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Superdensity: A New Model for Vertical Urbanism

超密度：垂直城市化的新模式

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Abstract | 摘要

Hong Kong has been, for decades, one of the world's most fascinating urban experiments. In one year alone (following the 2nd world war) the city grew by 50%, with a quadrupling over the next decade. Rapid growth, within the constraints of physical landscape, led to a characteristic urban form – dispersed high-density centers, surrounded by vast areas of natural vegetation.

In the context of the Pearl River Delta, we ask: how does Hong Kong take its next giant urban leap? What are the physical, social, and environmental dimensions that constrain the city's future growth? And what new spatial models of urbanization could be grafted onto this established city form?

Presented will be a new urban form that relies on three-dimensional systems of open space, transport and resource utilization.

Keywords: Connectivity, Density, Public Space, Urbanization, Vertical Urbanism

香港数十年来一直是世界上最为精彩的城市设计实验地之一。在仅仅一年之内（二战之后），香港的城市人口增长了50%，十年之后，人口翻了两番。城市的快速扩张加上实际地理条件的限制，形成了香港特色的的城市形态——周边为大片自然植被区所包围的分散式高密度中心。

在珠三角的环境背景下，我们要问的是：香港要如何实现下一个大的城市跨越式发展？制约香港未来发展的物理、社会和环境维度的因素有哪些？什么样的新的城市化空间模式可以应用到香港这种成熟的城市形态之中？

该文呈现的是一种依赖于三维系统，即开放空间、交通和资源利用的新的城市形态。

关键词：连通性、密度、公共空间、都市化、垂直城市化

Introduction

Many of our global cities face the challenges of urban intensification; balancing considerations of connectivity, affordability and amenity as they absorb wave upon wave of urban migration.

We often look to Hong Kong for answers to our urban challenges – it is one of our most fascinating urban experiments. Hong Kong has some of the densest districts on the planet but is also considered to be a highly attractive and livable urban environment. However, the city is under increasing population pressure, needing to accommodate a steadily growing population within a limited physical area.

This paper investigates how Hong Kong, an already dense city, might become even denser. By understanding the physical, social and environment dimensions that constrain the city's future growth, it will identify new spatial models for urbanization. It is necessary

引言

全球诸多城市都面临城市密度增加的挑战：在吸收一波又一波流入人口的情况下，如何平衡联接性、承载力和生活设施各方面的问题。

在应对这些城市化进程的挑战时，我们经常在香港这座城市中找寻答案——因为它是最为精彩的城市化实验作品之一。香港局部地区拥有世界上最高的人口密度，但而它仍然是人们眼中具有高度吸引力的宜居城市。然而，随着香港承受人口压力的逐步增大，它需要在有限的地理区域内承载日益增加的的城市人口。

该文章旨在探讨如何继续提升香港这个已然是高密度城市的密集度。通过了解制约香港未来发展的物理、社会和环境规模方面的问题，该文将确定香港城市化新的空间模型。我们有必要跳出高层建筑（在紧凑性城市方案中有重要作用）的局限，去探讨其他的城市系统的作用，包括城市街道和空间、公共基础设施和交通体系。

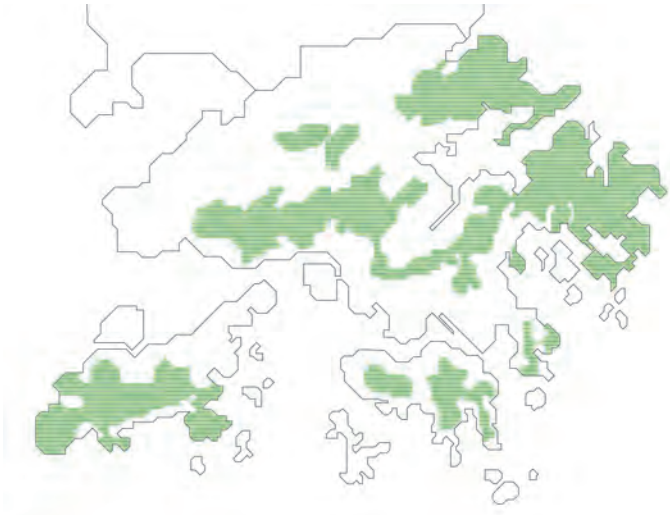

Figure 1. Hong Kong; unbuilt green space (Source: HASSELL)
图1. 香港，未开发绿地（来源：铿晓设计咨询（上海）有限公司）

Figure 2. Hong Kong; built urban space (Source: HASSELL)
图2. 香港，已开发城市空间（来源：铿晓设计咨询（上海）有限公司）

to look beyond tall buildings (which play a vital role in providing compact city solutions) to other city systems, including streets and spaces, public infrastructure and transportation.

