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How Big is Too Big? The Implications of Building Tall

多高才够高？建筑高层化的影响



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May Wei's rich experience covers many fields, from urban design, mixed-use, to high-end office. With the prospective and innovative experience, she can provide the whole process of customized solutions for client on branding strategy, product development, design implementation and operation management, besides establishing long term cooperative relationships with many developers.

魏文梅 (May Wei) 资深的设计经验覆盖了城市设计、大型综合体、高端商务办公等多个领域；凭借对行业市场的前瞻性和创新性，从品牌战略、产品开发、设计实施直至运营管理，她能为客户提供全流程定制化的设计解决方案，并与众多开发商建立了长期深远的合作关系。

Abstract | 摘要

Advances in technology and engineering have made it feasible to build truly awe-inspiring structures. But as the push to densify increases the pressure to build ever taller, it is important not to lose sight of the impact that tall buildings have on our world and our collective psyche. Are three 33-story buildings better than a single tower at 100 stories? Does a narrow, more efficient footprint warrant the development costs of building high into the sky? At what point does the race to build ever higher neglect the human scale and become unsustainable – or does it? This often polarizing argument, centered on the relationship between height and density, has huge implications for the cities of the future.

Using CallisonRTKL's Performance-Driven DesignSM strategy as context, this paper will provide an in-depth analysis of the social, environmental and economic impact of vertical development and a discussion of potential design alternatives influenced by recent trends in urban planning and design. The goal is to identify responsive and responsible strategies for achieving density, economic viability, and a sustainable quality of life.

Keywords: Context, Economics, Human Scale, Sustainability, and Verticality

技术和工程的进步让人们有能力建造真正令人敬畏的高层建筑结构。但随着“高密度化”趋势的袭来，建筑被迫向高层化发展，我们不能忽视超高层建筑对整个世界和我们集体心理的影响，这一点很重要。3幢33层高的楼是否优于1幢100层高的楼？有限但更高效的空间占用是否更好地解决摩天大楼的建造成本问题？建筑追逐高层化的步伐到达哪一点开始就会忽略人文尺度，背离可持续发展，或者说，是否存在这样的平衡点？这种探究使得人们对高度与密度的关系对未来城市有着巨大影响这一观点呈现两极化意见。

关键词：城市文脉、经济学、人体尺度、可持续性、垂直性

Advances in technology and engineering have made it feasible to build truly awe-inspiring structures. But as the push to densify increases the pressure to build ever taller, it is important not to lose sight of the impact that tall buildings have on our world and our collective psyche. Are three 33-story buildings better than a single tower at 100 stories? Does a narrow, more efficient footprint warrant the development costs of building high into the sky? At what point does the race to build ever higher neglect the human scale and become unsustainable – or does it? This often polarizing argument about the relationship between height and density has huge implications for the city of the future.

Particularly in China, where rapid growth has historically been accommodated in a haphazard manner resulting in inefficient land use, identifying strategies for achieving density, economic viability and quality of life is no small task. By examining the social, environmental and economic impact of vertical development, we can begin to formulate alternatives

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在中国，这种分化尤为明显，中国过去的快速增长是在一种杂乱无序的方式下实现的，土地利用十分低效，因此，制定能够兼顾建筑密度、经济活力和生活质量的战略绝非易事。通过探讨垂直开发的社会、环境和经济影响，我们可以着手制定遵循城市规划与设计趋势的备选方案。

建筑师、设计师和规划师对建成环境的状态有非常重要的影响力，这反过来也代表着重大的责任和机会，他们有责任有机会

informed by trends in urban planning and design.

Architects, designers, and planners have an outsized influence on the state of the built environment, which in turn represents a great responsibility and opportunity to create communities, buildings and interior spaces that have an enduring positive impact. It is important that, for responsible design offices, the design approach should draw on ample evidence about the social, economic and environmental impact of design to create compelling design with measurable benefits to people, profit and planet. It serves to reinforce the commitment to achieving goals and realizing the vision of the clients and communities we serve in a sustainable way. In this paper, we will examine strategies for achieving density in the urban environment, the pros and cons of height, and design alternatives with potential to bring greater value to the cities of the future.

Lowering Density via Satellite Cities

Population increase in China has resulted in innumerable challenges that have a detrimental impact on quality of life. As traffic congestion, pollution and property prices rise, investment in basic infrastructure struggles to keep pace. Over the last decade, most of China's first-tier cities have adopted similar planning strategies, attempting to find salvation in the form of satellite cities. These new suburban establishments proved quite profitable for developers who acquired outlying, neglected land at relatively low cost with varying, but usually plentiful, levels of government support. The satellites proved unsustainable, however, as the high speed with which these developments were commissioned and completed resulted in a harried approach to growth that only exacerbated the problems at hand.

