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Sustainable Vertical Urban Agglomeration

可持续发展的垂直城市群



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Abstract

This paper, with the project case designed by Institute of Shanghai Architectural Design & Research (Co. Ltd.), from the agglomerative character of the development of super high-rise buildings in China, describes the rise and development of the increasingly widespread super high-rise agglomerations in the country, closely following the conference's theme of sustainable vertical urbanism. Moreover, from the perspective of super high-rise agglomerations, it explains the necessity of the development of super high-rise buildings in the increasingly diverse and complex urban environment, as well as provides scientific and rational solutions by analyzing the development from horizontal city to vertical city.

Keywords: Vertical Urban Agglomerations, Sustainable Development, Design Strategy, Project Practice.

摘要

本文结合上海院设计的工程案例，从中国超高层发展所呈现的群落特征出发，紧扣迈向可持续发展的垂直城市主义的大会主题，阐述日益广泛的超高层群落在中国的兴起和发展。并以超高层群落的视角，通过从水平城市到垂直城市的发展的分析，阐述日趋多样复杂的城市环境中的超高层发展的必然性和科学合理的解决方案。

关键词: 垂直城市群 可持续发展 设计策略 项目实践

Vertical City, "Growth" of City and "Reverse Growth" of City

The term "vertical city" first appeared in *The Vertical City*, a book of collected stories authored by American writer Fannie Hurst, published in 1922. In the book, the term was used to refer to a metropolis composed of people of various social ranks. Later, it began to be used by architects in describing a shared characteristic of modern cities – high density.

Riverside Scene on the Pure Brightness Festival (see Figure 1), the world-famous ancient Chinese painting, for example, provides us with a vivid record of the prosperous life of Bianliang city during Northern Song Dynasty on a 5.25m-long horizontal scroll. In contrast, the 2m-high Virtual Tower, the work of Mr. Wong, an illustrator, gives us a view of a vertically erected "sky" city. The two masterpieces unfold before us scenes of well-functioning cities horizontally and vertically respectively.

The growth of a city is a long process. Traditional cities are horizontal, as represented by Ebenezer Howard's "garden city" and F.L. Wright's "broad acre city". With the rapid expansion of urban population, the scarcity of land and advancement in science and

垂直城市: 城市的“生长”和“逆生长”

“垂直城市”一词源自美国作家范尼赫斯特 (Fannie Hurst) 1922年出版的同名故事集 (*The Vertical City*)。作者起初引用“垂直城市”来概括发生在大都会各个阶层的生活。之后，这个词被建筑界引用，以描述一些高密度现代城市的共性特征。

中国历史上的名画《清明上河图》(图1) 长达5.25米，以超长的横向卷轴展开了北宋汴梁的城市生活; 插图师Mr. Wong的插画“超现实之塔” (Virtual tower) 高达2米，描绘了一幅纵向生长的天空之城。二者分别用水平和垂直两种方式展现了运行良好的城市场景。

城市的生长是一个缓慢的过程。传统的城市是水平城市，以霍华德的“田园城市”、赖特的“广亩城市”为代表。随着城市人口的高速增长、土地紧缺和科学技术进步，促使城市的维度由水平的蔓延向三维高空的发展，《马丘比丘宪章》对于城市的水平功能分区进行严格的控制，认为相互作用和交往是城市的重要特征，为超高层容纳更多的城市功能并促进城市垂直发展提供了理论依据。随着经济的繁荣发展，土地资源的越发短缺以及技术设备的发展突破，将城市的功能整合在相对集中的区域内或一定的垂直高度内，形成高度复合、相辅相成的超高层集群，使其承担更多的

technologies, cities are prompted to transform from horizontal sprawling to three-dimensional high-rise development. Charter of Machu Picchu objects to the excessively prim practice of function zoning, holding that interaction and socialization are essential features of cities, which establishes a theoretical basis for super high-rise accommodating more urban functionalities and promoting vertical development of cities. Along with economic prosperity and development, shortage of land as well as breakthrough in development of technologies and equipment, cities strive to integrate urban functions into relatively concentrated areas or within certain vertical height to create a highly compound area where these functions supplement each other, so as to assume more urban development functions. Vertical urban agglomerations with higher intensity and diversity will become the trend of today's international metropolis.