This integrated design response will unlock the fullest potential of Hong Kong to overcome barriers to higher density development. By testing this in the context of Hong Kong, we can gain insights into how all cities might grapple the challenge of urban density and its role in creating more functional, attractive and competitive cities globally (Figures 1 & 2).

Describing Density

This paper begins by exploring three primary ways of describing density within an urban context, with each used to illustrate a particular dimension of the density of a city.

Floor Area Ratio (FAR) is the ratio of a building's total floor area to its lot area, the measure most often used by planners and developers to describe the density of a site. As it measures the total floorspace of a building or buildings, FAR is a measure of the built form of a site, although it does not necessarily correlate to building height or site coverage.

Dwelling Units (DPH) is a measure of the number of dwellings within a particular site or neighborhood, often expressed as dwellings per hectare.

As household sizes tend to be within a limited range, DPH may also provide an indication of the number of people that may be living within an area. However, this is more accurately expressed by the third description of density, Population (PPH), also usually measured as the number of people per hectare.

Each of these measures provides information about a city, neighborhood or site, but alone, they do not provide a full picture of density. It is possible, for example, for a site to have a high FAR but relatively low DPH due to each dwelling having a particularly large floor area. Similarly, in contexts where dwellings are very small in area, an average DPH can yield a relatively high PPH.

By any of these measures, Hong Kong is a high density city. The city's population of more than seven million lies within an area of 1,100 square kilometers, an average density of approximately 70 people per hectare. However, with more than 75% of the city's area being unbuilt, the population density of the built-up areas of the city is much higher. Much of the city has a PPH of 2,000-3,000; in some areas, it approaches 4,000.

Hong Kong's characteristic urban form – dispersed high-density centers, surrounded by vast areas of natural vegetation – is the product of a number of historic, economic and social factors. The city grew rapidly at the end of the Second World War, with migrant workers flooding into the city from the Chinese mainland. Within a year, the city grew by 50%; a decade later, it had quadrupled to more than two million. Many of the city's new residents lived in tightly-packed settlements on Hong Kong Island and the lower end of the Kowloon peninsula.

In 1953, the Shek Kip Fei area was destroyed by fire, leaving 53,000 people without homes and triggering a new government housing policy for the city. Under this policy, the majority of Hong Kong's residents would be housed in new multi-story buildings, primarily within established urban areas and with an

这种一体化的设计方案将充分释放香港的潜力，克服发展更高集约型城市的障碍。通过在香港的城市环境下测试这一方案，我们可以获得启示：其他城市要如何应对城市密度的挑战；如何使此方案在全球范围内打造功能性更佳、更具吸引力和竞争力的城市方面的作用（图1、2）。

密度描述

文章首先将探讨在城市背景下三种描述城市密度的主要方法，每种方法可描述城市密度的一种维度。

建筑容积率是一座建筑的楼面总面积和用地面积的比率，容积率是规划方和开发方最常用的描述基地密度的衡量指标。容积率代表了一座或多座建筑的楼面总面积，因此它是衡量建筑形式的一个指标，尽管容积率并不一定与建筑高度或基地覆盖率相关。

住宅单元是衡量某一基地或街区住宅数量的指标，经常用每公顷住宅数（DPH）来表达。

由于家庭规模基本在有限的范围内，DPH也可以用来指示某个区域内的大致居住人数。不过，还有第三中更加准确的密度描述方法，即人口（PPH），也经常用于描述每公顷的人口数量。

这些指标每一个都体现了一座城市、一个街区或一个基地的相关信息，但单独的某个指标并不能体现城市密度的总体情况。例如，有可能某个基地的FAR比较高但DHP相对较低，因为每个住宅单元的楼面面积特别大。同样地，如果某个区域的住宅数量较少，这种情况下平均水平的DPH就可以产生相对较高的PPH。

不论采用哪一种密度衡量方法来看，香港都是一座高密的城市。香港城市人口超

area of 24 square meters assigned to each and every person.

By the time the footprint of the city expanded (through "new town" development in the 1970s), high-rise living was the norm. This typology was supported by two other factors that emerged in the late twentieth century: the high price of land and the construction of Hong Kong's metro system. High density residential development was able to deliver the best return on both private and public investment.