Case in point is Shanghai's "One City, Nine Towns" project – a decentralization initiative launched in 2001 as part of a strategic government effort to solve the city's urbanization woes (Figure 1). Nine town centers, four of which were newly brought into existence, formed the crux of the effort to effectively lower density by spreading the population out over a greater distance. Each new town – Gaoqiao, Fengcheng, Pujiang, Anting, Songjiang, Luodian, Fenjing and Zhoujiajiao – was designed to be self-sufficient and assigned a geographical theme derived from architecture and planning in North America and various European countries.



Figure 1. Shanghai's "One City, Nine Town" urban planning strategy (Source: Microsoft Corporation, Harris Corp Earthstar Geographics LLC)

图1: 上海的“一城九镇”城市规划战略 (来源: Microsoft Corporation, Harris Corp Earthstar Geographics LLC)

创造出能够持久发挥积极影响的社区、楼宇和内部空间。对于负责的设计办公室来说,重要的是设计方法充分借鉴了设计的社会、经济和环境的影响,打造无与伦比的设计作品,创造出可观的人文效益、经济效益和全球整体效益,有助于更好地实现通过可持续方式帮助客户和社区实现目标和愿景的承诺。本文将探讨城市环境密度战略,以及其优势和劣势,有可能为未来城市创造更大价值的备选设计方案。

通过卫星城市降低城市密度

在中国,人口增长带来了许多降低生活质量的挑战。由于交通拥堵、污染加剧和房价高涨,基础设施投资难以跟上时代的步伐。过去十年,中国多数一线城市采纳了相似的规划战略,试图通过卫星城市的形式自救。新城建设对开发商来说相当有利可图,因为他们以低价获得外围、受到忽视土地,并获得了政府不同程度但充分的扶持。然而,事实证明,卫星城很难符合可持续发展原则,卫星城建设委托和完工的超高速增长导致了掠夺式增长,只会使当前的问题加剧恶化。

上海的“一城九镇”项目就是一个典型例子,“一城九镇”是上海2001年推出的一项去中心化倡议,是政府解决城市城镇化困境战略任务的一部分(图1)。项目旨在通过向周边分散人口有效降低建筑密度,9个新城镇中心(其中4个为新建)构成这项任务的关键。新城镇包括高桥、奉城、浦江、安亭、松江、罗店、枫泾、临港和朱家角,每个城镇都采取自给自足模

式并确定了一个借鉴自北美和欧洲各国建筑与规划的地域主题。

15年后,9个新镇对上海的困境助益有限。这项设计没有考虑中国的文化和国情,极大地背离了潜在住户的需求。开发商为了扩大利润空间,将住户服务设定为只有中产阶段上层才能承受得起的价格。此外,设计师、有关部门和开发商之间不断进行的争执造成设计方案与最初相比出现巨大差异,也带来其它难题。那些搬来居住但仍然往返上海通勤的住户还加剧了交通恶化。由于这些错综复杂的因素和对市场需求普遍漠视,上海的卫星城市并没有按预计充分发挥作用。

值得一提的是,中国拥有全世界35个人口数量超过1亿的特大城市中的9个,其中有3个位列前101。如此一来,中国的压力与日俱增,而世界正拭目以待。新方法正在提上日程。

容积率高企取代城市郊区化

事实证明,城市郊区化是一项错误的补救措施,中国已经制定了建筑高层化的新的城镇化道路方向。例如,上海的新城市规划方法将市中心允许容积率由3.0增大到5.0的区间范围。类似的情况还发生在深圳,这个面积为上海四分之一,同样经历了人口暴发式增长的城市将容积率区间由4.0-5.0的增大至5.0-8.0。深圳最大城中村白石洲的容积率甚至超出已经提高的许可标准,达到10-12.0(图2)。

Fifteen years later, the nine towns have done little to relieve Shanghai. The designs failed to take into account Chinese culture and context, rendering them largely unappealing to potential residents. With developers hungry for wide profit margins, residential offerings were affordable only for the upper middle class. Additionally, an ongoing power struggle between designers, authorities and developers resulted in significant changes to original plans and other difficulties. Those that did move in still commuted to Shanghai, further aggravating traffic patterns. Thanks to these complicating factors and a general disregard for market demand, Shanghai's satellite cities have failed to perform as initially planned.

It is worth noting that China is home to nine of the world's 35 "megacities" – and three of the top ten – with a population in excess of ten million people (Wikimedia Foundation, 2016). As such, the pressure is on, and the world is watching. A new approach is in order.