At the same time, the characteristic of "reverse growth" is also seen during the process of urban development. At the very beginning, we have always tried to transform our natural environment and create more buildings. Then, the super high-rise has released more land area and we began to build gardens on roofs and balconies. In doing so, we are trying to pick up what we have lost and maintain a harmonious relationship between mankind and nature. Therefore, vertical city represents not only the development of city constructions, but also the sustainable development of economy and society, wherein mankind and nature coexist harmoniously.

Development Stages and Trends of Urban Agglomerations in China

Development Stages of Vertical Urban Agglomerations in China

In China, vertical urban agglomerations have experienced the following five development stages (see Figure 2):

Westernization

In recent and modern times, Shanghai, Guangzhou and Tianjin, all with foreign concessions, were the most prosperous cities in China. At that time, the buildings were not very high (approximately more than 80m), as were represented by those in the Bund of Shanghai and Qian Ye Chang historical block of Tianjin.

Gestation

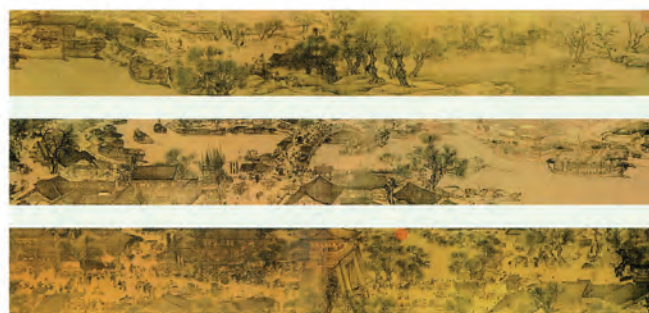
After the foundation of new China (after 1949), Guangzhou Baiyun Hotel, completed in 1976, was the first high-rise building that China had constructed. It laid a foundation for later design of super high-rises.

Infancy

Following the reform and opening-up (starting in 1978), Shanghai, Shenzhen and Guangzhou etc. began to witness some super high-rise agglomerations and complexes, the high-rise buildings at Lujiazui of Shanghai was among the representatives. All these areas were characterized by multiplex urban functions and convenient traffic conditions.

Groping

Since 2000, China has been groping for the correct way of building vertical urban agglomerations. During this period, CBD was first seen in first tier cities and then in principal capitals. Also, during this period, vertical urban agglomerations became more multiplexed, with even more functions and bigger sizes. In a super high-rise agglomeration, for instance, there could be as many as several



北宋张择端《清明上河图》
Along the River During Qingming
Festival, by Zhang Zeduan, Northern Song

Figure 1. Vertical and horizontal city (Source: Zeduan Zhang, Mr Wong)
图1.垂直城市与水平城市 (出自: 北宋张择端、Mr Wong)



Figure 2. The current stage of vertical urban agglomeration in China
图2.中国垂直城市群的发展阶段

城市发展功能，集约而多元化的垂直城市群落已成为当今国际大城市的发展趋势。

同时，从城市的发展过程中也可以看出“逆生长”的特征。城市发展初期，人类一直致力于改造自然，营造建筑。超高层的出现，又把地坪解放出来，同时融入屋顶花园等元素，致力于回归自然、追求人与自然的和谐。可见，垂直城市既是城市建设的发展，又是经济与社会的综合发展，同时还应该是天、地、人和谐的可持续发展。

中国垂直城市群的发展阶段与趋势

中国垂直城市群发展阶段

垂直城市群在中国的发展，大致可以分为以下五个阶段 (图2)：

西化阶段 (1848-1948)

近现代时期的中国，以上海、广州、天津等租界城市建设最为繁荣。城市高度并不高，约80余米。以上海外滩建筑群、天津劝业场历史街区为例。

孕育阶段 (1949-1978)

建国后 (1949年后)，1976年落成的广州白云宾馆 (34层，120m)，是中国建造的第一座超高层建筑，为之后超高层建筑的设计打下了基础。

dozens of individual buildings and the entire floor area could reach up to 1 million m²(e.g., Beijing Huamao Center), which assume some urban development functions.

Rapid development

Over the past five years, vertical urban agglomerations have mushroomed in China. There are nearly 100 super high-rise agglomerations, and complex agglomerations are just beyond counting, with 40 in Beijing alone. At this period, vertical urban agglomerations are more diversified in terms of functions and types. As for spatial forms, the agglomerations at this period have transformed from a simple gather-together to an interconnected organic whole, which assume bigger roles in urban development.