As Hong Kong's population continues to grow at a steady rate, and with limited land availability, it will continue to serve as an instructive model for high density urbanism. Tall towers are being delivered on smaller and smaller sites. The close integration of rail and property development continues. And unbuilt green spaces become even more valuable assets of the city. How Hong Kong could sustain even greater urban density is a fascinating question to consider.

Pushing The Limits Of Density

Just as each density measure (FAR, DPH, PPH) describes a dimension of density, so too they provide an insight into the limitations of higher density development.

FAR most directly relates to the creation of floor space, that is the footprint, height and efficiency of buildings. Optimization of FAR is achieved primarily through the engineering of taller building structures – and while buildings generally become more inefficient the taller they are (because of increased structural, servicing and vertical transport requirements), there have been significant steps in addressing these engineering limits to density. For instance, we now create buildings with a slenderness ratio of more than 15:1, such as 111 West 57th Street and 432 Park Avenue, both in New York. Hong Kong provides a multitude of examples of these building types, with small-footprint tall buildings sandwiched into highly constrained sites throughout the city (Figure 3).

While DPH similarly relates to individual buildings (and the number of dwellings within them), the number of dwellings in a larger site or neighborhood is more likely to be constrained by the provision of urban infrastructure such as transportation, water and energy networks. These systems are also primarily an engineering concern, with advances in technology and system design supporting higher levels of density.

过7百万，居住区域面积仅为1100平方公里，平均密度约为70人/公顷。然而，香港有超过75%的区域尚未开发，因此推高了建筑密集区域的人口密度。香港多数区域的PPH在2000到3000之间，但有些地区这一指标超过了4000。

香港特有的城市形态——分散式高密度中心，周边围绕大面积的自然植被区——是诸多历史、经济和社会因素结合产生的结果。香港在二战末期发展迅速，大量来自中国大陆的务工人员涌入香港。一年之内，香港的人口增长了50%；十年之后，人口翻了两番，超过了200万。许多新市民住在香港岛人口周密的地区和九龙半岛的下端地区。

1953年，石硤尾区在大火中损毁，导致53,000居民流离失所，由此催生政府制定新的城市住房政策。这项住房政策让大多数香港城市居民有了新的多层楼房住所，主要位于成熟的都市区，每个城市居民分配到的住宅面积为24平方米。

随着城市区域面积的扩张（通过20世纪70年代的“新城”开发），高层住宅已成为常规住宅建造种类，其兴起源于20世纪末期其他两个因素的支持：高昂的土地价格和香港地铁系统的建设。高密度住宅开发模式可以为私人和公共投资均带来最佳的收益。

香港人口数量保持稳定的增长态势，而可利用土地却是有限的，在这种背景下，香港将继续作为高密度城市化具有启发性的样本。地铁和物业开发紧密结合的模式还将继续。未开发的绿地成为香港城市更加宝贵的资产。香港要如何承载更加高密度的人口，是一个引人深思的问题。

拓展密度极限

正如每一种密度衡量指标（FAR，DPH，PPH）描述一个密度维度，它们也指示了更高密度开发的局限所在。

容积率与楼面面积有最大的直接关联，包括建筑占地面积、建筑高度和效率。容积率的最大化主要通过建造更高的建筑结构来实现——不过建筑的使用效率通常随着建筑高度的增加而降低（由于结构、服务和竖向交通要求的提升），因此要通过解决这些工程制约因素来应对城市密度问题还有很长的路要走。举个例子，我们现在建造的大楼的长细比超过了15:1，例如位于纽约的西57街111号建筑和公园大道432号建筑。香港有诸多此种建筑类型的例子，整个城市有许多占地面积小的高层建筑穿插在高度受限的区域之内（图3）。

每公顷住宅数（DPH）同样也与单个建筑（以及建筑内部的住宅套数）相关，较大区域或社区内的住宅数量最常为城市基础设施供应情况所制约，这些基础设施包括交通系统和水电气网络，而这些系统也是工程学需要考虑的主要问题，科技和系统设计的进步可以支撑更高的密度水平。这方面的例子有大型换乘系统与现有和新兴城市相整合，分散布局公共设施以化解人口密度增加对更大设施网络的影响（例如悉尼的中央公园，斯德哥尔摩的皇家海港）。香港已先行采用了“地铁与物业”整合的交付模式，是香港成功打造高密度城市过程中可论证的重要决定因素。

工程问题对密度的制约——由于这些制约因素与容积率和DPH相关——大多数通过城市规划和城市设计得以解决，具体来讲，就是在密度已经很高的城市环境中打造密度更高的开发项目。