Skyrocketing Far Supercedes Suburbia

With suburban spread a disproven remedy, China has charted a new urbanization course in the form of tall buildings. Shanghai's new city planning approach, for example, gradually increases permissible FAR within its urban center from 3.0 to a range of 5.0. Similarly, in Shenzhen – a city a quarter of the size of Shanghai that has experienced explosive population growth – the FAR has increased from a range of 4.0 to 5.0 to a range of 5.0 to 8.0. Baishizhou, the largest urban village in Shenzhen, exceeds even the increased allowance with a FAR of 10.0–12.0 (Figure 2).

In theory, land use intensification can be beneficial if done right. Land value increases, while a mix of uses contained in a smaller area promotes a more convenient and sustainable lifestyle. City streetscapes are revitalized, daily commutes are shortened, and energy usage and infrastructure requirements may be reduced. Yet a number of factors give us pause as to whether supertall towers are the best way to achieve this intensification. What social, environmental and economic benefit do towers provide, and at what cost?

Height and Density: The Ongoing Debate

The traditional approach to achieving high FAR is, of course, to increase floor area vertically. This has given rise to the supertall tower: an instant

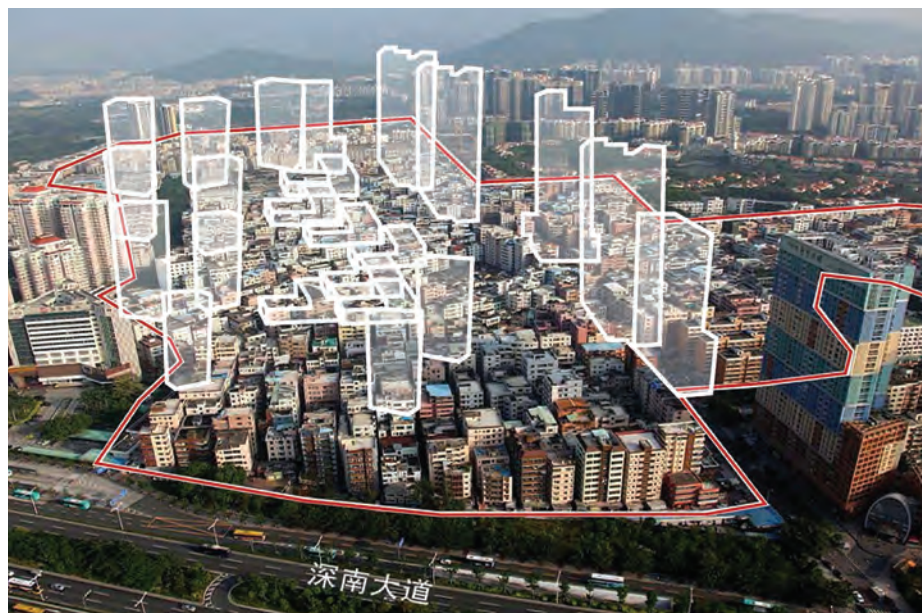


Figure 2. Baishizhou in Shenzhen: an urban renewal project with an increased allowable FAR of 10.0–12.0 (Source: RTKL)

图2 深圳白石洲：城市改造项目，允许容积率提升至10.0–12.0。（来源：RTKL）

landmark, a booster for real estate value, and a symbol of identity, prosperity and success. The supertall encourages a spirit of competition like no other building type, creating a clamor among the world's cities for their own unique, unparalleled skyline. And China's urban areas are, in many ways, leading the way: as of 2016, 51 of the world's 100 tallest buildings (completed and architecturally topped out) are in China (Wikimedia Foundation, 2016).

While much new development in China has moved full steam ahead with raising height to raise density, other cities around the world – particularly those with a rich history and heritage like London, Paris and Washington, DC – are engaged in an ongoing battle between a need to accommodate growing populations and a reluctance to dramatically alter their skyline.

Supertall tower skepticism comes from many sources with varied motivations and justifications, from historic preservation and NIMBYs to those concerned about rapid gentrification, overcrowding, or unsustainable development. Some question the intent of the tall tower and whether it is, in reality, a suitable response to market demand and need or whether they rise solely out of a desire to put grandeur and power on display. Additionally, some suggest that the benefits are not linear and that, at a certain tipping point, there is an inverse relationship between height and density.

How do we make sense of all this and plot a way forward? As the chart below demonstrates, for every benefit a tall tower provides, there is

理论上，如果使用得当，土地集约利用益处多多。随着土地增值，占地面积较小的综合体更加有利于实现便利和可持续的生活方式。城市街道恢复活力，日常通勤时间减少，能源利用和基础设施需求也可能随之减少。然而，超高层建筑是否是实现集约化的最佳途径，诸如此类的一系列因素令我们裹足不前。高层建筑能够带来哪些社会、环境和经济效益，需付出哪些代价？

