Wang, Lan (Ed.); Rau, Stefan (Ed.)

Conference Paper

zhong guo xin cheng xin qu gui hua yu fa zhan : = New towns and new districts case studies from the People's Republic of China

Reference: (2018). zhong guo xin cheng xin qu gui hua yu fa zhan : = New towns and new districts case studies from the People's Republic of China. Shanghai : Tongji University Press. doi:10.22617/BKK168204-2.

最佳城市发展案例研究系列 | 亚洲开发银行-同济大学城市知识中心出版项目
SERIES OF THE BEST URBAN DEVELOPMENT CASE STUDIES | ADB-TONGJI URBAN KNOWLEDGE HUB PUBLISHING PROJECT

中国新城新区规划与发展

NEW TOWNS AND NEW DISTRICTS CASE STUDIES FROM THE PEOPLE'S REPUBLIC OF CHINA

王 兰　饶士凡　主编
Editors Lan Wang and Stefan Rau

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TONGJI UNIVERSITY PRESS

亚洲开发银行－同济大学城市知识中心出版项目
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图书在版编目（CIP）数据

中国新城新区规划与发展 / 王兰 , 饶士凡主编 . —
上海 : 同济大学出版社 , 2018.5
ISBN 978–7–5608–6510–2

Ⅰ . ①中… Ⅱ . ①王… ②饶… Ⅲ . ①城市规划 – 研究 – 中国②城市建设 – 研究 – 中国 Ⅳ . ① TU984.2

中国版本图书馆 CIP 数据核字 (2016) 第 204775 号

出 品 人：华春荣
责任编辑：李　杰　胡　毅
责任校对：徐春莲
封面设计：完　颖

出版发行　同济大学出版社 www.tongjipress.com.cn
（上海市四平路 1239 号　邮编：200092　电话：021–65985622）
经　销　全国各地新华书店、建筑书店、网络书店
印　刷　上海安兴汇东纸业有限公司
开　本　787 mm × 1 092 mm　1/16
印　张　13.5
字　数　337 000
版　次　2018 年 5 月第 1 版　2018 年 5 月第 1 次印刷
书　号　ISBN 978–7–5608–6510–2
定　价　128.00 元

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缩略语表
Abbreviations

BRT — Bus Rapid Transit 快速公交系统

d — day 天

IT — Information Technology 信息技术

kg — kilogram 千克

km/h — kilometer per hour 千米每小时

kV — kilovolt 千伏

kW — kilowatt 千瓦特

L — liter 升

min —minute 分钟

Mu — Mu 亩 (1Mu=666.7m^2)

RKSI — Regional Knowledge Sharing Initiative 区域知识共享中心

t — ton 吨

t/hm^2 — ton per hectare 吨每公顷

℃ — degree Celsius 摄氏度

序一（亚洲开发银行）

今年是中国改革开放 40 周年，在过去的 40 年中，中国经济发展、城镇化的速度和规模前所未有。中国城镇人口占比从 1975 年的 19.4% 上升到 2016 年的 56.1%；2030 年中国城镇人口有望从 2016 年的 7.9 亿增至 10 亿。1990 年到 2005 年间，中国城镇人口翻倍；人均 GDP 是过去的 3 倍。城镇居民人均可支配收入从 2012 年的 9 489 元增长为 2016 年的 33 616 元，并有数百万人脱离贫困。虽然中国城镇化取得了可喜的成绩，但仍面临着许多挑战。中国许多大城市深受雾霾影响，城市空气污染严重影响公众健康、破坏城镇宜居环境。中国也面临着严重的城市水污染和水资源稀缺问题，在中国 32 座过百万人口城市中有 30 座城市将长期面临严重水资源短缺问题。中国把工业化和城镇化作为经济社会发展的主要驱动力，许多国家正渴望从这一发展模式中吸取经验和教训。

中国组织管理城市增长的主要方法为规划和建造新城新区，拓展原有城市区域和远郊新城镇，后者通过道路和交通基础设施连接市中心，距离控制在通勤范围内。上海通过新城新区有序实施城市和区域规划，成为模范；同时上海也与特别经济开发区相连，两者相得益彰。

近年来，中国转变了城镇化和发展政策的重心。根据《国家新型城镇化规划 (2014–2020 年)》纲要，中国从之前以国内生产总值为中心转向实现更高质量的增长，从经济和环境角度来说都更可持续。在城市规划中强调环境和社会维度，这种转变包括致力于让城市和新城新区变得更为宜居、绿色，更具包容性和竞争力。本书中第一部分的三篇介绍性文章概述了中国和欧洲的新城发展，第二部分的三个优秀的案例研究展示了中国新城新区的实践。这些成果曾在 2013 年 11 月召开的亚洲开发银行 – 同济大学城市知识中心研讨会展出。本书也是以此为基础的。

25 年来，亚洲开发银行一直大力支持中国的城市发展，总贷款额超过 68 亿美元，技术援助及资助额超过 6 100 万美元。我们很自豪能与各城市进行积极合作，采用多种方式促进城市发展成宜居、有社会包容性、有经济竞争力、有环境可持续性并能适应气候变化的地方。亚洲开发银行将通过项目继续支持中国城镇化建设，这些项目展示出的创新性解决方案能应对环境和社会经济的挑战。

本书旨在传播中国城镇化过程中的经验和教训，促进南南合作和知识交流。亚洲开发银行基于亚太地区其他国家的利益，推广此书。

小西步（Ayumi Konishi）

亚洲开发银行行长特别高级顾问

Foreword by Asian Development Bank

As the People's Republic of China (PRC) marks the 40th anniversary of its opening up and reforms this year, we all agree that the pace and scale of its economic development and urbanization during the past 40 years is unprecedented. The urban population increased from 19.4% in 1975 to 56.1% in 2016. By 2030, we expect the PRC's urban population to reach 1 billion from about 790 million in 2016. Between 1990 and 2005, the urban population doubled and per capita gross domestic product (GDP) tripled. Disposable incomes of urban residents averaged CNY 33,616 in 2016 increasing by CNY 9,489 from 2012, and millions have been lifted out of poverty. Despite these achievements, many challenges remain. Pollution haze affects most large cities in the PRC, putting major strain on public health and livability. Serious urban water pollution and water scarcity also affect 30 of the 32 cities that have over 1 million residents—all of which will face severe long-term water shortages. Other countries are eager to learn lessons from the PRC on modeling industrialization and urbanization as key drivers for economic and social development.

A key instrument the PRC has used for organizing and managing urban growth is the planning and construction of new districts that expand both existing urban areas and suburban new towns connected by road and transit infrastructure within commuting distance to the urban core. Shanghai stands as a model for its organized urban and regional planning through new districts and new towns, sometimes connected to and catalyzed by special economic zones.

In recent years, the PRC has shifted the focus of its urbanization and development policies from GDP-centered development towards achieving better quality urban and social development through the introduction of the *National New-Type Urbanization Plan 2014-2020*. This transformation includes a commitment to make cities, new districts, and new towns livable, green, inclusive, and competitive by emphasizing environmental and social dimensions in city planning. In this volume, three introductory articles provide an overview of new town development in the PRC and Europe, followed by three good practice case studies of new towns and new districts in the PRC. These cases were originally presented during the ADB–Tongji Urban Knowledge Hub Seminar in November 2013, and this volume builds on them.

For over 25 years, ADB has been supporting urban development in the PRC with more than $6.8 billion in loans and more than $61 million in technical assistance grants. We are proud to have been actively working with cities on multidisciplinary approaches to promote their development as livable, socially inclusive, economically competitive, and environmentally sustainable climate resilient places. ADB will continue to support the PRC's urbanization with projects that demonstrate innovative solutions to environmental and socioeconomic challenges.

This report shares knowledge from lessons learned from urbanization in the PRC. It is a contribution to the South–South cooperation and knowledge exchange promoted by ADB to benefit other countries in Asia and the Pacific.

Ayumi Konishi

Special Senior Advisor to the President, Asian Development Bank

序二（同济大学）

改革开放以来，中国城镇化进程的速度之快和规模之大都是史无前例的，每年都有 1 000 万以上的新增城市人口。中国城镇化进程既取得了显著的成就，也面临着严峻挑战，正在经历新常态下的转型发展。中国的城镇化实践引起国际社会，特别是发展中国家和国际机构的广泛关注。为此，亚洲开发银行和同济大学联合成立“区域性城市可持续发展知识中心”（以下简称城市知识中心），旨在研究中国城镇化发展过程中的典型案例，总结和推广中国城市发展和建设中的成功经验。

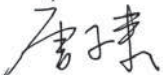
作为城市知识中心的基础，同济大学建筑与城市规划学院在城市和区域研究领域有着深厚的学术基础，是有着丰富实践经验的知识中心，在国际上享有较高的声誉和广泛的学术联系。2008 年联合国教科文组织在同济大学建筑与城市规划学院设立“亚太地区世界文化遗产保护中心”。2009 年同济大学承办了以城市规划为主题的中非论坛，向非洲发展中国家介绍中国的城市发展经验。同时，同济大学建筑与城市规划学院每年都为全国许多城市的领导干部和技术骨干举办城市规划培训班，并承担了全国各地的各类城市规划实践项目。

2010 年亚洲开发银行东亚局高管访问同济大学建筑与城市规划学院，希望基于同济大学已有的研究力量和知识储备以及与国内外城市建立的交流网络，与同济大学合作组建一个面向亚太地区的城市发展知识中心，这也是亚洲开发银行的第一个区域性城市知识中心。这个建议得到同济大学的积极响应。同年 3 月，亚洲开发银行 – 同济大学“区域性城市可持续发展知识中心”成立，致力于促进城市发展领域里的知识交流，共同推动本地区城市的可持续发展。

亚洲开发银行 – 同济大学“城市知识中心”在亚太地区传播和分享可持续发展的城市最佳实践，包括三种知识产品，即国际研讨会、最佳案例报告和城市知识中心网站。在过去几年中，“城市知识中心”每年都根据当年城市发展的主要议题，邀请相关领域的学术研究者、规划参与者和实施管理者，举办城市最佳实践的国际研讨会，并遴选最佳城市发展案例和颁发表彰证书。2010 年、2011 年和 2012 年城市知识中心成功举办了主题分别为“分享亚洲和太平洋地区可持续发展最佳城市实践经验”“社会和谐视角下的水乡古镇保护与发展”“城市转型：规划与融资”的国际研讨会，与会代表包括亚洲开发银行官员、国内外城市发展专家、亚行在华项目的相关城市官员。

2013 年，城市知识中心确定将中国城镇化发展过程中具有特色的新城和新区作为中国城镇化的重要议题进行剖析和探讨。城市政府在城区边缘或郊区建设新城或新区，作为空间拓展、产业发展和人口集聚的重要策略。城市知识中心与亚洲开发银行城市发展专家合作，根据特定标准，在中国新城新区建设实践中选取三个项目作为本年度的最佳城市发展案例。在此基础上，城市知识中心邀请相关领域专家、案例规划师、实施管理者等，对最佳实践案例的规划、实施和金融财务运作等方面进行分析和评价，总结新城和新区规划建设的经验和教训，完成相关案例报告。同年 11 月，城市知识中心举办了主题为“中国新城和新区：挑战与机遇”的第四届国际研讨会，分享中国新城和新区规划及实施的经验和教训，并实地考察了上海和无锡的最佳实践案例。同时，与亚洲开发银行“区域知识共享中心”合作，首次举办“中国新城和新区：挑战与机遇的影像思考”摄影展。本次推出的《中国新城新区规划与发展》是亚洲开发银行 – 同济大学城市知识中心的案例研究系列之一。本书基于新城和新区的发展案例报告，并汇集国际研讨会的发言讨论，探讨中国新城和新区在规划和实施方面的原则、机制和特点，力求传播可供借鉴和推广的规划与实施策略。

2010 年成立的亚洲开发银行 – 同济大学城市知识中心呈现出良好发展态势，成为亚洲开发银行其他区域知识中心的样板。这一城市知识中心的建立，形成了一个能够及时发现和总结国内城镇化进程中的成功经验，并且及时传播的区域知识合作平台。城市知识中心将一如既往地总结和传播国内外城市化的成功经验，促进亚太地区更好地实现以人为本、资源节约和环境友好的可持续城市发展。



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亚洲开发银行 – 同济大学“区域性城市可持续发展知识中心”主任

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Foreword by Tongji University

The unprecedented speed and scale of urbanization in the People's Republic of China (PRC) resulted from the country's reform and opening up policies that started around 1980. Each year since then, urban population has increased by more than 10 million people. While urbanization in the PRC resulted in remarkable achievements, it also led to severe challenges.

Since 2014, the PRC's urbanization policies have undergone major reforms under the new normal, characterized by slower economic growth. The country's urbanization practices caused widespread concern among the international community over the sustainability of its future urbanization. To study best practice solutions and share knowledge on urban sustainability, the Asian Development Bank (ADB) and Tongji University jointly established the Regional Knowledge Hub for Sustainable Urban Development in the PRC, or the Urban Knowledge Hub, in 2010.

The College of Architecture and Urban Planning (CAUP) of Tongji University is a knowledge hub with solid academic foundation and extensive practical experience in urban and regional planning and research. The CAUP enjoys a high reputation and entertains an extensive worldwide academic network. In 2008, UNESCO established the Asia-Pacific World Heritage Conservation Center in CAUP. In 2009, Tongji University hosted the China-Africa Forum on urban planning, introducing the PRC's urban development experience to developing countries in Africa. The CAUP serves as a training center on urban planning for leaders and technical administrators from cities all over the PRC. The CAUP also undertakes a variety of urban planning projects with a wide portfolio across the PRC.

The Urban Knowledge Hub disseminates knowledge through international seminars, case study reports, and an urban knowledge website. Since 2010, the knowledge hub has invited researchers, planning practitioners, and urban administrators to its annual workshops. Topics included historic preservation and development of Yangtze Delta water towns, planning and financing of urban transformation, efficient urban infrastructure, and utility service provision.

The 2013 topic was "New Towns and New Districts in China – Challenges and Opportunities". Many cities in the PRC plan and build new districts expanding urban areas or new towns in suburban areas as important instruments and strategies for organizing urban expansion, industrial development, and population growth. Urban Knowledge Hub experts from Tongji and ADB developed criteria for selecting the three case studies for the seminar and this book from all over the PRC. By invitation, academic experts, urban planners, and implementation managers analyzed and evaluated the best practice cases.

The case study reports in this book give an overview of features and lessons learned from the planning, construction, and operation of the projects. In September 2013, the fourth international seminar was held in cooperation with ADB's Regional Knowledge Sharing Initiative that funded a photo exhibit of new towns and new districts. More than 130 experts from the PRC, Europe, and India took part. This volume results from the 2013 Urban Knowledge Hub activities and workshop.

The Urban Knowledge Hub is a regional knowledge cooperation platform that will continue to identify key challenges as well as summarize and disseminate successful experiences promoting people-oriented, resources-saving, and environment-friendly sustainable urban development.

Zilai Tang

Director, Asian Development Bank-Tongji University Regional Knowledge Hub for Sustainable Urban Development in the PRC
Director, National Steering Committee of Urban and Rural Planning Education in the People's Republic of China
Professor, College of Architecture and Urban Planning, Tongji University, Shanghai

致　谢

本书由亚洲开发银行（Asian Development Bank，ADB）和同济大学建筑与城市规划学院（College of Architecture and Urban Planning，CAUP）联合出版，为亚洲开发银行和同济大学联合成立的“区域性城市可持续发展知识中心（中国）”合作成果之一。该城市知识中心成立于 2010 年。自成立之初，城市知识中心即每年举办研讨会，聚焦中国以及亚洲范围内城市可持续发展面临的挑战。

2013 年 11 月，城市知识中心第四届南南知识共享研讨会——“中国新城和新区：挑战与机遇”于上海同济大学成功举办，本书内容正是基于此次年度研讨会的成果。130 多名相关人士出席讲座，随后实地考察了上海嘉定新城和无锡太湖新城。由中华人民共和国财政部出资建立的区域知识共享中心（Regional Knowledge Sharing Initiative，RKSI）促成了研讨会及与案例研究相关的新城摄影展。

为本书作出贡献的作者们到会作报告，并撰写了中国新城和新区的最佳案例报告。城市知识中心团队成员包括同济大学的唐子来教授、王伟强教授、王兰教授和来自亚洲开发银行的饶士凡（Stefan Rau）、玛丽亚·皮娅·安科拉（Maria Pia Ancora）。该团队从研究案例和作者的选择，到研讨会安排及报告整体结构和内容的敲定都作出了贡献。王兰教授和饶士凡在钟亚辉、彭苹苹和玛丽亚·皮娅·安科拉的协助下，完成了书内报告的主编工作。

亚洲开发银行的管理、技术和行政人员为本书的出版提供了指导，其中潘哲尔（Sangay Penjor）为本书内报告的编制提供了宝贵的指导和支持。同济大学建筑与城市规划学院院长李振宇教授、党委书记彭震伟教授也对本书的出版给予了大力支持。温迪·沃克（Wendy Walker）和莎拉·阿芙扎（Sara Afzar）作为审稿人，提供了有价值的评论。克里斯蒂娜·卡迪齐（Kristina Katich）、丸山比奈子（Hinako Maruyama）为完善报告质量提出了宝贵意见。玛丽斯尔·大卫（Maricelle David）、露斯·贝妮葛诺（Ruth Benigno）和克里斯蒂恩·马威拉（Christine Marvilla）从材料汇编、评论、版式到最终出版提供了支持。出版工作和校对则由安娜·舍尔伍德（Anna Sherwood）、阚磊和马克·罗伯特·邓（Mark Robert Dy）提供支持。

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Acknowledgments

This is a joint publication of the Asian Development Bank (ADB) and the College of Architecture and Urban Planning (CAUP) of Tongji University as part of their cooperation on the Regional Knowledge Hub for Sustainable Urban Development in the People's Republic of China. Tongji University and ADB established this Urban Knowledge Hub in 2010 and has held annual workshops focused on key sustainable urban development challenges in the PRC and Asia at large.

This book builds on the results and findings of the Urban Knowledge Hub's fourth annual South-South Knowledge Sharing Seminar held in November 2013 in Tongji University on the topic "New Towns and New Districts in the PRC—Challenges and Opportunities". More than 130 participants enjoyed the presentations and ensuing field trips to Shanghai Jiading and Wuxi Taihu New Town. The Regional Knowledge Sharing Initiative (RKSI) funded by the Ministry of Finance of the People's Republic of China (PRC) contributed to the workshop and funded a photo exhibit on new towns in the PRC.

Authors who attended the seminar and delivered introductory speeches prepared best case studies on new towns and new districts in the PRC. The Urban Knowledge Hub team, namely Zilai Tang, Weiqiang Wang, Lan Wang from Tongji University, and Stefan Rau and Maria Pia Ancora from ADB contributed with the selection of case studies and authors and inputs on the overall structure and content of the workshop and this book. Stefan Rau and Lan Wang edited the report with support from Yahui Zhong, Esther Peng and Maria Pia Ancora.

Leadership was provided by the ADB management and technical and administrative staff, namely Sangay Penjor, who provided valuable guidance and support throughout the preparation of the book. Prof. Zhenyu Li, Dean of CAUP and Prof. Zhengwei Peng, Secretary of Party Committee of CAUP also provided full support. Wendy Walker and Sara Afzar provided valuable comments as peer reviewers, Kristina Katich, Satoshi Ishii, Hinako Maruyama, provided valuable comments that improved the quality of the report. Maricelle David, Ruth Benigno and Christine Marvilla provided support from compilation of materials, comments, formatting to final publication. Anna Sherwood, Lei Kan, and Mark Robert Dy provided publication support and proofreading.

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综　述

国际社会对中国是如何在过去 40 年里取得工业化和城镇化成功的故事越来越感兴趣，而这本书恰恰是对此的回应。新城新区对中国城市发展和扩张的作用举足轻重，这也是国际社会特别感兴趣之处。同时，中国如何规划城镇化进程的下一阶段，以容纳 2030 年预计涌现出的 3 亿城镇居民，也成为全球的关注点。

中国的工业化和城镇化战略成为发展的关键驱动力。自邓小平 1978 年提出了改革开放政策起，新兴城市和集聚经济对中国的经济增长奇迹作出了巨大贡献。从 1978 年到 2016 年，中国的城镇化率由 17.9%提高到 56.1%，导致 2016 年城镇人口约 7.9 亿。从 1978 年到 2013 年，城市数量从 193 个上升到 658 个，建制镇数量从 2 173 个增至 20 113 个。人口将持续由农村向城市转移，中国城镇人口预计在 2020 年达到 8.16 亿，2030 年达到 10 亿。

城市发展使亿万人摆脱了贫困，也为不断壮大的中产阶级带来了福祉，改善了条件。然而，社会差距、就业和服务不均等、区域发展显著不平衡和城乡差距，都加剧了中国社会经济发展面临的严重挑战。2013 年，城乡收入差距为 2.75 倍，且持续扩大。农民及农民工在教育、培训、就业、医疗和社会保障等方面的机会也不均等。环境恶化，天然土地和耕地流失，城市发展和扩张引发的空气、水和土壤污染，工业污染，以及不可持续性的交通给城市生活环境和居民身体健康带来巨大的挑战，这在大城市尤为显著。

深圳，从 1978 年一个人口仅为 3 万的渔镇发展成一个城镇居民达到 1 000 万的大都市，成为中国许多城市发展效仿的楷模之一。城市的近期城市发展史，像上海，主要是关于新城新区的发展。这也是通过优惠政策促进特殊地区的发展，如经济特区、经济技术开发区和出口加工区。新城有时位于这些区域内或毗邻这些区域，直接促进了这些城镇的发展。

自 20 世纪 80 年代初，工业化战略推进和吸引了国外投资，大量劳动力从农村涌入大城市的新工业区。合理有序的城市规划加上引资发展的优惠政策，仍是中国城镇化进程的主要特征。中国城市发展由以下三种发展模式主导：一是历史城区和现有城区的再开发，这包括拓宽道路，对之前的低层区进行高密度商业和住宅开发，升级基础设施，开展历史保护和填充重建；二是新区的规划和开发，直接扩大现有市区，组织工业、住宅和商业发展彼此分离；三是通过在城市的边缘区和远离城市的郊区开发新城，连接经济活动，并由交通干道、高速公路并且大多数时候由公共交通连接新城与市区。

本书包括两个部分。第一部分为新城新区介绍，包括描述中国新城新区主要特点的介绍性文章，比较欧洲的方法及项目实例，总结中国的三个案例研究。第二部分包括三个中国新城新区案例研究报告。

王兰在其《中国新城和新区的规划理念与开发模式》一文中总结道，三个主要城市规划理论影响着中国新城的成形。第一个影响是埃比尼泽 · 霍华德的田园城市理念，该理念认为新城镇应处于郊区位置，通过火车与大都市连接。住宅社区由空地和农田包围，享有绿色公共用地。工业区在通勤距离内，但与住宅区分开，以确保工业污染不影响邻里。第二个影响是柯布西耶光明城市的愿景，倡导汽车为导向的道路网格和复杂高层建筑。第三个影响是美国新城市主义中的公交导向开发。

中国新城新区有其自身特色：由宽阔的道路组成强大的道路交通网，其中道路与建筑物保持一定的缓冲带；道路交叉口之间保持相对较宽距离，一般在 300~500 m 之间；工业、住宅、商业、办公区域是分开的。从本书中展示的案例来看，一些特征已得到改善。例如，新城的街区面积和道路维度在规模上更加人性化，从而鼓励人们步行和骑行，尤其在北川案例中。

饶士凡概括了过去 25 年欧洲可持续发展背景下城市的发展概况。在他的文章《欧洲生态城市：结构紧凑、混合用途、绿色环保的宜居新区》中，他提出了重点规划原则，并在三个最佳实践案例中加以说明。他指出，国际公认的城市可持续发展原则包括：宜居性和包容性城市；紧凑型、高密度、混合使用、以交通为导向的城市；步行友好和人性化尺度城市；得益于生态系统服务的绿色环保、能适应气候变化的城市；资源、水和能源高效的城市；富有竞争力和经济多元化的城市。

他概述了可持续发展如何成为高度工业化和后工业化国家的新城市发展的主要范式，尤其是 1992 年联合国环境与发展大会以来。这些国家将跨学科和参与式规划方法应用到地方的 Agenda 21 项目中，例如确认和商定关键发展目标和主要环境质量指标。一系列的“生态城市”已建成，如欧洲、日本、韩国、新加坡和美国等地的许多城市采取了综合城市发展计划，采用更加生态高效的规划原则。这些规划原则包括宜居、绿色和包容性的城市概念，该类城市由一系列紧凑型城区

Executive Summary

This book responds to growing international interest to understand how the People's Republic of China (PRC) has been creating its industrialization and urbanization success story over the past 40 years. New towns and new districts have been instrumental in urban development and expansion in the PRC, making them particularly interesting. There is also an increasing global interest on how the PRC is planning for the next stage of urbanization to accommodate another 300 million urban residents projected by 2030.

The PRC's industrialization and urbanization strategy has been a key driver of development. Since Xiaoping Deng promoted the reform and opening up policy 40 years ago, emerging urban and agglomeration economies contributed extensively to the PRC's growth miracle. From 1978 to 2016, the PRC's urbanization ratio increased from 17.9% to 56.1%, which led to an urban population of about 790 million by 2016. Between 1978 and 2013, the number of cities rose from 193 to 658 and the number of townships rose from 2,173 to 20,113. As rural-urban migration continues, urban population is projected to reach 816 million by 2020 and 1 billion by 2030.

Urban development lifted hundreds of millions of people out of poverty. It also generated well-being and improved conditions for a growing middle class. However, social disparity, unequal access to jobs and services, significant regional imbalances, and urban-rural disparities are now creating severe socioeconomic challenges. The growing urban–rural income gap is at a factor of 2.75 (2013). There is also unequal access to education, training, jobs, health, and social security for rural people and for rural-urban migrants. Environmental degradation, loss of natural land and farmland, pollution of air, water, and soil caused by urban development and sprawl, industrial pollution, and unsustainable transport present very serious challenges toward ensuring livability and human health, especially in the large cities.

Shenzhen, now a metropolitan city of more than 10 million urban residents that grew from a fishing town of 30,000 in 1978, became one of the models for many urban developments that followed in the PRC. The recent urban development history of cities, like Shanghai, is mainly about the development of new districts and new towns. It is also about the development of special districts facilitating growth through favorable policies such as special economic development zones, economic and technological development zones, and export-processing zones. New towns are sometimes within or next to such zones, directly catalyzing the development of these towns.

Since the early 1980s, the strategy of industrialization has facilitated and has attracted large amounts of foreign investments, followed by a large influx of labor from rural areas to the new industrial zones of the big cities. Formalized urban planning and favorable policies attracting investments and development remain to be key features of the PRC's urbanization. Three main modes of physical development dominated the pattern of urban growth. First is the redevelopment of historic and existing urban areas. This includes road widening, high-density commercial and residential developments on former low-rise areas, historic preservation with infrastructure upgrading, and infill redevelopment. Second is the planning and development of new districts, directly expanding existing urban areas to organize industrial, residential, and commercial growth separate from one another. Third is the development of new towns in peri-urban and suburban locations away from the city that are linked to economic activities and connected by trunk roads, highways, and, most times, public mass transit.

This book comprises two sections. The first section, *Introduction to New Towns and New Districts*, includes introductory papers that describe key characteristics of new towns and new districts in the PRC, compare approaches and project examples in Europe, and summarize three case studies in the PRC. The second section, *Case Studies of New Towns and New Districts in the People's Republic of China*, presents three case studies.

Lan Wang summarizes in her paper, *Planning Concept and Development Model of New Towns and New Districts in the People's Republic of China*, that three key urban planning theories influence the shape of new urban areas in the PRC. The first influence is Ebenezer Howard's Garden City idea in which new towns are in a suburban location linked by train with the metropolis. The residential communities, surrounded by open space and farmland, have green commons. Industrial areas are within commuting distance but separate to ensure that industrial pollution does not affect the neighborhoods. The second influence is Le Corbusier's vision of a Radiant City with a car-oriented grid of thoroughfares and high-rise building complexes. The third influence is the New Urbanism movement in the United States with ideas of transit-oriented developments.

Robust road networks comprising wide roads with requirements for substantial setbacks for buildings and comparably large distances between road intersections, typically between 300 and 500 meters, characterize the developments of new

构成，这些城区中有高密度、混合用途建筑，以及由绿色空间构成、与便捷交通相连接并能提供绿色出行服务的适合步行的城市环境。

他提出了欧洲生态城市发展的四个最佳实践案例，一个来自瑞典（斯德哥尔摩市的哈马碧生态区），三个来自德国（弗莱堡市的丽瑟菲尔德区与沃邦区，图宾根市的法语区）。这些生态城市发展的杰出案例都应用了上述原则，并屡获殊荣。他同时提出，中国是否会为新型城镇化的下一阶段需要容纳 3 亿城镇居民这样的未来，反思目前主导的以需求为导向的倡导宽阔道路、超级街区、用途分离的城市模型。

吴缚龙教授的《中国新城新区的发展》一文，总结了本书所选的三个研究案例，因为它们代表了中国最近发展中优质和最佳的实践。

近年来，中国新城和新区建设一直在走更加有利于可持续发展的道路，许多已被中华人民共和国住房和城乡建设部归入“低碳生态城市”发展项目。本书中提到的三个最佳实践案例描写了一些先进发展原则的特征。

中国新城新区三个研究案例

北川新县城

郑德高、李新阳、贺旺的《北川新县城：欠发达地区县城的可持续发展路径探索》一文中的北川新城，是一个成功的例子。它宜居，绿色环保，步行方便，城市布局集中紧凑，用途混合。它的绿色开放空间网络充满吸引力，兼具联络性和可达性，集中在一条显著的绿色河道和市中心绿道。它的街区和道路尺度宜人，建筑和景观充满当地少数民族——羌族——的传统特色。它的建筑环境友好，低碳生态节能，具备城市基础设施技术。它的目的是健康的职住平衡。北川地处喜马拉雅山脉东部，2008 年“5 · 12”大地震后作为重置区来建设，遵循了最新的规划理念。受灾人员参与了搬迁的决策。国家基金、国际发展合作伙伴以及跨省结对合作伙伴支持了救援工作。规划过程包括社区、利益相关方和投资者的参与，规划执行的速度创下了纪录。

北川新城的设计是非常成功的，作者描述了为进一步吸引产业和旅游业投资目前所进行的活动，以解决近期挑战，实现持续经济和城市发展。主要挑战之一是缺少就业机会和居住人口。作者总结道，鉴于北川地理位置偏僻，山区人口稀疏，经济发展的预期目标可能过于宏大。

无锡太湖新城

司马晓、冯晓星和吴晓莉描述的无锡太湖新城，是一个国家级低碳生态城示范项目，以综合先进的城市发展规划为特征，应用了最先进的可持续规划方法和一组关键绩效生态效率指标。无锡是一个高科技制造业大都市，距上海不到一个小时车程，位于中国东部的长三角集聚区。太湖新城处于长江以南，通过这个项目，该区域沿着太湖东北岸线扩张，以明显的分区概念创建了三个分区，中间区域为中央商务区，两边分别为二级商业、文化中心和邻里中心。

无锡太湖新城的主要特点包括一个公共绿地的连接系统，沿湖和河道的滨水公园，一个包含道路、公共交通、自行车和人行通道网络的强大的交通系统，是城市可持续发展的一个强有力的框架。土地利用和开发密度设计提高了能源和资源效率，有助于步行和骑行。新城的设计高效节能，建筑和分布式可再生能源供应都采用了高标准，并使用了固体废物综合管理系统。虽然规划原则健全，但由于分阶段规划过于庞大，大面积的分阶段实施面临着大面积区域内建设周期较长，以及在新城大范围的许多区域同时开始实施规划的挑战。

上海嘉定新城

由詹运洲、何晓涛和邹玉撰写的上海嘉定新城报告，重点关注区域发展，包括社会和经济发展，就业和产业发展，土地利用，综合交通规划，以及嘉定新城的公共服务基础设施。嘉定新城位于上海西北部，其历史悠久的城市中心得到振兴，

towns and new districts in the PRC. Industrial, residential, commercial, and institutional areas are separated. In the case studies presented in this book, however, some of these features have been improved. For example, human scale block sizes and road dimensions encourage walking and cycling, especially in Beichuan.

Stefan Rau offers an overview of sustainable development as context for urban development in Europe in the past 25 years. In his paper *Eco-Cities in Europe: Compact, Mixed-Use, Green, Livable New Districts*, he identifies key planning principles and illustrates these along with three best practice cases. He observes that there are internationally accepted principles of sustainable urban development, and they include concepts of the livable and inclusive city; compact, high-density, mixed-use and transit-oriented city; pedestrian-friendly and human-scaled city; green, climate resilient city that benefits from ecosystems services; resources, water and energy efficient city; and the competitive, economically diverse city.

He outlines how sustainable development emerged as the primary paradigm for new urban developments in highly industrialized and post-industrialized countries, especially since the 1992 United Nations Conference on Environment and Development. These countries applied interdisciplinary and participatory planning methods in local Agenda 21 programs, such as the identification and agreement on key development goals and key environmental quality indicators. A series of eco-cities were built, and many cities in Europe, Japan, the Republic of Korea, Singapore, and the United States adopted integrated city development plans that targeted more eco-efficient planning principles. Planning principles include the concept of livable, green, and inclusive cities comprising a series of compact urban areas with high-density mixed-use built developments and walkable urban environments structured by green space, connected by public transport, and served by green mobility.

He presents four best practice cases for European eco-city development—one from Sweden (Stockholm Hammarby Sjöstad) and three from Germany (Freiburg Rieselfeld, Freiburg Vauban, and Tuebingen French Quarter). These are distinguished and award winning examples of eco-city developments applying the above principles. He asks if the PRC may reconsider its currently predominant supply-driven urban model with wide roads, superblocks, and separation of uses for its next phase of new-type urbanization to accommodate the next 300 million urban residents.

Fulong Wu's paper, *Introduction to the Three Chinese New Town Case Studies*, summarizes the three selected case studies in this book, as they represent good and best practices among recent developments in the PRC.

Recently, new towns and new districts in the PRC have been following a more sustainable development path. Many were included in the "Low-Carbon Eco-City" development program by the PRC's Ministry of Housing, Urban and Rural Development. The three best practice cases presented in this book feature some advanced development principles.

Three Case Studies of New Towns and New Districts in the People's Republic of China

Beichuan New Town, as presented by Degao Zheng, Xinyang Li, and Wang He in *Beichuan: A New Town Rising from Post-Disaster Rubble*, is a successful example of a livable, green, pedestrian-friendly, concentrated, and compact city layout with mixed uses. It has an attractive, connected, publicly accessible network of green open spaces focusing on a significant river greenway and a city center greenway. It has human-scaled blocks and streets, buildings and landscapes using traditional features of the local ethnic minority, the Qiang people. It has environment-friendly low-carbon eco-efficient buildings and urban infrastructure technology. It aims at a healthy job-housing balance. Beichuan is located in the east of the Himalayan Mountains, and was constructed as a relocation town after the devastating earthquake of 12 May 2008 following a state of the art planning concept. The affected people took part in the decision to relocate. National funds, international development partners, and inter-provincial twinning partnerships supported the relief effort. The planning process included the participation of the community, stakeholders, and investors, and the plans were implemented in record speed.

While the Beichuan New Town design is very successful, the authors describe current activities to attract further investments in industries and tourism to address the recent challenge of achieving further economic and urban growth. A key challenge is the lack of jobs and residential population. The authors conclude that economic development expectations may have been overly ambitious given the remote location and sparse population base of this mountainous region.

Wuxi Taihu New Town, presented by Xiao Sima, Xiaoxing Feng and Xiaoli Wu, is a national low-carbon eco-city demonstration project featuring sophisticated and integrated urban development planning, which applies state of the art sustainable planning methods and a set of key performance eco-efficiency indicators. Wuxi Taihu is a major metropolis with high-tech manufacturing. It is less than one hour away from Shanghai and within the Yangtze River Delta Agglomeration Region in Eastern PRC. The city is in the south of the Yangtze River. Through this project, the city expands toward and

地标也被保留，而新城区被规划成一个传统的中国新城，拥有宽阔的马路和大块的街区，最新的新城规划加入了可持续发展的元素：生态景观设计和老旧建筑的再利用。主要特点是园林公园、节能建筑和高设计水准的重点公共建筑。嘉定以汽车产业和研发集聚而出名，虽然这一新城目标人群有 80 万，职住比例高，但公共服务和基础设施水平显著落后于中心城区。

上海是长江三角洲全球巨型产业集聚的中心，中国重要的经济引擎、金融中心、研发中心和交通枢纽。新城新区的规划和建设已成为上海城市发展的重要战略。上海郊区的新城已成为上海城市创新和转型的工具，经历了从“卫星城”到“新城”的转型，容纳了核心功能，推广了分散式多中心的空间结构。

主编结语

在过去的 40 年里，新城新区已成为中国管理大规模城市和工业发展的有效模式。然而，许多这些过去的新城新区面临着规模的挑战，即许多城市道路和缓冲带非常宽，对步行和骑行缺乏吸引力。许多新城新区的建造尺度大，甚至导致住宅单元和工业用地供过于求。综合考虑中国各地当前规划的住房、商业和工业发展项目，供过于求的挑战在 2030 年有可能会加剧。考虑到接下来 32 年城镇化的重要性，我们在应对挑战时应当承认过去的错误，吸取从国际和国内最佳实践学到的经验教训。

随着中国践行更加可持续和尺度宜人的模式（如北川），新型城镇化规划（2014—2020）中可预见的是一条更可持续的道路。我们可以乐观地认为，未来 35 年内的城市发展和改造将坚持更可持续的发展模式。新型的新城新区可能会减少以汽车为导向，街区更小更方便行人，街道规模更加人性化，对步行和骑行具有吸引力，营造出的城市场所让人感到舒适和安全。

新城新区仍将是中国城市发展下一阶段的主要工具。由于可再生能源、智能电网、生态移动、节能建筑使用的增长和有效提供生态系统服务的绿色基础设施系统的采用，新城新区可能使更高的空气质量成为其特征。如何对过去 35 年的新城新区加以调整，使其更加可持续和宜居、规模更人性化、适合越来越多的老年人居住，也将成为城市规划者和管理者的重要任务。

2015 年 12 月，中国在《巴黎协定》中承诺显著减少温室气体排放。这将促进低影响、低碳生态城市的发展，能够有效和可持续地利用土地、水和自然资源，最终带来更加平衡和具有社会包容性的城市和城乡发展。

along the northeastern shoreline of Taihu Lake. A clear zoning concept creates three sub-districts, the middle one with the central business district, and the others with secondary business and cultural centers and neighborhood centers.

Key features of this new town include a connected system of public green spaces and waterfront parks along the lake and rivers and a robust transport system with road, public transport, bicycle, and pedestrian path networks that provides a strong framework for urban sustainability. Land use and development density designs promote energy and resource efficiency, walking, and cycling. The new town design is energy efficient with high standards for buildings and distributed renewable energy supply. It is served by an integrated solid waste management system. While the planning principles are sound, the phased implementation of the large area has been challenging with long periods of construction in large areas due to an ambitious phasing plan, simultaneously starting in many areas of the large territory for the new town.

The report on Shanghai Jiading New Town, presented by Yunzhou Zhan, Xiaotao He and Yu Zou, focuses on aspects of regional development including social and economic development, employment and industrial development, land use, integrated transportation planning, and public service infrastructure of the Jiading New Town, which is located in the northwest of Shanghai. The historic town center of Jiading was revitalized and landmarks were preserved while the new urban area is planned as a conventional Chinese new town with wide roads and large blocks, and more sustainable development elements like ecological landscape design and reuse of old buildings have been added in the recent efforts. Key features are landscape parks, energy efficient buildings, and key public buildings with high-level architectural designs. Jiading is known for its automotive industry and research and development cluster. While this new town has a target population of 800,000, the jobs-housing ratio is high while the level of public service and infrastructure significantly lags behind that of the central city.

Shanghai is the focus of the Yangtze River Delta Global Mega-Agglomeration, a key economic powerhouse, finance center, research and development center, and transportation hub in the PRC. The planning and construction of new towns and new districts has been a key strategy to organize urban growth of Shanghai. The new towns in suburban Shanghai serve as vehicles for urban innovations and the transformation of Shanghai. They transformed from satellite cities to new towns that accommodate core functions and promote a decentralized polycentric spatial structure.

Conclusion by the Editors

New towns and new districts have been an effective model to manage the PRC's massive urban and industrial development in the last 40 years. However, many of these past new towns and new districts face challenges of scale, i.e. many of the urban roads and setbacks are very wide and unattractive for walking and cycling, and development blocks are very large. Many were built on large scales and development blocks are very large, even creating an oversupply of residential units and industrial land. This challenge of oversupply is likely to further accelerate by 2030, when considering cumulatively all currently planned housing, commercial and industrial development projects of all cities in the PRC. The challenge will be to acknowledge past mistakes and apply lessons learned from both international and domestic best practices in light of the magnitude of urbanization expected over the next 32 years.

As more sustainable and human-scaled models are implemented in the PRC, i.e. in Beichuan, and a more sustainable path is foreseen in the New-Type Urbanization Plan, 2014–2020, we can be optimistic that a more sustainable pattern of urban development and redevelopment will be applied in the next 35 years. New-type new towns and new districts are likely to be less car-oriented with smaller, more pedestrian-friendly blocks, and more human-scaled streets, attractive for walking and cycling, generating urban places where people feel comfortable and safe.

New towns and new districts will remain to be key instruments for the next phase of urban development in the PRC. They will likely feature better air quality due to increased use of renewable energies, smart grids, eco-mobility, energy-efficient buildings, and green infrastructure systems that provide ecosystems services effectively. Adjusting the new towns and new districts from the past 35 years to be more sustainable and livable, more human-scaled, and accessible also for an increasing number of elderly people will also become an important task for urban planners and managers.

In December 2015, the PRC committed itself, through the Paris Agreement, to significantly reducing greenhouse gas emissions. This will promote low impact, low-carbon eco-city developments that efficiently and sustainably use land, water, and natural resources, ultimately leading to a more balanced and socially inclusive urban and urban-rural development for the PRC's urban billion.

新城新区介绍

中国新城和新区的规划理念与开发模式

王　兰

新城和新区的发展对于中国城镇化进程发挥着重要作用。过去 30 年间，中国城镇化率以每年 1% 的比例增加，而新城和新区是城市空间拓展、提高城镇化率的主要形式。据国家发展和改革委员会城市和小城镇改革发展中心课题组于 2013 年的调查，在 12 个省和自治区的 156 个地级市，90% 以上的地级市在规划建设新城新区；12 个省会城市共规划建设了 55 个新城或新区 [1]。大规模造城的驱动力主要包括三个方面：①以土地批租作为地方政府主要财政收入；②为产业发展提供空间，包括工业和房地产业；③对人口密度高和设施老化的老城提供人口疏解的空间，并试图通过新城新区产生的财政收入反哺旧城改造。因此，新城新区建设是中国快速和大规模城镇化进程的重要组成部分，也是该进程的核心推动力。

1979 年改革开放前，中国新城主要以工业卫星城为主要形式，以大型重工业为产业核心，以生产原料作为选址的重要依据。1979 年后随着计划经济向市场经济的转轨，各种机制和政策设计推动了新城新区的发展。1987 年之后国有土地所有权有偿使用制度的建立，开启了土地市场，随即土地批租成为地方政府城市建设的重要资金来源。1994 年的住房改革，单位分配住房转变为住房市场化，促进了房地产业的蓬勃发展。在这样的背景下，不同类型的新城和新区在 2000 年前后不断涌现。不同于之前主要为产业服务的卫星城，这些新城和新区成为新型的房地产开发载体、现代产业拓展空间和土地批租的主要来源。

新一批新城新区类型包括：以居住为主、房地产开发为核心，以大学校区为主体，以商务科技为产业基础，以政府部门迁址作为启动区，以区域性交通设施作为核心发展点（例如高铁新城）。在一些城市的超大新城或新区，这些作为带动发展的要素可能会整合，例如云南省昆明市呈贡新区包含了搬迁而来的政府和大学校区，上海市松江新城以大学校区和多元居住房地产开发为带动。

始于英国的新城运动提供了此类大型项目的规划和开发模板。新城概念始于英国学者霍华德提出的“田园城市（Garden City）”，他在《明日：一条通往真正改革的和平道路》一书中提出了在大都市郊区规划建设兼顾城市和乡村优点的新城计划，这种被称为田园城市的新城具有特定人口规模、用地构成和发展形式。霍华德通过设立新城开发公司，在伦敦周边开展了新城建设实验，开启了影响世界多个国家的新城运动。中国新城和新区的规划和开发，均在一定程度上借鉴了英国新城模式。

在规划理念方面，新城和新区的规划纳入了各种规划思路和原则。霍华德的田园城市结合城乡优点、功能分区和设置大型公共绿地串联不同功能空间等设想均被不同程度采纳。但中国人口规模大和密度高的压力，开发商寻求高投资回报，以及对汽车文化的推崇，同时由于柯布西耶光明城市对中国规划的影响，使新城新区的规划与霍华德的田园城市相距甚远。具体表现为：大尺度的道路结构和高密度的高层居住楼宇。美国新城市主义中的公交导向开发（Transit Oriented Development，TOD）也在中国新城和新区建设中受到重视。规划通常包含郊区地铁，建立主城区和新城之间的联系；地铁站点周围通常规划为综合开发。除了这些共性之外，不同类型的新城也具有一定的规划特点，根据不同的触媒，进行功能布局和空间设计。例如，高铁新城规划基于这一区域性交通设施带来人流和资本的假设，规划了商务、商业和居住等功能 [2–4]。新城和新区的整体规划试图实现在一定空间范围内公共设施的均衡配置，并在规划中设定分期开发进程。

在开发模式方面，开发公司模式被采纳，即规划划定出一定范围用地，由具有半公共性质的开发公司进行管理和开发，开展资金筹措、项目招标等市场行为。但不同点在于，中国大部分城市在开发公司之外，增设了新城或新区管理委员会作为政府的派出机构，对开发公司进行监督管理，并协助开发公司与各个政府职能部门进行沟通和协商，推进新城的规划和建设。

在中国新城规划和开发的多元主体中，地方政府通常负责启动项目、监管开发，部分地方政府提供一定前期资金。新城或新区管理委员会和新城公司协同负责规划，包括制定初步规划要求，邀请设计单位或主持设计

竞赛，确定最后规划方案；在开发方面负责土地收储，搬迁安置，基本道路和基础设施建设，完成土地的一级开发（即完成土地收储和平整、主要道路建设、市政基础设施铺设），并与私人开发商协商二级开发（获得土地使用权，根据规划进行房地产开发）。

以上海为例，作为中国新一轮新城新区建设中的先行者，上海在 2000 年提出了著名的“一城九镇”计划。经过 20 世纪 90 年代的大规模再开发，上海市提出了中心城区的“双增双减”政策，即增加绿地和开放空间，减少开发强度和密度，促使开发空间从中心城区转移到郊区。上海市政府实施推进的“一城九镇”计划让 10 个郊区各自选址，建设一个具有特定风格的新城，并提供一定启动资金。区政府成立开发建设管理委员会和开发公司，具体实施规划和开发，包括根据确定的风格制定了规划编制条件，组织了国际设计竞赛，依据选定的设计方案深化实施方案等 [5, 6]。

中国新城和新区建设管理委员会和开发公司结合的管理与运营模式融合了政府主导和市场手段。一方面开发公司的运作比完全政府运作更加接近市场，运用市场手段，快速灵活应对市场变化。另一方面可以比完全市场运作的机构在规划和开发方面获得政府更多支持和协助，例如其规划审批具有一定的优先性和特殊性；同时具有半公共性的开发公司也相应具有更多的社会责任，有利于贯彻地方政府的规划和开发意图。

在这种规划和开发模式下，以土地批租和地产开发为核心的新城和新区在全国很多城市涌现，拓展了产业发展的空间，一定程度上缓解了老城区人口密度高的压力，提高了居民的居住面积和品质，同时土地批租带来的资金推动了城市经济发展。新城通常提供较之老城更加现代先进的基础设施，更加便捷的车行空间，更加充裕的居住空间，但规划和开发方面存在的问题也日益凸显。在规划方面，规划用地的过大规模造成了土地资源的浪费，大尺度街区导致对小汽车的依赖和步行环境的低品质，产业空间和居住空间的分隔带来通勤的长距离和长时间。在开发建设方面，连接主城区的区域公共交通建设滞后，加剧了对小汽车的依赖，公共服务设施建设的不足带来生活不便和人气集聚困难。同时，购置新城和新区的居住物业成为投资保值的一种重要方式，使居住楼宇的入住率低，造成有楼无人的空城问题。中国快速城镇化背景下的新城建设，带来了大量土地和房产存量，需要在未来一段时间进行消解。这种新城和新区推动的城镇化被中国学术界称为“土地城镇化”，区别于强调人口从农村村民转化为城市市民的“人口城镇化”。

随着对存在问题的反思，中国新城和新区的规划和开发开始更多新的尝试。本次亚洲开发银行 – 同济大学区域性城市可持续发展知识中心选取的新城案例，代表着在新城规划和开发中的多元创新。整体规划和单一主体开发的北川新城探索了如何保留当地特色，促进新城产业发展。无锡新城采用了多种生态规划方法和技术。嘉定新城在小尺度街区、公共空间和景观设计，以及开发运作方面作出了创新。

本书探讨中国新城和新区的规划理念和开发模式，力求为亚太地区发展中国家的城市建设提供一定的借鉴。新城新区成为中国城镇化重要组成部分和推动力，这根植于中国的特定机制，包括具有实施操作性的规划体系、土地使用权批租制度、地方政府对于土地租金的支配权等 [7]。这些特定机制设计确保了新城新区建设与经济发展紧密结合，相互促进。其他国家和地区在借鉴中需要注意到相应的规划体系、土地所有制和开发机制，结合本国特点，开展可持续的新城规划和开发，为市民提供更好的居住和工作空间。

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欧洲生态城市：结构紧凑、混合用途、绿色环保的宜居新区

饶士凡

相对于未经规划的城市扩张，规划并实施新城新区才能有效地控制城市发展，同时提供充足、高效且可持续的市政基础设施与服务。理想的新城新区应效仿健康可持续的发展实践，确保在步行环境友好与公共交通的基础上实现紧凑型、混用型发展；保护生态系统、农田，以及现有城市区域和新规划区域之间的绿地；保护新城新区内部的绿色空间与生态系统，加强其对气候变化的适应力，提供相应的生态服务。通过公共交通如铁路、地铁、轻轨、大巴等快速交通实现新城新区与城市其他区域的紧密连接，这点至关重要。

新城新区对于控制城市发展和扩张是必要的，否则未经规划或协调的开拓和发展会导致结构难以持续，服务匮乏，甚至可能带来日后难以消除的社会与环境的负面影响，因为基础设施和地块一旦有了定论，将影响数代人。考虑未来 20 ~ 30 年间可预见的快速城镇化发展，亚太地区包括中国的城市化进程都将面临巨大的环境与社会挑战，2050 年预计新增城市居民 27 亿。可持续新城新区的发展，对所有决策者来说是一项重要任务。

欧美城市发展回顾：
工业污染，花园城市与城郊无序扩张

20 世纪早期的新城规划和设计发展是为了回应和解决当时老城区与工业城镇生活环境欠佳、不健康、不卫生的问题，尤其像伦敦、利物浦和曼彻斯特这些早期工业化城市。伯明翰和伦敦作为第一批工业化大都市，通过工厂和住宅区不断扩张。蒸汽动力火车发明后，人们想到可以把居民和污染行业迁离拥堵的市中心，同时将工厂与住宅区及商业中心隔开。分隔的区域可用火车连接，并围绕着火车站点发展。埃比尼泽·霍华德（Ebenezer Howard）第一次提出这些原则时，受此激励，在其《明日的田园城市》（*Garden Cities of Tomorrow*）一书中提出改善公共健康、卫生以及整个健康生活。

20 世纪 40 年代，城市规划师艾伯克隆比爵士（Sir Patrick Abercrombie）提出在伦敦周围设立绿化带的理念，他将整个区域规划为四个地域圈，即核心城市圈、近郊圈、绿化圈与外围乡村圈，由中心向外辐射，并沿铁路线设立新城镇。这些强有力的区域和城市规划理念近年来被重新启用，如今被称为“城市增长边界”和“公交为导向的发展”。

无序的郊区细分发展始于 20 世纪 50 年代。基于弗兰克·劳埃德·莱特（Frank Lloyd Wright）“广亩城市”（Broadacre City）的理念，这样的发展可视为以汽车为导向的霍华德的田园城市版本。在高速公路交叉口扩展高速公路系统、购物商场、工业区和办公园区，随后造成了现在的“边缘城市”。这些发展模式极不可持续，不仅土地资源利用率低下，而且由于极低的密度和一次性发展，不必要地消耗了过多能源，尤其在交通运输方面。

欧洲：
新兴的可持续城市发展与生态城市规划典范

1992 年在里约热内卢召开的联合国环境与发展大会使得可持续城市发展为大多数人所接受，成为转折点。会议议程第 21 条——《里约环境与发展宣言》，使全世界人们进一步意识到转向可持续的、保护自然的、资源高效利用的发展和生存模式的必要性。欧洲和全世界许多其他城市的当地政府、企业和市民都参与了“Agenda 21”计划的制定。

自 20 世纪 90 年代中期起，许多新城区规划在城市、区域、邻里和建筑内的土地、能源、水和一般资源的利用上都遵循了生态高效的原则。这套建筑能源和水资源的能效新标准，以德国规定为例，将建筑隔热性能的规定从要求上升到法律，以确保当地小型可再生能源生产商能够以保证价格为电网注入能量。在美国，“精明增长”和“绿色增长”开始普及，意味着美国摒弃了之前以汽车为导向、土地和交通大规模发展的城市无序扩张。“新城市主义”运动倡导以公交为导向的发展和更为紧凑密集的邻里发展。绿色建筑委员会遵循可持续的规划原则，为能源节约建筑制定了相关指导原则和一套评

价系统，为邻里发展制定了可持续的规划原则。一些城市，如芝加哥，提出绿色城市理念，设定了雄心勃勃的温室气体排放削减目标。中国政府一直倡导低碳生态城市发展，国内许多城市也开始规划和落实试点发展，取得了非凡的成果。

欧洲生态城市发展的研究与试点项目确立了若干生态规划的主要原则：站点周边以公交为导向的紧凑型城市理念，融入了若干种交通方式，带有高密度城市肌理、混合用途、步行友好的环境、公园和城市服务。下文将展示三个最佳实践案例。

新型生态区的最佳实践案例一：瑞典斯德哥尔摩市的哈马碧生态区（Hammarby Sjöstad）

斯德哥尔摩南部的哈马碧地区原先是一块工业区，被水域环绕，原计划是斯德哥尔摩申请 2004 年奥运会主办权的奥运村选址。1990 年开始规划把这片受污染的棕地重新开发成为新城区。原规划经调整后意欲实现全面的生态城市发展，成为世界上最成功的城市规划之一，甚至比原计划 2015 年完工还要提前。哈马碧生态区因此转变成为富有吸引力的新区（图 1），包括 11 000 个住宅单元，容纳约 25 000 名居民，主要是年轻家庭；10 000 个工作岗位；内有美丽的滨水区、公园和绿色庭院。

4~8 层的建筑提倡小街区人性化的密度和环境。22% 的住宅存量是公共住房，55% 是合作企业所有，还有 23% 为个人或公司所有。与按常规标准建成的建筑相比，这些建筑的生态效率高出两倍。建筑主要使用健康、干燥且有利于环境的可持续材料，如玻璃、木材、钢铁与石材。考虑到这里之前为工业污染区，该区域内的土壤在施工前都经过彻底的修复净化。

公共空间系统与公园严格按照高标准进行规划，如每栋公寓 300 m 内至少有 25~30 m^2 的小型公园和庭院（相当于 100 m^2 的住宅建筑空间的建筑总面积）。环境保护条例保护有价值的自然区域不受开发破坏。补偿机制要求以建立群落环境替代对未经开发过的绿地的开发以确保周边区域的生物多样性。

哈马碧如今享用着快捷便利的公共交通服务，交通工具采用轻轨、巴士和轮渡。轮渡免费乘坐，从清晨到深夜每日往返。宜人的公共交通、拼车、美丽的自行车道和引人入胜的人行道降低了私人汽车的使用（图 2，图 3）。拼车由区政府组织，面向本区内所有居民与上班族。大约 10% 的家庭都加入了拼车服务，有 25~35 辆

（a）

（b）

图 1　哈马碧生态区：紧凑、绿色、宜居区，有着尺度宜人的空间与建筑
图片版权：Johan Fredriksson, Arikogan

节能车可供本区使用。因此，哈马碧 80% 的出行都倾向于公共交通、骑车和步行。

哈马碧的大部分能源供给来自可再生能源，如沼气、燃料电池、太阳能电池、太阳能电池板，节能建筑也减少了能源消耗。试点废水处理厂处理废水后产生制热和制冷效果，这一副产品成为区内供暖与制冷系统额外的能量来源。哈马碧的目标是当地能源需求一半能自给。

哈马碧的水供应与废水处理系统采用了创新的节水节能技术，其目标是用水量从原来的平均每人每天 200 L 下降到 100 L。目前，通过使用节水器具，低耗水马桶以及冷热水混合水龙头，人均每天用水量减少到 150 L。

该城市通过创新的自动化地下管道系统处理固体废弃物，从建筑附近的垃圾投掷点抽吸收集垃圾后分为可燃垃圾、生活垃圾和食品垃圾。排入地下垃圾箱内的垃圾会被垃圾收集工具吸空，该收集工具通过抽泵将垃圾从垃圾箱里抽吸出来。

（a）

（b）

图 2　公园、水岸以及行人与自行车共用的通道都提升了整个区域的宜居性

图片版权：Arild Vågen

（a）

（b）

图 3　哈马碧的轻轨与轮渡服务全年都很便利

图片版权：Arild Vågen, Ankara

新型生态区的最佳实践案例二：德国弗莱堡市的丽瑟菲尔德（Rieselfeld）与沃邦（Vauban）区

德国西南部弗莱堡市的丽瑟菲尔德与沃邦两个新区于 20 世纪 90 年代中期开始规划并建造。丽瑟菲尔德位于弗莱堡西部边缘，是一个绿地居民区（图 4），旁边就是轻工业园区，并由新建轻轨与市中心相连。沃邦则位于市中心附近，之前是废弃的军事要地，德国统一后收回，并加以改造。两个新区都被设计为紧凑、混用型，以公共交通为导向的行人友好型绿色城市社区。

丽瑟菲尔德占地 70 hm^2，容纳了 11 000 名居民及 1 000 个固定工作岗位，并负责保护邻近 250 hm^2 的自然保护区。发展模式遵循一个小城市街区的系统，十字路口之间的步行距离不超过 100 m。凭借设计精妙的人行道、自行车道、绿化公园、步道和富有吸引力的公共广场打造令人愉悦的步行氛围（图 5）。公共设施包括数个社区中心、多座教堂以及共容纳 3 000 名学生的多所学校。

为避免街区建筑过于统一，每个街区都被分开并大部分出售给了建筑公司。私营合作建筑企业联合起来设计和建造多楼层的住宅楼，并聘请一名建筑师参与其中，帮助规划和资助该建筑。通常邀请来自年轻家庭的 6~10 名业主会根据自身的特殊要求和预算来参与设计和开发，建成后业主可拥有并居住其中一个单元。丽瑟菲尔德共有 150 个合作建筑项目。

有明确规定开发商不允许买下一整个街区，每个开发商在某个街区内只能拥有和开发不超过 3 个地块，以保证多样性。这就创造了一个良好的尺度，沿街步行时可发现每隔 20~30 m 的建筑风格都不一样。所有建筑都要求达到德国节能建筑的标准。

弗莱堡的另一生态区沃邦区以无车区和太阳能而著名。沃邦由一个废弃的军事区重新开发而成，现在建成

图 4　弗莱堡丽瑟菲尔德区：新型绿色、紧凑、尺度宜人、行人友好的城区

图片版权：Norbert Blau Luftfahrer

了一个混合用途的、步行友好型的绿色城区（图 6），拥有 2 000 个住房单元，提供 600 个工作岗位的商业与办公空间，并有一个中央市场与一个社区中心。沃邦项目从 1996 年开始规划，2006 年完成建设。整体规划与实施过程中公众（包括未来居民）和私有行业均有参与。

（a）

（b）

图 5　弗莱堡丽瑟菲尔德区：拥有绿色空间、独立住宅及电车服务的街区

图片版权：Andreas Schwarzkopf, Dr. Neil Clifton

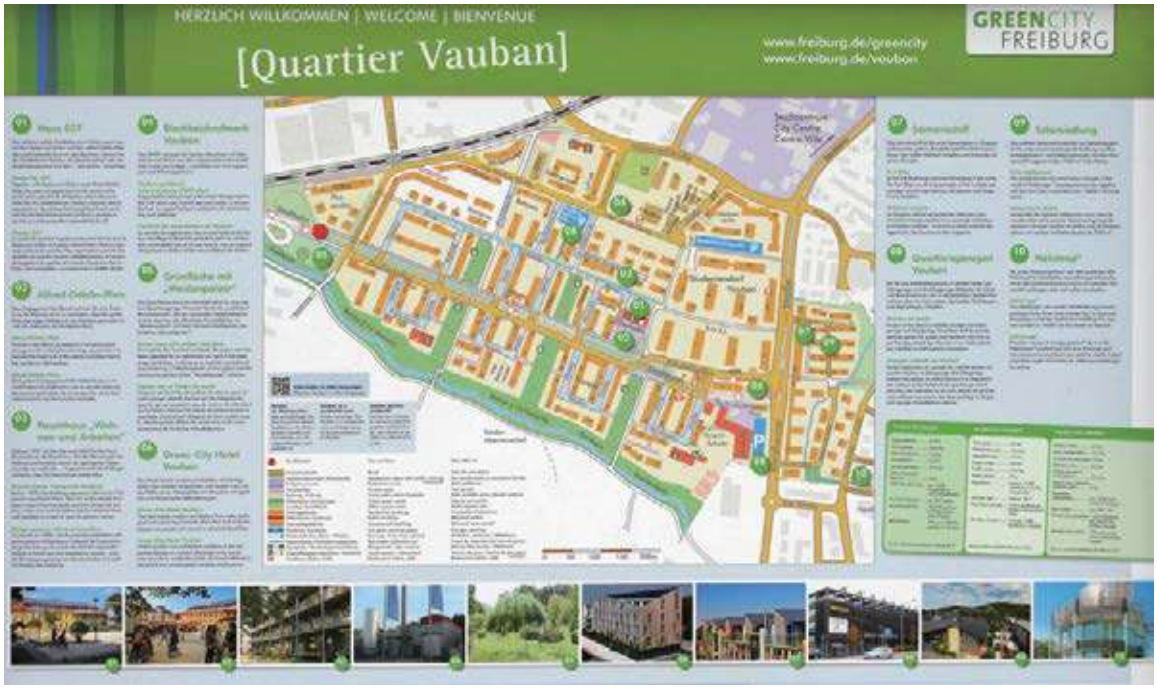

图 6　弗莱堡沃邦区：规划绿色、生态高效、尺度宜人、行人友好的新区
图片版权：Andreas Schwarzkopf（信息板展示）

“无车城”是指区内有些区域限制私家车准入，而部分地区完全禁车。停车场设在区外围，并有轻轨电车直通市内，非常方便。区内约 40% 的在住居民以及即将入住的居民同意放弃使用私家车，其余居民将车辆停放在区外的两个停车场内，并参与汽车共享和拼车。用地方案如此安排的目的是使任何家庭或工作场所与公共交通的距离都不会超过 500 m。区内主要交通方式是步行与自行车。交通规则明确行人与自行车优先，规定主干道速度不得超过 30 km/h，被称为“沟通空间”或生活街道的辅道速度不超过 10 km/h。所有街道都可供孩子们玩耍。为提倡使用自行车，建筑周围布满自行车架。这种整体的非机动交通理念使得沃邦区的私家车拥有率是弗莱堡市各区最低的，每千人仅有 150 辆，而全市为每千人 430 辆。

图 7　弗莱堡沃邦区：太阳能之城，关注太阳能发电、公共交通、自行车与行人
图片版权：Mangan 02

“太阳能之城”包括了先进的城市与建筑基础设施以节水节能（图 7）。整个新区的建筑要求至少达到德国节能建筑的标准，其中至少 100 幢建筑能够达到甚至超过“被动式房屋”（passive house）的标准。沃邦区内实现了一个太阳能小区，区内所有建筑的屋顶均覆盖有太阳能板（图 8）。

对于单体建筑来说，资源效率的最佳实践是遵循低能耗标准，由既是业主又是住户的合作建筑方规划并建造混合用途建筑。16 户居民通过社区自发组织对接论坛，共同协商、建造了他们的住房。这些四层住宅楼每栋容纳了 16 套公寓，从一室户到适合大家庭的复式住

（a）　　（b）

图 8　弗莱堡沃邦社区：所有屋顶都铺设了太阳能板，区内建筑均为节能建筑

图片版权：Andrewglaser, Mangan 02

宅等各种户型都有，同时还设有四间办公室，一间艺术室以及公共空间。洗盥污水通过建筑内的通风沙滤系统处理后可用于冲洗马桶。建筑内的 25 个真空马桶相比传统马桶节水 25%。污水与有机废弃物由建筑底部的垃圾箱收集，通过沼气池产生燃气供厨房使用。屋顶的太阳能集热器可提供 300~400 L 升的热水，建筑内的发电单元与小型复合供热单元能够提供额外的电力、热能与热水。屋顶太阳能板装机容量达到 3.2 kW，热能、发电单元与光伏板共能满足 80% 的建筑耗能与居民耗能。

弗莱堡的这两个新区是德国新区发展的一些实践案例中的最佳范例，具有生态、高效、宜居、紧凑、混用等特点，是以公交为导向的、行人友好的节能新区。弗莱堡因此赢得了许多的城市可持续发展与宜居奖项，肯定了该市为建造高度融合新区所做的努力。

新型生态社区最佳实践案例三：德国图宾根市的法语区

图宾根市有一所拥有 538 年历史的大学，全市人口为 90 000 人，学生 26 000 人。图宾根的法语区在 1993 年规划为混用城市社区，并在德国统一后收回的前军事区的基础上使用了所有可再利用的结构。建成于

图 9　图宾根市法语区：宜居小区，适合步行或骑行的有趣街道和优美广场

图片版权：Ramessos

2012 年的法语区现在有 6 500 名居民，区内有 150 家企业，提供了 1 000 个工作岗位，其中 50% 是服务业，20% 是技术行业和生产业，10% 是零售业。

相比于把地块售予商业开发商，图宾根市更愿意将其出售给合作建筑企业，以便实现市议会制定的私有小规模混用建筑的目标。通过多方咨询，市政府推动了合作企业的对接过程，甚至引入商业用户或手工艺人作为合作者以努力达到建筑混用的目的。这一过程中，当局鼓励投资当地经济，实施小规模分散供应策略，表现之一就是通过支持小型自营轻工业与零售商，而不是引入大型连锁超市或商场。因此，小规模轻工业的融入使得当地居民经济独具一格，对居民来说也并无妨碍。

法语区的交通理念是限制车辆，提倡汽车共享、骑车与步行。市政府大力推广汽车共享，希望人们能够按需用车，当地居民也广泛参与其中。因此，法语区的每千人汽车保有量降至 220 辆，而整个图宾根市每千人汽车保有量为 493 辆。由于车流量不大，骑车或步行都是方便安全的选择。如果要停放或锁自行车，许多自行车桩可供使用。自行车出行在生态区占所有出行方式的 24%，图宾根市的比例为 20%，而在德国则为 13%。整个法语区布局紧凑，步行体验愉悦，时间短且高效（图 9）。

欧洲生态城市的规划原则：紧凑、混用、绿色、宜居

综上所述，欧洲成功的生态城市和生态高效城市发展都共同体现了一些关键原则，这些原则也许可以为中国和亚太地区提供相关经验，具体如下：

（1）结构紧凑，尺度宜人：小街区，小尺度街道，有着步行友好的环境，从住所或办公场所到交通站点、商店、公共服务设施以及公园都不会超过 5~10 min 的步行路程。

（2）混合用途：城市的活力、文化、商业、居民区、机构与不扰民的轻工业制造共存于整个区域，居民区，甚至在同一建筑内也尽可能互不干扰。

（3）以交通为基础：方便快捷的公共交通和生态移动，如车辆共享、自行车租赁以及递送服务。

（4）尺度适宜、行人及自行车友好的街道：人行道与小路错落有致，景色优美，城市街区小，行人安全，沿街布有商铺、景观、灯光和公共设施。

（5）生态高效：用地高效、节能节水的城区和生活方式。

（6）绿色开放空间系统：绿色空间提供生态系统服务，公共健康，社区便利设施，生态设施，使工地增值。

（7）包容性：支持私营建筑合作企业小规模的投资，市政府更倾向于接受此种形式的产权而非商业开发商的提议。

（8）规划过程中聚焦小组与公众的参与。

（9）有竞争力的：混合用途创造了就业机会，产生了高科技中小企业，居住与工作环境吸引了高技术人才。

（10）基于需求的可持续投资：包容性的发展，均衡的供求关系。

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图 7：Freiburg Vauban solar city focused on producing solar electricity and on public transport, bicycles and pedestrians. Photo taken by Mangan02, available online at: https://commons.wikimedia.org/w/index.php?title=File:Solarschiff_ Solarsiedlung_Freiburg_im_Breisgau_september_2014.jpg&oldid=135161920 This file is licensed under the Creative Commons Attribution-Share Alike 4.0 International (https://creativecommons.org/licenses/by-sa/4.0/deed.en) license.

图 8（a）：Freiburg Vauban all roofs with solar panels in the solar district and all buildings are energy and resources efficient buildings. Photo taken by Andrewglaser (talk), available online at: https://commons.wikimedia.org/w/index.php?title=File:SoSie%2BSoSchiff_Ansicht.jpg&oldid=156661661 This file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported. (https://creativecommons.org/licenses/by-sa/3.0/deed.en) license. Attribution: Andrewglaser at English Wikipedia.

图 8（b）：Freiburg Vauban all roofs with solar panels in the solar district and all buildings are energy and resources efficient buildings. Photo taken by Photo taken by Mangan02, available online at: https://commons.wikimedia.org/w/index.php?title=File:Vauban_in_Freiburg_september_2014_03.jpg&oldid=135228323 This file is licensed under the Creative Commons Attribution-Share Alike 4.0 International. (https://creativecommons.org/licenses/by-sa/4.0/deed.en) license.

