

# SUSTAINABLE NEIGHBORHOODS

Through Inclusiveness, Connection & Environment  
包容、联系和重视环境的可持续居住

Case Study: **SHENZHEN, CHINA**





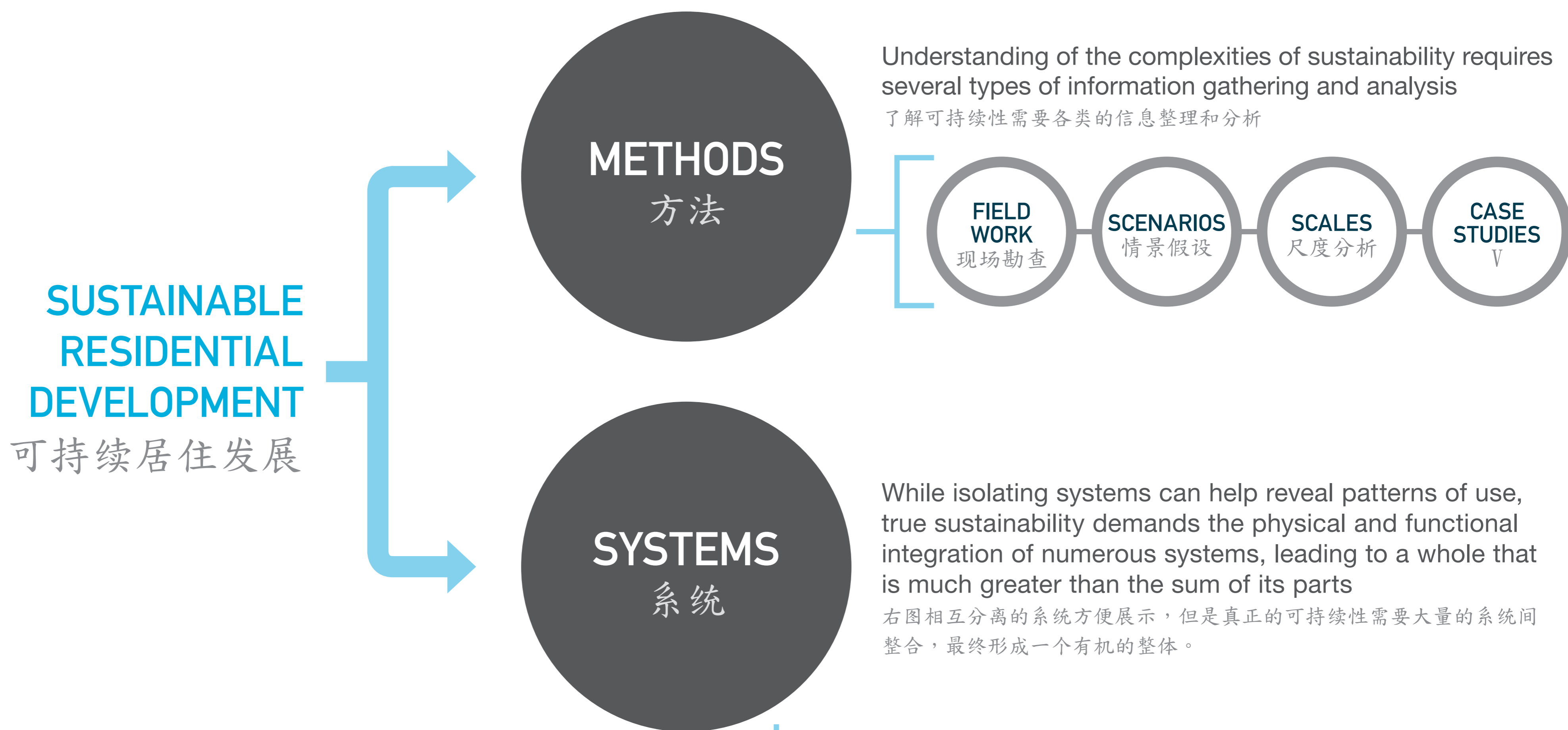
## MIT PLANNING STUDIO

Since 2005, **Vanke Corporation** has sponsored research seminars, studios, and workshops led by **Tunney Lee** and **Liang Zhao** at the **Massachusetts Institute of Technology** on the topic of **Sustainable Neighborhoods through Inclusiveness, Connection, and Environment (sNice)**. This exhibit synthesizes the four years of ideas, discussion, drawings, and writings produced by the students involved.