高度与密度：不休的争执

传统上，提高容积率的方法当然是垂直增加楼层面积。这种方法成就了超高层建筑，这一一目了然的地标，房地产价值的助推力量和身份、财富与成功的标志。与其它类型建筑不同，超高层建筑鼓励竞争精神，全球城市争相建立独一无二、无与伦比的天际线。中国的城镇地区在许多方面一路领先：到2016年为止，全世界100座最高建筑中有51座在中国建成或平顶（Wikimedia Foundation, 2016）。

在中国，许多新建筑都通过全力提升高度来提高密度，而在世界其它城市，尤其是那些有着悠久历史和丰富文化遗产的城市，比如伦敦、巴黎和华盛顿特区，则在应对人口膨胀需求与不愿急剧改变天际线之间进行着一场旷日持久的斗争。

超高层建筑怀疑论有许多来源，其动机和理由各不相同，从历史保护和“疑邻情绪”到快速中产化、过度拥挤或可持续发展等等。一些人质疑高层建筑的用途，怀疑其是应对市场现实需求与需要的合适之举，还是仅仅用于炫耀气派与实力的工

	Benefit	Cost
Social	Become an instantly recognizable, iconic landmark for the city.	Shift focus for development away from market demand and community needs to prestige and competition.
	Give the impression of economic power and help to promote the city.	Height is out of sync with the human scale, increasing light pollution and, in some cases, negative psychological impacts.
	Increase density while maintaining a smaller footprint, preserving land.	Limit street activation, social interaction and capital, resulting in isolation. Offer mixed programming, but remain segregated by zones and vertical transportation that offers zero opportunity for interaction.
Economic	Increase the land value of surrounding property.	Raise property prices to unaffordable levels.
	Offer great views from the upper floors.	Often with a high price tag and, depending on site and orientation, towers will restrict views from neighboring buildings.
	Create housing for more people in a smaller area.	Because of property prices, supertall towers with large units draw mainly wealthy tenants who sometimes have second homes – negating the impact on available and / or affordable housing – or small units that aim to fit as many people as possible inside.
	Innovation in vertical transportation is making it possible to reach even higher heights.	Many of the latest and greatest technological advancements are not yet economically feasible.
Environmental	Construction costs are spread out over a larger number of units.	Building tall is costly and energy-intensive.
	May decrease certain energy consumption through compact development that reduces sprawl (potentially limiting auto use and carbon emission) and shortens length of power lines.	Slower to adopt sustainable practices than other building types. In turn, sustainability standards are only beginning to adapt to reflect the unique challenges of supertall buildings.

Figure 3. Cost-benefit Analysis (Source: RTKL)
图3. 成本效益分析（来源：RTKL）

a considerable trade-off (Figure 3). This list is by no means exhaustive, and there have been a multitude of studies and articles written that make the case either way.

Trends in urban planning and development point to alternative design solutions for creating density without necessarily building supertall. Below, we examine these in theory and in practice and measure the efficacy of each in addressing the consequences of supertall towers.

Striking Compromise with Mid-Rise

Mid-rise is defined in this paper as 5 to 15 stories tall. So how is it possible to create density to the degree addressed by a supertall tower through this typology?

Firstly, as previously noted, the efficacy of the supertall tower in providing sustainable, affordable, efficient density is hotly debated, and the measures it must take to achieve that density are often extreme. Mid-rise, however, faces very few of these challenges. It is more economical to construct, more easily complies with environmental standards, and requires less of the advanced, cutting-edge (and therefore expensive) technology needed to accommodate and move people high in the sky. This typology inherently allows for more

flexibility in design and programming than the floor-by-floor or zone-by-zone configuration of the supertall tower. Mid-rise can also begin at up to 25 meters and rise up to 100 meters above grade without seeming imposing in scale.

Additionally, cities like Shenzhen have unveiled new planning initiatives that encourage “decking” across city blocks to enhance podium connectivity at higher levels, allowing accessibility and activation to take place above ground (Figure 4).

A great example of this theory in practice is Baishizhou in Shenzhen. One of the more



Figure 4. The Shenzhen Fenglong mixed-use development features crossover cultural programming (Source: RTKL)
图4. 以文化科技交互设计为特征的深圳丰隆综合体开发项目（来源：RTKL）

具。此外，一些人还提出，高层建筑的效益并不是线性的，当到达一定的临界点，高度和密度将呈现反比关系。

我们如何弄清楚这一切，进而规划一条前进道路？如下图所示，高层建筑的每一项效益都对应一项可观的代价（图3）。下表内容并不详尽，有许多书面研究和文章也从这两方面进行了探讨。

城市规划和发展趋势提出了另外的设计方案，不必建造超高层建筑就能实现所需密度。下文将从理论和实践两方面对这些方案进行探讨，衡量每个方案在解决超高层建筑挑战中发挥的功效。