图 9：Tuebingen French Quarter view of plaza and scaled street and individual buildings of the livable district with attractive streets and plazas nice for walking and cycling. Photo taken by Ramessos, available online at: https://commons.wikimedia.org/w/index.php?title=File:TuebingenFranzViertel1.jpg&oldid=158419078 “I, the copyright holder of this work, release this work into the public domain. This applies worldwide. In some countries this may not be legally possible; if so: I grant anyone the right to use this work for any purpose, without any conditions, unless such conditions are required by law.”

中国新城新区的发展

吴缚龙

本书是亚洲发展银行 – 同济大学城市知识中心的成果之一，旨在共享中国新城发展知识。书中的三个案例提供了中国不同新城发展的经验教训，这些新城的发展方式包括发展产业，混合发展产业与住宅，以及在自然灾害后通过集中重建新生活区来发展新城。虽然方式各有千秋，但都从规模和特征上诠释了中国的新城发展。

中国的“新城”概念，所指较为宽泛。本书所指的“新城”专指通过大规模国家层面的规划发展而成，但同时又视土地市场为房地产开发和工业发展主要驱动力的新城。这些新城本质上来说是经过正式规划的新居民地。

本文首先概括这三个案例的特征，然后再对中国新城的发展经验加以总结。

无锡太湖新城

太湖新城位于长三角的中心地带，地理位置优越，而其所处的无锡市，经济力量在该区域亦名列前茅。无锡市出于战略发展需要，选择发展新城，其城市发展重点也相应由原来的上海—南京沿线迁至太湖边。无锡市的发展得益于中央政府的大力支持，生态城的建设即为当地政府获得中央支持后的成果之一。生态城的发展以规划引领为特征。新城占地面积宽广，达到了 150 km^2。从某种意义上来说，新城自身已经发展成为一个城市，而不再是无锡市的卫星工业城。显著特征之一就是在整个新发展区域建立分区系统 [1]（Wu，2015）。经过奥雅纳工程咨询公司（总部位于英国，该公司在中国规划了许多生态城市，擅长采用综合的方法实现可持续发展）海外专家和其他咨询专家的努力，分区系统内确立了一系列生态规范。这也是借鉴国际政策的部分成果，充分体现在无锡中瑞低碳生态城示范性项目上。 尽管外国专家在整个规划过程中影响颇大，但太湖新城的规划和发展更多的是中国土地和经济发展的结果。生态城得以实施，很大程度上是因为整个太湖新城总体上被视为一个新经济空间。因此，生态规范对生态特征的发展施加了额外的要求，而不是仅仅满足于独立的生态发展，否则这样很容易由于缺乏经济活动而遭遇困境。从生态规划特征来说，区域设计考虑到绿色廊道和河道水网的保护和建设，充分融入该地区江南水乡的特色。从经济角度来说，与中国其他许多主要由制造业驱动的新城不同，太湖新城鼓励支持第三产业的发展。新经济包括金融业，创意产业（如无锡影视基地），信息技术产业，休闲产业，以及科学技术研究。新城发展同时鼓励更高的开发密度，发展步行系统，倡导绿色出行。为实现可持续发展，新城大力发展基础设施建设，发展水循环和污水处理技术。因此，太湖新城在经济发展和环境改善两个方面实现了更佳的平衡。与以往靠房地产开发来推动发展相比，太湖新城的发展选择了容纳新的经济成分。采取规划引领的方式相对紧密地融合了实体规划和环境指标。面积为 2.4 km^2 的生态示范区，或者叫作生态城，是整个占地 150 km^2 新城的一部分。在新城基础设施最终完善，人口数量越来越多以后，生态城的发展变得更加可推广扩展。新城的发展目前吸引了海内外的一致关注。

图 1　**无锡太湖新城，中央地区**
图片来源：作者拍摄

上海嘉定新城

嘉定新城位于上海市北部，是上海市政府规划的九座新城之一。1949 年前制定的上海区域规划已选择嘉定作为新城镇来发展，以缓解市区的交通拥堵。在 20 世纪 50 年代，嘉定被确立为工业卫星城之一。1990 年以前，嘉定的发展都比较缓慢，直到这一年上海将新城

镇发展作为新的发展策略。为加强上海的经济竞争力，嘉定的发展受到了区域性的重视。现阶段的目标是将嘉定发展成为容纳 80 万人口的新城镇。和上海的松江 [2] (Wang et al.，2010) 以及北京经济技术开发区的所在地亦庄 [3](Wu and Phelps，2011) 类似，嘉定的经济结构主要由第二产业主导，占总 GDP 的 69%。新城担任着重要的经济职能，是上海的制造业基地，同时制造业也是其主要的就业渠道。目前规划着力于促进低碳产业园的发展，引进能源节约技术。收入来源分析表明，土地收入是新城建设的重要来源。和新城所在的嘉定区相比，新城的税收收入一直处于显著增长的状态。2011 年采用了新的更为直接的筹款方式，通过信托、借贷和企业债券的方式直接筹集到了 23 亿元资金。在这之前，地方财政主要依靠土地发展来间接获取资金，新的直接筹款的方式能减轻地方财政的重负。嘉定新城的发展同时强调了景观管理和规划调控。然而，嘉定还是面临着一些挑战：一方面源于改善生活质量的挑战；另一方面，嘉定需要将新城从工业基地转变成宜居城市。新城的发展吸引了许多商家在地铁站附近选址。新城所展现的现代化的一面，的确让人印象深刻，标志性的建筑有嘉定保利大剧院以及主干道旁边的绿化通廊。但嘉定仍需思考其在上海乃至长三角的新角色定位。新的发展策略要求嘉定与其临近的苏州和嘉兴形成三角区域，这两座城市分别位于江苏省和浙江省。同中国其他许多新城一样，嘉定需要注意房产开发和产业发展的协同，加快城镇和产业之间的融合。也就是说，过去新城的发展以产业需求为导向，导致通勤距离过长，住宅区域开发不足。住宅和产业区域的分离，是综合型宜居城市发展的主要障碍。新城正在努力提高建筑环境的质量，完善公共交通系统。为吸引居民，生态改善也成为新城需要关注的主要问题，因为嘉定仍有工业新城的形象。除了经济功能，要使嘉定成为宜居之地，其建成环境的生态质量也需要重视。

北川新县城

促进北川的发展是震后重建的当务之急。北川不是传统意义上的新城，而是一个新建的县城。北川新县城是北川羌族自治县的行政中心。地震摧毁了北川旧址，现在的北川新县城重新选址于永昌镇的另一行政区域。北川的发展体现了国家和城市规划在重建中的地位。新县城是基于一定理念规划而成，这些理念包括紧凑式发展，更多的开放绿地，相对于其他新工业区采用的网格式大街区而言，更注重居住和商业功能的相对窄小的街道，职住发展的平衡，当地文化和特色的保护，以及非机动交通的优先发展。北川的重建得以更好地融合这些特征是因为新县城完全按规划在发展。新县城在 2011 年正式启用，占地 4.59 km^2。从某种程度上来说，新县城的建设可以视为一个大型城市项目。新县城的建成，离不开中央政府以及一些沿海省份的大力支持，比如，北川县内某工业园的发展得益于山东省的支持。尽管如此，北川的发展与沿海地区的其他新城，如上海的嘉定新城、无锡太湖新城以及昆山花桥新城的发展截然不同，这些新城的发展主要靠制造业和经济发展驱动。虽然新北川县内有一些工业企业，但新县城主要是靠地震后县政府重迁新建发展而成，因此就业岗位不足成为主要挑战。尽管规划导则中强调了高密度和紧凑型发展，实际居住密度和中国其他城市相比仍然很低。震后重建起初是由中央政府紧急投资支持，不久后投资相应减少，如何维持新县城发展成为严峻考验。此次灾后重建，可资借鉴之处良多。地震给北川人民的生活带来了灾难性的后果，灾后重新选址的决定是恰合时宜且不可避免

图 2　嘉定新城新建的居住区
图片来源：作者拍摄

图 3　北川新县城重建后的中心城区
图片来源：作者拍摄

的。空间规划考虑了保护当地遗产的需要，也为工业发展（通过联动发展产业园）留足空间。通过用地分区和设计，实现了旅游、工业及生活区的功能布局。北川的发展表明，规划能够在特殊情况下，在短期内营造出一个有序的建成环境，但恢复城市发展则需要更多的时间，因为在重建新县城生活空间后，应该追求经济长远发展。经济不繁荣，北川的可持续发展也会成为问题。然而，鉴于当地生态脆弱而敏感的现状，北川并不适宜大规模发展工业。换言之，自然环境的限制使得北川发展难以复制沿海地区的发展轨迹。初步建成后，北川由于投资的减少面临着巨大财政压力。为应对挑战，北川试图寻求新的经济增长动力，例如利用文化遗产发展旅游业以及更新工业园。新北川利用丰富的自然资源和当地文化景观，规划建成了一个大型旅游度假区。

三个案例展示了中国新城发展的不同模式。嘉定新城展示了上海大都市地区的新城发展是靠工业发展驱动，基础设施发展以工业区及工业发展为中心，宜居新区和工业产区之间的融合成为其发展的挑战。嘉定的发展目前面临着升级和创新的压力。新科技园区也已建成，新城从卫星城转变成城区区域内的新城，意义重大。无锡太湖新城是新开发的新城。2002 年，规划设想首次被提出，但实质性建设则在 2007 年以后。因此，无锡太湖新城是第三产业——创新产业发展的代表，同时也是低碳生态城市的示范。例如，太湖新城将生态指标落实到用地控制的层面。太湖新城争取到了中央政府不同的专项补助，发展目标宏伟——在 2020 年目标人口达到 100 万。这个目标基本上意味着新城要在一个崭新的地方，通过发展，在 20 年之内吸引 100 万人口。除去新生态特征的因素，从宏观层面来说，这个目标对区域用地的影响不容小觑。因为该地区本为农村地区，人口高度集中，新城的发展必然会导致农村地区的拆迁，农业人口的搬迁，以及农民为适应城市生活的调整。而新经济领域，如软件、数字图像和电影、研究与开发等并不适合原住民的工作需求。在实现其生态愿景发展目标的同时，生态城需要满足其多样化人口的社会需求。新北川县城严格意义上来说不算新城。它是地震过后国家干预的一个特例，得益于强有力的政府支持，以及北川和沿海地区省份的合作，北川在灾后得以迅速重建。规划在这种快速发展中起到了举足轻重的作用，决定了用地布局和建筑环境的特征。但当地社区的参与相对不足，公众参与度不高。北川的规划体现了先进的规划理念，如考虑到了紧凑发展、当地文化保护以及环境质量。然而，国家引领的规划，虽然在灾后紧急重建的背景下不可避免，但也为恢复经济带来了长期挑战。

书中的三个新城只是作为案例研究以供参考借鉴，并非其他城市可用来复制的发展模式[4] (Chen et al., 2009)。这些新城是在当地特殊的背景下发展起来的，如郊区经济工业化，经济重组，中心城区外新商业次中心的扩张以及灾后重建，反映出国家和市场之间多样化的关系以及城市规划的干预作用。 这些案例颇具价值，可供对照和其他国家学习，尤其是亚太国家。本书所呈现的案例更多地关注新城发展的规划方面。发展的基本过程中，问题颇多，如土地管理、经济重组、消费以及住宅开发。新城的发展，如城市分散化、郊区化以及住宅搬迁等，是由房地产开发所带来的收入双重机制驱动，满足了正在崛起的中产阶级的需求。嘉定新城案例中，引入债券和债务作为直接投资支撑城市发展，而在过去，土地开发主要通过间接融资方式。新机制的采用是否能改变新城发展活力，效果有待观察。北川案例展示了国家应对灾难的能力，居民得以搬迁到新县城。但这一案例同时也显示出社会参与和灾后恢复长期范围内内生经济发展的必要性。无锡太湖新城案例中，新城作为区域商业次中心及其创意产业的发展可能带着某些新经济体发展的所谓的类似“后郊区化”的印记，郊区不再是住宅空间，而是办公、商业和居住用途的混合体。同样地，无锡太湖新城也反映出城镇化的过程，数以千计的农民成为城市居民，农村变成了新的城市住宅区。因此，中国新城的发展是当地农民由农村迁移至城市、中心城居民搬出城市中心的过程。这些案例为中国城镇化动态的进一步研究提供了丰富来源，也为类似背景下的新城规划提供了经验。

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中国新城新区案例报告

北川新县城：欠发达地区县城的可持续发展路径探索

郑德高　李新阳　贺　旺

摘要：

北川新县城是灾后异地重建的全新县城，是按照现代城市规划理念，在短期内建设完成的。其先进的规划理念包括坚持集中紧凑的布局理念，带形开放的公共绿地，相对窄小的街道尺度，职住平衡的岗位设置，新羌风特色的风貌传承以及绿色低碳的生态技术。但灾后重建规划评估发现缺乏产业集聚与人口集聚是当前北川新县城面临的突出问题。本文通过两轮北川新县城总体规划背景及规划特色的介绍，探讨新城规划如何能够长远地可持续发展以及可能的路径选择，为其他新城新区建设提供参考借鉴。

关键词：

北川，新县城，总体规划

北川羌族自治县位于四川盆地西北部（图 1，图 2），距离最近的大城市绵阳市中心 42 km，距离四川省省会成都 160 km。2008 年汶川特大地震之后，由于北川老县城位于地震断裂带上，可用地条件有限，但其又是中国唯一的羌族自治县，因此在灾后重建过程中经过多地点的比选以及公众参与，最终决定将县城从曲山镇搬迁至其南 30 km 的原安县黄土镇范围内，即现在的永昌镇。

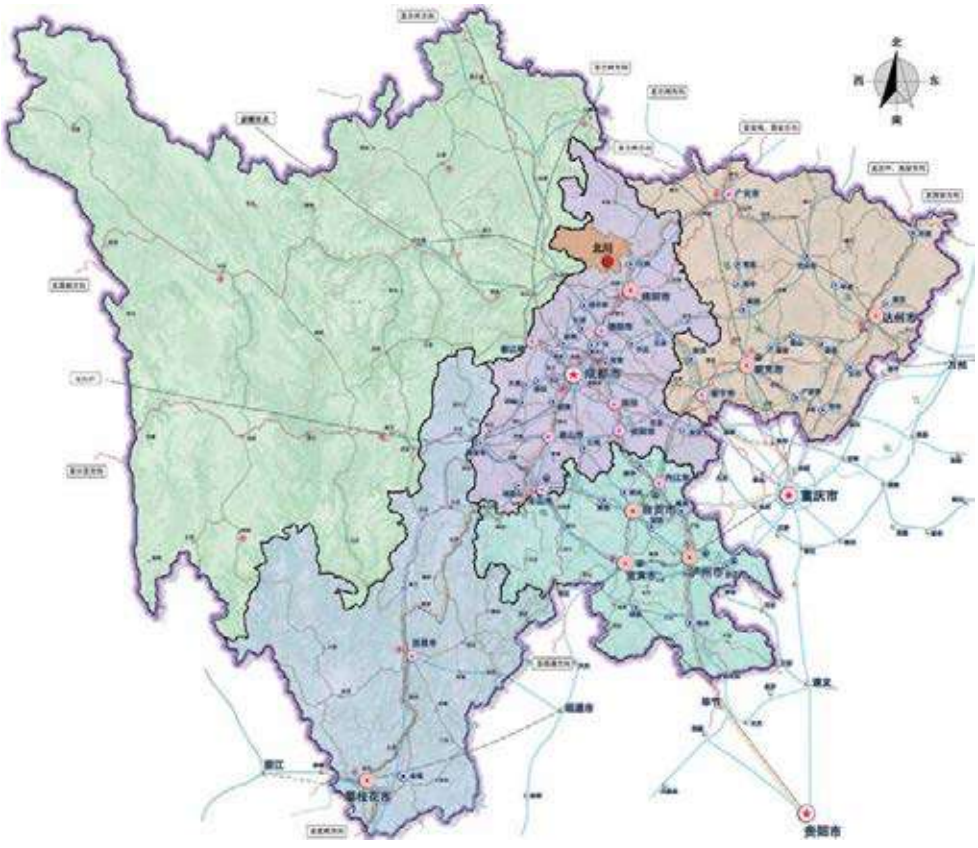

图 1　北川在四川省的区位

来源：自绘，底图来自四川省城镇体系规划（2013–2030），中国城市规划设计研究院

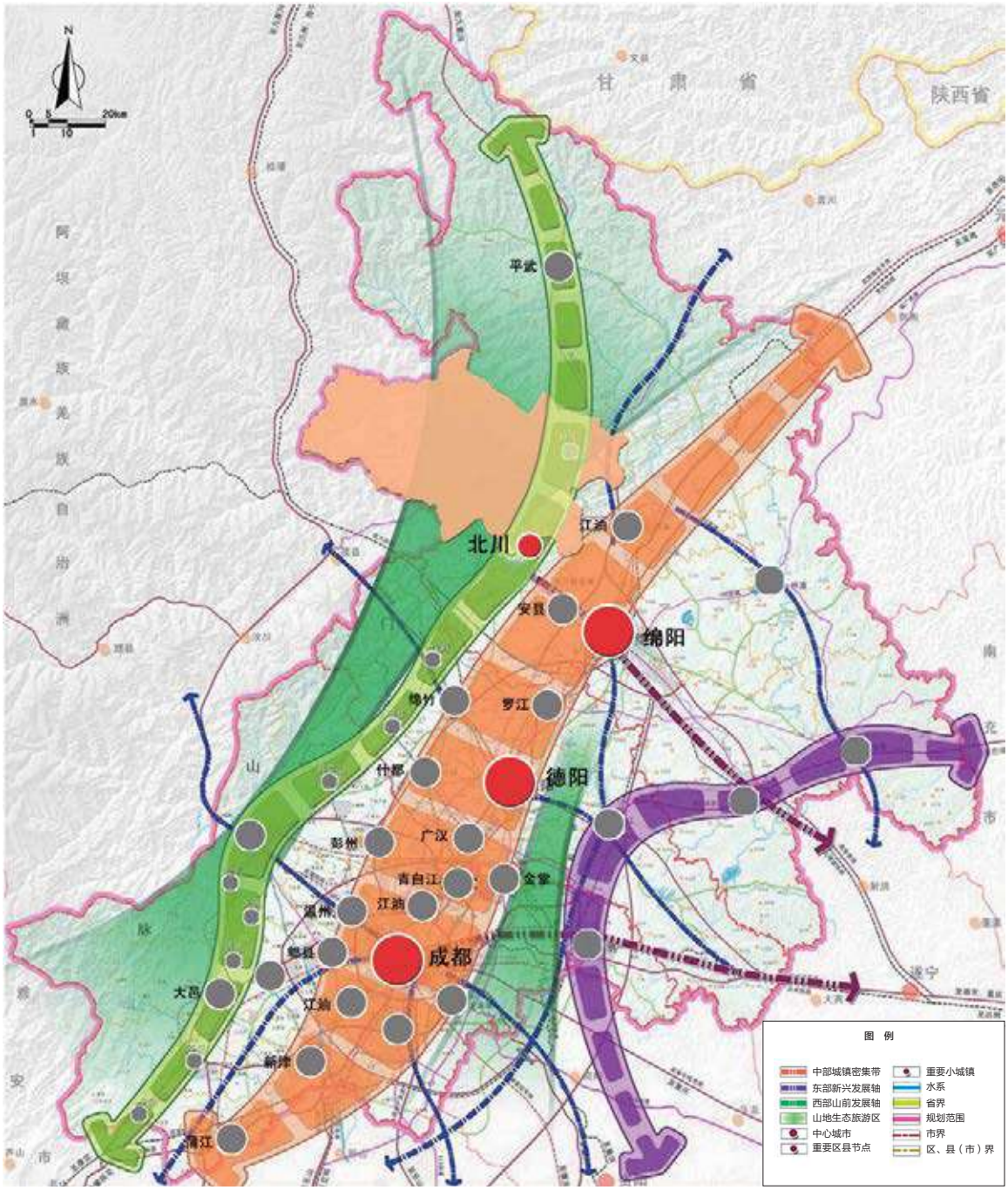

图 2　北川在成德绵地区的区位

来源：自绘，底图来自成德绵区域合作总体规划，中国城市规划设计研究院

目前北川县域下辖8个镇、14个乡以及1个民族乡。2012年北川地区生产总值31.7亿元，人均生产总值15 835元，三次产业结构25∶42∶33。2012年年末总人口24.1万人，其中非农业人口7.8万人，占32.4%。

从2008年以来，北川新县城总体规划历经两轮。在2008年11月初，国务院常务会议正式同意北川新县城选址之后，11月7日，北川正式启动灾后重建总体规划，2009年3月30日，四川省政府正式批复北川羌族自治县灾后重建总体规划。2011年6月，北川开始编制《北川羌族自治县县城城市总体规划（2011−2030）》，并于2012年7月13日通过四川省政府批复，作为指导北川今后20年城市发展与建设的法定文件。

本文拟通过上述过程的介绍以及相关规划的评述，针对北川新县城，一个特殊的新城的建设与发展，进行总结并试图对欠发达地区小县城的可持续发展路径进行探索。

1　灾后重建总体规划：异地重建的新城区

由于地形地貌的影响，2008年以来北川县域的建设主要集中在从老县城曲山镇至新县城永昌镇之间的山前河谷地区，是灾后重建的重点地区。灾后重建项目368个，总投资80亿元，分别占北川全县的42.40%、36.15%。该地区的主导产业已经从水电能源、矿产建材、农特产品加工和特色旅游等以初级产品为主的灾前主导产业发展成以农特产品加工、文化旅游产品、材料、机械制造、电子配套、特色文化旅游（老县城地震遗址、新县城当代文化遗产）等二次加工、特色鲜明的灾后主导产业。山前河谷地区人口发展基本保持稳定，2007年总人口11.5万人，占北川县域总人口的49%；2009年总人口11.8万人，占北川县域总人口的50%。

在《北川羌族自治县灾后重建总体规划》中，将北川城市性质定为“北川政治、经济和文化中心，川西旅游服务基地和绵西产业基地，现代化羌族文化城和生态园林城”。近期2015年之前主要建设安昌河东岸地区，建设用地4 km^2，安置人口3.5万人。远期2020年建设用地规模7 km^2，人口规模7万人。

在空间布局上坚持集中紧凑的布局理念，带形开放的公共绿地，相对窄小的街道尺度，职住平衡的岗位设置，新羌风特色的风貌传承以及绿色低碳的生态技术，以温家宝总理提出的“安全、宜居、繁荣、特色、文明、和谐”十二字为建设目标，以“以人为本、科学重建”为灾后重建工作的指导方针，努力将其建成为城建工程标志、抗震精神标志和文化遗产标志（图3）。

1.1　规划原则1：集中紧凑的布局理念

规划坚持集中紧凑的布局理念，严格控制建设用地指标。根据《城市用地分类与规划建设用地标准》（GB 50137−2011），此类少数民族地区人均城市建设用地可放宽到150 m^2/人，但规划将人均城市建设用地控制在105 m^2/人以内。

这种相对紧凑的城镇形态使绝大多数居民的出行在步行范围内，充分发挥公共设施和基础设施的服务效率。35.3%的居民步行5 min，91.2%的居民步行10 min，97.4%的居民步行15 min可达社区中心，步行5 min可达城市公园绿地，从而起到集聚人气的作用，也有利于未来的商业开发。

另外，紧凑的城镇形态既保护了城镇的山水格局，还大大降低了城镇基础设施的建设难度，保证了建设周期。

1.2　规划原则2：带形开放的公共绿地

为了有效使用公共空间，促进居民互动交流，也为了更加紧凑地开发，规划摒弃了一般小区设计中设置中央公共绿地的做法，而是将主要绿地指标集中在自北向南贯穿中心城区的沿永昌河现有水系设置的公园带上，并将历史古迹、抗震纪念、户外活动、居民休闲等内容与滨河绿地有机地组织在一起，促进了公共空间的共享与有效利用（图4）。

1.3　规划原则3：相对窄小的街道尺度

在北川新县城道路交通规划工作中，为避免照搬大城市交通发展模式，结合新县城居民实际需求，提出了“高密度、窄道路”的网络模式，干路红线总体上以20 m为主，核心区道路间距不超过200 m，核心区以外地区道路间距以300 m为主，在不增加道路用地的情况下，显著提高交通网络密度，提高交通系统可达性，同时相对窄小的街道为城镇居民提供了一个尺度适宜的交往和景观空间。

1.4　规划原则4：职住平衡的岗位设置

规划坚持以人为本、民生优先的原则，在城市东南角设置1.2 km^2的产业园区，提供约2万个就业岗位，同时依托齐鲁大道，沿线布局企业办公和生产服务、行政办公、集中开敞绿地、文化教育等城市主要公共服务

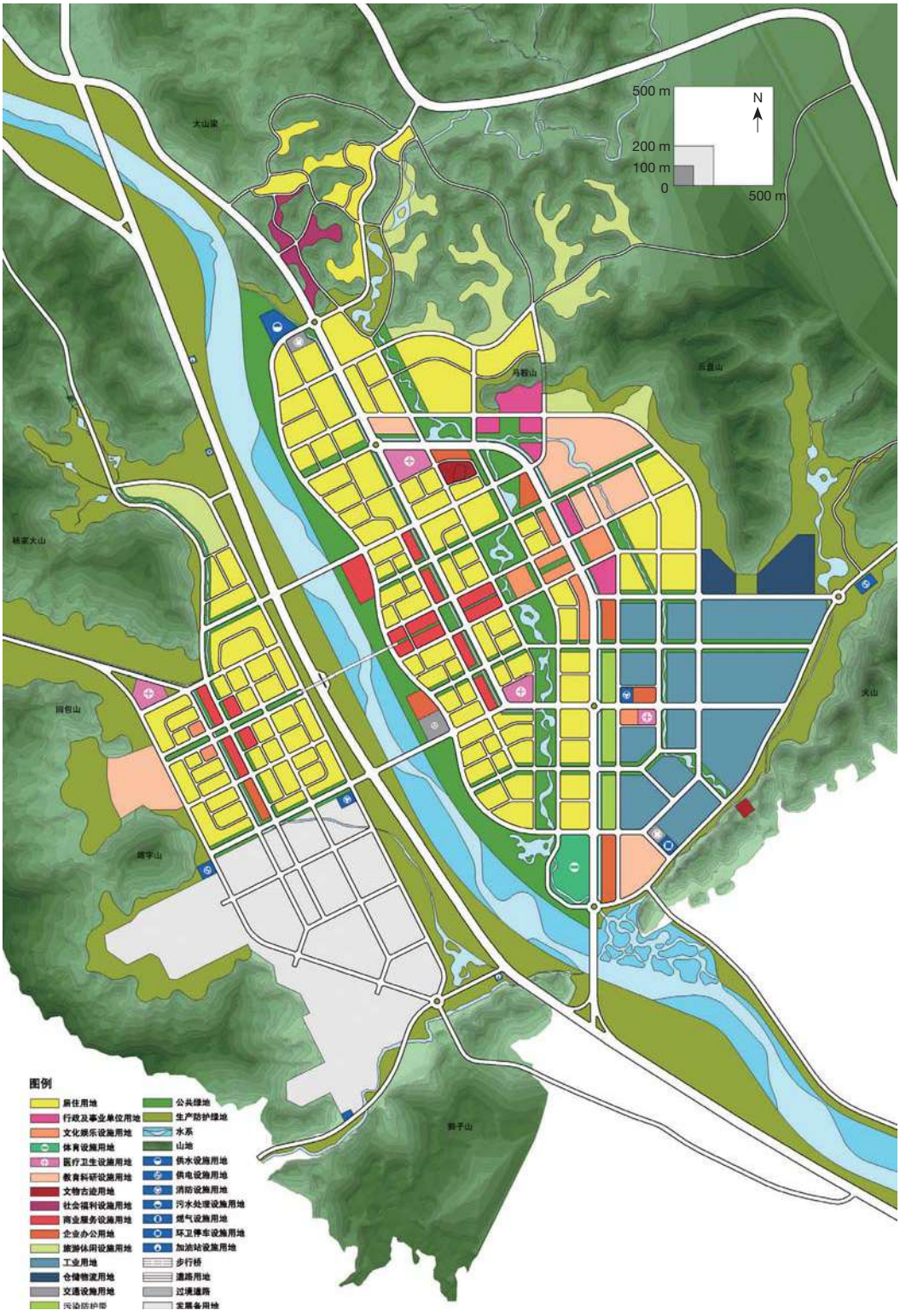

图 3　灾后重建总体规划新县城用地布局规划图

来源：北川羌族自治县灾后重建总体规划（2008–2020），中国城市规划设计研究院

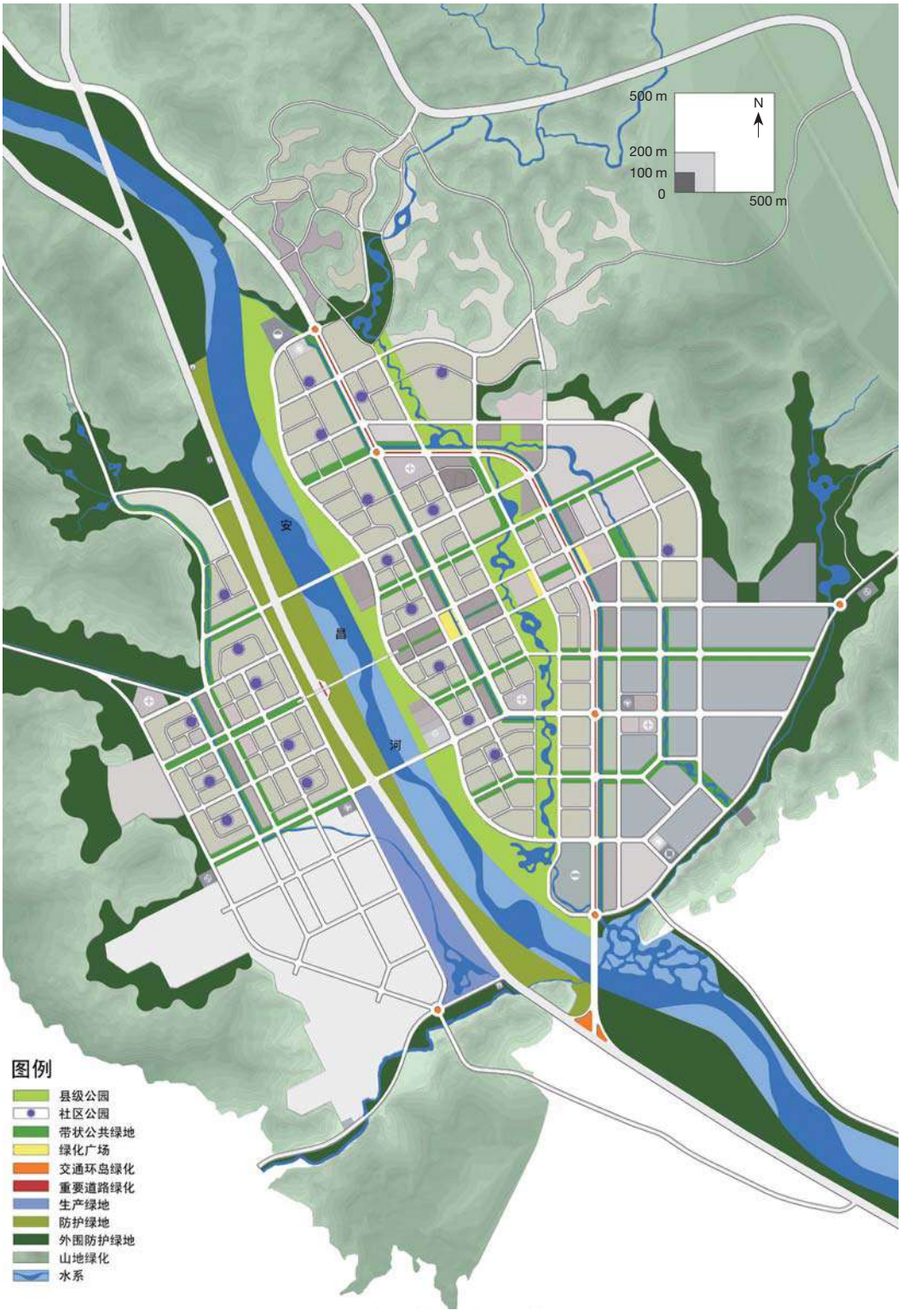

图 4　灾后重建总体规划新县城绿地系统规划图

来源：北川羌族自治县灾后重建总体规划（2008–2020），中国城市规划设计研究院

功能，形成半环形服务带。由淄博市人民政府援建的新川大道沿线为服务百姓日常生活的商业配套，兼有旅游服务功能，形成另外一个半环形的商业服务带。就近设置的商业街和产业园区可提供上万个就业岗位，方便居民就业，也大大降低了居民的出行成本。

1.5 规划原则 5：新羌风特色的风貌传承

规划坚持文化传承、民族特色的原则，按照凸显新县城羌族风貌的要求，通过建筑风格控制策略，对原生、传承及现代羌风建筑在空间上进行分区布局，并在此基础上对单体建筑按照“公建重于居住、边角重于内部、底顶重于中段、小品重于建筑”的原则进行控制，使整个县城既具有统一的羌族风貌，又拥有丰富的建筑风格（表 1）。

表 1 北川建筑风貌控制手法及类型

设计手法	风貌类型	设计定位
原貌体现	原生羌风	焦点建筑，主题街区
精华传承	传承羌风	背景建筑，建设主体
现代演绎	现代羌风	焦点建筑，点睛之笔

来源：北川羌族自治县灾后重建总体规划（2008–2020），中国城市规划设计研究院。

1.6 规划原则 6：绿色低碳的生态技术

规划始终将国家节能减排政策作为规划工作的指导方针，将节能减排理念贯穿于规划全过程，在规划布局、专项规划、建筑控制等环节通过工程措施、新技术应用等将节能减排落实到规划建设的实处。具体来说，规划通过优化布局，提高绿化水平，降低热岛效应；通过设置严格的准入门槛，提升产业能级，实现工业节能减排；通过慢行优先的理念以及绿色步行体系的设计，实现交通节能减排；通过雨水渗透、智能电网、三网合一等适宜技术，保护生态环境并避免重复建设；通过在将近 70% 的道路使用 LED 节能灯具，建筑设计严格执行国家绿色建筑标准，促进清洁能源的利用以及建筑的节能减排。

2 后重建时代的规划评估

灾后重建总体规划对安置受灾群众、落实援建项目以及推动城市功能的尽快恢复起到了很好的指导作用，充分体现了先进理念与实施措施的结合，规划方案与项目建设的结合，专项规划与工程建设的结合，规划控制与建设管理的结合，政府决策与民众意愿的结合，规划布局与城市设计的结合。经过两年的规划建设，2011 年 2 月 1 日北川新县城开城，标志着北川新县城正式启用。北川新县城现状建设用地面积达到 4.59 km^2，现状人口 2.6 万人（图 5）。

然而新的发展形势以及发展条件的变化将直接或间接导致北川发展定位与空间布局的改变，与此同时，由于灾后重建总体规划编制时的特殊背景以及局限性，面对未来发展，该规划已经无法指导后重建时代北川进一步长远的可持续发展。具体来看，北川面临定位提升的契机以及缺乏人气的挑战。

2.1 规划评估 1：当代文化遗产

北川自 2008 年汶川特大地震以来的抗震救灾和灾后重建，充分体现了以爱国主义为核心的民族精神和以改革创新为核心的时代精神。与此同时，北川作为中国唯一的羌族自治县，其对羌族文化的传承与弘扬充分体现了社会主义核心价值体系。

2008 年 11 月 16 日，温家宝总理在视察北川时提出，要将新县城建设成为“城建工程标志、抗震精神标志、文化遗产标志”。当前，东岸城区框架已经形成，首批居民已经入住。东岸城区在国内大师的通力协作下，规划水平高、设计理念新、建筑质量好，成为城建工程标志；建设动员范围广、投入力度大、统筹效率高，成为抗震精神标志；民族气息浓郁、地方特色鲜明、建筑风貌统一，成为文化遗产标志。

基于以上两点特征和温总理对北川“城建工程标志、抗震精神标志、文化遗产标志”的要求，北川应当充分挖掘自身的文化价值，以当代文化遗产为要求和指针，在下一步发展中处理好保护与发展之间的关系。

2.2 规划评估 2：“冷美人”

北川新县城的建设基本完成了温总理提出的“安全、宜居、繁荣、特色、文明、和谐”的规划标准，然而，北川整体经济实力尚不强劲，工业发展竞争力不足，城乡差距较大，北川需要在今后发展中进一步发展经济，提高城镇化水平。与此同时，虽然北川东岸城区基本建成，但集聚人口较少，缺乏人气，成为一个“冷美人”，在北川中心城区进一步的发展中同样需要通过触媒的打造、人气的聚集、经济的发展来创造一个繁荣的县城。

具体来说，在产业发展、就业岗位提供、住房建设、财政可持续等方面，北川均面临新的挑战。

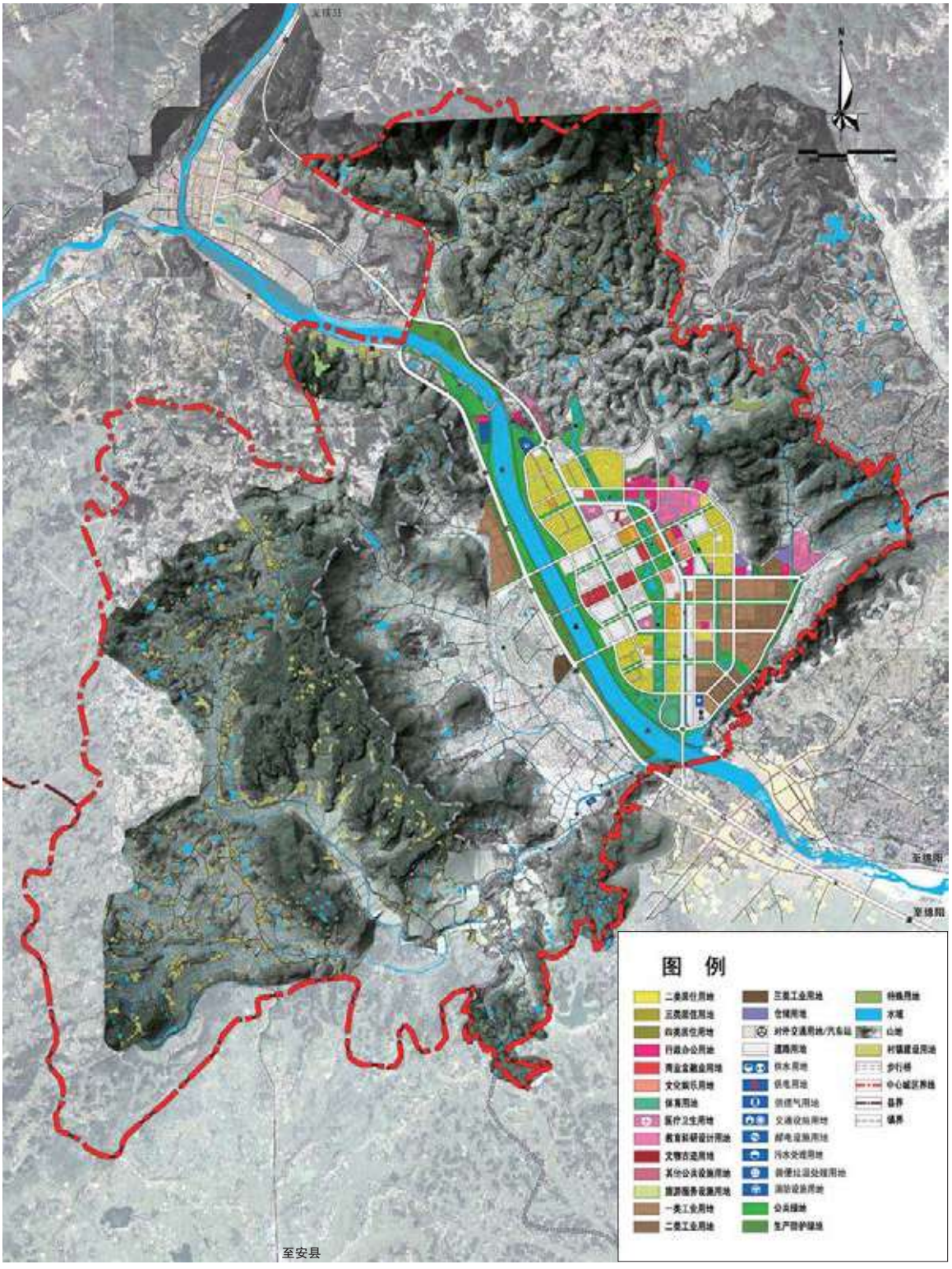

图 5　北川羌族自治县县城城市总体规划土地使用现状图

来源：北川羌族自治县县城城市总体规划（2011—2030），中国城市规划设计研究院

2.2.1 用地及生态条件不支撑工业成片发展

根据四川省主体功能区规划，北川属于国家级重点生态保护地区，不适宜发展对环境污染较大的工业。与此同时，根据坡度、地质灾害等的综合分析，在当前永昌镇 22 km^2 范围内仅有 10.86 km^2 可以建设，其中已建面积 5.53 km^2，尚有 5.33 km^2 土地可以开发（图 6，表 2），可用地少，也不适合对用地要求较多的工业成片规模化发展。

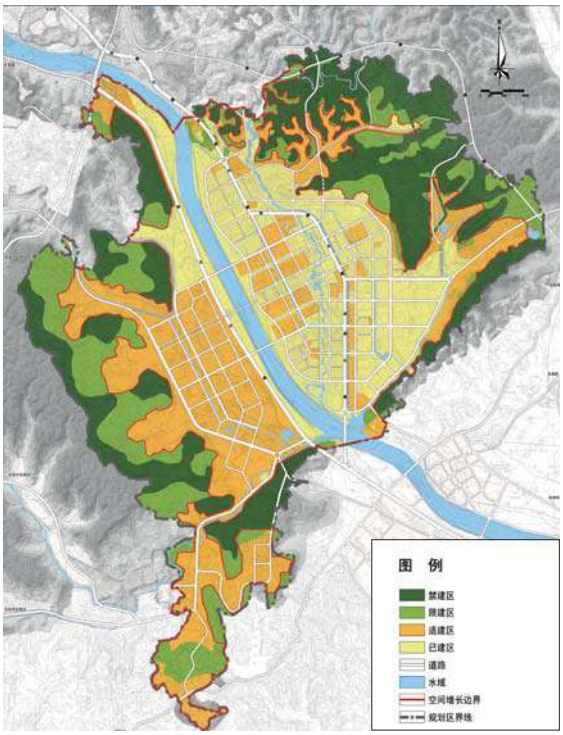

图 6 北川中心城区土地使用适宜性分析
来源：北川羌族自治县县城城市总体规划（2011–2030），中国城市规划设计研究院

表 2 北川中心城区建设用地适宜性分析

分区类型	面积（hm^2）	比例
适建区	1 086	49%
限建区	471	21%
禁建区	504	23%
水域	141	6%
合计	2 202	100%

来源：北川羌族自治县县城城市总体规划（2011–2030），中国城市规划设计研究院。

2.2.2 本地工业企业发展潜力大

在北川灾后重建以及产业复兴过程中，外地企业起到了很大的作用。但是在对当前山东产业园中入驻企业的分析可以发现，从长远来看，本地工业企业发展潜力更大。在 33 家已入园企业中，外来嵌入型企业 8 家，已开工 6 家，主要为机械类企业，但普遍存在地均产值低的问题，调查企业的产出仅 13 万元/mu（图 7，图 8）。而立足本地企业、资源或者市场的企业发展势头均较好。立足本地企业类的企业共 5 家，已开工 3 家，在产业链上与周边长虹等大企业有分工协作关系，主要生产电子器件。立足本地资源类的企业主要为食品药品类企业，共 12 家，目前已开工 4 家。立足本地市场类的企业主要为材料类企业，共 6 家，目前已开工 3 家。与此同时，立足本地企业与资源的企业大多属于劳动密集型企业，对促进就地城镇化也有较大的推进作用。立足本地市场类企业的地均产值较高，是促进产业集约发展的重要支柱。

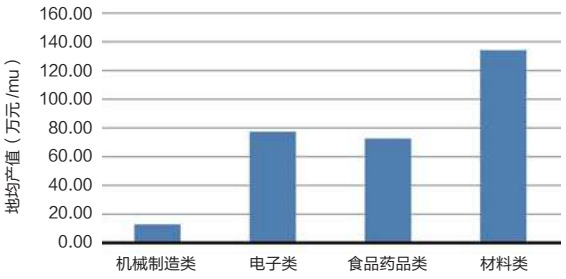

图 7 北川山东产业园区 2011 年各类企业地均产值
来源：北川羌族自治县县城城市总体规划（2011–2030），中国城市规划设计研究院

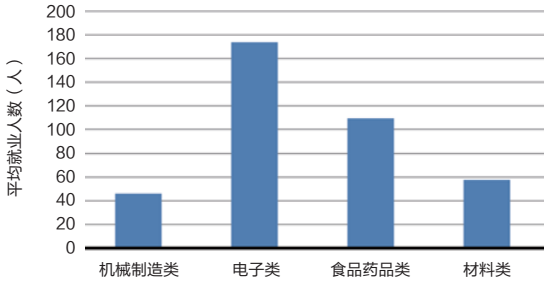

图 8 北川山东产业园区 2011 年各类企业平均就业人数
来源：北川羌族自治县县城城市总体规划（2011–2030），中国城市规划设计研究院

2.2.3 就业岗位不足

当前新县城工业园区的发展以及商铺的建设并没有很好地起到吸纳劳动力，从而促进本地城镇化的目的。山东工业园区 2011 年就业人数仅 1 408 人，而平均每个商铺解决就业仅 12 人，就业岗位的缺少与类型上的趋同，都在不同程度上制约着城镇人口的就业状况。

从另一方面来看，当前北川县域非农业就业仍以外出就业为主，全县外出就业人数占就业人数的 35.7%，而新县城外出就业人数占就业人数的 77.3%，其中省内市外就业人数占多数（图 9，图 10）。因此，北川需要通过工业、旅游等基础就业岗位的发展带动人气的集聚。

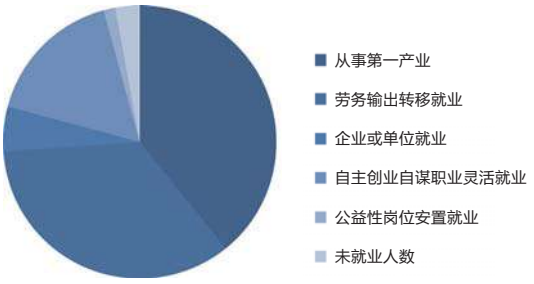

图 9　2011 年北川全县劳动力就业情况
来源：北川羌族自治县县城城市总体规划（2011—2030），中国城市规划设计研究院

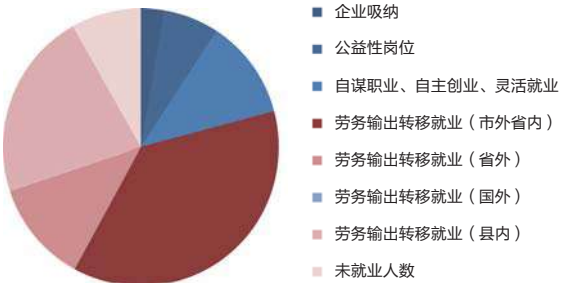

图 10　2011 年北川新县城劳动力就业情况
来源：北川羌族自治县县城城市总体规划（2011—2030），中国城市规划设计研究院

2.2.4 居住开发强度偏低

北川东西岸城区现状已建居住用地 87.60 hm^2，包括小学和幼儿园用地 7.81 hm^2，主要集中在安昌河东岸地区，占规划居住用地的 43.80%。当前居住片区以行列式多层住宅为主，容积率在多层建筑高度的限制下已做到极致，基本在 1.5 左右（表 3）。而中心城区

表 3　现有居住区相关经济技术指标

居住区	用地面积（hm^2）	容积率	建筑密度
白杨坪片区	17.13	1.47	—
红旗片区	21.87	1.49	30
温泉片区一期	28.42	1.48	31.46
温泉片区二期	20.75	1.39	31.46

来源：北川羌族自治县县城城市总体规划（2011—2030），中国城市规划设计研究院。

10.8 km^2 的可建设用地，按照 25%~30% 作为居住用地，其容积率按照 1.5 控制，仅能容纳 5.0 万 ~8.5 万人。

随着北川影响力的进一步扩大以及新型城镇化进程的加快，北川中心城区将进一步集聚人口。北川中心城区的发展将不得不面临人口规模快速增长与有限的居住用地存量之间的矛盾，未来人口承载的压力将不断加大。同时居住开发强度低也直接影响政府的财政收益，不利于财政的可持续发展。

根据土地经济学的解释，在销售价格既定的情况下，容积率越低，土地出让费也越低。相比周边县市安县，其住房销售单价为 3 300~3 400 元 /m^2，而土地出让费可以达到 200 万元 /mu，而北川的土地出让费大约为 100 万元 /mu（图 11）。因此北川需要考虑在尚未开发建设的地区，适当增加居住用地的比重以及开发强度。

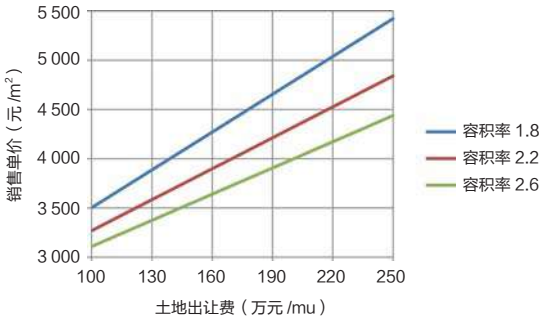

图 11　土地出让费、容积率、销售单价之间的关系
来源：北川新县城土地开发强度研究，中国城市规划设计研究院

2.2.5 财政压力巨大

北川灾后重建靠投资拉动，短期内拉动了经济的发展。而在后重建时代，北川得到的投资正在逐步减少。震前固定资产投资额占地区生产总值的比重在 50%~70%，2009 年固定资产投资额是地区生产总值的 5 倍，2010 年是 4.5 倍，而 2011 年仅为 1.5 倍（图 12）。

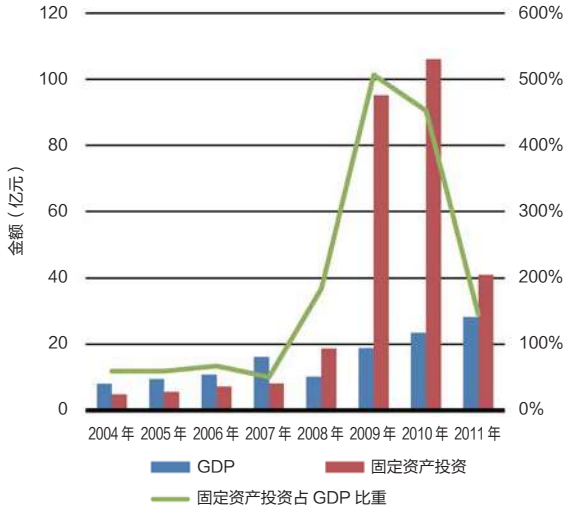

图 12　2004–2011 年北川 GDP 与固定资产投资之间的关系
来源：北川羌族自治县县城城市总体规划（2011–2030），
中国城市规划设计研究院

与此同时，北川政府欠银行的债务已达 100 多亿元，而 2010 年财政收入为 3.1 亿元，2011 年财政收入为 4.4 亿元，北川财政的可持续发展面临严峻考验（图 13）。

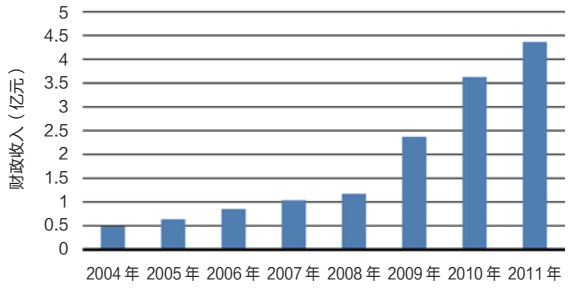

图 13　2004–2011 年北川财政收入
来源：北川羌族自治县县城城市总体规划（2011–2030），
中国城市规划设计研究院

根据低谷效应理论的解释，固定资产投资的投资效益系数（国内生产总值增加额 / 固定资产）较低，投资总额巨大的基础设施投资之后（花了后 5 年的资金），带来的后续投资减少。而投资回报周期较长，回报周期的时间就是低谷效应的时间。弥补低谷效应需要发挥投资所产生的效应以及投资之外的其他增长。

随着后重建时代的北川进入正常的城镇发展路径，随着山东省各类对口援建性项目的逐步减少，投资对经济发展的拉动作用将减弱，北川进入增长瓶颈期，需要寻找经济可持续发展的新动力。

3　后重建时代的总体规划

根据当前北川发展面临的机遇与挑战，在北川新一轮的总体规划中，应当重点关注城市定位、发展路径、发展框架等内容。在城市定位中需要追求持续的繁荣发展，在发展路径上需要在区域型产业中寻找突破口，而在发展框架上需要制订分区发展的不同政策。

3.1　城市定位

灾后重建总体规划中对北川的城市性质定位为“北川政治、经济和文化中心，川西旅游服务基地和绵西产业基地，现代化羌族文化城和生态园林城”。而随着震后对北川关注度的迅速提升，其地位已经远远超过一个普通城镇，成为全国乃至世界关注的焦点。因此需要对北川未来的定位进行重新思考，对北川城市定位的思考主要聚焦于以下四个方面。

3.1.1　国家当代文化遗产、羌族文化名城

北川是汶川特大地震这一重大事件的重要物质载体，是羌族文化的重要物质载体，是反映中国人民伟大的抗震救灾精神的重要空间场所。同时，北川又是一座异地重建的新城，充分体现了羌族文化与现代文化的结合，体现了“现代羌族文化城”的深层内涵，基本达到了“城建工程标志、抗震精神标志和文化遗产标志”的目标。北川建设成为规划师与建筑师合作的典范（李晓江，2011），成为现代小城镇建设的典范，具有极高的文化价值。如果加上成为抗震纪念馆的老北川县城，新老两个县城联合起来应该按照“当代文化遗产”的目标来定位。

3.1.2　四川省旅游基地

北川发展旅游具有明显的区位优势以及资源优势。从旅游区位上来看，北川中心城区位于九寨沟北环线、羌文化旅游走廊和汶川地震遗址参观线三条大龙门山旅游试验区精品旅游线路的交汇点，今后随着九环线改道桂溪 – 曲山 – 永昌，北川的旅游区位优势将进一步体现。从旅游资源上来看，北川新县城及周边地区拥有的传统羌族文化、大禹文化、生态资源，以及当前的抗震文化、城镇规划与建设的资源，构成了多层次多样化的旅游资源，其旅游职能已经不仅限于灾后重建总体规划中描述的服务职能，将成为新的旅游目的地。旅游在北川今后的发展中，应当成为北川发展的主要动力之一，推动北川中心城区的旅游从目前观光学习型旅游进一步向商务

型、休闲型旅游发展，而这种商务型、休闲型旅游将会进一步突破川西北的范围，将北川的影响力延伸至全国范围。

3.1.3 绵阳西部特色产业基地

北川中心城区从宏观区位上来说是绵阳西部及绵安北城镇发展带上的带动极核，从北川自身来说，承担着由山区经济向山区平原经济综合发展的重任，是北川实现工业化、城镇化目标的重要载体。北川当前的产业发展面临着内生型及嵌入型产业发展的矛盾。外来嵌入型企业虽然有高新技术企业，但与地方产业、资源关联性弱，对地方经济的带动作用尚未显现。内生型企业立足本地市场与资源，是带动北川经济发展的主要动力。因此，北川需要立足于该类企业的培育，促进产业的特色发展，以工业化促进城镇化，以城镇化推进工业化，以工业发展作为近期发展的抓手，促进人口集聚，以城镇化作为远期发展的目标，促进工业化的发展。

3.1.4 北川县域政治、经济、文化中心

作为全国唯一的羌族自治县的县城，北川中心城区将成为北川乃至整个川西羌族聚居地区重要的政治、经济、文化中心，川西山区通往平原地区的重要门户和节点城市。

基于以上思考，在后重建时代的总体规划中突出当代文化遗产的作用，强调旅游等产业对北川发展的带动作用，秉持城镇繁荣发展、旅游弹性发展、工业集聚发展的原则，将北川城市性质定义为“国家当代文化遗产、羌族文化名城；四川省旅游基地；绵阳西部特色产业基地；北川县域政治、经济、文化中心”。

3.2 发展路径

城市产业可分为本地型产业以及区域型产业两种类型。本地型产业，如工业、居住、一般服务业等，由于用地条件的约束，吸引的是数量有限的就业人口、居住人口。区域型产业，如会议、学习、旅游等，对用地要求较小，对环境影响较小，但可以吸引众多的论坛型人口、学习型人口和旅游型人口，对于欠发达地区有着良好生态以及文化禀赋的县城发展，是一条可供选择的发展路径。

为了集聚人气，促进城市的可持续发展，北川新县城需要从区域型产业中寻找突破口。因此，在后重建时代的北川总体规划中，基于对北川城市定位的考虑，策划了论坛型、学习型以及休闲型的区域型产业，以区域型产业的发展促进城市的可持续发展。

3.2.1 论坛型产业

论坛型产业本身所需用地不多，但可以带动周边住宿、餐饮、旅游等产业的发展。同时论坛型产业较少受到季节变化的影响，可以为城市发展带来持续的人流，因此已经逐步成为风景优美的中小城市重点关注的产业之一。

海南博鳌以举办博鳌亚洲论坛为起点，带动了高端会展经济、旅游等产业的发展，通过会务、酒店餐饮和客房、高尔夫、景区观光、温泉、机场等一系列服务设施建设，博鳌正在成为商务会议和旅游度假的圣地。博鳌地区当前拥有家庭旅馆 40 多家、五星级酒店 3 家、四星级酒店 5 家，以及 2 个高尔夫球场、1 座机场，每年举办近 400 场会议。2010 年博鳌地区接待游客达 280 万人次，平均每天接待中外游客超过 7 500 人次。

随着北川新县城人居环境以及影响力的提升，在北川新县城举办的区域性会议也呈现越来越多的趋势。为了适应该趋势以及提升北川区域职能的需要，规划在新县城西岸城区南侧建设体现羌族风韵的区域性会议中心，配建高端宾馆、康体休闲等功能。其占地 27.7 hm^2，位于新县城入口处及设施链关键节点部位，有利于塑造良好的城市入口景观，有利于带动西岸南部地区发展，同时不位于主要轴线上，有利于弹性建设。

3.2.2 学习型职能

学习型职能的建设基于该城市独特的历史要素、典范的空间实践和先进的规划建设理念，通过自上而下的组织学习或者自下而上的自发学习，学习型区域职能的培育将可能带动数倍于本地常住人口的人流，从而带动相关产业的发展。

井冈山作为百家爱国主义教育示范基地和中国十佳优秀社会教育基地，总人口仅 14.8 万余人。其学习型职能的建设，一方面通过中国井冈山干部学院这一载体，自上而下地对党政干部、企业经营管理者、专业技术人员和军队干部进行培训，另一方面，积极吸引自下而上的自发学习人群。2014 年 1—4 月份，井冈山接待旅游者 219.08 万人次，是井冈山常住人口的 15 倍之多，实现旅游收入 15.09 亿元。

北川新县城的选址与建设，充分考虑了防灾减灾的要求，是灾后重建的标志性工程。同时，北川先进的城市规划理念、紧凑的空间布局、现代羌族的建筑风格、绿色低碳的生态技术等也正在逐步成为其他城市学习的榜样。北川已经被中宣部确定为“三基地一窗口”（爱国主义教育基地、社会主义核心价值体系的基地、开展民

族团结进步的宣传教育基地和展示中国发展模式、发展理念、发展道路的窗口）。北川应当以此为契机，积极落实相关政策措施，成为宣传系统红色旅游路线以及“三基地一窗口”的学习基地，成为建设系统示范型城镇的学习培训基地，成为文化旅游系统民族文化、非物质文化遗产的学习基地。

3.2.3 休闲型职能

随着人们生活水平的提高，度假休闲产业将会得到迅速的发展。对于欠发达地区的中小城镇而言，其拥有的独特的文化资源、优良的生态环境，将有助于其在后工业化时代发挥后发优势，通过旅游休闲带动其可持续发展。

新西兰城市纳皮尔市与北川类似，也是一座经过灾后重建而得到复兴的小城镇。1931 年纳皮尔市发生的 7.8 级地震摧毁了大部分商用建筑，重建已使它成为一座集中了大量 20 世纪 30 年代风格建筑的全球最新城市。依托该重建过程中所形成的全球唯一的装饰艺术城区，以及沿海的自然风光资源，纳皮尔市策划了丰富的节庆活动以及繁华的商业活动，吸引周边地区人群来此地观光消费，同时打造装饰艺术周末及布道团音乐会周末 (Mission Concert Weekend)。而与此同时，魅力城市生活以及城市品牌形象的打造，反过来推动了纳皮尔市第二产业的提升。

休闲型职能作为北川新县城今后需要重点发展的职能之一，需要以开茂水库、顺义河周边为中心，发展休闲度假旅游，将北川新县城发展成以休闲旅游、度假旅游为特色的旅游目的地。

3.3 空间框架

在功能布局上，中心城区形成 4 个功能片区，包括东岸以保护当代文化遗产、促进工业园区更新的城区，西岸宜居新城区，北侧开茂旅游度假区和西侧经开区新区（图 14）。

3.3.1 东岸

（1）保护当代文化遗产

规划将东岸范围划分为核心保护范围以及建设控制地带。核心保护范围包括东岸建成区（除了北川山东产业园区），面积 2.64 km^2。保护山水环、生态廊、休闲带、生长脊、设施链、景观轴的整体格局，保护大自由、小规整、疏密相间的空间肌理，保护羌风羌韵的建筑风格，保护一环两带多廊道的绿化布局，保护小街区密路网的道路布局，保护建筑、绿化与道路之间的空间关系，任何人不得非法改变或破坏现有状况、面貌与环境。

建设控制地带主要包括东西岸城区以及中心城区范围内的开茂旅游度假区，控制地带面积 11.2 km^2。保护并维护该范围内望山融丘、理水亲人的山水格局，保护周边山体的植被资源以及生态环境，新建建筑必须服从于现在的空间格局与建筑肌理，在建筑风貌、建筑高度、空间肌理等方面必须与保护范围内的风貌与建筑相协调，禁止建设破坏原有羌风羌貌或者阻挡城市与山体视线廊道的建筑或构筑物。

（2）促进工业园区更新

四川北川经济开发区现状虽然入园 33 家企业，但多数未投产建设，大多数企业占用北川东岸城区原本就很紧张的土地资源，产出效益较低，对土地资源是极大的浪费。

规划逐步对北川山东产业园区进行更新。促进云盘南路东侧企业的局部调整，形成三条带状的布局。沿永昌大道形成企业办公带，以现代羌族的建筑风格替代当前的工业建筑风格，形成沿永昌河的良好景观；同时沿云盘河形成生产、展示、体验产业带，以 2.5 产业替换当前的第二产业，促进北川中心城区产业升级；沿蒋家河形成休闲旅游带，推动北川旅游业发展。

3.3.2 西岸：宜居新城区

西岸城区规划建设用地 289 hm^2，居住人口 5.5 万人。规划建设宜居新城区。

规划延续东岸景观轴线，以河西中央绿带，两侧布局商业作为河西地区轴带的空间布局，建筑高度可在基本控制高度的基础上增加 30%，以凸显轴带空间形象。在其两侧的居住用地宜进行商住混合开发，丰富轴线两边活动以及景观，在其端头营建高端旅游设施，提升北川旅游品位。

规划在西纵三路西侧结合桂花河水系建设绿带，作为西岸居民户外活动的主要场所，在西纵三路东侧建设为当地居民服务，兼具旅游服务功能的商业服务设施带，从而构建商业绿化水街。西纵三路商业绿化水街与绿化景观轴线相交，形成西岸城区十字形的公共活动空间（图 15）。

规划形成 4 个以多高层为主的居住单元，容积率为 1.8~2.5，层数以 6~12 层为主，局部地区可以超过 12 层。其容积率在灾后重建总体规划最高 1.8 的基础上适度提升，以达到集约紧凑利用土地的目标。另沿西山二路形成中低密度开发的居住单元，平均层数 2 层，高

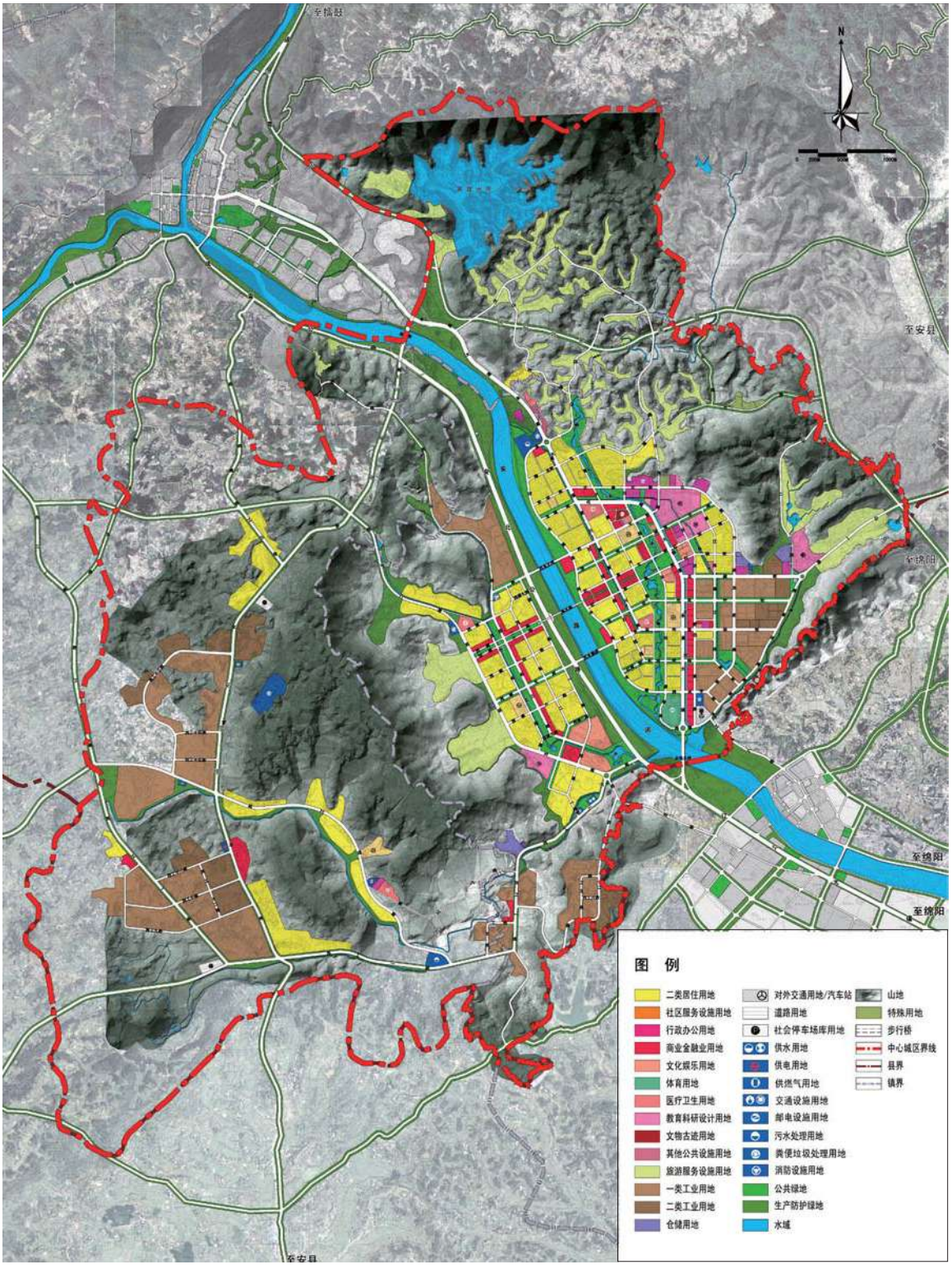

图 14　**北川羌族自治县县城城市总体规划土地使用规划图**

来源：北川羌族自治县县城城市总体规划（2011—2030），中国城市规划设计研究院

图 15　西岸城区十字形公共活动空间
来源：北川羌族自治县县城城市总体规划（2011—2030），中国城市规划设计研究院

度小于 15 m，低密度强度控制，打造宜人的居住环境。在居住单元周边结合公共空间配置一所中学、一所小学、一所医院。

3.3.3　开茂旅游度假区

北川新县城旅游用地 192.39 hm^2，其中东岸 145.74 hm^2，主要位于北侧的开茂旅游度假区中。规划秉持弹性发展、整体开发的原则，因地制宜建设开茂旅游度假区（图 16）。

规划仅圈定发展用地，不规定发展时序，以项目为导向，建立专家会商制度，控制北川旅游发展与布局，促进旅游的弹性发展。规划围绕特定山头，以主要道路为界线，将旅游用地分为 8 个开发单元，每个单元的建设用地面积控制在 10~20 hm^2，促进以开发单元为单位的整体开发。

规划结合水库、温泉等优势资源，合理设置旅游开发主题，打造融入羌族特色，结合山水文化的四川省休闲度假旅游基地（表 4）。

图 16　新县城北部旅游休闲度假片区总平面图
来源：新县城北部旅游休闲度假片区城市设计，中国城市规划设计研究院

表 4　旅游开发主题及开发项目建议

开发地点	开发主题	项目建议
水库周边板块	休闲主题	生态农庄、度假小镇、高星级宾馆等
顺义河周边	度假主题	小型娱乐休闲度假设施、传统农业观光旅游度假设施、温泉度假疗养设施、商业地产等
云盘山东侧	文化主题	度假酒店、文化休闲设施、演艺中心、文化创意设施等
河西板块	高端定位	高端休闲会所、高端度假旅游

来源：北川羌族自治县县城城市总体规划（2011—2030），中国城市规划设计研究院。

3.3.4　经开区西区：分期建设，特色发展

规划在逐步对北川山东产业园区进行更新的基础上，择机启动经开区新区建设，共同形成四川北川经济开发区。其工业用地总面积 359.02 hm^2，城市建设用地面积 570 hm^2，其中东区 114 hm^2，西区 456 hm^2。

经开区新区建设秉持分期建设的原则，严禁分头开发，近期可以启动西岸南侧常乐地区的工业区建设，中期建设西南侧的工业组团，远期建设西北侧的工业组团，近期需要对未开发的工业组团进行控制。在经开区的工业准入上，发展适合自身市场、自身资源的产业，发展农特产品加工、文化旅游产品加工等产业，禁止发展占地大、耗能高、对环境有影响的产业。

4　结语

截至 2013 年年底，北川新县城常住人口已经达到 3.1 万人，在 2011 年 4.59 km^2 现状建设用地的基础上，又有 0.25 km^2 土地出让，现状建设用地达到 4.84 km^2，建设用地规模已经突破 2008 年灾后重建总体规划的近期建设规模。0.25 km^2 的土地出让为北川政府获得了 2.9 亿元的土地出让收入，单位价格远远高于周边县市，显示了北川优良的人居环境对地方财政的推动作用。

