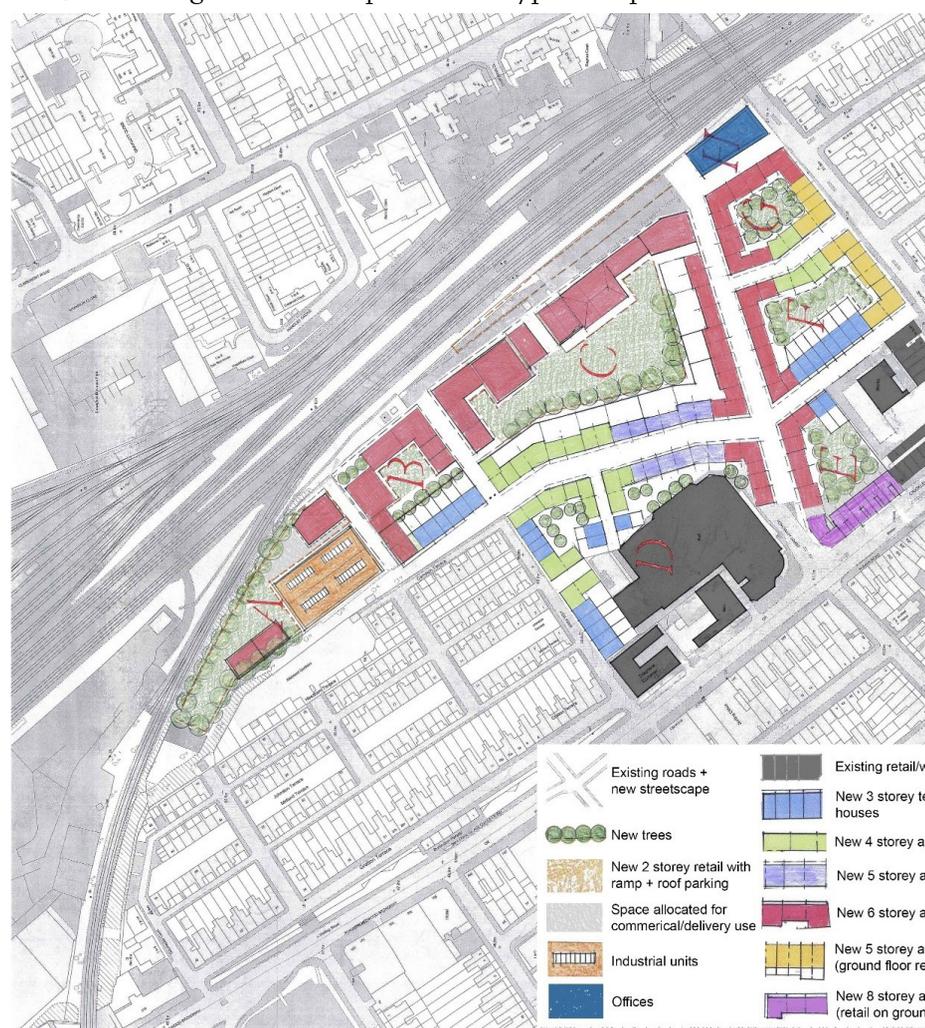
London-like neighbourhood scenario one: Urbanising Retail Boxland

In some circumstances, especially large sites, continuity of trading may be made possible by using sites vacated through natural wastage and moving each retailer once only from old buildings to the new, more compact ‘urbanised’ ones.

Attention should be paid to new models of retailing which are developing rapidly through the adoption of new technologies, including e-commerce. Shopper’s expectations are likely to increasingly be of ‘experiential retail’ where goods are examined in-store but delivered through logistics networks rather than the conventional ‘take it home with you’ model. If this proves the case then even less parking and better urban environments will be required to maximise the quality of customer experience. This favours the London-like neighbourhood approach because people prefer these neighbourhoods.²⁶

Scenario Two: urbanising Industrial Boxland

The second approach assumed that the existing building use on the same site was light industrial rather than retail. There are many sites in London where big sheds are configured in this way and used for a variety of job creating uses, including industrial space. This type of space can accommodate



London-like neighbourhood scenario two: Urbanising Industrial Boxland

²⁶ See Boys Smith (2016), *Heart in the Right Street*, pp. 85-98.

a variety of occupants ranging from manufacturing to depots to mixed employment uses. It can also provide smaller spaces for start-ups with an infrastructure of homes, shops and other businesses in the vicinity.