Development Speed of Vertical Urban Agglomerations in China in the Last 30 Years

Due to limited land area, political demands on urban image and other objective factors, China has to rapidly develop the vertical urban agglomerations. Over the last three decades, the development speed of vertical urban agglomerations in China has been surprisingly quick and super high-rise agglomeration and urban complexes have become the epitome of a vertical city. With the birth of China's first generation of urban complexes, represented by Beijing China World Trade Center and Shanghai Center, and the advent of Beijing CBD and Shanghai Lujiazui financial center, China's vertical urban agglomerations have witnessed revolutionary change in both numbers and sizes.

See the following pictures for distribution, development time and average size of urban complexes (see Figure 3-5).

Development Trend of Vertical Urban Agglomerations in China

Vertical urban agglomeration is a new concept of building group. It is a super high-rise agglomeration composed of one or more super high-rise projects developed under centralized planning and control. Currently in China, development of super high-rise transfers from single building to clusters, and our attention turns from single building construction technology to overall city, the focus of studies and explorations on vertical city is shifted to agreement of functions, special structure, public functions and sustainability. That is to say, connectivity, integrity and harmony among building groups should command more attention. This is revealed from the following aspects:

- 1. Height should no longer be the only yardstick to measure a vertical city;
- 2. There will be a trend of transformation from single high-rise building to multifunctional, multiplex and agglomerated building groups.
- 3. There will be a trend toward comprehensiveness, high efficiency, high technology and high emotional touch.
- 4. More attention will be paid to ecology, energy efficiency, intelligence, zero discharge and a rational attitude toward city.
- 5. There will be a trend toward high integration with public urban systems and spaces for social benefits and non-profit facilities.
- 6. Cultural heritages of cities will be given more respected and better protected.

In a word, greater emphasis is put on expression of operative efficiency of overall urban functions in vertical city.

Stage of Development 发展 阶段	Time 年代	Representative City 代表 城市	Representative High-Rise Agglo 代表性和高层建筑聚集地	Picture 图片	Representative Building 代表 建筑
Westernization 西化 阶段	1851—1948	Shanghai, Guangzhou & Tianjin 上海、广州 与天津	the Bond of Shanghai 上海滩		Peace Hotel Shanghai Sassoon House 上海和平饭店 沙路大厦
			Quin Ye Chang of Tianjin 天津英租界		Quin Ye Chang of Tianjin, National Commercial Bank Limited 天津英租界, 国家商业银行
Gestation 孕育阶段	1949—1978	Guangzhou & Tianjin 广州 与天津	Guangzhou Bai Yun Hotel 广州白云宾馆		Guangzhou Bai Yun Hotel 广州白云宾馆
			Shanghai TV Tower 上海电视塔		Shanghai TV Tower 上海电视塔
Infancy 萌芽阶段	1979—1999	Shanghai Shenzhen & Guangzhou 上海、 深圳 与广州	Lujiazui of Shanghai 上海陆家嘴		Shanghai Oriental Pearl TV Tower Shanghai JinMao Tower 上海东方明珠, 上海金茂大厦
			Caiweiwei of Shenzhen 深圳蔡伟街		Shenzhen Imperial Estate Building Shenzhen China World Trade Center Building 深圳地王大厦, 深圳中国世界中心大厦
Growing 探索阶段	2000—2007	Beijing, Shanghai, Guangzhou First-tier Cities, Part of Second-tier Cities 北京、上海 广州、 一线城市、部分 二线城市	Runduo Wanjiao Town 国华万象城		Shenzhen Runduo Wanjiao Town 深圳国华万象城
			SOHO		Jian wai SOHO of Beijing 北京建外SOHO
Rapid development 快速发展阶段	2008 Now 2008至今	Beijing, Shanghai, Guangzhou First-tier Cities, A Wide Range of Second-tier Cities 北京、上海 广州、 一线城市、 广大二线城市	Wuhan Wanda 武汉万达		Wuhan Tiandi Royal Jiang Yuan 武汉天地 瑞康江岸
			Modern MOMA Beijing 北京现代MOMA		Modern MOMA Beijing 北京现代MOMA