与此同时，根据后重建时代总体规划的要求与引导，北川积极开发开茂水库等潜在的旅游资源，目前已经得到众多开发商的关注，准备在水库周边进行旅游休闲业态的开发。

作为汶川特大地震之后唯一异地重建的县城，北川新县城以投资作为动力，得到了跨越式的发展。然而在北川城市发展步入常态之后，作为和其他众多城市类似的欠发达地区的小城市，北川新县城如何得到持续的关注，继而走出一条可持续发展路径？

通过北川 2008 年以来的两次总体规划实践以及当前的城市实际发展发现，本土资源的挖掘与利用是可持续发展的基础，城市品质的营建是可持续发展的关键，而区域型产业的发展是推动该类城市可持续发展的主要路径之一。

欠发达地区的城市需要特色发展作为推动，而特色发展需要对本土资源的深刻理解与运用。在规划中，北川立足自身的旅游资源、文化资源、原材料资源以及市场资源，积极发展适合自身的旅游产业以及立足本土原料与市场的制造业，以旅游基地和特色产业基地作为城市发展的目标。

城市品质的营建包括先进的规划理念、紧凑合理的空间布局、清晰明确的空间架构、特色鲜明的空间风格以及绿色低碳的生态技术等。通过城市品质的营建，一方面可以为本地居民营建良好的人居环境，另一方面也可以吸引周边人口的入驻，吸引高端产业的入驻，提升城市整体价值。

区域型产业的发展需要以本地资源以及优良的城市品质作为基础，也需要创意的策划以及精心的实施。通过区域型产业的发展，用有限的空间吸引无限的人口，集聚人气，推动相关产业发展，促进城市的新型城镇化与新型工业化，实现可持续发展的目的。

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无锡太湖新城：面向实施的整体生态规划探索

司马晓　冯晓星　吴晓莉

摘要：

太湖新城是无锡城市空间由“运河时代”迈向“太湖时代”的战略节点，2010 年被国家住房和城乡建设部授予“国家低碳生态城示范区”称号后，经历了由传统新城建设到生态新城建设的转型提升。在既有完善的传统规划基础上，太湖新城建立了以生态咨询、指标体系为重点的生态规划编制体系，与总体规划、城市设计、控制性详细规划等传统规划编制体系相辅相成，兼顾技术策略与管理策略建立可操作的指标体系，促进本地产业与生态环境高效融合，通过精细化的城市设计直接指导新城空间建设，为生态新城的建设奠定了基础。本文通过对太湖新城生态规划背景及规划特色的介绍，探讨如何在“整体”视角下将“生态城”建设目标与内容融入现行规划体系，建立一条面向实施的有效路径，对国内其他生态新城建设具有一定的参考意义。

关键词：

无锡，太湖新城，生态规划

1　崛起的无锡太湖新城

1.1　无锡：历史文化悠久、经济繁荣的“太湖明珠”

无锡东距上海 128 km，西距南京 183 km，北枕长江，南临太湖，是中国近代民族工业的发源地，素有“小上海、鱼米之乡”的美誉，是国家级历史文化名城。市域总面积 4 788 km^2，常住人口 600 多万人；市区 1 659 km^2，常住人口 300 多万人。

作为长三角区域中心城市之一，无锡周边拥有中国最良好的自然环境、最优秀的人力资源、最活跃的市场基础和最发达的经济条件。2012 年 GDP 总额、人均 GDP、工业总产值、财政收入在长三角核心地区[1]分别为第 4 位、第 1 位、第 3 位、第 6 位，经济总量、工业产值等多项指标位列中国城市前十名，尤以创新、创意及物联网产业发展和环境治理、太湖生态修复而闻名（表 1）。

1.2　太湖新城：肩负“国家低碳生态城示范区”使命的城市新中心区

太湖新城总面积约 150 km^2，四面环水，背城面湖，东邻苏南机场约 1 km，北距老城区约 6 km，自然环境与交通条件优越，现状常住人口约 40 万人（图 1）。2002 年，无锡市新一轮城市总体规划首次提出“太湖新城”建设设想，通过新的城市中心建设拉开城市发展框架，落实“城市南进”战略。太湖新城是无锡城市空间由“运河时代”迈向“太湖时代”的战略节点。

2009 年，在全球提倡低碳减排、生态绿色的宏观背景下，温家宝总理视察无锡时提出：“把治理太湖和转型发展引向深入，加快建设生态城、旅游和现代服务城、高科技产业城、宜居城。”快速城市化过程中，无锡的城市发展受到越来越多问题的制约，如区域间城市的无序竞争、城市的蔓延式扩张、耕地资源的过度占用、流域治理与环境保护等。2010 年 7 月 3 日，国家住房和城乡建设部与无锡市人民政府签署《共建国家低碳生态城示范区——无锡太湖新城合作框架协议》，授予太湖新城“国家低碳生态城示范区”称号，赋予其一项重要使命，即通过生态新城建设探索一条转变资源能源利用方式、推动城市转型发展的路径。

1.3　规划引领太湖新城的发展与转型提升

从因循传统新城的发展模式开启新城建设，到新城承担生态示范城区建设的新使命，规划在太湖新城的建设中起到了重要的引领作用。

2002 年，规划部门首先开展了太湖新城概念规划国际咨询工作，对新城用地发展方向及核心区功能布局进行研究。基于概念规划国际咨询的成果，规划部门将核心思路融入了 2003 年完成的《太湖新城分区规划》。

2004 年，太湖新城启动核心区及沿湖地区概念规划，参考同类城市建设经验，制定了核心区土地综合利用和空间形态方案，并对沿湖地区开发提出了明确的设想。

1 包括上海、南京、杭州、宁波、苏州、无锡、镇江、常州、南通、扬州、泰州、绍兴、湖州、嘉兴、舟山、台州等 16 个城市。

表 1　2012 年长三角各地市综合实力排名

城市	GDP		人均 GDP		工业总产值		财政收入	
	亿元	排名	元	排名	亿元	排名	亿元	排名
上海	20 181.7	1	85 373.0	7	33 186.4	1	3 743.7	1
苏州	12 011.7	2	114 029.0	3	28 745.5	2	1 204.3	4
杭州	7 802.1	3	111 758.0	4	12 962.3	4	1 627.9	2
无锡	7 568.2	4	117 357.0	1	14 446.9	3	658.0	6
南京	7 201.6	5	88 525.0	5	11 437.8	6	733.0	5
宁波	6 582.2	6	114 065.0	2	12 155.1	5	1 536.5	3
南通	4 558.7	7	62 506.0	14	9 890.1	7	419.7	9
常州	3 969.9	8	85 040.0	8	8 970.3	8	379.0	11
绍兴	3 654.3	9	82 966.0	11	8 551.3	9	469.3	8
扬州	2 933.2	10	65 691.0	12	7 198.5	10	225.0	13
嘉兴	2 890.6	12	84 080.0	9	6 039.9	13	471.9	7
泰州	2 701.7	13	58 378.0	15	7 127.3	11	223.6	14
镇江	2 630.4	14	83 651.0	10	6 105.7	12	215.5	15
湖州	1 664.3	15	63 714.0	13	3 333.8	15	246.9	12
舟山	853.1	16	87 883.0	6	1 199.8	16	133.5	16
台州	2 911.3	11	49 438.0	16	3 530.8	14	408.9	10

来源：《2013 年江苏省年鉴》《2013 年浙江省年鉴》《2013 年上海市年鉴》。

图 1　太湖新城区位示意

来源：深圳市城市规划设计研究院有限公司

2005 年，太湖新城总体规划初步完成，并在随后 3 年内完成了市政工程、景观环境等专项规划，以及太湖新城的重要功能区、干道两侧、滨水地区的城市设计方案优化，并实现了控制性详细规划的全覆盖。

2007 年，太湖新城建设指挥部正式成立，标志着新城建设正式启动。太湖新城的各项规划也进入了实施阶段。

2009 年，温家宝总理视察无锡时将“生态城”作为无锡“四城”（即生态城、旅游和现代服务城、高科技产业城、宜居城）建设的首要目标。由此，太湖新城中

注入了更丰富的生态内涵，太湖新城的生态建设日益得到各级领导重视。

为了更好地落实太湖新城建设生态城的总体目标，无锡市于 2010 年分别委托英国奥雅纳公司、瑞典腾博公司完成了《太湖新城生态规划咨询》《中瑞低碳生态城示范区规划咨询》两项工作。其中，占地 2.4 km^2 的中瑞低碳生态城示范区于 2010 年规划“落子”于太湖新城中区，旨在借鉴瑞典生态城市建设的先进理念和成功经验，推动两国在发展绿色经济和低碳技术方面的合作。两项咨询工作形成了《无锡太湖新城——国家低碳生态城示范区规划指标体系及实施导则（2010–2020）》《无锡中瑞低碳生态城建设指标体系及实施导则（2010–2020）》两个重要的指标体系，以指导新城的开发建设（图 2）。

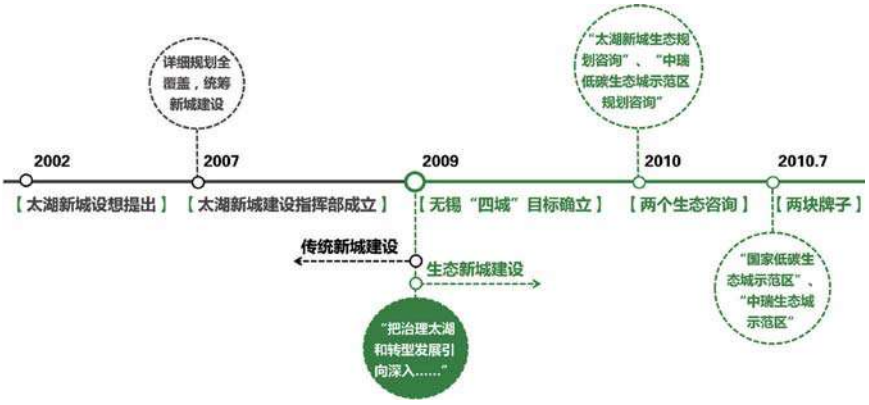


图 2　太湖新城大事记

来源：深圳市城市规划设计研究院有限公司

2011 年至今，太湖新城的规划编制管理工作，一方面基于太湖新城总体规划，完成了能源、慢行交通、环境景观等专项规划的编制；另一方面，以上述两个指标体系为指导，推动新城 10 个控规单元规划的调整，主旨是将生态指标落实到控制性详细规划层面，作为地块出让条件之一，直接指导新城的生态建设。

总体而言，太湖新城经历了由传统新城建设到生态城建设的转型提升，“低碳生态”赋予了新城新的建设内涵，以生态咨询、指标体系为重点的生态规划编制体系，与总体规划、城市设计、控制性详细规划等传统规划编制体系相辅相成，为新城整体转型提升奠定了基础（图 3）。

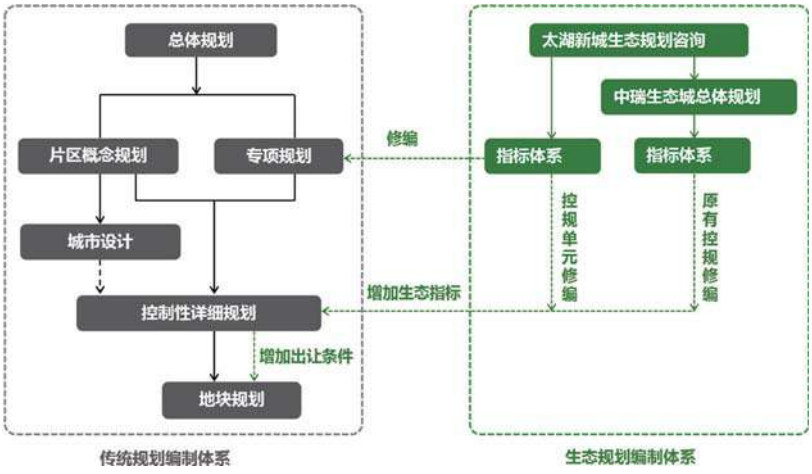


图 3　太湖新城规划总体框架

来源：无锡太湖新城建设指挥部办公室

2 空间规划

2.1 目标定位：城市的新中心区

新一轮无锡市城市总体规划将太湖新城规划定位为无锡新的城市中心，将承担无锡的行政商务中心、科教创意中心和休闲居住中心等重要功能，是一座开放式、生态型的现代化新城。根据新城总体规划，预计2020年新城总人口约100万人，提供就业岗位50万个左右。新城的城市建设用地9 980.69 hm^2，占总用地的66.59%；非建设用地5 019.31 hm^2，占总用地的33.41%。太湖新城的人均建设用地达到了99.8 m^2。

其中，居住用地2 543.9 hm^2，占城市建设用地的25.49%；公共设施用地2 415.25 hm^2，占24.20%；工业用地567.92 hm^2，占5.69%；仓储用地23.78 hm^2，占0.24%；对外交通用地7.83 hm^2，占0.08%；道路广场用地2 079.11 hm^2，占20.83%；市政公用设施用地202.35 hm^2，占2.03%；绿地2 140.55 hm^2，占21.45%（图4）。

2.2 城市组团：三大组团功能明确

太湖新城以华谊路和蠡湖大道为界，自东往西将太湖新城分为功能明确的三大组团。

东区约23 km^2，以太湖国际科技园为载体，重点建设国家传感信息中心、高新科技研发园、大学科技园、软件园、数码设计园、创意产业园。

中区是整个太湖新城最为重要的组成部分，面积约55 km^2，重点建设太湖新城金融商务中心、行政中心、文化中心和宜居社区。

西区72 km^2，以山水城旅游度假区、科教产业园为载体，发展创意产业和生态休闲旅游，规划建设为全国一流的大学城科技园、国内外有影响力的政产学研一体化示范区、旅游度假休闲基地、影视文化拍摄基地（图5）。

2.3 空间结构：一核、一带、两园两区

在充分尊重太湖新城依山傍湖、自然生态环境好的优势条件，太湖新城规划形成了“一核、一带、两园两区”的总体结构。“一核”即行政文化及商务金融核心

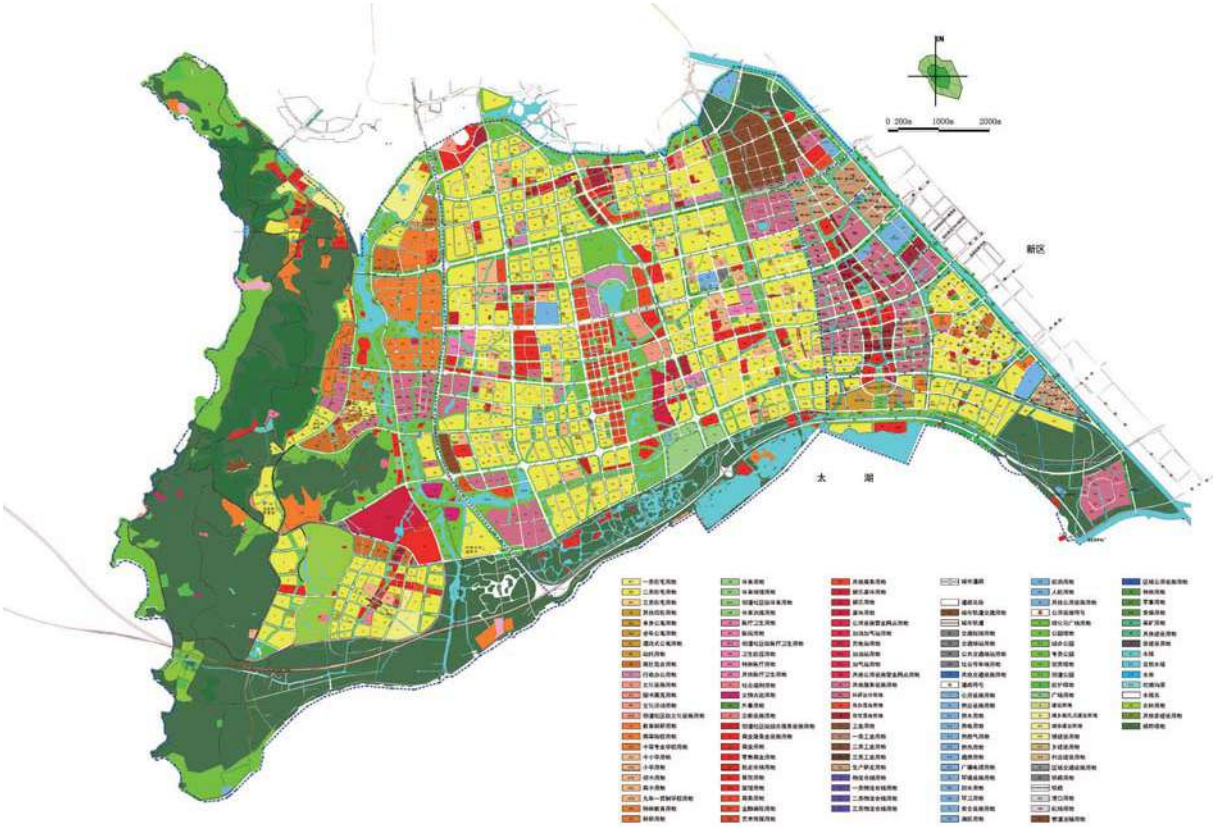


图4 太湖新城土地利用规划图

来源：无锡太湖新城建设指挥部办公室

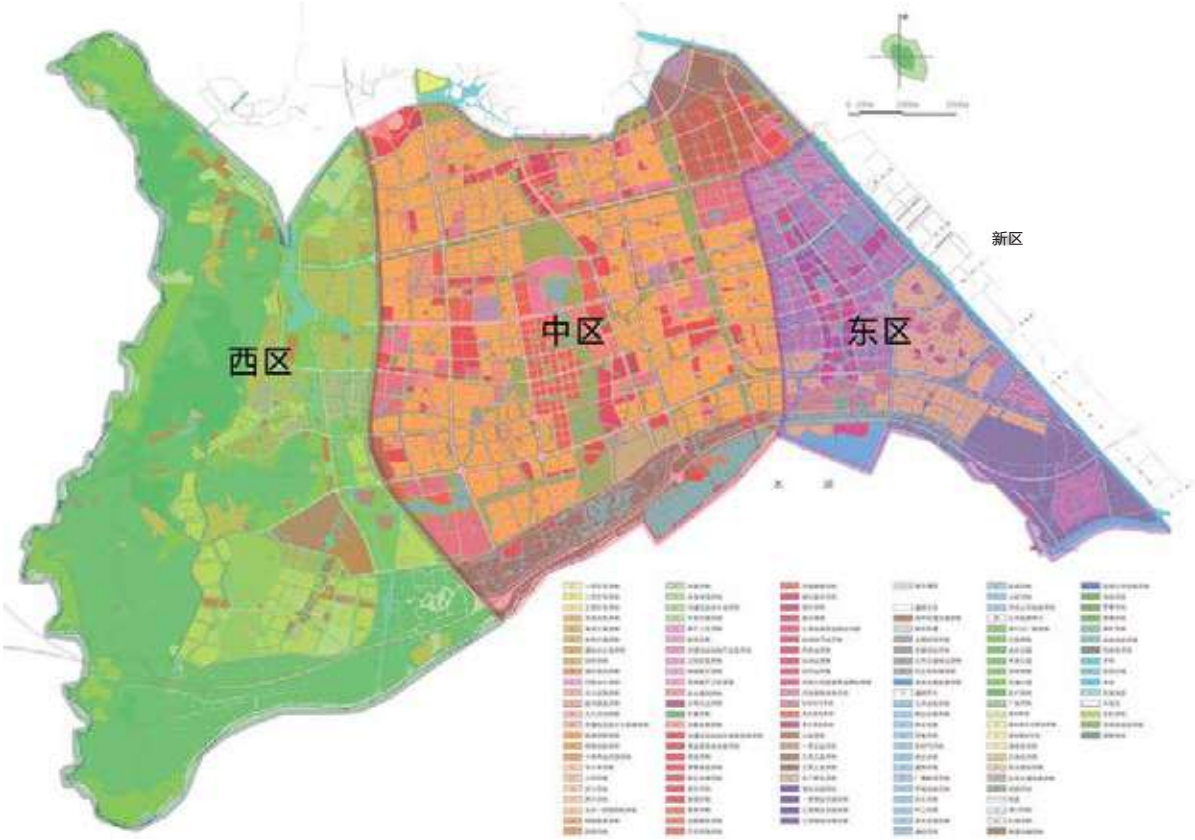


图 5　太湖新城功能组团规划图
来源：无锡太湖新城建设指挥部办公室

区，“一带”即环太湖山水风光带，“两园两区”即太湖国际科技园、科教产业园及核心区两侧的配套生活区（图 6）。

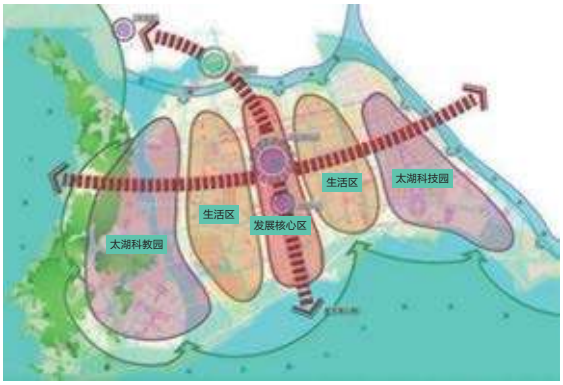


图 6　太湖新城规划空间结构图
来源：无锡太湖新城建设指挥部办公室

2.4　公共设施：“街道 – 睦邻中心 – 基层社区”三级配置

规划构建了“街道级 – 睦邻中心级 – 基层社区级”三级公共设施体系，三级公共设施服务的居民规模依次为 5 万 ~10 万人、3 万 ~5 万人、1 万 ~1.5 万人。其中，街道可设置街道办事处、街道体育活动中心、街道文化活动中心、街道卫生服务中心、街道养老院、街道社区公园等；睦邻中心可设置社区文体活动中心、社区商业设施、菜市场、邮政电信设施、再生资源回收站及公共厕所、公共停车场等；基层社区可设置居民委员会、文化活动站、社区卫生服务站、社区居家养老服务站、居民健身点、社区绿地等。社区中心建设过程中鼓励混合土地使用（图 7）。

2.5　道路交通：以轨道交通和快速交通为骨架、常规公交为主体

太湖新城规划采用方格网道路的组织形式，按照快速路、主干道、次干道、支路四级设置，形成“五横八

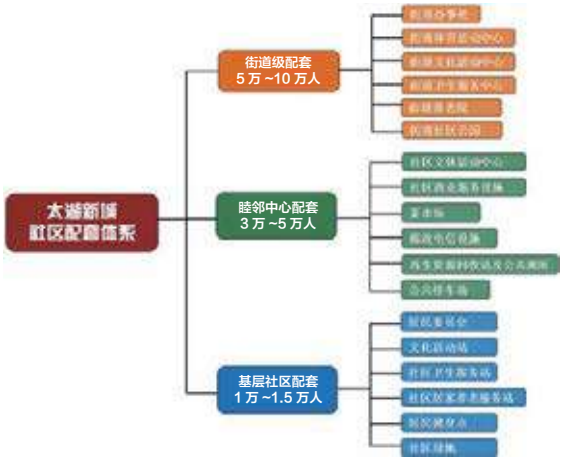


图 7　太湖新城公共设施级配体系

来源：无锡太湖新城建设指挥部办公室《太湖新城社区配套设施规划》

纵”的主干骨架路网，道路总长约 300 km。此外，规划将建设 1 条高速公路（环太湖高速公路）、3 条快速路（高浪路、蠡湖大道、华清大道）、2 条轨道交通（1 号线、4 号线）、6 条 BRT 线，串联新城人口密集地区，引导 TOD 开发模式（图 8）。

2.6　生态结构：形成以绿色廊道和河道水网为主的城市生态本底

太湖新城依托山、湖、林、湿地、河流等良好的景观生态资源基础，规划建设“三纵三横”的绿地系统。“三纵”为尚贤河湿地公园、长广溪湿地公园和蠡河景观带，“三横”为梁塘河生态景观绿地、吴都路景观带及太湖湖滨公园，绿色廊道间距约 4 km，穿插于太湖新城之中，提高了新城的排氧能力（图 9）。

图 8　太湖新城道路交通规划图

来源：无锡太湖新城建设指挥部办公室

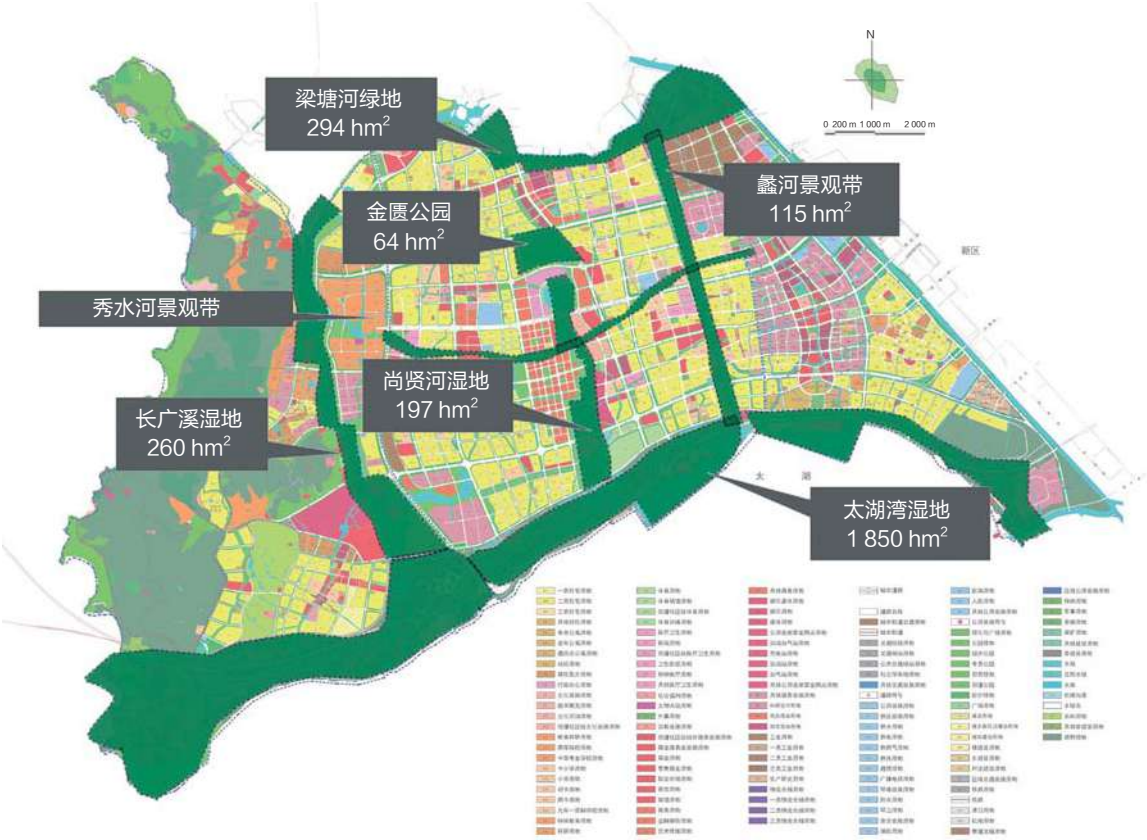


图 9　**太湖新城绿地系统结构示意图**

来源：无锡太湖新城建设指挥部办公室

新城对原有大小 300 多条河道予以保留整治，规划形成“四纵四横”主干水网格局，规划 2020 年河道总长约 280 km，河网密度 1.9 km/km^2，水面率 4.3%。在保护原有湿地水系的基础上，进一步打通太湖山水与城市的共生联系（图 10）。

3　生态建设策略

3.1　注重以生态节能为导向的城市功能空间布局

3.1.1　鼓励复合的城市功能

太湖新城规划鼓励形成产业功能复合多元的城市组团。依托现有的新能源产业、产学研机构、休闲影视的良好基础，发展以商业金融、科教创意、休闲旅游为主的第三产业，以及 IT、新材料、科技孵化等低碳产业，优化产业、公建与居住、用地与交通之间的关系，提高职住平衡指数，建设功能复合的城市组团。

规划倡导在多种功能相容的城市街区采用混合布局的土地开发模式，鼓励商住混合、商办混合，建议新城拥有混合功能的街坊比例超过 50%。

3.1.2　提高土地利用的集约度

适当提高轨道交通沿线及交通枢纽地区的开发强度，强化公交枢纽周边的用地功能混合，鼓励建设城市综合体或公共活动中心，80% 的公共活动中心结合公共交通枢纽建设。规划建议办公设施的综合总容积率控制在 2.5~6.0，商业设施综合容积率控制在 3.5~6.5。

合理开发利用地下空间，加强公共活动中心地区地下空间的联系。通过营造合理的街区尺度，有效降低机动车出行比例。

3.1.3　优化公共设施布局

实现基本公共服务设施空间布局的均衡化、服务功能均等化，加强公共服务设施建设并提高其可达性。优化

图 10　太湖新城水系综合整治

来源：无锡太湖新城建设指挥部办公室

基本公共配套设施布局，实现 97% 以上居民步行 500 m 可达幼托、80% 以上居民步行 500 m 可达小学、100% 居民步行 500 m 可达公共绿地，鼓励绿色出行（图 11）。

3.2　构建多层次的绿色交通网络

3.2.1　大力发展绿色公交体系

太湖新城以“公交都市”为理想，构建轨道交通、常规公交等多方式协调、换乘便捷的公共交通客运服务系统，实现公共交通便捷化及低能耗。

优化公交线路设置，在有条件的城市主干道两侧设置公交专用道，加大公共线路网密度，至少达到 3 km/km^2。优化公交站点设置，实现居民步行 500 m 可达。

3.2.2　建设全覆盖的慢行系统

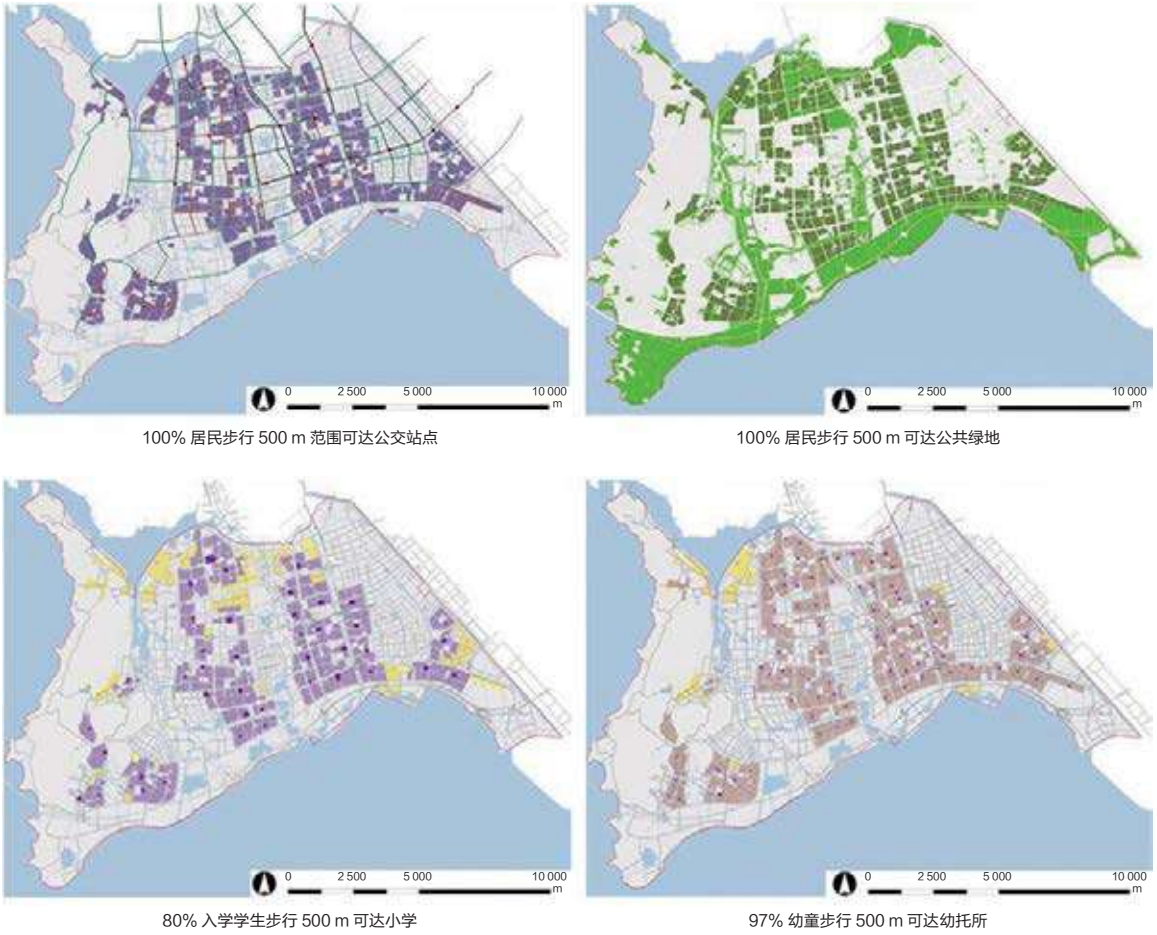
基于对外道路交通、新城轨道交通、水陆运输交通、公共交通、生态基础设施的综合叠加分析，规划形成水环境路线、生态体验、文化遗产、休闲旅游、感知城市五条专题慢行线路（图 12），路网密度至少达到 3.7 km/km^2。

以“确保每个单元内至少有 1~2 个换乘枢纽和 2 km 的服务半径”为基本原则，提出新城慢行换乘枢纽、慢行服务节点的基本框架。同时，将慢行系统深入到社区并与交通枢纽和大型公共建筑相结合，完善公用自行车租赁系统，提高绿色出行比例（图 13）。

3.3　推动以节能减排为目标的资源能源综合利用模式

3.3.1　建设共同管沟

太湖新城借鉴国外的建设经验，以全生命周期的理念，推动共同沟的建设。规划采用新型管材或综合管沟，在环核心区沿路建设共同沟，内置电缆、电信、给水干管、中水管等，总长度约 16.4 km。



100% 居民步行 500 m 范围可达公交站点　　100% 居民步行 500 m 可达公共绿地

80% 入学学生步行 500 m 可达小学　　97% 幼童步行 500 m 可达幼托所

图 11　生态城规划提高公共设施可达性

来源：无锡太湖新城建设指挥部办公室

3.3.2　可循环水再生技术 / 水资源

（1）提高非传统水资源利用率

规划建议供水管网损耗率不大于 5%，新建项目非传统水资源利用率达到 40% 以上，新建项目节水器具普及率达 100%，多方面降低水资源损耗。

（2）提高污水处理率

规划采用统一的中水回用系统，将各种排水经过物理处理、物理化学处理或生物处理达到规定水质要求，建议中水使用范围扩大到 30%。

（3）实现雨水高渗透零影响

新城道路及建筑采用雨水综合利用系统，通过透水地面的使用增加雨水下渗，保证雨水下渗量在开发前后保持不变，实现零影响。

3.3.3　废弃物处理技术

（1）固体废弃物排放减量化

新城提倡绿色消费，日人均生活垃圾排放量不大于 0.8 kg/（人 · d）；减少建筑废弃物产生量，结合新景观建设进行资源化利用实现土方平衡，建筑垃圾排放量不大于 450 t/hm^2。

（2）固体废弃物资源化利用

规划推行最大化废弃物再利用的策略，要求新城生活垃圾再利用率不低于 95%，建筑垃圾再利用率不低于 75%。

（3）固体废弃物分类收集及无害化处理

规划建议太湖新城垃圾分类收集及无害化处理率达 100%，并在中瑞生态城示范区内采用瑞典的先进技术，建设真空垃圾收集系统。

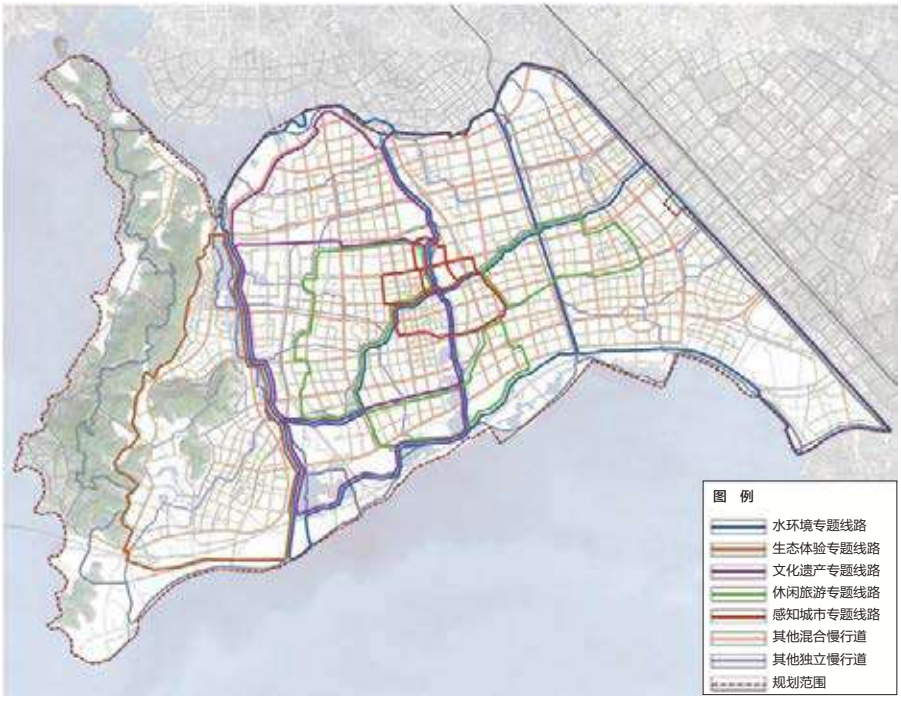


图 12　太湖新城慢行系统规划

来源：无锡太湖新城建设指挥部办公室

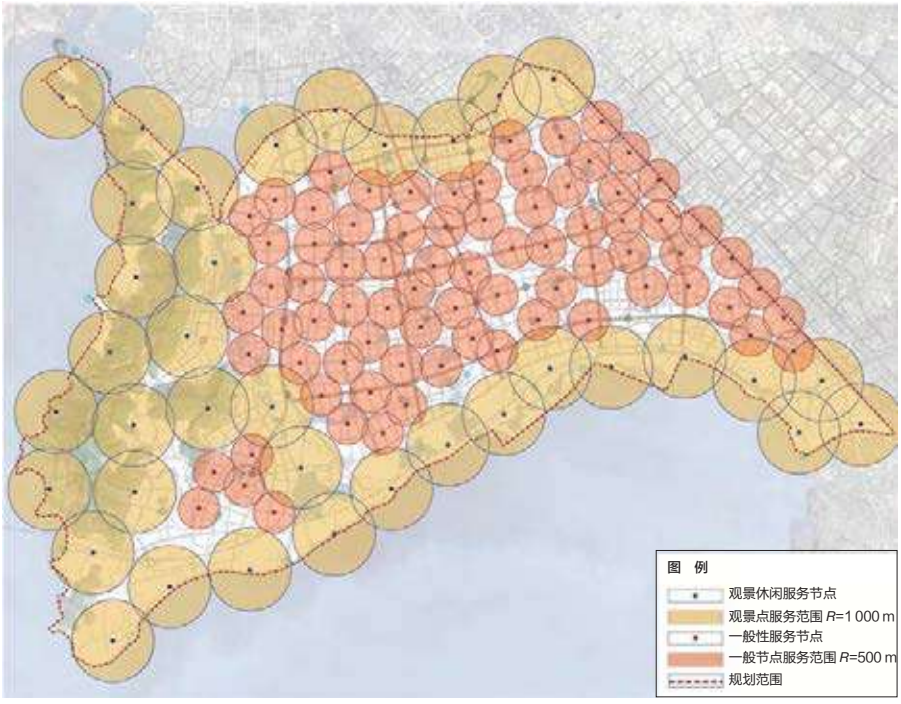


图 13　太湖新城慢行服务节点

来源：无锡太湖新城建设指挥部办公室《无锡太湖新城慢行交通系统规划》

3.3.4 能源节能再生技术

（1）新建建筑节能战略

考虑长江中下游地区的气候特点，规划要求建筑布局以南北向为主，鼓励自然通风设计。规划大量借鉴绿色建筑的相关先进技术，大量采用遮阳、保温、隔音等环保技术以降低单位建筑能耗，保证新建居住和公共建筑节能率不低于 65%。

（2）可再生能源利用战略

规划倡导大力开展可再生能源的循环利用，要求太湖新城和中瑞低碳生态城示范区的可再生能源利用率分别达到 8% 和 20% 以上，新建建筑可再生能源利用率达到 15% 以上。同时，太湖新城将推广应用分布式能源，依据区域建筑负荷提出分布式能源的利用范围、技术形式，并根据不同建筑性质要求使用不同的可再生能源组合形式或区域能源，提高能源利用效率（图 14）。

（a）分布式能源　（b）沿路太阳能路灯建设　（c）太阳能景观照明设施

图 14　分布式能源设置、可再生能源利用

来源：无锡太湖新城建设指挥部办公室

3.4 保护并改善生态环境

规划为太湖新城设定了严格的生态环境建设目标。要求新城监测空气质量高于或等于二级标准的天数达到 350 d/ 年；加强太湖的污染防治工作，使新城内地表水环境质量不低于三类水质标准；推行项目建设的环境影响评价工作，争取实现环境噪声达标区覆盖率达 100%。

推行多种形式、多层次的绿化环境建设，切实提高太湖新城的碳汇能力。提高绿化用地内的植林率，至少达到 45%；合理布置高大乔木，生产防护绿地、道路绿地、公园绿地植林率分别不低于 80%、70%、60%。积极推广建筑物的立体绿化，新建建筑按建筑性质设置一定的屋顶绿化比例要求。

以人为本，打造宜居的城市街区和建筑。对建筑布局采用风环境模型评估、热岛效应模拟评估、日照模拟评估等技术模型，打造“低热岛效应”、适宜风速的城市微气候，人行区风速不大于 5 m/s，住区日照达标覆盖率达到 100%，新建住区室外日平均热岛强度不大于 1.5 ℃。

3.5 全面推广绿色建筑

太湖新城的新建建筑均需按照《绿色建筑评价标准》《江苏省绿色建筑评价标准》进行建设，要求新建建筑 100% 通过绿色建筑一星级以上认证，其中，20% 通过绿色建筑二星认证，10% 通过绿色建筑三星认证。

住宅项目中积极推广太阳能、地热能的使用，非传统水源利用和节水器具、绿色环保建材的使用，要求绿色环保材料使用比例达到 100%，本地建材使用比例大于等于 70%。推广产业化住宅和智能化系统，要求产业化住宅比例不小于 10%，实行绿色施工，绿色施工比例达 100%。

4 新城建设的经济、社会和环境影响

4.1 新城建设时序

按照“先完善规划，后集中建设”的原则，2002 年规划部门着手开展太湖新城的规划研究工作，此后五年

时间内完成了太湖新城总体规划、控制性详规和各类分区、专项规划的反复论证、反复修改、反复深化。

按照“先产业培育，后城市功能”的原则，2005 年先期启动东西两翼产业园区的开发建设，为新城创造就业岗位、吸引人口奠定基础，截至 2009 年年底，东区太湖科技园建成 70 万 m^2 三创载体，吸引 60 余家研发机构和软件服务外包企业入驻；西区山水城依托大学城优势，建成北大无锡基地、恒华科技园、大学生创业园等科教基地，并吸引各类高新企业 70 余家，其中包含巨人网络、IBM- 中国云计算中心和软通动力等知名企业入驻。

按照“先基础设施，后地块开发”的原则，2007 年成立太湖新城建设指挥部，开始启动大规模建设，首先开展市政基础设施主干线路、骨干环境工程建设以及保障民生的安置房建设，拉开新城开发建设的大框架，同行适时启动了市民中心、博览中心、大剧院等重大功能性项目的规划建设，有利于城市新中心的形象快速形成，通过 3 年的时间，“道路成网、绿地湿地成片、功能性项目成型”的城市新中心框架基本建成，为接下来的社会性项目梯度建设奠定基础。

近两年，中区办公、住宅、商业项目按照“开发相对集中，配套适度超前”的思路有序推进建设：高端写字楼和办公用房优先在金融商务第一街区内选址；大规模的集中商业设施和城市综合体项目优先在市民中心和已建住宅项目的附近选址；住宅开发建设本着由近及远的原则，加大靠近老城区的地块出让力度，有序向南推进，确保了社区公共服务设施适度超前配套到位，同时保证使用效率。

4.2 新城建设的经济影响

太湖新城建设启动资金主要通过土地资源的开发整理获取，由政府融资平台向银行借贷先行获取建设启动资金，然后通过土地拍卖收益将钱还给银行。

4.2.1 建设投资及运营维护成本

2007–2012 年年底，太湖新城中区[1] 累计投入基础设施、环境工程、公建配套和安置住房建设的资金总计近 500 亿元。2011 年投入道路、管网、环境工程的运营维护的费用总计约 1.5 亿元，并随着建设量的增长逐年递增。

4.2.2 经济收益分析

2007—2012 年年底，太湖新城中区共拍出土地 4 500 mu，土地收益款达 140 亿元。与此同时，土地价值、产业发展、区域影响力提升等隐性收益逐渐凸显，2012 年中区住宅平均地价为 800 万 /mu，与 2004 年相比翻了两番。随着新城建设逐渐步入良性循环，大量社会资本进入新城参与商品住宅、商业综合体、办公楼等开发建设，同时还有民营资本投入建设学校、医院等公共服务配套设施。

4.3 新城建设的社会影响

4.3.1 原住民安置及其生活保障

太湖新城尚未启动建设以前，该区域内现状居住人口约 19.5 万[2]，以农村户口为主。居住用地以自然村的形式散乱分布，多是 20 世纪 80 年代修建的二层农村住宅，建筑质量相对较好。城市化推进过程中，首先，与基础设施、环境工程同步，规划建设一批高质量的安置房住宅小区，用于征地拆迁人口就近安置，解决其住房问题。其次，被征地农民一次性全部纳入城市社保，享受市民待遇。同时，制定了“街道留用地政策”，将新城出让土地中集体土地总量的 10% 划给街道用作留根资产，以集体经营的方式为当地居民带来分红或者就业机会。

4.3.2 吸引新住民

随着东西两翼产业园区、金融商务街区发展日趋成熟，大量人才涌入新城就业。同时，新城生态环境优良，生活配套日趋完善，凭借高品质的居住环境吸引大量老城区市民购房定居。2012 年年底，太湖新城中区商品房已建成销售近 400 万 m^2，在建约 400 万 m^2。

4.3.3 公共服务设施规划与建设

新城通过一系列公共设施专项规划对文教体卫等配套设施提前预留控制，后期开发建设中本着“适度超前，兼顾效率”的原则有序引导建设单位进行配建。其中，市级、区级公共服务设施一般由公立运营主体通过土地划拨、财政出资的形式开发建设，同时积极引入社会资本，参与学校、医院、养老等公共服务配套设施的建设和运营。在社区公共服务设施配套层面，按照“街道级、

1 太湖新城东、中、西区分属三个不同行政主体管辖，受统计口径限制，本文以太湖中区为对象进行分析。

2 2005 年数据。

睦邻社区级、基层社区级”三级建设重点，街道级公共服务设施一般由街道政府采用土地划拨的方式单独取得用地开发建设权，睦邻中心级、基层社区级公共服务设施则要求相应的住宅开发商在各自地块中代建，保证社区公共服务的公平性和均等化。

5 规划实施

5.1 新城的实施机制

5.1.1 建设管理体制

2007 年，无锡市委市政府成立太湖新城建设指挥部，由市长担任指挥部总指挥，各部门主要负责人任成员，大力推进太湖新城规划建设工作。新城建设实行“市区合力联动机制”，由太湖新城建设指挥部统一领导、统一规划、统一协调，分片区组织实施建设。

其中，东区（太湖科技园）和西区（山水城）由滨湖区具体负责规划、开发和建设。中区采用封闭运作形式，由太湖新城建设指挥部下设办公室（以下简称“指挥部办公室”）具体负责规划、开发和建设工作；除建设管理权外，经济社会发展管理、社会事务和行政管理以及财政税收管理等仍由滨湖区承担（图 15）。

5.1.2 投融资体制

无锡市成立太湖新城发展集团有限公司，在指挥部办公室的直接领导下，负责中区建设的投融资活动，资源开发、基础设施、环境工程和重点公建等项目的建设，以及成立子公司自主开发建设其他经营性项目。同时，成立太湖新城建设管理中心（全民事业法人），作为市级政府性资金运作主体，负责中区土地出让金的专项管理，作为出资方注资新城集团，增加新城集团的注册资本金，增强太湖新城中区的投资建设能力。

太湖新城中区的土地出让金由市级财政扣除上缴规费和按政策规定统筹使用的资金后，集中归还指挥部办公室使用。至 2013 年 9 月，新城集团采用银行借款、信托产品、股权融资和融资租赁等形式为新城建设融资共计 460 亿元。

此外，依托生态建设的显著成效，新城争取到了低碳生态建设、水系治理及湿地建设两方面的专项补助资金。低碳生态建设补助分别为“江苏省建筑节能和绿色建筑示范区补助”和“绿色生态城区示范区中央财政补助”。水系治理方面，太湖新城取得了“太湖流域中央财政水污染防治补助资金”“太湖水环境治理省级专项资金”等多项中央级、省级专项补助资金，累计约 2 亿元，为太湖新城的水系治理及湿地建设提供了重要的资金支持。

5.2 新城的运营维护

5.2.1 道路设施的运营管理

随着太湖新城建设的快速推进，新城后期的运营管理也日益成为重点。太湖新城中区土地收益和税收收入分别归属指挥部办公室和区级政府，因此在运营责任落实上仍存在一定分歧。2010 年 2 月无锡市政府召开协调会议，明确了道路工程运营维护的相关责任主体。太湖新城中区所有新建道路由滨湖区城管局接收、管理，已由市级主管部门接管的快速道、主干道同时下放。经费按市统一的管养定额执行，市级已接管的快速路、主

图 15 太湖新城建设管理体制机构

来源：深圳市城市规划设计研究院有限公司

干道，管养经费由市级财政支付，其他道路管养经费由指挥部办公室支付。

5.2.2 城市绿地及配套设施的运营管理

太湖新城中区各处湿地、公园经过两年的施工养护期后，由指挥部办公室委托新城集团专业物业管理子公司接管，指挥部办公室每年按预算拨付物业管理公司一定数额的养护经费，湿地、公园内的各类配套设施由该物业公司负责统一招商运营，收取租金。

5.2.3 重要功能性项目的运营管理

太湖新城中区自 2007 年起陆续建设了市民中心、博览中心、无锡大剧院等重要功能性项目，非营利性设施由财政出资维护管理，其他有一定盈利能力的项目本着“政府补贴，市场化运作”的原则，交由专业管理公司负责运营管理。

2010 年，无锡太湖国际博览中心一期工程建成投用，成立专业会展平台管理公司——无锡太湖国际博览中心有限公司负责，博览中心的运营管理，该公司为新城集团全资子公司，除每年获得市财政一定数额补贴外，该公司主要收入来源为展位租金、广告收入和门票销售等。

2012 年 5 月，无锡大剧院建成投用，成立无锡大剧院保利管理有限公司，负责大剧院的运营管理，该公司由拥有专业剧院管理背景的中国保利集团文化艺术有限公司持股 60%，新城集团持股 40%，除每年获得市财政一定数额补贴外，该管理公司主要收入来源为大剧院的演出门票收入。

以上两家管理公司运营情况良好，基本收支平衡或略有盈余。

6 结论

2012 年国家发改委调研数据显示，12 个省会城市平均每个城市提出建设 4.6 个新城（新区）的规划目标，144 个地级城市平均每个城市建设 1.5 个新城（新区），大规模的新城已经成为我国地方经济建设和城市拓展的重要战略平台，深刻地影响了我国的城镇化进程。

随着宏观背景的转变，生态城建设已然成为新一轮的新城建设热点。但是，国内大部分生态城规划缺乏“整体”视角，缺少将“生态城”建设目标与内容融入现行或即将完成的规划体系中的有效路径，更多追求的是小系统范围内的高效、经济和低污染。

当前，大部分城市的传统新城建设已经具备了一定的基础，形成相对完善的规划编制体系，如何将生态文明有效落实到新城建设的各个层面、面向实施直接指导新城建设，对我国新型城镇化建设具有重要的现实意义，太湖新城从以下几个方面提供了值得思考的借鉴经验。

6.1 中观层面整体生态规划的技术路线探索

不同于国内其他独立开展的生态实践，太湖新城依托既有完善的传统规划基础，探索了一条“传统规划 – 生态审视 – 指标体系 – 规划更新”的面向实施的整体生态规划技术路线。

通过对传统规划的生态审视，制定了适合本地气候条件的中观层面生态优化发展战略，在《太湖新城生态规划咨询》《中瑞生态城总体规划》的基础上，形成了《无锡太湖新城——国家低碳生态城示范区规划指标体系及实施导则》和《无锡中瑞低碳生态城建设指标体系及实施导则》两套指标体系成果。前者针对 150 km^2 的太湖新城，更强调中观层面的指标可控性，后者针对 2.4 km^2 的中瑞低碳生态城，更强调微观层面的技术可操作性。

指标体系为新城提供了低碳生态方面的理念和目标参考，但不能直接运用于日常的规划管理中，建设生态城还需要将这些生态理念和目标反馈落实到法定的控规及各专项规划中。太湖新城随后完成了《太湖新城控制性详细规划生态指标更新》《中瑞低碳生态城控制性详细规划修编》，并编制了能源、慢行系统、市政管线、水系环境等相关生态专项规划。最后，在地块规划层面，将生态指标作为出让条件，直接指导实施建设（图 16）。

6.2 兼顾技术与管理建立可操作的指标体系

6.2.1 并非“一刀切”，导则中预留足够弹性

不同于传统的生态城市指标体系，无锡生态城的指标体系并不是简单的目标性指标，也不是“一刀切”的指标体系，而是在导则中结合实施的可行性，对指标进行了针对性的分解。以《太湖新城——国家低碳生态城示范区规划指标体系及实施导则》为例，指标体系中62个指标是以能实现指导全城建设为目标而制定的共性指标，导则中结合太湖新城规划建筑类型、功能定位等因素的差异性，对共性指标进行有针对性的分解。例如，指标体系中的新建居住和公共建筑设计节能率不小于 65%，考虑不同建筑类型节能措施的难易程度，参照江苏省建筑节能设计标准，将该指标分解为新建居住、商业、文化娱乐设施、学校建筑设计节能率分别不低于

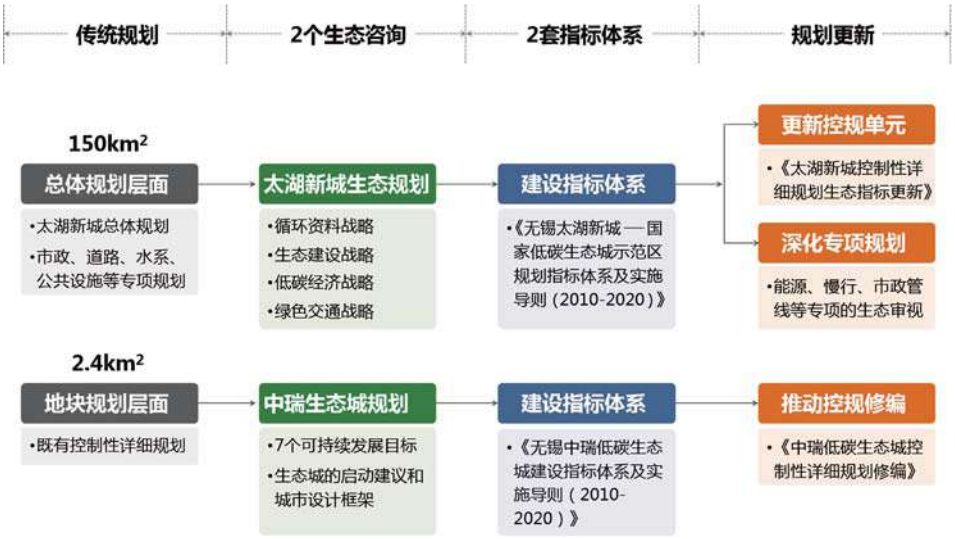


图 16　技术路线：传统规划—生态审视—指标体系—规划更新

来源：深圳市城市规划设计研究院有限公司

65%、67%、65% 和 60%，有区别地实施节能目标，确保了后期技术措施的可操作性。

6.2.2　技术策略和管理策略相结合

为实现指标，规划设计需要选定适宜的技术措施，而后期只有正确的运营管理手段才能发挥技术措施的节能、节水等特性。因此，实施导则中注重技术策略与管理策略的结合，指标体系中既包括技术性指标，也包括生态管理性指标。例如，为实现单位建筑面积能耗指标提出了选用节能电梯和办公设备、设计分项计量装置与城市能耗统计数据中心联网等技术措施，此外还制订了特定设备调试方案、节能物业管理模式和能耗限额加价等管理措施，使设计目标得以落实。

6.2.3　本地化特征的体现

指标体系的建立同时也考虑了无锡的本地化特征。如本地植物指数、植物种类、绿化用地植林率、透水地面比例、单位面积建筑年耗能、新建地区可再生能源占总能耗的比例、供水管网漏损率、城区风环境、住区日照达标覆盖率、住区室外日平均热岛强度、新建建筑达到绿色建筑星级标准等，均与本地特征及地方性法规进行了衔接。

6.3　本地产业与生态环境的良好支撑

太湖生态城的建设并非从零开始，太湖新城临近现有城区，拥有强大的城市经济支撑动力和创新发展基础。生态城建设启动前，太湖国际科技园、山水城、东南大学产学研基地、新能源新材料产业等已具有很好的基础，形成了完整的产业、居住体系。相比之下，国内其他生态城大多是依托生态概念重点发展居住及生活配套，城市功能单一，且规划生态城多为独立项目，和当地城市经济、社会、环境关系分割，缺乏全面整体的规划统筹。

太湖新城已具备多元化功能规划，形成生态、宜居、高科技产业、旅游与现代服务的一体化综合发展格局。强大的新能源产业基础有助于新城低碳生态技术的发展，且已形成企业、研发、政府、市场的互动合作基础。

6.4　直接指导新城空间建设的精细化城市设计

2005 年，太湖新城启动核心区城市设计，优化中心区功能布局，研究城市天际轮廓线、重要空间节点、界面、场所。此后 3 年，相继完成重要功能区、干道两侧、滨水地区等特色空间城市设计，2007 年形成城市设计全覆盖。

新城更加关注特色空间的营造，对不同地区的研究重点不同，重要功能区城市设计关注高度、天际轮廓等片区的整体协调性，干道两侧城市设计关注界面、建筑退线等街道空间尺度，滨水地区城市设计根据水系功能定位，更加关注节点设计、设施配套等。实施层面，城市设计的重要指标直接落实到地块出让的规划条件中，直接指导新城的实际建设（图 17）。

图 17　**太湖新城核心区城市设计优化方案**
来源：无锡太湖新城建设指挥部办公室

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上海嘉定新城：面向可持续发展的规划探索

詹运洲　何晓涛　邹　玉

摘要：

上海是中国重要的经济中心和航运中心。上海市郊区新城的规划建设既是应对新型城镇化的发展要求，又是长三角区域一体化进程加快、区域内各城市间合作日益密切的必然选择，更是上海市创新驱动、转型发展的重要载体和途径。上海的郊区新城建设经历了“卫星城”—“新城”的建设历程，始终坚持中心城功能优化和有机疏散原则，促进形成多中心的城市空间结构的基本目标。

本文从区域的视角，在整个上海市新城规划建设的大背景下，聚焦上海市嘉定新城发展历程变迁、社会经济发展、人口就业特点、土地使用、社会服务设施、综合交通等方面，运用横向对比和纵向对比等分析方法，总结上海市新城，特别是嘉定新城发展现状特点。以嘉定新城开发实施的第一手资料为基础，剖析规划建设实施的模式、创新和挑战。最后总结嘉定新城规划建设的成功经验，提出若干未来嘉定新城发展需要重视的领域和亟须解决的问题，为嘉定新城的开发建设，也为上海市新城的可持续发展提供借鉴。

关键词：

嘉定，新城，规划，实践

1　背景与概况

上海简称“沪”，地处太平洋西岸，长江三角洲前缘，交通便利，腹地广阔。2013 年年末全市常住人口约 2 415.15 万人，人均生产总值 14 547 美元，相当于世界中等发达国家或地区的水平。上海是中国重要的经济中心和航运中心，国家历史文化名城。上海与江苏省、浙江省共同构成以上海为龙头的中国最大的城镇群“长三角城镇群”（图 1）。上海正逐步建设成为现代化国际大都市，国际经济、金融、贸易、航运中心。2014 年，中共中央、国务院印发了《国家新型城镇化规划（2014–2020）》，是今后一个时期指导全国城镇化健康发展的宏观性、战略性、基础性规划。上海市郊区新城的规划建设既是应对新型城镇化的发展要求，又是长三角区域一体化进程加快、区域内各城市间合作日益密切的必然选择，更是上海市创新驱动、转型发展的重要载体和途径。

1.1　新城发展历程

上海郊区城镇建设经历了“卫星城”—“新城”的建设历程（图 2），始终坚持着优化中心城功能和有机疏散、沿区域性交通轴线培育城镇节点、促进形成多中心的城市空间结构的基本目标。

2001 年国务院批准的《上海市城市总体规划（1999–2020）》提出建设 11 个郊区新城，分别为宝山、嘉定、松江、金山、闵行、青浦、南桥、惠南、城桥及空港新城和海港新城等。

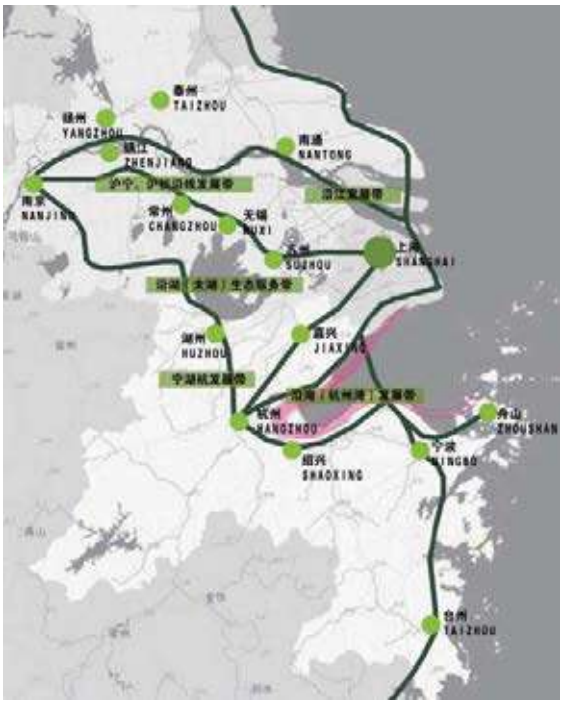
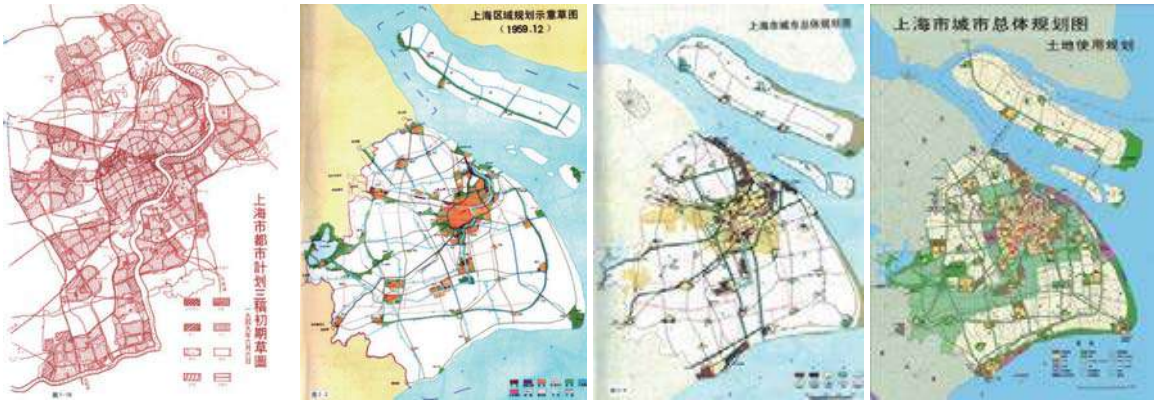


图 1　**长江三角洲区域空间发展结构图**

图片来源：《以人为本，科学规划，加快上海大都市创新转型发展》，上海市规划和国土资源管理局



1949 年　　1959 年　　1986 年　　1999 年

图 2　上海市历次总体规划总图

资料来源：上海市城市规划设计研究院 . 循迹 · 启新——上海城市规划演进 . 上海：同济大学出版社，2008

“十五”期间，上海市开展了“一城九镇”试点，探索推进郊区城镇加快发展，促进郊区城镇化、特色化和多元化，为此后一段时间的郊区城镇建设积累了经验。

“十一五”期间，按照“三个集中”的要求，明确提出市域“1966”城乡规划体系，把上海市域分成中心城、新城、新市镇、中心村四个层面进行统筹安排，首次实现市域城乡规划全覆盖，确立了上海城乡规划体系格局（图 3）。

1.2　嘉定新城概况

嘉定区位于上海市的西北部，与江苏省的昆山市和太仓市接壤（图 4），总面积约 463 km^2，2011 年现状常住人口 150.62 万人，城镇建设用地 221 km^2。嘉定区位于长江三角洲重要的沪宁发展走廊，经济发展水平一直位于上海郊区前列，工业发展以汽车产业为特色。

1956–1967 年在近期规划草案（图 5）的基础上，上海市政府批准建设人口规模 20 万人的 5 个卫星城。这 5 个卫星城包括闵行、吴泾、嘉定、安亭和松江。其中嘉定（位于嘉定老城）和安亭 2 个卫星城均位于嘉定区。

1986 年，国务院批准的《上海市城市总体规划方案》，明确了中心城 – 卫星城 – 郊县小城镇 – 农村集镇 4 个层次构成的城镇体系（图 6）。嘉定、安亭仍然作为卫星城，南翔作为郊区小城镇。

20 世纪 90 年代末，上海市开展了总体规划的编制工作。2001 年经国务院批准的《上海市城市总体规划（1999–2020）》将嘉定新城作为规划的 11 个新城之一，规划人口 25 万人。安亭、南翔规划为中心镇，人口为 10 万人左右（图 7）。

此后，依据全市总体规划，嘉定区开展了区域总体规划的编制工作。2007 年批准的《嘉定区区域总体规划实施方案（2006–2020 年）》规划嘉定新城包括嘉定新城主城区、南翔和安亭的组合新城（图 8）。本文后面所论述的嘉定新城若没有特别指明均为嘉定新城主城区。

1.3　新城定位与目标

1.3.1 新城定位

新城是上海市世博后战略发展重点地区。后世博时期的上海空间战略将聚焦于郊区新城。新城建设将作为上海进一步提升发展能级、谋划世博后城市发展的重要举措之一，成为上海未来战略转型的重要抓手。

新城是上海市经济发展的重要潜力地区。发展郊区新城，进一步缩小新城和中心城的差距，促进重大基础设施、优质教育医疗资源进入新城，满足新城居民的生产生活需求，为上海未来发展提供巨大潜能。

新城是上海市实现可持续发展的机遇地区。新城建设为上海市进一步发展提供巨大的发展空间。这既延续了“十五”以来上海城市发展重心从市区向郊区转移的趋势，也适应新的战略需求，同时也符合国际大都市“城市 – 区域”的空间导向。

1.3.2　发展目标

到 2020 年，新城建设取得突破性进展，在郊区基本形成与中心城区功能互补、发展错位、联系紧密的新城群。

图3 上海市城乡规划体系图

资料来源:《上海市城市近期建设规划（2006–2010)》

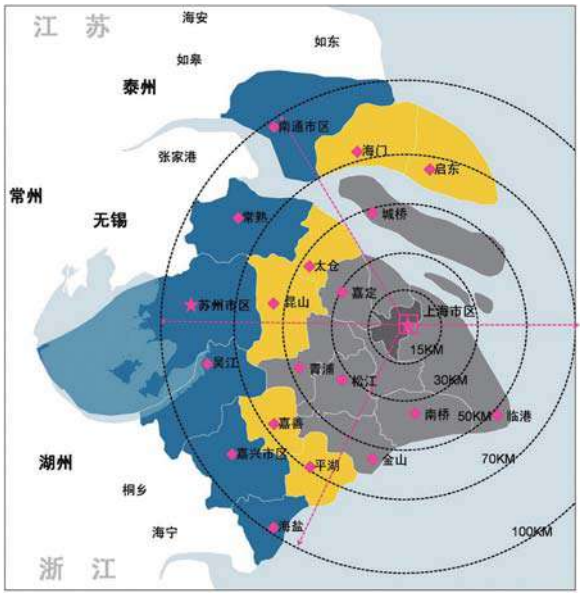


图 4　嘉定区区位图

灰色：上海市市域范围；黄色：上海市周边第一界面城镇；蓝色：上海市周边第二界面城镇

资料来源：上海市城市规划设计研究院．“创新驱动 转型发展”背景下上海大都市城乡发展规划战略研究．2012

图 5　上海区域规划示意草图（1959 年）

资料来源：上海市城市规划设计研究院．循迹 · 启新：上海城市规划演进．上海：同济大学出版社，2008

图 6　上海市卫星城和郊区重点城镇分布示意图（1985 年）

资料来源：上海市城市规划设计研究院．循迹 · 启新：上海城市规划演进．上海：同济大学出版社，2008

图 7　**上海市城镇体系规划图**（2001 年）
资料来源：上海市城市总体规划（1999—2020）

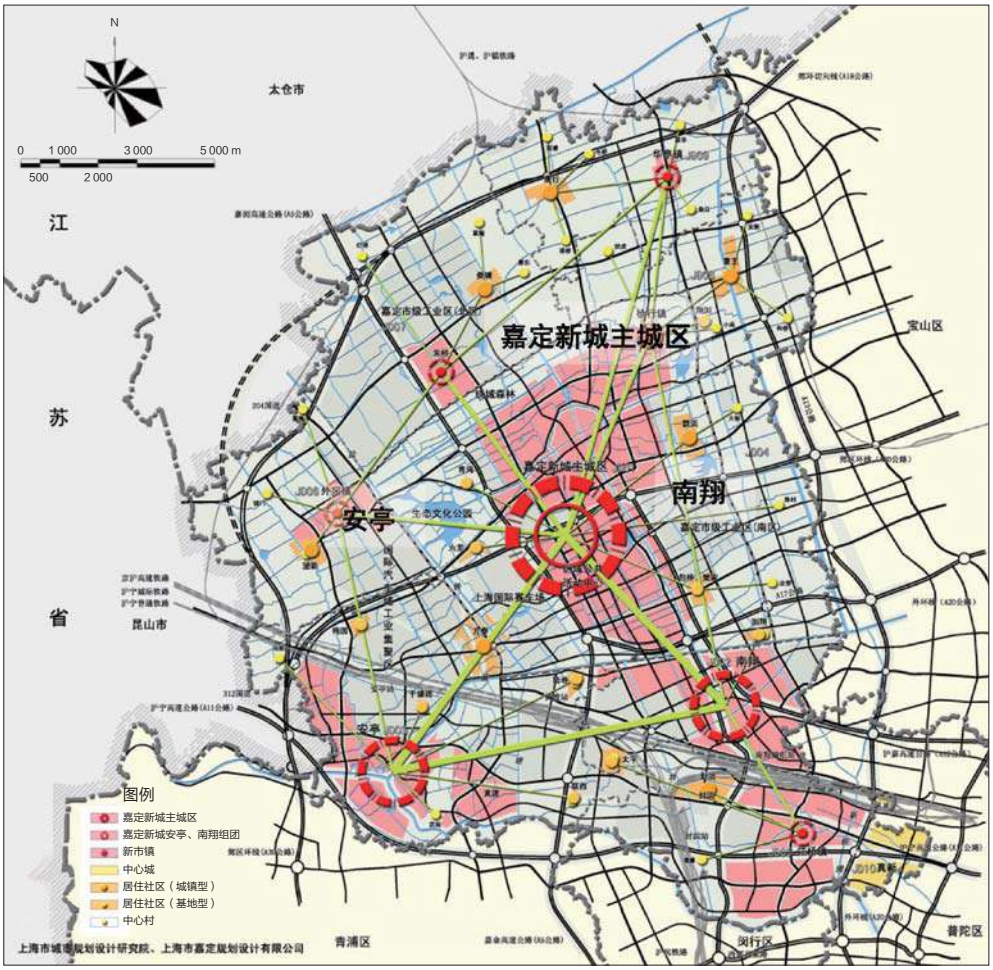


图 8　嘉定区城乡体系规划图

资料来源：嘉定区区域总体规划实施方案（2006–2020 年）

嘉定新城、松江新城初步确立长三角地区综合性节点城市地位，集聚 80 万 ~100 万人口；浦东临港新城、青浦新城、奉贤南桥新城具备较高能级的城市综合集聚辐射功能，集聚 60 万 ~80 万人口；金山新城、崇明城桥新城对周边地区发展的服务带动作用明显增强，集聚 20 万 ~40 万人口（图 9）。