Figure 3. 111 West 57th Street, New York (Source: WSP Parsons Brinckerhoff)
图3. 纽约，西57街111号（来源：WSP Parsons Brinckerhoff）

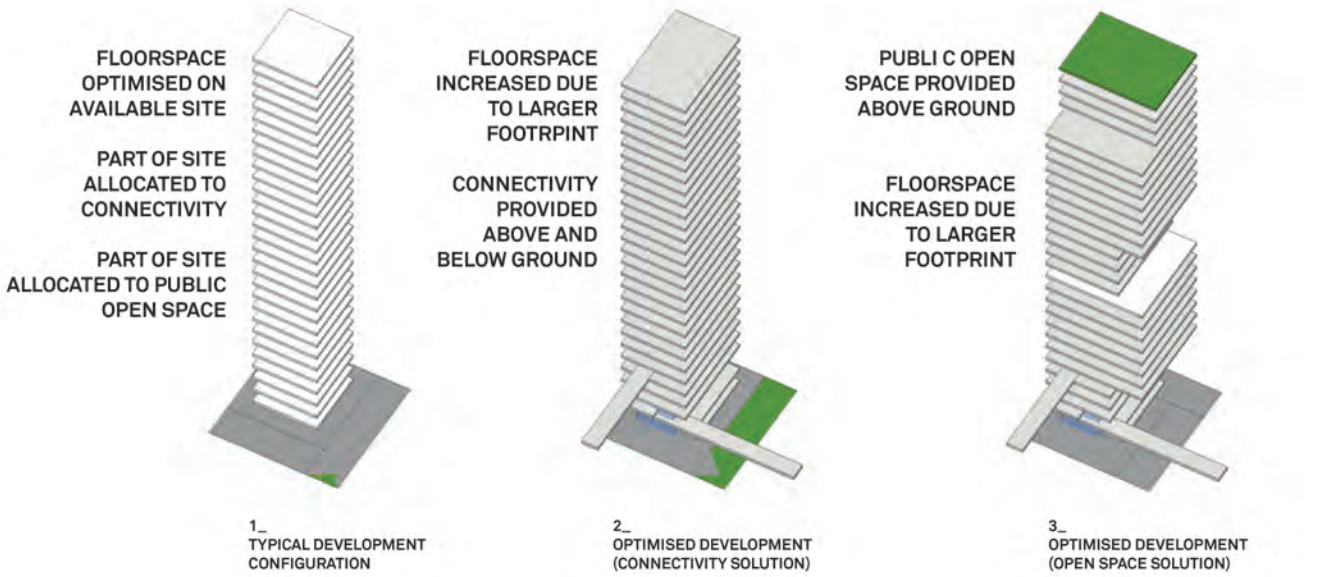

Figure 4. The optimization of density through physical, urban and social infrastructure (Source: HASSELL)
图4. 通过物理、城市和社会基础设施提升城市密度（来源：铿晓设计咨询（上海）有限公司）

Examples include mass transit systems integrated into both existing and new cities and the decentralization of utilities to isolate the impacts of intensification on broader networks (such as Central Park in Sydney and Royal Seaport in Stockholm). Hong Kong has pioneered the model of integrated "rail and property" delivery, arguably the key determinant in its formation into a successful high density city.

The engineering limits to density – as they relate to the measures of FAR and DPH – have for the most part been addressed in the way we plan and design our cities, and more specifically, to enable higher density development within already dense urban environments.

However, these engineering solutions have limited impact on the third measure of density (PPH), which relates more closely to the provision of social infrastructure, such as open spaces and parks, community facilities, and public and private amenities. If these important aspects of the city are not considered, we may deliver increases in FAR and DPH while compromising the attractiveness and livability of the city (and thus the counteractive result of reduced PPH).

The creation of social infrastructure – our schools and universities, child and health care, cultural institutions, meeting places and markets – is difficult in dense city environments; more so, the creation of open spaces with good solar access, fresh air, or a view of the sky. As we intensify the built footprint of the city, we reduce the area available for open space; and yet, this open space becomes more critical for communities living in dense cities and neighborhoods. This conundrum of urban density is perhaps the most difficult to resolve; there are few examples of cities that have successfully mediated these seemingly conflicting conditions.

If we are to break through the thresholds for density in our most dense cities, we must explore innovative options for integrating social infrastructure – and more specifically, investigate how it can be delivered vertically as well as horizontally in the city. As the increase in a city's floor space ratio accelerates, so too might its "public benefit ratio," so that physical, urban and social infrastructure are concurrently delivered and enhanced.