The re-provision of this type of flexible building in the reconfigured site design allows for the continuation of employment and enterprises on the site and does not, therefore, contribute to the diminution of London’s employment space. The addition of much-needed homes, including affordable and social housing, to the site increases the likelihood that Londoners can both live and work in the same neighbourhood, reducing commutes, improving quality of life and saving time, resources and energy and potentially increasing productivity.

The same amount of commercial and community space is retained under this scenario (albeit moved to a different part of the site in some cases) and there is increased provision for retail. Surface ‘Yard’ space on the site is retained and rationalised to allow for working vehicles, goods and machinery, as much as possible.

Resulting densities

An increase in housing density of up to 355 per cent was achievable in scenario one where the uses on the site were rearranged and car parking was rationalised – all without loss of commercial space and whilst providing a ‘London-like neighbourhood’. In scenario two we were even able to increase the amount of commercial space by five per cent.

Density of homes and commercial space under different scenarios

	Current	Integrated complete streets	Uplift in density
Homes per Ha			
Scenario One: Urbanising Retail Boxland	21	94	355%
Scenario Two: Urbanising Industrial Boxland	21	71	243%
All commercial floor space per Ha			
Scenario One: Urbanising Retail Boxland	1,568 sq m	1,568 sq m	0%
Scenario Two: Urbanising Industrial Boxland	1,568 sq m	1,646 sq m	5%

Regeneration values

The valuation for the buildings on the site assumed ‘end asset value’ rather than a new to market, new build value. In practice, this means that values have been based on second hand comparables and do not include a ‘new build premium’ (or discount) which will vary over time and according to market conditions. This ‘end asset value’ is of particular importance to long-term landlords, owner-occupiers, investing institutions and landowners because their interest is long-term. The new build premium is only important when considering the short-term price for a site or buildings. Subsequent owners paying a new build premium would need to factor in depreciation over time as it erodes.

Total site values have been calculated by applying the appropriate value per square metre for the property type to the total area (square metreage)

of that property type.

Values are taken from sales evidence on the site at the time of analysis in March 2016. While the market has moved since then and the absolute valuations will have changed, the relative changes and uplifts still apply.

We have run two valuation models. The first, 'integrated complete streets value', assumes that the whole site integrates into the surrounding street fabric and consequently achieves the same values as street properties neighbouring the site.

The second model, the 'full place potential' value, assumes that the whole site is improved and the nature of the location changed to the extent that it can achieve values of a physically similar but more successful place in London. This assumes that the 'London-like neighbourhood' redevelopment has led to a wider, wholesale reinvention of the place to create greater appeal.

At all stages, social rented stock, calculated from Census data is assumed to be worth 40 per cent of market value to a local authority or Housing Association landlord. This is an average level for London but will vary in practice, site by site, according to the net income streams that are achieved. Where additional homes are provided on the site, 35 per cent have been given 'Affordable' status and have been valued as social rented homes.

The two types of 'London-like neighbourhood' developments analysed above are delivering between £313m (up 180 per cent) and £415m (up 232 per cent) of additional value to the site, based on 2016 valuations.

It may be that (at least in the short term and in some sites) more value would be deliverable and more homes could be built via super high density models. However, super high density can come with very material challenges of long-term value, costs, wellbeing, equity and the need for additional infrastructure. Super-dense developments also cost far more to build per unit and per square metre than simple, 2-6 storey buildings on traditional streets. They also normally include a high ratio of common areas and facilities which require management and maintenance and therefore high service charges. Even if rents are kept down, homes will generally not be affordable to lower and even middle income households as a result. We do not think ubiquitous super-density is the right long-term sustainable model for most of London. Instead, by aiming to create more 'London-like neighbourhoods', we can build a greater number of homes alongside the shops and workplaces London needs. .

More connectivity, more walking, more safety and more value

As part of our research, Space Syntax modelled the city-wide and local connectivity of both scenarios. In both cases they found that, city-wide, while the redesign did not change the relationship with the larger scale urban context, it did take better advantage of the surrounding major streets and related activity patterns. Locally, the proposed designs also made for a better connected site. This higher connectivity is likely to be associated with more walking, safer streets and higher values. The full analysis is set out in appendix two.

A Worked Example

Potential uplift for the site under different scenarios (based on 2016 values)

	Value of existing buildings	Value of extended or replaced buildings	Additional value of integrated complete streets	New total value	Total uplift including full place potential
Scenario One – Urbanised Retail Boxland	£178m	£254m	£54m	£593m	232%
Proportion of full end value	30%	43%	9%	100%	
Scenario Two – Urbanised Industrial Boxland	£174m	£181m	£47m	£487m	180%
Proportion of full end value	36%	37%	10%	100%	

Better Brownfield: Conclusion and recommendations

Conclusion

With so much pressure to deliver more housing, it would be tempting to aim for the highest density numbers, cramming the maximum number of homes onto a site. This would be a mistake. We need more new homes but these must be balanced with the need to deliver workplaces, shops, cafes, well-designed public spaces and the greenery that create attractive and pleasant neighbourhoods with a strong sense of place.