中层建筑——明智之举

中层的定义是5至15层。怎样才能通过中层建筑达到高层建筑实现的密度。

首先，如前所述，高层建筑在提供可持续、可负担、有效的密度方面发挥的功效遭到激烈的质疑，实现这种密度往往必须采取极端的措施。而中层建筑则几乎不必面对这些难题。建造中层建筑更符合经济原理，更易遵循环境标准，不需要多么先进尖端（价格高昂）的技术来解决高层居住和移动问题。比起按楼层或按区块进行配置的高楼，这种类型在本质上允许更加灵活的设计和利用。中层建筑的高度可以从低于标准的25米开始，上至100米不等，不会形成壮大的外观。

此外，深圳等城市纷纷推出新的规划举措，鼓励开放平台联系整个城市街区，将裙楼的连通性推向更高水平，使地上呈现一片便利和活力景象（图4）。

深圳白石洲城市改造项目是这个理论在实践中的一个绝佳范例。这个项目是深圳市一个比较突出的城市重建项目，它是一个为周边多个创新产业园和一个研发园区提供支持的居住中心。在这里，由于城区提



Figure 5. A mixed-use model (Source: RTKL)
图5. 综合体模型 (来源: RTKL)

prominent urban regeneration projects in the city, it is a residential hub supporting adjacent innovation industry parks and a research and development campus. Here, office workers enjoy better work-life balance facilitated by an urban district offering plentiful amenities – including everyday conveniences, as well as entertainment – within walking distance.

On-site relocation requirements have had a significant influence on the program layout: with a FAR of 10–12.0, the narrow site is oriented north-to-south and creates extremely high density, but it has faced opposition under strict local codes. The challenge here is discerning how this level of density can be made palatable, as well as sustainable, for local authorities and residents. A reasonable programming strategy that balances the scale between residential space designated for relocation and those designed for sale is a necessity.

Rather than build a concrete forest of office and residential towers that will block views and cast shadows over the entire development, Baishizhou may be more impactful as a mid-rise development with a larger, multi-deck podium that fulfills the remaining GFA requirement. A three-dimensional mixed-use model of shorter towers connected by these stacked podiums shows more promise for facilitating social engagement, as well as convenient access to facilities (Figure 5). These open areas, featuring enhanced indoor-outdoor interaction facilitated by the podiums in comparison to supertall towers, present a multitude of options for use, from community gatherings to educational facilities. They additionally facilitate shortcuts between public transit and homes and offices.

It is important to keep in mind that high density development presents challenges both

inside and outside its boundaries. How the development is connected to roads, highways and transit and the capacity of that network cannot be overlooked. If the FAR is 10.0–12.0, the pathways and modes of transit leading to it must be capable of handling the number of people flowing in and out of it or congestion will inevitably arise (Figure 6). A new light rail has been proposed for the north-south axis of Baishizhou, reducing automobile reliance. However, CRTKL's strategy is to look at the transportation network on a city-wide scale.

Layered Programming

Tenants across all sectors now demand a higher level of flexibility in arrangement and orientation, and layered programming provides

供步行可达的丰富设施, 包括日常便利设施和娱乐设施, 办公室白领能够更好地平衡工作与生活。

现场回迁需求对方案布局有显著影响: 在10–12.0的容积率下, 狭窄的场地被设计为南北朝向, 开创极端高密度, 但这个方案遭到严格的地方法规的反。问题在于鉴别这样的密度水平如何才能贴合地方有关部门和住户的需求, 同时兼具可持续性。能够在用于回迁和用于销售的居住空间之间实现规模平衡的合理设计策略是一个必要条件。

与其选择建造一片在整个建筑范围内阻挡视野、投射阴影的写字楼和住宅楼的混凝土森林, 白石洲选择了可能发挥更大影响的中层开发, 用一座较大的中高层裙楼填补剩余建筑面积需求。在这个三维综合体模型中, 中层建筑通过层叠式裙楼连通, 更加有利于开展社会活动和便利地利用各项设施(图5)。与超高层建筑相比, 这些强化了户内外互动的裙楼开放区域可以有多种利用方案, 包括社区聚会场地、教育设施, 或者充当公交与家和办公室之间的捷径。

需要点出的是, 高密度开发对其内部和外部都带来了挑战。开发项目如何连通道路、高速公路和运输线路, 这个交通网络的承载能力不容忽视, 如果采用10–12.0的容积率, 步道和相应的交通模式必须能够处理进出的人流量, 否则将不可避免地出现拥堵(图6)。CRTKL提出了一项在白石洲南北中心轴建设轻轨的提议, 减少了对汽车的依赖。然而, 更加明智的策略是考虑建设一个覆盖全市的交通网络。