2005年以来在万科集团的资助下、麻省理工学院的**Tunney Lee**和赵亮教授指导了一系列研究讨论和规划设计课程。课程围绕着“sNice”（包容、联系和重视环境的可持续居住）的理论主题。这个展览集成了学生们四年来的思考、讨论、图纸和论文。

# SUSTAINABILITY THROUGH CONNECTIVITY & ACCESSIBILITY

建立在网络联系和公共资源可获得基础上的可持续发展



There is now abundant scientific evidence that humanity is living unsustainably in the economic, social and environmental spheres. This body of work is grounded in the need for more sustainable residential development, particularly in the need of residents to **connect** through networks of community facilities, open space, and transportation and to have adequate **access** to public goods such as housing, education, health, and recreation.

有足够的科学证据表明人类生存在个不可持续的经济、社会和环境。们的研究建立在对可持续居住发展的要中。确切的说、建立在居民对将每人联系起来的网络的需求：包括社区施、开放空间、交通等。也是对宅、教育、健康、娱乐等公共产品可获的基础上。



# NATURAL SYSTEMS 自然景观系统

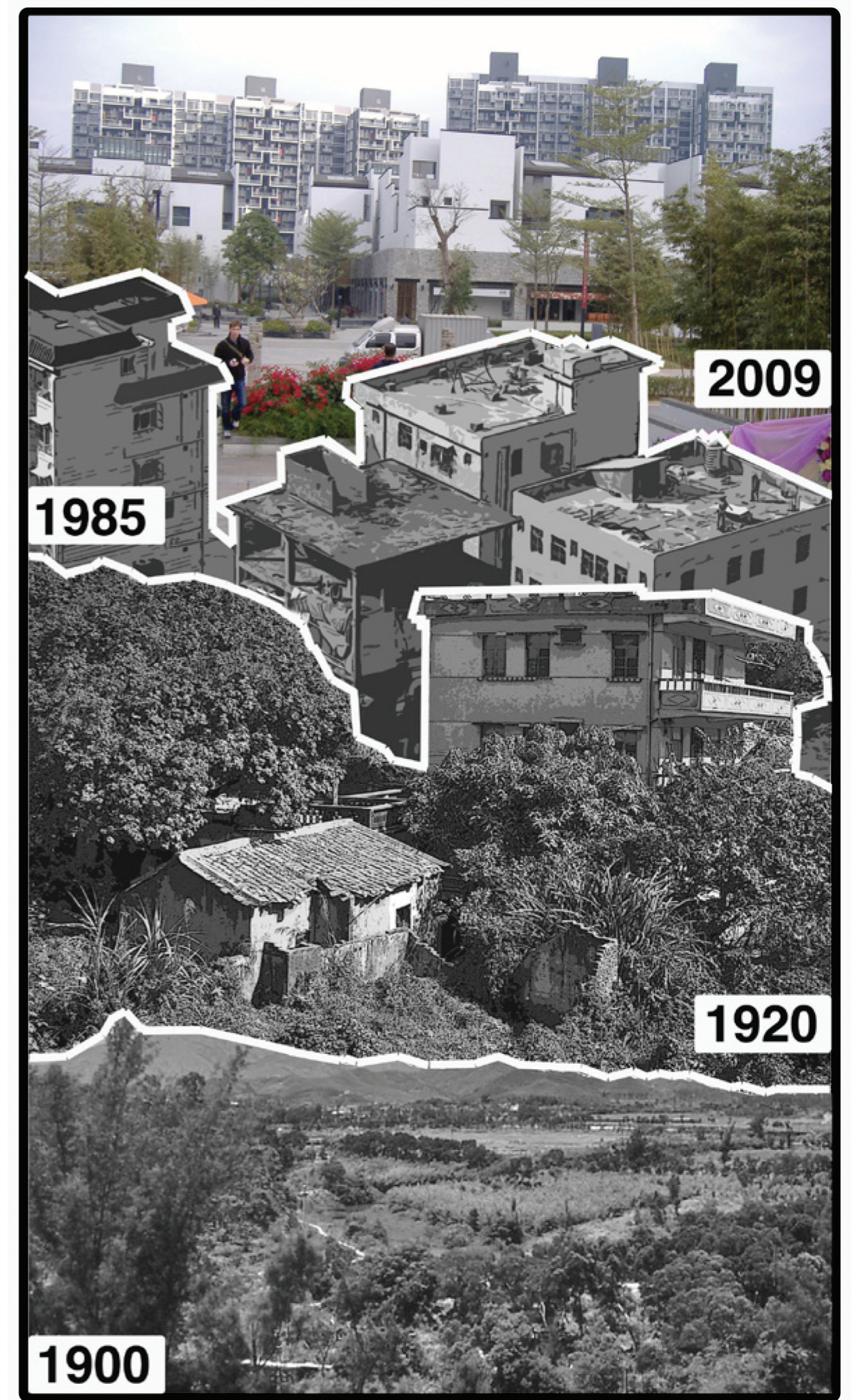
Connect natural systems to establish a backbone for further development while making open space accessible to all residents