Figure 3. Distribution of urban complexes in China
图3.中国城市综合体存量分布

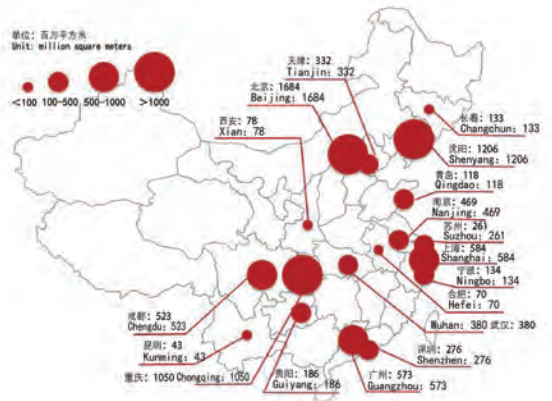


Figure 4. The development period of representative urban complexes
图4.典型城市综合体的建设时期

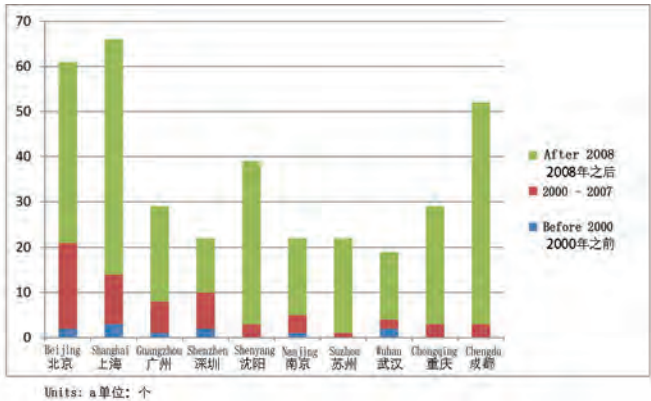


Figure 5. The scale of representative urban complexes
图5.典型城市综合体的平均建设规模

Integration Strategy of Sustainable Vertical Urban Group

Focus of Vertical Urban Group Design

During the process of urban development, the focus on basic factors cannot be removed, such as function, traffic, space, ecology, history context etc. Most successful cases of vertical city agglomeration both at home and abroad share some features – full functionality, smooth traffic, abundant space, comfort and convenience, vitality, seamless coordination with the surroundings, including coordination between human and geographical environment.

Design Strategy of Vertical City Agglomeration

To sum up, we believe that we should focus our attention on the following aspects as designing a mature vertical city: emphasize on recombination of urban functions, connection of urban transportation, as well as sharing, interweaving and penetrating of urban spaces; respect the technical strategy for urban culture and geographical environment; seek support from proper ecological and energy-efficient technologies, etc (see Figure 6).

Recombination – the Perfection of Urban Functions

Rich functionality is the basis for urban development and also the main feature of vertical architectural complex, thus a proven configuration is of great importance for urban publicity performance of vertical super high-rise complex. Function diversity and complementary relationship between different functions can meet the needs of different groups to keep the vertical city vibrant at different ages.

Connection – Orderly and Efficient Urban Transportation

Efficient connection of a vertical city with its infrastructure and public space shall be created, particularly the connection with the urban transport system. This includes, for example, integration with subway and other large-capacity public transit means as well as fast connection with city center, airport, train station and other traffic facilities. Depending on the spatial level, such a connection might refer either to the connection of underground pedestrian systems, connection of over-ground or near-ground space or to overhead connection of high-rises. In addition, it might imply the connection with the urban public space, green land, business and entertainment network; it also means the connection between urban space created by vertical super high-rise complex and the city.

Sharing – Maximization of Public Property

Vertical high-rise should not only serve specific groups but also strive for maximum sharing amongst social groups, which well suits its scale of

萌芽阶段 (1979-1999)

改革开放后(1978年), 在上海、深圳、广州等城市开始出现一些整体规划和开发的超高层集群, 代表实例有上海陆家嘴等。这些实例都具有功能复合、交通便捷的基本特征。

摸索阶段 (2000-2008)

2000年以后, 中国对于垂直城市群落的建设在摸索中前进。“CBD”建设在一线城市展开, 并逐渐向一些省会级城市蔓延。垂直城市群的功能种类增多、复合性增强, 规模扩大。超高层集群中建筑单体数量可达数十座, 面积规模可接近100万平方米(如: 北京华茂中心), 承担了一定的促进城市发展的职能。

快速发展阶段 (2008至今)