2　新城发展现状特点

“十五”规划以来，郊区新城已成为推进上海城镇化的主要载体。嘉定新城规划建设成效显著。新老城联动推进，中心城市政基础设施框架基本形成，景观工程全力推进，社会事业和功能性项目高标准配置，城市服务能级明显提升（图 10）。人口逐渐向新城集中。

2.1　社会经济

根据 2010 年的数据分析，上海市新城的经济发展水平还较低。一方面与上海人均 GDP 相比，除嘉定新城人均 GDP 达到上海市平均水平之外，其他新城的人均 GDP 均低于上海市平均水平。另一方面与紧邻上海的周边长三角城镇相比，新城发展也存在较大差距。紧邻嘉定的昆山市和太仓市的人均 GDP 均超过上海新城。

从第一、二、三产业的占比来看，新城当前经济结构以第二产业为主导，基本处于“二三一”产业结构阶段（图 11）。嘉定新城第二产业比重在 65% 左右，略高于昆山、太仓、吴江、嘉善、平湖等上海周边长三角城镇（60% ~ 65%）。

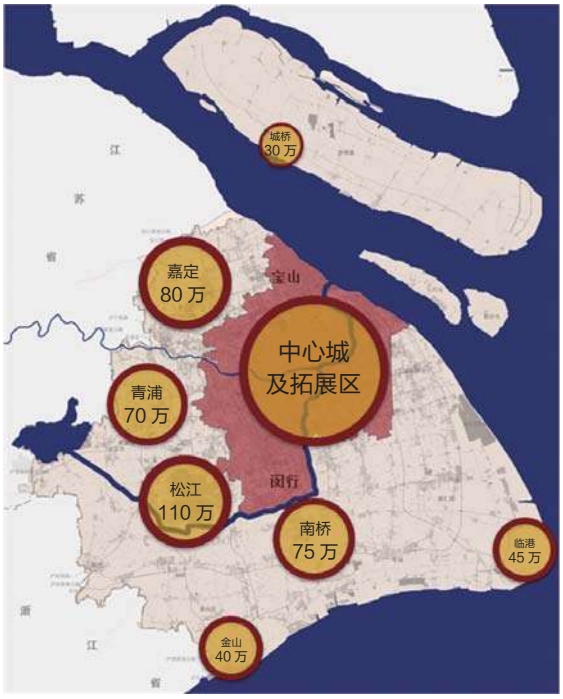


图 9　**上海市新城发展规划图**

资料来源：上海市城市规划设计研究院．

“创新驱动 转型发展”背景下上海大都市城乡发展规划战略研究．2012

图 10　**嘉定新城规划成效显著**

资料来源：嘉定区规划和土地管理局

新城建设用地产出低于上海市平均水平和中心城区水平。新城地均产出之间存在着较大差距，其中松江最高，其次为嘉定和青浦，城桥、南桥和临港地区相对较低（图 12）。此外，通过对上海市 31 个市级以上开发区的地均产值和投资强度进行比较，新城范围内的开发区也远低于全市平均水平（图 13）。

2.2　人口发展

2010 年嘉定新城总人口为 47.4 万人，与 2000 年嘉定新城总人口相比，人口增幅超过 70%[1]，主要取决于外来人口增长。在郊区 7 个新城中该趋势基本一致，只是在增幅上有所差异（图 14）。嘉定新城常住人口增长率在郊区 7 个新城中排在第 4 位。上海市郊区新城内工业园区常住人口增长率基本高于城区（除工业园区外的新城地区）人口增长率，反映出各新城产城融合度有所提高。嘉定新城工业园区常住人口增长率仅略高于城区增长率，产城融合度提高趋势不明显。

从影响新城吸引居住意愿的因素看，首要的因素是与市区交通联系的方便程度，这反映了新城的独立性仍然不足，许多功能尤其是就业仍需要保持与中心城很高的联系度，其次是购物、社交、教育等方面的差距。但新城也有其特有的优势，主要体现在自然环境优美、房价等生活成本相对较低等方面（图 15）。

从影响新城吸引工作意愿的因素看，首要因素仍是与市区交通联系的方便程度，这反映了新城的就业能级和岗位与人口导入仍不匹配，就业机会少且选择少（图 16）。

2.3　就业岗位

从 2010 年全市岗位分布的情况来看，新城岗位密度为 0.26 万人 /km^2，相当于中心城的 29%，与中心城周边地区[2]相当（图 17）。从职住比[3]来看，新城最高，

1　数据引自《统筹城乡规划，优化完善郊区城镇结构和功能布局研究》。

2　中心城周边地区指上海市外环线附近的若干街道和镇，例如包括南翔镇、江桥镇、顾村镇、杨行镇、吴淞街道、友谊路街道、高桥镇、高东镇、曹路镇、唐镇、合庆镇、川沙镇、康桥镇、周浦镇、浦江镇、吴泾镇、梅陇镇、马桥镇、新桥镇、九亭镇、七宝镇、莘庄镇、徐泾镇、华漕镇、新虹街道、颛桥镇等。

3　职住比指新城就业人口与居住人口的比值。

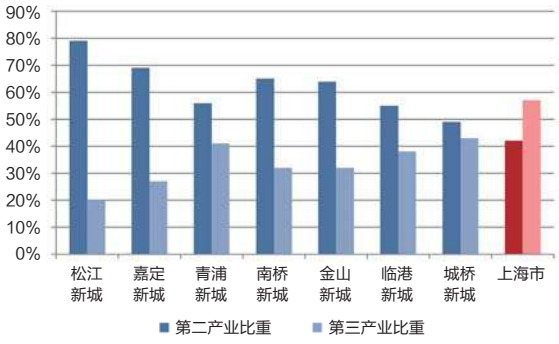


图 11　2010 年上海郊区新城第一、二、三产业比重

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

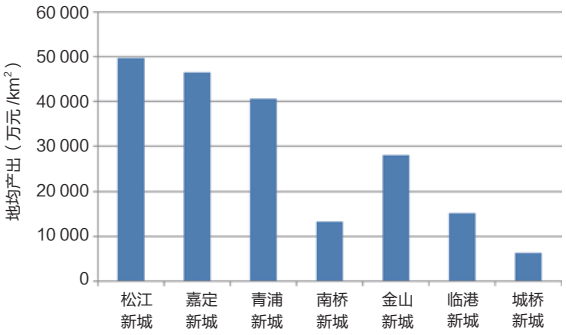


图 12　2010 年上海郊区新城地均产出

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

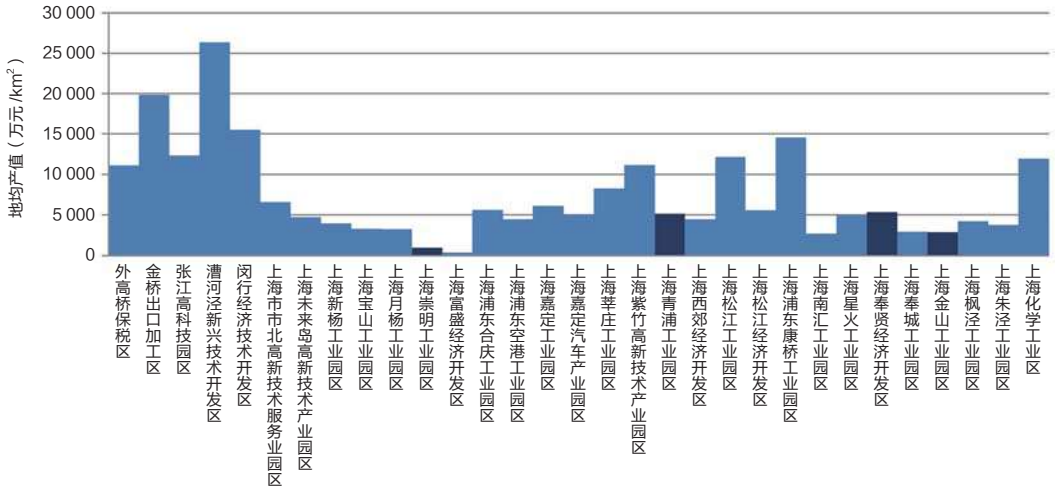


图 13　2010 年上海 31 个市级以上开发区地均产值

数据来源：上海市开发区统计年鉴

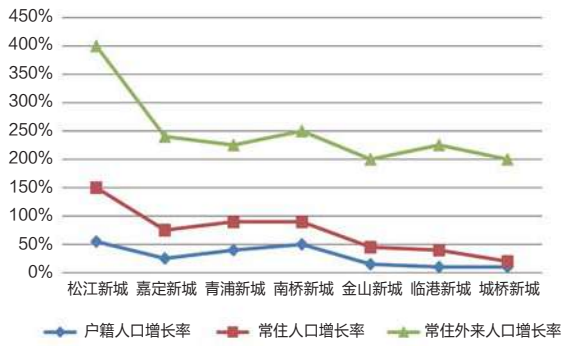


图 14　上海郊区新城各类人口变化情况图（2000–2010 年）

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

为 0.52，高于中心城和周边地区，就业岗位规模和人口规模相对平衡。嘉定新城就业岗位以制造业为主。

2.4　土地使用

新城建设用地使用较为粗放，郊区新城人均建设用地均超过上海市平均水平。嘉定新城人均建设用地在郊区新城中位于第二位（图 18）。2010 年嘉定新城集建区范围内未来可建设用地不超过新城规划建设用地的 15%，位列各个新城末位（图 19），土地资源紧约束显著。

从嘉定新城的用地结构来看，嘉定新城道路广场用地占比偏低，工业仓储用地占比偏高，绿地占比偏低（图 20）。

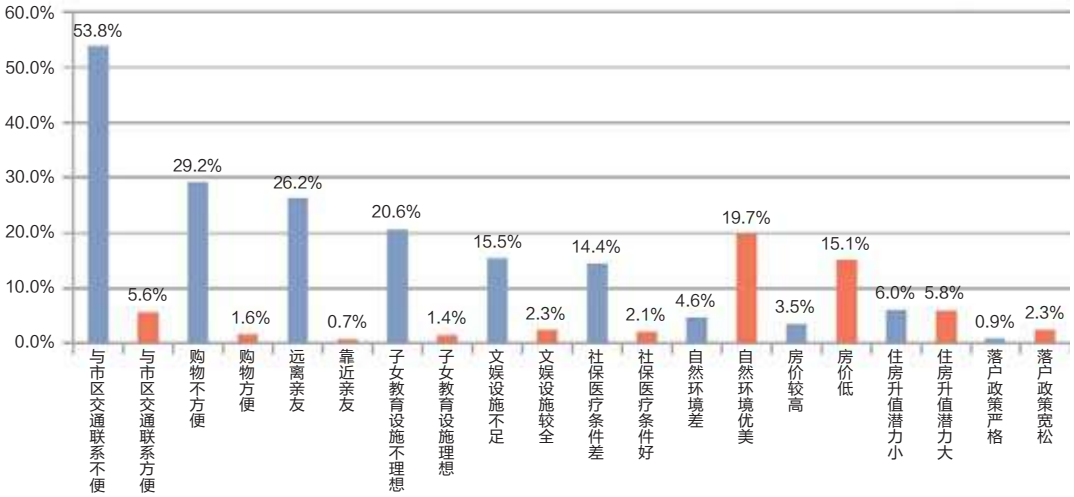


图 15　影响上海市郊区新城吸引居住意愿的因素分析

数据来源：上海市城市规划设计研究院

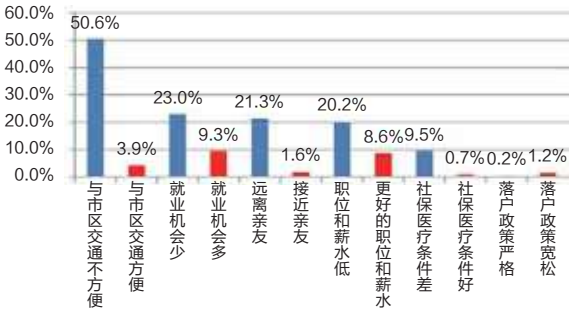


图 16　影响上海市郊区新城吸引工作意愿的因素分析

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

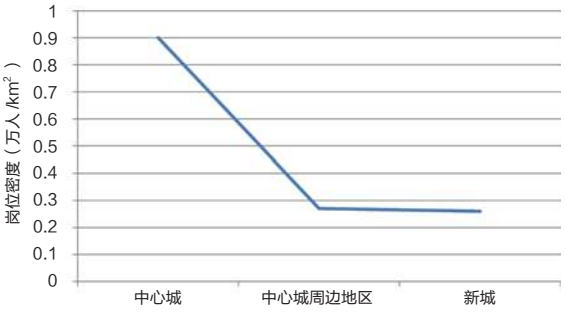


图 17　2010 年上海市中心城、中心城周边地区、新城岗位密度

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

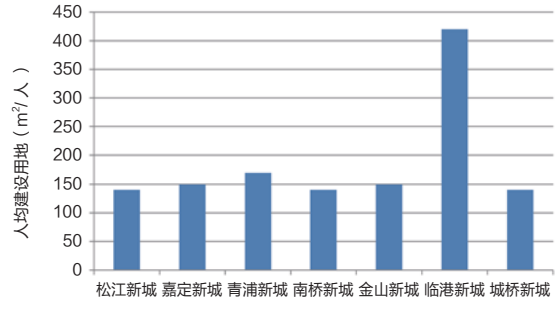


图 18　2010 年上海市郊区新城人均建设用地

数据来源：上海市统计年鉴，上海市城市规划院现状用地数据库

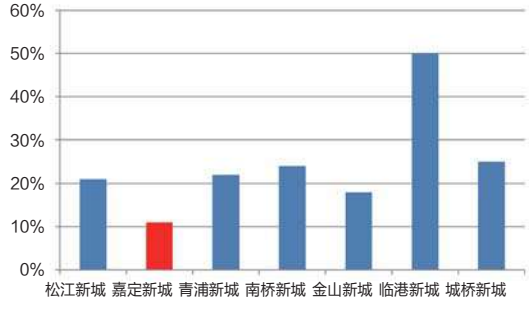


图 19　2010 年上海市郊区新城建设用地余量占总建设用地比重

数据来源：上海市统计年鉴，上海市城市规划院现状用地数据库

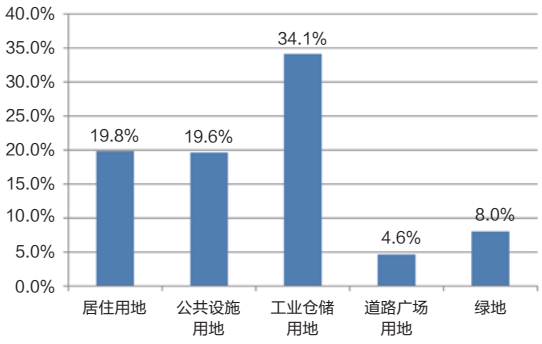


图 20　2010 年上海市嘉定新城现状建设用地比重

数据来源：上海市城市规划设计研究院现状用地数据库

2.5　社会服务设施

郊区的社会服务设施的数量和能级仍落后于中心城。郊区 7 个新城拥有 2 家市级医院，占全市总量的 3%，拥有 21 家区级医院，占全市总量的 20%（图 21）。郊区新城拥有全市重点中学 14 所，占全市总量的 17.7%（图 22）。同时，与毗邻上海的江苏省各市对比，上海市郊区县在医院、学校等千人指标的对比上低于苏南地区的常熟市、昆山市、太仓市，也低于苏北地区的南通市、启东市、海门市等市。

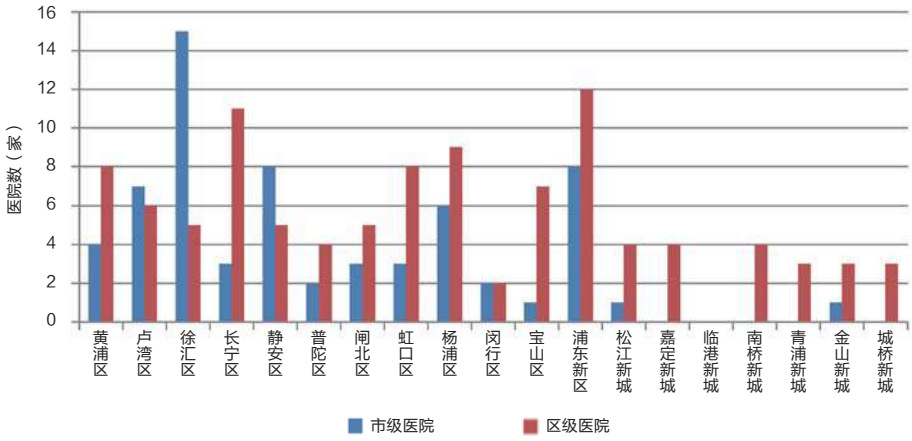


图 21　2011 年上海市各区市级、区级医院数统计图

数据来源：2012 年上海市统计年鉴，其中人口基数都为第六次人口普查常住人口

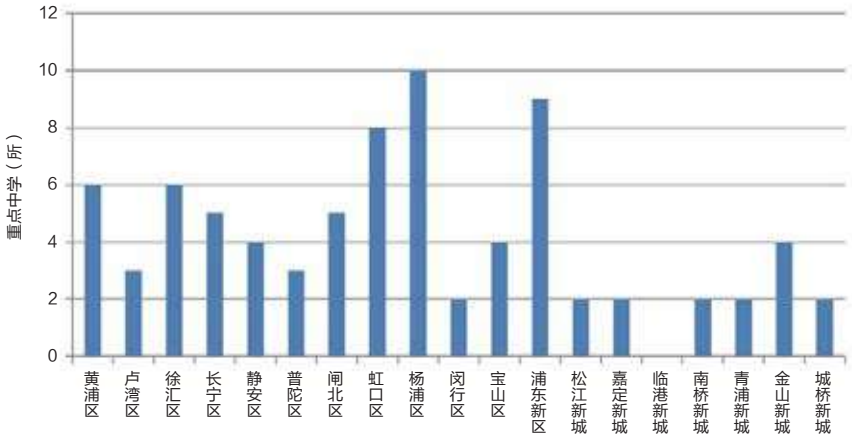


图 22　2011 年上海市各区重点中学数统计图

数据来源：2012 年上海市统计年鉴

2.6 综合交通

通过 2010 年相关数据对市域、新城内部的交通分析，上海市新城，特别是嘉定新城，综合交通方面存在以下特点。

市域交通设施完善，城际交通设施欠佳。市域交通设施，如高速公路、干线公路、轨道交通极大地改善了嘉定新城交通通达性，有力支撑了新城发展。以铁路客站为代表的城际交通设施服务功能较差，如安亭北站的集散系统欠完善，无法发挥区域性高标准、高质量的城际客运交通服务功能。嘉定新城与中心城的联系过度依赖高速公路。

新城内部交通设施水平不高。路网密度偏低（图 23），嘉定新城道路网密度为 1.29 km/km^2（中心城为 1.7 km/km^2），常规公交 300 m、500 m 覆盖率仅为 12%~36%、26%~65%（中心城为 68% ~86%）。线路重复系数高[1]、公交线路运营时间短、发车间隔长，高峰时段市通郊线路较拥挤。

嘉定新城以内部出行主导。调查显示新城内部出行比例为 79%，至郊区其他区域的比例为 11%，至中心城的比例为 9%，新城之间的出行比例为 0.8%（图 24）。

慢行交通主导、个体机动交通发展迅猛。慢行出行（包括步行和自行车出行总合）比重超过 60%，沪 C 牌照（工作日不得进入外环线以内区域）助推个体机动车出行比例普遍超过 20%，公交出行比例不足 10%（图 25）。个体机动车出行水平总体与中心城相当，但以摩托车为主，远郊尤为明显。

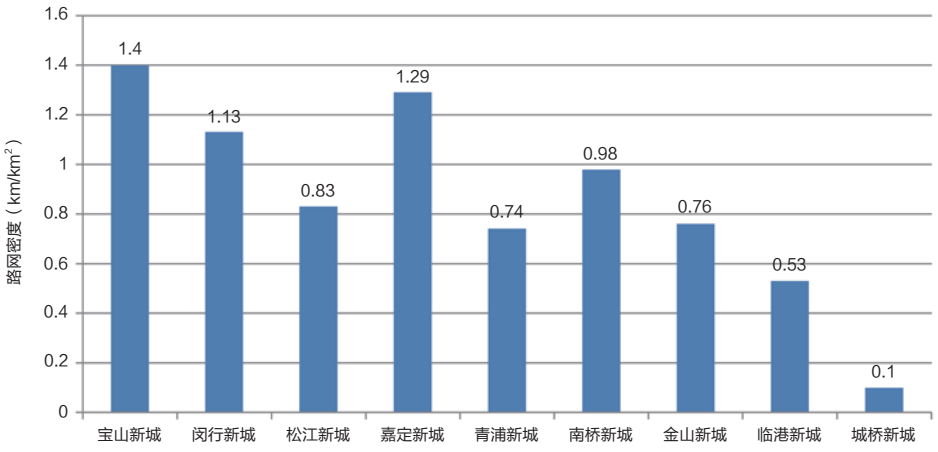


图 23 上海市郊区新城路网密度统计图

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

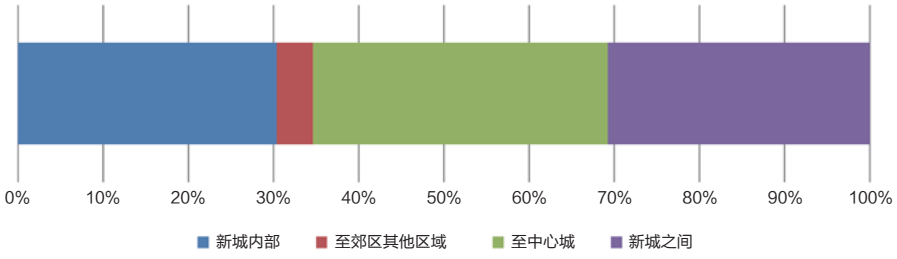


图 24 2010 年上海市郊区新城出行目的地统计图

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

1 公共交通线路重复系数是指公共交通线路总长度与线路网长度之比。

从通往嘉定新城的轨道交通 11 号线的客流特征（表 1）来看，在新城的全天上客量为 3.47 万人次，占全区站点总量的 57%。早高峰期间 19% 的乘客在嘉定区下车，69% 的乘客在中心城下车，可见轨道交通主要服务于新城对外交通。

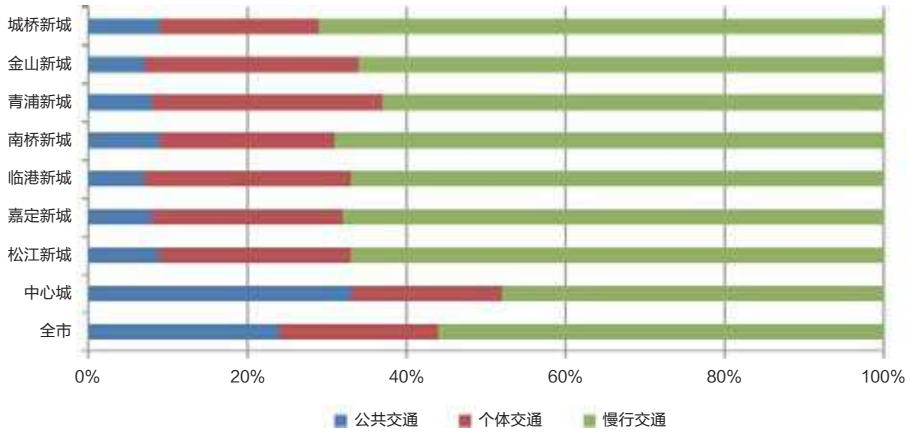


图 25　2010 年上海市郊区新城出行方式统计图

数据来源：上海新城发展战略研究，上海市城市规划设计研究院

表 1　2010 年上海市轨道交通 11 号线客流特征

下客区域	嘉定新城站点		嘉定区站点	
	规模	比重	规模	比重
嘉定区	1 394	19%	1 996	19%
浦西内环内	1 683	23%	2 492	24%
浦西内外环	2 555	35%	3 551	34%
浦东内环内	216	3%	323	3%
浦东内外环	562	8%	830	8%
其他地区	842	12%	1 183	12%

数据来源：上海新城发展战略研究，上海市城市规划设计研究院。

3　嘉定新城建设实践

根据国家发改委相关课题组调查显示，12 个省会城市，平均每个城市要建 4.6 个新城新区；144 个地级城市，平均每个城市规划建设约 1.5 个新城新区。新城建设是我国城镇化发展的重要途径。从2004年到2014年，嘉定新城的建设已越过 10 年，嘉定新城建设实践过程中积累了丰富的经验。

3.1　规划引领

嘉定新城在城市建设过程中尤为注重规划引领。规划实施上一直坚持文化引领策划、策划引领规划、规划引导实践的理念。依据嘉定区江南水乡的特质，在城市设计研究的基础上，提出建设“千米一湖、百米一林、河湖相串、荷香满城”的生态宜居城市的规划目标。目前，新城主城区区域控规覆盖率达到 95% 以上。“一核两翼、三位一体、无缝对接”的集中连片城市化发展格局逐渐成型。2004 年，在四大板块布局的基础上，提出嘉定新城三个组团，即嘉定主城区、安亭、南翔三位一体的组合式发展的核心理念。2009 年，在新城核心区加速发展的基础上，总结三大组团的发展状况，以加速城市化、促进“两个融合”为总体思路，提出“聚焦一个核心、延伸两翼”。

3.2　规划实施

3.2.1　原则

嘉定新城规划实施中坚持“四个先行、四个就地、四个著名”。“四个先行”是指规划先行、动迁先行、基础设施先行、公益性项目先行。“四个就地”是指产业就地提升、基础设施就地完善、农民就地安置、发展就地预留。“四个著名”即著名建筑师、著名开发商、著名施工企业打造著名项目。保障新城总体结构的合理性，居住和就业的均衡性，新城建设的高品质，产城融合与可持续发展，同时充分考虑当地居民的利益，避免空城和“鬼城”。

3.2.2 成就

经过 10 年的努力，新城建设取得重大进展。中心区市政基础设施框架基本形成，“四大景观”生态环境工程全力推进。社会事业和功能性项目高标准配置，城市服务能级明显提升。

新城中心区道路交通体系基本形成，新城核心区规划道路约 89 km。至 2012 年年底，新城核心区“四纵四横”骨干道路框架体系已基本形成，有 31 条道路建成通车，通车里程约 60 km，共有 18 条公交线路通达，累计完成投资 18.38 亿元。

“四大景观”等生态景观体系已经形成，截至 2012 年年底，新城中心区内生态景观工程已建设完成 199 万 m^2，在建生态景观工程 77.9 万 m^2；管线配套工程同步推进，截至 2012 年年底，已建设完成电力 48 km、燃气 54.31 km、上水 58 km、信息管线 60 km。

新城河道湖泊综合整治成效明显，新城中心区规划河道 30.1 km（包括漳浦河、横沥河等），生态景观湖泊 18 个。截至 2012 年年底，完成河道整治 18.5 km，生态景观湖泊 13 个；在建河道 2.4 km，景观湖泊 1 个。

自新城建设以来，瑞金医院北院、交大附中嘉定分校、区图书馆（文化馆）、华二初级中学、区妇幼保健院、嘉定新城实验幼儿园、嘉定新城规划展示馆、德富路学校、双丁路幼儿园等 14 个功能性项目竣工并投入使用，建筑面积约 45 万 m^2，累计投资额约 25 亿元。

新城核心区共有 31 家开发商，其中投资在建 38 个项目，保利家园、中信泰富又一城、龙湖郦城、盘古天地、绿地秋霞坊、嘉宝紫提湾、鼎申风荷丽景等一批高品质楼盘相继开盘销售。至 2012 年年底，市场化项目累计开工面积 460 多万 m^2（包括动迁配套房），竣工面积近 246 万 m^2，销售面积近 186 万 m^2，总投资 200 多亿元。2013 年上半年，新城中心区的市场化项目发展态势良好，新开工面积 80.8 万 m^2，竣工面积 19.3 万 m^2，完成投资 20 亿元，其中，销售额 28.3 亿元，同比增长 50%。

3.2.3 创新——打造世博园外城市最佳实践区

（1）低碳发展

嘉定新城建设坚持低碳发展理念，广泛借鉴国内外城市可持续规划建设的案例，致力于打造上海市世博园外城市最佳实践区。

嘉定新城大力发展绿色交通体系。发展以中等容量快速公交为主体的嘉定区第二层次公交系统，与轨道交通（第一层次）、常规公交（第三层次）共同组成嘉定区多层次公交网络系统。新城实施低碳观光旅游策略，嘉定新城四大景观中行人步道、自行车道、水上游览等慢行系统实现全覆盖。推广使用低碳交通工具和管理技术。在嘉定新城中心区建立智能交通系统，包括交通信息采集与发布系统、交通监控与安防系统、交通信号控制系统和停车诱导系统。

推动节能新技术运用——由于推行“节能、节地、节水、节材”的建筑要求，嘉定新城被命名为上海首个建筑节能示范城区。其中嘉定图书馆采用了更为节能的燃气空调系统；规划展示馆利用老厂房改建，采用地源热泵作为热源；科教展示中心同样利用老厂房改造，同时设计绿色屋顶、地源热泵、冰蓄冷、地下室光导照明、雨水回收利用等节能措施；远香湖公园采用了生态水净化系统、覆土建筑、透水材料、回收材料。

（2）环境保护

嘉定新城规划建设中注重环境保护。采用新能源、新技术注重垃圾处理，采用环保型变电站。在垃圾处理方面推进居民生活垃圾分类试点工作、探索集贸市场垃圾减量资源化利用、推进镇级垃圾压缩中转站建设。

嘉定新城建造了上海电力系统中首座环保型、节能型、数字化变电站——110 kV 封周路变电站。从建筑设计、设备选择等方面均充分考虑了节能环保的要求，并采用了地源热泵空调、太阳能发电、节能型照明等多种国际先进节能技术的设备，预计每年可节约标煤 41.2 t，减少二氧化碳排放 79 t，节能降耗达到国内先进水平。

3.3 资金运作模式

嘉定新城建设资金来源主要为三部分：土地出让收入、税收、融资。

3.3.1 土地收入

2003—2013 年，嘉定新城累计出让土地约 6 000 mu，累计出让金约 250 亿元，土地出让收入中区级所得扣除成本部分进入新城建设专项基金（图 26）。

3.3.2 税收

2006—2012 年，新城注册企业总共约 18 万家，税收约 20 亿元，其中区级税收约 10 亿元进入新城基金（图 27）。

图 26　历年嘉定新城经营性地块出让面积统计表

数据来源：上海嘉定新城发展有限公司

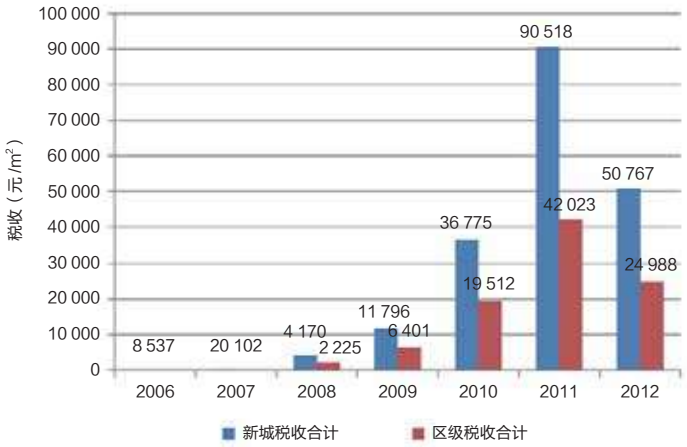


图 27　嘉定新城税收历年统计表

数据来源：上海嘉定新城发展有限公司

3.3.3　融资

自 2011 年至 2013 年 9 月，嘉定新城融资总额约 100 亿元，银行贷款约 82 亿元，信托、委托债权、企业债等融资 23 亿元（图 28）。

3.4　管理方法创新

嘉定新城在规划时坚持“四个著名”的原则，这为新城建设品质奠定了基础，但要真正实现将“新城建设出好形象”，每个项目必须从规划、设计、施工到管理全过程管理，其中的最难点就是市场性项目品质，关于这方面嘉定新城做了一些有益的尝试。

3.4.1　项目审批机制创新，成立修建性详细规划以及风貌控制委员会

新城公司在 2006 年开展了控制性详细规划的编制工作，从城市设计层面，在地块划分、业态、色彩、外墙材料、公共空间、地块多层高层控制线、建筑风格、建筑小品、标志标示等不同方面以城市设计导则方式进行控制。项目成立了风貌控制委员会，即：

（1）在方案报批前，对每个地块的建筑设计方案展开评定，对于符合城市设计要求的方案，予以上报。

（2）在立面施工阶段，对建筑小样进行检查、封样，不符合立面控制元素不予施工。

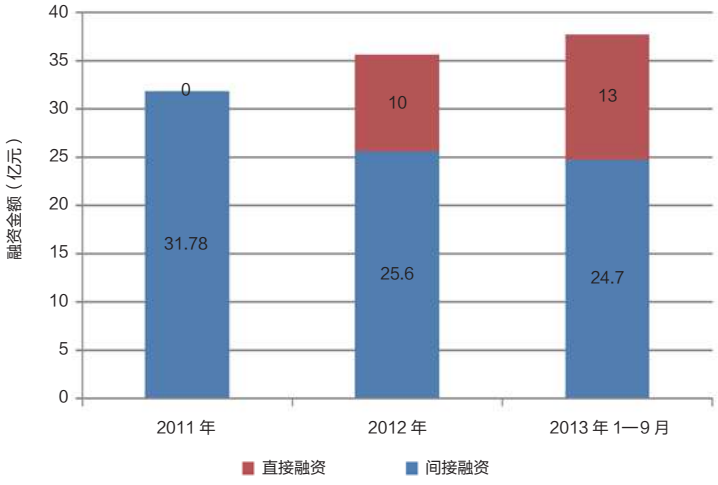


图 28　嘉定新城公司历年融资金额

数据来源：上海嘉定新城发展有限公司

（3）在竣工验收阶段，对建筑形态进行复查，若存在问题则进行返工。

以东云街商业地区开发为例，东云街各地块的逐步落地，风貌控制的效果清晰可见：三十家开发商，除个别地块外，风格基本一致；新江南水乡风格基本体现；城市广场空间予以保留。

3.4.2　项目控制技术手段创新——推行附加图则

依据上海市人民政府办公厅批准的《上海市控制性详细规划技术准则》的相关规定，嘉定新城规划建设控制引导采用控制性图则和引导性图则相结合的方式。嘉定新城主城区范围内编制的控制性详细规划除了提出普适性的规划控制要求，形成普适图则（控制型图则）外，需要通过城市设计或专项研究提出附加的规划控制要求，形成附加图则（引导性图则），对规划建设和建筑设计进一步进行引导，保证建设品质。

在《上海市控制性详细规划技术准则》要求的控制性指标之外，嘉定新城控规增加了控制性图则的范畴。比如建筑物贴线率及沿街高度的严格控制、底层的骑楼退界和位置、高层塔楼的精确位置、屋顶绿化和垂直绿化的量化控制、地块入口及二层连廊的位置等。增加市政公用设施和地下空间的专项控制性导则。在城市设计阶段编制市政综合方案，明确园区电力开关站、燃气调压站等市政配套设施的位置和规模，并将成果落实到导则中。

此外，坚持“带工程设计方案”挂牌公开出让。由嘉定区规划和土地资源管理局、新城公司共同组织进行方案设计竞赛，评出优胜方案并确定深化单位，经修改深化至施工图深度，形成挂牌出让工程技术方案。工程方案对管线、标高、室外总体等技术要点严格控制。挂牌文件要求竞买人按照最终出让的工程设计方案作为实施建设条件。规划设计费用由新城公司支付，并纳入土地出让成本。

2013 年 5 月《嘉定新城中心区总部园区控制性详细规划增补图则及附加图则》获上海市人民政府审批，为嘉定新城城市建设又翻开新的一页。

3.5　城市规划建设的困难与挑战

3.5.1　建设和管理联动机制有待完善

根据上海市嘉定区人民政府（嘉府发［2012］15 号），嘉定新城管委会是 64 km^2 区域内的规划主体，牵头编制辖区内社会事业设施规划。在具体分工上，新城公司作为辖区内建设主体，负责新建镇级社会事业设施，建设资金来源为新城专项资金、公建配套资金和市专项补贴资金。而公建配套设施建成后，根据明确区管或镇管模式办理移交，区级社会事业设施运营管理与维护维修，由区社会事业主管部门负责，相关费用由区财政承担。镇级社会事业设施运营管理与维护维修，由新城管委会负责，相关费用由新城管委会财力（镇级财力）承担。但在实际操作过程中，新城营造往往重建设轻管理，镇级有限的财力也往往造成高水平管理的缺位。建议在新城专项资金、配套资金和专项补贴资金中充分考虑后续管理的需求，完善建设和管理联动机制。

3.5.2 产城导入滞后于城市建设

嘉定的城市化发展，要在上海发展大格局中，构建自身既有生态优美、宜业宜居的特质，又有产城融合发展的格局。嘉定新城致力于产业转型，引入总部经济，吸引了京东、百度、东方财富等一批知名电商的地区总部，上海联合产权交易所等多个项目也确定入驻，但产业的转型发展仍然滞后于快速的城市建设。

嘉定新城要真正宜居宜业，聚集人气当属重要环节。新城建设自 2004 年开始，随着轨道交通 11 号线建成通车，四大景观的落成，正为新城集聚着人气，但是，产业脱节、商业配套开发进度的滞后，对新城人口的导入依旧存在很大的制约。在嘉定新城的未来建设中，仍将坚持“宜业宜居”的定位，从而让“好产业”和“好生活”汇聚嘉定。

3.5.3 商业面积过剩，同质化竞争严重

目前嘉定新城规划远香湖商圈和嘉定新城站两个大型商圈，有3大商业街、4大商业综合体、7个邻里中心。区域内规划建设保利台北风情街、中信泰富、新光百货、日月光伯爵天地、东云街、西云楼等 21 座城市综合体，总计商业面积将超过 70 万 m^2，人均商业面积约 6 m^2。从现阶段看，新城的商业地产，已呈过度开发，尽管郊区也要转型发展现代服务业，但商办物业已普遍过剩，而商业的体量似乎也超出区域的消费规模。

4 规划实施经验与反思

从嘉定新城规划实施情况来看，做得比较好的主要有城市棕地更新、城市风貌和生态建设、公共设施建设等方面，但在区域一体化、产城融合、滨水地区改造、交通等方面仍然有待提升。

4.1 经验借鉴

4.1.1 城市棕地更新

嘉定区作为上海市的老工业基地，存在大量工业园区和工业用地（图 29）。在嘉定新城向南发展的过程中，采用一次规划分步实施的策略，改造工业用地为新城中心及居住生活区。嘉定区成立嘉定新城公司作为统筹规划、土地出让和建设的国有开发公司。将核心区的工业用地转型作为商业、居住和绿化等用地（图 30）。对核心区周边较为集中的工业用地采用近期保留，远期改造为科技研发用地或商业办公用地的更新模式。对工业用地内较好的厂房进行建筑改造，作为社会服务设施进行利用，如规划展示馆和科教展示中心等。

4.1.2 城市风貌

嘉定区以“百米一林、千米一湖、河湖相串、荷香满城”为城市风貌塑造的原则，“蓝绿相间”的生态环境品质对提升城市整体环境品质和对人的吸引力起到良好的促进作用（图 31）。

作为历史文化名城，主城区北部老城传统风貌保护较好，建筑高度控制在较低的范围内，地标建筑法华寺塔空间特征明显（图 32）；南部新区城市风貌为现代简约，与嘉定汽车的发展定位形成良好呼应。从现状城市建设来看，未来城市将呈现江南水乡传统和现代简约风格相辅相成的风貌特征。

强化主城区小尺度街坊特征，通过增加支路密度、增设街坊内部通廊、优化道路断面形式、设计步行商业街等方式，进一步加强人性化交通可达性，增强地区活力（图 33）。

4.1.3 生态建设

嘉定新城规划确定了“一核、一轴、两环、多园、多廊”的绿地系统（图 34，图 35）。规划为嘉定新城的发展预留了充足的生态环境空间。嘉北郊野公园和绕城森林等绿化空间为嘉定新城未来的品质提升和生态环境建设预留了空间。

4.1.4 公共设施建设

2008 年 11 月，远香湖一期工程开建，与位于紫气东来景观轴西端的“上”字形 F1 赛道遥相呼应。2009 年 1 月，嘉定保利大剧院项目设计方案（由世界建筑大师安藤忠雄担纲设计）揭幕。2009 年 4 月，嘉定友谊公园开园仪式在嘉定新城举行。2009 年 8 月，嘉定新城城市规划展示馆竣工并开馆。2009 年 12 月 24 日上海交通大学医学院附属瑞金医院北院举行开工典礼。2009 年 11 月，上海交大附中嘉定分校举行了合作办校协议书签字仪式。2009 年 12 月，轨道交通 11 号线北段一期通车。2010 年 1 月，嘉定新城图书馆（文化馆）、博物馆项目开工。

嘉定新城建设始终坚持公共设施先行，高等级的文教体卫设施相继落户新城（图 36），有效地改善了城市公共服务设施配套水平和能级，提高了新城的吸引力。

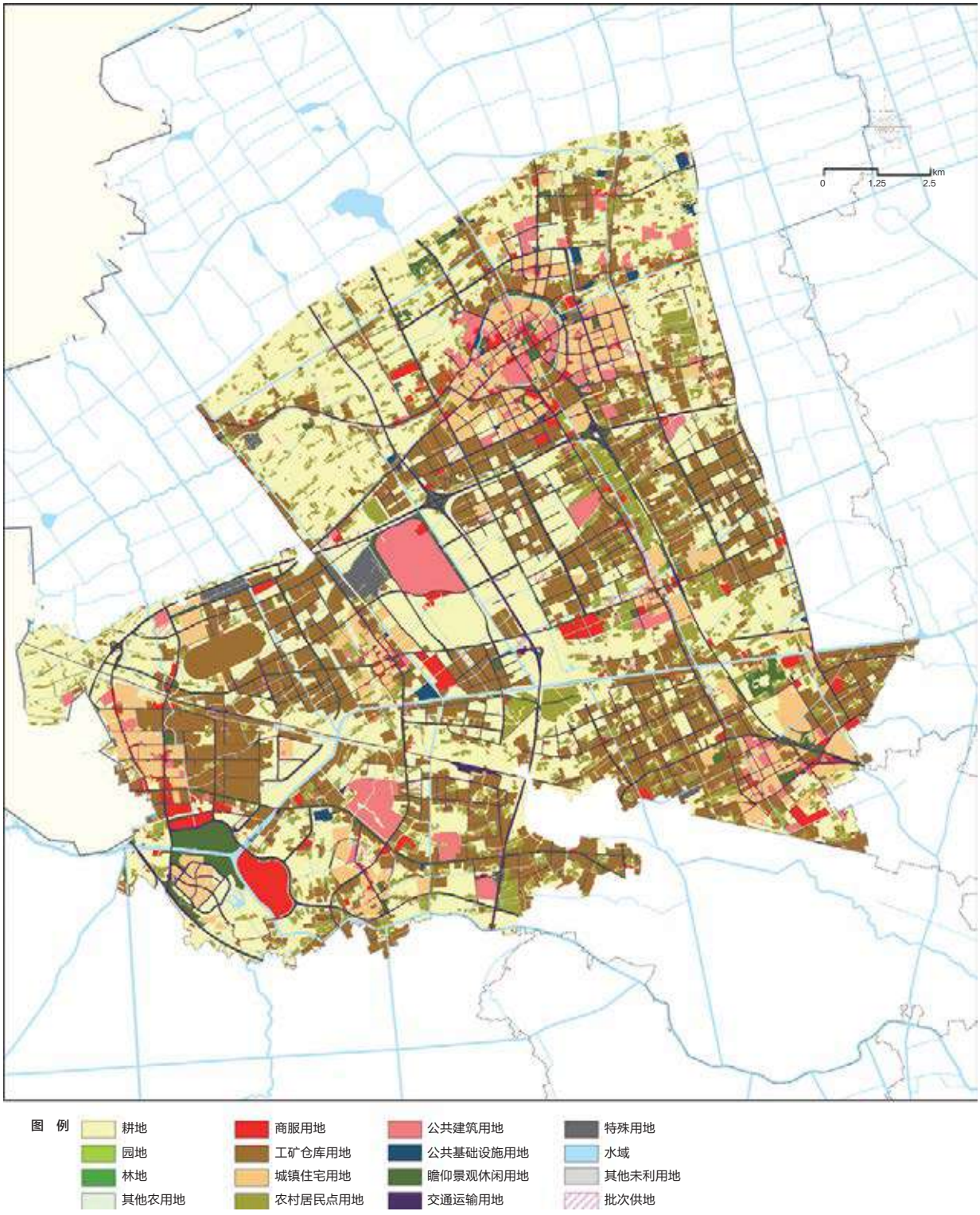


图 29　1996 年嘉定新城主城区土地使用现状图

数据来源：上海市规划设计研究院现状土地数据库

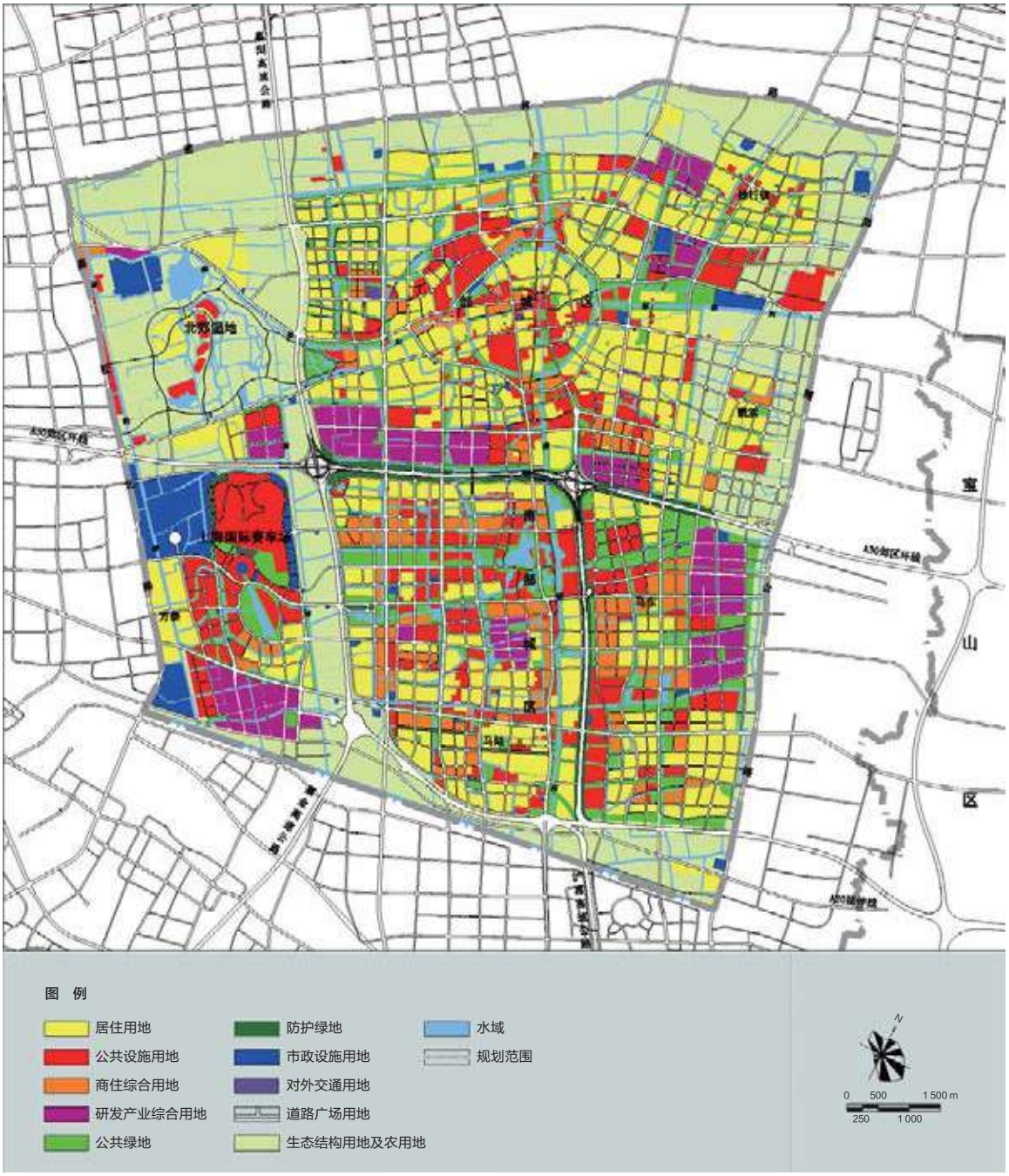


图 30　2010 年嘉定新城主城区土地使用现状图

数据来源：上海市城市规划设计研究院现状土地数据库

图 31　**嘉定新城主城区城市设计效果图**

图片来源：嘉定区规划和土地管理局

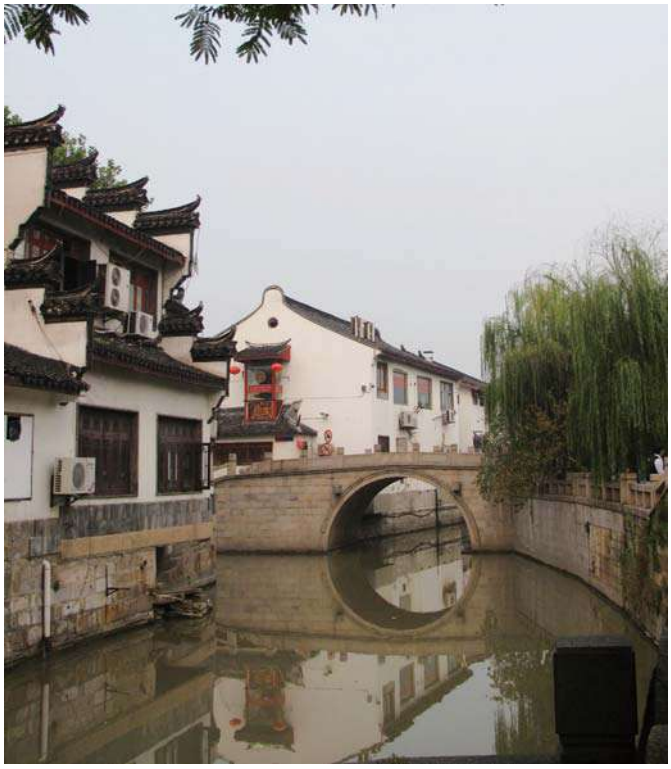


图 32　**嘉定新城主城区北部老城州桥景区现状照片及影像图**

图片来源：作者拍摄及 Google 地图

图 33　嘉定新城主城区道路系统分析图与效果图

图片来源：嘉定区规划和土地管理局

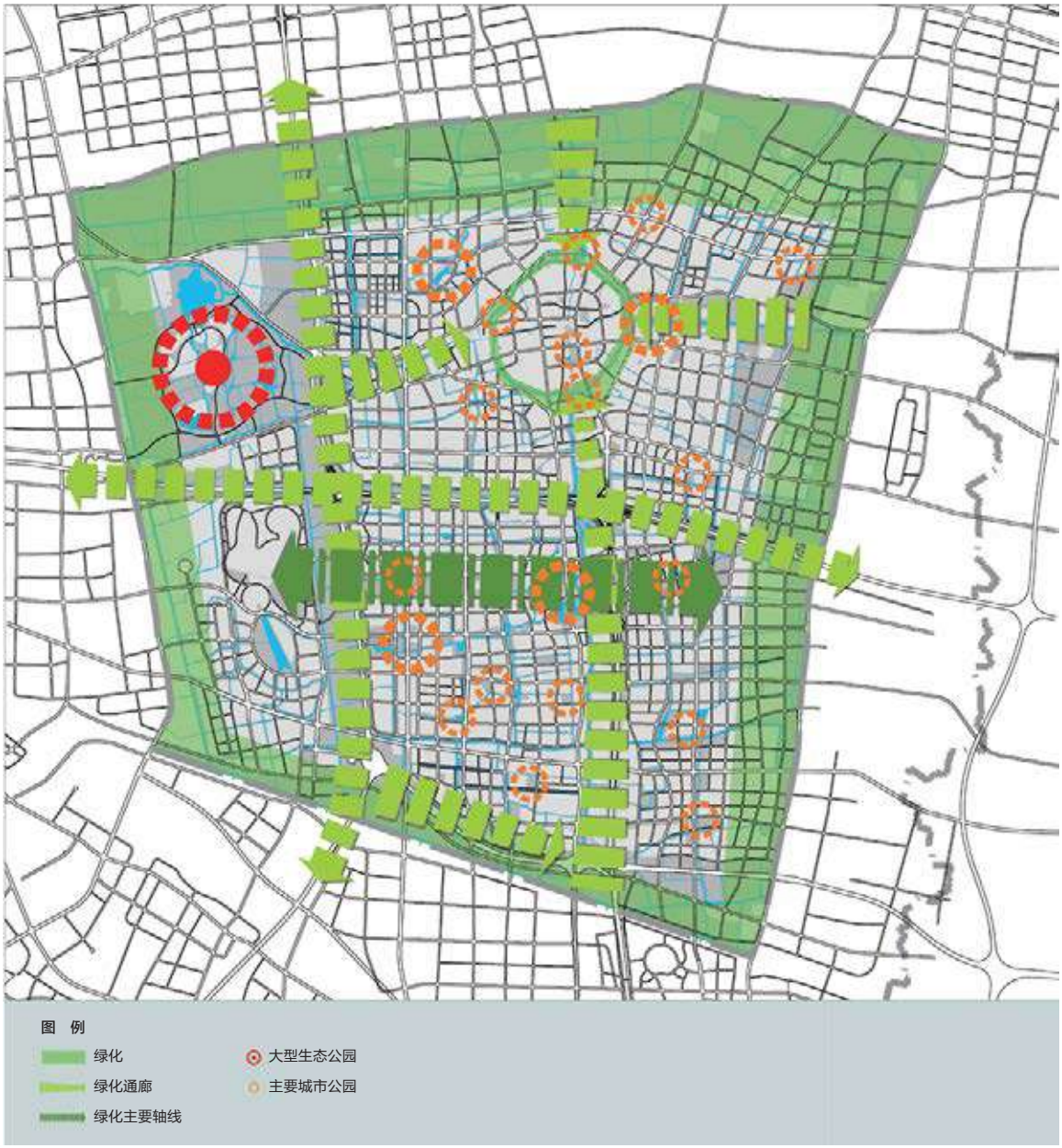


图 34　嘉定新城主城区绿地系统规划图

资料来源：上海市城市规划设计研究院，嘉定主城区总体规划修编（2012–2020）

4.2　若干思考

4.2.1　区域一体化

对于上海市新城的发展，特别是嘉定新城的发展应从区域的视角进行分析。从长三角视野来看，由沪、江、浙、皖“三省一市”组成世界级城市群，上海作为龙头，引领多层次的腹地空间，形成区域空间网络（图 37）。

从大都市区视野来看，基于社会、经济、环境各方面的互通和紧密影响，上海与近沪的苏州、嘉兴等城市的“同城化”是必然趋势，需要寻求战略协作空间（图 38）。

图 35　**嘉定新城主城区主要景观节点现状图**

图片来源：嘉定区规划和土地管理局

图 36　**嘉定新城主城区主要公共服务设施现状及效果图**

图片来源：嘉定区规划和土地管理局

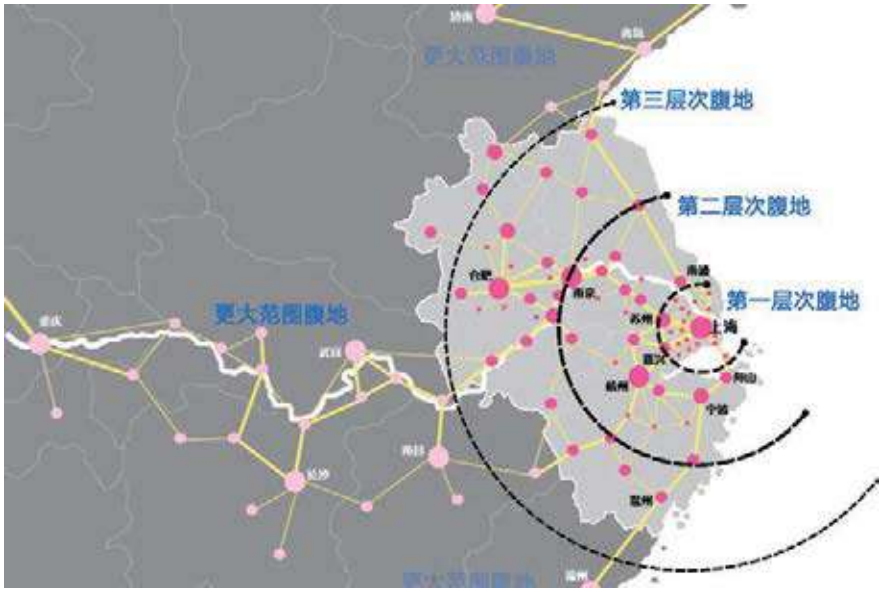


图 37　**长三角腹地规划图**

资料来源：上海市城市规划设计研究院．“创新驱动 转型发展”背景下上海大都市城乡发展规划战略研究．2012

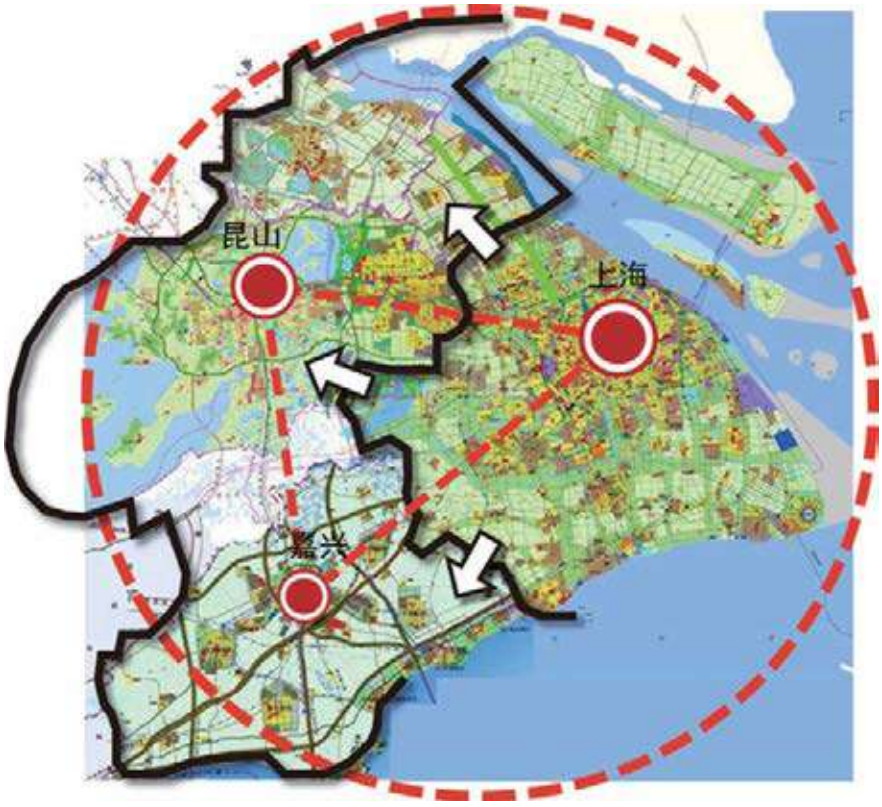


图 38　**上海大都市战略规划图**

资料来源：上海市城市规划设计研究院．“创新驱动 转型发展”背景下上海大都市城乡发展规划战略研究．2012

嘉定区为上海市的西北门户，位于对接江苏省的前沿。但在嘉定新城的规划建设中，尚未充分考虑区域合作。区域产业、用地布局、交通等方面均需进一步深化考虑与周边城镇，特别是与昆山、太仓的融合发展与错向定位（图 39，图 40）。

4.2.2 产城融合

嘉定新城现状有大量的工业用地，提供了大量的就业岗位，但多为较低端的制造业岗位，与新城的发展定位不符。与此同时，对于新城重点需要引入的高端人才，反而无法在本地实现相应的就业，职住分离矛盾严重。

新城实现产城融合需要进一步通过产业结构调整，促进人口结构优化，以适应新城在长三角地区的定位。

4.2.3 滨水地区功能提升

嘉定古称练祁市，因境内练祁河而得名。嘉定新城内有练祁河、祁迁河、横沥河、蕴藻浜（图 41）等多条河流穿越，但沿河地区多为被工业仓储等用地占据，沿河可达性差，稀缺的滨河资源尚未得到利用（图 42）。因此需要借鉴国内外滨河水系的开发更新经验，优化包括蕴藻浜等骨干水系的功能，综合整治沿线环境。

4.2.4 综合交通优化

区域交通方面，嘉定新城交通过多依靠沪嘉高速公路与中心城联系，其他干线公路的通达性和通行能力仍然不高，与中心城网络化联系尚未建成（图 43）。

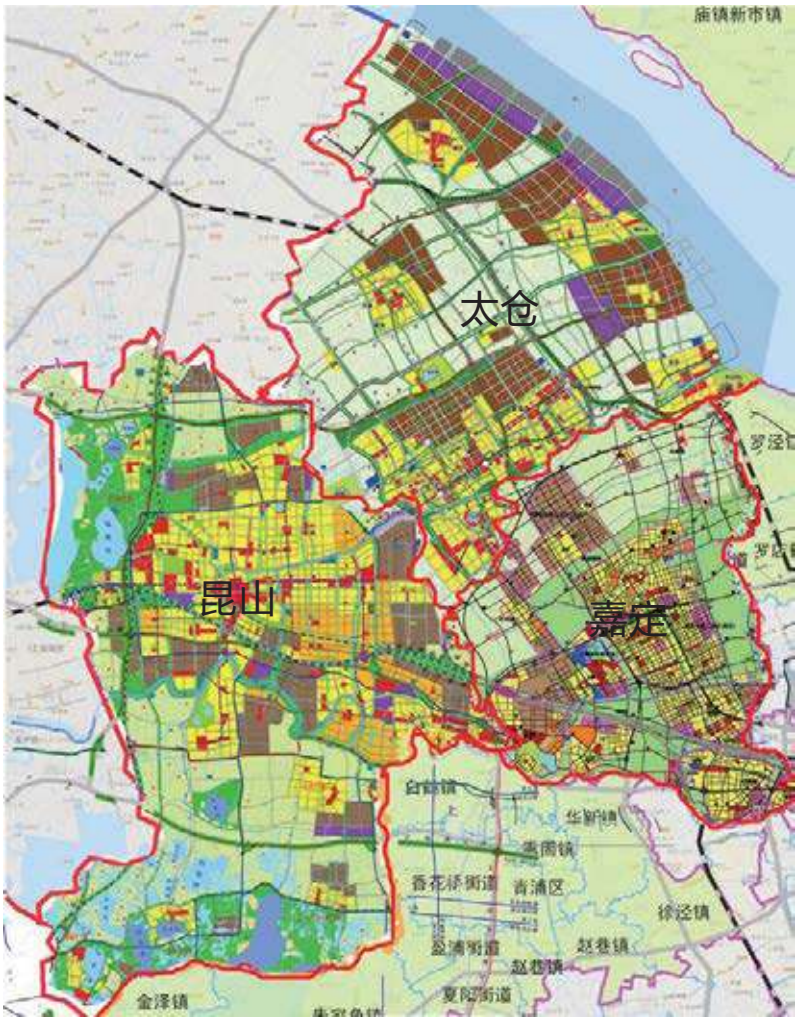


图 39 嘉定昆山太仓地区规划用地拼合图

资料来源：上海市城市规划设计研究院．“创新驱动 转型发展”背景下上海大都市城乡发展规划战略研究．2012

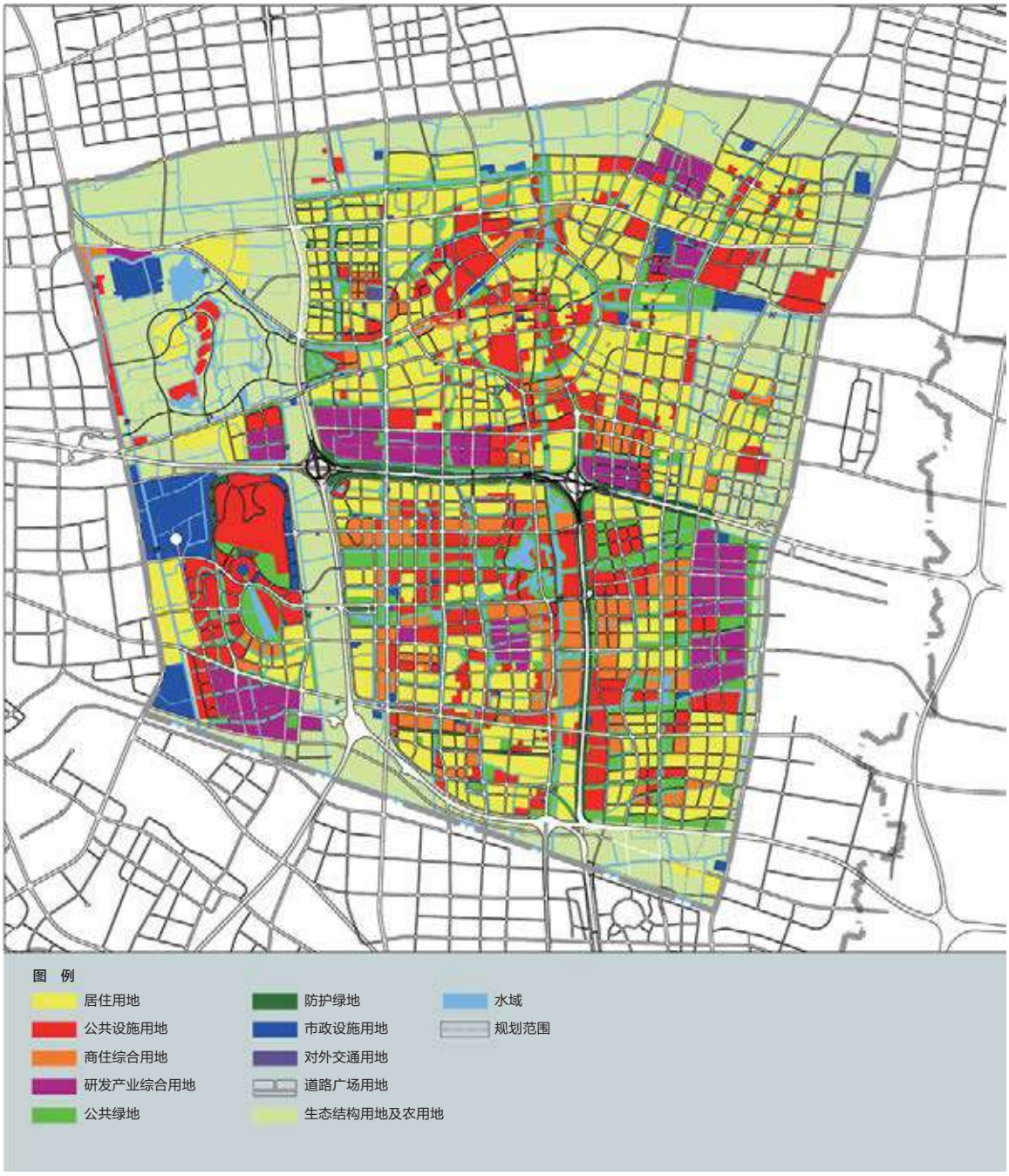


图 40　**嘉定新城主城区土地使用规划图**

资料来源：上海市城市规划设计研究院，《嘉定主城区总体规划修编（2012–2020）》（未批准）

图 41　**蕴藻浜沿线现状照片**

图片来源：作者拍摄

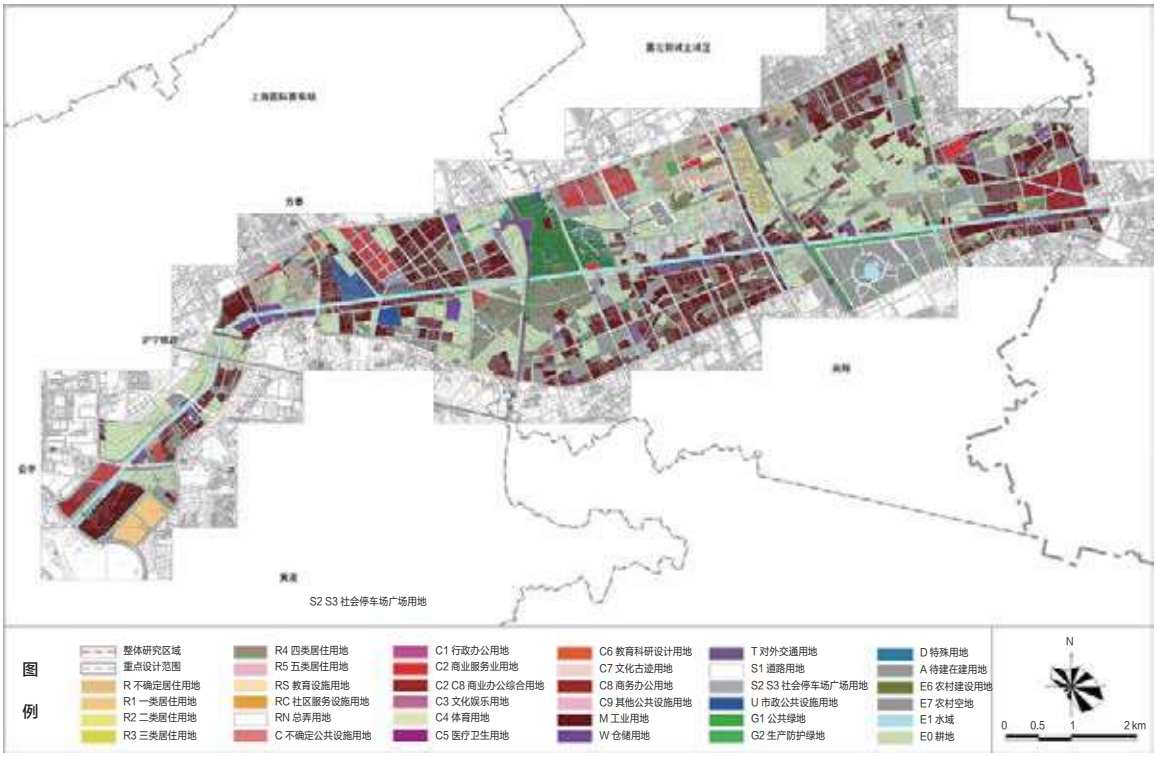


图 42　**嘉定区蕴藻浜沿线土地使用现状图**

资料来源：上海市城市规划设计研究院，嘉定区蕴藻浜沿线空间现状调研

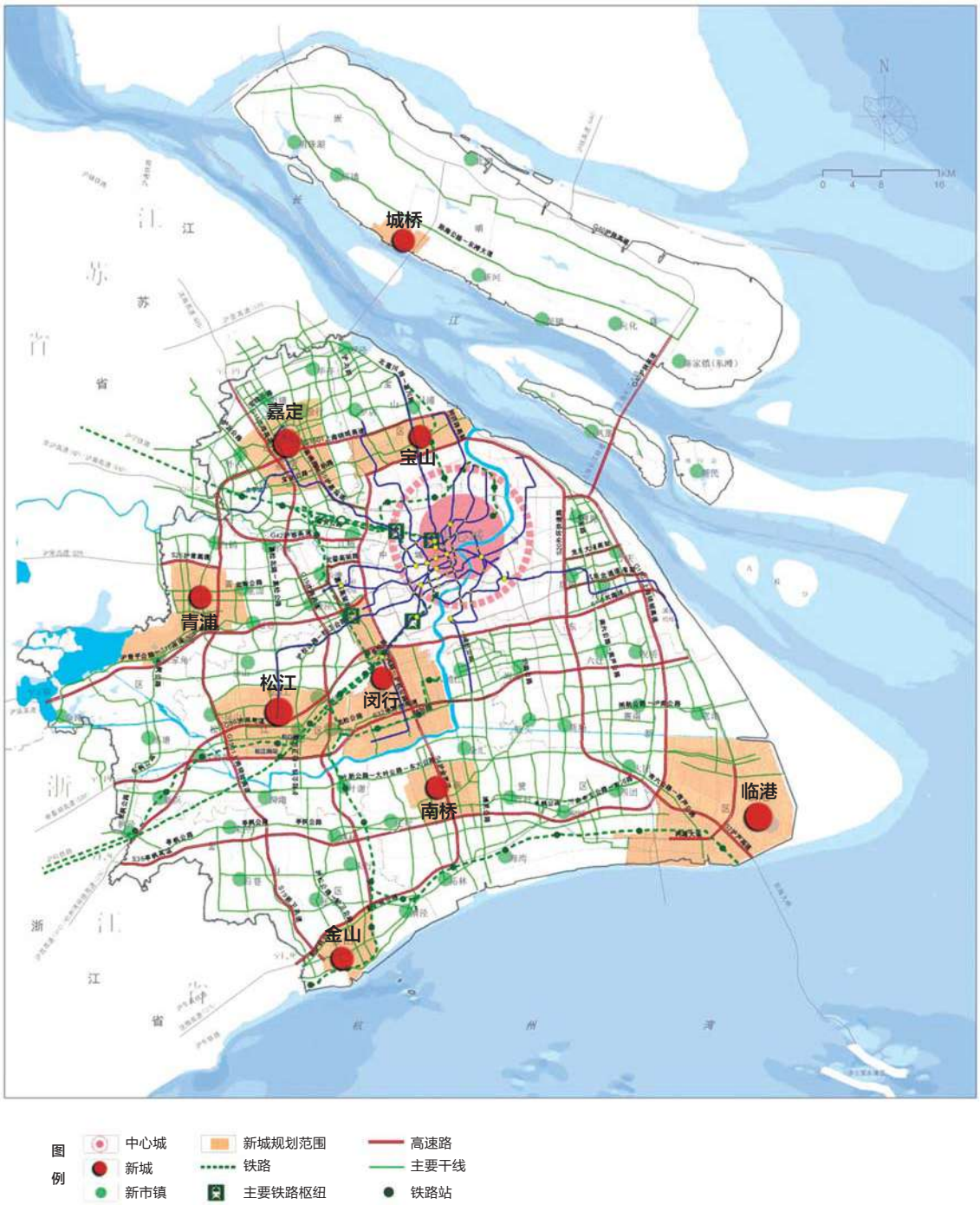


图 43　**上海市郊区新城与市域快速道路和轨道交通关系分析图**

资料来源：上海市城市规划设计研究院，新城规划建设评估

轨道交通 11 号线站距较短，站点过密，导致运营速度相对较低，难以形成对新城发展的有力支撑，造成嘉定新城与中心城高速公路的常年拥堵，以及通行时间过长，联系薄弱。

因此嘉定新城一方面应强化与中心城的联系，尤其是优化快速干道和轨道交通的联系，另一方面也应加强与区域内其他地区和城市包括青浦、松江、昆山、太仓等地的联系。在提升对外交通联系的同时，优化以枢纽为中心的新城内部公共交通体系。