把自然系统联系起来、为未来发展提供骨架、建立可以让所有的居民都可以到达的公共空间。

## EFFECTS OF URBANIZATION 城市化的结果

In the process of growing in just 30 years from a handful of small fishing and farming villages to the present regional metropolis of at least 12 million residents, nearly all of Shenzhen's buildable land has been developed, degrading the natural hydrological system and drastically decreasing both quantity and quality of open space.

在短短的三十年里深圳从一群小渔/农村发 到 1200万人口的大城市、城市中 可开发的土地 本已经用完、建设使自然的排水系统退化并 破坏和减少了开放空间。



Across China, decades of increasing development pressures have resulted in a degradation of natural systems. Highly sensitive areas such as steep slopes and watersheds have become the sites of intensive development, with dangerous repercussions on the health and safety of residents as well as long term environmental sustainability.

中国几十年的发展压力导致了自然系统的退化。高敏感的地区、如陡坡和水域变成了高强度的建区、这会对居民的建康、安全以环境造成长期损害。

### transformed landscape 改变了的景观

Apartments and offices have replaced most of Shenzhen's native vegetation, drastically reducing capacity for stormwater retention and causing severe erosion. 住宅和办公代替了大部分深圳原始的植被、大大减少了对洪水的抵御能力并导致严重的 水土流失。

