

Designing Cities as Human Habitats

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Is it time to rethink what it means to design cities as human habitats?

Humans are not designed to live in cities.

For over 99.99% of our evolutionary history, we lived immersed in nature among small communities which moulded our psychological and social well-being. Since the industrial revolution, urban living has grown exponentially - bringing millions of strangers rubbing shoulder to shoulder with one another within landscapes largely devoid of nature and breaching with fatiguing stimuli. Frequently, these dense living environments inadequately meet our innate psychological need for restorative nature, leading individuals to either seeking refuge from the crowds, or to move away from urban density to seek more spacious and calming living conditions. Without a desired community network as support, this can have a negative knock-on effect on our social well-being.

Is it possible to design high density urban habitats that harmonise our need for daily quality contact with restorative nature and our need for a variety of meaningful social bonds? And is it time to rethink what it means to design cities as human habitats?

Evolution of Human Habitats

A habitat by definition is an environment that meets all the conditions an organism needs to survive¹. For the vast majority of modern human history spanning 200,000 years, the human habitat was the savannas of Africa where we first evolved living as nomads, and later the temperate grasslands of Asia and Europe. Small permanent settlements only appeared with the rise of agriculture 12,000 years ago. Up until this point humans had lived, worked and played within nature intimately. We lived in small, sparse nomadic communities which fashioned our social networks typically comprising of close-knit community groups of a few dozen individuals of core family members, extended family members and close friends. These close-knit community groups would interact with other groups to trade and hold various ceremonies forming a wider and looser layer of social bonds. We therefore evolved having various layers of relationships within a small societal network.



Fig 1.
Balancing high density living
with nature
(Image credit: NParks)

Only with the advent of the industrial revolution approximately 200 years ago, did urbanisation rapidly occur; according to United Nations data, it was only in 2007 that the balance was tipped towards more people on the planet living in urban environments than rural. This represents a paradigm shift of the human habitat within our lifetime. It also leads to a bigger question - how does this new urban habitat away from nature and amid crowds of strangers impact our psychological and social well-being?

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Fig 2.
Low-density
development in the UK
(Image credit: Jason Wright)

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Integrating natural environments into our urban setting will affect our personal well-being.

Implications of the urban habitat on our well-being.

We have an innate affiliation with nature which is described by Edward O. Wilson’s Biophilia concept² that suggests our tendency to seek connections with nature stem from our evolutionary past. The concept of biophilia implies that we hold a biological need for connections with nature on psychological, physical and social levels. Hence, integrating natural environments into our urban setting will affect our personal well-being.

The benefits of having a close connection with nature on our psychological well-being have been proved by various scientific evidence. Kaplan and Kaplan’s Attention Restoration Theory³ proposes the power of nature to focus our cognitive abilities, while Roger Ulrich’s Stress Reduction Theory⁴ proposes natural environments reduce stress. The work by Richard Louv’s on Nature Deficit Disorder⁵ indicates that without contact with nature leaves us vulnerable to a variety of maladies.

The urban habitat is intended to be densely populated, and characterised by significantly reduced space for nature. MIT Senseable City Lab’s “Green View Index” that determines green canopy coverage in major cities shows merely 15.3% green coverage in New York, 12.7% in London and 8.8% in Paris. These figures are significantly lower than the habitats humans had evolved within, thereby severely limiting the psychological benefits that contact with nature provides.

Global economic competition and the pursuit of shinier iconic structures inevitably come at a cost. However, these negatives can be negated with efforts to incorporate biophilia into our urban developments. One solution to design the urban habitat with high contact with nature has been the development of dispersed cities comprising of low-rise dwellings, private gardens and expansive open parks. These low-density urban areas in effect mimic the savanna and grassland landscapes our ancestors evolved within, presenting a convenient connection with nature (Fig. 2 and 3). Interestingly this is supported by Jay Appleton's Prospect-Refuge Theory[®] that suggests how certain environments feel secure when we can observe while not being seen which stems from evolutionary survival in savanna landscapes, where the predator must be able to see their prey without being seen.

A renowned example of a high-density urban environment seeking restorative nature was London in the 1800's, where millions lived in overcrowded and unpleasant conditions. In response, the urban planner Ebenezer Howard married town-and-country with the Garden City Movement demonstrated through the Letchworth Garden City and Welwyn Garden City. They were designed as utopian low-density cities where people lived harmoniously together with nature comprising of wide-open parks, tree lined avenues and a greenbelt encircling the city. The Garden City ideals went on to be employed in cities throughout the world including in the USA, Canada, India, Australia, Brazil and New Zealand.