Balanced neighbourhoods should be ‘London-like neighbourhoods’. They should look like the best of London, built on integrated streets following traditional patterns. Public transport needs to be within a walkable distance or easily accessed and neighbourhoods need to be supported by social infrastructure such as schools and doctors’ surgeries.

We must aim to intensify land use and make the very best treatment of valuable space in the capital. That means taking a critical look at sites where a Boxland approach to industrial and retail uses has resulted in poor land use. This is no mean feat but is provably advantageous to the landowner so market solutions should be available – if the planning framework allows.

There are significant barriers to overcome. These range from the technical to the financial, from the regulatory to the need to harness the right combination of skills and experience. Historically, few investors or developers have had the appetite or experience to do this sort of thing. That is now changing.²⁷

Key barriers include planning guidance and building rules that make it hard to build traditional London neighbourhoods. This needs to change.

Tackling these obstacles will require enormous collaboration across different areas of discipline, developer types, landowners, London boroughs and the GLA.

The scale and complexity of Boxland, of developing industrial and ‘big box’ retail sites can be daunting. The challenges are even greater if those sites are to be regenerated with a ‘mixed-use’ approach combining housing and commercial activity, particularly if sites are still operational.

If we are to make the very best use of London’s valuable land, a ‘mixed-use’ approach is essential. Combining uses across a neighbourhood is the best way to preserve and enhance commercial space for economic benefit, deliver essential housing and brighten communities with an attractively built environment.

27 CAG Consultants, (2017), *London Industrial Land Demand*.

Recommendations

There is a lot to welcome in the new draft London Plan and the draft revised National Planning Policy Framework. Both favour increasing densities and making the best possible use of land. However, there should be greater emphasis on what desirable densities look like and a broader approach to using land well.

We have six key recommendations:

The Mayor must champion the need for mixed-use “London-like neighbourhoods”

A clear definition of “London-like neighbourhoods” should be written into the new London Plan when it is finally published next year, so that they can be implemented into borough plans and delivered by landowners and developers. Policy support for London-like neighbourhoods should also be cross referenced with other policies such as the drive for ‘healthy streets’.²⁸

Rather than simply pushing up densities, new homes should be delivered by creating mixed-use “London-like neighbourhoods”, with terraced housing, mansion blocks and mid-rise blocks set a long traditional street patterns and combined with shops, amenities and workplaces. Redeveloping “Boxland”, sites with single story retail and industrial sheds provide the opportunity.

The new London Plan must take a broad approach to density

Good growth needs good density. The drive to accommodate all of London’s housing need within its boundaries without altering the Green Belt brings the risk of pushing densities too far on individual sites rather than creating balanced neighbourhoods that mesh with the fabric of traditional London. There is a risk that we end up with a vicious circle of spiraling land prices, superdensity, high service charges and neighbourhood resistance.

The draft new London Plan is already seeking to adopt a more sophisticated design-led way of defining density rather than relying on the previous measure ‘housing units per hectare’. But it needs further clarity.

A better approach might consider the ‘intensity of land use’ across a wider area. This would involve measuring the total amount of usable space (of all types) that will be created per hectare of land, taking into account surrounding roads, blocks and open space rather than just the boundaries of a single site. Such a measure would include all amenities, commercial uses and open public space and look at how an individual site changes the characteristics of the neighbourhood as a whole (rather than maxing out the metrics solely for the ground on which it sits). This would control the mass and scale of buildings in an area whilst balancing commercial and residential uses.

Redefine national building standards for cities

Currently, the national guidelines published by the Building Research Establishment (BRE) make high density but low-to-medium rise building as seen in Chelsea, Hackney or Peckham hard to replicate, particularly

28 The maintenance of ongoing use and the importance of streets and urban form needs to be reflected more clearly in policies GG2, D1, E7 and H1. The policy on Healthy Streets (T2) should also reflect the need for a good urban form, beauty and lack of high rise wind tunnels materially to encourage walkability. All these policies should cross-reference to ‘London-like neighbourhoods’.

if you add in shops and workplaces. These national guidelines must be actively challenged by Government with support from the Mayor.

