



绿色城市规划设计实践

GREEN CITY
PLANNING
AND DESIGN
PRACTICE

绿色街区 规划设计

GREEN BLOCK
PLANNING AND DESIGN

陈 天 臧鑫宇 编 著

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Preface

Since *Silent Spring* was published in 1962, the eco-movement and green movement have lasted for almost 70 years. Since first being formally proposed in the 1970s, the theory of ecological cities has developed over more than 40 years. Whilst the various theories and concepts of urban ecology and ecocity building have been evolving, the world's cities have been growing rapidly and nowhere more so than in China. This rapid growth has contributed to a severe global crisis: climate change, ecological deterioration, resource and energy exhaustion, conflicts between urban populations and their need for land, vegetation and water, and urban environmental pollution, traffic congestion and heat island phenomena are becoming more serious, especially in China. Building eco-cities has become the fundamental way to solve the urban problems by changing from the conventional concept of the city and beginning its transformation to the start of the green era. This great urban transformation encompasses issues of the economy, society and general livelihood, and it promises to give us a clearer understanding of the new mission of this green era – creating a green civilization. All the researches in ecology, environmental protection, energy conservation, regionalism and sustainable development, to name just a few, need to be embodied in this great new adventure of civilization. How to get there? The task before us is to achieve the greater goals of eco-civilisation and eco-city development in a way that can successfully reconcile the demands of working at an urban scale with the architectural design that is responsive to its users, its context, and the need to control and deliver a genuinely "green" specification and performance. Professor Chen and his fellow researchers have identified and studied a key tool for this task: the "green block". Compared with the large-scale construction of China's new urban districts, the design of meso-scale green blocks is more fully in accordance with the eco-city concept. In real, practical terms, as well as in the theory of eco-city development, building "green blocks" offers controllability of architectural scale and better management of sustainable construction processes – essential underpinnings to the creation of urban systems that work towards protection of our planet's ecosystem.

This book not only provides eco-design ideas for planners and designers, but will, I believe, resonate with its readers in a way that helps them to develop their capacity for ecological thinking and their ability to find effective methods and strategies for urban development – this is vitally important for China.

Paul Downton

Semaphore, South Australia, 16 June 2014

序言

1962年,随着《寂静的春天》正式出版,生态与绿色运动至今已经发展了近70年;生态城市理论自20世纪70年代正式提出至今,也已经近40年。这期间,全球城市在迅速发展的同时,也面临着严峻的生态危机。气候变暖、生态环境恶化、资源和能源枯竭,城市人口与土地、植被、水体之间的矛盾不断加剧,城市环境污染、交通拥堵、热岛现象愈发严重……尤其在中国,人口与环境之间的矛盾更加尖锐。生态城的建设已经成为解决城市问题的根本途径,从生态城市到生态城,代表我国城市转型的开始和绿色时代的来临,转型期的生态城建设,在综合考虑经济、社会、民生等问题的同时,更需要清醒地认识到绿色时代赋予城市建设的新使命——创建绿色文明。绿色文明的广泛内涵使得城市可以采取多种策略以适应不同的建设需求,生态、环保、节能、文脉、地域性、可持续等方面的研究都是绿色文明的体现。为了实现绿色文明的伟大目标,促进生态城市的健康发展,我们首要的任务是探寻一种能够满足城市规模和建筑设计需求的方法,为设计提供一个真正的“绿色准则”。为此,陈天教授及其科研团队提出“绿色街区”这一核心理念。相较于中国大规模的城市新区建设,中观尺度的绿色街区设计更能契合生态城市的理念和内涵。可以说,绿色街区是生态城市理论与实践的现实选择,其研究意义不仅在于规模的可控性和建设的可持续性,更在于人类对地球生态系统的保护。本书的写作初衷不仅在于为规划设计者提供一种街区尺度的生态设计思路,更希望能唤起读者的共鸣,激发绿色生态思维,为中国的城市建设提供具有实效性的规划方法和策略。