More recently, the COVID-19 pandemic has triggered a re-appraisal of dense urban living, with increasing numbers in search of restorative nature. This is reflected in the UK housing market. A survey of buyers and sellers registered with Savills real estate in May 2020 found 51% of people in London were considering a move outside the city compared to 42% for the same period of 2019, and 30% were more likely to consider a village or countryside location for their next move. Half of the respondents said having a garden had become more important to them, and if compromises were needed they would forgo another bedroom for a garden.

While low density living increases our connection with nature thereby improving our psychological well-being, it has its negatives.

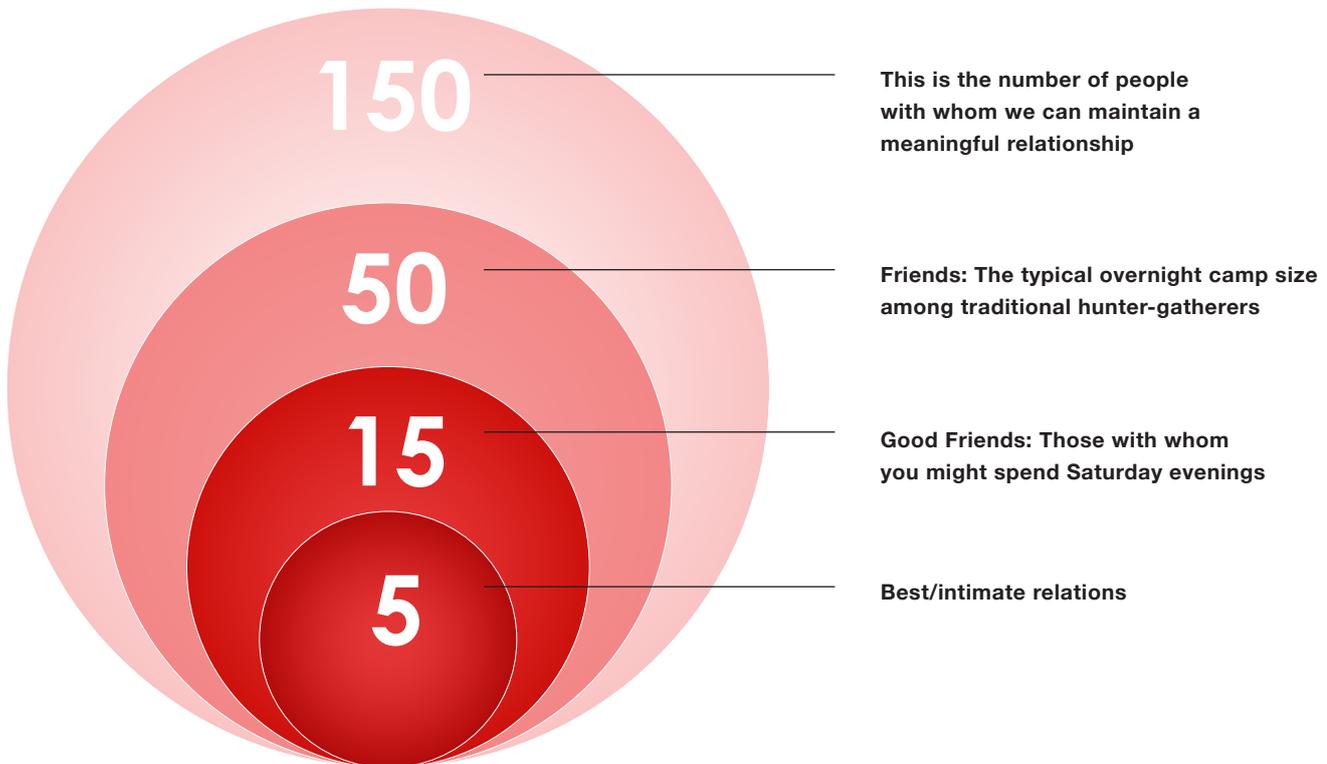
Fig 3.
Low-density development in the UK
(Image credit: Jason Wright)



High urban density is an important attribute for environmental sustainability as cities of the future will have to be compact in form, so as to be resource-efficient. When designed well, high urban density offers greater green transport options, more walkability and more energy efficient compact dwellings. Low urban density is often dependent on private vehicles, long commutes and energy devouring detached dwellings.