5 结语

加快郊区城镇化步伐、推动市域城乡一体化发展是支持上海未来发展的强大动力。推进上海的新城建设，破解发展瓶颈，优化市域城市空间布局，既是谋划上海进入后世博时期城市发展的重要举措，也是推动区域内各城市间合作日益密切的必然选择，更是上海市创新驱动、转型发展的重要载体和途径。经过数十年的发展建设，上海市新城发展取得了一定的成绩，新城规模逐步扩大，经济发展快速提升，城市风貌得到极大改善，满足市民的生产生活需求，为上海未来发展提供巨大潜能。与此同时，新城发展也存在着用地规模较为粗放，人气不足，就业岗位较少，用地结构不合理，交通设施不完善等问题。本文总结嘉定新城发展的经验和问题，提出值得新城发展借鉴的棕地更新、城市风貌、生态环境、公共设施建设等方面的成功经验，同时指出嘉定新城今后发展应在区域一体化、滨水地区功能提升、产城融合、综合交通优化等方面予以关注。希望能够对全国的新城建设提供一定的经验借鉴，促进新城发挥重大作用，促进新城的可持续发展。

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Urban Knowledge Hub People's Republic of China

Sharing Urban Best Practices for Sustainable Development in Asia and the Pacific

“亚洲开发银行 – 同济城市知识共享”研讨会，2013 年 11 月 12–13 日
中国新城和新区：挑战与机遇

第四届城市知识共享研讨会。继 2010 年、2011 年、2012 年亚洲开发银行（以下简称“亚行”）– 同济大学区域性城市可持续发展知识中心（简称“城市知识中心”）成功举办了 3 届“亚洲开发银行 – 同济城市知识共享”研讨会后，2013 年主办第四届国际研讨会。会议期间将介绍和分享近期中国新城和新区规划及实施的经验，并实地考察上海和无锡的最佳案例。本届会议也与亚洲开发银行区域知识共享中心合作举办题为“中国新城和新区：挑战与机遇的影像思考”的摄影展。

第一天上午议程包括开幕式和主题发言。开幕式由同济大学、亚行和上海市财政局代表致辞。主题发言由国际城市发展专家和上海市规划局领导介绍新城和新区规划、实施与管理的方法。上午下半场及下午两个专场由城市发展专家介绍经挑选的国内外新城新区案例，并着重阐释案例在规划和实施中的经验和教训。演讲结束后进行专家组讨论和开放式集体讨论，并以此作为本次会议的总结。根据研讨会传统，城市知识中心将为最佳案例获奖代表颁奖。

第二天所有与会者乘坐巴士考察第一天介绍的上海和无锡两处最佳案例：“上海嘉定新城”和“无锡太湖新城”。与会代表可以充分与当地规划和管理人员进行交流和讨论。

亚洲开发银行下属的东亚局和上海同济大学建筑与城市规划学院联合开发“城市知识中心”这个首创项目。鉴于城市化的庞大规模和持续发展，该项目旨在积极促进中国和亚洲以及太平洋其他地区之间城市管理经验的有益交流。

ADB

第一天：2013 年 11 月 12 日研讨会
上海同济大学建筑与城市规划学院，文远楼（A 楼）三楼

08:30 注册

1. **开幕式致辞**
主持人：唐子来教授，同济大学建筑与城市规划学院规划系主任

09:00 伍江教授致辞，同济大学副校长
小西步（Ayumi Konishi）先生，亚洲开发银行行长特别高级顾问
刘汉勇博士，上海财政局对外经济处处长

2. **主题发言 1**
主持人：唐子来教授，同济大学建筑与城市规划学院规划系主任

09:15 **中国新城的演变：从工业卫星城镇到生态城市的转变**
吴缚龙教授，伦敦大学学院巴特雷特建筑学院规划系教授

09:45 **上海新城的经验教训**
徐毅松先生，上海市规划和国土资源管理局副局长

10:15 **问与答**

10:30 茶歇

3. **主题发言 2**
主持人：玛丽亚·皮娅·安科拉（Maria Pia Ancora），亚洲开发银行东亚局城市发展专家

10:45 **印度德里、孟买和加尔各答的新城发展**
卡瓦斯·卡帕迪亚（Kavas Kapadia）教授，印度新德里规划与建筑学院原院长

11:15 **欧洲的生态城市：紧凑、多功能、绿色、宜居的新城区**
饶士凡（Stefan Rau），亚洲开发银行东亚局城市发展专家

11:45 **问与答**

4. **摄影展“中国新城和新区：挑战与机遇的影像思考”**
主持人：薄洋（Jorn Brommelhorster），亚洲开发银行东亚局首席经济学家

12:00 **展览开幕：中国新城新区案例**
小西步（Ayumi Konishi）先生，亚洲开发银行行长特别高级顾问

12:05 **新区展示 1：宁波东部新区**
王伟强教授，同济大学建筑与城市规划学院

12:10 **新区展示 2：郑东新区**
陶涛先生，洲联集团总规划师

12:15 **新区展示 3：金州新区（大连经济技术开发区）**
刘刚博士，同济大学建筑与城市规划学院

12:25 集体照，C 楼底楼

12:30 午餐，三好坞餐厅二楼

5. **案例 1**
主持人：王兰教授，同济大学建筑与城市规划学院

13:30 **上海嘉定新城区：新型城市模式的经验分享**
詹运洲先生，上海城市规划设计研究院副总工程师、总规中心主任
何晓涛先生，上海嘉定新城发展有限公司总裁助理、总师办主任

14:10 **问与答**

6. **案例 2**
主持人：饶士凡（Stefan Rau），亚洲开发银行东亚局城市发展专家

14:30 **无锡太湖新城的低碳生态城市**
吴晓莉女士，深圳市城市规划设计研究院副总规划师
冯晓星女士，无锡市规划局新城分局副局长

15:10 **问与答**

15:30 茶歇

7. **案例 3**
主持人：王伟强教授，同济大学建筑与城市规划学院

15:50 **北川：从灾后废墟中建起的新城**
郑德高先生，中国城市规划设计研究院上海分院院长
贺旺先生，四川省绵阳市副秘书长，北川市原副市长

16:30 **问与答**

8. **专题及全体讨论**
主持人：迪伟什·沙兰（Diwesh Sharan），亚洲开发银行东亚局城市与社会发展处处长

16:50 **专题讨论：从案例研究中获取的经验与教训**
小西步（Ayumi Konishi）先生，亚洲开发银行行长特别高级顾问
杨金林先生，亚洲开发银行东亚局高级顾问

唐子来教授，同济大学建筑与城市规划学院规划系主任
童明教授，同济大学建筑与城市规划学院
吴缚龙教授，伦敦大学学院巴特雷特建筑学院规划系教授
维尼塔·雅达夫（Vinita Yadav）教授，印度新德里规划和建筑学院
鲁米·艾扎兹（Rumi Aijaz）先生，印度观察家研究基金会

17:50 **专题总结：亚行项目的经验与教训**
迪伟什·沙兰（Diwesh Sharan）先生，亚洲开发银行东亚局城市与社会发展处处长

9. **城市知识中心最佳案例颁奖典礼**
主持人：王兰教授，同济大学建筑与城市规划学院

18:00 2013 年度最佳案例颁奖典礼

10. **总结**
18:15 哈米德·谢里夫（Hamid Sharif）先生，亚洲开发银行驻中国代表处主任
唐子来教授，同济大学建筑与城市规划学院规划系主任

18:30 晚宴，白玉兰宾馆二楼唐宫大堂

第二天：2013 年 11 月 13 日 新城和新区考察

1. **上海嘉定新城考察**
08:00 白玉兰宾馆出发

09:30 步行考察上海嘉定新城，并与规划师及当地官员进行讨论

11:30 问与答

12:00 嘉定午餐

2. **无锡新城考察**
13:00 上海嘉定新城出发

15:00 步行考察无锡太湖新城，并与规划师及当地官员讨论

17:00 问与答

17:30 无锡晚餐

18:30 返回上海

20:30 抵达白玉兰大酒店

Introduction to New Towns and New Districts

Planning Concept and Development Model of New Towns and New Districts in the People's Republic of China

Lan Wang

The development of new towns and new districts in the People's Republic of China (PRC) plays an important role in its recent urbanization. In the past 30 years, PRC's urbanization rate has increased by 1% per year, with new towns and new districts being the main form to expand urban space. In 2013, the research group of Cities and Small Towns Reform and Development Center of the National Development and Reform Commission conducted research on 12 provinces and 156 prefecture-level cities from autonomous regions. Findings include that 90% of all prefecture-level cities plan to develop new towns and new districts and 12 provincial capital cities planned and developed 55 new towns and/or new districts.

There are three key drivers for large-scale urban development. The first is land leasing, which is the main source of fiscal revenue for local governments in the PRC. The second is the provision of ample space for urban growth, including industrial land, housing, and commercial real estate development. The third key driver is the provision of space for resettlement from old cities with high population density and aging facilities and support for old city redevelopment using revenue from new towns and new districts. The development, therefore, of new towns and new districts plays a very significant role for the PRC's rapid and massive urbanization and economic development.

Before the reform and opening-up policy that started in 1978, industrial satellite cities were the main form of new towns and new districts. The centers of these cities were large, heavy industry, state-owned enterprises. Proximity to raw materials primarily determined the location. Since 1978, with the shift from a planned economy to a market economy, the formulation of mechanisms and policies stimulated the development of new towns and new districts.

The establishment of a system of paid use of state-owned land in 1987 liberalized the land market. The removal of the housing allocation policy, which required the state-owned enterprises to provide housing for workers, and the privatization of housing ownership in 1994 established the housing market and triggered the vigorous development of the real estate industry. While satellite cities solely provided space to serve industries, new towns and new districts emerged around the year 2000 that provided space for industrial and residential real estate development. The new type of real estate development became the main form of approved land leasing, making it the main source of capital for urban construction for local governments.

The various types of newly established new towns and new districts included (i) residential and real estate development; (ii) industrial and technology business cluster development; (iii) university campus development; (iv) relocated government departments; (v) regional transportation facilities development (i.e. high-speed train stations). In some cases, larger new towns or new districts integrate several of the above elements. Chenggong New District in Kunming in Yunnan Province, for example, includes relocated government offices and a new university campus. A university campus, commercial retail, recreation, and several residential real estate developments anchor Shanghai Songjiang New Town.

Developing new towns started as a movement in the United Kingdom originating from the *Garden City* concept by Ebenezer Howard in his book *Tomorrow: A Peaceful Path to Real Reform*. He proposed new town planning and construction to consider the benefits of both urban and rural areas in metropolitan suburbs. A typical Garden City would have around 30,000 residents and commercial and public services around

a commuter railway station. Howard established a new town development company, carried out new town construction experiments in the surroundings of London, and started the new town movement, which influenced urban development around the world.

The PRC's new towns and new districts also drew lessons from Howard's Garden City model — such as combining the advantages of both urban and rural areas, functional separation of residential and industrial land, and the preservation of large-scale green land for farming and recreation — and adopted them in varying degrees. With a large population moving to cities, developers in the PRC sought high returns on their investment. High-density, car-oriented developments are typical, influenced by Architect Le Corbusier's *Bright City*. Some of the PRC's new towns adopted Corbusier's model that included car-culture and wider roads, higher density and high-rise residential buildings.

With newly built subways extending out to suburban areas of the PRC's megacities, the PRC adopted the concept of transit-oriented development (TOD), which the American New Urbanism movement promoted. Key features of TODs are subway lines that connect suburbs and new towns to the central areas of the city and comprehensive mixed use, higher density development around subway stations. Some new towns that have strong anchor users such as a key industry, government center, university or other special facilities have their own planning features and layouts. For example, new towns around a high-speed train station rely on incoming traffic and capital. Therefore, businesses, commercial, and residential functions are closely connected around the station. In new towns and new districts plan for public facilities within convenient reach of residents and workers to ensure a good level of service.

The management and operation model combining the new town and new district construction management committee and the development company combines good features of both government-led and market-based instruments. A semi-private development company can respond quickly and flexibly to changes in demand and supply. It also benefits from support and assistance by the government in planning, development, and approval procedures. A semi-public development company also has a higher level of social responsibility wherein developers balance public with private interests.

Typically, for each new town and new district, a semi-public development company under the municipal government is responsible for planning, implementation, financing, procurement, and management. The government appoints a steering committee as a government agency to supervise and manage the development company and assist the company with communication and negotiation with various government departments to advance the planning and construction of the new town.

Local governments initiate projects and regulate the development and, in some cases, invest in the initial planning and implementation phases. The city mayor establishes a management committee, which coordinates the planning and implementation process. The committee organizes auctions for the developers, develops the basic requirements for preliminary planning, selects the design institutes that participate in the urban planning and design competition as engineering consultants, presides over design competitions, and determines the final master plan. After urban planning and urban design is completed, two main entities would be responsible for implementation. The municipal government is responsible for first-degree land development. Various departments are in charge of land acquisition, relocation and resettlement of residents, basic road and infrastructure construction, completion of soil storage and leveling, main road construction, and municipal infrastructure, for example. The government consults with private real estate developers in second-degree development, which includes arrangements such as access to land use rights and real estate development according to the master plan.

The City of Shanghai pioneered the new era of new towns and new districts construction in the PRC. It presented its "One City and Nine Towns" program in

2000 to organize the rapid urban and industrial growth. After extensive redevelopment in the 1990s, Shanghai proposed an increase of green and open spaces and a decrease of development density and intensity for its central city. Shanghai also proposed an increase in suburban development. It provided 10 suburban towns seed capital to select sites and construct their own new towns with a specific style. The district governments of Shanghai appointed development and construction management committees. It incorporated development companies to take charge of planning and development, including implementing guidelines for an assigned specific style given by the government and organizing international design competitions, to ensure high quality urban design. This model of planning and developing new towns and new districts in the PRC centered on land leasing and real estate development eased overcrowding of original center cities and improved the quality of life for residents. Meanwhile, revenues from land leasing boosted the economic development of the cities. The advantage of later development with state of the art infrastructure and larger dwelling units and more space for cars make new towns compared to old towns popular for residents and investments.

In terms of planning, however, new towns and new districts tend to be land use extensive with wide roads, large setbacks, large development blocks, and car-dependent, often with low quality pedestrian environment. While the separation of industrial and residential land results in long commuting distances from home to work, the construction of public transportation connecting the new towns with the main cities is lagging, intensifying dependence on cars. Also, inadequate and inconvenient public service facilities, especially at the beginning of implementation, restricted the popularity of the new towns.

At the same time, investing in residential property in new towns and new districts has become an important way for private households to hedge against inflation. This investment strategy of private households is also the reason for low occupancy rates in many of the new towns and new districts, which is also due to the unpopularity of renting out condominiums. This "ghost town phenomenon" has occurred in many places. This urbanization model has been called "land urbanization" in the PRC's academic circle, as opposed to "population urbanization", which builds on relocating people from rural to urban areas.

Lessons learned from Shanghai and from the PRC's overall experience with new towns and new districts initiated new approaches and experiments in planning and development. This book reflects some of these new approaches and experiments, along with case studies that the ADB-Tongji Regional Knowledge Hub for Sustainable Urban Development in the PRC selected. The Beichuan New Town with overall planning and development by a single body explored how to preserve local cultural characteristics and promote economic and industrial development. Wuxi Taihu New Town adopted a variety of ecological planning methods and techniques. Jiading New Town made innovations in small-scale blocks, public space, landscape design, development, and operation.

New towns and new districts have become an important part of the PRC's urbanization because of specific mechanisms, which include the planning system that enables swift implementation, land use rights leasing approval system, governing rights to land rent for local governments. These mechanisms ensure the integrated promotion of new town and new district construction along with their economic development. These are some of the lessons other countries may learn from the PRC's experiences to promote sustainable new town planning and development with their own countries' characteristics to provide their citizens better living conditions.

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Eco-Cities in Europe: Compact, Mixed-Use, Green, Livable New Districts

Stefan Rau

Planning and implementing new towns and new districts — as opposed to unplanned urban expansion and sprawling development — are an effective way to manage urban growth and provide adequate, efficient, and sustainable municipal infrastructure and services. Ideally, new towns and new districts should follow sound sustainable development practices, ensuring compact, mixed-use development based on public transport and pedestrian-friendly environments; preserving ecosystems, farmland, and other green space between existing and newly planned urban areas; and protecting green space and ecosystems within the new towns and new districts that provide climate resilience and ecosystems services. It is critical that public transport, such as commuter rail, subway, light-rail, or bus rapid transit, link new towns and new districts to the rest of the city.

New towns and new districts are necessary to manage urban development and growth. Unplanned and uncoordinated settlements and developments will otherwise lead to unsustainable structures with lack of services and likely negative social and environmental impacts that will be hard to overcome later as infrastructure and land parcels will be locked in for generations. In light of expected rapid urbanization in the next 20 to 30 years, Asia and the Pacific, including the PRC, will face massive environmental and social challenges. The development of sustainable new towns and new districts is an important task for all policy makers. The task is no less than sustainably accommodating an expected 2.7 billion new urban residents by 2050.

Industrial Pollution, Garden Cities, and Suburban Sprawl in Europe and United States

New town planning and design evolved in the early 20th century in response to poor, unhealthy, and unsanitary living conditions in historic and industrial towns, especially the early industrial cities such as London, Liverpool, and Manchester. Birmingham and London were the first industrial metropolises that expanded with factory and housing districts. With the introduction of the steam-powered train, ideas emerged to move residents and polluting industries away from the congested center city and separate factories from residential neighborhoods and civic and commercial centers. These separated districts would then be linked by trains and develop around railway stations. Ebenezer Howard, in his book *Garden Cities of Tomorrow*, was motivated to improve public health, hygiene, and overall healthy living when he first promoted these principles.

In the 1940s, urban planner, Patrick Abercrombie, developed the concept of a greenbelt surrounding London, organizing the region in four rings: core city, suburban ring, greenbelt and outer country ring with new towns along train lines radiating out from the center. These robust regional and urban planning concepts have recently been re-used and are now called *urban growth boundary* and *transit oriented development*.

Sprawling suburban subdivision developments started in the 1950s. Based on Frank Lloyd Wright's principles from his *Broadacre City* concept, these developments were car-oriented versions of Howard's *garden city*. Expanding highway systems and shopping malls, industrial zones, and office parks at freeway intersections later lead to what are now called *edge cities*. These very unsustainable development patterns lead to land and resources inefficient and needlessly energy consumption, especially for transport due to very low density and single-use development.

Emerging Paradigm of Sustainable Urban Development and Eco-City Planning in Europe

The 1992 United Nations Conference on Environment and Development in Rio de Janeiro was a turning point for mainstreaming sustainable urban development. *The Agenda 21, the Rio Declaration on Environment and Development* propelled global awareness of the need to change toward a sustainable, nature preserving, resource-efficient mode of development and human life. Local governments, businesses and citizens in many cities around the world took part in developing *Local Agenda 21* programs.

Since the mid-1990s many new urban districts around the world started to follow principles of eco-efficiency including land, energy, water, and general resources efficiency in cities, districts, neighborhoods, and buildings. This set new standards for energy and water efficient buildings. Germany's regulations, for example, evolved from requirements for increased building insulation into laws that ensure local small-scale renewable energy producers can feed into the power-grid at a guaranteed price. In the United States, *smart growth* and *green growth* became common, indicating a departure from the car-oriented land-and-transport extensive urban sprawl. The *New Urbanism* movement promotes transit-oriented development and more compact and dense neighborhood development. The US Green Building Council developed guidelines and a rating system for energy efficient buildings and sustainable planning principles for neighborhood development. Cities like Chicago developed its green city concept with ambitious targets to reduce greenhouse-gas emissions. The government of the PRC has been promoting low-carbon eco-city development, and many pilots have produced remarkable results.

In Europe, eco-city development research and pilot projects identified key planning principles, often summarized as the *compact city* concept with transit-oriented development around stations that integrate several modes of transport with high-density urban fabric, a mix of uses and pedestrian-friendly environments, parks, and urban services. Below are three best practice cases.

New Eco-District Best Practice Case: Hammarby Sjöstad, Stockholm, Sweden

Hammarby in South Stockholm was an industrial area around bodies of water. It was planned to be the Olympic Village for Stockholm's unsuccessful bid to host the Olympics in 2004. Planning to redevelop this polluted brownfield into a new urban district started in 1990. The original plan was adjusted to make it a comprehensive eco-city development, one of the most successful worldwide, even ahead of its completion in 2015. Hammarby was transformed into an attractive new district with 11,000 dwelling units for 25,000 residents, mostly young families, jobs for 10,000

(a) (b)

Fig. 1 Hammarby Sjöstad: Compact and Green, Livable, District with Human-Scaled Spaces and Buildings
Source: Johan Fredriksson / Arikogan

workers, and beautiful waterfronts, parks, and green courtyards.

Buildings with 4 to 8 stories advocate human-scaled density and environment on small blocks. Public housing comprises 22% of the housing stock. Cooperatives own 55% and individuals or firms own 23%. Buildings are now twice as eco-efficient compared to normal standard buildings. These buildings focus on sustainable materials that are healthy, dry, and environmentally sound such as glass, wood, steel, and stone. The soil was thoroughly decontaminated from industry pollutants before construction began.

Planning for the open space system and parks followed high standards requiring, for example, a small park or courtyard with an area of 25 to 30 square meters within 300 meters of every apartment (equivalent to 100 square meters of gross floor area of residential building space). Environmental protection guidelines protect valuable natural areas from development. A compensation mechanism required that development of a previously undeveloped green area be replaced by biotopes that ensure biodiversity in another place nearby.

Hammarby now enjoys fast and attractive public transport service with light-rail transit, buses, and ferries. The ferries are free of charge and run daily from early morning to late night. Attractive public transportation, carpooling, beautiful bicycle paths, and very attractive pedestrian pathways and sidewalks reduced the use of private cars. The district government organizes a carpool, which is open to all residents and workers. About 10% of households

(a) (b)

Fig. 2 Parks, Waterfronts and Pathways for Pedestrians and Cyclists Enhance the Livability of the District
Source: Arild Vågen

(a) (b)

Fig. 3 Light-rail and Ferry Service to Hammarby Sjöstad Is Convenient All Year
Source: Arild Vågen / Ankara

joined the carpool system that has 25 to 35 gas-efficient cars available. As a result, the people prefer public transportation, bicycles, and walking for 80% of all their trips in Hammarby.

While renewable sources, such as biogas, fuel cells, solar cells, and solar panels, supply most of Hammarby's energy, energy efficient buildings also reduce the need for energy. A district heating and cooling system uses excess energy, a by-product, in the form of heat and/or cold temperature from wastewater from a pilot wastewater treatment plant. Hammarby targets to locally produce half of the local energy demand.

Water supply and wastewater management systems use innovative water and energy conserving technology. Hammarby has a goal to reduce water consumption from the average 200 liters per person per day to 100 liters. So far, they've managed to bring consumption down to 150 liters by using water efficient appliances, low-flush toilets, and mixer taps.

The city manages solid waste through an innovative automated system of underground pipes that collects waste through suction from garbage drop-off points near the buildings with segregating waste at the drop-off points into combustible, domestic and food waste. The wastes are discharged into underground tanks that are emptied by a collection vehicle that sucks out the waste from the tanks using pumps.

New Eco-District Best Practice Cases: Rieselfeld and Vauban, Freiburg, Germany

In the city of Freiburg in southwestern Germany, two new districts: Rieselfeld and Vauban were planned and built in the mid-1990s. Rieselfeld is a green-field residential neighborhood at the western edge of the city and next to a light-industry park. A new light-rail links it to the downtown. Vauban is near the city center. It is a redevelopment of an abandoned military site that was returned to the city after the reunification of Germany. Both new districts are designed as compact, mixed-use transit-oriented, pedestrian-friendly, green urban communities.

Freiburg Rieselfeld is home to 11,000 residents and 1,000 permanent jobs on a 70-hectare area, and protects a 250-hectare nature reserve next to it. The development pattern follows a system of small urban blocks, scaled for walking with less than 100 meters between street intersections. Well-designed sidewalks and paths, bicycle lanes, trails, green parks, and attractive public plazas also make walking pleasant. Public facilities include community centers, churches, and schools for 3,000 students.

To avoid uniform building blocks, each block was subdivided into parcels and sold mostly to building cooperatives. Private building cooperatives were formed to design and build a multi-story residential building together, engage an architect, plan and finance the building. There are 6 to 10 different owners, often young families, who would then each own a unit and live in the building they helped design and develop according to their specifications and budget. A total of 150 cooperative projects were built in Rieselfeld.

Rules were established to prohibit developers from buying a whole block. A single developer is not allowed to own and develop more than three parcels in one block to ensure variety. This rule created a pleasant scale when walking along the streets as building designs change every 20 to 30 meters. All buildings were required to comply with Germany's low-energy building standard.

Freiburg Vauban is known as car-free, solar district. It is a former military site redeveloped into a mixed-use, walkable, and green urban district with a total of 2,000 dwelling units, commercial and office space for 600 jobs, and a central market place with a community center. Planning started in 1996, and construction was completed in 2006. The city's general public (the future residents) and the private sector took part in planning and implementation process.

The "Car Free City" concept includes restricted zones for private automobile access in the whole district while selected areas are totally free of cars. Parking structures are located at the periphery of the development, and a light-rail transit streetcar provides excellent access to the city. Around 40%

Fig. 4 Freiburg Rieselfeld: New Green, Compact, Human Scaled, Pedestrian-Friendly Urban District
Source: Norbert Blau Luftfahrer

(a)

(b)

Fig. 5 Freiburg Rieselfeld: Green Spaces, Blocks with Many Individual Buildings and Tram Service
Source: Andreas Schwarzkopf / Dr. Neil Clifton

of households moving to the district agreed to live without their own cars, others park vehicles outside in the two parking structures and/or participate in car sharing and carpooling. The land use plan is arranged so that no home or workplace is more than 500 meters away from public transport. The primary modes of transport in the district are walking and bicycle riding. Traffic rules clearly prioritize pedestrians and bicycles with speed limit on main streets of 30 km/h. On side streets, also referred to as "communication spaces" or living streets, the maximum speed is 10 km/h. All streets are suitable for kids to play. Covered bicycle

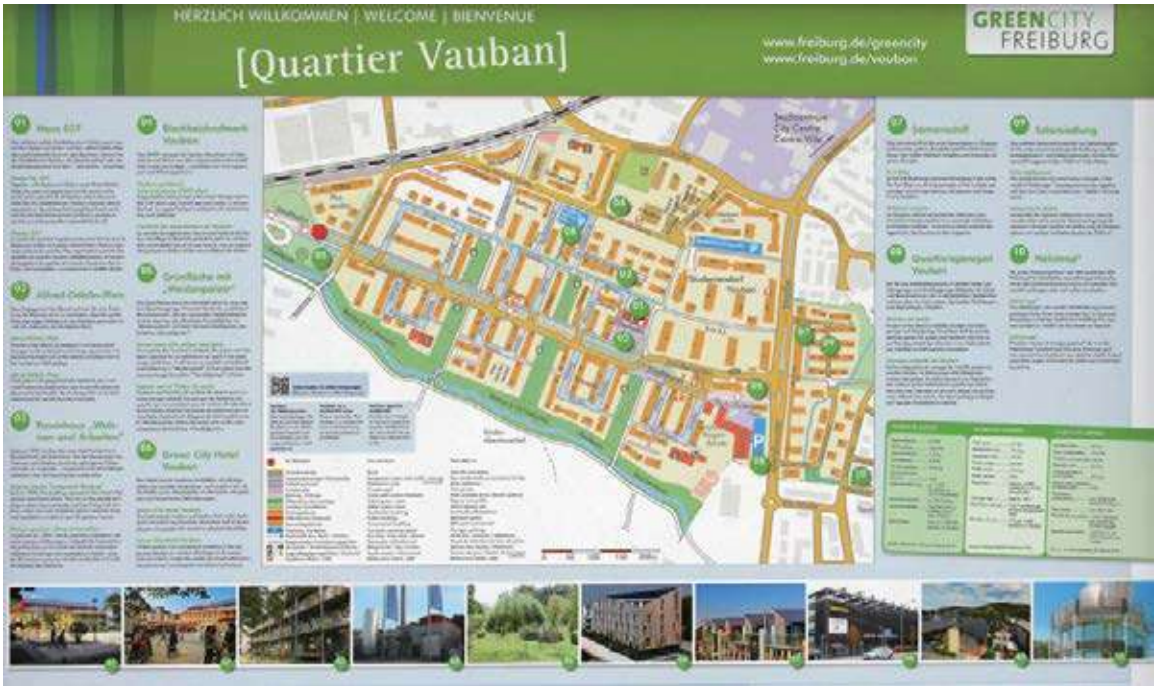

Fig. 6 Freiburg Vauban: Planning the Green, Eco-Efficient, Human Scaled Pedestrian Friendly New District
Source: Andreas Schwarzkopf (info-board display)

racks at buildings promote cycling. This holistic concept for non-motorized transport results in the lowest car ownership ratio in Freiburg with 150 cars per 1,000 residents compared to 430 cars per 1,000 residents citywide.

Fig. 7 Freiburg Vauban: Solar City Focused on Producing Solar Electricity and on Public Transport, Bicycles and Pedestrians
Source: Mangan 02

The “Solar City” concept includes advanced urban and building infrastructures for water and energy conservation. Throughout the district, buildings are required to meet at least the German low-energy building standard, and at least 100 buildings meet the even higher German efficiency standard of “passive house”. A solar-city sub-district was implemented in which solar panels completely cover all house roofs.

For individual buildings, a best practice for resource efficiency is a multi-use building with low-energy standard planned and implemented by an owner-occupier cooperative. A community self-organized a matchmaking forum for 16 families who coordinated and developed their building together. The four-story structure accommodates 16 apartments ranging from one bedroom to duplex apartment units for large families and includes 4 offices, an artist studio, and communal areas. Gray water from basins and showers are cleaned by an on-site ventilated

(a) (b)

Fig. 8 Freiburg Vauban: All Roofs with Solar Panels and Energy and Resources Efficient Buildings
Source: Andrewglaser / Mangan 02

sand filtration system and used for flushing. The 25 vacuum toilets used in the building are 25% more water efficient than conventional toilets. Sewage and organic waste are collected in a tank in the building's basement and fermented into cooking gas in an experimental biogas reactor. Solar-thermal collectors on the roof supply 3,400 liters of hot water reservoir and the small combined heating and power plant unit supplies additional electricity, heat, and hot water. Solar cells totaling 3.2 kW are installed on the roof. The heat and power unit and the photovoltaics combined supply 80% of the electricity consumed by the building and its residents.

These two new districts in Freiburg are some of Germany's best practice examples of new district developments that are eco-efficient, livable, compact, mixed-use, transit-oriented, pedestrian friendly, and energy efficient. The City of Freiburg has won many awards for urban sustainability and livability for its overall efforts and for its new and well-integrated districts.

New Eco-District Best Practice Case: French Quarter, Tuebingen, Germany

The City of Tuebingen has a 538-year-old university and a population of 90,000, of which 26,000 are students. The French Quarter was planned as a mixed-use urban community in 1993 that utilized all reusable structures on a former military site that was returned to the city after the German reunification. Construction was completed in 2012, and it is now home for 6,500 residents and 1,000 jobs in 150 businesses comprising 50% services, 20% skilled trade or production, and 10% retail.

The city prefers selling land parcels to building cooperatives over commercial developers, implementing the city council's objective of owner-occupied small-scale mixed-use buildings. Through many consultations, the city administration facilitated the process of matchmaking the cooperatives and even managed to achieve mixed-use buildings by including a commercial/craftsman user in the cooperatives. Through this process, the administration promoted investments in the local economy by supporting small owner-operated light industry and retailers as part of the implementation strategy of small-scale decentralized supply as opposed to chain supermarkets and stores. This resulted in a unique local neighborhood economy that integrates small-scale light industry that does not disturb the residents.

The traffic concept was to limit cars to promote car sharing, cycling, and walking. The city government facilitated car sharing, which enables car availability on demand and is now widely used by the local residents. The result is a low level of

Fig. 9 Tuebingen French Quarter: Livable District with Attractive Streets and Plazas Nice for Walking and Cycling
Source: Ramessos

car-ownership of 220 cars per 1,000 residents in the French Quarter, compared to 493 cars per 1,000 residents in the overall city. Low volumes of car traffic make cycling and walking convenient and safe. For parking and locking a bicycle, numerous bike stands are available. The share of cycling as percentage of all trips in the eco-district is 24%, compared to 20% in the city and 13% in Germany overall. The district's compactness makes walking pleasant, short, and efficient.

Principles of Eco-Cities in Europe: Compact, Mixed-Use, Green, and Livable New Districts

We may conclude that successful eco-city and eco-efficient urban developments in Europe share some common key principles that may serve as lessons for the PRC and Asia and the Pacific. These principles include the following:

(i) Compact and human-scaled: small urban blocks, scaled streets with pedestrian-friendly environments, and 5- to 10- minute walking distance to and from home and work, to transit stations, retail shops, public services, and parks.

(ii) Mixed use: urban vibrancy through a mix of culture, businesses, residential, institutions, and non-disturbing light manufacturing within the urban district, neighborhoods, and buildings.

(iii) Transit-based: convenient public transportation and eco-mobility, i.e. car-sharing, rental bikes, bicycle parking, delivery services, high density and mix of uses around transit station.

(iv) Human-scaled living streets that are pedestrian, and bicycle friendly: fine-meshed network of beautiful sidewalks and pathways, small urban blocks, pedestrian safety, shops along sidewalks, landscape, lighting and public furniture.

(v) Eco-efficient: land use efficient, energy efficient, water efficient urban districts and lifestyles.

(vi) Green open space system: green space to provide ecosystem services, public health, community amenities, increased land value and ecological infrastructure.

(vii) Inclusive: small scale investments organized in private building cooperatives and prioritization of this form of ownership by city government as opposed to proposals from commercial developers.

(viii) Focus group and public participation during planning.

(ix) Competitive: mixed use with jobs creation promoting high-tech small and medium-size enterprise spinoffs and provision of live and work space attractive for highly skilled academics.

(x) Sustainable investments as demand-based inclusive development, balancing supply and demand.

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Fig. 1(b): Hammarby Sjöstad view of waterfront and human-scaled residential buildings. Photo taken by Arikogan, available online at: https://commons.wikimedia.org/w/index.php?title=File:Hammarby_Sjöstad_Estocolmo_Suecia_rio.jpg&oldid=96533959. This file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported (https://creativecommons.org/licenses/by-sa/3.0/deed.en) license.

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Fig. 6: Freiburg Vauban infoboard of planning the green, eco-efficient, human scaled pedestrian friendly new district. Photo taken by Andreas Schwarzkopf, available online at: https://commons.wikimedia.org/w/index.php?title=File:Infotafel_in_Freiburg-Vauban_an_der_Endhaltestelle_Innsbrucker_Straße_2.jpg&oldid=138838601. Category: Vauban (Freiburg im Breisgau) This file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported https://creativecommons.org/licenses/bysa/3.0/deed.en) license.

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Fig. 9: Tuebingen French Quarter view of plaza and scaled street and individual buildings of the livable district with attractive streets and plazas nice for walking and cycling. Photo taken by Ramessos, available online at: https://commons.wikimedia.org/w/index.php?title=File:TuebingenFranzViertel1.jpg&oldid=158419078 “I, the copyright holder of this work, release this work into the public domain. This applies worldwide. In some countries this may not be legally possible; if so: I grant anyone the right to use this work for any purpose, without any conditions, unless such conditions are required by law.”

Introduction to the Three Chinese New Town Case Studies

Fulong Wu

The three case studies presented below were first presented at the ADB-Tongji Urban Knowledge Hub Seminar in November 2013 (for program details see appendix). They have different development priorities, each provides different lessons on new town development in the People's Republic of China (PRC), ranging from an industrial development approach, a mix of industrial and residential development, to an approach focusing on reconstructing new residential communities after a natural disaster. They demonstrate the scale and character of new town development in the PRC.

While the term "new town" is used loosely in the PRC, the examples here refer to a specific category of new towns, which are developed through large-scale, state-planned development. At the same time, these new towns use the land market as a key driver for housing development and industrial growth. These new towns are, essentially, formally-planned new settlements.

Wuxi Taihu New Town

The strength of Taihu New Town is its location in the heartland of the Yangtze River Delta. The economy of Wuxi, the municipality governing the new town ranks at the top in the region measured in per-person gross domestic product. Wuxi Taihu New Town is a strategic development of Wuxi, shifting its center of gravity toward the south-west and closer to the Taihu Lake from the city's original core along the Shanghai-Nanjing railway and the Grand Canal. The development of Wuxi enjoys favorable support from the central government.

The development of the eco-city is part of the local government's endeavor to capture central support. Its development is characterized by plan-led approaches. The new town is becoming a new city in itself, rather than a satellite industrial town of Wuxi Municipality. A salient feature is the development of a zoning system to cover the new development area (Wu, 2015). With the input of overseas expertise from the United Kingdom based engineering firm ARUP which has planned a number of eco-cities in the PRC and is specialized in the integrated approach to sustainable development, and other consultants, the ecological codes developed for the project have been embedded into the zoning system.

Its demonstration project of Wuxi Sino-Swedish Low Carbon Eco-City is part of international policy learning. While foreign expertise has strong influence over the planning process, the development and planning of the new town is more an outcome of PRC's land and economic development. The eco-city will likely be implemented because the whole new town is viable as a new economic territory. The ecological codes, therefore, impose some additional requirement to advance ecological sustainability rather than a stand-alone eco-development, which bear the risk of economic failure due to potential lack of economic activities.

In terms of ecological planning, the design ensures the preservation and construction of green corridors and the network of water bodies. This fits well into the characteristics of this area known for the southern Jiangsu water landscape. In terms of the economy, the new town supports the development of the service sector, in contrast to many other Chinese new towns, which are mainly driven by manufacturing industries. The new economy of Wuxi includes the financial sector, creative industries, such as the Wuxi Film and TV Studio, IT, leisure, and science and technological research. The development also

encourages higher density and a pedestrian system for green transportation. The development of water recycling and sewage treatment reflects the new town's emphasis on infrastructure development to support sustainability. As a result, the new town is able to balance economic development and ecological management. Rather than being driven by residential development, the development of Taihu new town includes accommodating new economic sectors.

The integration of physical planning and environmental indexes is the strength behind its planning-led approach. The ecological demonstration zone, or the eco-city, with 2.4 square kilometers (km^2), is part of a larger new town area of 150 km^2. When infrastructure of the new town is completed and becomes more established with a growing population, the development of the eco-city will be viable. Its development thus attracts domestic and overseas attention.

Fig. 1 Wuxi Taihu New Town Central Area
Source: Photo by Fulong Wu

Jiading New Town

Jiading New Town is in the north of Shanghai and is one of nine towns planned by Shanghai City. Dating back to the regional plan of Shanghai, just before 1949, Jiading was chosen as one of the new towns to develop to reduce the congestion of the city proper of Shanghai. In the socialist period, Jiading was developed as an industrial satellite town. Its development was slow until the 1990s when new town developments became a new strategy of Shanghai. By that time, the development of Jiading gained regional importance in enhancing Shanghai's economic competitiveness. Now, the target is to develop Jiading into a new city of 800, 000 people.

From the economic structure, Jiading is similar to another new town of Songjiang in Shanghai (Wang et al., 2010) and Yizhuang, where Beijing Economic and Technological Development Zone is based (Wu and Phelps, 2011). Industry, which accounts for 69% of the total gross domestic product (GDP), dominates the economic structure of Jiading. As a manufacturing base for Shanghai, it has important economic functions. The manufacturing industry is the major source of employment.

Recent planning efforts began to promote the development of low-carbon industrial parks and introduce energy-saving technologies into the new town. Analysis shows that land leasing is an important source of revenue for new town construction. The tax income of the new town has been growing significantly, in comparison to the district of Jiading where the new town is located. Since 2011, a new direct fund-raising approach has been introduced, with CNY2.3 billion direct funds raised from trust, debt, and corporate bonds. This direct fund-raising approach aimed to reduce the heavy burden of local public finance, which heavily relies on indirect funds from land development. The development of the new town attracted commercial activities near its mass transit station. The development also emphasizes landscape management and planning regulation. However, Jiading still faces some challenges. One important challenge is figuring out how to improve the quality of life. Jiading needs to turn the new town from an industrial base to a livable city.

Jiading presents an impressive image of a modern city, with signature buildings such as Jiading Poly Theatre and the greenways along the main avenues. However, given the increasing competition between different cities, it still needs to consider what its new role would be in Shanghai and the Yangtze River Delta.

Shanghai's overall new town strategy requires Jiading to consider how to play its role in regional development and cooperation, in particular a triangular cooperation relationship between Shanghai, Suzhou, and Jiaxing, two cities respectively in Jiangsu and Zhejiang Provinces, next to Shanghai.

Jiading, like many other Chinese new towns, needs to pay attention to residential development along with industrial development and promote "town and industry integration". Historically, the development of new towns was oriented toward industry needs, often leading to long distance commuting and underdeveloped residential areas. The separation between residential and industrial areas becomes a major obstacle toward an integrated livable city. The new town now strives to improve the quality of its built environment and the public transport system. The ecological improvement is also a major issue for the new town to attract residents, because Jiading still has an image of industrial new town. The ecological quality of the built environment is important for the new town to become an ideal place to live in addition to its economic functions.

Beichuan New Town

Beichuan is an administrative center of Beichuan Qiang ethnic autonomous county. It is not a "new town" within a municipality but a newly built county town. Post-earthquake reconstruction drives its development. The earthquake destroyed its old town seat, leading to its relocation to another administrative area of Yongchang Town. The development of Beichuan shows the role of state and city planning in the process of reconstruction. The town was planned according to a set of principles such as compact development, more open and green spaces, narrower streets to show its residential and commercial function (rather than a grid system of superblocks used in many new industrial areas), the balance between residence and industrial development, preservation of local culture and characteristics, and prioritization of non-motorized transport. These features have been better incorporated into Beichuan reconstruction because the new town is an entirely planned new development.

Fig. 2 New Residential Area of Jiading New Town
Source: Photo by Fulong Wu

The development of the new town was completed in 2011, covering an area of 4.59 km^2. To some extent, new Beichuan can be regarded as a mega urban project. Support from the central government and other provinces in the coastal region made this viable. For example, Shandong Province supported the development of an industrial park in Beichuan. Nevertheless, the development of Beichuan is very different from other new towns in the coastal region such as Jiading New Town in Shanghai, Taihu New Town in Wuxi, and Huaqiao New Town in Kunshan, which are driven by manufacturing industries and economic development. Although there are some industrial enterprises in new Beichuan, this new town development is centered on the reconstruction of a town seat after an earthquake. Consequently, job provision becomes a major challenge. Although planning guidance emphasizes higher density and compact development, the residential density is still quite low compared to other Chinese cities. A sudden influx of capital investment was financed by post-earthquake reconstruction but investment has since declined. This raises a serious issue about how to sustain its development.

Much can be learned from post-earthquake reconstruction. The decision to relocate was inevitable and appropriate, given the disastrous effect of the quake on the life of the people of Beichuan. The spatial

plan considers the need to preserve local heritage and provide space for industrial development (via the industrial parks through joint development). The functional division between tourism, industry, and living areas has been achieved through land use zoning and design. The development shows that in this particular circumstance planning could immediately create an orderly-built environment. Despite these achievements, it would take a much longer time for Beichuan to become resilient, as economic development has to drive long-term development after the reconstruction of living space. Without a prosperous economy, the sustainability of Beichuan would become a problem.

Further, because this is an ecologically fragile and sensitive area, it is not suitable for large-scale industrial development. In other words, the natural environment constraint means that it is difficult to replicate the trajectory of growth in coastal regions. Beichuan faces high financial pressures as investment falls after initial reconstruction. Beichuan is trying to find new growth impetus by using cultural heritage to develop tourist industries and upgrading its industrial park, for examples. In new Beichuan town, a large tourist resort has been planned to take advantage of rich natural resources and local cultural landscape.

The three case studies present different models of new town developments in the PRC, which provide important lessons for urban planning (Wu, 2015). Jiading represents the development of a new town in the large metropolitan region of Shanghai, which is driven by industrial growth. Infrastructure development is centered on industrial areas and industrial development. Moreover, industrial development needs to consider technological innovations. The economy of Jiading new town is now under pressure to be upgraded through innovations. New technological parks have been set up to achieve the objective. Integrating a livable new residential area and industrial production has been a challenge. The significance of the new town is its transformation from a satellite town to a new city in the Shanghai city-region.

Wuxi Taihu New Town is a new generation new town. Its planning proposal started in 2002,

Fig. 3 Reconstructed Central Area of Beichuan New Town
Source: Photo by Fulong Wu

but substantial construction took place after 2007. Accordingly, Wuxi Taihu New Town represents the development of the service sector, creative industries, and the experiment of low-carbon and eco-cities, such as the experiment to integrate land use control and ecological indexes. The new development managed to attract central government support with various new titles. The new town's growth is extremely ambitious with a target population of one million by 2020. Despite many new ecological features, the impact on regional land use, from a macroscopic perspective, would still be significant. Further, because this rural area was densely populated, the development of the new town involves demolition of rural villages, relocation of rural farmers, and their adaptation to urban living. The new economic sectors of software, digital image and film studio, research and development are not the source of jobs for its original residents. The challenge in developing the eco-city, therefore, is to realize its ecological vision while meeting the social needs of a diverse population.

Beichuan New Town is not a new town in a traditional sense. It represents a unique case of state intervention in the aftermath of an earthquake. Strong state support and the partnership between Beichuan and the province in the coastal region led to swift post-earthquake reconstruction. Due to rapid development, planning played a significant role in determining the layout of land uses and the characteristics of the built environment. The involvement of local community is

inadequate, and public participation is lagging. The planning of Beichuan incorporates good planning principles, such as compact development, preservation of local cultures, and environmental qualities. However, state-led planning, which was inevitable in the context of urgent post-disaster reconstruction, meets the long-term challenge of resilience.

These three new towns are presented here as case studies rather than model developments that could be replicated in other places (Chen et al., 2009). They are developed in the specific local contexts: industrialization of suburban economies, economic restructuring and the expansion of new business subcenters outside the central location, and post-disaster reconstruction. They reflect the diverse relationship between the state and market and the intervention of city planning. They are valuable cases for comparison and cross-country learning, especially in Asia and the Pacific.

The cases presented here are more about the planning aspects of new town developments. There are a lot of questions on the underlying process of development, such as the politics of growth, economic restructuring, consumption, and housing development. The dual mechanisms of generating revenue through new real estate development and fulfilling the need of a rising middle class drives the development of new towns as urban decentralization, suburbanization, and residential relocation.

In the case of Jiading, we see the introduction of direct financing through bonds and debts to fund urban development. In the past, land development was largely associated with the need for indirect financing through land development. With this new mechanism, it remains to be seen whether the dynamics of new town development will change.

The case of Beichuan demonstrates the capacities of the state in response to disaster. Residents have been relocated into new town. But the case also reveals the need for social participation and endogenous economic development in the long term of post-disaster resilience.

As shown in Wuxi Taihu New Town, the development of a new town as a regional subcenter of business and creative industries might bear some similarities to the post-suburbia in the development of new economies, where the suburban areas are no longer residential spaces but rather a mix of offices, commercial, and residential uses. Yet, at the same time, Wuxi Taihu New Town reflects a process of urbanization, as thousands of rural farmers become new urban residents, their villages become new urban residential areas. Thus, the development of new towns in the PRC is a process of relocation of local farmers, rural to urban migration, and the out-movement of residents from the central city. These case studies provide a rich source for further research on the dynamics of urbanization in the PRC and lessons from planning new towns in this context.

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Case Studies of New Towns and New Districts in the People's Republic of China

Beichuan New Town: Sustainable Development through Post-Earthquake Reconstruction in a Remote Area

Degao Zheng, Xingyang Li, Wang He

Located in the northwest of Sichuan Basin, Beichuan Qiang Autonomous Town is 42 kilometers (km) away from Mianyang, the nearest big city, and 160 km away from Chengdu, the capital of Sichuan Province (Figs. 1 and 2). The Great Wenchuan Earthquake of 12 May 2008 destroyed the old town of Beichuan, which was on the fault line near the epicenter. It was the only Qiang autonomous town in the People's Republic of China (PRC). Due to the limited available land, it was decided, through comparison of various options and public participation, that the new town would be relocated 30 km to the south from Qushan Town to the former Huangtu Town of An Town, presently Yongchang Town.

Now there are 8 towns, 14 villages, and 1 ethnic village under the jurisdiction of Beichuan Town. Its gross domestic product (GDP) was CNY3.17 billion ($508.8 million) in 2012, and GDP per capita was CNY15,835 ($2,542) with a ratio of 25 : 42 : 33 for primary, secondary, and tertiary sectors contributing respectively. By the end of 2012, it had a population of 241,000, of which 78,000 were non-agricultural, accounting for about 32.4% of the total.

Fig. 1 Location of Beichuan in Sichuan Province
Source: Drawn by the authors with the base map from Urban System Plan of Sichuan Province, China Academy of Urban Planning & Design

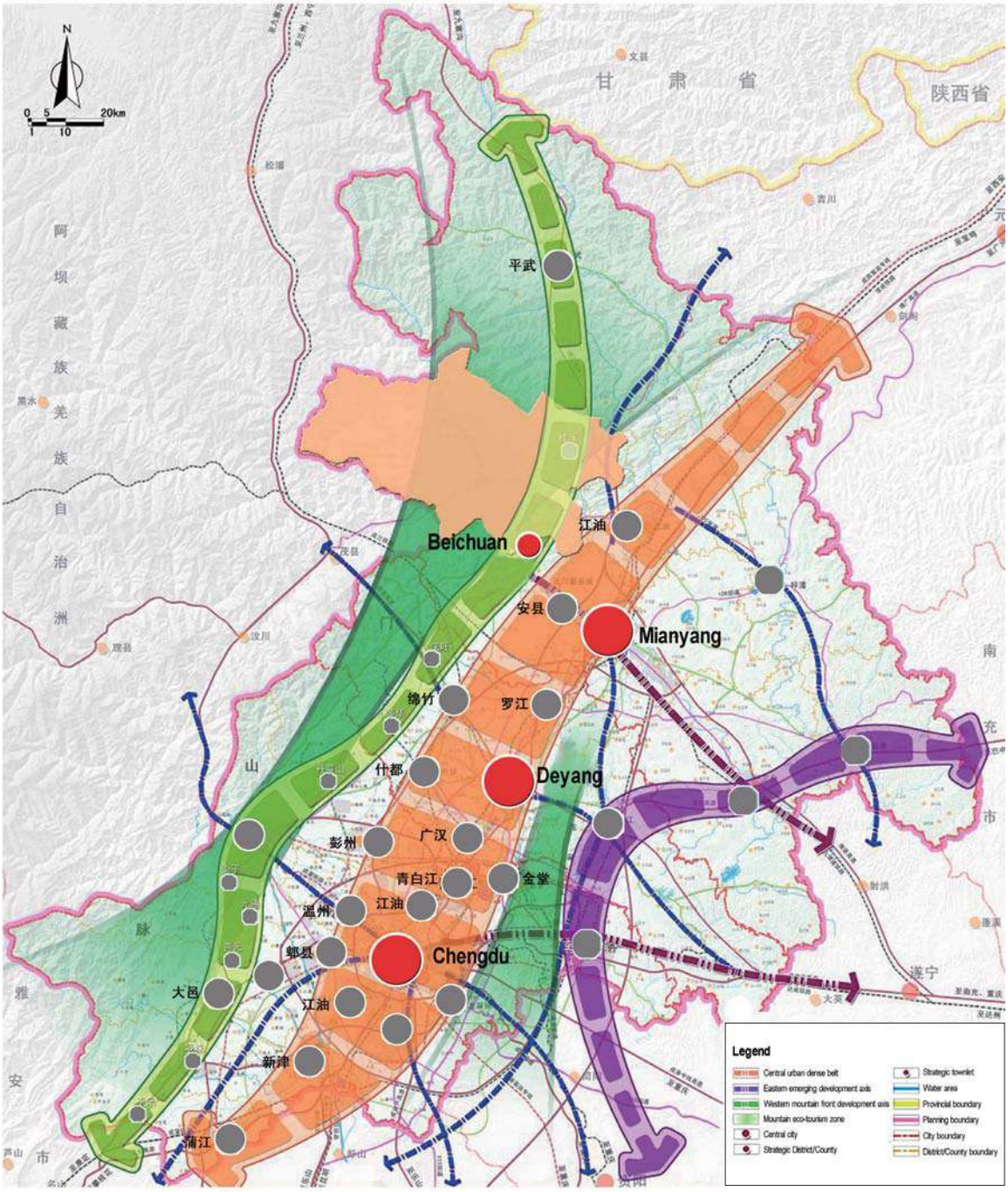

Fig. 2 Location of Beichuan in Chengdu-Deyang-Mianyang District
Source: Drawn by the authors with the base map from Master Plan of Regional Cooperation in Chengdu, Deyang and Mianyang District, China Academy of Urban Planning & Design

Since 2008, Beichuan New Town went through two rounds of overall planning. In November 2008, the executive meeting of the State Council approved the relocation and officially initiated the overall planning for reconstruction. In March 2009, the Sichuan provincial government (SPG) approved the post-earthquake reconstruction overall plan of Beichuan Qiang Autonomous Town. In June 2011, the comprehensive master plan for 2011–2030 started; the SPG approved it in July 2012 as the statutory guideline for Beichuan's urban development for the next 20 years.

1 Overall Planning for Post-Earthquake Reconstruction: A Relocated New Town

Due to geographic and topographic reasons, the construction of Beichuan Town since 2008 concentrated in valleys between the old Huangshan Town and the new Yongchang Town. These key areas involved 368 projects and a total investment of CNY8 billion ($1.17 billion). The economy of this area recently changed from agricultural commodity before the earthquake to manufacturing and light industry with distinct activities, including local agricultural product processing, cultural tourism products manufacturing, materials, machinery manufacturing, electronic products manufacturing, and cultural tourism featuring earthquake remains in the old town and modern cultural features in the new town. In 2007, the total population was 115,000 accounting for about 49% of the population in Beichuan County. In 2009 it was 118,000, making up 50% of Beichuan County's residents.

According to the overall plan for post-earthquake reconstruction of Beichuan Qiang Autonomous Town, Beichuan New Town is the political, economic, and cultural center of Beichuan County. It is also a tourism base for western Sichuan, an industrial base for western Mianyang, the city of modern Qiang culture, and an ecological garden city. The short-term goal has been to construct the east bank of Anchang River before 2015, which will cover 4 square kilometers (km^2) of development land and accommodate 35,000 people. The medium-term goal is to cover 7 km^2 of development land and accommodate 70,000 people by 2020.

The new town adheres to the concept of concentrated, compact city with a system of public green open spaces, human-scaled, comparatively narrow streets, jobs-housing balance, landscapes using traditional features of the Qiang people, and buildings and urban infrastructure technology that are environment-friendly, low-carbon, and eco-efficient. In line with both the vision of PRC's former Premier, Wen Jiabao, of a safe, livable, prosperous, distinctive, civilized, and harmonious city and the policy of people-oriented and scientific reconstruction, new Beichuan town was built as a model for urban re-construction projects with seismic-proof technology, rich with cultural heritage (Fig. 3).

1.1 Planning Principle 1: Concentrated and Compact Layout

Strict limits on development land enforce the concept of a concentrated and compact layout. According to the Code for Classification of Urban Land Use and Planning Standards of Development Land, urban development land per capita in ethnic minority areas can be increased to 150 square meters (m^2) per person, but the number is under 105 m^2 per person in Beichuan.

Compact urban layout enables short trips from home to work, shops, services and recreation within walking distance of most residents, and optimize efficiency of public facilities and infrastructure. For 35% of the residents, community centers are within 5 minutes' walking distance, 10 minutes for 91%, and 15 minutes for 97%. Public green spaces and city parks are also within a 5-minute walk for almost all residents. This layout promotes high foot traffic, which benefits commercial development.

In addition to the above advantages, compact urban layout also protects local environment and landscape, significantly easing the urban infrastructure construction, and shortening the construction period.

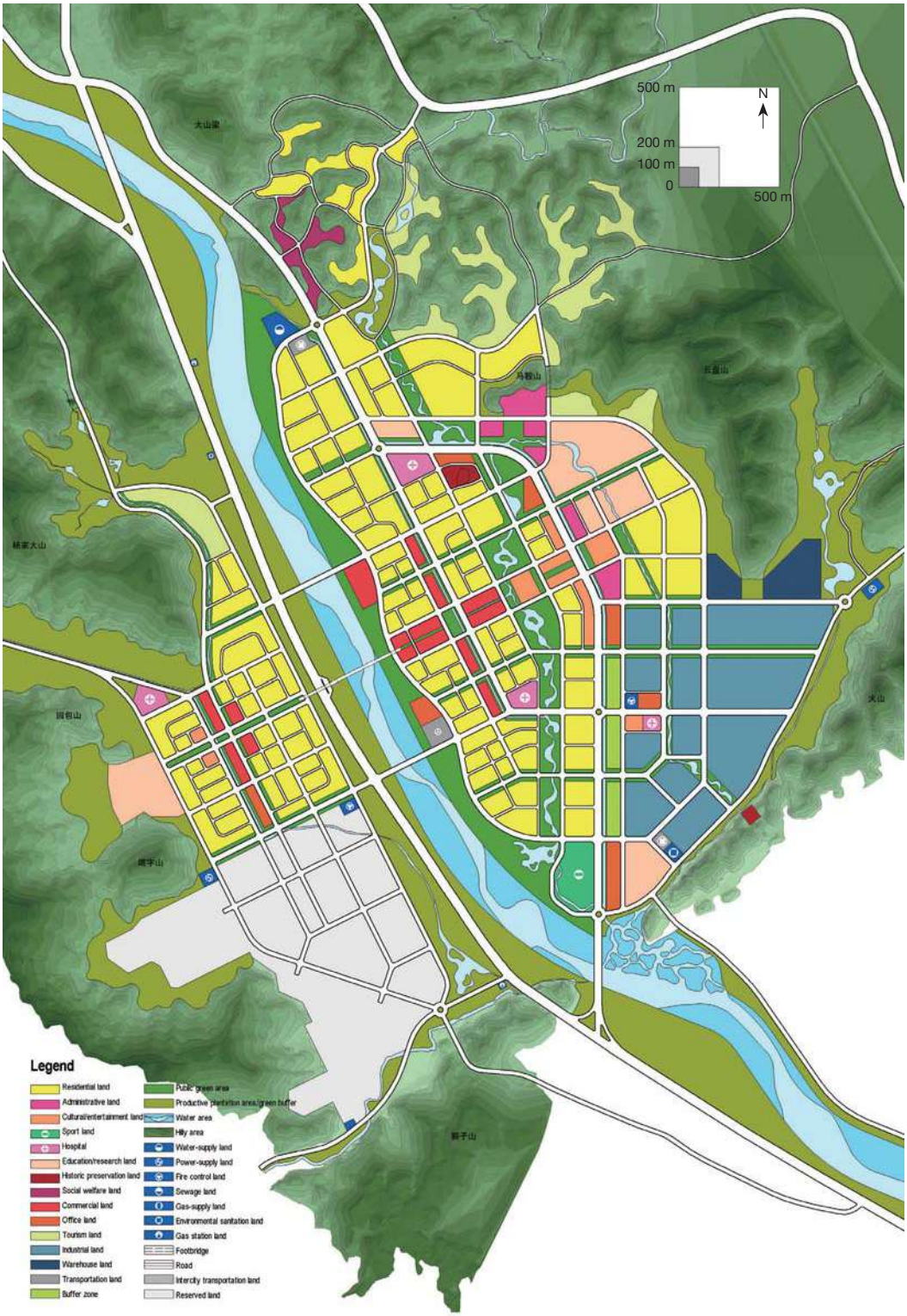

Fig. 3 Layout of the New Town According to Overall Planning for the Post-Earthquake Reconstruction
Source: Beichuan Qiang Autonomous Town Overall Planning for the Post-Earthquake Reconstruction (2008–2020), China Academy of Urban Planning & Design

1.2 Planning Principle 2: Public Green Open Space System

In line with the development's goal to effectively use public space, promote a sense of community among residents, and develop more compactly, the new town has a riverfront park along the Yongchang River. It is a major public green space that runs north to south through the town. Historical sites, earthquake remains, outdoor activities, and recreation are organically connected to the riverside green space, forming a connected open space system (Fig. 4).

1.3 Planning Principle 3: Comparatively Narrow Streets

Rather than following the development pattern of new towns and new districts in large cities with large blocks and wide roads, the new Beichuan town adopts a road network pattern with short distances between intersections and narrow streets that are friendly to the city pedestrians and bicycles. Road boundary lines are often 20 meters (m) wide. In the core area, the distance between two roads is no more than 200 m. Outside the core area, the distance is typically 300 m. Without increasing the land area used by roads, the density of the road network is greatly increased and the traffic system is more accessible. The comparatively narrow streets provide residents with pleasantly scaled urban spaces to meet and interact.

1.4 Planning Principle 4: Jobs-Housing Balance

The principle of "people-orientation" focuses on livelihoods and social inclusion. A 1.2 km^2 industrial park is under construction at the southeast of the town, which will generate 20,000 jobs. Currently, major urban public service functions including corporate offices, manufacturing, administrative offices, concentrated open green space, cultural facilities, and educational institutions are located along Qilu Road, forming a semicircular service zone. Along Xinchuan Road, one of the first roads built with assistance from the Zibo City government, are commercial facilities catering to the daily needs of residents. They also include travel agencies, forming another semicircular zone of commercial services. The thousands of jobs generated by commercial streets and the industrial park nearby will significantly lower commuting costs for residents.

1.5 Planning Principle 5: Landscapes Using Traditional Features of the Qiang People

The new Beichuan town's architectural design and landscape adheres to the principle of preserving cultural heritage and ethnic characteristics. Architectural guidelines for private building construction respond to the Qiang people's request to highlight their culture by following the traditional and modern Qiang styles in building architecture. The guidelines ensure that construction uses traditional Qiang structures, materials, and proportions: public construction outweigh residential buildings; corners and edges outweigh the interior; roofs and foundations outweigh the middle portions of building, and oddments outweigh constructions. This lends the town a unified urban landscape and architectural style that is uniquely Qiang (Table 1).