Technical requirements that come with each use class category can be challenging to combine in a mixed-use setting – such as the required distances between habitable rooms to avoid overlooking. This can force down residential densities which would reduce the potential catchment for surrounding shops.²⁹

Specific rules or guidance on street design, daylight and sunlight, turning circles, access, staircases, on-street-parking, lifts and many others all of which collectively mitigate against high density low rise development also make it hard to deliver ‘London-like neighbourhoods’.³⁰

To deliver density at a human scale and replicate the best of London, we need new guidance for urban areas which take into account available open space near the development, the benefits of traditional streets of various widths as an amenity and different building types at varying scales – terraced housing, mansion blocks and mid-rise flats.

The next version of the London housing design supplementary planning guidance (SPG), some of which is expected to be published later this year, must seek to champion density at a human scale. In particular, it should seek innovative technical and design solutions to some of the technical difficulties of combining uses in cities.

Government must place even greater emphasis on design and style

The recently published draft revised National Planning Policy Framework (NPPF) sets out guidelines for ‘achieving well-designed places’.³¹ This includes design policies developed with local communities to reflect local aspirations with the aim of giving planning applicants greater certainty about what is likely to be acceptable. The use of visual tools such as design guides and codes are encouraged to provide a clear framework at the outset.

Defining standards of what is likely to be acceptable in terms of optimum land use, urban form and design at the outset would create certainty and be reflected in land values. This follows the same upfront approach that the Mayor is already taking with regards to developer’s contributions to affordable housing. Defining standards from the outset would keep land values in check and avoid pressure for over development.

The new London Plan should embrace this approach and take it further. This could be done in three ways:

- a) **Encourage form-based Area Actions Plans:** this involves identifying ways to make better use of land, improve the built environment, enhance the quality of public areas and deliver more space for employment-generating uses, as is being done by Southwark Council for the Old Kent Road in South East London.
- b) **Create Community Codes:** Extend the requirement for borough-wide design codes for small sites to development (Policy H2 of the draft new London Plan) to Boxland sites. Such codes, ideally to be worked up with local residents, could

²⁹ Douglas Wheeler Associates (2009), *Research examining the barriers to achieving mixed use development and identifying approaches to overcome these barriers.*

³⁰ See Boys Smith (2016), *A Direct Planning Revolution for London?*, pp. 22-7. London First (2017), *Guiding Light: Unlocking London's residential density*

³¹ Paragraph 125 of the draft NPPF states that; ‘To provide maximum clarity about design expectations, plans or supplementary planning documents should use visual tools such as design guides and codes. These provide a framework for creating distinctive places with a consistent and high quality standard of design.’

be relabelled Community Codes.

- c) **Pilots:** The GLA could work with boroughs to allocate several prominent development sites as pilots for a ‘zoning’ or design-code led approach.

The Mayor must adopt a more assertive approach to limiting Boxland

The new London Plan needs to be clearer about its approach to industrial land. On one hand, certain policies in the draft (Policies E5 and E6) offer protection to Strategic Industrial Land and Locally Significant Industrial Sites by making it hard to build homes on these sites. On another, there is support for the intensification of land use on industrial sites and co-location with residential uses in certain circumstances (Policy E7).

But there is a danger that boroughs interpret policies in the draft new London Plan too narrowly, settling for the safety of the status quo rather than risk creative change.

Yet land use on sites accommodating single storey industrial sheds and ‘big box’ retail is rarely optimal and we must not waste the potential to combine uses with better design.

The new London Plan should put greater emphasis on bringing forward sites with ongoing industrial or retail use by mixing commercial and residential development.

Mayoral support for a more creative alternative to Boxland is essential to encourage more landowners of industrial and big box retail sites to consider redevelopment on a mixed-use basis.

The GLA should prompt boroughs to look critically at all industrial sites, even those that are operational, to determine if a ‘mixed-use’ approach is possible.

The new London Plan needs to go further than the draft and set out more clearly how uses can be integrated in urban form³² to deliver the ‘good growth’ the Mayor is striving for.

The Greater London Authority (GLA) should bring together a combination of expertise

Too often development happens in silos with housebuilders in one corner and commercial developers in another. A mixed-use approach must breakdown these artificial barriers from the very start by ensuring collaboration by experts in different fields.

City Hall should act as a hub for property professionals and boroughs to share experiences and to deploy expertise and learning of what works between sites. The ability to bring together all interested parties across disciplines can help develop a better understanding of the complex play-offs between different uses, enabling compromise at early stages thus speeding up decision-making and delivery.