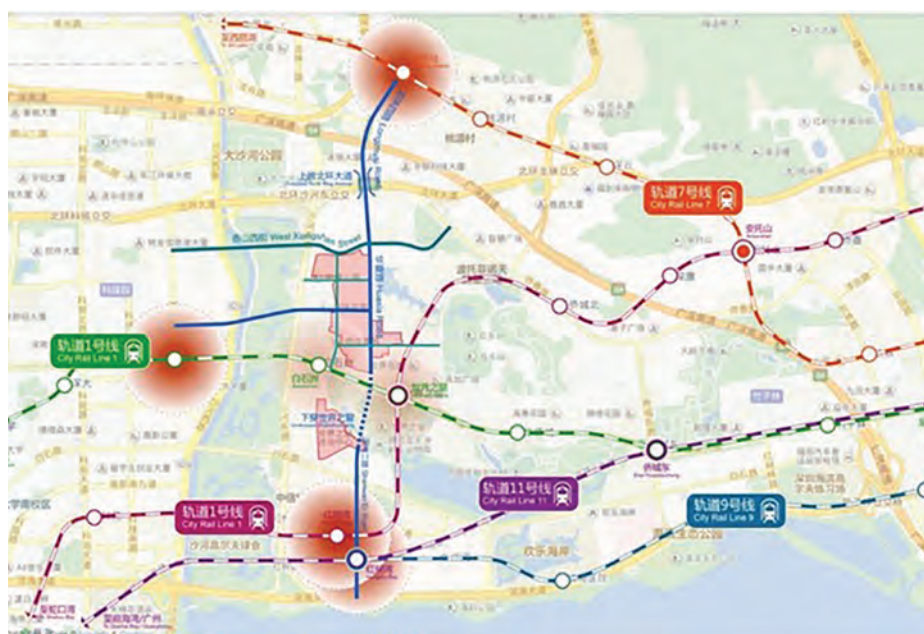


Figure 6. Transit considered in an urban context (Source: RTKL)
图6. 拟议的城市交通线路 (来源: RTKL)



Figure 7. The podium roof at Shanghai Joy City Phase II plays host to entertainment and socialization (Source: RTKL)
图7. 上海大悦城二期裙楼屋顶引入娱乐和社交设施（来源：RTKL）

endless opportunities for creativity and adaptability. Different types of programming can easily co-exist – with retail alongside office space, entertainment or cultural offerings, for example – and is adaptable over time according to market needs. Supplemented by excellent wayfinding and changes in texture, color, and scale, spaces are created and experienced more easily. These advantages appeal to more innovative tenants and programming, allowing tenants like flexible office space provider WeWork and Class-A corporate headquarters to be accommodated in the same area.

A podium with layered programming and a large footprint not only connects levels between buildings but also increases social interaction above – and even below – ground. Integrating easy vertical transportation encourages more interaction compared to a supertall building with the same total GFA; while supertall towers also have layered programming and vertical transportation, each floor is more isolated and there is a lack of opportunity for meaningful connections. The podium roof is a particularly attractive value add as a space for communal activities (Figure 7).

Located in southeast Beijing near the gateway to Tianjin, the 775,960-square-meter Beijing Fenzhong Temple is the focal point of a “Great City” within a city and an excellent example of layered programming. Its urban environment is composed of creative office space, lifestyle offerings, a shopping mall and exhibition space, all of which are integrated via a multi-layered podium. Designed as an interface between residential, work and recreational zones, the podium features plentiful green space and a network of plazas that provide an opportunity for social interaction and other programming (Figure 8). Sky bridges provide

direct access from the office and residential space to the parks.

Human Scale

Urban development cannot be successful if it does not meet the needs of the end user. Across all sectors – hospitality, retail, office, residential, etc. – we continue to hear about changing demographics and lifestyle preferences, and that people now seek, first and foremost, an experience. The mid-rise typology is simply more effective at creating connectivity within an experiential

分层设计

如今，各行业的商铺对布局和朝向有更加灵活的需求，分层设计为创意性和适应性提供了无限机会。不同类型的设计能够和谐共存并能应时调整以适应市场需求，例如，商业场所旁边置以办公空间、娱乐或文化设施。辅之以出色的导向设计及结构、颜色和规模上的改变，空间的打造和体验变得更加容易。这些优势吸引了更多标新立异的商家和创意设计，各类商铺能够被安置到同一片区域，比如灵活办公空间供应商WeWork 和甲级企业总部。

分层设计并占据较大空间的裙楼不但能够连通建筑物之间的楼层，还增加了地上甚至地下的社交活动。与总建筑面积相同的超高层建筑相比，结合便捷的垂直运输能够促进更多互动；虽然超高层建筑也有分层设计和垂直运输，但每个楼层都更为孤立，并且缺乏实现有效互联的途径。裙楼屋顶用于开展社交活动，是一个尤具吸引力的附加值设计（图7）。