The Ideal Model For Superdensity

The purpose of this paper is to develop a new model for super-dense urbanism, an integrated three-dimensional arrangement of buildings, spaces and connections. The principle of the "public benefit ratio" is fundamental to this solution, as it provides the social infrastructure that complements the physical and urban infrastructure that higher density development currently delivers (Figure 4).

Delivery of public benefits means new ways of allocating space within cities. It leads to the investment case for new kinds of technical solutions, not on their own merits, but because of the additional density they enable.

Our current use of the city footprint is immensely wasteful – even in a city like

不过，这些工程解决方案对第三种密度衡量指标每公顷人口数量（PPH）的影响有限，PPH与社会基础设施的供应的联系更为紧密，例如开发空间和公园、社区设施和公共及私有便利设施。如果这些城市基础设施问题没有得到认真考虑，我们可能会创造更高的容积率和DPH，同时牺牲城市的吸引力和宜居性（也因此将导致PPH的降低）。

社会基础设施的建造——我们的中小学和大学、儿童和医疗、文化机构、聚会场地和市场——在高密度的城市环境中是很困难的，而打造日照良好、空气流通、可见蓝天的开放空间也是如此。我们增加城市建筑密度的同时也挤压了开放空间的存在，而开放空间对高密度的城市和街区的社区生活来说日益重要。城市密度方面的难题可能是最难解决的：鲜少有先例城市成功地调和了这些貌似矛盾冲突的因素。

如果我们要打破密度最高城市的密度限值，就必须探索整合社会基础设施的创新性方案——更具体地，探讨如何竖向和横向布局城市基础设施。随着城市容积率的增长加快，城市的"公共利益率"可能也要加快提升，如此，物理的、城市和社会的基础设施可以同时实现并得到加强。

超级密度的理想模式

该文旨在提出发展超级密度城市化的一种新型模式，整合三种密度衡量指标去布局建筑、空间和连接通道。"公共利益率"的原则对该方案至关重要，因为它提供了社会基础设施，对目前更高密度的城市开发产生的物理基础设施和城市基础设施形成了补充（图4）。

Hong Kong. It is mostly given to cars and air-conditioning plants; on roadways and rooftops respectively. This provides us with an unrivalled opportunity to push the boundaries of urbanism. If we can materially increase the public amenity of the urban footprint and make it accessible to the public, then we have a strong case for increasing the number of people with access to it. If we can invest in the institutions of social infrastructure and integrate them into vertical arrangements, then we can push new limits for density until once again we reach the edge of what engineering can answer.

It provides a direct link between the public access and amenity of our built environment and the competitiveness of our cities. Our pursuit of a favorable "public benefit ratio" drives particular design outcomes:

1. The horizontal footprint of the city is sacrosanct. It must be of high amenity and it must be public. The footprint of the city must have green space, solar access, acoustic comfort and public amenities.

2. Rooftops must be rethought, redesigned, made publicly accessible, safe and attractive. Cooling towers or lift over-runs are no longer the priority. Public access to rooftop parks, squares, cafes and markets becomes central to the concept of the public domain.

3. Public roofs are connected to public land with vertical streets. Our vertical streets maintain both private and public functions, much as our conventional streets do now. These vertical streets are not mere fantasies, but the core mechanism for integrating social infrastructure into the built environment: schools, child care, healthcare, theatres, libraries and schools. Movement in this dimension is subject to site-responsive solutions – potentially ramps and stairs, high-speed lifts or new technologies that can rapidly transport people from below ground to ground level to the upper levels of these new structures.

4. Private motor vehicles must be removed from the city, and streets handed back to the public. All transit must be below-ground, with vertical streets tapping into horizontal mass transit systems; layered ever deeper as the demand for new capacity grows. Public transport infrastructure is closely integrated with development, both in design and delivery, to optimize the commercial, social and community benefits of this investment.

These four principles build upon ideas that are familiar to many urban designers, planners and engineers, but by translating them to the third dimension of the city, they become entirely new systems for living, working and moving. They provide the foundations of a new mechanism for the planning and design of cities and new pathways to creating super-dense environments that are highly livable, attractive and prosperous places.

More than just super-towers, this new model of urbanization takes the form of super-connectors or super-spaces (Figures 5 & 6).