This puts GLA in the best position to instigate partnerships and delivery vehicles such as Joint Ventures and for bigger schemes,

32 In the draft New London Plan, Figure 6.3 illustrating simplified approaches to consolidation on industrial land, is only moderately helpful in understanding the need for mixed-use ‘London-like neighbourhoods’.

development corporations that take into account interest of the public, private and third sector.

The Vision thing – Create Boulevards, Elizabeth Towns and Thames Towns

Our spatial vision for the future of London needs to become profoundly more inspirational about where our new development will be and what it will be. Chapter two of the London Plan sets out where much (though not all) development can come from. However, these sites need to be linked together with a greater and more comprehensible focus on what they will be and how they will look. We suggest three unifying themes to capture the potential to banish Boxland and build ‘London-like neighbourhoods.’

- **Elizabeth Towns:** a popular programme for a series of medium-rise, high density traditional mixed-use town centres on former Boxland along the new Elizabeth Line with their own distinctive, popular and beautiful aesthetic and walkable, finely-grained urban form. This will be particularly relevant in places such as Ilford
- **Thames Towns:** a popular programme for a series of low-rise, high density traditional mixed-use towns along the banks of the Thames Estuary with their own distinctive, popular and beautiful aesthetic and walkable, finely-grained urban form. Thames Towns are not built from towers, but nor are they sprawling car-dependent suburbia.³³
- **Create Boulevards:** a partially community-led programme for the popular beautification and intensification of London’s arterial roads with more trees and a range of beautiful, popular medium-rise developments with pre-set designs agreed by local communities to permit faster and higher development of more homes.

³³ See <http://dev.createstreets.com/front-page-2/campaigns-copy/thames-towns/> for more details.

³⁴ See <http://dev.createstreets.com/create-boulevards/> for more details.

Community Codes

Most Londoners are in favour of more housing. But they are often suspicious about the form that this new housing will take. This is not surprising. New development is often neither in line with what people want nor in line with best practice on physical and mental wellbeing.

Community co-led design codes could give ordinary Londoners confidence that what they want to see in their neighbourhoods is what ends up happening, as well as providing certainty for local government and developers. The new draft NPPF encourages design codes for precisely this reason.

Design codes are a set of illustrated design rules and requirements which instruct and may advise on the physical development of a site or area, and are much more common in other countries. There are now over 400 form-based codes in US and Canadian cities. In 2010 Miami, became the first major US city to replace their historic approach with a design code. The US Department of Defence has recently switched to using them. They are common in most of Europe, which has consistently managed to build systemically more homes than the UK with nothing like the equivalent level of political controversy. In countries such as France, for example, if developers and builders follow the Local Urban Plan to the letter, then the difficulty, complexity and cost of achieving development control is very low compared to the UK.

Making use of pre-set clear design codes in more situations could speed up the delivery of new homes and permit a wider range of smaller and third sector developers. Communities should work with local authorities and architects to draw up 'Community codes' that set appropriate parameters for new development. Greater certainty would remove the huge advantage that larger, more experienced and well-capitalised developers have under the current, historically and comparatively very peculiar British development control-led planning system.

Appendix 1: Housing estimates methodology

This appendix explains the methodology used by Create Streets analysis to estimate the number of homes that could be built on London's industrial and 'big box' retail sites.

How much industrial and big-box retail land is there in London?

Our primary data source for this analysis is OpenStreetMap (OSM). This is the first free, editable, and crowd-sourced map of the world.³⁵ This has been shown to be very accurate, especially in urban areas.³⁶ We consider it a sufficiently reliable source of spatial information for a top down study. Since this study focuses on industrial and 'big-box' retail sites, we accessed the OSM information relative to land use and, in particular, we accessed the data labelled industrial and retail. While the areas labelled industry did not need filtering (they are all industrial sites), the areas labelled retail had to be filtered since some were not 'big-box' retail sites, but high street shops, minimarkets or other smaller amenities. We therefore used a mixed automatic and manual method to identify 'big box' retail sites. This method, first, automatically identified the biggest retail sites by selecting the biggest areas.³⁷ Secondly, it filtered out, through visual inspection of satellite pictures, retail areas which were not big-box retail sites, such as commercial strips on high streets.

At the end of this process, we identified a total of 1,221 sites across Greater London, covering 6,121 hectares. Of these 1,221 sites, 1,120 were industrial (5,554 hectares); while 100 were big box retail (566 hectares). Reassuringly, the 5,554 hectares of industrial land is within 7 per cent (393 hectares) of the most comparable figure available (5,162 hectares) from the 'Core industrial uses', from the GLA.³⁸

The aim of this study was to assess how many homes could be built on these sites by considering different density and accessibility scenarios. To do so, we had first to assess the current conditions of the sites and their surroundings. This was a four-step process.

