INTELLIGENT DENSITIES / VERTICAL COMMUNITIES

A new housing model for London
SOM presents a new model for delivering vertical communities at intelligent densities.

How can we design more liveable, sustainable and cost-effective residential buildings? How can we bring the efficiencies of the office sector to residential buildings? How can higher-densities relate to different demographics, and how can we create better vertical communities?
London is currently facing what many are calling a ‘housing crisis’.

SOM are proposing that this housing shortage should be treated as an opportunity, a chance to create new and desirable housing typologies, as well as a point in time to step back and take stock of how we are impacting the environment and how we might design homes which do not exacerbate this situation.

1. London’s population is expected to increase by 1.5 million people by 2030
8.5 million people

10 million people

2015

2030
There is a general fear of creating more density in London. And yet, while the capital is four times larger than any other UK city, very ‘liveable’ cities, such as Brighton, have similar levels of density.

London is shown in an even more favourable light when compared to other cities on the world stage in which one might aspire to live, including Paris, New York, Barcelona and San Francisco, all of which are considerably denser.

2. Population (millions) in relation to the average gross urban density (persons/ha, urbanised areas)
London’s most dense boroughs are, in terms of density, nowhere close to other well known residential districts.

3. London’s densest boroughs, Kensington & Chelsea and Islington, are some of the most desirable residential locations

All maps data ©2015 Google
Kensington & Chelsea, London: **55 units/ha**

L’Eixample, Barcelona: **130 units/ha**

Upper West Side, New York: **160 units/ha**
The majority of London is, in fact, of low scale and low density.

At 55 units/hectare, our densest Boroughs are, surprisingly, Kensington & Chelsea, and Islington.

4. London Boroughs Densities. The average London density is **20 units/ha**

5. **Kensington and Chelsea**
   - Population: 158,300
   - Area: 12.1 km²
   - 55 units/ha

**Islington**
- Population: 206,300
- Area: 14.8 km²
- 55 units/ha

Source: Office for National Statistics (Census 2011)
If the whole of Greater London’s density was increased to this level it could accommodate 21.2 million people. We require only 50% of that to house the predicted population in 2030.

6. If all of London was build at the same density as Islington, it would only cover **38% of its current area.**

7. To house the additional 1.5 million in population for 2030, London would only need **50% of its current area.**

Source: Office for National Statistics (Census 2011)
It has been suggested by some that in order to accommodate the population increase, we need to build on green belt land. SOM performed a simple analysis of the city, which shows that this is simply not the case.

8. London’s regeneration and opportunities areas.

9. London’s Densities related to the PTAL value.
Regeneration areas
Opportunities areas

437 km²
Existing lower density Areas with PTAL >3

267 km²
Existing higher density Areas with PTAL >4
By very slightly densifying areas with the highest transport rating (PTAL), for example, the number of homes required can be achieved very quickly, and without touching conservation areas or green belt land.

10. If we only densified 15% of the areas with PTAL > 3 & 4 we could uplift London’s density from 20 units/ha to 23.5 units/ha and we could house an additional 1.5 million people.
Greenbelt within London
Conservation District
68 km²
Areas to be densified
In the NLA’s 2013 Tall Building Study, 60% of the Londoners whom they surveyed said that they would be happy to work in a high-rise building, while only 27% said that they would be happy to live in one. While London’s office towers are internationally admired and replicated, the residential buildings are not of the same quality:

Why is this?
Post war  |  1970's  |  Today

Popularity

Residential

Office
One explanation for this shortcoming is, perhaps, the fact that architects and planners have been taking guidance on housing design as a code requirement, as opposed to using it as it was intended: to provide advice on minimum standards.

The resultant product is often a one-size-fits-all building. With standards that limit and inhibit designers, rather than challenge and inspire innovation, we are in danger of not producing high density projects in which Londoners will aspire to live.
ONE SIZE DOES NOT FIT ALL

- STUDENT
- ESTABLISHED PROFESSIONAL
- YOUNG PROFESSIONAL
- NEW FAMILY
- LARGE FAMILY
- ELDERLY COUPLE
- EMPTY NESTERS
- RETIRED SINGLE
Looking to the past, London’s housing stock boasted great variety in its typologies, while the streets and squares of London provide wonderful amenities.

We decided, therefore, to explore how our high-density buildings could incorporate all of these differing typologies, as well as provide new facilities to the community.

11. A model able to incorporate different house typologies and amenities, as a vertical neighbourhood.
Our proposal also aims to offer future adaptability to enable inhabitants to change spatial volume to suit their needs.