近五年时间, 中国迎来了垂直城市群的发展热潮。以超高层集群形式出现的垂直城市群将近100处, 以城市综合体形式出现的更是不计其数, 仅北京就有40多处。这一时期的垂直城市群在功能类型上更为丰富, 在空间形态上, 也由简单的聚集逐步演变为相互联系的有机整体。承担了更大规模的城市发展职能。

中国垂直城市群近三十年的发展速度

建设用地的紧张、对城市形象的政治需求等因素诱发了中国走上快速发展建设垂直城市群的道路。在近三十几年中, 中国垂直城市群展现出了惊人的发展速度, 超高层集群和城市综合体模式成为一个垂直城市的缩影, 伴随着北京国贸中心、上海商城为代表的新一代城市综合体的诞生, 和北京CBD、上海陆家嘴金融中心的首次出现, 中国的垂直城市群在数量上和规模上都发生着翻天覆地的变化。

图示城市综合体的分布、建设时期、平均规模(图3-5)。

中国垂直城市群的发展趋势

垂直城市群是一个新兴的群体建筑概念, 是在整体开发、整体规划、整体控制的前提下, 由一个或多个超高层项目组成的超高层集聚群落。当今中国超高层的发展已由单体建筑转移到超高层集群, 关注点由单体技术转变到城市整体, 对垂直城市的研究探索热点转移到功能配比、空间结构、公共功能、可持续性等方面, 我们更需要探讨的是建筑群落之间的联系和它们的整体性、和谐性。主要表现在以下几个方面:

1. 高度将不再作为垂直城市发展的唯一标尺;
2. 从单体超高层向多功能、复合型、集群化的建筑集群发展的趋势;
3. 向综合、高效、高技术、与高情感并存发展的趋势;
4. 关注生态节能、智能化水平、零排放, 理性对待城市的关系的趋势;
5. 向与城市公共体系高度结合、重视与社会福利和非盈利公共空间高效融合的趋势;
6. 尊重城市和文化形态遗产, 延续并保护城市文脉肌理的趋势;

总之, 更注重城市整体的功能运作效率在垂直城市中的体现。

可持续发展垂直城市群的整合策略

垂直城市群设计的关注点

在城市发展进程中, 始终离不开对基本要素的关注, 如功能、交通、空间、生态、历史文脉等等。国内外垂直城市群落的成功案例大多具有某些共性特征: 功能齐全、交通顺畅、空间丰富、舒适便利、充满活力、与周边环境有良好呼应, 包括人文与地域环境的呼应等。

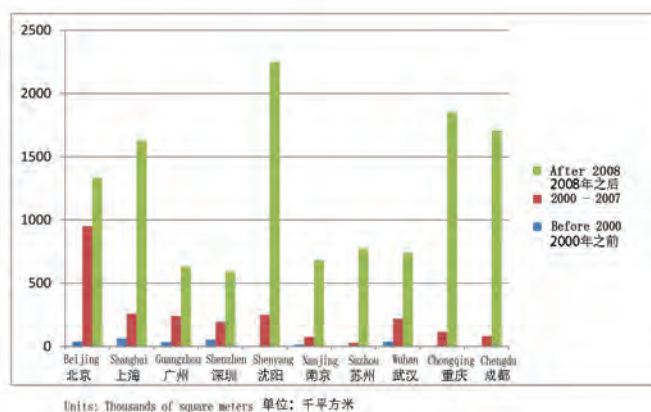


Figure 6. Design strategies of vertical urban agglomeration
图6. 垂直城市群的设计策略

development and intension of planning and is where its social function lies. Sharing between the vertical city and the society not only creates interweaving and penetrating between indoor and outdoor spaces, but also attracts and creates some vibrant space for public activities.

Respect for Urban Context and Territoriality

Apart from incarnating its geographical features and adaptability to the historic environment and site conditions, a vertical city should also preserve and inherit its history so as to secure the continuation and development of urban humanities in super high-rise complexes.

Application of Suitable Eco-Energy Saving Technology

A vertical city should resort to the integrated use of passive and active eco-energy saving technologies. Good architectural design practices could be employed to choose favorable orientation, utilize natural ventilation and solve the problem of sun exposure and shade.

Planning and management measures of vertical city agglomeration

Full Involvement of Government Administration

The role of government is indispensable in promoting the construction of vertical city agglomeration in that, long-term and rational planning objectives, preferential guide measures, reasonable control means and strict supervision would be of great importance for a healthy and mature vertical city agglomeration.