Step one – categorising industrial and 'big-box' retail sites based on built density

The London SHLAA 2017, which provides the evidence base for the new draft London Plan, outlines three different character settings for

³⁵ <http://www.openstreetmap.org/>

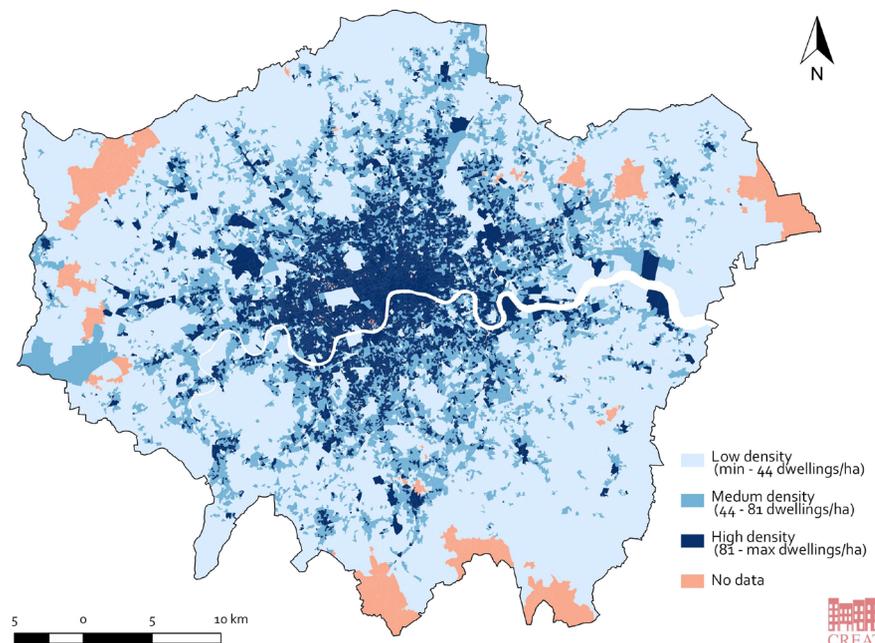
³⁶ See, for example: Haklay, M. (2010). "How good is volunteered geographical information? A comparative study of OpenStreetMap and Ordnance Survey datasets." *Environment and planning B: Planning and design*, 37(4), 682-703; Girres, J. F., & Touya, G. (2010). "Quality assessment of the French OpenStreetMap dataset." *Transactions in GIS*, 14(4), 435-459; and Ludwig, I., Voss, A., & Krause-Traudes, M. (2011). "A Comparison of the Street Networks of Navteq and OSM in Germany" in *Advancing geoinformation science for a changing world* (pp. 65-84). Springer Berlin Heidelberg.

³⁷ This was obtained through the Jenks Natural Breaks classification method, which creates classes of data based on natural groupings, which minimize differences between classes. ESRI.2008. ArcGIS Desktop Help 9.3.

³⁸ 5,162 hectares is the total for all industrial sites not including utilities, waste management and transport uses. For reference, see: AECOM (2016). *London Industrial Land Supply & Economy Study*. Appendices.

sites: suburban, urban, and central.³⁹ We followed this approach for our own categorisation based on built density of both residential and non-residential. To do this:

- Firstly, we calculated the volume of each building (residential and non-residential) within each Output Area.⁴⁰
- Secondly, we divided the volume by the average size of a home (232.8 m³) to estimate the corresponding number of dwellings. This was calculated by using the average sizes of properties for the following housing typologies: semi-detached, terraced, and flats and the average height of dwellings.⁴¹
- Thirdly, we divided the number of dwellings in each Output Area by the hectares of each Output Area to estimate the dwellings per hectare.
- Finally, we subdivided our output into three and created the following categories:
 - low density (between the minimum of the distribution and 44 dwellings per hectare);
 - medium density (between 44 and 81 dwellings per hectare); and
 - high density (between 81 dwellings per hectare and the maximum of the distribution).



39 GLA (2017). The London Strategic Housing Land Availability Assessment 2017 SHLAA 2017. Part of the London Plan evidence base, p 24.

40 <http://www.openstreetmap.org/>

41 As found in Savills (2015). "Size matters. How big are our houses?" http://www.savills.co.uk/research_articles/186866/188035-0, [Online; accessed 19-December-2017]

Characterisation of London Output Areas based on built density



We then assigned to each industrial and 'big box' retail site its appropriate category (low density, medium density, or high density) by looking at its Output Area. Note that some Output Areas (the pink areas) did not have any data. Thirty two of the 1,220 industrial and 'big box' retail sites identified were in these areas. To categorise these sites, we assigned to them the information on built density associated with the closest Output Area.