1.6 Planning Principle 6: Environment-Friendly, Low-Carbon and Eco-Efficient Technology

The plans for the new town follows the national energy saving and emission reduction policy

Table 1 Method of Controlling Architectural Style in Beichuan

Method of Design	Style	Design Positioning
To exhibit the original appearance	Original Qiang style	Hotspot architecture, theme streets
To inherit the essence	Inherited Qiang style	Background architecture, main body of construction
To put on a modern look	Modern Qiang style	Hotspot architecture, finishing touch

Source: Beichuan Qiang Autonomous Town Overall Planning for the Post-Earthquake Reconstruction(2008–2020), China Academy of Urban Planning & Design

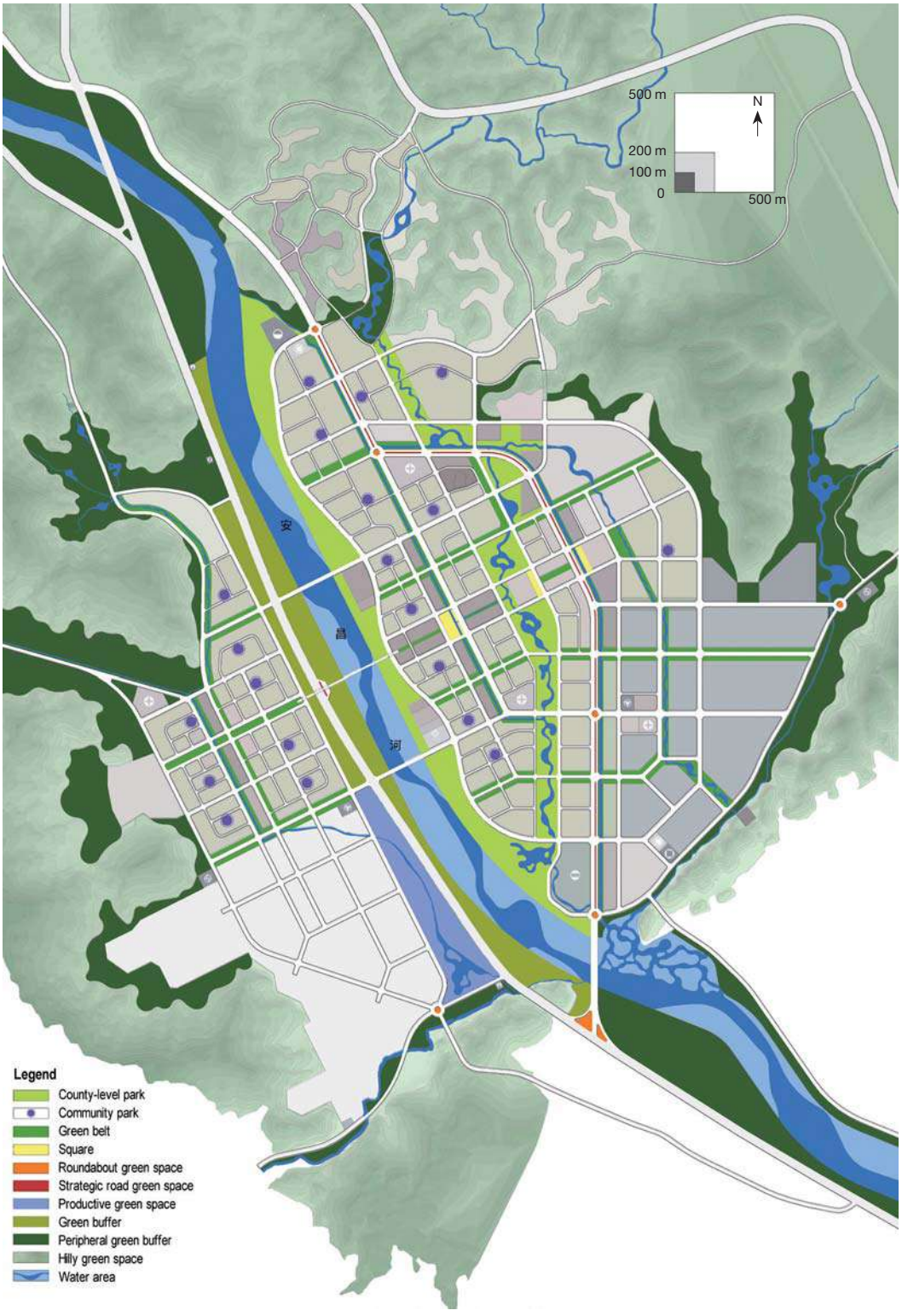

Fig. 4 Green Area Layout of the New Town, Overall Planning for Post-Earthquake Reconstruction
Source: Beichuan Qiang Autonomous Town Overall Planning for the Post-Earthquake Reconstruction (2008–2020), China Academy of Urban Planning & Design

throughout conceptual design, master planning, and building construction. This remains evident through control plans and monitoring with structural and non-structural engineering measures and new technologies. The urban layout increases green space and benefits from ecosystem services such as reduced urban heat island effect with cooler temperatures in hot summers in parks. Rainwater filters through permeable paving and green space, enhancing groundwater recharge, benefiting from the new town's high green ratio.

Strict thresholds implement energy savings and emissions reduction in industries, commercial, and domestic buildings. Non-motorized traffic, pedestrians, and bicycles are also a priority. The town's environment-friendly walkway network saves energy and reduces emissions by reducing the need for private vehicles. A smart power grid and technology that merges three networks increase efficiencies and avoid redundant construction. The town uses energy-saving LED lamps in 70% of its streetlights and strictly enforces national standards for green building. As a result, the town uses clean energy more efficiently, improves energy savings — by using energy saving appliances, for example — and reduces emissions in building construction and operation.

2 Post-Earthquake Reconstruction Planning Evaluation

The overall post-earthquake planning guided the resettlement of affected people, implementation of aid funded construction projects, and fast restoration of urban functions. The planning was comprehensive and included advanced concepts, implementation measures, master planning, project level construction planning, sector planning, engineering construction planning control, and construction management. The plan layout and urban design also reflect the government decision-making process and the will of the people through an intensive participation process. After 2 years' planning and construction, Beichuan New Town officially opened to the public on 1 February 2011. Currently, the occupied land of Beichuan New Town covers an area of 4.6 km^2 and accommodates a population of 26,000 (Fig. 5).

Unfortunately, new development and a change in socioeconomic and environmental developments will affect the development and spatial layout of Beichuan New Town directly and indirectly. Due to the special circumstances at the time, the original overall master plan can no longer provide adequate guidance for the continued sustainable development of Beichuan. Beichuan now faces a deficit of residential population and the inability to attract a sufficient number of jobs and improve its strategic advantage, possibly due to its remote location.

2.1 Planning Evaluation 1: Contemporary Cultural Heritage

Since the earthquake, the relief and post-earthquake reconstruction of Beichuan have fully embodied the national spirit of patriotism and triggered a spirit of reform and renovation. As the only Qiang autonomous town in the People's Republic of China, Beichuan has inherited and carried into the future the Qiang culture, which also reflects socialist core values with Chinese characteristics.

On 16 November 2008, during his visit to Beichuan, former Premier Wen Jiabao pointed out that the new town should be built as "a symbol of urban construction projects, earthquake relief, and cultural heritage". With the completion of the east bank development, residents have started to move in. Thanks to the cooperation of domestic experts, the east bank, with its high level planning, new design concept, and excellent quality, has become a model for urban construction projects. Due to the vast scope of mobilization, great investment, and high efficiency of overall planning, it has also become a model of earthquake relief and response. With strong ethnic characteristics, local features, and unified architectural landscape, it has become a model of reviving cultural heritage.

Based on the above features, as well as the request of former Premier Wen Jiabao, Beichuan New Town should make full use of its cultural value, take contemporary cultural heritage as the guideline,

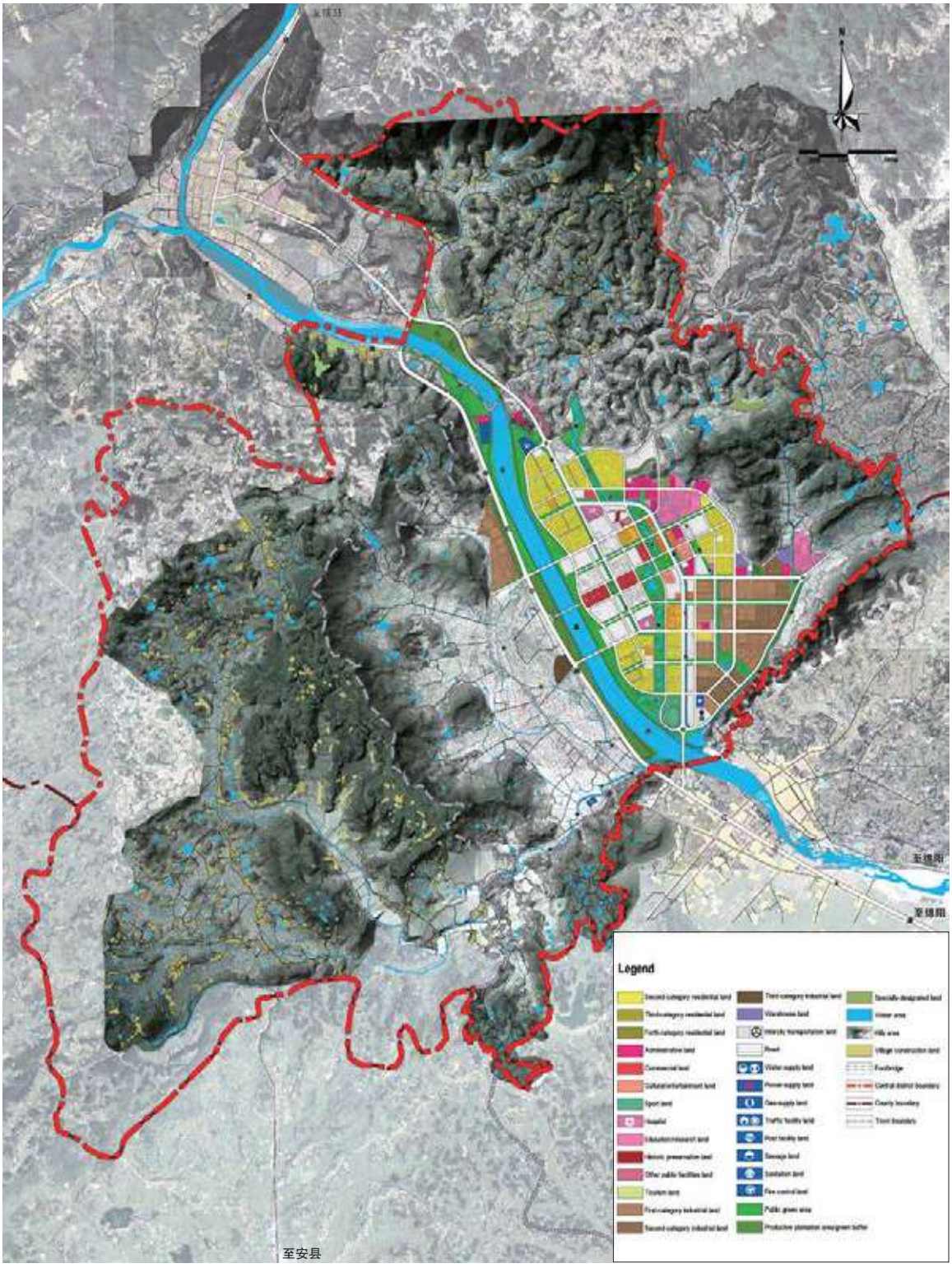

Fig. 5 Land Use Status Quo According to Overall Planning of Beichuan Qiang Autonomous County
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

and balance both cultural protection and future development in the years to come.

2.2 Planning Evaluation 2: A "Cold Beauty"

While the construction of Beichuan new town achieved the standard proposed by former Premier Wen Jiabao of a safe, livable, prosperous, distinctive, civilized, and harmonious city, Beichuan needs to further develop its economy and raise its urbanization level. The overall economic strength of Beichuan is far from sustainable, its industrial development is not yet competitive, and the urban-rural development and income gap is significant. The population of the newly constructed urban area on the east bank is hardly growing and needs more residents. Without sufficient population, it will become a cold beauty. Beichuan needs economic growth accelerants, investments, employment, housing, sustainable finance, and, above all, people to transform it into a prosperous and sustainable new town.

2.2.1 Land Use and Ecological Conditions Insufficient to Support Large-scale Industrial Development

According to the main functional zone planning of Sichuan Province, Beichuan is located in a national key ecological protection region, which is not suitable for the development of polluting industries. Meanwhile, a comprehensive analysis on slope and geological disasters shows that only 10.9 km^2 of the 22 km^2 area of Yongchang Town is available for development; 5.6 km^2 of this has already been used, leaving 5.3 km^2 to be developed (Fig. 6 and Table 2). With so little land to spare, it is not suitable for large-scale industry that demands a large amount of land.

2.2.2 Local Industrial Enterprises with Great Growth Potential

Non-local enterprises play an important role in the post-earthquake reconstruction and industrial revitalization of Beichuan. However, judging from enterprises in the Shandong Industrial Park, local industrial enterprises have greater long-term growth potential. Of the 33 enterprises in Shandong Industrial Park, six of the eight non-local enterprises started operations. Most of these enterprises are involved in machinery manufacturing. However, they all face problems of low productivity as measured by gross domestic product (GDP) per land area. A survey shows that the output of enterprises is just over CNY130,000 (just over $20,000) per Chinese mu, or 666 m^2.

In contrast, local enterprises using local resources and markets are developing well. Some are consumer

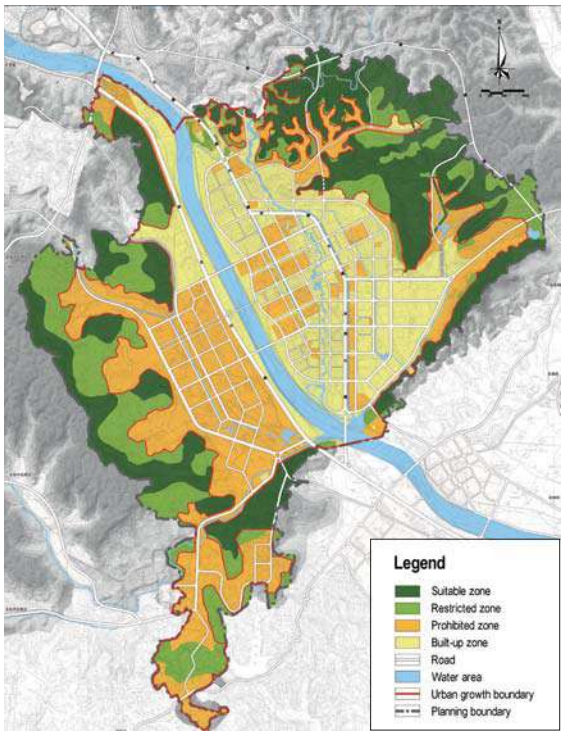

Fig. 6 Suitability Analysis on Land Use in Central Urban Area of Beichuan
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

Table 2 Suitability Analysis on Development Land in Beichuan Town

Zone Types	Area (hm^2)	Proportion
Suitable zone	1,086	49%
Restricted zone	471	21%
Prohibited zone	504	23%
Water area	141	6%
Total	2,202	100%

Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

electronics manufacturers that cooperate with big enterprises in the region, like Changhong. There are 12 enterprises using local resources and four of them have started operations. Most of these enterprises are in the food or pharmaceutical sectors. There are six enterprises that produce for local markets and three of them have started operation. Most of these enterprises are materials manufacturers. Local enterprises using local resources are the most labor-intensive, which is beneficial for residents and urban growth. With a higher gross domestic product per land area, enterprises based on local markets have been an important pillar to promote intensive industrial development.

2.2.3 Lack of Jobs

The development of the industrial park and the construction of commercial space failed to absorb the surplus labor to boost urbanization. Shandong Industrial Park only employed 1,408 people in 2011. The average number of employees was only 12.

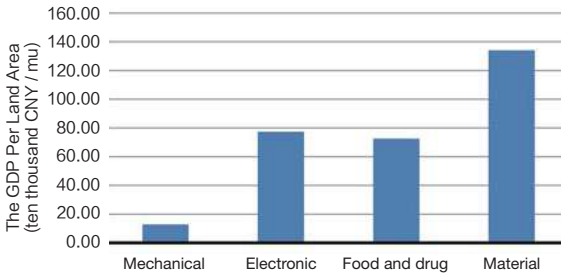

Fig. 7 The Gross Domestic Product per Land Area of Enterprise, Shandong Industrial Park, Beichuan, 2011 (CNY ten thousand)
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

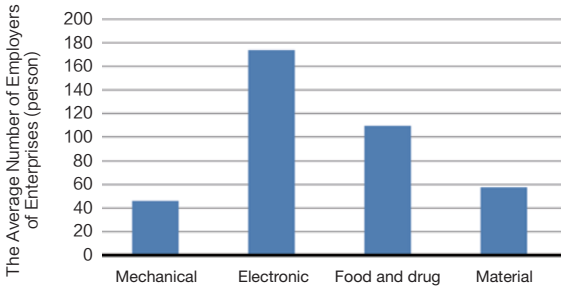

Fig. 8 The Average Number of Employees of Enterprises in Shandong Industrial Park of Beichuan, 2011
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

People working in the non-agricultural sectors of Beichuan county are mainly employed outside of Beichuan, which accounts for 35.7% of the whole county's labor force and 77.3% of the whole town's labor force. People working outside of Beichuan County but still in Sichuan Province represent the majority. Beichuan needs to develop industry and tourism and create more jobs to build up a solid jobs and population base.

2.2.4 Low Density Residential Development

Developed residential land on both sides of the river covers 87.6 hectares (hm^2), including 7.8 hm^2 for primary schools and kindergartens. On the east bank of Anchang River, 43.8% of the planned residential land has multistory buildings, with an established height limit and a maximum plot ratio of 1.5 (Table 3). Of the 10.8 km^2 of land available for development in the downtown area, 25%–30% is for residential use that can house 50,000 to 85,000 residents at a plot ratio of 1.5.

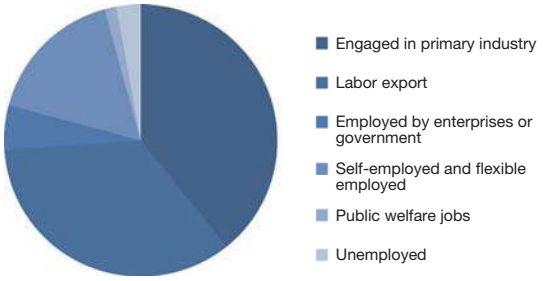

Fig. 9 The Employment Situation of Beichuan, 2011
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

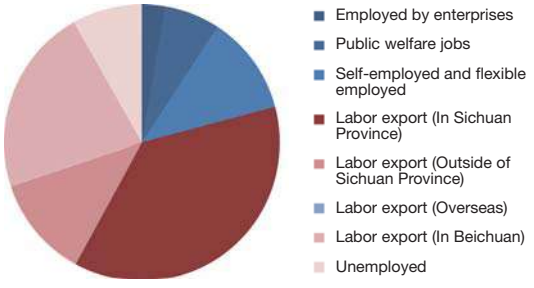

Fig. 10 The Employment Situation of New Beichuan Town, 2011
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

As the town's influence grows and urban development progresses, more people will migrate from rural villages to Beichuan's downtown area. The town, therefore, must anticipate the challenge of supporting rapid population growth with limited residential land reserve. Currently, the low-density residential development directly affects the local government's financial revenues, due to lower land leases, limiting financial capacity.

Table 3 Relevant Economic & Technical Indexes, Existing Residential Areas

	Area (hm^2)	Plot ratio	Building density
Baiyangping Area	17.13	1.47	–
Hongqi Area	21.87	1.49	30
Hotspring Area Phase 1	28.42	1.48	31.46
Hotspring Area Phase 2	20.75	1.39	31.46

Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

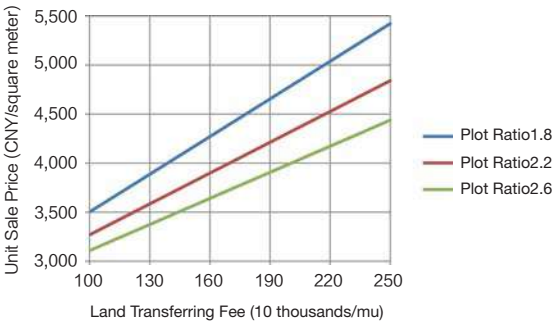

Fig. 11 Relation between Land Transfer Fee, Plot Ratio, and Unit Sale Price
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

According to land economics, when unit price is fixed, the lower plot ratio results in lower land transfer fees. In Anxian Town, Beichuan's neighboring city, unit price is CNY3,300 to CNY3,400 per square meter[($509-$525)/m^2] and land transfer fee reaches up to CNY2 million per mu (about $309,000 per 666 m^2). In Beichuan, it is only about CNY1 million per mu ($154,000 per mu). Therefore, it is necessary for Beichuan to raise the proportion of residential land and increase development intensity in undeveloped areas.

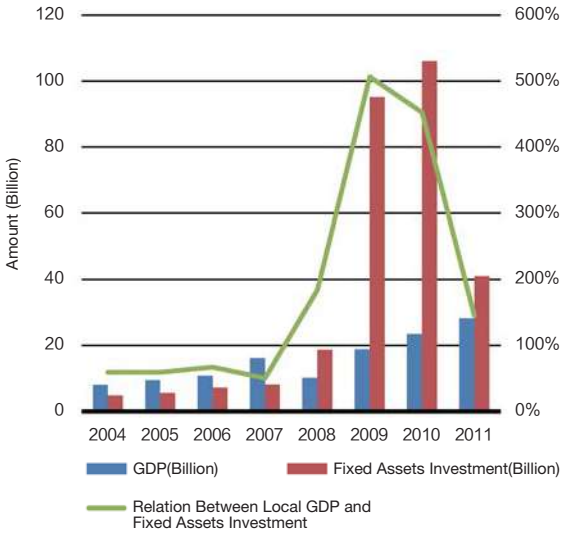

Fig. 12 Relation Between Local GDP and Fixed Assets Investment from 2004 to 2011
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

2.2.5 Financial Constraints

Driven by investment, post-earthquake reconstruction of Beichuan stimulated short-term economic growth, but post-reconstruction investment is slowly decelerating. Before the earthquake, fixed assets investment accounted for 50%-70% of local GDP. In 2009, it became five times the local GDP in 2009, 4.5 times in 2010, and 1.5 times in 2011. Estimates expect the figures to keep dropping from 2012 onwards.

In the meantime, the debt burden to banks is more than $1.5 billion, compared to revenues of Beichuan of about $47.8 million in 2010 and $67.9 million in 2011. This is a challenge to financial sustainability.

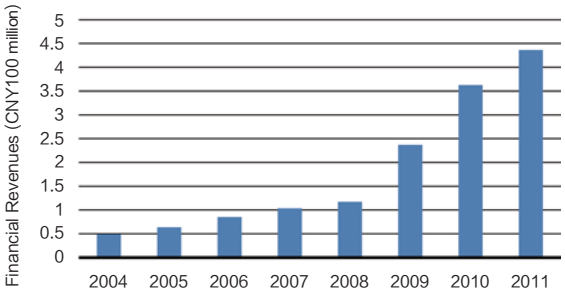

Fig. 13 Financial Revenues of Beichuan, 2004–2011 (CNY hundred million)
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

According to the valley effect, the investment efficiency coefficient of fixed assets investment is low, measured as increase of GDP divided by fixed assets, and follow-up investment after large infrastructure investments (money spent in the following 5 years) is small. The loan repayment period is long and coincides with the valley effect. To cope with this, the efficiency of the investments and other benefits should be optimized.

As the post-reconstruction development of Beichuan New Town reaches normal speeds and as the number of construction aid projects from Shandong Province decreases, the stimulus of investment in economic growth will weaken. Beichuan needs to find a new momentum to generate sustainable economic development.

3 Post-Reconstruction Overall Planning

In light of the opportunities and challenges of Beichuan, the new overall master plan should focus on Beichuan's regional economic positioning. It should lay out a sustainable development trajectory and framework that aims for sustainable prosperity, breakthroughs in regional industry development, and initiates various policies to develop the different economic sectors.

3.1 Beichuan's Positioning

According to the overall plan for post-earthquake reconstruction of Beichuan Qiang Autonomous Town, Beichuan New Town is defined as the political, economic, and cultural center of Beichuan County, the tourism base in western Sichuan, an industrial base in western Mianyang, the city of modern Qiang culture, and an ecological garden city. However, along with the increasing attention Beichuan received after the earthquake, it is no longer an ordinary town, and it has enjoyed attention from all over the PRC and even the whole world. Therefore, there is a need to reconsider the potential positioning of Beichuan, which mainly focuses on (i) the contemporary cultural heritage and Qiang culture; (ii) tourism base in Sichuan Province; (iii) industrial base in Western Mianyang; and (iv) political, economic and cultural center of Beichuan County.

3.1.1 Contemporary Cultural Heritage and a Town of Qiang Culture

Beichuan New Town is a relocation town. Its design represents a combination of traditional Qiang culture and modern culture. It deeply embodies the concept of a modern city of Qiang culture and achieves the goal of a symbol of urban construction engineering, the spirit of earthquake relief, and cultural heritage. Its construction, which has high cultural value, is a model of cooperation between planners and architects in the planning and construction of contemporary small towns (Xiaojiang Li, 2011). Considering Beichuan New Town together with the old Beichuan County, which is now an Earthquake Relief Memorial Museum, Beichuan can expand its role as a showcase for contemporary cultural heritage.

3.1.2 Tourism Base in Sichuan Province

There are obvious location and resource advantages for promoting the development of tourism in Beichuan. It is and will be an important gateway and node leading to the mountain area in western Sichuan. Beichuan New Town is located at the conjunction of three classic tourism routes, the Jiuzhaigou North Loop Route, Qiang Culture Route, and Wenchuan Earthquake Memorial Route. In the future, along with the route change of the Ninth Loop Route to Guixi-Qushan-Yongchang, the location advantages of Beichuan will increase. Beichuan New Town and its surroundings possess a diverse and multi-layered set of tourism resources including traditional Qiang and Dayu culture, ecological and landscape scenery, and current earthquake relief culture. There is also further potential for urban development. Its tourism will no longer be limited to ordinary travel services as described above. Instead, Beichuan itself will become a new tourism destination. Hence, tourism should be one of the key drivers for the future development of Beichuan. Transforming tourism in the central urban

area to include sightseeing, educational, commercial, and nature based recreational tourism would boost the country's awareness of Sichuan Province and uplift its status.

3.1.3 Industrial Base in Western Mianyang

Beichuan New Town's macro location makes it a key node in the development corridor connecting the western Mianyang and the northern town of Mian'an. Beichuan has the opportunity and responsibility to transform from a resource-based "mountain economy" to a combined resources and industry based "mountain-plain economy" and to promote industrialization and urbanization. Currently, the contradiction between a local economy and economy dominated by outside investments challenges the industrial development in Beichuan. While outside enterprises typically possess advanced technologies, their links to local industries and resources tend to be weak, resulting in limited impact on the local economy. Local entrepreneurs, markets, and resources are the base for local enterprises, which are now the main driving force for economic development. Therefore, Beichuan should focus on promoting local enterprises and improve the enabling environment for industrial investments and jobs. The town would also benefit much from stronger interaction between industrialization and urbanization. In the short term, industrial development should focus on population aggregation. Sustainable urbanization, while promoting industrialization, should be a key objective and emphasis for the long term.

3.1.4 Political, Economic and Cultural Center of Beichuan County

As the only Qiang Autonomous County in the PRC, the central urban area will be an important political, economic, and cultural center of Beichuan County and for the whole Qiang ethnic minority inhabited area in western Sichuan.

The future development of Beichuan should, therefore, highlight the role of contemporary cultural heritage and emphasize the key role of tourism and conference industries based on principles of urban prosperity, resilient development of tourism, and cluster development for selected industries. Beichuan should be known as Contemporary Cultural Heritage, a Town of Qiang Culture, Travel Service Base in Sichuan Province, Industrial Base in Western Mianyang, and the Political, Economic and Cultural Center of Beichuan County Area.

3.2 Development Path

There are two types of urban economies: local economy, serving local markets, and regional economy and industry. Restricted by its peripheral location, local economy including industry, housing, and general services, attracts a limited number of workers and residential population. To increase the population and improve sustainable development, Beichuan New Town needs to find a breakthrough in the local industries. Therefore, sustainable development of cultural and recreational tourism, conference and exhibition, and education-based regional industries should serve as the foundation for post-reconstruction plans. Potentials for further development may include tourism with small impact on the environment as it may offer a development path for counties in less developed areas with good natural environment and cultural endowment.

3.2.1 Conference and Exhibitions Industries

Conference and exhibition-based industries do not occupy much land and it can promote the development of hospitality, catering, cultural, educational, and recreational tourism and other industries in its surroundings. Seasons do not affect conference and exhibition-based industries. They can bring a steady flow of people to the city and benefit its development. Therefore, they have become one of the prime choices as an industry type for small and medium-sized cities in scenic areas.

The Boao Forum for Asia on Hainan Island for example has generated a high-end exhibition economy promoting tourism and other industries. Through the construction of a series of infrastructure and facilities such as hotels, golf courses, wellness, airports, and

the provision of a full range of related services such as conferences, catering, and sightseeing tours, Boao is becoming an ideal place for commercial conferences and vacations. Currently, Boao has over 40 family inns, 3 five-star hotels, 5 four-star hotels, 2 golf courses, and an airport. It holds nearly 400 conferences every year. In 2010, Boao received 2.8 million tourists with 7,500 guests per day on average from within the PRC and abroad.

Along with improvements in the living environment and the increasing popularity of Beichuan New Town, the number of regional conferences held is growing. To adapt to this new trend and to improve its regional function, Beichuan plans to build a regional conference center at the southern urban area on the west bank of the new town and support facilities like high-end hotels and fitness and wellness centers. It covers an area of 27.7 hm^2 and is located at the southern entrance of the new town. It will help to create a pleasant gateway landscape and drive the development of the southern west bank area. As it is not located on the main axis, flexibility for facility designs is possible.

3.2.2 Education

The development of an education sector may take advantage of the unique culture and history of Beichuan, its space development practice, and the advanced planning and construction concept of the new town. Through top-down organized learning or bottom-up voluntary learning, the cultivation of an education sector may deliver a flow of people several times the local population and boost the development of related industries.

As one of the One Hundred Demonstration Bases of Patriotic Education and the PRC's Top Ten Outstanding Social Education Bases, Jinggangshan in Jiangxi Province with a population of 148,000 may serve as an example for Beichuan. Its education sector achieved growth in two ways. First, Jinggangshan Cadre Institute of the PRC holds training courses for party and government cadres, business managers, professional and technical personnel, and military cadres in a top-down way. Then, it attracts voluntary learners in a bottom-up way. From January to April in 2014, Jinggangshan received 2.2 million tourists and earned CNY1.5 billion (about $242 million) in tourism revenue, which is 15 times the revenue of the local people.

The Publicity Department of the Communist Party of the PRC (CPC) central committee identified Beichuan as the city of "Three Bases One Window". It recognizes Beichuan as a "Patriotic Education Base, Base of Socialist Core Value System, Publicity Educational Base of National Unity and Progress, a window for displaying the development model, development idea and development path of the PRC". Beichuan should actively implement the relevant policies and measures to become an education base to systematically publicize red tourism routes and develop the "Three Bases One Window". Beichuan New Town should become a base for learning and training on constructing a systematic demonstration town and as an educational base for national culture tourism and intangible cultural heritage.

3.2.3 Recreation Sector

Along with the improvement of people's living standards, there are plans to develop the leisure industry rapidly. For small and medium sized towns in less-developed regions, their unique cultural resources, and outstanding ecological environment will benefit them in fully exploiting their advantages the in post-industrial era. Leisure industry will drive its sustainable development.

Napier in New Zealand, for example, is a city that resembles Beichuan. It was also a small town revitalized through post-disaster reconstruction. In 1931, a 7.8 magnitude earthquake struck Napier and destroyed most of the commercial buildings. Reconstruction made it become the newest city in the country with a concentration of 1930s style architecture, the only contiguous Art Décor urban area in the world. Napier relied on its urban area and its natural coastal scenic resources to establish diverse festival activities and colorful commercial activities, including an Art Décor Weekend and Mission Concert Weekend to attract

people from its surroundings. In turn the glamorous urban life, the brand and image of the city, helped to improve the secondary industry.

The goal for Beichuan New Town is to become a tourism destination that features leisure and vacation. The recreation sector may center on the scenic areas of Kaimao Reservoir and the surroundings of Shunyi River for the development of leisure and vacation tourism.

3.3 Spatial Development Framework

The spatial development framework features four functional areas downtown:

(i) the east bank area, which focuses on the protection and development of contemporary cultural heritage and upgrading of the industrial park;

(ii) a new residential area on the west bank;

(iii) the Kaimao Tourism Resort area in the north; and

(iv) the new part of the economic development zone on the west side.

3.3.1 East Bank

(i) Protect and Develop the Contemporary Cultural Heritage

According to the master plan, two zones form the east bank: a core protection area and a construction control area. Covering 2.6 km^2, the core area includes the developed area on the east bank (except the Beichuan Shandong Industrial Park). In this zone, there is a landscape ring, an ecological corridor, the recreation belt, the growth ridge, a public facilities bracelet, and a landscape axis. Most structures here are protected, such as the urban fabric, which is neat in detail and orderly — the Qiang architecture, several corridors, and the road network.

The construction control area covers 11.2 km^2 and includes undeveloped areas in the east and west banks as well as the Kaimao Tourism Resort. In this area, mountain and water landscapes are protected and maintenance is required. Vegetation and ecological environment of the surrounding mountains are also protected. New construction has to follow existing typologies, architectural appearance, and height requirements. Damages to original Qiang characteristics or blocking visual corridors are strictly forbidden.

(ii) Upgrading the Industrial Park

While 33 enterprises have located in the Beichuan economic development zone, most of them have not started operation. Enterprises that now occupy scarce land resources in the east bank have low output production.

The plan systematically upgrades Shandong Industrial Park. Enterprises on the east side of South Yunpan Road will reposition to form a three-line-shaped layout. There are also plans to build an office zone along Yongchang Road. Replacing the current industrial architecture style with modern Qiang architecture style will improve the appearance along Yongchang River. In the meantime, there are plans for a production, exhibition, and experience zone along Yunpan River, and the current secondary industry will be replaced with “industry 2.5” to promote industrial upgrades in Beichuan downtown. Along Jiangjia River will be a recreational and tourist zone to boost the tourism development of Beichuan.

3.3.2 West Bank: A New Livable District

In the urban area around the west bank of the river, there are plans to develop an area of 289 hm^2 with 5,500 residents into a new livable urban district.

The landscape axis on the east bank will extend into the west bank district. There will be commercial areas on both sides of the central greenbelt of the west bank. Construction heights may increase by 30% compared to the basic height limit to emphasize the axis. Land on both sides of the axis will be a mix of commercial and residential uses. At the end of the axis will be high-end tourism facilities.

On the west of Xizongsan Road, plans for a green park along the Guihua River will complete the open space network. East of Xizongsan Road will be commercial facilities, including travel services, to serve local residents. There will be a riverside commercial street on Xizongsan Road, which will intersect with the axis of the green park, linking it to the public space on the west bank of the river.

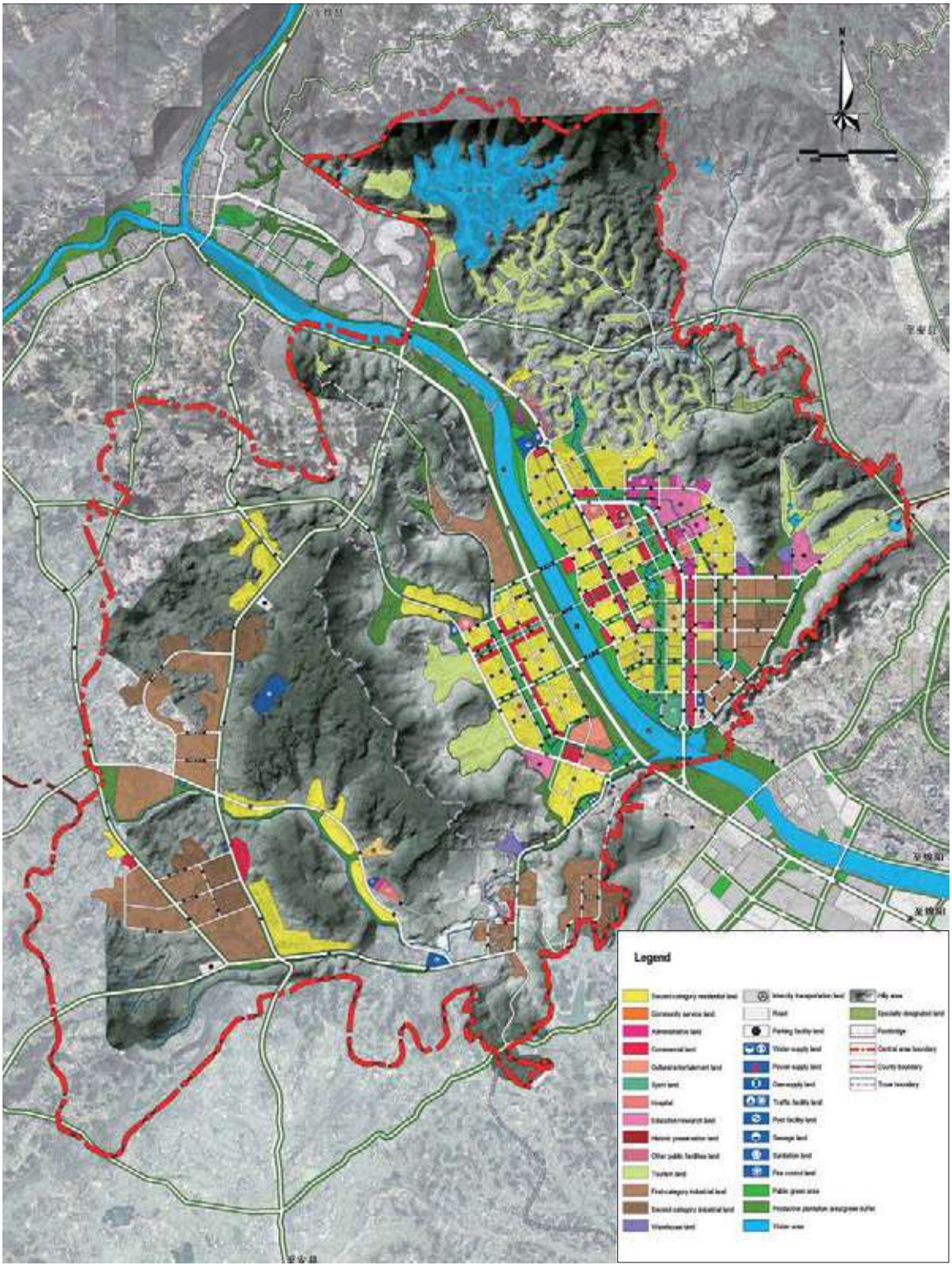

Fig. 14 Land Use Planning Map for Beichuan Qiang Autonomous County in Overall Urban Planning
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

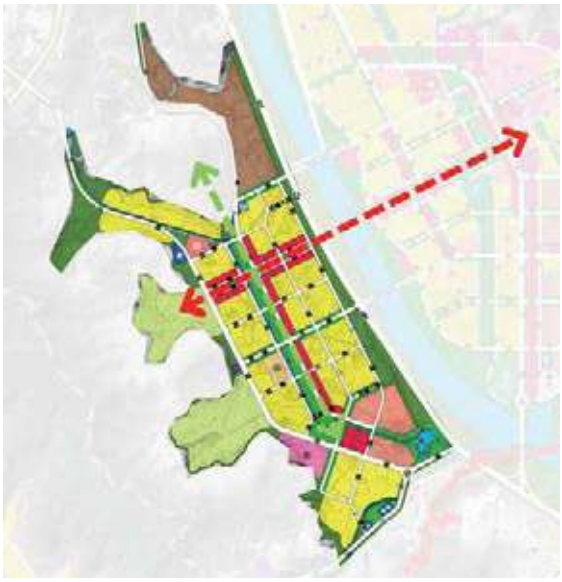

Fig. 15 Public Open Space on the West Bank of the River
Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2011–2030), China Academy of Urban Planning & Design

The four residential areas allow 6 to 12-story buildings and plot ratios from 1.8 to 2.5. Its plot ratios are properly increased based on 1.8 in the overall plan for post-earthquake reconstruction to ensure the new town is a compact city. In addition, there will be a low-density residential area along Xishaner Road with a middle school, a primary school, and a hospital built nearby.

3.3.3 Kaimao Tourist Resort

In Beichuan New Town 192.4 hm^2 of land is set aside for tourism; 145.7 hm^2 of it is on eastern side, primarily in the Kaimao Tourism Resort north of the new town. There is no implementation schedule at this time.

An expert consultation process will be established to control the development and layout of tourism and promote a flexible development. Major roads separate mountains and divide the land into 8 development units. The development land for each unit is from 10 to 20 hm^2.

Fig. 16 General Plan of the Tourist and Leisure Resort on the North of the New Town
Source: Urban Design for the Tourist and Leisure Resort on the North of the New Town, China Academy of Urban Planning & Design

Taking advantage of the natural setting and resources such as the reservoir and hot spring, tourism themes are carefully chosen to build on the Qiang cultural characteristics in combination with landscape beauty (Table 4).

Table 4 Themes of Tourism Development and Suggestions on Projects

Location	Theme	Suggestion
Reservoir area	Leisure	Ecological farms, resort towns, hotels, etc.
Shunyi River area	Holiday resort	Small-sized recreational and leisure facilities, traditional sight-seeing agriculture facilities, hot spring facilities, commercial properties, etc.
Eastern area of Yunpan Mountain	Culture	Resort hotels, cultural and leisure facilities, performance centers, cultural facilities, etc.
West bank area	Upscale	Upscale recreation clubs, upscale holiday resorts, etc.

Source: Urban Overall Planning for Beichuan Qiang Autonomous Town (2008–2030), China Academy of Urban Planning & Design

3.3.4 The West Area of Economic Development Zone: Phased Construction and Featured Development

During the gradual upgrade of Beichuan Shandong Industrial Park, construction of the Beichuan, Sichuan economic development zone will begin. The urban development land is 570 hm^2, of which the east area covers 114 hm^2 and the west, 456 hm^2. The industrial land is 359 hm^2.

Construction of the new part of economic development zone will be in phases, and separate development prohibited. In the short term, construction of the industrial zone in Changle south of west bank will start. In the medium term, industrial clusters on the southwest will be developed, and in the long term, industries will be developed in the northwest. With regard to access to the economic development zone, industries that suit local markets and resources will be developed, including farm product processing, cultural and tourist product processing, tourism, etc. Industries that cover a large area of land, consume a large amount of energy, and affect the environment are forbidden.

4 Conclusion

By the end of 2013, Beichuan New Town reached a permanent resident population of 31,000. Construction land increased in 2011 from 4.6 km^2 to 4.8 km^2. The scale of land for construction exceeded the short-term area planned at the post-earthquake reconstruction planning stage. The 0.25 km^2 land transfer in 2011 earned CNY300 million (about $49.6 million) in land lease for the Beichuan government. The achieved unit price for land is significantly higher than in the surrounding counties, which demonstrates the good living environment in Beichuan and its positive impact on local finance.

In the meantime, according to the requirement and guidance of overall planning for post-earthquake reconstruction, Beichuan actively develops potential tourism resources such as Kaimao Reservoir. So far, it received interest from many tourism and leisure developers for the area surrounding the reservoir.

As the only relocation county after the Great Wenchuan Earthquake, Beichuan New Town took an investment and supply driven approach and benefited from high-speed urban development. However, as Beichuan New Town enters a slower pace and state of development, as a less-developed small town that resembles many others of the same kind, a key question is how Beichuan New Town can attract continuous attention, jobs and people, and lead a sustainable future development?

Through the two overall planning practices since 2008 and the current development reality of Beichuan, we find that exploration and exploitation of local resources can provide a basis for sustainable development. The establishment of a city brand

and image may become a key to its sustainable development. The development of locally based industries is one of the main ways to promote the sustainable development of similar cities successfully.

Cities in less-developed regions need to build on their special features. Feature development needs a deep understanding and sustainable use of local resources. Beichuan actively develops a sustainable tourism industry taking full advantage of its location, local cultural, natural resources and materials, and its manufacturing industry. Beichuan aims to be a tourism base and destination and a featured industry base.

The establishment of a city brand and image involves an advanced marketing strategy emphasizing its resources, its location, culture, nature, and industries. Marketing will take advantage of the advanced planning concept, compact and reasonable layout, clear space structure, distinctive spatial style, and environment-friendly low-carbon eco-efficient building and infrastructure technology. The establishment of a distinct city brand and image will improve the overall value of the city, enhance the awareness of the good living environment for local residents, and attract surrounding population and high-end industries.

The development of locally based industries should build on local resources and rely on creative planning and careful implementation. By developing local industries, limited space can attract a large population that creates a lively atmosphere and promotes the development of related industries. This would improve the process of further urbanization and industrialization, leading to sustainable economic development.

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Wuxi Taihu New Town: Planning and Building a Low-Carbon Eco-City

Xiao Sima, Xiaoxing Feng, Xiaoli Wu

1 The Making of Taihu New Town

1.1 Wuxi: "Pearl of Taihu Lake" Built on History, Culture, and Prosperity

Wuxi City in Jiangsu Province is famous for its history and its culture. As the "little Shanghai" and "City of Abundance" of the People's Republic of China (PRC), it is also the birthplace of modern industry in the country. Wuxi is known for innovation, creativity, Internet of Things (IoT) industrial development, environmental governance, and ecological rehabilitation of Taihu Lake. Wuxi is 128 kilometers (km) west of Shanghai and 183 km east of Nanjing. It is bordered by the Yangtze River to the north and Taihu Lake to the south. Wuxi has more than 6 million permanent residents. Three million of these residents live in urban districts that take up 1,659 square kilometers (km^2) of Wuxi's total land area of 4,788 km^2.

As one of the key cities in the Yangtze River Delta Region, Wuxi enjoys advantageous natural surroundings, excellent human resources, a dynamic market, and an advanced, diversified economy. In 2012, Wuxi's gross domestic product (GDP) ranked fourth; its per capita GDP first; its total industrial output value, third, and its fiscal revenue, sixth among the cities in the Yangtze River Delta Region. Its aggregate economic and industrial output value ranked among the top 10 in the PRC.

1.2 Taihu New Town: A National Level Low-Carbon Eco-City Demonstration Project

Wuxi Taihu New Town covers an area of 150 km^2. It is at the shore of Taihu Lake, only 1 km west of the Sunan Shuofang International Airport and 6 km south of the historic urban center. About 400,000 residents currently enjoy its beautiful natural environment and convenient access to transportation. The suggestion to build this new town was first proposed in 2002 as part of Wuxi's new general plan. The goal was to provide a framework for urban and economic development by constructing a new city center. It would also further promote the city's strategy of urban development toward the south. Taihu New Town was part of a strategy to turn Wuxi from a city by the Grand Canal to a city by Taihu Lake.

Against the background of national and international advocacy and policies to reduce carbon emissions and promote eco-efficient developments, former Premier Wen Jiabao noted during his 2009 visit in Wuxi "the focus of governing Taihu Lake and its transformation should be on developing Wuxi as a livable city based on environmental sustainability, ecological and cultural tourism, modern service, and high-tech industries". In the process of rapid urbanization, Wuxi's development faces increasing challenges, such as competition among cities in the Yangtze River Delta Region, urban sprawl, excessive occupation of cultivated land, and management and environmental protection issues of Taihu Lake Basin. On 3 July 2010, the Ministry of Housing, Urban and Rural Development, and the Wuxi Municipal Peoples Government signed the National Low-Carbon and Eco-City Demonstration Area-Taihu New Town cooperation framework agreement, which names Taihu New Town as a National Level Low-Carbon Eco-City Demonstration Area. The goal was to develop a land use, resource, energy efficient urban development pattern.

Table 1 Ranking of Cities' Comprehensive Strength in Yangtze River Delta Region, 2012

City	GDP		GDP per Person		Gross Industrial Output Value		Financial Revenue	
	CNY100 million	Ranking	CNY	Ranking	CNY100 million	Ranking	CNY100 million	Ranking
Shanghai	20,181.7	1	85,373.0	7	33,186.4	1	3,743.7	1
Suzhou	12,011.7	2	114,029.0	3	28,745.5	2	1,204.3	4
Hangzhou	7,802.1	3	111,758.0	4	12,962.3	4	1,627.9	2
Wuxi	7,568.2	4	117,357.0	1	14,446.9	3	658.0	6
Nanjing	7,201.6	5	88,525.0	5	11,437.8	6	733.0	5
Ningbo	6,582.2	6	114,065.0	2	12,155.1	5	1,536.5	3
Nantong	4,558.7	7	62,506.0	14	9,890.1	7	419.7	9
Changzhou	3,969.9	8	85,040.0	8	8,970.3	8	379.0	11
Shaoxing	3,654.3	9	82,966.0	11	8,551.3	9	469.3	8
Yangzhou	2,933.2	10	65,691.0	12	7,198.5	10	225.0	13
Jiaxing	2,890.6	12	84,080.0	9	6,039.9	13	471.9	7
Taizhou(泰州)	2,701.7	13	58,378.0	15	7,127.3	11	223.6	14
Zhenjiang	2,630.4	14	83,651.0	10	6,105.7	12	215.5	15
Huzhou	1,664.3	15	63,714.0	13	3,333.8	15	246.9	12
Zhoushan	853.1	16	87,883.0	6	1,199.8	16	133.5	16
Taizhou(台州)	2,911.3	11	49,438.0	16	3,530.8	14	408.9	10

Sources: Jiangsu Statistical Year Book 2013, Zhejiang Statistical Year Book 2013, Shanghai Statistical Year Book 2013
Notes: GDP means Gross Domestic Product; CNY means yuan.

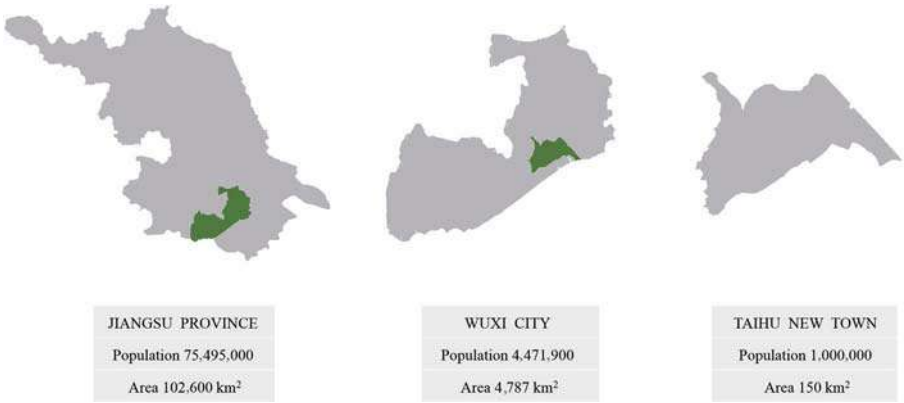


Fig. 1 Location Map of Taihu New Town, Wuxi City, Jiangsu Province
Source: Urban Planning & Design Institute of Shenzhen

1.3 Planning the Transformation of the Taihu New Town Low-Carbon Eco-City

Planning and construction of Taihu New Town first followed the conventional development pattern of the time in the PRC, but shifted to a new and more integrated approach, with a program and guidelines from the Ministry of Housing, Urban, and Rural Development, to build a low-carbon eco-city.

The Wuxi Planning Department first organized an international planning competition for Taihu New Town. It carried out research on land development and functional layout for the core area of the new town. Then, it integrated the key results into the Zoning Plan of Taihu New Town, which was completed in 2003.

In 2004, the conceptual planning for the core area and lakefront of Taihu New Town began. A comprehensive land use plan for the core area was envisioned, and ideas for the lakefront area were developed. The result was a plan for a compact, high-density, mixed-use urban center with attractive pedestrian areas and waterfronts.

In 2005, the conceptual master plan for Taihu New Town was completed. In 2005–2007, detailed municipal engineering, landscape, and detailed urban design plans for areas along key urban corridors and waterfronts were developed and optimized. By 2007, all regulatory and detailed plans for the entire Taihu New Town were complete. The headquarters for construction supervision was then arranged on site, marking the official launch of construction.

In 2010 the engineering and planning firms, ARUP and Tengbom were engaged for the ecological planning of Taihu New Town and Sino-Swedish Low-Carbon Eco-City Demonstration Area, to enhance planning and to make sure plans would be implemented in the best way to achieve the goal of an advanced low-carbon eco-city. The Sino-Swedish Low-Carbon Eco-City Demonstration Area covers 2.4 square kilometers (km^2). It promotes bilateral cooperation with Swedish partners on green economy development, low-carbon technology, and successful implementation of eco-city planning and construction by learning from advanced Swedish ideas. ARUP and Tengbom worked collaboratively with the local government to develop the *Planning Indicator System and Implementation Guideline of the National Low-Carbon Eco-City Demonstration Area in Wuxi Taihu New Town, 2010–2020* and *Indicator System and Implementation Guideline of Wuxi Sino-Swedish Low-Carbon Eco-City, 2010–2020*. These two key planning documents guided the development and construction of Taihu New Town.

Since 2011 the establishment and management of Wuxi Taihu New Town plans have included (i) energy efficiency, non-motorized transport, and environmentally sustainable landscape; and (ii) 10 detailed control plans. The detailed control plans gave clear direction for a more sustainable development of the new town. They were adjusted, with guidance from the two consulting firms and the developed indicator systems, to allow key ecological performance indicators to be measured,

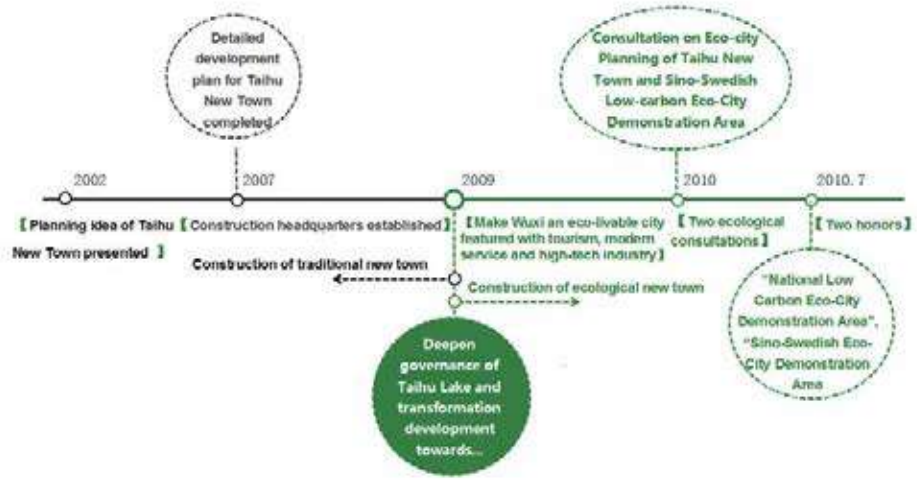


Fig. 2 Timeline of Planning and Implementation of Taihu New Town
Source: Urban Planning & Design Institute of Shenzhen

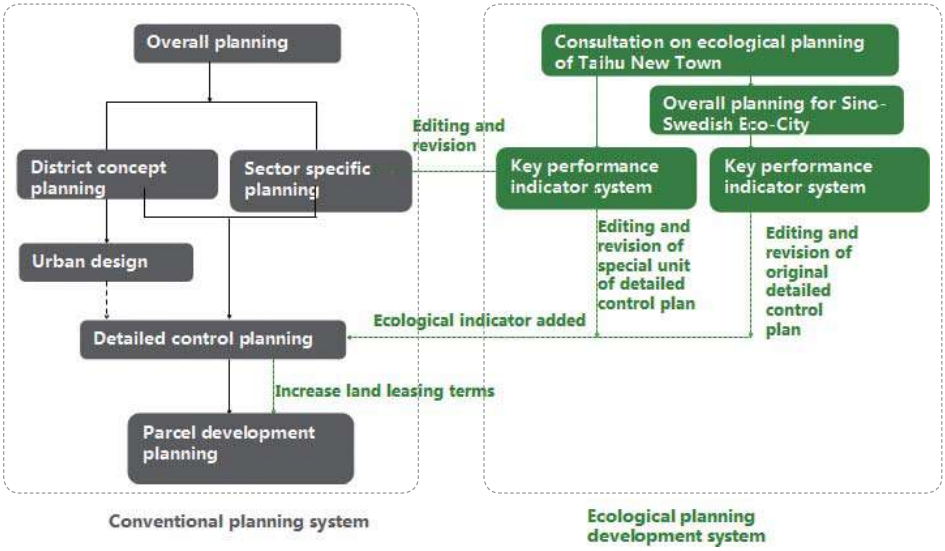


Fig. 3 Overall Framework of Taihu New Town Planning
Source: Office of Headquarter for Wuxi New Town Construction

which became a key condition for leasing contracts with land developers.

Eco-city planning focused on establishing key performance indicators and merged with the conventional planning system that followed the PRC's planning model and regulations, such as general planning, urban design, and detailed control plan. The resulting framework became the foundation for the transformation and upgrading of the new town.

2 Spatial Planning

2.1 Vision: Establish a New Central Area as Low-Carbon Eco-City for Wuxi

The new Wuxi General Master Plan positions Taihu New Town as the new city center that will be home to many vital urban functions, including the city administration and business center, research, science and education, recreation and residential areas and it will be a new modern city based on ecological planning. According to the general master plan, the estimated population of Taihu New Town in 2020 will be about 1 million and the estimated number of jobs will be about 500,000. The total urban construction land area is about 100 km^2, accounting for 67% of the total land area of Wuxi New Town. The remaining 50 km^2 are for roads, open space, and other land uses. Per capita construction land for Taihu New Town will be about 100 square meters (m^2).

About 2,544 hm^2, or 25% of the urban construction land is for residential; about 2,415 hm^2, or 24%, for public facilities; and 568 hm^2, or 6%, for industrial use. Warehouse and logistics get 24 hm^2, or 0.2% of the urban construction land; 8 hm^2, or 0.1%, for external transport; 2,079 hm^2, or 21%, for roads and open spaces; 202 hm^2, or 2%, for municipal public facilities; and, finally, 2,141 hm^2, or 21%, for green open space.

2.2 Urban Structure: Clear Functions of Three Zones

Bounded by Huayi Road and Lihu Avenue, Taihu New Town is divided into three distinct zones with clear functions from east to west.

The eastern zone occupies about 23 km^2. Its main feature is Taihu International Science Park, including the National Sensing Information Center and high-tech research and development, University Science, software, digital design, and the creative industry parks.

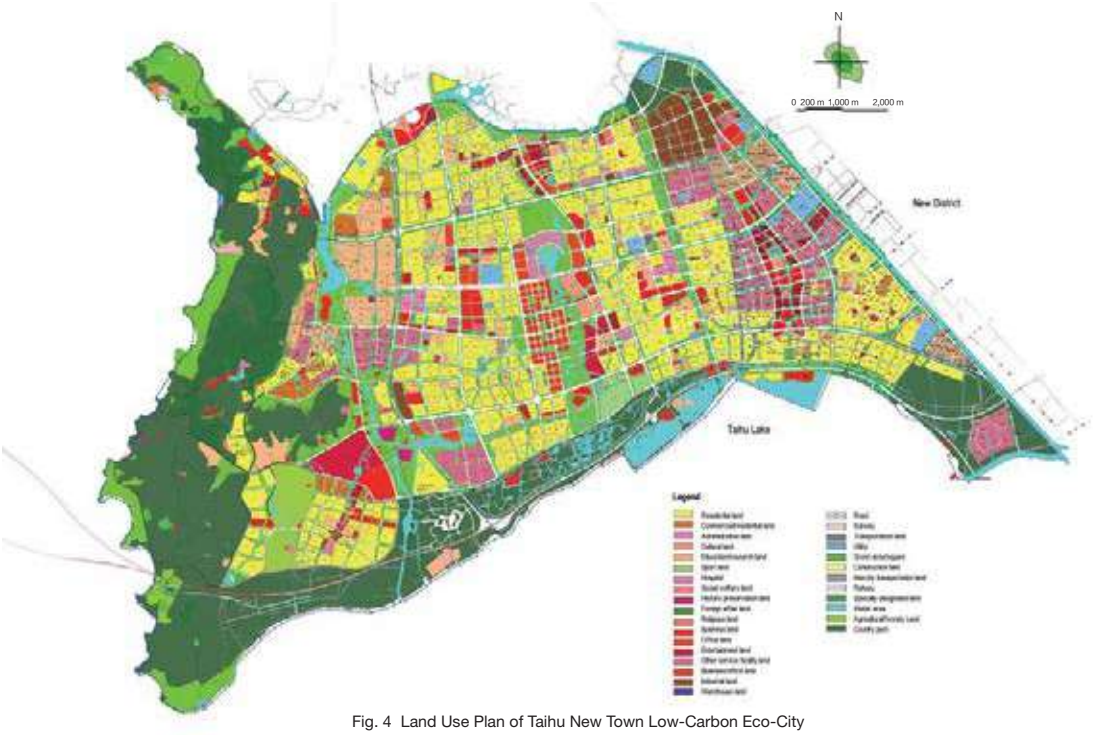


Fig. 4 Land Use Plan of Taihu New Town Low-Carbon Eco-City
Source: Office of Headquarter for Wuxi Taihu New Town Construction

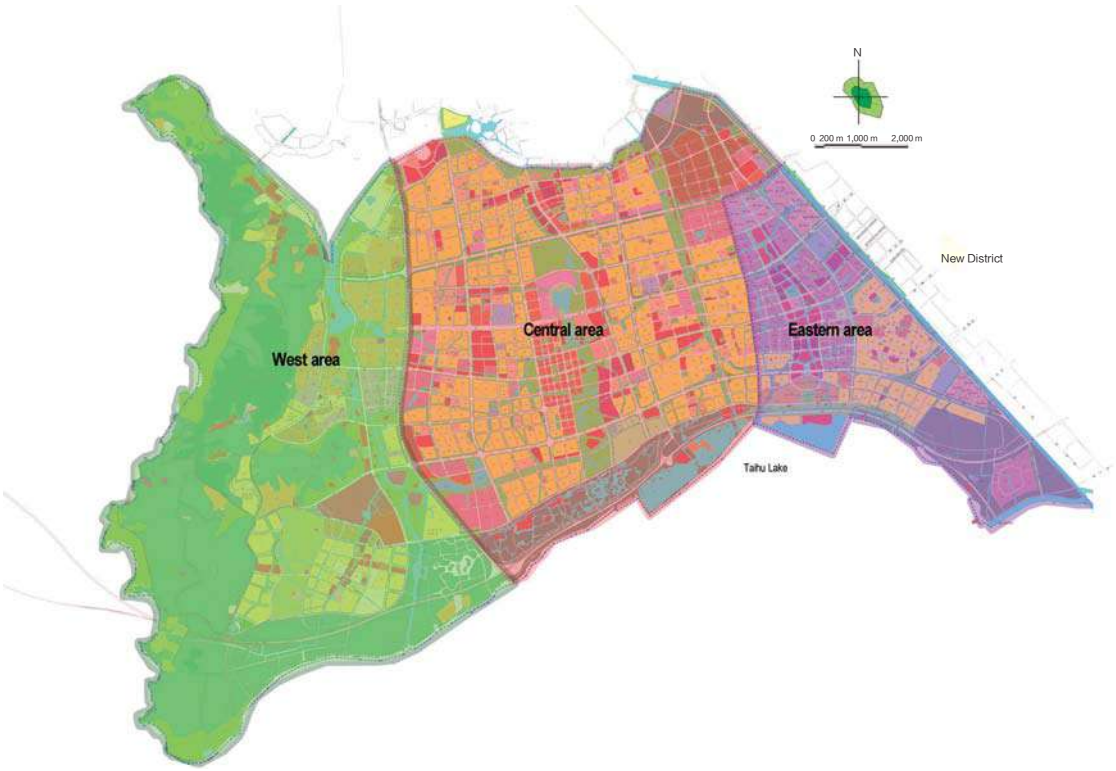


Fig. 5 Three Functional Zones of Taihu New Town
Source: Office of Headquarter for Wuxi Taihu New Town Construction

The central zone, the heart of Taihu New Town, covers about 55 km^2 and focuses on the financial and business center, administrative center, cultural center, and high density livable residential communities.

The western zone covers about 72 km^2 with Shanshui City Scenic Resort and the Science and Education Industry Park as the main features. Plans for this zone include creative industries, ecological and recreational tourism, a national first-class university science park, a demonstration area integrating administration, production, study and research, and a base for tourism, leisure, and the movie and television industry, all of which attract domestic and international interest.

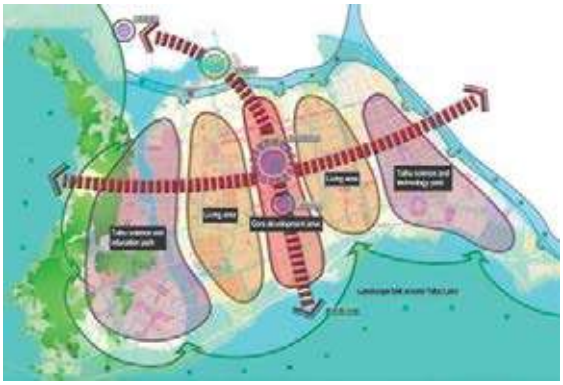


Fig. 6 Spatial Structure Diagram for Taihu New Town
Source: Office of Headquarter for Wuxi Taihu New Town Construction

2.3 Spatial Structure: One Core, One Belt, Two Parks, and Two Zones

Taihu New Town is nestled under a mountain and near a lake. It established an overall structure of one core, one belt, two parks, and two zones to take advantage of its lush and green natural environment. The core refers to the administration, culture, and business financial area. The belt refers to the Taihu Lakefront landscape scenery. The two parks refer to Taihu International Science Park and the Science and Education Industry Park, while the two zones refer to the residential communities planned on both sides of the core area.

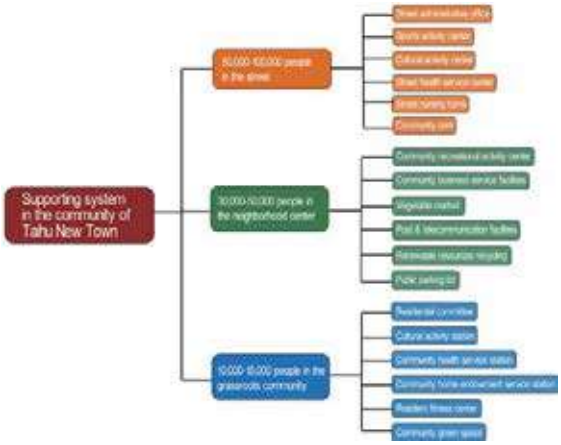


Fig. 7 Supporting System on the Public Facility Level of Taihu New Town
Source: Supporting Facility Plan for Taihu New Town Community, Office of Headquarter for Wuxi Taihu New Town Construction

2.4 Public Facilities: A Three-Tier System of Street, Neighborhood Center, and Grassroots Community

A three-tier public facility system comprising the streets, neighborhood centers, and grassroots communities, was established. The public facilities serve a population of 50,000 to 100,000 at the street tier; 30,000 to 50,000 at the neighborhood center tier; and 10,000 to 15,000 at the grassroots community tier. The street tier includes public facilities such as the administrative offices, sports activity center, cultural activity center, health service center, nursing home, and community park. The neighborhood center tier includes the community recreational activity center, community business facilities, produce market, postal telecommunications facilities, renewable resources recycling, public toilets, and public parking lots. The third tier grassroots community includes facilities such as the residential committee, cultural activity station, community health service station, community home endowment service station, resident fitness center, and community green space. The construction of public facilities should carry out the concept of intensive and optimal land use. The community centers are encouraged to follow the mixed land use model.

Fig. 8 Planning Map for Road Traffic of Taihu New Town
Source: Office of Headquarter for Wuxi Taihu New Town Construction

2.5 Sustainable Road and Urban Transport System: Metro-Rail-Transit, Bus Rapid Transit, and Bus Service

The road network of Wuxi Taihu New Town is laid out as a grid of trunk roads comprising five main east-west, eight main north-south roads, and smaller local roads. There are four levels of roads: expressways, trunk roads, secondary trunk roads, and branch streets, with a total length of 300 kilometers (km). The road network density is 6 km per km^2. A highway (Circum-Taihu Lake Highway) and three expressways (Gaolang Road, Yihu Avenue, and Huaqing Avenue) provide rapid road access. Public transport linking Taihu New Town with other parts of Wuxi includes two rail transit lines (Lines 1 and 4) and 6 bus rapid transit lines to enable transit-oriented development (TOD) easy and convenient access to public transport service from all residential areas, commercial areas, workplaces, and recreational areas.

2.6 Open Space and Ecosystem Structure: Green Parks, Corridors, Lakefront and Riverway Network

Wuxi Taihu New Town is endowed by a scenic natural setting with a mountain, lake, forest, wetland, and river. The plan focuses on making a green city with an abundance of green open spaces. The green space system comprises three major east-west and three major north-south green corridors. The three main north-south greenbelts are the Shangxian River Wetland Park, Changguangxi Wetland Park, and Lihe River Landscape Belt. The three main east-west open spaces are the Liangtang River Ecological Landscape Green Space, Wudu Road Landscape Belt, and Taihu Lakeside Park. The green corridors are about 4 km apart, spreading

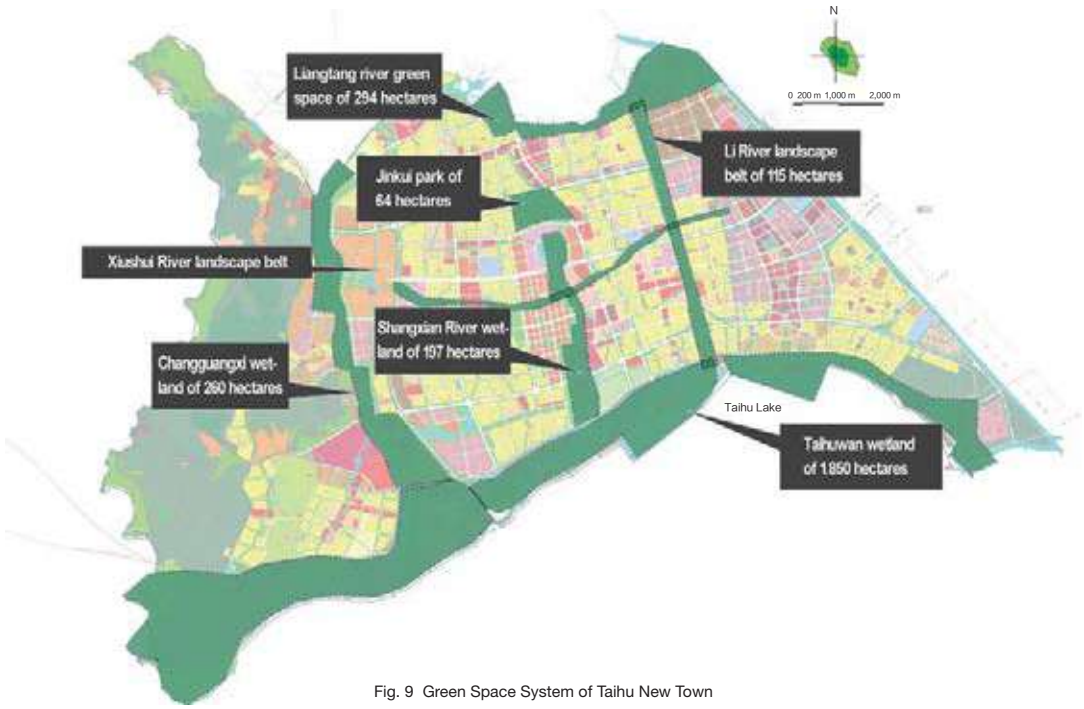


Fig. 9 Green Space System of Taihu New Town
Source: Office of Headquarter for Wuxi Taihu New Town Construction

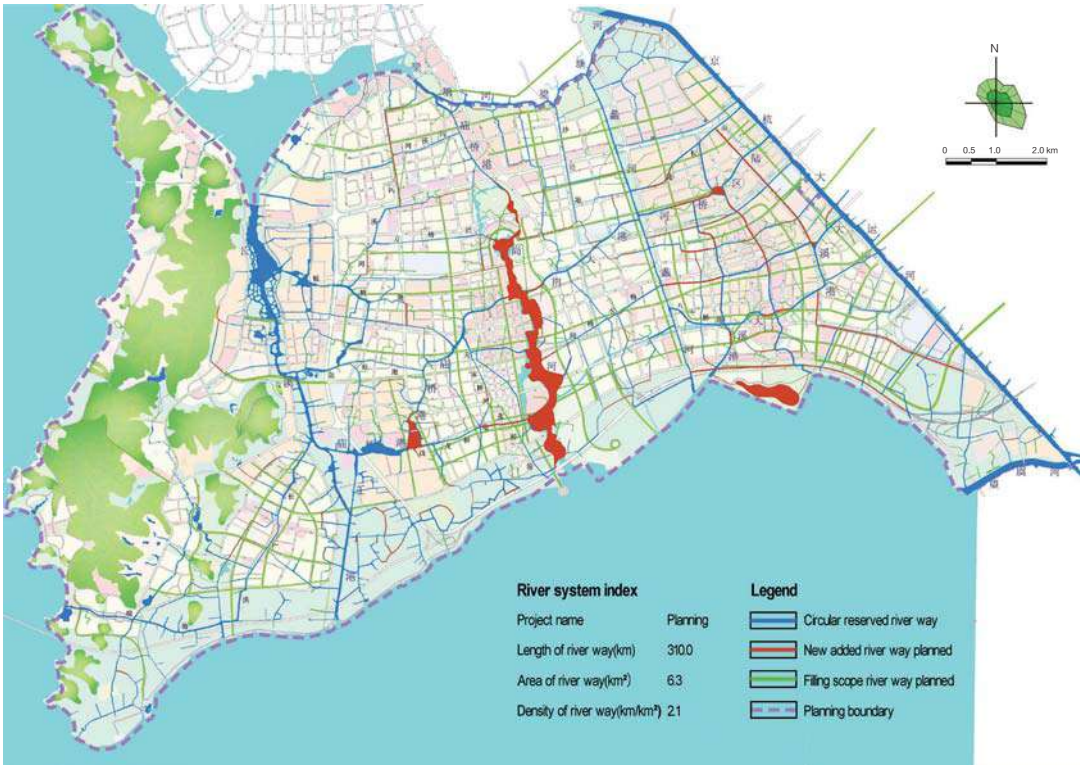


Fig. 10 Comprehensive Improvement for River System of Taihu New Town
Source: Office of Headquarter for Wuxi Taihu New Town Construction

across the entire Taihu New Town. They offer many well-distributed ecosystem services to the new development such as improved air quality, pollutant absorption, microclimate, water filtration, and storm water management, and other ecosystems services that green space provide.