Sophisticated Management Mode

A multiplex and multi-level owner team will provide democratic and general development decisions and insights for the construction of a vertical city. A socialized committee co-created by the government, a technical team and the investor and an efficient administrative system can be adopted to propel the complicated daily operations of the vertical city.

Design Team with Social Responsibility

A sophisticated design concept and a high sense of social responsibility of an excellent design team are the footstone to ensure the construction objectives of a vertical city agglomeration. A high sense of social consciousness and responsibility, on the other hand, will contribute to long-term recognition and approval of the project.

Public Functions of the City for a Better External Environment for Vertical City Agglomeration

Sharing between the vertical city and the society might involve not only functions for commercial, office, living and other purposes, but also open space such as green land, civil squares, sightseeing yards and public buildings such as public facilities, medical, cultural and exhibition establishments, etc.

Case Studies

(see Figure 7)

55# Lot Project on Haimen Road in Shanghai

Located in the central area and at the heart of North Bund between the famous Tilan Bridge (Jewish) Historical Reserve and Huangpu River and covering a total area of 446,000 square meters, 55# Lot Project on Haimen Road is an important part of the super high-rise complex at the river front of North Bund (currently it consists of a total of 14 lots, including one 300m super high-rise, two 263m super high-rises, two 200m and two 150m super high-rises respectively, together with nearly 20 high-rises below 100m). It comprises two 263m super high-

垂直城市群的设计策略

经过归纳、实践和总结，我们认为一个成熟的垂直城市群落，强调对城市功能的重组、城市交通的连接、城市空间的共享、交织与渗透，尊重城市文脉和地域环境的技术策略以及寻求适当的生态节能技术支持等(图6)。

重组—城市功能的完善

丰富的城市功能是城市发展的基础，也是垂直建筑群落的主要特征，良好的功能配置对于垂直超高层群的城市公共性的表现，具有非常重要的作用。功能的多样性和不同功能之间的互补关系，能够满足不同使用人群的要求，让垂直城市在不同时间段内保持活力。

连接—城市交通的有序高效

垂直城市应该与城市基础设施、城市公共空间具有高效的连接，特别是与城市交通系统的衔接，这种连接在空间层次上可以是地下步行系统的连接、地面的连接、近地空间的连接，还可以是高层建筑之间的空中连接。连接还意味着同城市公共空间的连接、城市绿地的连接、城市商业和娱乐网络的连接。也意味着垂直超高层群落所营造的城市空间与城市的链接。

共享—公共属性的最大化

垂直超高层不应该仅为特定人群服务，应让全社会最大程度的共享。这是与垂直城市的开发规模和规划高度相匹配的，也是垂直城市的社会职能所在。垂直城市与社会共享，不仅营造室内外的空间交织和渗透，还要吸引并营造一定的承担公众活动的活力场所。

尊重城市文脉和地域性

垂直城市应体现地域特征，与所处历史环境和场地条件相适应。对于基地的历史应保留和传承，保证城市人文在超高层城市群内的延续和发展。

运用适当的生态节能技术

垂直城市应综合采用被动式和主动式生态节能技术。通过建筑设计手段选取良好朝向，利用自然通风，解决日照和遮阳问题。

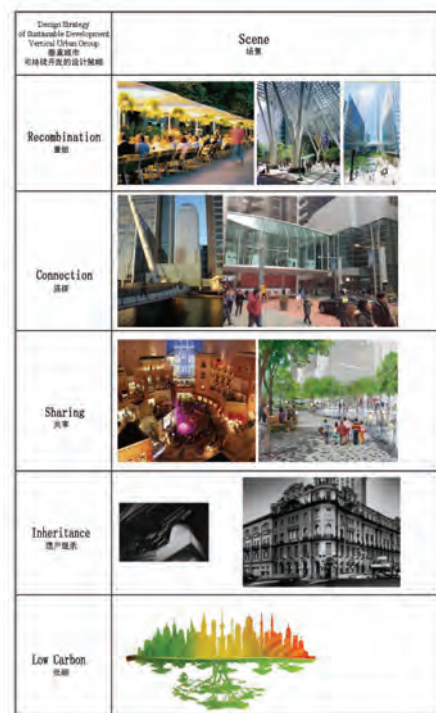


Figure 7. The urban elements of projects concerned in the projects designed by ISA Architecture

图7.上海院工程实践涉及的城市基本要素

rise office buildings and one three-floor theme commercial center. In almost a decade, Shanghai Investigation, Design and Research Institute has involved in more than 80% of individual design and overall design coordination; 55# Lot on Haimen Road is designed with the joint efforts of Shanghai Investigation, Design and Research Institute, PCPA, Benoy, ARUP and RFR (see Figures 8-10).