保罗·唐顿

澳大利亚,2014年6月16日

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Design Theory

设计理念

GREEN BLOCK PLANNING AND DESIGN

绿 / 色 / 街 / 区 / 规 / 划 / 设 / 计

1. 绿色街区的概念、特征与设计原则

1.1 绿色文明的提出

绿色文明，亦称生态文明，是人与自然和谐共存的文明，是人类社会反思黄色文明（农业文明）和黑色文明（工业文明）时的种种生态问题而提出的更高层级的社会文明阶段，因“绿色”本质象征的生命、健康、活力内涵而被形象地称为绿色文明^①。绿色文明的提出始于人类对自然生态危机的认知，其本质在于人类社会的可持续发展。绿色文明的理念是实现人类生活目标和社会发展目标向可持续发展的转变^②，这一理念已经深入到社会、经济、政治、文化等多个领域。对于城市建设而言，绿色文明倡导人类生产、生活的生态化，其目的是建立经济、社会与自然的可持续发展模式。

中国转型期的城市面临人口与资源、环境的深刻矛盾，科技手段已经不能很好地解决日益严重的社会问题，我们必须呼吁社会发展回到维护自然生态环境平衡上来，以绿色、生态、可持续为城市建设的基本目标，提出绿色文明指引下的城市发展构架，绿色生活、绿色行动、绿色城市、绿色街区、绿色建筑都可以归属于这一发展框架下。中国新型的城镇化道路，是一种基于中国现实情况的可持续发展策略，也是绿色文明的体现，从社会发展的整体战略和城市建设的各个方面，制定了系统的规划策略。

1.2 绿色、生态、低碳的概念思辨^③

顺应生态城市的研究进程，学界提出了生态、绿色、低碳这三个核心概念。生态，是指生物的生存状态，其概念源于19世纪80年代德国生物学家恩斯特·海克尔（E. Haeckel）提出的生态学概念。生态城市是以生态学原理为基础，综合研究自然、经济、社会的复合生态系统，是自然环境良好、经济高效、社会安定的可持续发展的城市^④。美国生态城市建设者协会主席理查德·瑞吉斯特（Richard Register）最早提出生态城市概念，在其编著的《生态城市：重建与自然平衡的城市》一书中，通过120多个生态城市建设案例，系统总结了近几十年来的生态建设经验。瑞吉斯特认为，生态城市的三个标准是生命、美与公平，生态城市的未来形态是绿色、紧凑与自然紧密结合的三维形体^⑤。

绿色，代表生命、健康和活力，从本质上体现的是和谐、可持续的生态思维。绿色概念源于20世纪70年代绿色和平组织发起的绿色运动，其核心目的是保护地球的自然环境和生物的安全，倡导绿色、和平、可持续的方法。此后，随着世界范围内绿色运动的发展，绿色概念逐渐深入到经济、社会、环境、技术、文化等诸多领域。绿色概念突破了传统的含义，即生命、自然、和平，更表达了生态、健康、和谐、安全等含义，学界开始出现了绿色城市、绿色经济、绿色文化、绿色行动和绿色意识等多种概念。1990年，加拿大学者大卫·高尔敦（David Gordon）在《绿色城市》（Green Cities）一书中，提出了绿色城市的基本内容，探讨了自然、经济、社会的可持续发展策略^⑥。相对于生态城市，绿色城市往往更加强调绿色的本质含义，即生命、健康和活力，并体现一定的美学原则。城市转型期的绿色城市旨在转变城市的发展模式和人们的生活方式，形成人与人、人与社会、人与自然的和谐共存。低碳的主要含义是降低温室气体（主要为CO₂）的排放，低碳概念与城市相结合即形成了低碳城市。低碳城市主要是指

1. The Concept, Features and Designing Principles of Green Block

1.1 Proposing Green Civilization

Green Civilization, or called Ecological Civilization, is the civilization of the harmonious coexistence state between human and the nature, and is an advanced social civilized stage proposed based on rethinking the various ecological problems happened in the period of Yellow Civilization (Agricultural Civilization) and Black Civilization (Industrial Civilization). Due to the color of green naturally displays the meaning of living, health and vitality, so we it is vividly called green civilization. The statement of green civilization was put forward when people started to acknowledge the natural ecological crisis and realized the significance of sustainable development in human society. The main concept of green civilization is to realize the transformation of making the goals of mankind living and social development sustainability, which has deeply carried out in the fields of society, economy, politics, culture and others. In urban development, Green Civilization advocates us to live and product ecologically with the purpose of establishing sustainable developing models in economy, society and nature. In China, every city in the transformation phase is confronting with profound contradictions of the population, resources and environment. Since the increasing social issues have not been totally solved by technology methods, we must appeal to all to keep the social development in a way that could maintain natural ecological environment in balance. Based on the target of urban development which is being green, ecological and sustainable and under the guidance of green civilization, it is important to provide the urban developing structure which covers green life, green movement, green city, green block and green building. Considering the actual situation of China, the urbanization is a sustainable strategy and reflection of green civilization, making systematic planning strategy at every aspect from overall social development to city construction.