12. As we change needs during our lives, our house should be able to adapt following these changes.
We propose a series of modules that could be organised around a central core with a variety of options for configuration, providing maximum flexibility for unit mixes, sizes and volumes.

13. Structural adaptability diagram
14. Service flexibility diagram
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This would allow for a wide variety of choices in configurations.

15. A number of different apartment typologies
16. Flexibility matrix
The module would also include a number of shared amenities which allow the building to come alive and help its inhabitants to develop a strong sense of community.

17. The model will include at least 15-30% of shared community areas for its inhabitants.
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- Residential typologies
- 15-30% Community areas

ENTERTAINMENT
- Cinema
- Theatre
- Library
- Art Gallery

WORKSPACE
- Workshop
- Business Lounge

CHILDREN
- Family Support
- Creche
- Playground

EXTRA STORAGE
- Wine Cellar
- Rentable Storage

RETAIL
- Markets
- Shops
- Dry Cleaning
- Cafes
- Restaurants

HEALTH
- Indoor Pool
- SPA
- Fitness Centre
- GP / Pharmacy
As well as forcing us to evaluate how we go about creating sustainable communities, meeting the demands of the housing shortage provides us with the impetus to measure how our buildings impact on the environment.

The fact that current designs are not even close to carbon neutrality is of grave concern: effectively, the buildings we are designing today will be out of date in 2030.

In response to this concern, SOM have been researching, among other initiatives, the use of timber in place of concrete.

18. Path to achieve Carbon Neutrality:
Equivalent to a reduction of 880 cars off the road per year

19. Environmental Sustainability:
Reducing electricity bill by 75% per year
Achieving Carbon Neutrality

Materials selection 40%
Efficient Structure 20%
Building maintenance 20%
Renewable resources 10%
End of life 10%

Environmental Sustainability

Efficient equipment and furnishing 41%
Efficient building system 20%
Efficient building envelope 16%
Passive design 10%
Occupant behaviour 10%
Renewable resources 3%
To illustrate the carbon savings that could be made, SOM compared a typical 60 storey concrete residential building to a hybrid 60 storey timber proposal: wood columns, wood walls and wood floors. This exercise showed a 80% reduction in carbon.

The continuing research that SOM has developed also showed that if, for example, the two hundred-odd residential towers that currently have planning permission in London were constructed from wood, they would only use ¼ of the UK’s annual yield of timber. Whilst UK suppliers are not yet set up to supply such a demand, it is worth considering the potential for UK industry.

20.
Timber, combined with different percentages of concrete, is a valid solution for every type of building, from small to high-rise.
**Concrete Benchmark**
Embodied CO2: 370 kg/m²

**Timber Tower**
Embodied CO2: 50 kg/m²
Carbon neutrality and energy efficiency are achieved not through one easy solution but by incremental practices.

We must find ways to share not just public space, but amenities and energy resources. Adaptability should be considered our keyword: to be intelligent every new building should be able to relate to its context in terms of size and energy contribution.

21. Proposed sustainability strategies for water edge areas:
   - Water source heating & cooling
   - On site generation
   - Integrating park into the building
   - Energy sharing

22. Proposed sustainability strategies for dense urban areas:
   - Energy centre
   - Energy sharing between building uses
   - Harvesting waste energy

23. Proposed sustainability strategies for park edge areas:
   - Integrating park into the building (social sustainability)
   - Heat Island reduction
   - Shallow ground source heating & cooling
At SOM, we are currently in the process of taking some of this ‘Blue Sky Thinking’ and attempting to translate it into tangible and meaningful change.

Such change, however, will take more than just one building. What is required is a shift in attitude from architects, planners and developers alike to find ways to develop buildings as communities and not as competition to one another.

24. Manhattan Loft Gardens, London UK
SOM proposes intelligent strategies that will aspire to achieve the highest environmental targets possible for the complex and unique urban context that London presents.
Skidmore, Owings & Merrill (SOM) is one of the leading architecture, interior design, engineering, and urban planning firms in the world with a reputation for quality, innovation and management.

SOM’s London office was established in 1986 in response to the award winning commissions for both Canary Wharf and Broadgate developments.

In recent years the practice has built an impressive portfolio of residential work and has secured planning approval for over 4,500 units in the past year alone.

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Kent Jackson is the design director in SOM’s London office. His experience encompasses a diverse range of scales and uses, including residential developments, corporate offices and large mixed-use urban schemes.
This research was presented at the NLA Breakfast talk by Kent Jackson in July 2015.