55# Lot Project on Haimen Road consists of functions such as Riverside office, shipping center, marina berth, five-star hotel, commercial center, international cinema, apartment, public transit hub, passenger

垂直城市群的规划管理措施

政府管理部门的充分介入

在垂直城市群的建设中，政府的推动力是不可或缺的: 长远而合理的规划目标、优惠的引导措施、合理的控制手段、严格的监管，都将为健康、成熟的垂直城市群发挥重要的作用。

先进的管理模式

多元和多层级组成的业主团队，将为垂直城市区的建设提供民主而全面的开发决策意见。采用由政府、技术团队和投资方共同组成的专业委员会和高效的行政管理体系，推进垂直城市复杂的日常运营。

有社会责任的设计团队

优秀的设计团队的先进的设计理念和对社会的高度责任心是保证垂直城市群建设目标的基石。高度的社会觉悟和责任心，会为项目赢得长远的认可和共鸣。

发挥城市的公共职能，为垂直城市群提供良好的外部环境

垂直城市与社会共享的，不仅包括其自身的商业、办公、居住等功能体，还可以是公共绿地、市民广场、景观庭院等开放空间，以及公共设施、医疗、文化、展览等公共建设项目。

案例研究

(图7)

上海海门路55号

项目位于上海北外滩核心地段，著名的提篮桥(犹太)历史保护区和黄浦江之间。总建筑面积44.6万平方米，是北外滩滨江超高层建筑群(目前共有14个地块组成，包括1栋300米、两栋263米、两栋200米和两栋150米的超高层，还包括近20栋100米以下的高层建筑)的重要的一部分。由两幢263米高的超高层办公楼，和一座三层的主题商业中心组成。上海设计院在近十年间，参与了这一片区域中80%以上的单体设计和总体设计协调工作; 海门路55号项目由PCPA、Benoy、ARUP、RFR、上海设计院共同参与设计(图8-10)。

由滨江办公、航运交易中心、游艇码头泊位、五星级酒店、商业中心、国际影城、酒店式公寓、公交枢纽、客运轮渡码头、国际邮轮码头、2000米长的滨江绿化公园、1000米长的屋顶绿化长廊等功能组成，促使北外滩建筑群的功能实现了充分的互补和综合。通过地铁与主要建筑的连接、空中连廊与屋顶花园高线的连接、地下空间与客运码头的连接，内部公共空间与公交枢纽的连接，实现了群体之间以及和城市的高效、舒适连通，也实现了空间的渗透和美好环境的共享。

上海船厂

上海船厂区域开发项目位于上海浦东陆家嘴金融中心区东侧，前身为上海船厂。现由政府整体规划和开发为滨江金融城，方案设计单位有KPF、矶崎新、美国ARQ设计工作室等。地上总建筑面积84.73万平方米，地下52万平方米。涵盖办公、商务、商业、居住、文化、观演、展览等功能，由六组办公综合楼和九座住宅楼组成。我院参与设计地块包括: 2E1-1、2E3-2、2E5-1、2E7-1(图11、12)。