Step two - estimating density, PTAL and spatial accessibility of the immediate surroundings

To generate scenarios for new housing, we then needed to measure density (dwellings per hectare), Public Transport Accessibility Level (PTAL) and spatial accessibility of the immediate surroundings of the industrial and 'big box' retail sites.⁴²

- Density and PTAL were calculated by picking the site boundaries, drawing 400 meters buffers around each of them and averaging the values of density and PTAL for the census areas (Output Areas) whose central points lay within the buffer areas.
- Spatial accessibility for each site was calculated by assigning to each site the level of spatial accessibility of the street segment to which it was closest. The spatial accessibility levels for the street network of Greater London were previously calculated using the Multiple Centrality Assessment (MCA), a tool developed by a research team lead by Professor Sergio Porta of Strathclyde University.⁴³

Step three - estimating the volumes of existing buildings and their corresponding density

To compute how many new houses could be built in each site, we then estimated the existing volumes. We did with the same actual built-density methodology used in step one. Firstly, we calculated the volume of each building on each site. Secondly, we estimated the corresponding number of dwellings by dividing the volume by the average property size (232.8 m³). Thirdly, we estimated dwellings per hectare, by dividing the number of dwellings in each site by the site's area.

Step four - creating scenarios

Finally, we created six different scenarios for housing uplift on every one of the 1,220 industrial and big box retail sites while maintaining existing use:

- **Scenario 1: existing surroundings scenario.** This is the most conservative scenario. It is driven off the amount of new housing currently surrounding the sites and only permits mixed-use development up to this level. This would only permit 17,100 new homes. Its low number compared to all other scenarios shows both the potential and what a major uplift the London Plan intends on existing densities.

⁴² A measure of public transport accessibility computed by Transport for London (TfL) for small census areas (Output Areas).

⁴³ Crucitti, P., Latora, V., & Porta, S. (2006). "Centrality in networks of urban streets." *Chaos: an interdisciplinary journal of nonlinear science*, 16(1), 015113.

- **Scenario 2: case study scenario.** This scenario follows the worked-up case study in chapter three for the site studied. It achieves very material density increase, with an implied 258,600 new homes.
- **Scenario 3: 2017 draft new London Plan scenario.** This is driven off the target densities for a given PTAL as set out in the SHLAA 2017 (Table 2.8) and the draft new London Plan. This implies 277,800 new homes. This does not include the uplift for Opportunity Area target or achieved densities as described in the SHLAA.⁴⁴
- **Scenario 4: opportunity area density scenario.** This scenario applies the higher ‘Opportunity Area Density Assumptions’ (as set out in Table 2.10 of the SHLAA).⁴⁵ These are applied only to opportunity areas. All other sites are driven off the standard density assumptions as in Scenario 3. This scenario implies 303,600 new homes.
- **Scenario 5: average density trends scenario.** Finally, we have run a scenario which applies the average density trends in opportunity areas between 2004 and 2016 as set out in the SHLAA Table 2.11.⁴⁶ These are applied only to opportunity areas. All other sites are driven off the standard density assumptions as in Scenario 3. Showing how London is in some places at present being over-developed to a non-London typology, this achieves the most new housing (308,000 homes).

44 GLA (2017). The London Strategic Housing Land Availability Assessment 2017 SHLAA 2017. Part of the London Plan evidence base, p 24, Table 2.8

45 GLA (2017). The London Strategic Housing Land Availability Assessment 2017 SHLAA 2017. Part of the London Plan evidence base, p 26, Table 2.10.

46 GLA (2017). The London Strategic Housing Land Availability Assessment 2017 SHLAA 2017. Part of the London Plan evidence base, p 26, Table 2.11.

Appendix 2: Accessibility analysis

Accessibility modelling by Space Syntax of the case study

The feasibility study redesign proposals have been analysed in terms of their existing and proposed 'Spatial Layout Accessibility' patterns.

Spatial Accessibility Modelling

Spatial accessibility models are created by transforming the street pattern of an area into a network 'graph'. In urban systems, the road centreline map of the area is often used as a starting point, where the network is divided into individual 'segments' of space, each segment being the street or path between two intersections.

Each segment is then evaluated using a mathematical algorithm to calculate its inter-accessibility within the network. This measures how relatively easy or difficult it is to reach that segment from all other segments, or how likely it is that movement between different parts of the network is likely to pass along that segment for different scales of journeys.