CRTKL设计，位于北京东南门户靠近天津入口，面积775,960平方米的北京分钟寺项目是内城“立体城市”的焦点，也是分层设计的一个绝佳案例。其城市环境由创意办公空间、时尚生活设施、购物中心和会展空间组成，这些都通过一个多层裙楼整合为一体。作为生活、工作和休闲区的一个接口，裙楼拥有大量绿色空间和有机连接的几大广场，可设计为社交和其它用途（图8）。通过天桥可直接从办公室和住宅空间到达公园。



Figure 8. Multi-layered green space incorporated into the podium of the “Great City.” (Source: Callison)
图8. 纳入“立体城市”裙楼的多层绿色空间（来源：Callison）

environment. It maintains the human scale and is better at activating street frontages in a way that promotes neighborhood vibrancy. (While a skyline may be thrilling from a distance, being surrounded by supertall towers, usually with monolithic and cold façades at street level, is a very different experience.)

Mid-rise towers with podiums also provide greater opportunity for interspersed public green space – a socially, economically and environmentally-friendly benefit, the value of which cannot be understated in dense urban areas. Whether these combine in the form of open spaces, courtyards, atriums, forums or water features – or all of the above, as in the previously mentioned “Great City” project – there are endless opportunities for these to be effectively and impactfully integrated with retail, food and beverage, office, hospitality, and residential spaces, facilitating varying and dynamic levels of interaction between each. Green space surrounding supertall towers, on the other hand, is usually underutilized, with minimal or zero interaction with the programs in the tower beyond a purely visual connection.

For an example of these tenets in practice, we look to the Longgang project, located at the intersection of two of Shenzhen’s main road. As the first city to introduce the idea of an “innovation city” as part of an overarching urban planning strategy, Shenzhen will play host to this mixed-use development in the midst of several high-tech industrial parks (Figure 9). Here, the podium is designed as an experiential hub with a central “Intellectual Plaza” connected by two sky bridges.

Office spaces form four separate islands with connections to the inner ring provide unimpeded visibility and accessibility for the plaza (Figure 10). Here, people from different industries and offices can interact. The sky bridges connect all open spaces and will remain accessible to the public 24/7. The retail program is installed along the perimeter of the second ring, establishing a symbiotic relationship between the two and activating

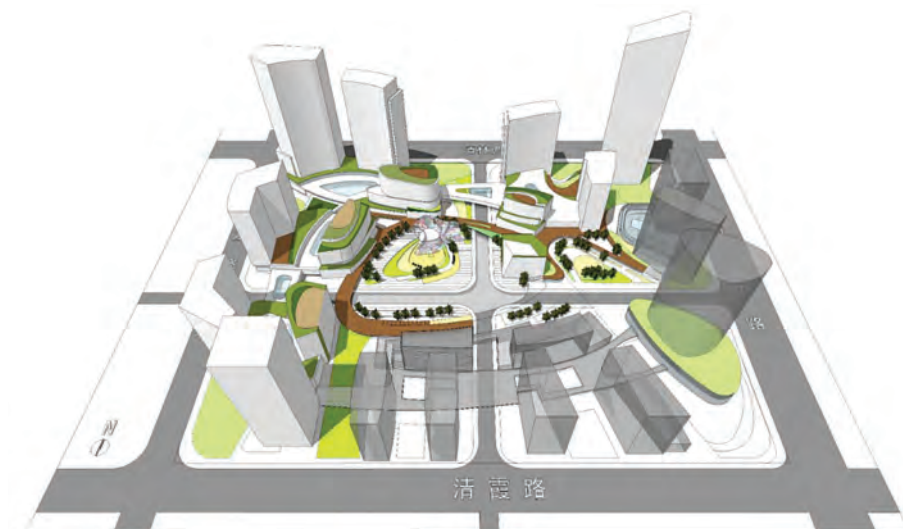


Figure 9. Overall site (Source: RTKL)
图9：总平面图（来源：RTKL）

人文尺度

城市开发的成功取决于是否能够满足最终用户的需求。在各行各业，酒店、商业、办公、住宅等等，我们不断听到人口特征和生活方式偏好的变化，人们如今首先追求的是一种“体验”。中层类型的建筑能够更加有效地在一个体验式环境中创建连通。这种类型保留了人文尺度，能够以一种促进社区活力的方式更好地实现街面繁荣（而超高层类型虽然能够从远距离呈现令人惊心动魄的天际线，但在超高层建筑包围下，往往以一个单体建筑为中心，采取冷色调外观的街道则是一种非常不同的体验）。