1.2 Thinking and Analyzing the Concepts of Green, Eco and Low-carbon

With the researching process of ecological city, the academics have proposed three major concepts: eco, green and low-carbon. Ecology means the survival status of living things, which comes from the ecological concept proposed by the Germany biologist Ernst Haeckel in the 1880s. Based on the principles of ecology, after comprehensively studying the complex ecosystem which combined by nature, economy and society, eco-city is a

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⑤ Richard Register. Ecocities: Rebuilding Cities in Balance with Nature[M]. 2006.

⑥ David Gordon. Green cities: ecologically sound approaches to urban space. Montreal: Black Rose Books, 1990.

sustainable city with good natural environment, high-efficient economy and social security. Richard Register, the President of the American Association of Eco-city Builders firstly proposed the concept of eco-city in his book *Eco-cities: Rebuilding Cities in Balance with Nature*, based on 120 more cases of building eco-city he systematically summarized years of experiences from advocating for ecology construction. In Register's opinion, there are three standards to definite eco-city which are living, beauty and fairness. The future form of eco-city is a 3-D shaped closely combined by green, compactness and nature. The color of green stands for life, health and vitality, which basically shows the harmonious and sustainable ecological thinking. The concept of Green originated from Green Movement which was held by the Greenpeace in the 1970's to protect natural environment and biological security and to appeal for green, peaceful and sustainable methods. Thereafter, with world-wide green movement awakening, the concept of green is gradually adopted in the fields of economy, society, environment, techniques, culture and others. It reaches beyond the traditional meaning of life, nature and peace. It expresses eco health, harmony and security. So, the academics bring up many relevant concepts, like green city, green economy, green culture, green movement, and green awareness. In 1990, Canadian scholar David Gordon put forward the basic component of green city in *Green Cities*, approaching the sustainable strategy for nature, economy and society. Compared to the eco city, green city more emphasizes the essential meaning of the color of green that is life, health and vitality which presents some aesthetic principles. During the city transforming period, green city is aiming at transforming the city development and the way of human live into harmonious coexistence state between man and man, man and society, man and nature. Combining with the idea of low carbon which mainly means to reduce greenhouse gas emissions (mainly CO₂), it becomes low carbon city. What function of low carbon city has is developing low carbon economy during city construction, reducing greenhouse gas emissions with low carbon technology and pattern, to accomplish the high efficient economy, energy security and environmental protection.

在城市建设中发展低碳经济，采用低碳模式和低碳技术，减少温室气体排放，实现经济高效、能源安全、环境保护的城市^①。

生态城市、绿色城市、低碳城市这三个概念具有共同的核心理念和思想，均以生态学理念为指导，协调人与自然环境的关系，实现经济、社会、环境的可持续发展。然而，三者的内涵深度并不相同，生态城市的内涵范畴最广，绿色城市次之，而低碳城市从某种意义上来说可以作为生态城市的一个子集，因此也有专家学者提出低碳生态城市的概念^②。从研究的对象上来看，生态城市的研究对象最为全面，绿色城市次之，低碳城市最为具体（表1）。基于当前中国生态城市建设的现实情况，生态、绿色、低碳已经成为转型期中国城市的战略选择，成为解决城市发展与环境、资源矛盾的唯一路径^③。如何制定并实现实效性较强的生态、绿色、低碳策略，是今后很长时期内亟待解决的重要课题。

表1 生态、绿色、低碳城市的概念比较
Table 1 Comparison of Eco-city, Green City and Low-carbon City