项目通过功能的重组，以金融办公为主，同时将居住功能融入其中，在滨江区域融入文化、观演建筑，共同营造功能完善的垂直城市。

通过保留老船厂区的船台，结合景观设计对其加以利用，设计两条轴线，不仅联系起区域的历史和现状，还连通了城市群和滨江景观，以期实现对历史文脉与地域性的尊重和发展。

Project Name 项目名称	Time of Design 设计时间	Picture 图片	Shanghai Investigation, Design and Research Institute	Shanghai Investigation, Design and Research Institute	City Planning Institute	Transport Planning Institute	Open Space Planning Institute	Historical Protection Institute	Shanghai Investigation, Design and Research Institute	Shanghai Investigation, Design and Research Institute
Shanghai Hong Kong (Kowloon-Wharves) Tower (KOWLOON-Wharves) 上海香港新世界 大厦 (西贡-码头)	1996/2002		●	●	●	●	●	●	●	●
Changsha Mall 购物中心	2002/2005		●	●	●	●	●	●	●	●
Donghai Integrated Development Project (Donghai Center) 上海东汇中心 综合体开发项目	2003 / now 2003至今		●	●	●	●	●	●	●	●
Huashan Park Project 华山公园项目	2007 / now 2007至今		●	●	●	●	●	●	●	●
Shanghai United Square 上海联合广场 购物中心	2008 / now 2008至今		●	●	●	●	●	●	●	●
Shanghai International Financial Center	2010 / now 2010至今		●	●	●	●	●	●	●	●
55# Lot Project on Haimen Road 上海海门路55号 项目	2012 / now 2012至今		●	●	●	●	●	●	●	●
Shanghai Harbor 55 Project 上海海门路55号 项目	2012 / now 2012至今		●	●	●	●	●	●	●	●

Figure 8. The master plan of 55# lot project on Haimen Road
图8.海门路55#地块区域总平面图



Figure 9. The bird's eye view of 55# lot project on Haimen Road
图9.海门路55#地块鸟瞰图



Figure 10. 55# lot project on Haimen road: connection with the city
图10.海门路55#项目与周边城市功能的连接

ferry terminal, international cruise terminal, 2,000m long riverside green park and 1,000m long roof greening promenade, realizing full complementation and integration of the functions of building groups in North Bund. Efficient and comfortable communication between building complexes is achieved via connection of subway system with major buildings, connection of air corridors and that of roof garden highline, connection of underground space with passenger terminals and that of internal public space with public transit hubs, thus achieving penetration of spaces and sharing of a better environment.

Shanghai Shipyard

The regional development project of Shanghai Shipyard, formerly Shanghai Shipyard, is located in the east of Lujiazui Finance and Trade Zone in Pudong Shanghai. With overall planning of the government, it has been developed into a riverside finance and trade center. Its design is a result of cooperation amongst KPF, Arata Isozaki, ARQ design studio from the US, etc. In total, it covers an over-ground area of 847,300 square meters and an underground area of 520,000 square meters. It accommodates office, business, commercial, residential, cultural, performance and exhibition functions, comprising six groups of office buildings and nine residential buildings. We are involved in the design of lots including 2E1-1, 2E3-2, 2E5-1 and 2E7-1 (see Figure 11 & 12).

Through recombination function, the project focuses on financial and office purpose, meanwhile residential function is well integrated. Buildings for culture and exhibition purpose are also available in the riverside area, altogether to create a fully functional vertical city.

Slipway of the original shipyard area is well reserved and made full use of by adding landscape design, while designing two axes that not only link up the regional history and status quo but also lead to the city agglomeration and riverside scenery, thus to show respect for and development of historical context and territoriality.

By highlighting the sharing nature of site landscape axis, forming interweaving and penetration via creating movable platforms, sunken plazas and sightseeing terraces, it is possible to realize sharing with the city to the maximum extent and enhance urban publicity of vertical super high-rise complexes.

Summary and Prospect

China's vertical cities have reached international level in such aspects as overall development, project scale, function combination, protection of historical context, etc., yet there is still room for improvement with regards to tridimensional traffic network, social sharing, space penetration, openness and attractiveness, etc. and space vitality and accessibility is yet still inadequate. There is a plenty of room for improvement in future project practice. It is hoped that study in this article could provide much-desired assistance and technical support for the design and construction of vertical cities in China.

同时通过强化场地景观轴线的共享性，设置活动平台、下沉广场、观景露台，形成空间的交织与渗透，最大限度地实现与城市的共享，促进了垂直超高层群落的城市公共性。

总结与展望

我国垂直城市群在项目整体开发、项目规模、功能组合、历史文脉保护等方面已经与国际水平相当，但在立体交通网络、社会共享、空间渗透以及开放性和趣味性等方面还有待改善，空间活力和可达性不足。未来的项目实践中，仍有许多可提升的空间。本文的研究希望能为中国垂直城市群的设计和建设提供更好的帮助和技术支持。



Figure 11. The bird view of Shipyard project

图11.船厂项目鸟瞰图



Figure 12. The fashion space refurbished by the old workshop

图12.老厂房改造的时尚场所