The resulting pattern of intersecting lines is then analysed using a bespoke software package to establish the amount of movement that is likely to flow along any street segment when people are moving from all possible origins to all possible destinations. Routes are calculated based on the least angular deviation from any origin to any destination. A Spatial Layout Accessibility Map uses colour to denote the likelihood of any route being selected, from red (most likely) through orange and yellow to green and blue (least likely).⁴⁷

Multi-Scale Accessibility Modelling

Spatial Layout Accessibility values can be calculated across multiple scales to identify the most accessible routes for either pedestrians moving at the local scale to the most accessible routes for vehicles moving at a larger, more global scale. Some routes are more likely to be selected for more local journeys, some for more global journeys, and some will be selected for both.

Research by Space Syntax has found that locations with stronger multi-scale accessibility values are more likely to support 'movement-sensitive' land uses such as retail and commercial uses. This happens because such locations attract multiple scales of movement and therefore a broader

47 Hillier, B., Yang, T., Turner, A. 2012. "Advancing depth-map to advance our understanding of cities." In: Greene, M and Reyes, J and Castro, A, (eds.) *8th International Space Syntax Symposium*. Pontificia Universidad Catolica de Chile: Santiago, Chile. Hillier B., Vaughan, L. 2007. "The spatial syntax of urban segregation." In: *Progress in Planning* 67. Hillier B (2012) *The genetic code for cities: is it simpler than we thought?* eds. Portugali Y, Meyer H, Stolk E and Tan E "Complexity Theories of Cities have come of age: an overview with implications to urban planning and design" *Springer Complexity*, Heidelbergdkz.

48 Hillier, B. (1996), "Cities as movement economies", *Urban Design International* 1,1, pp. 49-60

catchment of people. Multi-Scale Spatial Layout Accessibility is established by first selecting the top 10 per cent of locally accessible routes (highlighted in blue), then the top 10 per cent of globally accessible routes (highlighted in green). Routes that occur in the top 10 per cent at both scales – the Multi-Scale routes – are highlighted in red.

Urbanizing retail Boxland: city-wide street connectivity



Existing



Proposed

The analysis shows that the proposed redesign does not change the relationship with the larger scale urban context. However, the proposed new buildings are taking better advantage of the surrounding major streets and related activity patterns with higher density development and commercial and retail development at ground level.

Urbanizing retail Boxland: local street connectivity



Existing



Proposed

The analysis shows that the proposed redesign creates a clear internal structure with smaller residential blocks overlooking traditional streets. This structure connects directly to the site boundaries and across into other nearby residential streets. This makes navigation easier. In this option the street along the railway retains relatively high local accessibility levels. This will contribute to decent levels of through-movement and the safety of the whole neighbourhood, including the new public spaces created within the site.

Urbanizing industrial Boxland: city-wide street connectivity



Existing



Proposed

The analysis shows that the proposed redesign does not change the relationship with the larger scale urban context. However, the proposed new buildings are taking better advantage of the surrounding major streets and related activity patterns with higher density development and commercial and retail development at ground level.

Urbanizing industrial Boxland: local street connectivity



Existing



Proposed

The analysis shows that the proposed redesign creates a clear internal structure. This structure connects directly back to the site boundaries, making it easy to navigate to the industrial units within the site. Local accessibility along the railway line decreases to a degree. This is very acceptable because the largely industrial and residential function of this space does not depend on high levels of local through-movement.

London needs to build 66,000 new homes a year. But with the population projected to grow by 70,000 a year up to 10.5 million by 2041, London also needs schools, shops, amenities and space for tens of thousands of new jobs. To prepare for and accommodate such levels of growth we must make the very best use of land in the capital. Yet despite the Mayoral drive to increase densities in London, too much space is wasted across the city on sites currently occupied by single-story big box retail and industrial sheds.

In this report we argue for the redevelopment of “Boxland” into genuinely mixed use neighbourhoods where people want to live. We have identified 1,220 potential sites which could theoretically accommodate between 250,000 and 300,000 new homes alongside commercial uses.

There is potential to transform these sites into a more popular London vernacular with terraced housing, mansion blocks and mid-rise blocks set within traditional street patterns and combined with shops, amenities and workplaces.

Done well, higher densities can be a force for good. A concentration of people means more economic activity to support better shops and amenities. It also means more council tax and business rates to support local services. A tighter knit urban fabric can be healthier by encouraging people to walk rather than rely on cars.

Our proposals for Better Brownfield embrace the need for growth and higher densities by encouraging more housing that is built at human-scale, integrated with the fabric of the city and in a familiar vernacular.