Low urban density where individuals seek private refuge from the fatiguing stimuli of dense cities can lead to social deserts. According to the anthropologist Robin Dunbar⁷ the “magic number” of meaningful social bonds the human brain can maintain is 150 (Fig. 4), which remains true for early nomadic societies as well as modern societies. However, 150 alone doesn’t tell the whole story as the theory suggests we maintain successive layers of relations from the tightest family core members out to a large pool of acquaintances. The design of low urban density potentially limits one’s interpersonal relationships to his or her immediate family layer comprising of just a few individuals. It can be hard to make meaningful relations beyond this inner layer into successive wider community layers caused by extensive private boundaries and large distances between community facilities.

Fig 4.
Dunbar's relationship hierarchy



Given the exponential growth of urbanisation, with high density urban habitats as an inevitable, we have to judiciously review our design approach to avoid a paradox of crowded isolation where individuals may feel the need to retreat to their private apartments to block off the crowds of strangers and the external world.

High density urban areas need to be appropriately designed to appeal to our psychological and social well-being more than low density areas if they are to be considered as a viable option for future environmentally sustainable and liveable cities. Our evolutionary history tells us our psychological well-being requires daily contact with restorative nature, but the way we typically design dense cities often contains low greenery coverage. We also need good designs to facilitate opportunities to form various layers of meaningful social relations within our local community which our evolutionary history indicates significantly contributes to our social well-being.

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Singapore’s Urban Landscape Model

Singapore is exemplary in remodelling the modern human habitat. As one of the densest cities on the planet, it is pioneering an urban landscape concept that harmonises both human needs for daily contact with restorative nature and meaningful social bonds within local communities.

With a population of 5.7 million and a land area of 720 km², Singapore is the second most densely populated country in the world at 8,358 people per km². Singapore does not have the luxury of space to allow for extensive low-density areas. In response the city has over the past 50 years pioneered a new model for urban density that factors in our desire for contact with nature. In more recent years there has been a drive to develop landscapes and programmes within the urban habitat to enable forming of meaningful social bonds among its residents.



Top / Fig 5.
XS sized landscape –
Corridor planting
(Image credit: Jonathan Lam)



Right / Fig 6.
S sized landscape -
Sky garden at
Kampung Admiralty
(Image credit: NParks)

Improving psychological well-being through biophilic design

Since Singapore's Garden City vision in 1967, the dense urban plans of Singapore have been designed with greenery as a key component of the built infrastructure. Contact with nature is not optional but a crucial part of a healthy urban habitat. More recently, with the launch of the City in Nature vision in 2020, biological complexity with horizontal and vertical layering of species and habitats has become a priority. These are aesthetic attributes that evolutionary theories suggest we are innately drawn to as identified in Lee Lee-Hsueh's work on ecological aesthetics⁹.

Differentiated from the conventional approaches taken by London's Royal Parks and New York's Central Park to consolidate public open greenery, Singapore's approach is to design and program biological complexity into all scales of the urban fabric covering sizes XS, S, M, L and XL.

Examples include:

- XS** Indoor planting, corridor planting (Fig. 5) and green walls.
- S** Community gardens, allotment gardens and sky gardens (Fig. 6).
- M** Neighbourhood parks and multi-tiered forest planting along the road verges known as Nature Ways (Fig. 7).
- L** Nature reserves, national gardens and regional parks (Fig. 8).
- XL** The Park Connector Network seamlessly linking parks together, and the Nature Park Networks seamlessly linking nature reserves and nature areas together (Fig. 9).

By carefully curating the various urban landscapes in consideration of scale, it is possible to infuse nature with biological complexity within urban density and allow for Singaporeans to engage with nature throughout their various daily activities. This is termed biophilic design. Biophilic design applies to all urban landscapes whether living in a high-rise tower with skyscraper greenery, commuting along the lush Park Connector Network or working in an industrial estate set within verdant streetscapes. The approach Singapore has taken demonstrates that as a city becomes denser in its built form, it is entirely possible to equally infuse an increasing proportion of nature to mitigate the negative psychological effects of urbanisation. Nature complexity, density and accessibility should be a prerequisite for architectural density when designing future cities.

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Top Right / Fig 7.

M sized landscape – Jalan Jurong Kechil Nature Way
(Image credit: NParks)

Top Left / Fig 8.

L sized landscape – Singapore Botanic Gardens
(Image credit: NParks)

Bottom Right / Fig 9.