带塔楼的中层裙楼还能更多地提供穿插公共绿色空间的机会，公共绿色空间具有社会、经济和环保效益，其价值在高密度城区不容忽视。无论此类裙楼采取开放空间、庭院、中庭、小广场或水景的形式——或者以上全有，正如前文所提到的“立体城市”项目——都具备与商业、饮食、写字楼区、酒店及住宅空间进行巧妙且高效结合的无限可能，从而提升各楼层间多样化且充满活力的互动。另一方面，超高层建筑周围的绿色空间往往利用不足，除了纯粹的视觉连接之外，与楼内各个方案只有极少，甚至没有互动机会。

举一个尝试在实践当中运用这些原理的例子，深圳两个主要道路交汇处的龙岗项目。作为第一个将“创新型城市”理念引入城市整体规划战略的城市，深圳将在几个高科技产业园区之间开展这项综合体开发（图9）。在这里，裙楼被设计为一个体验中心，其中央“智慧广场”由两座天桥连接。

4个在内环相连的岛屿构成整体办公环境，与中央广场之间有很好的可视性和可达性，来自不同企业和办公空间的人们能够在中央广场和多层岛屿间展开交流（图10）。天桥连接所有开放空间，并将全天候（24/7）向公众开放。商业及创意办公部分被置于外环周围，与绿色空间之间形成一种共生关系，并通过充当与绿色空间连接的纽带激活了整个开发项目。龙岗项目虽然在本质上是一个高密度项目，但其整体设计充分考虑了人文尺度，通过中多层平台消化大量面积，与中央广场一起，共同提供丰富的公共空间及交流平台，有效地降低建筑高度，控制建造成本并创建宜人尺度，避免了高密度超高层塔楼林立的非人性化环境。

再举一个例子，同样位于深圳的华润置地大冲项目。在这个项目中，万象城购物中心汇集了丰富多彩的产品和活动，汇聚最



Figure 10. Program islands around a central plaza; first and second rings of sky bridge connections (Source: RTKL)
图10：中央广场周围环绕若干中多层岛屿裙房；由内外公共连廊连接（来源：RTKL）



Figure 11. Shenzhen CRL Dachong West Plaza (Source: RTKL)
图11. 深圳华润置地大冲项目西广场（来源：RTKL）



Figure 12. The sky bridges at Shenzhen CRL Dachong (Source: RTKL)
图12. 深圳华润置地大冲项目天桥（来源：RTKL）

the entire development by connecting it to green space. Though high density in nature, Longgang is entirely designed with the human scale in mind. Large amounts of FAR area are taken up by the multi-level podium deck. Together with the central plaza, it provides a social space and platform with rich texture and atmosphere. This helps to control the overall building heights (as well as budget) and create the right sense of scale, so as to avoid an inhuman environment surrounded with many supertall towers.

Another example, also located in Shenzhen, is CRLand Dachong. The project brings together a Mixed-use shopping center with diverse offerings and activities, an exquisite raised street featuring the latest luxury brands, a hip, art-infused retail street, and a historically conscious green plaza (Figures 11 and 12). Overall, the project achieves authenticity – a development that is characteristically reflective of Shenzhen – by leveraging synergy between art and technology as the community's dominant cultural influences to shape a modern, yet intimate and comfortable, work, live and play destination.

Shifting Pressure to the Podium

When setting out to create responsible density, supertall towers are one answer, but we must maintain an awareness of, and willingness to explore, other options. For the cities and megacities of the future, contextually-responsive and sustainable ways to achieve development goals and ensure responsible resource usage will be of the utmost importance. As demonstrated here through cost-benefit analysis and case studies, leveraging podiums and mid-rise buildings as connective tissue mitigates the impact of many of the disadvantages of tall towers while adding social, economic and environmental value. Beyond enabling higher performance, this alternative model also provides better opportunities for placemaking, social engagement and the overall longevity and resiliency of the urban environment. Intelligently weaving local culture and identity into the design of the mixed-use model further enhances a sense of authenticity and contributes to long-term value.

新奢侈品品牌的精品商业街，时髦而富有文艺气息的购物街和深具历史底蕴的绿色广场（图11、12）。总体而言，这个项目真实再现了深圳特色，将艺术与科技融合协作作为社区主流文化潮流，打造出一个既充满现代气息，又贴心舒适的工作、生活和娱乐目的地。

裙楼——压力转嫁之选

对于打造负责任的高密度，超高层建筑是一个选择，但我们还必须保留考虑其它方案的想法和意愿。对于未来的城市和特大城市，选择尊重环境特性、可持续方式来实现开发目标，确保负责任的资源利用将是重中之重。正如本文通过成本效益分析和案例研究论证的那样，利用裙楼以及中层建筑间作连接媒介可在创造社会、经济和环境附加价值的同时减轻高层建筑的许多不利影响。除实现更高性能外，这种替代性模式更加有利于空间创造、社会活动和城市环境的整体寿命与弹性。将地方特色文化与文脉创造性地融入综合体立体设计，能够进一步增强特色感，有利于长期价值的实现。

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