The new town will preserve and rehabilitate more than 300 rivers and creeks and their environments by 2020 in the form of a 200 km primary water network comprising four east-west and four north-south rivers. The network will have drainage density of 1.9 km/km^2 and a water surface ratio of 4.3%. A key goal is to link the Taihu Lake Wetland and open space system closely to the new town.

3 Eco-City Development and Construction Strategy

3.1 Eco-Efficient and Energy Saving Urban Spatial Layout

3.1.1 A Vibrant Mix of Uses: Diverse and Complex Urban Functions

Wuxi Taihu New Town will be a compact city with complex and diverse residential, commercial, industrial, and recreational functions. It will build on and expand the energy, film and movie, recreation, and tourism industries. Industries and universities will organize the expansion of research and development. The town's focus on business finance, leisure tourism, information and communication technology (ICT) development, new materials research and development, technology incubation centers, science and education in the arts and creative industries, and low-carbon industry development promotes the services sector. Transportation links and the close relationships between industries, public services, and residential land will create favorable jobs and housing balance, resulting in a compact city with short distances from home to work and leisure.

Within urban blocks, the plan advocates mixed land use with residential, commercial, and office buildings. It also suggests that the ratio of mixed-use blocks to residential and other uses in the new town exceed 50%.

3.1.2 Land Use Intensity and Efficiency

The development intensity and the mix of land uses surrounding the metro stations and transportation hubs will increase. The construction of high-density, mixed-use development complexes with public activity centers is advocated, with 80% of these centers connected to public transportation hubs. Mixed-use developments must be high density with a total comprehensive plot ratio between 2.5 and 6.0 for office facilities and between 3.5 and 6.5 for commercial facilities. In addition, underground space will be developed to connect buildings. The transit-oriented, mixed-use, and high-density development around public transport stations and reasonable block sizes promote walking and cycling, and will reduce the number of private vehicles used.

3.1.3 Optimize Public Facility Layout

The locations of basic public service facilities are distributed to make sure all residents and workers in the new town have equal and convenient access. To encourage non-motorized transport, public facilities are near residents to enable 97% of residents to walk to childcare within 500 meters, over 80% to walk to primary schools within 500 meters, and all residents to walk to public green spaces within 500 meters. Hence, green transport is advocated.

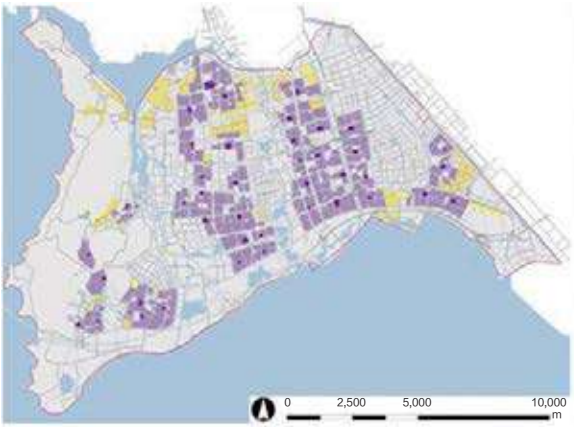
3.2 Establish a Multi-Tier Sustainable Public Transport Network

3.2.1 Develop Green Public Transportation System

Wuxi Taihu Low-Carbon Eco-City New Town aims to build a sustainable urban transport and eco-mobility system, focusing on public transport service with convenient multimodal transfer stations that integrate railway transit with local and city-buses to realize a convenient and low-carbon transport system.

100% of the residents can walk 500 meters to the nearest bus station

100% of the residents can walk 500 meters to the nearest public green space



80% of the students can walk 500 meters to the nearest primary school

97% of the young children can walk 500 meters to the nearst childcare

Fig. 11 Eco-City Planning Improves the Accessibility of Public Facilities
Source: Office of Headquarter for Wuxi Taihu New Town Construction

The optimized bus route alignments and exclusive bus lanes on both sides of the trunk roads increase speed and density of the bus route network that will reach at least 3 km per km^2 of urban area. Throughout the Taihu New Town, bus stops are within convenient walking distance of only 500 meters, which equals about a 6-minute walk.

3.2.2 A Pedestrian and Bicycle Friendly New Town Focused on Non-Motorized Transport

Throughout Taihu New Town, blocks that are not too large, through-block connections, and wide sidewalks and bicycle lanes create a convenient pedestrian and bicycle path network. At least one to two public transport transfer stations for every 2 km of service radius, combined with the high-density mixed-use developments around transit stations and distributed public facilities, ensure a sound and convenient framework for pedestrian and bicycle circulation. A convenient public bicycle leasing system will encourage green trips, further reducing the need for private vehicles.

In addition, there will be convenient and attractive pedestrian and bicycle pathways in the five green corridors that offer pleasant leisure and recreation routes with various themes: a water environment route, an ecological experience route, a cultural heritage route, a leisure tourism route, and an urban experience route. Pathway network density reaches at least a 3.7 km of pathway per km^2.

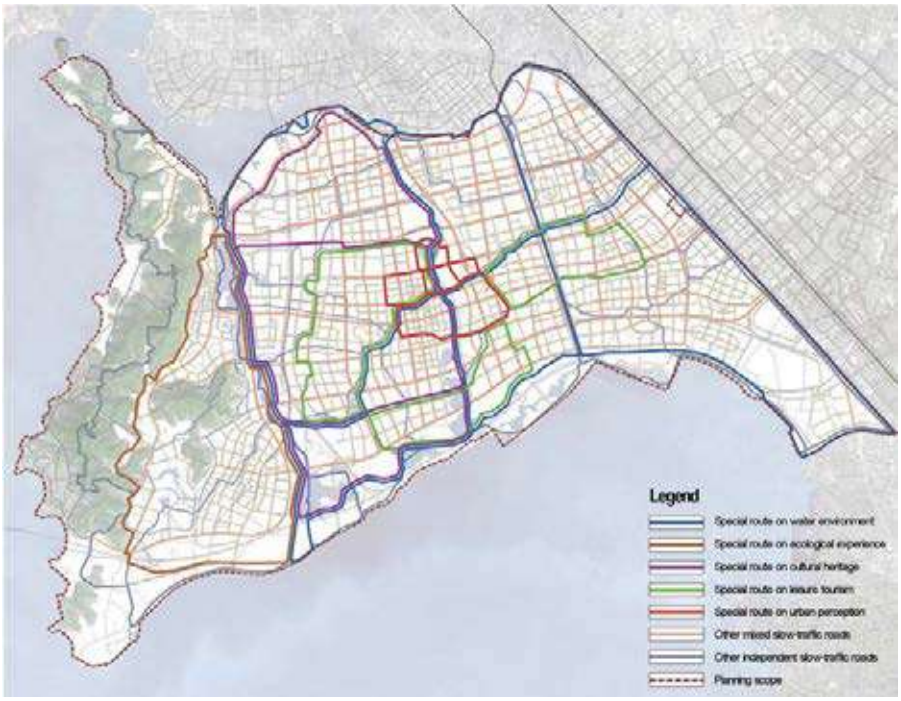


Fig. 12 Non-Motorized Transport System of Taihu New Town
Source: Office of Headquarter for Wuxi Taihu New Town Construction

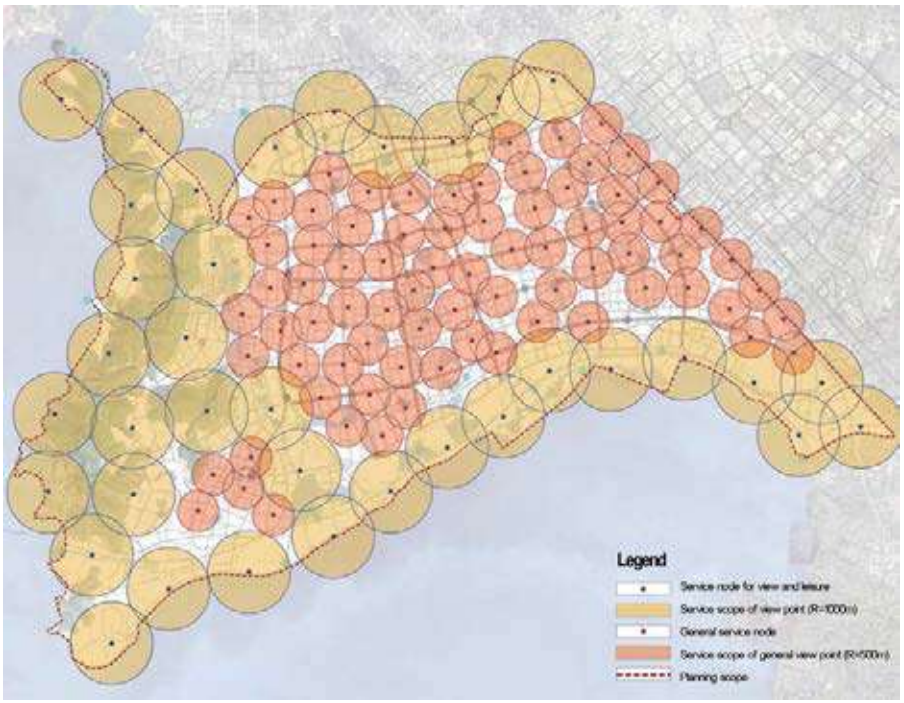


Fig. 13 Convenient Bus Stops and Traffic Service Node for Non-Motorized Transport of Taihu New Town
Source: Slow Traffic System Plan for Wuxi Taihu New Town Plan, Office of Headquarter for Wuxi Taihu New Town Construction

3.3 Eco-Efficient and Integrated Utilities for Energy Savings and Emissions Reduction

3.3.1 Common Utility Trenches

Common utility trenches with ducts for various services in Taihu New Town follow international best practices. New pipes and a comprehensive utility trench is used along the road around the core area including electricity cable, telecommunications, a water supply main pipe, and a reclaimed water pipe with a total length of about 16.4 km.

3.3.2 Water Use Efficiency, Wastewater Treatment, and Water Reuse

(i) Improve Efficiency and Use of Unconventional Water Resources

Taihu New Town has an ambitious target of no more than 5% non-revenue water lost from leaky pipes. It aims to utilize more than 40% of unconventional water resources, i.e., treated wastewater. The use of water-saving appliances in private households and commercial, industrial, and public buildings should be at 100%. These key measures will maximize water use efficiency and decrease loss of water resources.

(ii) Improve the Wastewater Treatment Ratio

Wuxi Taihu New Town has full coverage of wastewater collection and treatment. When completed, the unified wastewater treatment and reclaimed water recycling system will make sure that the effluent quality meets PRC standards and water quality requirements after physical, chemical, and biological treatment. The town aims to use reclaimed water for 30% of all water its water needs.

(iii) High Infiltration and Zero Impact of Rainwater Drainage

In Taihu New Town, roads and buildings adopt a comprehensive rainwater filtration system to maximize rainwater infiltration and groundwater recharge through permeable ground. This ensures that land absorbs the same amount of rainwater even after urban development, achieving zero impact on groundwater recharge.

3.3.3 Integrated Solid Waste Management

(i) Solid Waste Generation Reduction

Wuxi Taihu New Town advocates green lifestyles and reduced consumption with no more than 0.8 kg of solid waste per capita daily. It also aims for no more than 450 tons per hectare of construction waste through resource recovery and utilization, and landscape construction balancing cut and fill earthwork.

(ii) Solid Waste Recycling, Resource Recovery, and Utilization

The solid waste management system maximizes solid waste recycling. It requires that at least 95% of domestic waste and at least 75% of construction waste is recycled.

(iii) Separate Collection and Harmless Treatment of Solid Waste

Solid waste is segregated at the source and collected in separate units. The non-hazardous solid waste treatment rate reaches 100% in Taihu New Town. In the Sino-Swedish Eco-City Demonstration Area, a vacuum waste collection system is being installed introducing advanced technology from Sweden as used in Hammarby Sjöstad.

3.3.4 Energy Saving and Regeneration Technology

(i) Energy Efficiency for New Buildings

Given the hot summer and moderate winter climate zone in the middle and lower Yangtze River Region, the planning code requires north-south building orientation, with main rooms in dwelling units facing south, encouraging passive solar gains in the winter and natural ventilation. The buildings follow advanced green building technology by adopting environmental protection technologies such as external sun shading, heat preservation, and thermal insulation to reduce the energy demand and consumption, and ensure that the energy savings rate of new residential and public buildings are at least 65% compared to conventional buildings in the PRC.

New public buildings must achieve the standard for public building energy efficiency. Energy-saving measures of green buildings are in the form

(a) Distributed energy (b) Construction of solar street lamp along the road (c) Solar landscape lighting facility

Fig. 14 Distributed and Renewable Energy Production Compact Combined Heat Power and Photovoltaic Cells
Source: Office of Headquarter for Wuxi Taihu New Town Construction

of thermal insulation of walls, roofs, raised floor, and low-E double pane glass windows for good thermal performance of the building envelope. While controlling the building shape coefficient, window to wall ratio, and building orientation, the shading facilities are applied according to code requirements. For roof insulation, 120 millimeters (mm) of foam glass is used; in some cases, green roofs are also adopted. For outer walls with 50 mm thick rock wool insulation boards, 200 mm thick shale hollow bricks are used. Elevated floors use 30 mm thick mineral wool insulation board. Insulated aluminum alloy with low emission is used in glass curtain wall facades. Long-term efficiency gains compensate for increased investment costs.

(ii) Strategy of Distributed and Renewable Energy Supply

Wuxi Taihu New Town has a system that distributes energy supply from renewable sources, such as photovoltaic cells. The renewable energy production rate of Taihu New Town will reach at least 8% and the Sino-Swedish Low-Carbon Eco-City Demonstration Area, a minimum of 20%. New buildings will reach at least 15% by 2020. Taihu New Town also uses facilities for distributed energy generation using different technologies of combined forms of renewable energy with energy from the grid to improve the efficiency of energy utilization.

3.4 Protect and Improve the Ecological Environment

Targets for environmental quality targets include monitored air quality with better or equal to secondary standard 350 days per year. Water pollution prevention and control of Taihu Lake is strengthened, making the quality of the surface water environment in Taihu New Town no worse than class IV, including surface water source from second-level protected areas, fish and shrimp wintering grounds and migration routes, aquaculture areas, and other fishing waters and swimming area. For all projects, a construction and environmental impact assessment is required, with an aim to reach 100% coverage of up-to-standard, noise-control zones.

The protection and development of significant public green open space improves the capacity of ecosystem services related to microclimate improvements, air quality improvements through oxygen production, pollutant absorption, and carbon sequestration. The forestation rate in afforesting land will be increased to at least 45%. The forestation rate of production and protective green space, roadside green space, park green open space should be respectively no lower than 80%, 70%, 60% and 40%. Building owners will implement the requirement under the town master plan to follow a certain proportion when greening building roofs.

The town's livable urban blocks and buildings are people-oriented. In terms of architectural layout, wind environment model, heat island effect simulation, sunlight simulation, and other technical models were used to optimize urban microclimate in the architectural layout, which minimizes urban heat island effect and promotes natural urban ventilation with suitable wind speeds. In pedestrian areas, building arrangements reduce wind speed to no more than 5 meters per second. In residential areas, the standard sunshine coverage rate should reach 100%. In new residential areas, the daily average outdoor heat difference should be no more than 1.5 degrees.

3.5 Promote Green Building

In Taihu New Town, new buildings are constructed according to the *Evaluation Standard for Green Building* and *Evaluation Standard for Green Building in Jiangsu Province*. Under these evaluations, all buildings are required to be certified with at least a 1-star rating, 20% with a 2-star rating, and 10% with a 3-star rating.

In residential projects, solar and geothermal energy, unconventional sources of water supply, water-saving appliances, and environment-friendly construction materials are used and actively promoted. The use ratio of green material is required to reach 100% and that of the local building materials is required to reach 70% or more. Construction adopts industrialized prefabricated elements for residential buildings using intelligent systems and green construction at 100%.

4 Economic, Social, and Environmental Impacts of Taihu New Town

4.1 Timeline of Taihu New Town Construction

Based on the principle of advanced planning, followed by coordinated construction, the planning department started research on the planning of Taihu New Town in 2002. The master plan was completed in 2007 after constant improvements of the general plan, detailed control plan, various sector plans, and sub-area plans.

In line with the theory that urban development follows industrial development and jobs, the eastern and western industrial parks were developed early in 2005, establishing a foundation to create jobs and attract people to the new town. By the end of 2009, in the 700,000 m^2 eastern Taihu Science Park — the technology innovation, startup, and creativity center — was built. It attracted over 60 research and development institutions and software service outsourcing enterprises. In Shanshui City in the west area, taking advantage of its proximity to the university town, the Wuxi branch of Peking University, Henghua Technology Park, Business Incubator for new graduates, and other science and education bases were built. This attracted more than 70 high-tech enterprises, including Giant Interactive Group, IBM – PRC Cloud Computing Center, iSoftStone, and other reputable firms.

In line with the strategy to construct infrastructure first before developing plots, the construction headquarters for Taihu New Town was established in 2007 and large-scale construction started. As a primary framework for the development of the new town, the first construction was the trunk lines of municipal infrastructures, key environmental engineering projects, and resettlement housing to guarantee people's living space. Meanwhile, the planning and construction of the Civic Center, Expo Center, Grand Theater, and other key projects were launched to create an image of completeness for the new city center instantly. It took only 3 years to build the basic framework of the new city center, including the road network, greenbelt and wetland, and key development projects.

During the past 2 years, the construction of office, residential, and commercial projects moved forward in line with the idea of a centralized development and moderately developed support functions in the center. High-end office buildings and office occupancy are prioritized for centrally located sites. The large-scale central business district facilities and urban complex

1 The eastern, central, and western districts of Taihu New Town fall under the jurisdiction of three different administrative bodies. Because of the restriction by statistic specification, this chapter makes an analysis with the central area of Taihu as an object.

projects were prioritized near the Civic Center; in this location, residential projects were also constructed first. A development principle was to focus on developing the center first followed by periphery. Residential development and construction followed a sequence of orderly southward development with land leases allowing the funding and development of public service facilities.

4.2 Financing Mechanism of the New Town Construction

The start-up capital for construction of Taihu New Town is mainly obtained through the development and consolidation of land resources and land leases to developers. The government used commercial bank loans to obtain the start-up capital for advance construction of infrastructure and key public structures. Land auctions were held, and the revenue was used to repay the commercial bank loans.

4.2.1 Construction Investment and Operation, and Maintenance Cost

From 2007 to the end of 2012, the cumulative investment in infrastructure, civil and environmental engineering projects, public facilities, and resettlement housing in the center of Taihu New Town[1] was about CNY50 billion (about $8 billion). The operation and maintenance (O&M) cost for road, pipe network, and environmental infrastructure about CNY150 million (about $24 million) in 2011. The O&M cost will increase with the continued development of the new town.

4.2.2 Economic Benefit Analysis

From 2007 to the end of 2012, a land area of 4,500 Chinese mu (1 mu = 666 m^2) in the center of Taihu New Town was auctioned off, and the revenue was CNY14 billion (about $2.2 billion). Economic benefits, including land value increase, industrial development, and job creation are very significant. The average price of residential land in the center was CNY8 million (about $1.3 million) per mu in 2012, four times the amount compared to the price in 2004. Along with the successful development and construction, a large amount of private capital flowed into the new town and was invested in the development and construction of housing, commercial buildings, and office buildings. Private capital is also invested in the construction of schools, hospitals, and other public service facilities arranged in public-private partnerships.

4.3 Social Impact of New Town Construction

4.3.1 Native Resident Resettlement and Livelihood Security

Prior to the construction of Taihu New Town, there were about 195,000 residents in the area, most of whom have rural household registration. The residential land was scattered in the form of natural villages with mainly two-story rural residences built in the 1980s with relatively good construction quality. During the urbanization process, in line with the pace of infrastructure construction and environmental engineering, high-quality residential communities were built to accommodate affected people whose lands and homes were expropriated and demolished. All landless farmers were included in the urban social insurance system for a lifetime and enjoy the same benefits as urban residents. Furthermore, the policy on land reserved for sub districts was adopted, under which 10% of the total collectively owned land within the Taihu New Town's leased land is reserved as assets and managed collectively to bring dividends and job opportunities to locals.

4.3.2 Attract New Residents

As the development of the eastern and western industrial parks and financial business district matured, a large number of qualified and talented people flocked into the new town. Meanwhile, the attractive natural environment of the lakefront, excellent living conditions, and high quality housing and public facilities attracted many old town citizens to buy apartments and settle down. By the end of 2012, about 4 million m^2 in the center of Taihu New Town made up the market-rate housing.

4.3.3 Planning and Construction of Public Service Facilities

Through a number of special plans, land for public facilities, culture, education, sports and health facilities,

and other community support facilities was reserved. These public facilities provided services on time while allowing some consideration for efficiency. Public service facilities in cities and districts were developed by the public agencies operating the facilities. Meanwhile, it actively introduces social capital to promote public-private partnerships in the construction and operation of public service facilities such as schools, hospitals, and nursing homes. The three-tiered public facilities service coverage system consists of the street, neighborhood center, and grassroots community tiers. The public service facilities in sub districts are generally developed on land separately obtained by the sub district government. The corresponding housing developers construct public service facilities at the neighborhood center and grassroots community levels on their parcels to make sure that everyone has equal access to and adequate provision of public services.

5 Planning and Implementation

5.1 Implementation Mechanism of New Town

5.1.1 Construction Management System

The Wuxi municipal government set up the construction headquarters in 2007, with direct oversight by the mayor and the department heads as board members. The construction headquarters was in charge of the overall guidance and management, planning, coordination, and organized implementation. Construction was delegated to sub district construction management offices by dividing Taihu New Town into different areas.

The Binhu District administration was responsible for planning, development, and construction of the east area of the Taihu Science Park and the west area of the Landscape Park. The office of construction headquarters was responsible for the central area. Apart from construction management, the Binhu District also undertook work on economic and social development, social affairs and administration, and financial management.

5.1.2 Investment and Financing System

The construction headquarters established the Taihu New Town Development Group. This company is responsible for investment and financing in the central area and construction of projects, such as resource development, infrastructure, environmental engineering, and key public buildings. It also developed other operations by setting up subsidiaries. The Wuxi Taihu New Town Construction Management Center, a legal entity as state-owned enterprise, was incorporated on the municipal level and put in charge of land-leasing management in the central area. Its capital injection into the group as a stakeholder increased the registered capital of the group and strengthened abilities to invest and construct.

Fig. 15 Construction Management System and Institutional Arrangements of Taihu New Town
Source: Urban Planning & Design Institute of Shenzhen

After deducting charges by the municipal finance bureau and funds applied for coordination according to policies and regulations, the remaining land-leasing revenues from the center are given back to the office of the construction headquarters. Taihu New Town Development Group financed construction with up to CNY46 billion (about $7.5 billion) by way of bank loans, trust products, equity financing, and finance lease until September 2013.

In consideration of the achievements in ecological design, Wuxi Taihu New Town received special state and province subsidies for low-carbon ecological construction, water-system management, and wetland construction. These subsidies include a subsidy for an energy-efficiency and green buildings demonstration area by Jiangsu Province and a central government subsidy for an eco-city demonstration area. For the wastewater management system, subsidies from the central and provincial governments included CNY200 million (about $32.7 million) as part of the central government subsidy for water pollution control in Taihu Lake Basin and special provincial capital for water environment management in Taihu Lake Basin. Other special funds provided important financial support for water and wastewater management, and wetland construction.

5.2 Operation and Maintenance of Wuxi Taihu New Town

5.2.1 Operation and Maintenance of Roads

As the profit from land lease and tax revenue in Taihu New Town went separately to the office of construction headquarters and the district government, differences remained in claiming O&M responsibility. The Wuxi municipal government held a coordination meeting in February 2010 to define which entity should be responsible for O&M of the roads. The Binhu District took over all new roads in the central area. Lower level agencies are now responsible for expressways and main streets that were previously under municipal departments. The expenditure for management and O&M was charged according to municipal stipulations. The municipal finance bureau bears expenditures for expressways and trunk roads under its management while the new town office of construction headquarters bears expenditures for all other roads.

5.2.2 Operation and Maintenance of Urban Green Space and Supporting Facilities

After 2 years of O&M, the Office of Construction Headquarters entrusted the property management subsidiary of Taihu New Town Development Group to take over the wetlands and parks in the central area and allocated funds for O&M based on budget and cost. This property management subsidiary collects rent on supporting facilities of wetlands and parks by inviting investments.

5.2.3 Operation and Maintenance of Important Functional Projects

Since 2007, several important facilities such as the Civic Center, Taihu International Exposition Center, and Wuxi Grand Theater have opened. The government funds the operation and management of these non-profit facilities by private management companies identified through bidding. Apart from getting a certain amount of government subsidies from finance every year, their income mainly comes from ticket sales.

In 2010, operations began after Phase 1 of the Taihu International Expo Center was completed. The Taihu International EXPO Center Limited Company, a professional expo platform management company, is a subsidiary owned by the Taihu New Town Development Group. It was established to operate and manage the Expo Center. In May 2012, Wuxi Grand Theater was completed and put into operation. Wuxi Grand Theater Poly Management Limited was incorporated to operate and maintain the theater. The Culture and Arts Company of the PRC Poly Group Corporation, with a professional theater management background, holds 60% of the company, while Taihu New Town Development Group holds the remaining 40%. The above two management companies are managed soundly and achieve a balance of expenditure and payment or even produce a small surplus.

6 Conclusions

According to the survey data of the National Development and Reform Commission in 2012, each of the 12 provincial cities plans to construct an average of 4.6 new towns and/or new districts and each of the 144 prefecture level cities plans for an average of 1.5. Large-scale new town developments have become an important and strategic element for the PRC's economic and urban development.

With the change of economic conditions, reduced growth rates, and importance given to the development of an ecological civilization, low-carbon eco-city construction has become a government priority, stimulating a new round of construction of new towns. However, many domestic eco-cities fail to consider a comprehensive approach and ineffectively integrate comprehensive eco-efficiency objectives with the current planning regulatory system. Many projects pursue high efficiency, economic development, and lower pollution within a confined area and system.

For new urbanization in the PRC, including the various aspects of ecological civilization effectively on every level of new urban development and urban management while guiding the implementation of eco-cities remains a key challenge. Taihu New Town offers some lessons learned.

6.1 Comprehensive Eco-City Planning

Taihu New Town builds on an improved traditional master plan. It integrates comprehensive eco-city planning principles, including sound traditional planning principles, incorporation of eco-efficiency principles, the development and adoption of a key performance indicator system, updated master plan, and a monitoring mechanism to report environmental quality standards set in the key performance indicators.

From an ecological perspective on the traditional planning, an optimized sustainable development strategy for local climate conditions was established. The local government, together with consulting firms, ARUP and Tengbom, developed two sets of key environmental and eco-efficiency performance indicator systems: (i) *Planning Indicator System and Implementation Guideline of the National Low-Carbon Eco-City Demonstration Area in Wuxi Taihu New Town* and (ii) *Indicator System and Implementation*

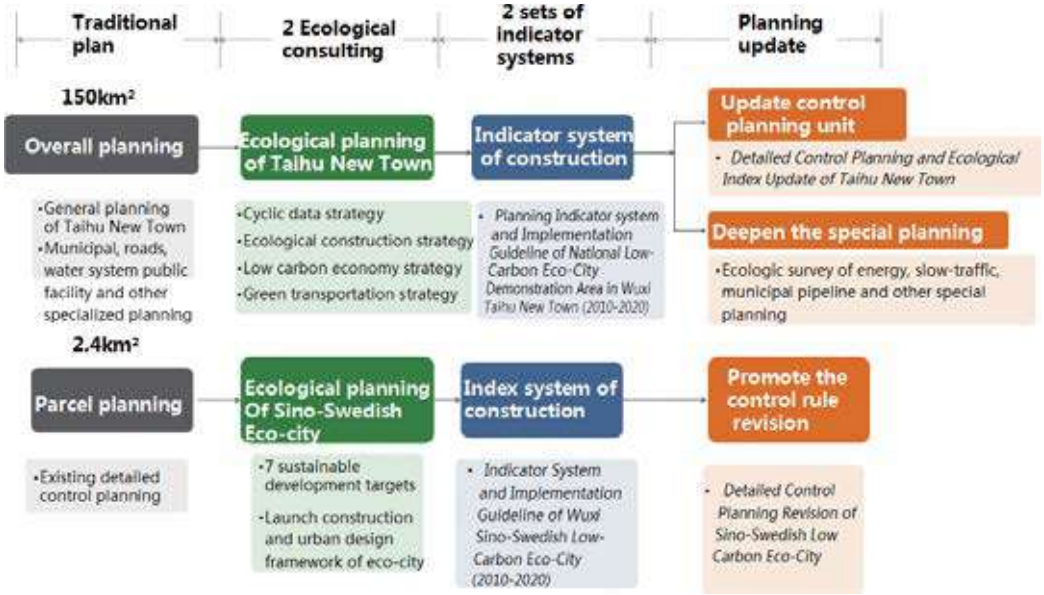


Fig. 16 Technical Route: Traditional Planning, Ecologic Survey, Indicator System, planning update
Source: Urban Planning & Design Institute of Shenzhen

Guideline of Wuxi Sino-Swedish Low-Carbon Eco-City. The planning indicator system, as a basis for the strategy, focused on indicator control on a less detailed level, while the indicator system and implementation guideline focused on the Sino-Swedish Low-Carbon Eco-City and emphasized on the technical and operations aspects on a detailed level.

The key performance indicator system provides Taihu New Town with an objective reference on low-carbon ecological efficiency, but it cannot be directly applied to daily planning and management. In terms of eco-city construction, it is still necessary to monitor and provide performance feedback of the eco-city objectives, and monitor indicator performance and all aspects of the planning and operations. Taihu New Town planners completed the *Detailed Control Planning and Ecological Index Update of Taihu New Town* and *Editing and Revision of Detailed Control Planning of Sino-Swedish Low-Carbon Eco-City*. They developed many specialized sector and area-specific eco-city plans on energy, sustainable urban transport, municipal pipeline, water and wastewater management, environmental management, and other relevant specialized ecological plans. Finally, at the parcel planning level, as terms and conditions for the leasing contracts, the eco-efficient key performance indicators provided direct guidance for the implementation and construction of resources, water, and energy efficient buildings and site planning.

6.2 Key Performance Indicator Systems for Planning and Operations

6.2.1 No "Sweeping Approach", Enough Flexibility Is in the Guideline

Compared to the traditional indicator system of eco-cities, the system of Taihu low-carbon eco-city is not a simple objective system that can be applied to all eco-city developments. Rather, it is a system in which a targeted decomposition for the key performance indicators are (i) considered according to their feasibility of implementation and (ii) presented in the planning and implementation guideline. Taking the planning indicator system as an example, 62 common indicators are designed to guide the general planning and construction of Taihu New Town. In the guideline, the key performance indicators are targeted and decomposed to address specific requirements, i.e., building types, functional position of the Taihu New Town planning. For example, a key performance indicator on energy efficiency requires that energy-savings rate of newly built residential and public buildings 65% or more compared to standard buildings in the PRC. Considering the complexity of energy-saving measures for different buildings and referring to the energy saving design standards of buildings in Jiangsu Province, the index is decomposed and operable. According to the decomposed index, the design and energy saving rate of new residential, commercial, cultural and entertainment facilities, and school buildings should be 65% or more. Adjusting the implementation of the energy-saving targets makes sure that technical measures are possible.

6.2.2 Combination of Technical and Management Strategy

Technical measures must be chosen carefully during planning and design to achieve the targets. After construction, only operation and management (O&M) means are relevant such as energy-savings and water-savings during operation. Therefore, the guideline emphasizes on the combination of the technical aspects during planning and construction of a management strategy for operation. Hence, indicators for both technical and eco-efficient operations to manage the new town are included.

For example, to achieve the energy-consumption target of buildings per unit area, the planning indicator proposes to technical measures such as energy-efficient architectural design, including natural lighting and ventilation, building insulation, energy-efficient heating and cooling systems, energy-saving elevators, and office equipment and smart metering devices connected with urban energy data center providing real-time consumption. In addition, there are operation indicators that consider management measures,

Fig. 17 Optimization Plan for Urban Design in the Core Area of Taihu New Town
Source: Office of Headquarter for Wuxi Taihu New Town Construction

such as special plans for equipment debugging, energy-saving property management, and energy consumption quota pricing, to carry out the eco-efficiency objective.

6.2.3 Consideration of the Local Conditions

The following local characteristics were connected to local regulations during the establishment of the indicator system: climate, precipitation, native plant species, forestation rate in afforesting land, proportion of permeable ground, annual energy consumption of buildings per unit area, the proportion of the renewable energy accounting for total energy consumption in newly built area, water supply pipeline leakage rate, coverage rate of urban wind environment, coverage rate of standard sunshine in residential area, the daily average outdoor heat island intensity in residential area, and new green buildings with star ratings.

6.3 Favorable Support from Local Industry and Ecological Environment

The construction of Taihu Low-Carbon Eco-City built on the existing urban area where there are strong linkages, urban economic support, and innovative development foundation. Before the launch of the eco-city construction, Taihu International Science Park, Shanshui City, the production-teaching-research base of Southeast University, new energy and new material industries laid a favorable foundation and formed a complete industry adjacent to the new town project. Many other domestic eco-cities prioritize eco-efficiency concepts without integrating urban context and mixing urban land uses. In addition, many eco-city projects are separate from the local urban economy and social and environmental context, which leads to a lack of comprehensive and overall planning.

Taihu New Town includes a mix of uses that integrate ecological, residential, high-tech industry, tourism and modern service, and links them to the urban context. Its powerful new energy industry base supports the development of low-carbon ecological technology. It set the stage for cooperation between government, enterprises, research and development, and the market.

6.4 Urban Design Guiding the Spatial Development of Taihu New Town

In 2005, the urban design stage for the Wuxi Taihu New Town core area started. Its aim was to optimize the functional layout of the central area, and to research on urban skylines, important spatial nodes, interfaces, and sites. In the following 3 years, it successively completed the urban space design covering the entire new town by 2007.

The new town features spaces each with its own research emphasis. Urban design in important function areas focuses on the overall harmony of building height, skyline, building masses, building types, materials, and public space design in the area. On both sides of the trunk roads, there are guidelines on building-public space interface, building setback lines, and other street spatial design aspects. In Binshui District, according to the drainage function, it focuses more on the design of nodes and supporting facilities. On the implementation level, the important index of urban design is directly measured in the planning terms and conditions of the parcel leasing contracts to guide the building design and construction of the new town.

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Shanghai Jiading New Town: Adjusting a Plan Toward Sustainable Development

Yunzhou Zhan, Xiaotao He, Yu Zou

1 Background and Overview

Shanghai, or Hu, is at the central coast of the People's Republic of China (PRC). It is in the Pacific Ocean's Yellow Sea Region at the head of the Yangtze River Delta. It has convenient transportation, vast fertile and productive hinterland. At the end of 2013, the Shanghai Municipality had a permanent residential population of about 24.2 million and a gross domestic product (GDP) per capita of $14,547. It reached a level of moderately developed countries and regions in the world. Shanghai is a key economic center and transportation hub, and a nationally significant historic and cultural city in the PRC. The Jiangsu and Zhejiang Provinces and the City and Town Cluster in the Yangtze River Delta form the PRC's largest agglomeration region. Shanghai has become a modern first tier global megacity with key functions in global economy and finance, production, trade, land, water and air transportation. In 2014, the Communist Party of China's Central Committee and the State Council issued the *New Type Urbanization Plan for the PRC, 2014–2020*. The plan is a blueprint for strategic and general planning to guide the next stage of the PRC's urbanization in a sustainable and inclusive way. The new towns in Shanghai meet the development objectives of the urbanization plan. It facilitates sustainable growth, integration, and cooperation in the Yangtze River Delta.

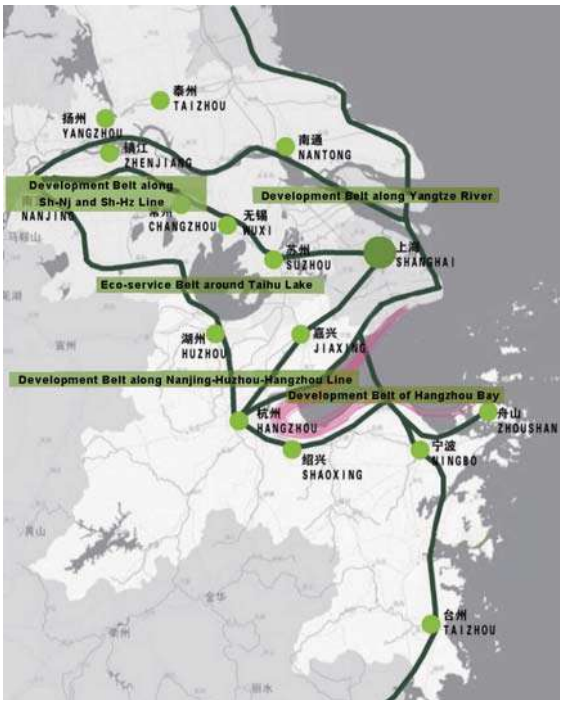
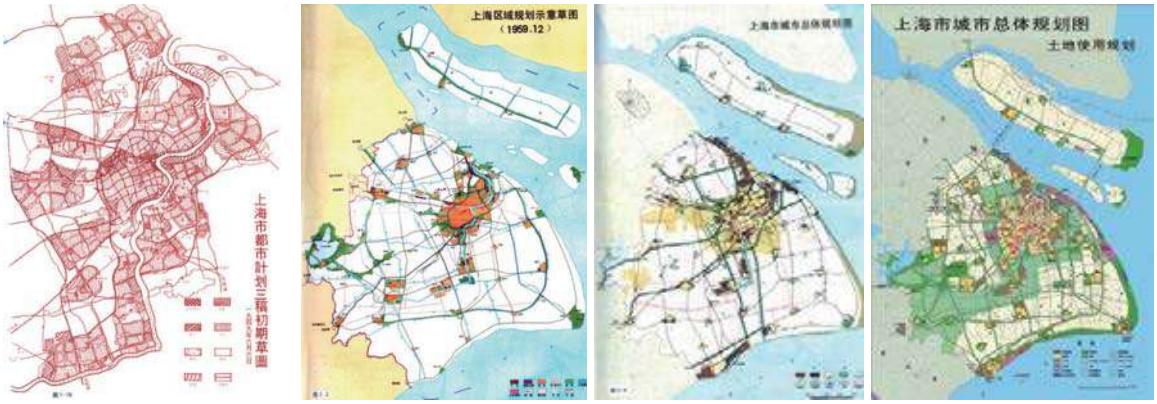


Fig. 1 Spatial Development Structure of Yangtze River Delta Region
Source: Shanghai Municipal Planning, Land and Resources Administration

1.1 Development History of New Towns in Shanghai

The towns in the suburban area of Shanghai underwent a transformation from "satellite city" to "new town". In this process the location of functions among central city and decentralized locations were optimized and urban nodes were promoted outside the central city and along the regional transport corridors, aiming at a polycentric urban spatial structure.

In 2001, the State Council approved the *Comprehensive Urban Plan of Shanghai, 1999–2020*. It proposed the construction of 11 new towns and new districts in the suburban areas, including the new towns of Baoshan, Chengqiao, Haigang, Huinan, Jiading, Konggang, Jinshan, Minhang, Nanqiao, Qingpu, and Songjiang. To advance new town development and promote diversity of new towns, pilot projects of the "one city and nine towns" concept were planned during the period of the 10th Five-Year Plan, 2001–2005. During the 11th Five-Year Plan, 2006–2010, according to the requirements of "three centralizations", the "1-9-66" Urban-Rural Planning System of the administrative



1949 1959 1986 1999

Fig. 2 History of Comprehensive Master Development Plans of Shanghai from 1949 to 1999
Source: Shanghai Urban Planning and Design Research Institute

region of Shanghai was enacted. The "1-9-66" stood for an overall plan of Shanghai at four levels of the central city ("1"), new satellite cities and new towns ("9"), and central villages ("66"). It is the first attempt to include both urban and rural areas in one city plan, establishing the basic framework of urban-rural planning in Shanghai.

1.2 Overview of Jiading New Town

Jiading District is in northwest Shanghai, at the border to Kunshan and Taicang of Jiangsu Province. It covers an area of 463 square kilometers (km^2) with 221 km^2 of developable land and a population of 1.5 million in 2011. Jiading is located along the Shanghai-Nanjing Development Corridor and is characterized by its automobile industry. It currently leads economic growth among the suburban districts of Shanghai.

Already, in the 1956–1967 short-term city development plan, the Shanghai municipal government approved the construction of five satellite towns — Anting, Jiading, Minhang, Songjiang, and Wujing — each with a population of 200,000. Among them, Jiading (in the historic Jiading Town) and Anting are in Jiading District.

The 1986 State Council approved the *Urban Comprehensive Plan of Shanghai*. It defined a four-level urban structure comprised of the central city, satellite cities, suburban towns, and rural market towns. Jiading and Anting continued as satellite towns and Nanxiang as a small suburban town.

In the late 1990s, Shanghai started to develop a comprehensive master plan. In the *Comprehensive Urban Plan of Shanghai (1999–2020)*, Jiading was declared one of the 11 new towns with a planned population of 250,000. Anting and Nanxiang were categorized as central towns with a population of 100,000.

After that, the development of the regional comprehensive development plan began in Jiading District. Approved in 2007, the *Implementation Plan of Regional Overall Planning in Jiading District (2006–2020)* stipulated that the new town be composed of Anting Town, Nanxiang Town, and the core area of Jiading New Town. Unless otherwise specified, "Jiading New Town" in this report refers to the core area.

1.3 Positioning and Development Goals of Jiading New Town

1.3.1 Positioning of Jiading New Town

Jiading New Town is a key area for development following the 2010 World Exposition in Shanghai. The development strategy of Shanghai focused on new towns in suburban areas following the exposition. New town construction will be one of the most important measures to promote advanced development and prepare for Shanghai's further growth. It will become a strategic tool for future urban transformation.

Fig. 3 Shanghai Urban-Rural Planning System of 2006
Source: Shanghai Municipal Urban Planning Administration Bureau & Shanghai Urban Planning and Design Research Institute

Fig. 4 Location of Jiading District
Source: Shanghai Urban Planning and Design Research Institute
Gray: Shanghai Domain; Yellow: Cities belong to the 1st interface surrounding Shanghai; Blue: Cities belong to the 2nd interface surrounding Shanghai

Fig. 5 Draft Shanghai Region Development Plan, 1959
Source: Shanghai Urban Planning and Design Research Institute

Fig. 6 Distribution of Satellite City and Suburban Key Town in Shanghai, 1985
Source: Shanghai Urban Planning and Design Research Institute

Fig. 7 Planning of Town System of Shanghai, 2001
Source: Shanghai Municipal Government

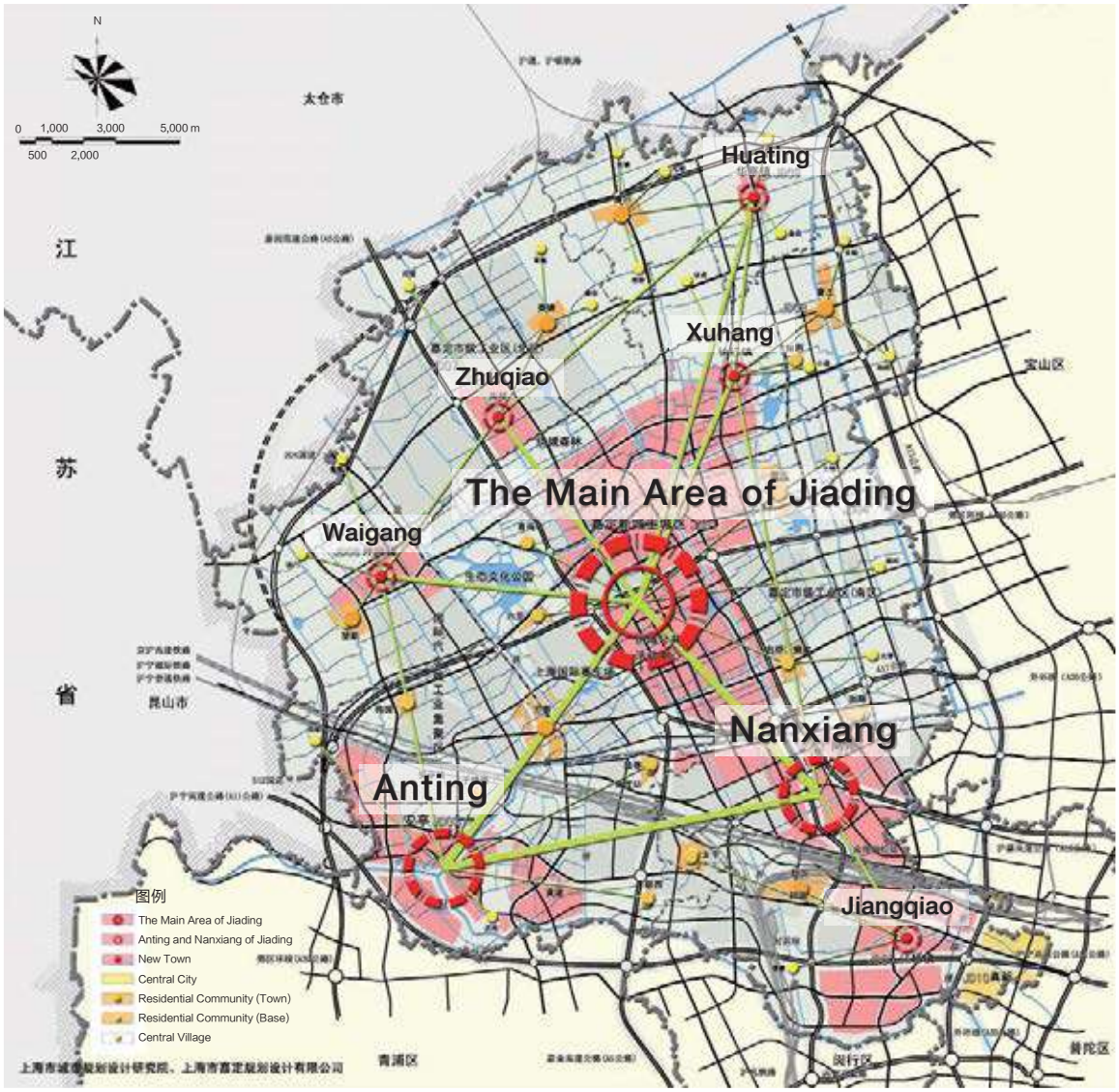


Fig. 8 Urban-Rural System Plan of Jiading District, 2006–2020
Source: Shanghai Urban Planning and Design Research Institute

Jiading New Town has potential for strong economic growth in the near future based on expanding industries, mainly the automotive industry and its supply chain. The construction of new towns will reduce the socioeconomic and infrastructure service divide between the central city and the suburban areas. The new town will improve the livelihoods of local people by major investments in infrastructure, education, and health care facilities. This will stimulate and enable the future sustainable development of Shanghai and its surrounding areas such as Jiading.

Jiading New Town is full of opportunities for sustainable development and significantly contributes to Shanghai's overall development. It will provide sufficient space for industrial and urban development and continue Shanghai's shift of focus from central urban areas to suburban areas following the 11th Five-Year Plan. The move delivers the new strategic needs of the agglomeration region and follows principles and patterns of other megacities in the world.

1.3.2 Development Goals of Jiading New Town

According to the comprehensive development plan, by 2020, Jiading New Town will have achieved its major development goals. One of its goals is to transform into a suburban new town cluster that is well connected to and complements functions of downtown Shanghai. This would significantly contribute to its overall development, with industrial production and research and development focused on automotive industries, science, and education, while providing pleasant residential communities and enabling harmonious social development.

Jiading and Songjiang New Towns were established with the objectives of becoming key urban nodal points in the Yangtze River Delta, each accommodating a population of 800,000 to 1 million. Fengxian Nanqiao, Pudong Lingang, and Qingpu are to become new towns with high levels of urban, integrating, clustering, and radiating functions, each accommodating a population of 600,000 to 800,000. Jinshan and Chongming would be new towns that promote integrated development with their surrounding areas, each accumulating a population of 200,000 to 400,000.

2 Jiading New Town's Current Development

Since the 10th Five-Year Plan, new towns have been a main vehicle to promote balanced and distributed urbanization in Shanghai. Remarkable achievements were made in the planning and construction of Jiading New Town, including the harmonious restoration and revitalization of its historic town center and the development of a modern new town. The municipal infrastructure and services of the central new town is complete. Landscape and open space projects were designed and constructed. Public social facilities and programs were implemented at very high standards. The level of services provided by Jiading New Town has significantly improved, attracting a large population to live in the central new town area.

Fig. 9 New Town Development Planning of Shanghai
Source: Shanghai Urban Planning and Design Research Institute

Fig. 10 The Planning Achievements of Jiading New Town with Pleasant and Green Environment
Source: Jiading District Planning and Land Administration Bureau

2.1 Economy

According to 2010 statistics, the level of economic development in Shanghai's new towns is low. Compared to the per capita GDP of Shanghai's city center, the level in the new towns is below average, except for Jiading New Town, which reached the average level of Shanghai. There remains a wide development gap between Jiading and neighboring towns like Kunshan and Taicang. The latter two are both far ahead of Shanghai's new towns in terms of per capita GDP.

Secondary sector industries dominate the current economic structure of the new towns, like in the case of Jiading's car and supply manufacturing. Manufacturing in Jiading New Town accounts for about 65% of total GDP. This is slightly higher than the number of neighboring towns within the Yangtze River Delta, such as Jiashan, Kunshan, Pinghu, Taicang, and Wujiang, where the second sector accounts for 60%–65% of GDP.

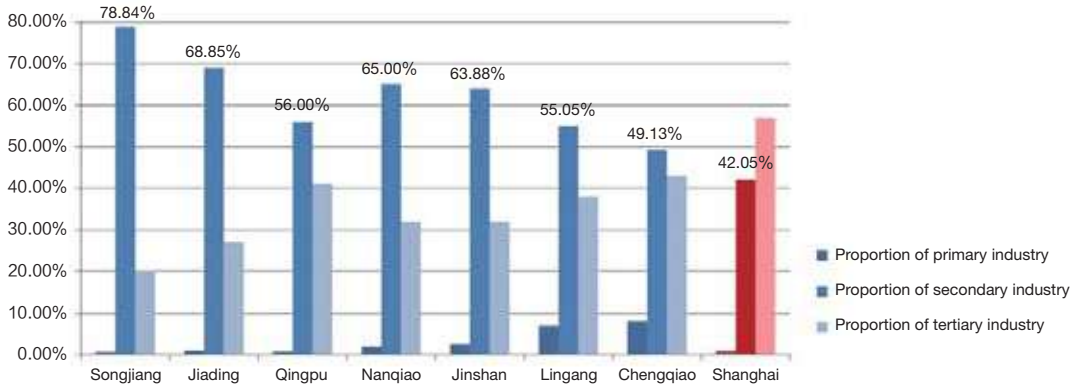


Fig. 11 Primary-secondary-tertiary Industrial Structure of Shanghai New Town by percentage of GDP, 2010
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

The productivity per developed land area of Jiading New Town is below average compared to Shanghai and its core area. There are also significant variations among the new towns in Shanghai, with the highest per area output in Songjiang, followed by Jiading, Qingpu, Chengqiao, Nanqiao and Lingang, the latter being relatively low. Comparisons are also made to quantify the average output value of land and investment intensity of 31 development zones in Shanghai. Productivity levels of development zones in the new towns are far below the average of Shanghai for these two indicators.

2.2 Population

In 2010, the total population of Jiading New Town was 474,000. The population growth rate from 2000 to 2010 was 70% in Jiading New Town, which depended mostly on migrants.[1] The growth trend resembles that of the other six new towns in Shanghai, only slightly different in rate numbers. The 2000 to 2010 growth rate of the permanent population in Jiading New Town ranked 4th among seven Shanghai new towns. The growth rate of permanent population in the industrial park is generally higher than that in the urban area.

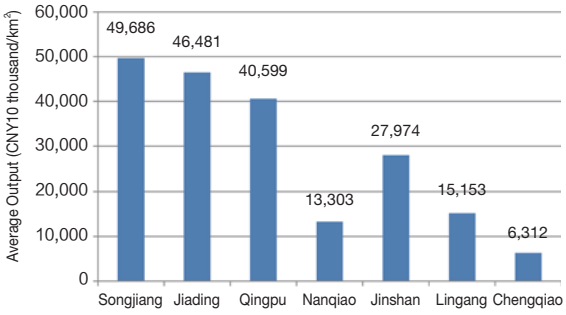


Fig. 12 Average Output of Built-up Land of Shanghai Suburban New Town, 2010
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

1 This data is from *A Study on Integrating Urban-Rural Development and Optimizing the Structure and Functional Layout of Cities and Towns in Suburbs*.

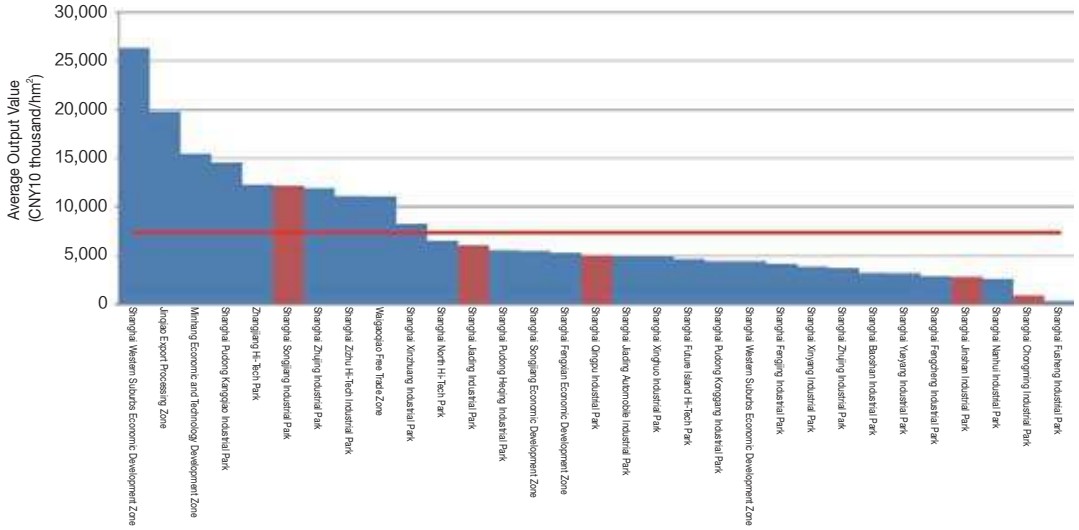


Fig. 13 Average Output Value of Land of 31 Development Zones Above Municipal Level in Shanghai
Source: Shanghai Development Zone Statistics Yearbook

However, the level of integration between the city center and the industrial zone is not obvious.

Convenient public transportation with easy access to the city center plays an important role in attracting new residents in a new town. Many service functions, especially jobs, are concentrated in the city center, as are many other functions including commerce, health care, education, culture, and social interaction. Besides, the new town has its own advantages, such as more green space in a beautiful environment, lower housing prices, and a generally lower cost of living.

Among the factors that attract people to move to the new town, convenient public transport access to the city center ranks at the top. There is a job-housing mismatch that indicates that the number of jobs and job diversity are insufficient to serve the residents of the new town.

2.3 Employment

Judging from the distribution of jobs in the whole city, the employment density of Jiading New Town is 2,600 persons per square kilometer (km^2), equal

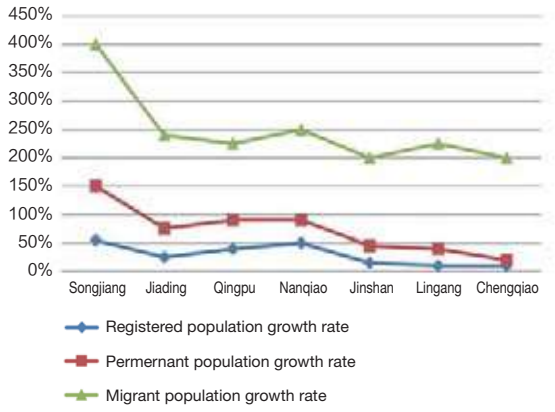


Fig. 14 Population Change of New Town in Suburban Shanghai, 2000–2010
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

to 29% of that in central Shanghai and similar to the surrounding areas of the city center.[1] Judging from the job-housing ratio, Jiading New Town ranks first with 0.52, even higher than that of the cental area and its surrouding area.[2] Jobs and population are thus in a rational balance. However, most jobs in Jiading New Town are manufacturing jobs.

1 The surrounding area of the central city includes the streets and towns around the outer ring road of Shanghai. For example, Nanxiang Town, Gucun Town, Yangxing Town, Wusong Street, Youyi Street, Goaqiao Street, Gaodong Street, Caolu Street, Tang Town, Heqing Town, Chuansha Town, Kangqiao Town, Zhoupu Town, Pujiang Town, Wujing Town, Meilong Town, Maqiao Town, Xinqiao Town, Jiuting Town, Qibao Town, Xinzhuang Town, Xujing Town, Huacao Town, Xinhong Street, Zhuanqiao Town, etc.

2 Job-housing ratio refers to the ratio of employment population to residential population in Jiading New Town.

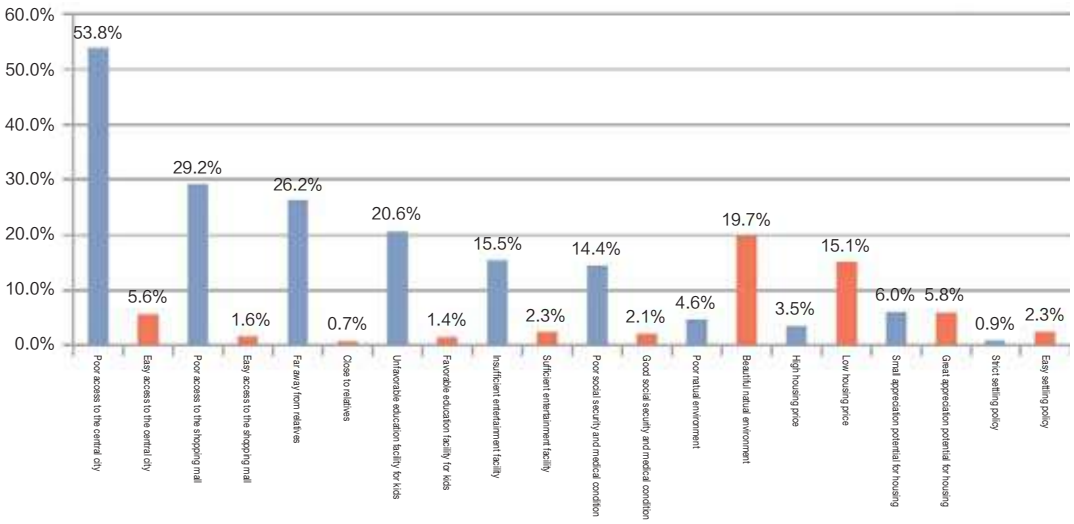


Fig. 15 Factor Analysis of Appeal of New Town for Residents in Suburban Shanghai
Source: Shanghai Urban Planning and Design Research Institute

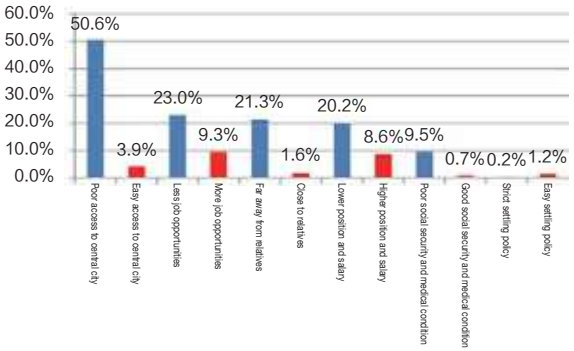


Fig. 16 Factor Analysis of Appeal of New Town for Job Opportunity in Suburban Shanghai
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

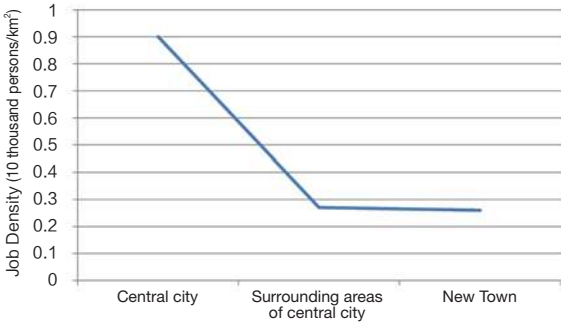


Fig. 17 Job Density of Central City, Surroundings of Central City and New Town, Shanghai, 2010
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

2.4 Land Use

Construction land in Jiading New Town is extensive and the per capita construction land in the suburbs is above the Shanghai average. The per capita construction land in Jiading New Town ranks second. The urban land left for future development within the intensive development area is no more than 15% of the planned land for construction in Jiading New Town, the lowest among the new towns. Land resource is quite limited.

From the perspective of land use structure in Jiading New Town, the proportion of land used for roads, public squares, and public green space is low, while that for industries is high.

2.5 Social Services and Infrastructure

In terms of the number and level of social service facilities and infrastructure, the suburbs lag behind the center city of Shanghai. Seven new towns in the suburbs have two municipal hospitals, accounting for only 3% of that of the whole municipality; 21 district level hospital, accounting for 20%; and 14 key middle

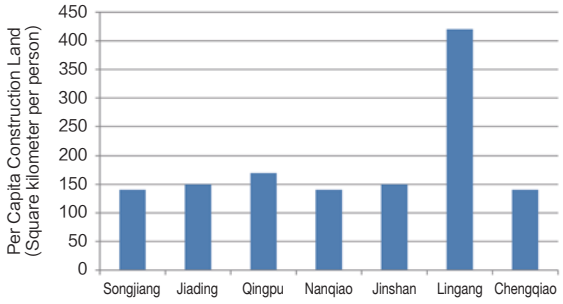


Fig. 18 Per Capita Construction Land of New Town in Suburban Shanghai, 2010
Source: Shanghai Statistics Yearbook; Shanghai Urban Planning and Design Research Institute

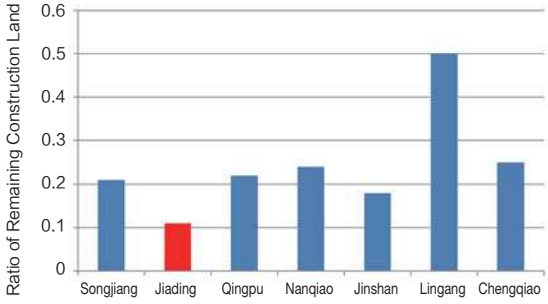


Fig. 19 Ratio of Remaining Construction Land to Total Construction Land of New Towns in Suburban Shanghai, 2010
Source: Shanghai Statistics Yearbook; Shanghai Urban Planning and Design Research Institute

schools, accounting for 17.7%. Compared with cities in Jiangsu Province next to Shanghai, suburban new towns in Shanghai do poorly in health services, with one hospital per thousand persons and one school per thousand persons. Shanghai's new towns fall behind cities in southern and northern Jiangsu like Haimen, Kunshan, Nantong, Taicang, Qidong, and Shangshu.

2.6 Comprehensive Transportation

The main findings from the transport system analysis of Shanghai and the central area of new towns in 2010 are as follows.

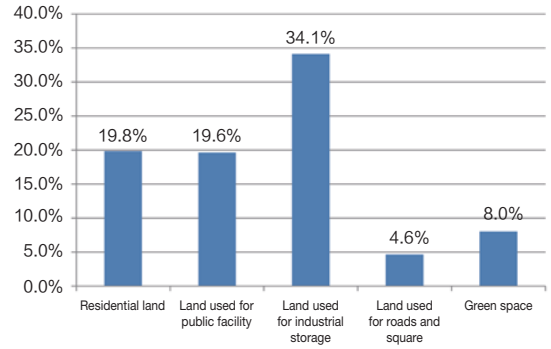


Fig. 20 Proportion of Current Construction Land of New Town in Suburban Shanghai, 2010
Source: Shanghai Urban Planning and Design Research Institute Current Situation of Land Use Database

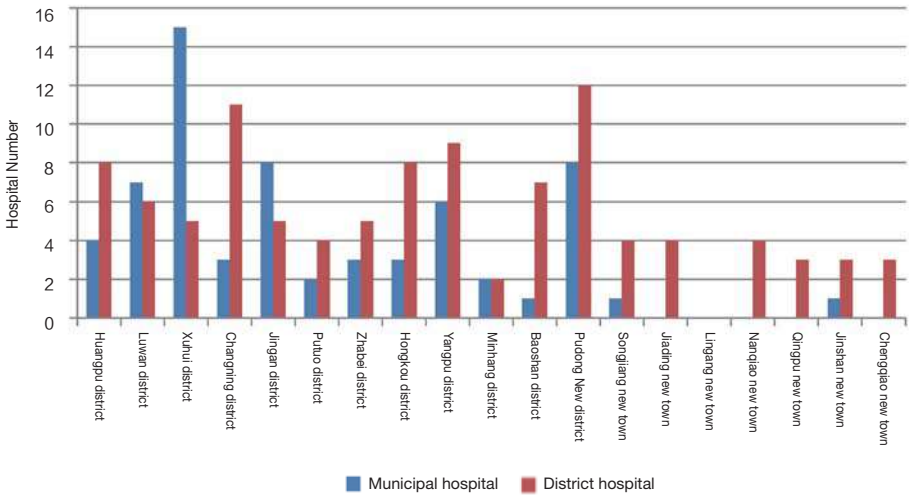


Fig. 21 Number of Municipal and District-Level Hospital in Different District of Shanghai, 2011
Source: Shanghai Statistics Yearbook, 2012
Note: Population base statistics are the resident population from the Sixth Population Census.

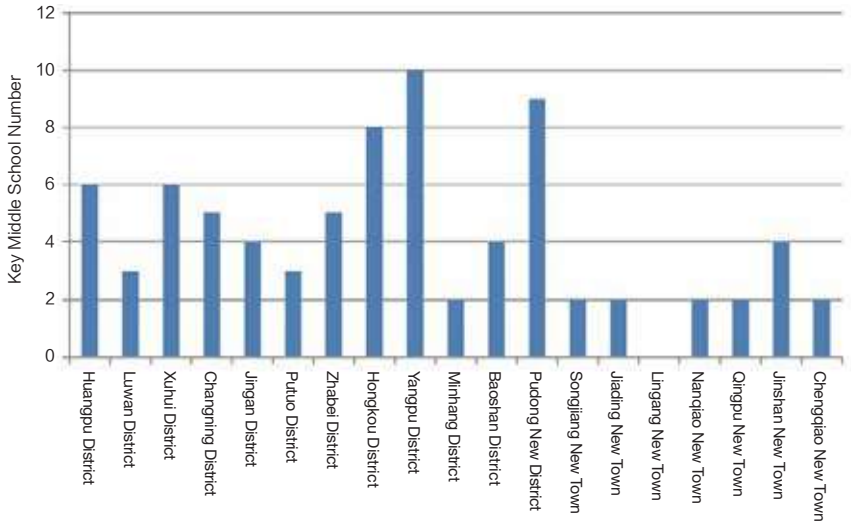


Fig. 22 Number of Key Secondary School in Different Districts of Shanghai, 2011
Source: Shanghai Statistics Yearbook, 2012

The transportation infrastructure and facilities at the municipal level are sound while the intercity transportation lags behind. The transportation infrastructure and facilities in municipalities, expressways, trunk roads, and rail transport, for example, have greatly improved the accessbility of Jiading New Town, which has supported its development. The service provided by intercity transportation and facilities, i.e. by the train station, is poor. For instance, the distribution control system is insufficient to provide high standard and high level intercity transportation service. The commute between Jiading and the central area relied heavily on vehicles and buses on the expressway.

Transport infrastructure and facilities in the Jiading New Town need to be improved. The density of road networks is low at 1.29 km per km^2 in Jiading New Town and 1.7 km road per km^2 in the central city. In Jiading New Town, coverage of bus stops within a 300 meter (m) radius is 12% to 36% and within a 500 meter radius, 26% to 65%. In the central city, it is 68% within a 300 m radius and 86% within a 500 m radius. The coefficient of repetition of lines and roads is high,[1] the operation time of bus lines is short, the interval time between buses is long, and roads from the central city to suburbs are congested during rush hours.