实现公共利益意味着采用新的方式分配城市空间，这会带来新型技术方案的投资案例，不是因为方案的自身优劣，而是因为可以增加密度。

我们目前对城市建筑占地面积的利用十分不足——即使是在香港这样的城市。大部分面积给了小轿车和空调机房，分别占据了车行道和屋顶空间。这给予了我们打破城市化界限的无与伦比的机会。如果城市建筑范围内的公共设施能得到实质性的增加并为公众所利用，那我们就有了增加可利用这些设施的人群数量的强有力的案例。如果可以投资社会基础设施机构并将之融入垂直化布局，那我们可以创造新的密度限值，直到我们再次抵达工程学可以解决的极限。

这提供了我们建筑环境中公众可得的便利设施与城市竞争力之间的直接联系。我们追求有利的“公共利益率”会推动特别设计成果的产生：

1. 城市横向的建筑足迹难以更改，必须具备高度便利的设施条件并保持公益性。城市建筑建设区域内必须有绿地、日照、隔音设施和公共设施。

2. 屋顶空间必须再考虑再设计，方便公众使用，同时要具备安全性和吸引力。冷却塔或电梯超程不再是首要考虑的问题，通向屋顶公园、广场、咖啡厅和市场的公共通道已成为公共领域概念的核心。

3. 公共屋顶通过竖向街道与公共土地相连。我们的竖向街道既有私人功能也有公共功能，和我们现在传统街道的功能大致一样。这样的竖向街道不仅

Figure 5. Shenzhen Housing Proposal; overall view (Source: HASSELL)
图5. 深圳社会保障房方案；概览（来源：铿晓设计咨询（上海）有限公司）

Figure 6. Shenzhen Housing Proposal; stacked community program within buildings (Source: HASSELL)
图6. 深圳社会保障房方案；建筑内部堆叠式社区计划（来源：铿晓设计咨询（上海）有限公司）

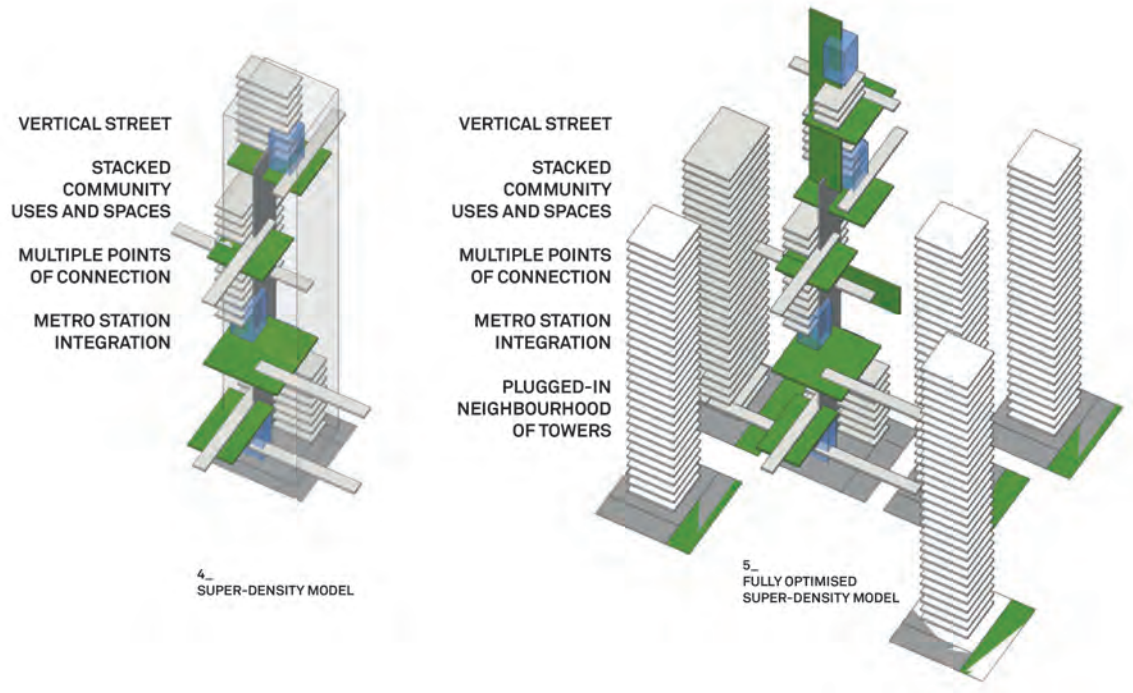

Figure 7. A new model for superdensity; as a catalyst for neighbourhood renewal (Source: HASSELL)
图7. 超密度的新模式，推动社区更新改造（来源：铿晓设计咨询（上海）有限公司）

Some of these ideas were investigated in a speculative social housing project undertaken by HASSELL with the Shenzhen Centre for Design in 2012. Having grown rapidly through the mass migration of workers from all over China, the provision of high quality social housing is a key consideration for the city. Shenzhen has consumed much of the available land of the city. Currently, only 2.25% (around 44 square kilometers) of the city remains undeveloped; however, under current projections, more than 6 times this area is required for future urban growth.