XL sized landscape – Sungei Buloh Nature Park Network
(Image credit: NParks)



Improving social well-being through community landscapes

Singapore like many other developed cities throughout the world is at risk of facing increasing rates of personal isolation within their societies as households get smaller and more people live alone. The Department of Statistics Singapore figures indicate household sizes shrinking by 10% over the past ten years, and single occupant households increasing by almost 50% in the past ten years. During the same period the population density of Singapore has increased by 12% allowing for more opportunities to develop more meaningful social bonds within the community, but it can also exacerbate the crowded isolation paradox. When the reduction in household size is twinned with increased private seclusion away from urban crowds, it leads to a toxic cocktail of weak layers of social bonds and poor social well-being. Our evolutionary history shows us we are not designed to live isolated in small family units, nor are we designed to continuously form meaningful social relationships with the many hundreds of strangers we rub shoulder with in public daily.

One solution to mitigate urban isolation is to learn from our human evolutionary social circle composition by creating landscapes that can facilitate development of social bonding among the local community help reach the “magic number” of 150 meaningful social bonds. Singapore purposefully contains a high proportion of public open landscapes managed by the authorities, which are open to all members of society from various locations and backgrounds. These landscapes are effective at bringing large groups together, but do not leave much room for people to develop a sense of personal control and identity over the space. Traditionally, there has been a much lower proportion of semi-public landscapes available for smaller community groups with common passions to come together, where they can personalise the space and form meaningful social bonds. This has begun to change over recent years with the introduction of a number of community gardening initiatives that facilitate more convivial relations amongst neighbours and like-minded community members.

Fig 10.
Community in Bloom garden
(Image credit: Community
in Bloom, NParks)

A case-in-point would be the Community in Bloom (CIB) programme established in 2005 that brings together local communities with a passion for gardening to work hand-in-hand to create beautiful gardens within their neighbourhood (Fig. 10). Today, CIB has over 1,600 community gardens across Singapore that have engaged more than 40,000 gardening enthusiasts. Designed and managed by the community, these gardens facilitate convivial relations to form amongst neighbours who would otherwise unlikely interact walking past each other in the shared public corridors or open public landscapes. Mrs Rina Lai, 49, of the Toh Yi CIB resident's network, said she had difficulty re-integrating into the Singapore community when she returned eight years ago after being in the UK for six years. Through the CIB programme, she was able to meet other people and form a sense of belonging in her estate. “We have managed to build up a very strong spirit with the residents by working on the garden together,” said Mrs Lai.

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These spaces can support social cohesion, boost feelings of self-esteem, create a sense of belonging, trust and support, which are essential qualities for social well-being.





Fig 11.
Allotment garden programme
(Image credit: Community in Bloom, NParks)

The allotment garden programme is another prime example. Set up in 2016, it seeks to establish 2,000 allotment garden plots by the end of 2021, run by the community within public parks (Fig.11). One of the programmes key objectives is to encourage community bonding through bringing together various gardening enthusiasts to work along-side each other and share gardening knowledge. With ongoing efforts and success, this strategy is now being translated at a wider scale to include the common corridors of public residential blocks through developing raised planter trials to assess suitable designs and practices. This programme potentially allows for all high-rise residents with green thumbs to take a certain level of ownership over the narrow public spaces in front of their apartment to personalise to their planting taste whether it be growing an assortment of edibles or creating a floral extravaganza. More importantly this programme aims to ignite genial environments for neighbours to informally interact with each other and strengthen neighbourhood relationships.

The presence of semi-public landscapes in urban habitats is important in developing convivial relationships amongst neighbours and local community. These spaces can support social cohesion, boost feelings of self-esteem, create a sense of belonging, trust and support, which are essential qualities for social well-being.

Conclusion

High density cities will become the dominant human habitat over the coming decades as resources become more limited. We have traditionally traded contact with nature and community conviviality for efficiency of our urban landscapes, but at what costs?

The manner in which we design modern urban habitats should take inspiration from our evolutionary history that connect us with nature on a daily basis and allow for a rich layered social network in our local communities. It should ultimately enhance our psychological and social well-being, as opposed to taking away from it.

Designing cities that infuse natural diversity, complexity and most of all daily opportunities to experience nature at various scales, opens opportunities to create more attractive high density living without detriment to our psychological well-being. The richest social landscapes are those that provide opportunities of choice to residents to gradually transition from fully public to semi-public and then to private, to facilitate a rich layered community social network. These attributes are an imperative to how we must define our urban habitats.

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