类型 Contents	时间与事件 Time and Events	主要理念 Major Concept	研究对象 Researching Object	覆盖科目 Covered Subjects
生态城市 Eco-city	1970 年，联合国教科文组织提出“人与生物圈 (MAB) 计划”；1984 年，前苏联生态学家 O. Yanitsy 首次正式提出生态城市概念。In 1970, UNESCO proposed "Man and the Biosphere (MAB) Plan"; In 1984, the Soviet ecologist O. Yanitsy first formally proposed the concept of the ecological city.	人与人的和谐 人与自然的和谐 自然系统的和谐 Harmony between humans, harmony between human and nature, ecosystem harmony	生态产业 生态环境 生态文化 Ecological industry, ecological environment, ecological culture	生态学、城市生态学、生态工程学、产业生态学等 Ecology, urban ecology, ecological engineer, industry ecology, etc
绿色城市 Green City	1989 年，英国经济学家皮尔斯 (Pierce) 在其著作《绿色经济蓝皮书》中首次提出绿色经济概念；2005 年，美国《城市环境协定——绿色城市宣言》提出了系统的绿色城市内容。In 1989, the British economist Pearce (Pierce) first put forward the concept of green economy in his book Blue book of green economic. In 2005, American (Green Cities Declaration Urban Environmental Accords) systematically provided the content of green city.	生态环境 和谐社会 循环经济 Ecological environment, harmonious society, cycle economy	城市环境、绿色经济、绿色建筑、绿色交通、绿色能源、绿色产业等 Urban environment, green economy, green building, green transport, green energy, green industry, etc	生态学、哲学、产业生态学、城市规划、地理学等 Ecology, philosophy, industrial ecology, urban planning, geology, etc
低碳城市 Low-carbon City	2003 年，英国政府发布的能源白皮书《我们能源的未来：创建一个低碳经济体》，引发低碳城市建设热潮。In 2003, the British government released energy white paper The Future of Our Energy: Creating a Low Carbon Economy, triggered a constructional upsurge for low carbon city.	低碳经济 低碳生活 低碳社会 Low-carbon economy, low-carbon life, low-carbon society	低碳技术、循环经济、能源利用、产业、交通规划等 Low-carbon technology, cycle economy, energy utilization, industry and transport planning, etc	生态学、生物气候学、产业生态学、城市规划等 Ecology, biology climate, industrial ecology, urban planning, etc

①陈飞，诸大建. 低碳城市研究的内涵、模型与目标策略确定 [J]. 城市规划学刊，2009(4): 7-13.
Chen Fei, Chu Dajian. Research on the Content, Models and Strategies of Low Carbon Cities [J]. Urban Planning Forum, 2009(4): 7-13.

②沈清基，安超，刘昌寿. 低碳生态城市的内涵、特征及规划建设的基本原理探讨 [J]. 城市规划学刊，2010(5): 48-57.
Shen Qingji, An Chao, Liu Changshou. A Discussion on the Connotation, Characteristics, and Basic Principles of Planning/Construction of the Low Carbon Eco-city [J]. Urban Planning Forum, 2010(5): 48-57.

③李迅，刘琰. 低碳、生态、绿色——中国城市转型发展的战略选择 [J]. 城市规划学刊，2011(02): 1-7.
Li Xun, Liu Yan. Low Carbon, Ecology and Green——The Strategic Choice of Chinese Cities for Transformative Development [J]. Urban Planning Forum, 2011(02): 1-7.

1.3 绿色街区的概念

基于“绿色”所具有的生态、活力、生命、健康等深刻内涵，绿色街区不仅具备城市物质空间的特性，也兼具深刻的生态、人文关怀，它是城市空间尺度、城市形象与生态、人文内涵的统一体。

从城市空间系统的角度来看，绿色街区与绿色城市、绿色建筑共同构成了绿色文明的空间载体，是城市生态系统的一个重要组成部分。绿色街区是绿色城市理念在城市中观层级的体现。绿色城市是一个复杂的系统，包括了自然生态环境、经济社会体制、物质文化生活等方面的绿色追求和愿景。绿色愿景的规划策略需要从城市的各个层级具体实施，而绿色街区则是实现绿色愿景的重要节点，从城市规划角度能够在短期内显现其示范效应，从而对绿色城市愿景的实现起到积极的促进作用。同时，绿色街区也是绿色建筑理念在城市中观层级的延伸。绿色建筑在国内外社会各界的积极推动下，已经形成了清晰的理念、定义和系统的设计原则。尤其在我国的生态城市建设过程中，绿色建筑的“四节一环保”措施已经取得了广泛的认同。绿色街区的提出能够从街区层级拓展绿色建筑的理念，有助于在微观建筑和宏观城市之间搭建“绿色桥梁”。综上所述，相对于绿色城市，绿色街区是一个基本单元；相对于绿色建筑，绿色街区又是一个基本系统。