The HASSELL proposal therefore sought to increase density within the site without compromising social or environmental outcomes. Within each of the buildings, shared facilities for residents are stacked vertically, allowing for easy access and creating upper level connections between buildings. These spaces, including fitness and meeting rooms, homework spaces, small parks and greenhouses, help to promote a strong sense of community among the tenants, while generating a unique architectural solution for the buildings. Normally, these uses would be located in lower scale buildings at ground level, effectively consuming site area without contributing to the overall density of the development – the HASSELL solution not only increased the site density by 20% (to a relatively modest FAR of 6.0), it doubled the area of shared community space (both outside and inside buildings) that could be delivered.

These initial design studies will be extended into the Hong Kong context, with the greater intensity of that city providing even more potential to deliver an exploratory model for super-density in the Asian city. This super-density model will be presented at the CTBUH Conference using analytical and conceptual diagrams, as well as visualizations of potential built outcomes.

Applying The Model To The City

It is expected that the application of this model to the city could occur in two distinct phases of implementation.

Firstly, existing buildings and spaces will be renovated to adopt elements of the super-density model, including the potential of (Figure 7)

_new upper and lower connections between buildings

_liberation of roof tops for public open space

_insertion of new community programming, schools and universities, markets and meeting rooms

_removal of streets, parking and other car space to create additional public space

_new vertical connections from existing Metro stations to buildings above

The second phase would see a more proactive transformation of Hong Kong

仅是想象，整合社会基础设施与建筑环境的核心机制在于：学校、儿童护理、医疗、剧院、图书馆和学校。

4. 私有机动车辆必须从城市中清除，将街道还回给公众。所有的换乘站必须设在地下，竖向街道切入横向公共换乘系统；随着运量需求的增长加深层级。公共交通基础设施在设计和交付层面与项目开发紧密结合，最大化项目投资的商业、社会和社区效益。

以上四项原则的理念基础为众多城市设计师、规划师和工程师所熟悉，只有将这些原则转化为城市的第三个维度，才能使之可以成为全新的生活、工作和活动的新系统。它们为城市规划设计带来新机制，成为打造高度宜居、富有魅力、繁荣的超密度城市环境的新途径。

除了摩天大楼之外，该城市化新模式还利用了超级连接通道和超级空间的模式（图5、6）。

其中些这理念HASSELL与深圳城市设计促进中心在2012年的探索性社会保障房项目中已经进行了研究。来自全国各地的大量务工人员大量涌入深圳，保障房建设有了快速增长，但提供高质量的社会保障性住房是深圳需要考虑的重要问题。深圳市可利用土地已消耗了大部分。目前，仅有2.25%（约44平方公里）的土地尚未开发；但按照目前的预计，超过6倍如此规模的土地才能满足深圳未来的城市发展。

因此HASSELL的解决方案旨在增加区域密度而不减少社会或环境效益。在每栋建筑内部，居民使用的共享设施均竖向堆叠布置，方便取用，同时在建筑之间形成了高

with the construction of a system of super-density structures throughout the city. These structures would be located in areas of the city that require greater intensification – places more distant from established centers, corridors and transport nodes. Ideally, these are located above new Metro stations, linking urban transformation with the delivery of new connectivity systems that benefit the entire city.

Within these towers, we create new verticalized "main streets" linking stations below ground with parks in the sky, fringed by retail, commercial and public activities, and with bridges at multiple levels connecting to adjacent buildings and open spaces.

In a city of verticality – from towering landscape forms to sky-rise commercial buildings – these towers will create an evocative new image for a city that is constantly finding new ways to drive urban innovation and experimentation (Figure 8).

This model of vertical urbanism has the potential to:

_break through existing barriers to higher density (whether measured by FAR, DPH or PPH)

_catalyze the redevelopment of major sites, whole streets and neighborhoods, creating a multiplier effect of super-density