The road and transport network focus on needs within Jiading. Statistics show that the internal transport of Jiading New Town accounts for 79% of all trips, 11% for trips between suburbs, 9% for trips to the central city, and 0.8% for trips between new towns.

Non-motorized transport dominates while private car ownership and use grows very rapidly.

More than 60% of local communters choose non-motorized transport modes of walking and cycling. The "Hu C" license is exclusively issued for vehicles in suburban areas while entry into the center city within the outer ring road on working days is forbidden. The number of license increased and the use of private vehicles as a mode of transportation surpassed 20% while the transportation by bus is less than 10%. In Jiading New Town, private vehicle use for trips is equivelant to that of the center city, but most people in peripheral locations choose motorbikes, which is more obvious in more remote suburbs.

1 The coefficient of repetition of lines and roads means the ratio of total length of public transportation to the length of network of lines and roads.

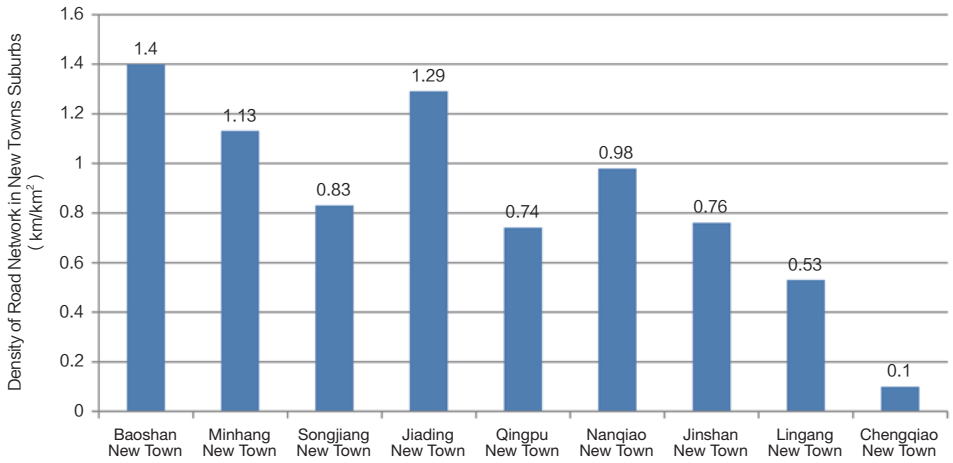


Fig. 23 Density of Road Networks of New Town, Suburban Shanghai
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

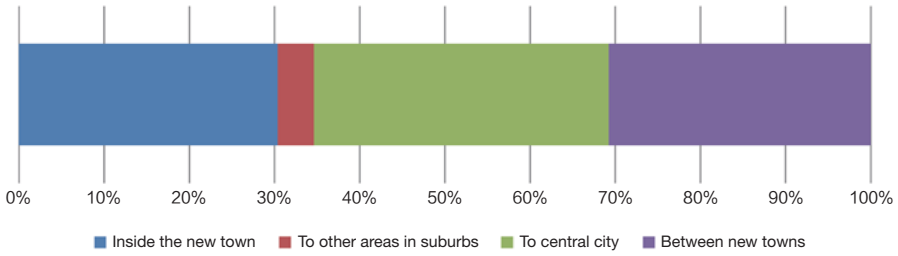


Fig. 24 Travelling Destination of New Town in Suburban Shanghai, 2010
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

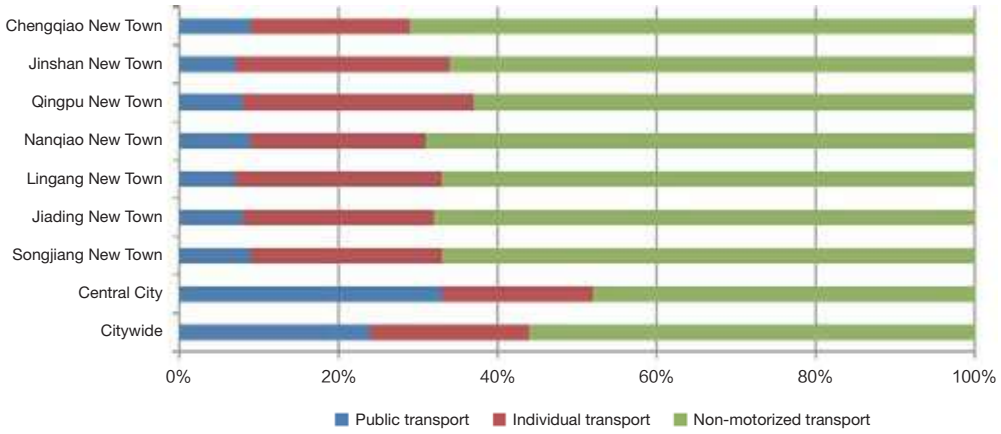


Fig. 25 Modes of Travel in New Towns, Suburban Shanghai, 2010
Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

Metro Line 11 transports more than 34,700 passengers from Jiading New Town to the center city every day, accounting for 57% of all passengers from Jiading District; 19% of the passengers exit in Jiading District and 69% in the center city. Therefore, the rail transit serves mainly out-going commute of the new town (Table 1).

Table 1 Passenger Flow of Metro Line 11, 2011

Drop−Off Area	Jiading New Town Station		Other Stations in Jiading	
	Volume	Percentage	Volume	Percentage
Jiading District	1,394	19%	1,996	19%
Within the Puxi Inner Ring	1,683	23%	2,492	24%
Outside the Puxi Inner Ring	2,555	35%	3,551	34%
Within the Pudong Inner Ring	216	3%	323	3%
Outside Pudong Inner Ring	562	8%	830	8%
Other Areas	842	12%	1,183	12%

Source: Strategy Research on Shanghai New Town's Development; Shanghai Urban Planning and Design Research Institute

3 Implementation of the Jiading New Town Master Plan

New city and new town construction has become an important instrument for urbanization in the PRC. From 2004 to 2014, Jiading New Town has been under construction and gathered much practical experience.

3.1 Planning Guidance

The implementation of the plan is based on the principle that the design should be guided by culture, design, and sound planning. Jiading is in the Jiangnan area south of the lower reaches of the Yangtze River with an abundance of lakes, rivers, and canals. This geographical feature was translated into urban design for a livable and green city featuring one lake per km, a forest per hectometer, with interwoven water bodies, and the fragrance of lotus flowers in the air. Currently, the detailed control plan for the main urban area of Jiading New Town covers more than 95% of the total land area. The development layout is organized in three areas with one core area and two "wings". A key concept introduced in 2004 is the City Cluster of Jiading, composed of the main urban area of Jiading District, Anting New Town, and Nanxiang New Town, based on the previous pattern of four subdistricts. In 2009, in light of rapid growth of the main area, the concept was adapted to focus on the main area and extend the two wings toward the main area to accelerate development and promote the linkage of manufacturing and services industries in the district.

3.2 Implementation of the Plan

3.2.1 Principle

In implementing the plan of Jiading New Town, the principles of four priorities, four local preferences, and four prominent projects have been applied. Priority is given to (i) planning, (ii) resettlement, (iii) infrastructure, and (iv) functional projects. Local preferences include (i) the promotion of industrial upgrading using local conditions, (ii) improvement of local infrastructure, (iii) local resettlement of farmers, and (iv) reserved adequate space for future development. Four prominent projects should be developed by renowned architects, developers, and famous contractors. The rational development layout, the balance between housing and jobs, and high quality construction of the new town was to be ensured. The affordability of housing for local residents should be considered to avoid high vacancies and keep the new town from turning into a “ghost town”, with investments by out-of-towners. This would make sure that industrial and residential development is sustainable and integrated.

3.2.2 Implementation progress

After 10 years of development, Jiading New Town construction has made great progress. The framework of municipal infrastructure in the main area was constructed. Social facilities are completed and equipped with high standards that elevate level of urban services. The road network in the main area of the new town is completed, including 31 roads with a total length of 60 km and 18 bus lines, with a total investment of CNY1.8 billion (about $290 million).

The ecological landscape system comprised of four parks was established and, by the end of 2012, a 2-km^2 green ecological parkland in the main area of the new town was completed, with another 779,000 square meters (m^2) under construction.

By the end of 2012, the town had 48 km of cables for the transmission of power, 54 km of pipes for gas, 58 km of pipes for water, and 60 km of cables for communications. Comprehensive improvement of waterways and lakes was completed. According to the plan, there are about 30 km of waterways (including Zhangpu River and Hengli River) and 18 lakes in the main area. By the end of 2012, 18.5 km of the waterways and 13 lakes were completed, with another 2.4 km and one lake under construction.

A total of 14 public service facilities were built and put into use since the start of the new town project, including Shanghai Ruijin Hospital North, Shanghai Jiaotong University High School (Jiading Campus), Jiading Library, Shanghai Hua Er Middle School, Jiading Maternity and Infant Health Hospital, Jiading Urban Planning Exhibition Hall, Jiading Defulu School and Shuangdinglu Kindergarden, with a construction area of 450,000 m^2 and an investment of CNY2.5 billion (about $401.3 million).

In the new town main area, 31 developers invested in 38 ongoing projects, with upscale residential properties put on the market sequentially. By the end of 2012, the housing construction area reached 4.6 million m^2, including resettlement houses, with 2.5 million m^2 completed and 1.9 million m^2 sold, with a total investment of CNY20.0 billion (about $3.2 billion). With this momentum, another 808,000 m^2 was newly constructed in the first half of 2013, with 193,000 m^2 completed and a total investment CNY2.0 billion (about $321.0 million). Meanwhile, sales increased by 50% yearly to CNY2.8 billion (about $454.3 million).

3.2.3 Innovation-Aiming for Urban Best Practice Area outside the Exposition Park

(i) Low-Carbon Development

Jiading New Town applies lessons learned from low-carbon development from the PRC and abroad, aiming at becoming a best practice outside the Shanghai Expo Park. The new town invested in a green transportation system with a multi-tier, multi-modal transport system focusing on public and non-motorized transports. The public transit system is comprised of metro rail transit as the first layer, medium capacity bus rapid transit as second layer, and regular bus service as the third layer. The new town adopts a low-carbon sightseeing tour strategy. The non-motorized system includes pedestrian pathways, bicycle paths, and water excursion in the four landscape parks. Low-carbon transport management is applied in the form of an intelligent transport and traffic management system in the main area, including traffic information collection and release system, monitoring and security system, centralized traffic signal control system, and parking guiding system.

New energy-saving and resource efficient technology is promoted in the new town. By fulfilling the construction standards of an energy, land, water, and material efficient district, Jiading New Town was awarded the title of first demonstration area for building energy-efficiency in Shanghai. Energy-saving gas air-conditioning operates in the Jiading Library and old factories were renovated and transformed to an urban planning exhibition hall with geothermal pumps as heat source. The Jiading Science and Education Center, formerly an old factory building, has energy-saving and water resource recovery technologies in place such as green roofs, geothermal heat-pump, ice storage system, underground lighting guide devices, and rainwater collection and reutilization systems.

Yuanxiang Lake Park introduces an ecological water treatment system, earth-covering structures, pervious material, and recycled material in its construction.

(ii) Environmental Management Infrastructure

Environmental infrastructure and management in Jiading New Town is vital. Renewable energy sources and technology are introduced. Solid waste treatment includes waste classification and segregation in pilot communities, waste reduction and recycling in market fairs is under research, and waste transfer stations are under construction.

The 110kV Transformer Substation in Fengzhou Road is the first digital substation used in Shanghai. Energy efficient design and facility technologies were applied such as geothermal air-conditioning and solar powered lighting that are estimated to save 41.2 t of standard coal units and reduce CO_2 emissions by 79 t, an advanced level in the PRC.

3.3 Funding and Operations Model

The funding for the planning and construction of Jiading New Town includes land transfer fees, tax revenues, loans, bonds, and trust funds.

(i) Land Revenue

About 6,000 mu (1 Chinese mu = 666 m^2) of land has been leased in Jiading New Town since 2003, with a total transfer revenue of about CNY25 billion (about $3.9 billion). All land lease revenue from districts will go into the construction special funds for the new town after the cost is deducted.

(ii) Tax Revenue

The corporate tax revenue in the new town area from 2006 to 2012 amounted to about CNY2 billion (about $321 million); around 180,000 enterprises registered in Jiading New Town and about CNY1 billion (about $161 million) from districts were allocated to the special fund for the new town construction.

(iii) Loans, Bonds, and Trust Funds

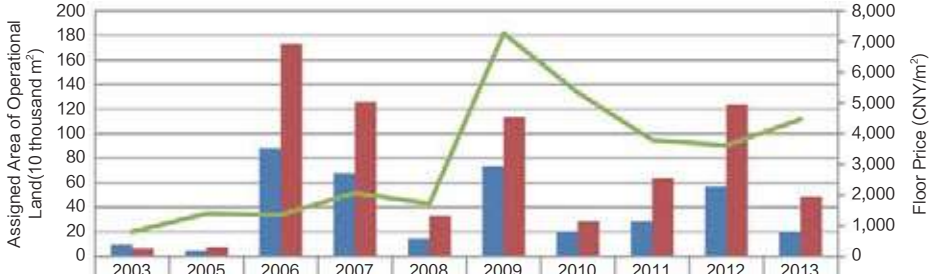
Since 2011, a total of about CNY10.0 billion (about $1.6 billion) has been raised for the Jiading New Town Project, with CNY8.2 billion (about $1.3 billion) from commercial bank loans and CNY2.3 billion (about $365.1 million) from trust funds, entrusted debt, and corporate bonds.

3.4 Innovations in Management

Selecting renowned architects, developers, and contractors for the projects guarantees the quality of the construction in Jiading New Town. However, to build a better image of new Jiading, the whole process of every project, from planning, design, construction to management, must be monitored to control the quality of market housing and office building. The following attempts were made in Jiading.

3.4.1 Innovation in Approval Mechanism of Projects: Developing Regulatory Plan and Establishing Landscape Control Committee

In 2006, the New Town Development Company started to develop the regulatory plan as an urban



	2003	2005	2006	2007	2008	2009	2010	2011	2012	2013
Transferring area (10,000 m^2)	9.2	4.8	87.7	67.8	14.7	73.6	20.6	28.2	56.7	19.8
Buildable area (10,000 m^2)	6.4	7.6	172.7	125.6	33	113.2	28.4	63.6	123.8	48.8
Floor price (CNY/m^2)	793	1,401	1,358	2,067	1,715	7,268	5,339	3,790	3,612	4,468

Fig. 26 Statistics of Assigned Area of Operational Land in Jiading New Town over the Years
Source: Shanghai Jiading New Town Development Company

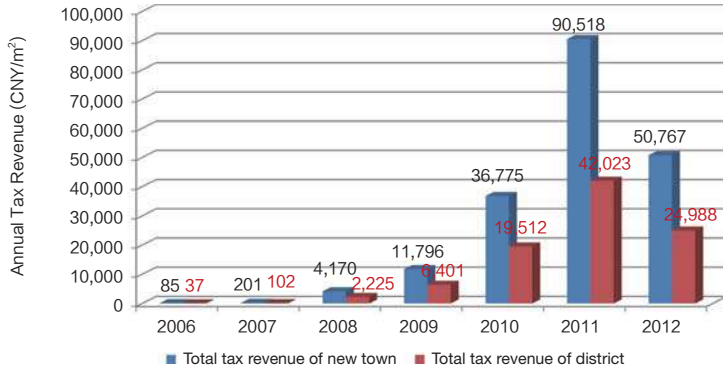


Fig. 27 Annual Tax Revenue of Jiading New Town over the Year
Source: Shanghai Jiading New Town Development Company

	2011	2012	Until Sep. 2013
Indirect financing	31.78	25.6	24.7
Direct financing	—	10	13
Total	31.78	35.6	37.7

Fig. 28 Financing Amount of Companies in Jiading New Town over the Years
Source: Shanghai Jiading New Town Development Company

design guideline to regulate the development of parcels, commercial and office buildings, colors, exterior materials, public space design, height limit of high-rises and multi-storey buildings, architectural style, and street furniture and signage. A Landscape Committee was established to (i) evaluate the design projects of every parcel and submit qualified approvals; (ii) examine and seal samples of architecture for construction of facades and stop construction of elements that do not complying with the guidelines; and (iii) review the architectural form during the construction period and upon completion and request remedies and changes as needed.

In Dongyun Street, for example, each parcel of the street has been implemented, and the effect of lanscape control gradually became visible. With few exceptions, the 30 developers cooperated to keep a unified style, the typical feature of watertowns in the Jiangnan area, southern Yangtze River Delta, was showcased, and a flexible space for the city square was reserved.

3.4.2 Innovation in Technical Tools for Project Regulation: Implementing Additional Plans

According to Shanghai Technical Guidelines on Detailed Control Planning approved by Shanghai Municipal Government Office, the control and guide in Jiading New Town's planning and construction adhere to a combination of regulatory and guiding plans. The detailed control plan developed in the scope of the main town area of Jiading New Town provides not only the regulatory plans but also the urban design guideline plans with added requirements. It further guides the planning and construction of architectural design and ensures the quality of construction.

In addition to the regulatory index required by the Shanghai Technical Guidelines on Detailed Control Planning, the scope of the regulatory plan for Jiading New Town is extended, which includes minimal setbacks, building lines, and building heights along the street, location of ground-level arcades, position of high-rise buildings, quantitative controls for rooftop and vertical greening, and the position of entrance and stairs to second floor. Regulatory plans for public utility and underground space was also expanded. A comprehensive plan was formulated during the urban design phase to define the position and size of municipal facilities like substations and gas regulating stations.

Public bids to prepare an engineering and design plan was launched. The Jiading District Urban Planning and Land Administration Bureau and the New Town Development Company cooperated to organize competitions for design plans and decided the winning schemes, which were the basis for detailed construction design. In the end, the final engineering and technical program and design was to be publicly auctioned. The program strictly regulates the technical elements like pipelines, elevation, and outdoors projects. The bidding documents require the buyers to carry out construction in strict accordance with the final plan. The New Town Development Company will bear the planning and design expenditures as a part of the cost of land transfer.

In May 2013, the Shanghai municipal government approved the Supplementary and Additional Plans of the Detailed Control Plans of Headquarter Park in Jiading New Town, marking a new chapter for the new town construction.

3.5 Challenges

3.5.1 Mechanism Linking Construction and Management Needing Improvement

According to the Document Published by the District Government of Jiading[2012] NO.15, the Jiading New Town Administrative Committee takes charge of the planning for the 64-km^2 area and its public utilities. The New Town Development Company handles the construction of the area, including public utilities, with special funds for new town development, funds for public facilities, and special subsidy from the municipality. After the public facilities are constructed, management, and operation and maintenance (O&M) of the district facilities will be transferred to the district public service departments from the district budget office. The New Town Administrative Committee will carry out management, operation, and maintenance of the town facilities with the funds coming from the town budget. But in actual operation, the construction of Jiading New Town often prefers construction to management, and limited township financial resources often cause the absence of high-level management. It is recommended to fully consider (i) the needs of follow-up management in special funds for the new town, matching funds, and special allowance funds and (ii) improve the linkage mechanism of construction and management.

3.5.2 Industry and City Integration Lags Behind Urban Construction

Jiading's urbanization should have its own character in the broader context of Shanghai's development. It should build itself a beautiful environment for residents and workers while ensuring a development pattern that integrates industries and towns. The new town has succeeded in industrial transformation by introducing headquarters economy in the past 2 years. It has attracted a number of headquarters for e-business enterprises like Jingdong, Baidu, and Eastmoney as well as Shanghai United Assets and Equity Exchange. However, to create a livable and business-friendly place, it is important to attract more residents and gather consumption activities in the area. Since construction of Jiading New Town started in 2004, Metro Line 11 and four major landscape parks have been built, which attract people to the new town. However, more people need to move to Jiading, which is constrained by a slow development of industries and commercial facilities. Jiading New Town will continue to work on a "livable and business-

friendly" environment to integrate good industries and a good life.

3.5.3 Commercial Areas Become Excessive and Competition among Similar Kinds Is Fierce

The current commercial areas planned in Jiading New Town include two business centers in Yuanxiang Lake and Jiading New Town Station, comprised of three commercial streets, four commercial mixed-use developments, and seven neighborhood centers. There are plans for 21 commercial mixed-use developments within the new town with a total gross floor area of more than 700,000 square meters (m^2), about 6 m^2 per resident. However, given the current situation, the business property has been excessively developed although industries in the suburban areas are still transforming into modern service industries. It seems that most business properties are redundant and the business volume seems to still exceed the capacity of consumption in the area.

4 Evaluation of the Implementation of the Plan

After the plan was implemented, achievements were made in the redevelopment of brownfields, urban landscape and ecological park development, and public facilities. However, further improvement is needed in regional integration, harmonization of urban development with industrial development, rehabilitation of water ecology and riverside areas, as well as improvement to the transport system.

4.1 Lessons Learned

4.1.1 Redevelopment of Brownfields

As an old industrial base in Shanghai, Jiading accommodates land for industrial use. In its southwards development, Jiading New Town adopts a strategy of phased building construction to redevelop industrial land and adapt it to uses for the main area and residential uses. Jiading New Town Company was created in Jiading District. As a state-owned development company, it is in charge of the overall planning, land transfer management, and construction. The industrial land in the main area is redeveloped as commercial, residential, and green land. The industrial land concentrated around the main area is planned as reserve land in the near future. It will be later redeveloped as a science and research park, and commercial and office center in the long term. The well-preserved factories in the industrial areas will be converted into public social service facilities, such as the Planning Exhibition Center and the Science and Research Center.

4.1.2 Urban Design

The goal of the plan is to build a livable city with green open spaces and ecological water environments with one lake per kilometer, a forest per hectometer, interwoven water bodies, and the fragrance of lotus flowers in the air, making it attractive for residents and workers.

The famous historic and cultural city center of Jiading in the northern district has been well preserved, restored, and revitalized, with low buildings to contrast with the Fahua Pagoda, the local historic landmark. The new area in the south represents a simple modern style, fitting with its industrial orientation as a motor town with automotive industries. Based on current urban construction, the whole district will later show an integrated and contracted style with both watertown traditions in the *Jiangnan style*, the style in the southern Yangtze River Delta, and morden intepretation of that theme with simple architectural expression.

In the next phase of construction, the small-scale neighborhoods in the central district will be improved and rehabilitated with a more flexible and accessible road system. There will be more bypasses, corridors within neighborhoods, and improved cross-sections of roads and pedestrian streets to improve access to the area.

4.1.3 Public Green Open Space System and Ecological Projects

The Jiading New Town Master Plan specifies a green space system made up of one core park, one

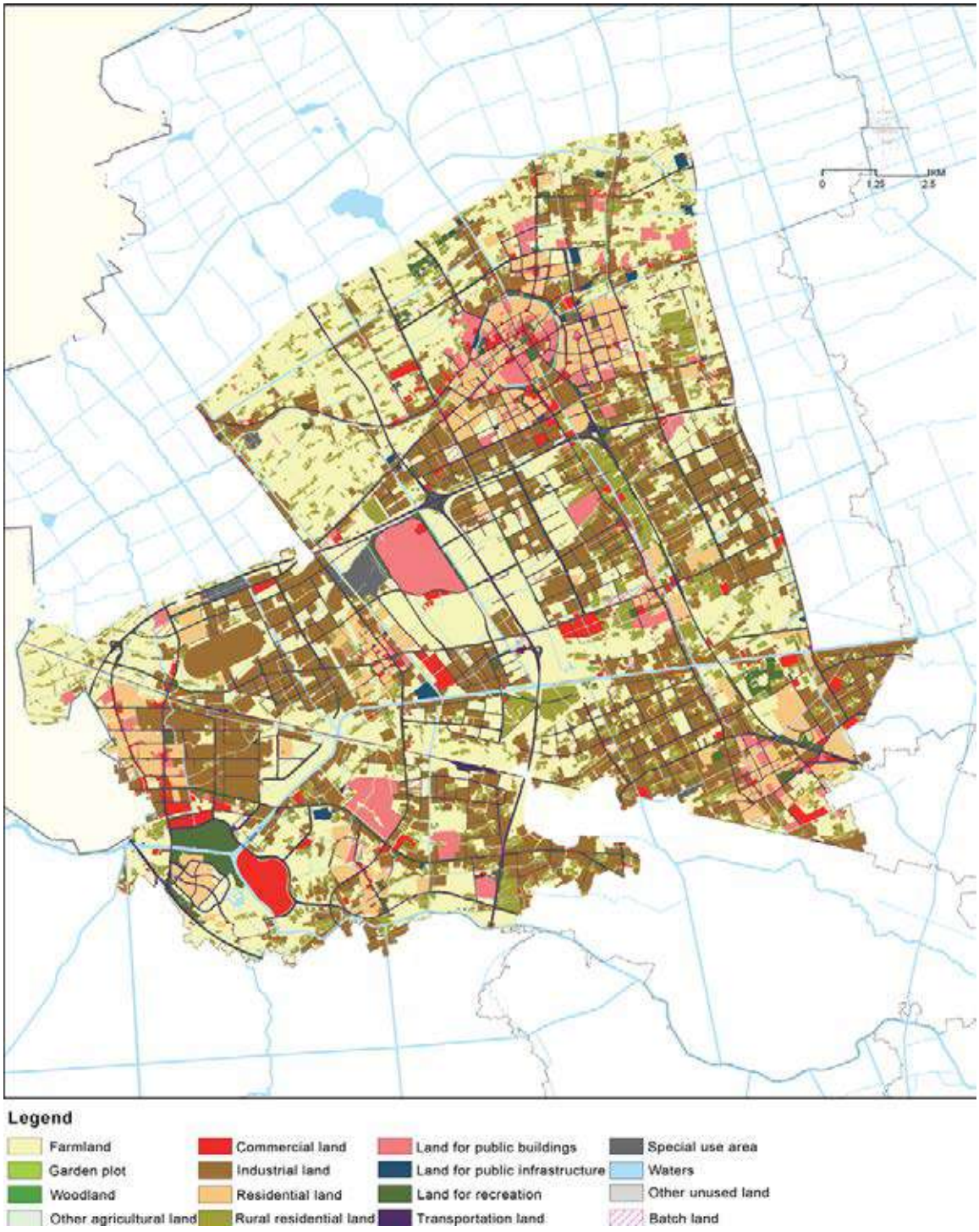


Fig. 29 Land Use of the Main Urban Area of Jiading New Town, 1996
Source: Shanghai Urban Planning and Design Research Institute; Current Situation of Land Use Database

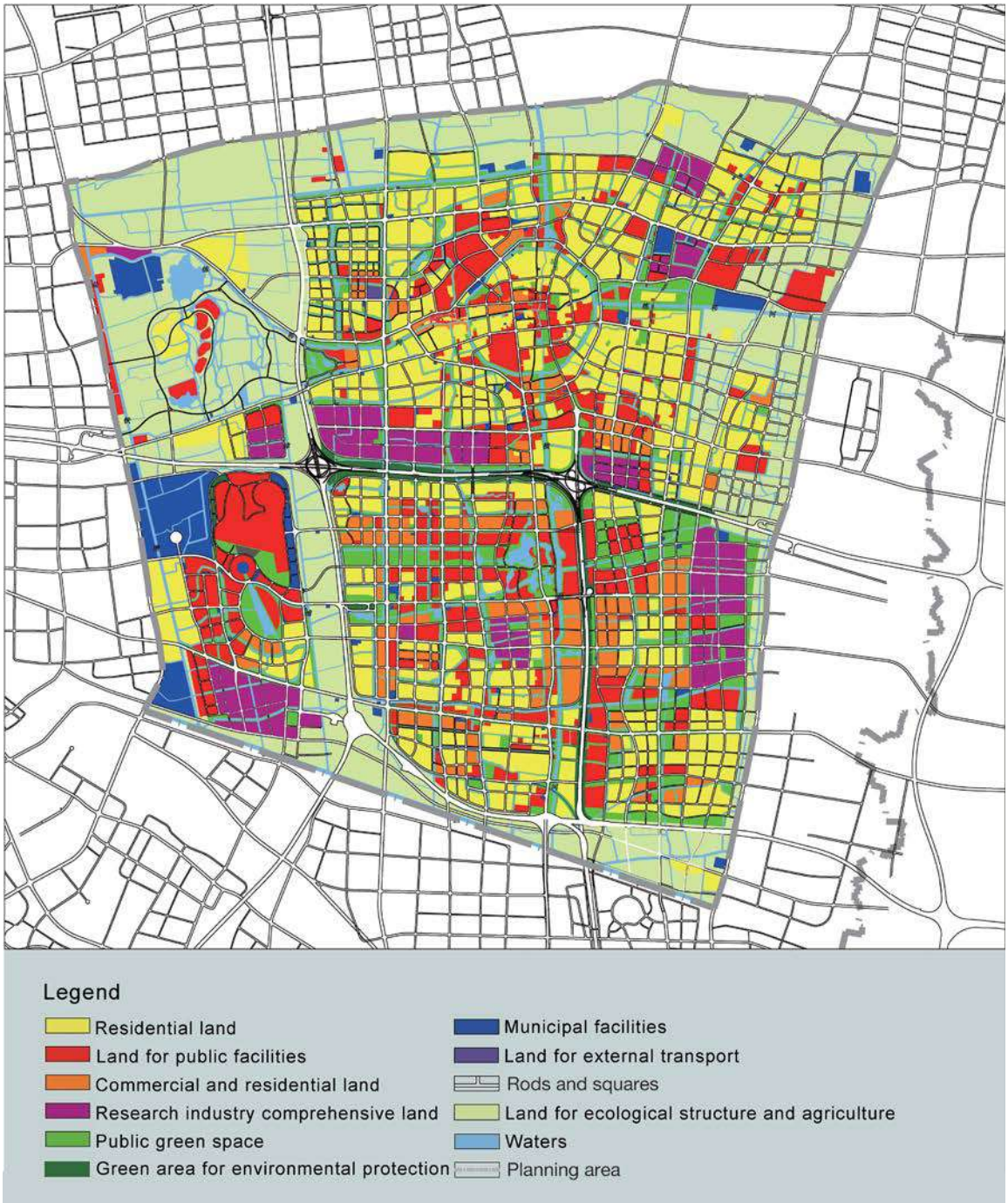


Fig. 30 Land Use of the Main Urban Area of Jiading New Town, 2010
Source: Shanghai Urban Planning and Design Research Institute; Current Situation of Land Use Database

Fig. 31 Urban Design of the Main Urban Area of Jiading New Town
Source: Jiading Planning and Land Resource Administration Bureau

Fig. 32 Photos and Satellite Image of Zhouqiao. Restored and Revitalized Historic Jiading of Jiading New Town
Source: Photos by the Writers and Satellite Image from Google Maps

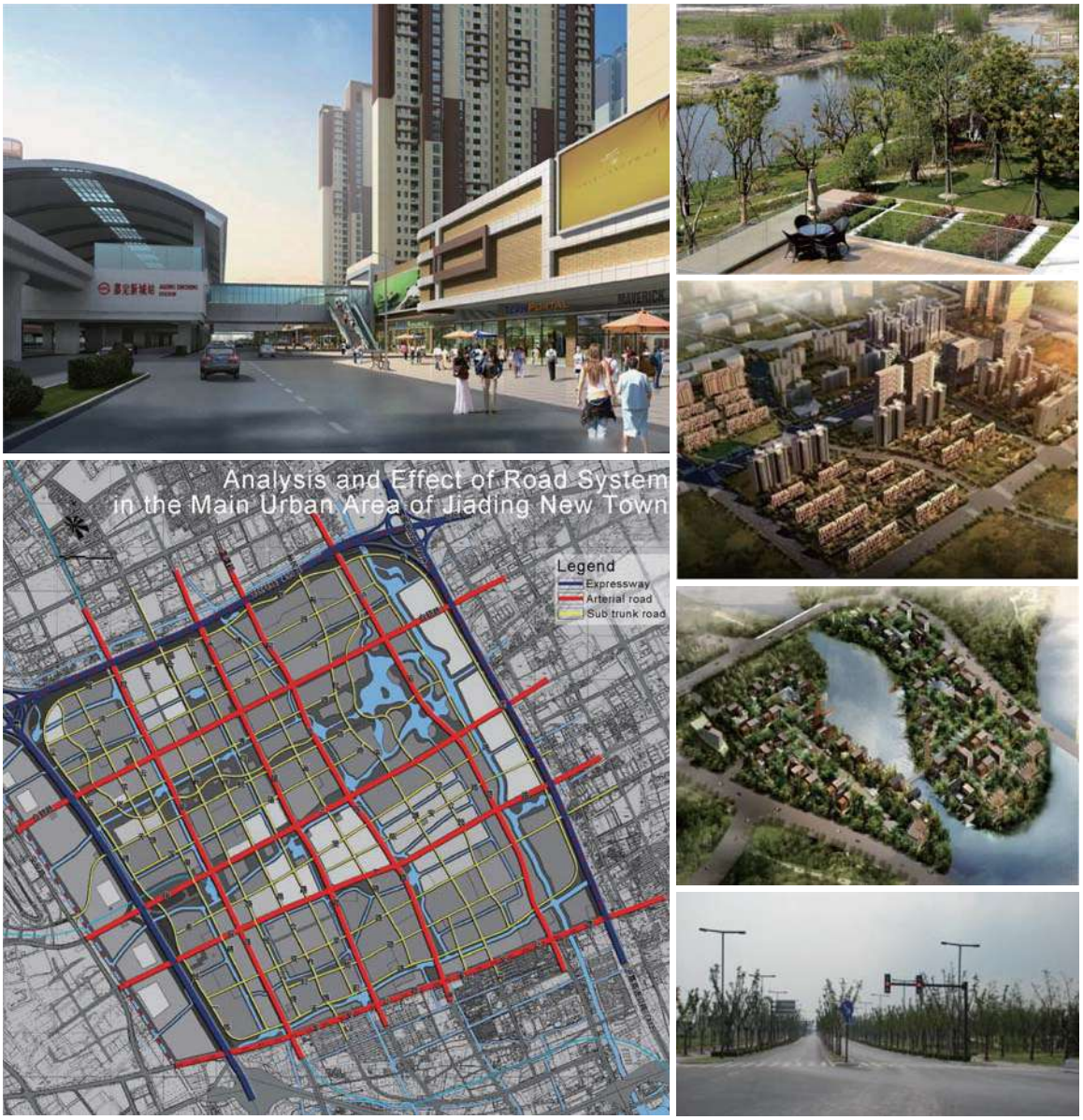


Fig. 33 Analysis and Effect of the Road System, Main Urban Area, Jiading New Town
Source: Jiading District Planning and Land Administration Bureau

green axis, two green rings, and multiple parks and green corridors. More space was reserved for ecological rehabilitation projects in the future. The Jiaoye Park in Northern Jiading and the suburban forest rings will contribute to ecosystems services and park amenities in Jiading New Town and improve the livability for all people.

4.1.4 Public Service Facilities

Public facilities were prioritized in the construction of Jiading New Town. General service improved in the new town and resulted in attracting more residents with the completion of many facilities, including cultural, education, sports, and health facilities.

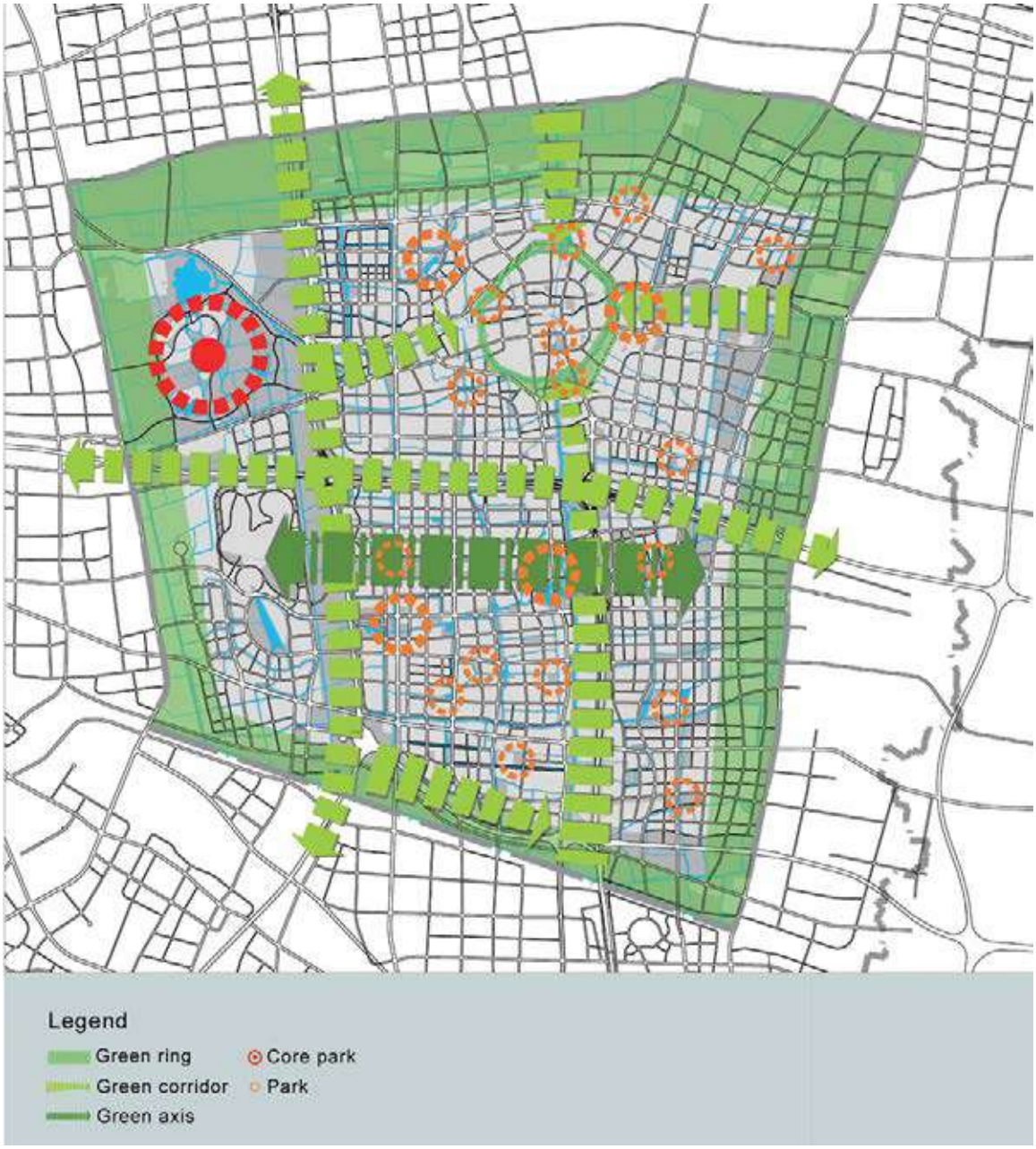


Fig. 34 Planning of the Greenfield System, Main Urban Area, Jiading New Town
Source: Shanghai Urban Planning and Design Research Institute, Revision of the Overall Plan for Main Urban Area in Jiading, 2012–2020

In November 2008, Phase 1 construction of Yuanxiang Lake started, echoing the Shang-shaped Formula One race track on the west landscape axis of Ziqidonglai Park. In January 2009, the Jiading Poly Theater opened (design by Japanese architect Tadao Ando). In April 2009, Jiading Friendship Park opened. In August 2009, Jiading New Town Urban Planning Exhibition Hall was completed and opened to the public. On December 24, Shanghai Ruijin Hospital North, an affiliation to the School of Medicine of Shanghai Jiaotong University started its operation. In November 2009, the signing ceremony of Shanghai

Fig. 35 Present Main Scene Node, Main Urban Area, Jiading New Town
Source: Jiading Planning and Land Resource Administration Bureau

Fig. 36 Present Situation and Effect of the Main Public Service Facilities, Main Urban Area, Jiading New Town
Source: Jiading Planning and Land Resource Administration Bureau

Jiaotong University High School, Jiading Campus was held. In December 2009, the first section of the north end of Line 11 was completed and put into use. In January 2010, the construction of the new library and museum started.

4.2 Reflection

4.2.1 Regional Integration

The development of new towns in Shanghai, especially Jiading New Town, needs to be looked at from a regional development perspective. The role of Jiading New Town should be understood in the context of the Yangtze River Delta Mega-Agglomeration, a world-class city cluster within Shanghai Municipality and the provinces of Anhui, Jiangsu, and Zhejiang.

Jiading New Town and its role also needs to be understood from the Shanghai Megacity perspective, based on interactions in terms of society, economy, and environment, and the relationships of co-urbanization between Shanghai, Suzhou, and Jiaxing.

As the northwestern gateway to Shanghai, Jiading New Town is the frontier to Jiangsu Province, but regional cooperation is not fully considered in its planning. Improvements should be made in intergrated planning and development of industries, land use, and transportation in coordination with adjacent towns and cities, especially with Kunshan and Taicang.

4.2.2 Integration of Town and Industry

There are large areas of industrial land and companies in the new town with a large number of jobs. Currently most jobs are in low-end manufacturing, which does not align with the development strategy for Jiading New Town. Qualified talents cannot find adequate employment here, which causes an imbalance between jobs and housing. However, the strong manufacturing base and the large number of jobs is one of the key strengths of Jiading New Town.

The industrial structure of Jiading New Town should be further improved. Industries should be upgraded to enhance the function and balance the high quality housing supply with adequate, qualified jobs, which would contribute to a better population distribution in the Yangtze River Delta Agglomeration Region.

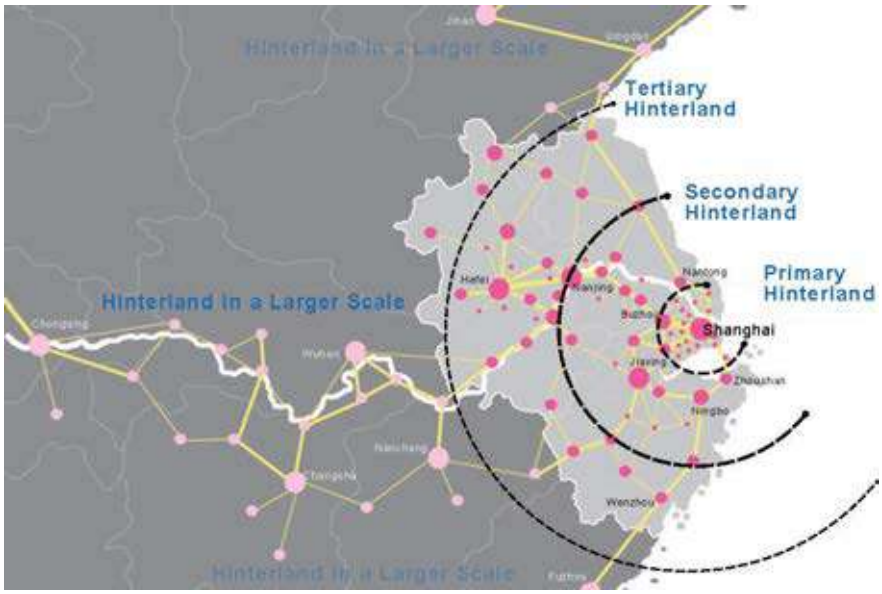


Fig. 37 Planning of the Hinterland of Yangtze River Delta
Source: Shanghai Urban Planning and Design Research Institute

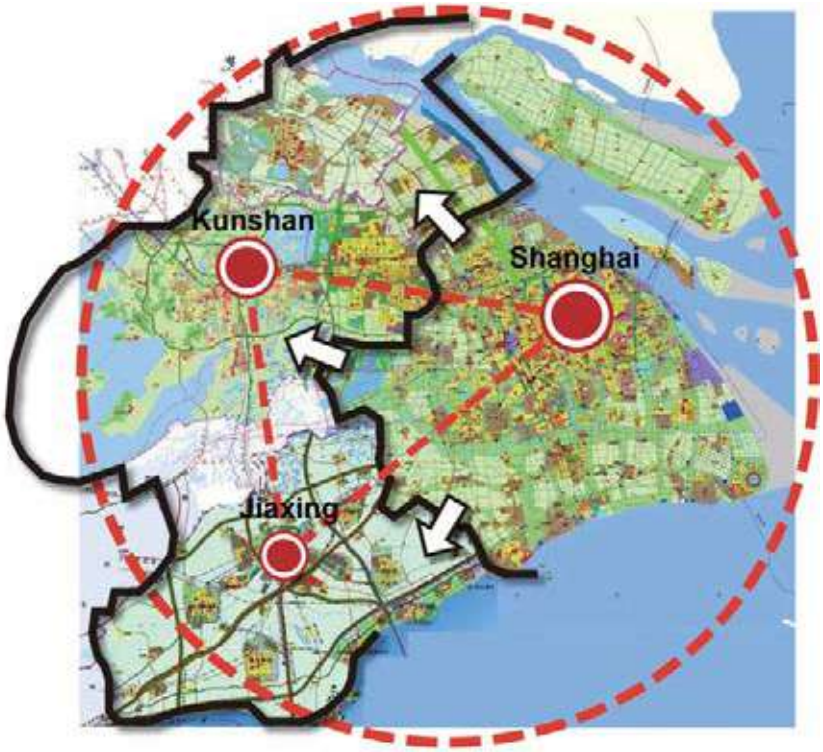


Fig. 38 Strategic Planning of Shanghai as a Metropolis
Source: Shanghai Urban Planning and Design Research Institute

4.2.3 Upgrading the Waterfront Areas

Historically known as Lianqi, Jiading was named after its main river within its territory, the Lianqi River. There are four main rivers flowing throught the district: the Hengli, Lianqi, Qiqian, and Yunzao rivers. Currently, areas along the river banks are mostly used for industries and warehousing with poor accessibility. The potential of riverfront development has not been utilized. Hence, lessons learned from successful international and domestic cases of renewal of waterways, ecological rehabilitation of rivers and riparian landscapes, river greenways, and waterfront developments should be applied in the next phase of Jiading New Town development.

4.2.4 Optimization of Comprehensive Transportation

Currently, commuters rely heavily on the Shanghai-Jiading Expressway because of limited accessiblity and capacity of public transport. A more complete transport network to the central city has yet to be built.

While Metro Line 11 is convenient, it has many stations close to each other, which reduces its speed and increases the trip duration between Jiading New Town and Shanghai's center city. Traffic congestion on the expressway frustrate the commuters. Therefore, improved links with the center city and other suburban towns like Qingpu and Songjiang districts, Kunshan, and Taicang in the region are needed. Shanghai needs to introduce a rapid commuter rail system as regional rail networks linking the center city with the new towns and the suburban areas with high-speed, high volume rail service. This missing intermediary system between citywide metro systems and intercity high-speed rail network is also missing in other agglomeration regions in the PRC and needs urgent attention, planning, and investments. Meanwhile, it also needs to optimize the internal transportation system within the new town area.

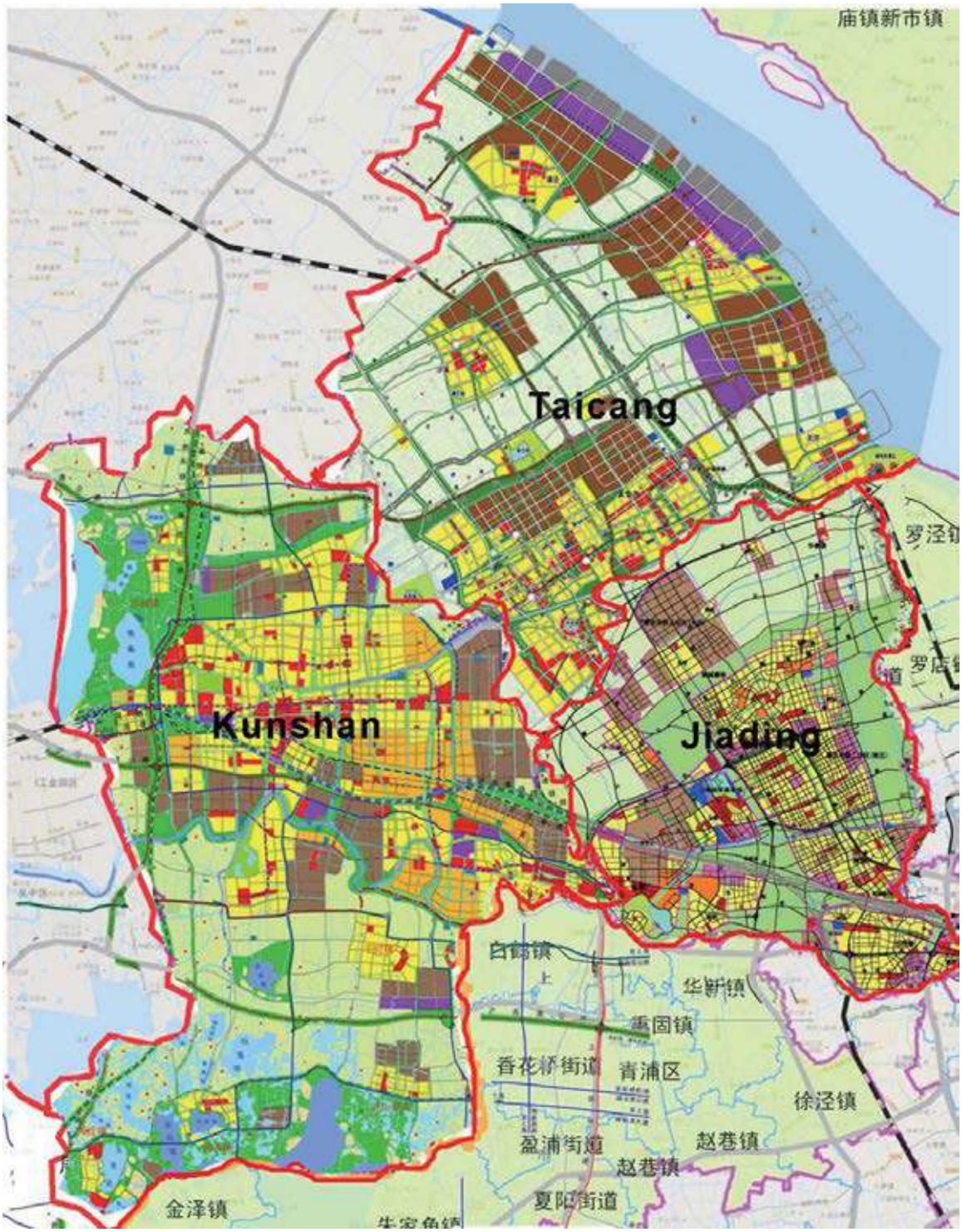


Fig. 39 Land Use of Jiading, Kunshan, and Taicang
Source: Shanghai Urban Planning and Design Research Institute

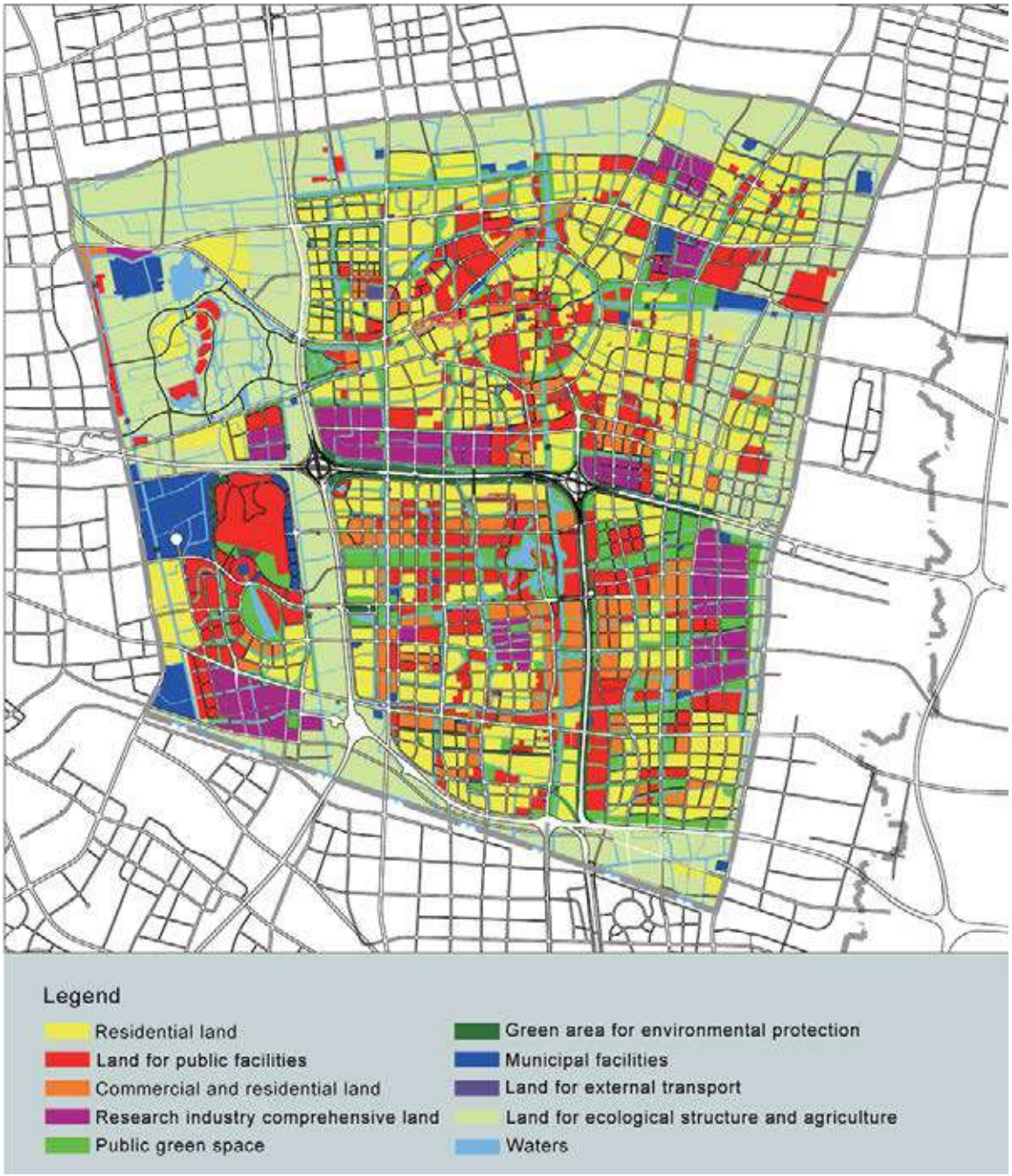


Fig. 40 Land Use Planning, Main Urban Area, Jiading New Town
Source: Shanghai Urban Planning and Design Research Institute, Revision of the Overall Plan for Main Urban Area in Jiading, 2012–2020 (Unapproved)

Fig. 41 Present Situation Along Wenzaobang
Source: Author

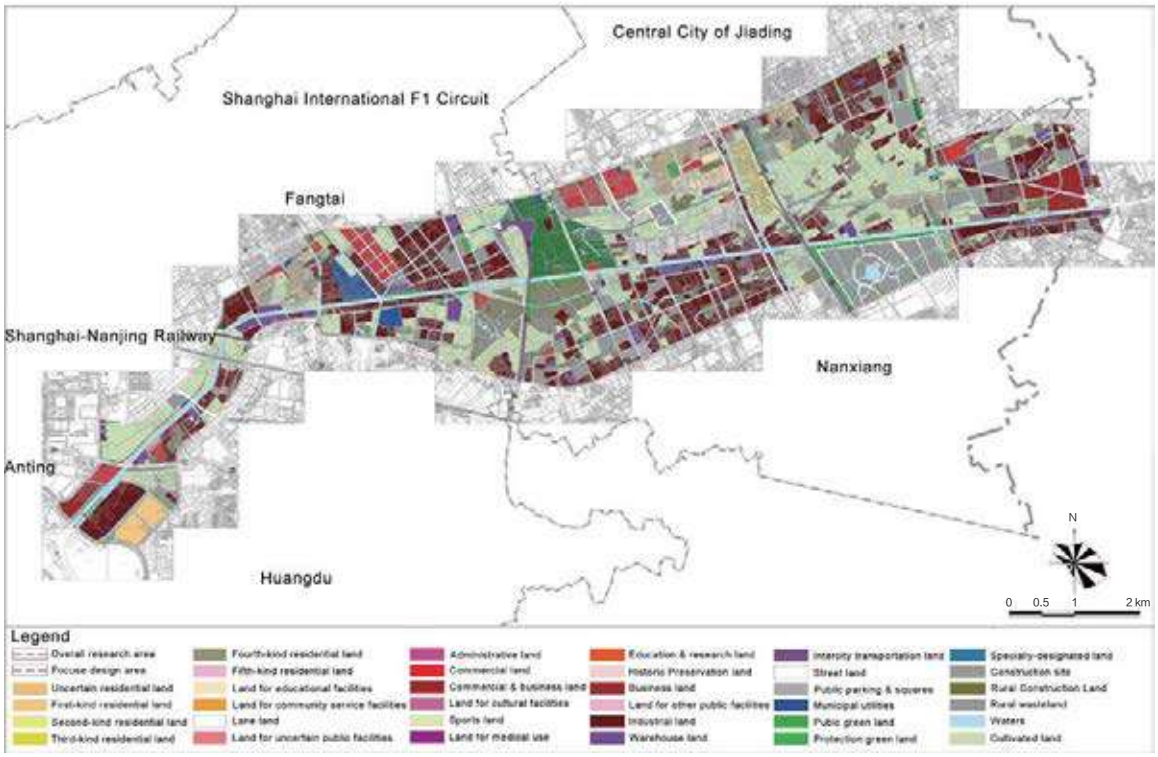


Fig. 42 Present Land Use Situation Along Wenzaobang Street, Jiading District
Source: Shanghai Urban Planning and Design Research Institute, Report on Current Space Situation alongside the Wenzaobang Street in Jiading District

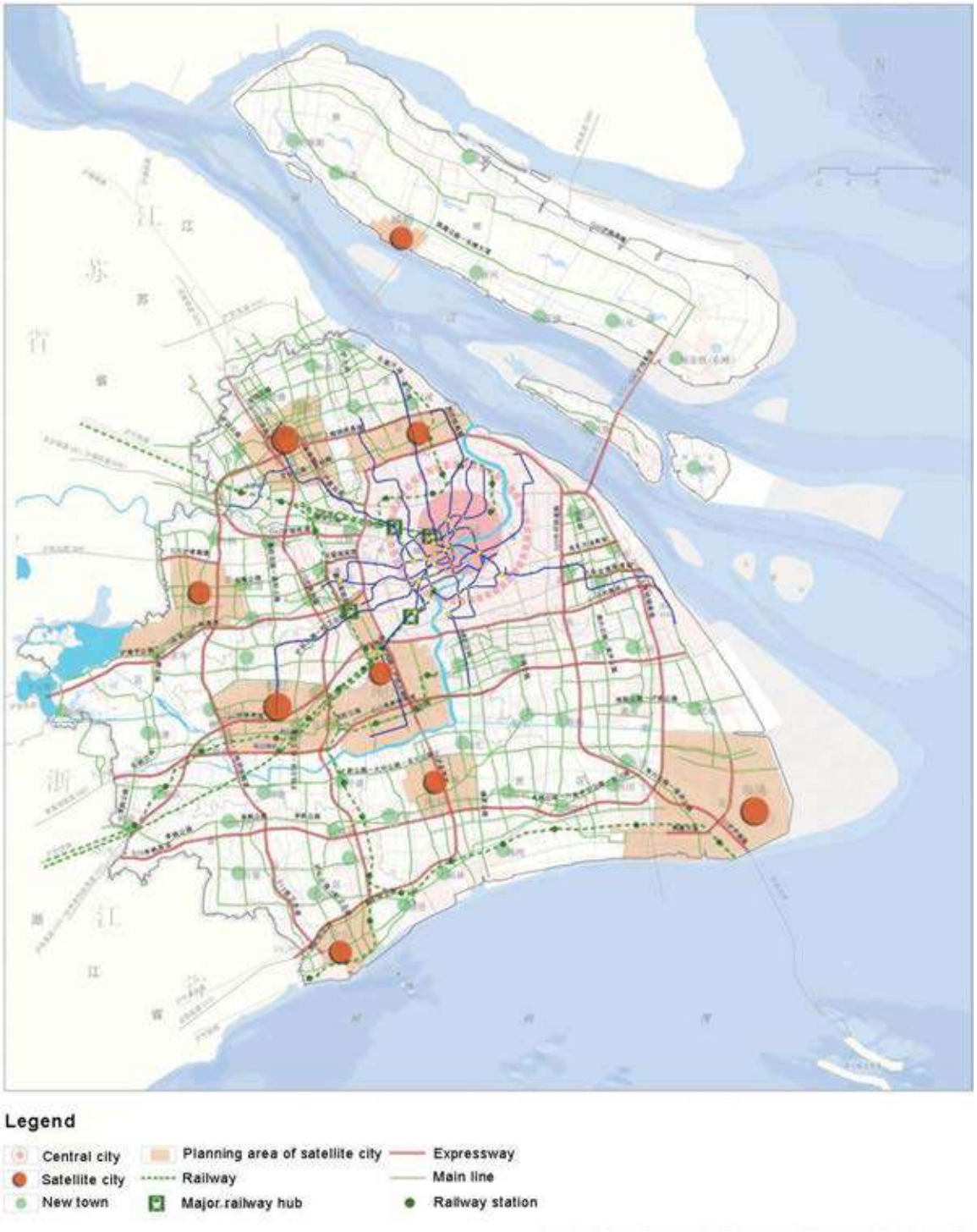


Fig. 43 Analysis of the Relationship between Expressway and Rail Transit in New Towns in Suburb Shanghai and in the Central City
Source: Shanghai Urban Planning and Design Research Institute

5 Conclusion

Ten years of rapidly developing new towns surrounding the center city and promoting urban-rural integration in Shanghai has been very successful in managing a balanced and orderly urbanization in the heart of the Yangtze River Delta Mega-Agglomeration Region. A further improved development of new towns will continue to contribute greatly to the future sustainable development of Shanghai. Advancing new town construction in Shanghai, reducing the strain on the center city, and optimizing the distribution of urban development are important measures for the future of Shanghai and the Yangtze River Delta Region. Closer cooperation among cities in the region and innovation-driven transformative economic development of Shanghai and the region is crucial.

New towns grow rapidly, their economies develop fast, the cityscapes improve, and the needs of residents and industries are served increasingly well. Many challenges such as extensive land use, lack of resident population and jobs, inadequate land use structures, and lack of adequate transport infrastructure remain.

Successful experience of brownfield redevelopment, ecological infrastructure and green space integration, urban design, and public facilities can be used as reference for other new towns.

However, Jiading New Town urgently needs to improve development. It needs to improve industrial development; upgrade job levels; improve integration of industrial transformation with research and development; improve transport systems, including high-volume, high-speed suburb-city and suburb-suburb commuter rails; and improve green networks, waterfront parks, environmental protection, ecological restoration, and environmental management.

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Urban Knowledge Hub People's Republic of China

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Sharing Urban Best Practices for Sustainable Development in Asia and the Pacific

ADB-Tongji Urban Knowledge Sharing Seminar, Shanghai, 12–13 November 2013

New Towns and New Districts in China-Challenges and Opportunities

This book is the result of the hub's activities that culminated in the workshop in 2013.

The Urban Knowledge Hub is a pioneering initiative made possible through partnership between the East Asia Department of the Asian Development Bank and the College of Architecture and Urban Planning, Tongji University in Shanghai. Given the enormous scale and continuing nature of urbanization, the goal is to nurture productive knowledge exchanges in urban management which can be applied within the People's Republic of China (PRC) and elsewhere in Asia and the Pacific.

The Workshop program has been as follows:

Fourth Seminar. Following three successful Urban Knowledge Sharing Seminars in 2010, 2011 and 2012, the Asian Development Bank (ADB)-Tongji University Regional Knowledge Hub for Sustainable Urban Development is organizing the fourth seminar in 2013 to disseminate best practices in sustainable urban development in the People's Republic of China. The topic of this year's seminar will be *New Towns and New Districts in China – Challenges and Opportunities*. Best practices case studies of recently planned and implemented New Towns and New Districts in the People's Republic of China will be presented and lessons learned will be discussed followed by field visits to some of the examples in and near Shanghai. This year's seminar is organized in cooperation with ADB's Regional Knowledge Sharing Initiative.

Day 1. The morning session on Day 1 will include ADB, Tongji University and Shanghai Municipal Government welcoming addresses and presentations by international resource persons who will introduce the topic and share state of the art approaches to planning, implementation and administration of New Town and New District developments. Later in the morning the exhibition on New Towns will be opened. The last morning session and the first three afternoon sessions of Day 1 will include portraits and case study presentations emphasizing lessons learned from the process and from the life in and operations of the New Towns and New Districts. These presentations will be followed by a panel and plenary discussion. The afternoon sessions conclude with a panel and plenary discussion. Following the tradition, on Day 1 in the evening, the Urban Knowledge Hub Good Practices Award will be presented to representatives of the respective award winning projects.

Day 2. Participants will be taken on a site visit to those good practices cases of New Towns and New Districts presented on Day 1 which are within reach of Shanghai via bus: Shanghai Jiading New District and Wuxi Taihu New Town. Participants will be able to ask and discuss with planners and administrators involved in the preparation and administration of the New Town and New District projects.

Day 1 Seminar at Tongji University, Shanghai, 12 November 2013
3rd Floor, Bldg. Wenyuan, College of Architecture and Urban Planning

Day 1 **Morning Sessions**

08:30 Registration and Networking

1. Opening Remarks
Moderator: Prof. Zilai Tang, Head of Department of Urban Planning, College of Architecture and Urban Planning(CAUP), Tongji University

09:00 Prof. Jiang Wu, Vice President, Tongji University
Ayumi Konishi, Special Senior Advisor to the President, ADB
Dr. Hanyong Liu, Director, International Division, Shanghai Finance Bureau

2. Keynote Speeches Session 1
Moderator: Prof. Zilai Tang, Head of Planning Department, CAUP, Tongji University

09:15 **The Evolution of New Towns in China: From Industrial Satellite Towns to Eco-Cities**
Prof. Fulong Wu, Bartlett School of Architecture, University College London

09:45 **Lessons Learned from New Towns in Shanghai**
Yisong Xu, Deputy Director, Shanghai Urban Planning and Land Resources Bureau

10:15 **Questions and Answers**

10:30 Tea and Coffee Break

3. Keynote Speeches Session 2
Moderator: Maria Pia Ancora, Urban Development Specialist, East Asia Department, ADB

10:45 **New Towns Development in Delhi, Mumbai and Kolkata**
Prof. Kavas Kapadia, Former Dean, School of Planning & Architecture, New Delhi, India

11:15 **Eco-Cities in Europe–Compact, Mixed-Use, Green, Livable New Districts**
Stefan Rau, Urban Development Specialist, East Asia Department, ADB

11:45 Questions and Answers

4. Introduction to the New Towns and New Districts Exhibition
Moderator: Jorn Brommelhorster, Chief Economist, East Asia Department, ADB

12:00 **Opening of the Exhibition: Cases of New Towns & New Districts in the PRC**
Ayumi Konishi, Special Senior Advisor to the President, ADB

12:05 **Portrait 1: Ningbo Eastern New District**
Prof. Weiqiang Wang, CAUP, Tongji University

12:10 **Portrait 2: Zhengzhou Zhengdong New District**
Tao Tao, Chief Planner, Werkhart World Wide 5–Star Alliance

12:15 **Portrait 3: Jinzhou New District, Dalian Development Area**
Prof. Gang Liu, CAUP, Tongji University

12:25 Group Photo

12:30 Lunch Break, Sanhaowu Restaurant, 2nd Floor

Day 1 **Afternoon Sessions**

5. Case Study 1
Moderator: Prof. Lan Wang, CAUP, Tongji University

13:30 **Shanghai Jiading New District: A Learning System of Adapted Urban Pattern**
Yunzhou Zhan, Chief Planner, Shanghai Urban Planning and Design Institute
Xiaotao He, Director of Chief Engineer Office, Shanghai Jiading New District Development Company

14:10 Questions and Answers

6. Case Study 2
Moderator: Stefan Rau, Urban Development Specialist, East Asia Department, ADB

14:30 **Wuxi Taihu New Town: A Low-Carbon Eco-City**
Xiaoli Wu, Deputy Chief Planner, Shenzhen Urban Planning and Design Institute
Ms. Xiaoxing Feng, Deputy Director, New Town Division of Wuxi Planning Bureau

15:10 Questions and Answers

15:30 Tea and Coffee Break

7. Case Study 3

Moderator: Prof. Weiqiang Wang, CAUP, Tongji University

15:50 **Beichuan: A New Town Rising from Post-Disaster Rubble**
Degao Zheng, Director, Shanghai Branch, Chinese Academy of Urban Planning & Design
Wang He, Vice Secretary–General, Mianyang City, Sichuan Province; Former Vice Mayor, Beichuan County

16:30 Questions and Answers

8. Panel and Plenary Discussion

Moderator: Diwesh Sharan, Director, Urban and Social Sector Division, East Asia Department, ADB

16:50 **Panel Discussion: Lessons Learned from the Case Studies**
Ayumi Konishi, Special Senior Advisor to the President, ADB
Jinlin Yang, Senior Advisor, East Asia Department, ADB
Prof. Zilai Tang, Head of Planning Department, CAUP, Tongji University
Prof. Ming Tong, CAUP, Tongji University
Prof. Fulong Wu, Bartlett Professor of Planning, University College London
Prof. Vinita Yadav, School of Architecture and Planning, New Delhi, India
Rumi Aijaz, Senior Fellow, Observer Research Foundation, New Delhi, India

17:50 **Conclusion: Lessons Learned for ADB Project Cities**
Diwesh Sharan, Director, Urban and Social Sector Division, East Asia Department, ADB

9. Urban Knowledge Hub Awards Ceremony

Moderator: Prof. Lan Wang, CAUP, Tongji University

18:00 **Best Practices Awards in 2013**

10. Seminar Closing Remarks

18:15 Hamid Sharif, Country Director, ADB's Resident Mission in the People's Republic of China
Prof. Zilai Tang, Head of Planning Department, CAUP, Tongji University

18:30 Dinner Reception, Tanggong Restaurant, 2nd Floor of Magnotel Hotel

Day 2 13 November 2013: Study Tour to Shanghai and Wuxi

Study Tour to New Towns & New Districts from Case Studies

1. Site Visit of Shanghai Jiading New District

08:00 Departure from Magnolia Hotel

09:30 Tour and Walk in Shanghai Jiading New District and Discuss with Planners and Local Officials

11:30 Questions & Answers Session with Planners and Local Officials

12:00 Lunch in Jiading

2. Site Visit of Wuxi Taihu New Town

13:00 Departure from Shanghai Jiading New District

15:00 Tour and Walk in Wuxi Taihu New Town and Discuss with Planners and Local Officials

17:00 Questions & Answers Session with Planners and Local Officials

17:30 Dinner in Wuxi

18:30 Return to Shanghai

20:30 Arrival at Tongji University, Shanghai