绿色街区的概念需要结合城市层级的“绿色”与建筑层级的“绿色”，从街区层级探讨其绿色内涵，从而最大限度地发挥绿色街区在城市规划和建筑学的整合性意义和作用。因此，绿色街区是以生态学为核心理念，以绿色建筑为基础，以实现绿色城市为目标，资源集约利用、生态环境安全、人与自然和谐共存的街区。

1.4 绿色街区的特征

保护生态环境，减少环境污染；
厉行全生命周期内的资源和能源节约；
遵循空间舒适度和美学原则；
技术适应性，提倡低技术，适度结合高技术；
街区系统性，以街区作为生态系统的基本单元，实现街区的基本目标；
街区健康安全，有利于防灾减灾。

1.5 绿色街区的设计原则

- (1) 设计应尊重自然，保护街区内部的生态环境要素，构建稳定的街区生态安全格局；
- (2) 设计应节约资源和能源，在街区内部各类设施（包括建筑物、构筑物、基础设施等实体要素）全生命周期内实现资源和能源的节约和高效利用，以绿色建筑标准作为街区建筑设计的基本要求；
- (3) 设计应方便使用者。街区空间设计应遵循一定的美学原则，进而满足人的心理需求和使用要求，注重街区安全，并体现街区所处城市的地域性和文化性；

All of the 3 concepts of eco-city, green city and low carbon city have a common theory which is guided by ecological theory to coordinate the relationship between human and natural environment to achieve the sustainable development in the fields of economy, society and environment. However, the connotations are not the same. Eco-city covers the most, green city dose less, and low carbon city on some level could seem to be a part of eco-city. Therefore, some academics proposed another concept as low carbon ecological city. From the view of researching object, eco-city has the most comprehensive content, green city comes secondly, and low carbon city has most specific one (Table 1). According to the actual situation of eco-city development in China, the strategic choice and also the only solution for us in this transforming period is finding an ecological, green and low carbon way to solve the contradiction among urban development, environment and resources. How to plan and accomplish ecological, green and low carbon strategy effectively is what we need to do in the very long future.

1.3 The Concept of Green Block

All of the profound meanings of the color of green-ecology, vitality, life and health indicate the urban material spatial properties of Green Block, and ecological and humanistic concerns. It is the unification of urban spatial scale, city image with ecology and humanism. From the view of urban spatial system, Green Block, Green City and Green Building have become the spatial carrier of green civilization and have been taking a good part in urban ecosystem. Green Block is the embodiment of Green City concept in mesoscale urban space. Green City is a complex system that includes green pursuing and vision in the aspects of natural ecological environment, economic social system, and material and cultural life. The planning strategy of Green Vision needs to be carried out at every hierarchy of the city, and the key point is to build the Green Block, which shows the demonstration effect in short term from the view of City Planning and also promotes the realization of green city vision, and at meanwhile, Green Block extends Green Building Theory into mesoscale urban space. With the highly recommendation from the community both at home and abroad, the Green Building theory has become a design principle with clear concept, definition and system. Especially the Eco-city Development process in China, the Four Savings and One Protection Policy has been widely adopted. The Green Block proposal extends the Green Building theory at block level and intends to build the Green Bridge between micro architecture and macro city. To sum up, for green city, green block is a basic unit; for green building, it is a basic system. Studying the concept of Green Block, we should also consider the meaning of green at urban level and architecture level to discuss the connotation of green from at block level and maximizes the integrated meaning and function in urban planning and architecture. Thus, the concept of Green Block is ecology-oriented, basing on the theory of green, being targeted at becoming green city, with resources utilization, secure ecological environment and harmonious coexistence state between human and nature.