_deliver a new capacity for the city to grow and intensify over many decades

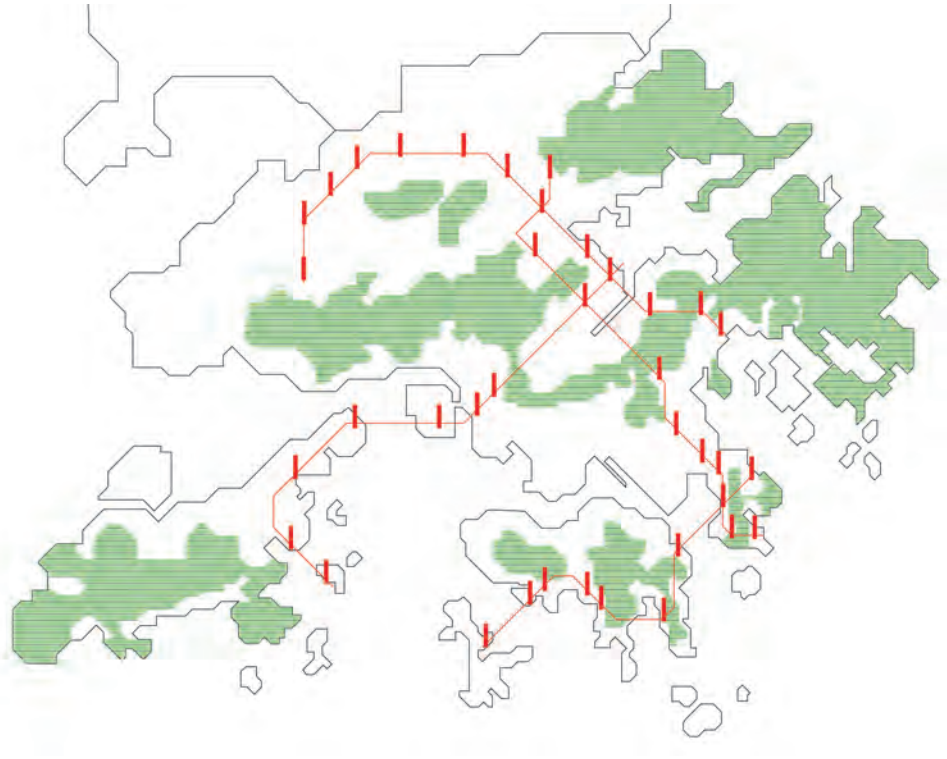

Figure 8. Hong Kong; potential for new super-density towers (Source: HASSELL)
图8. 香港，新的超密度高层建筑的潜力（来源：铿晓设计咨询（上海）有限公司）

层连接通道。这些空间，包括健身区和聚会区、家庭作业区、小型公园和暖房，有助于在租户间形成较强的社区归属感，同时产生独特的建筑方案。通常情况下，这些用途的设施会布置在较矮规模的建筑的地面层，有效地消耗了用地面积却对提升项目整体密度没有贡献——HASSELL提出的方案不仅将基地密度提升了20%（中等水平6.0容积率），还让社区共享空间面积增长了一倍（包括建筑内外范围）。

这些初步设计研究可推广至香港，在提升密度方面发掘更多城市潜力，为亚洲城市实现超级密度提供探索性的借鉴模式。该超级密度模式将在世界高层建筑与都市人居学会（CTBUH）大会上利用分析图和概念图和潜力建筑成功效果图进行展示。

新模式在城市中的运用

该新模式在城市中的运用有望在两个不同的执行阶段得以实现。

首先，现状建筑和空间将得到翻新，以容纳超级密度模式的相关元素，其潜力包括（图7）

_ 建筑之间上下部分形成新的联系

_ 释放屋顶公共开放空间

_ 加入新的社区计划、中小学和大学，市场和聚会室

_ 移除街道、停车场和其他汽车空间，以增加公共空间

_ 在现有地铁站与建筑之间形成新的垂直连接通道

在第二个阶段，香港将经历更加积极主动的改造，在全城范围内建立超级密度构筑物的系统。这些构筑物将被布置在需要提升密度的区域——远离成熟城市中心、廊道和交通节点的地方。理想状态下，这些构筑物将位于地铁站之上，利用有益于整个香港新的连接系统去连接城市改造区。

在高层建筑之内，我们创造出新的垂直式的“主街道”，将地下车站与空中公园连接起来，周边设置零售、商业和公共活动区，多个楼层还设有连通廊桥，连接至毗邻建筑与开放空间。

在一个垂直化城市之中——从摩天大楼景观形态到高层商业建筑——这些高楼大厦将为城市带来引发共鸣的新形象，不断寻找新的方法去推动城市创新和实验（图8）。

垂直城市化模式的潜力在于：

_ 打破现有障碍，提升密度（不论采用容积率、DPH或PPH哪一种衡量指标）

_ 推动对主要区域、整个街道和街区的改造，实现超级密度效应的倍增效应

_ 形成城市发展的新空间，在数十年内不断拓展空间密度