### altered hydrology & land use 水文和土地使用被改变

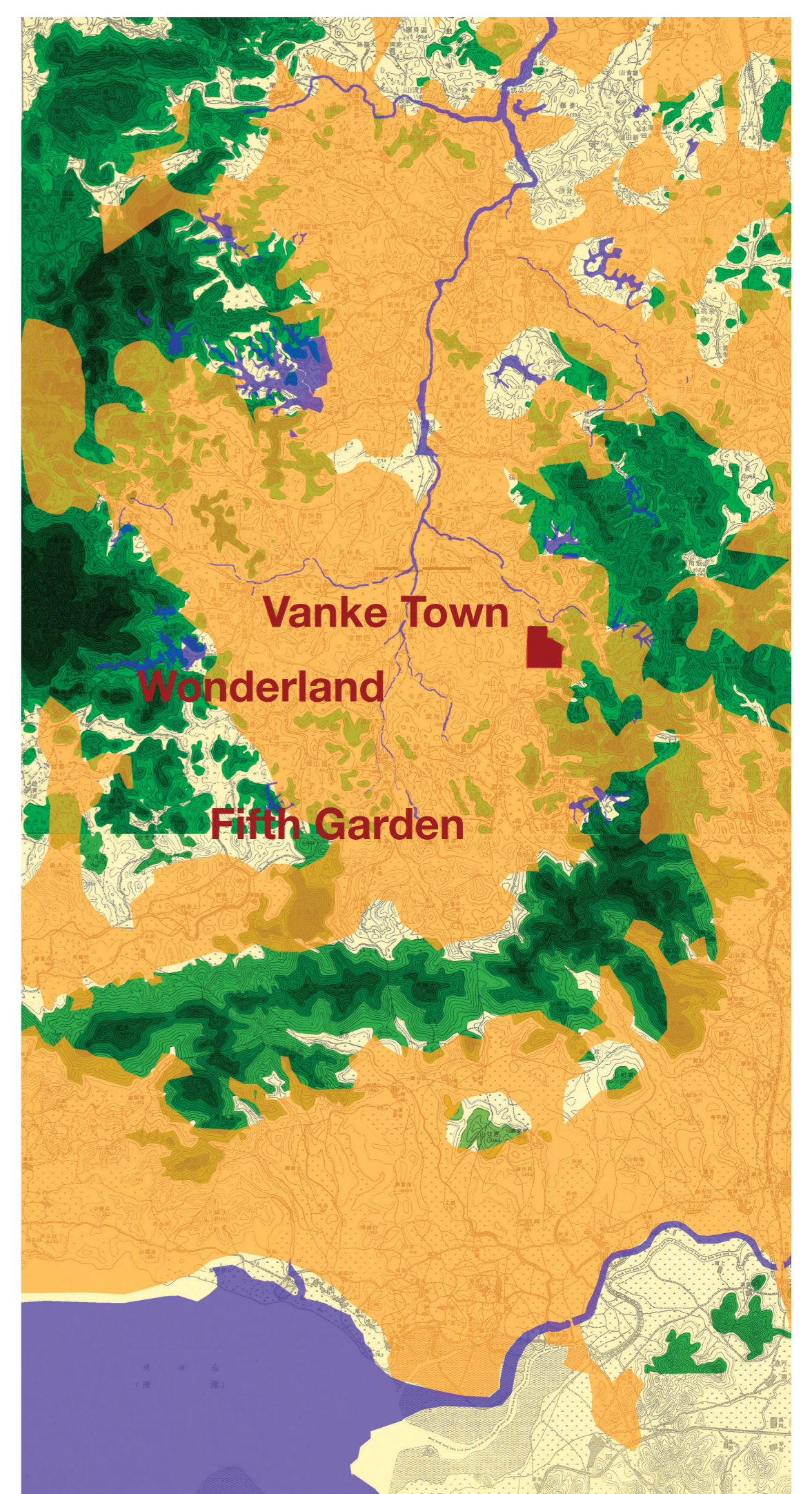
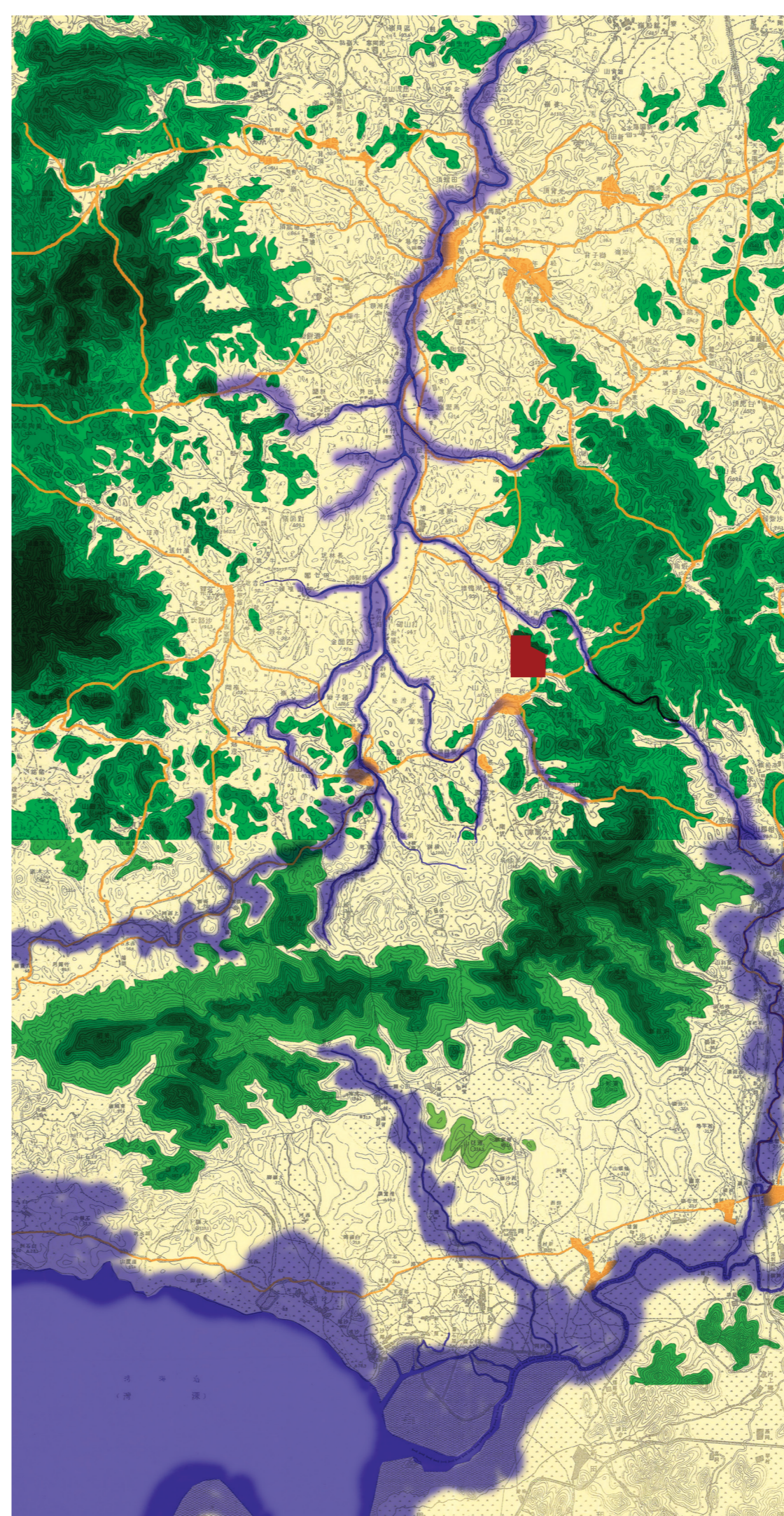
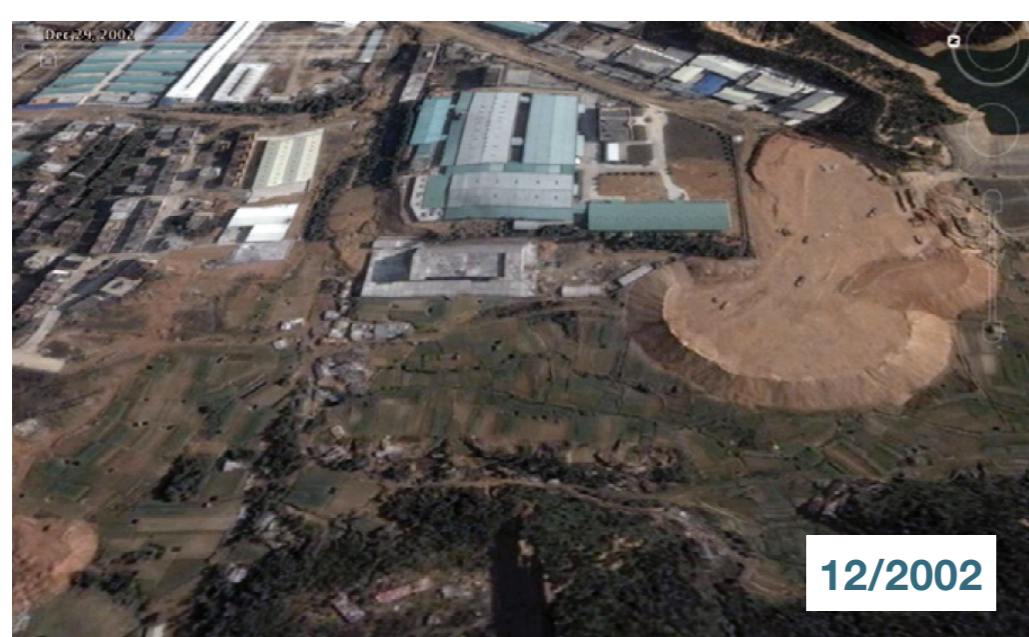
In the past 70 years, development (orange) has overtaken nearly all of Shenzhen's buildable land and encroached upon the hydrologic network. 在过去七十年里、深圳的开发用掉了几乎所有的可建设土地并且侵蚀了水文网络。

### demolished landforms 原有的地形被夷平



Hillsides are denuded and even removed to make way for new development, destroying existing landforms and disrupting drainage patterns and natural habitat

让路、这样摧毁了原有的地貌、水文系统和生物栖息地。



## CONSERVING WATER

### 保护水资源

#### goals 目标

- A** reduce on-site water needs by harvesting and recycling rainwater  
通过对雨水的保持和重新利用减少场地水需求
- B** minimize the amount of unfiltered stormwater discharge  
减少未经过滤的雨水排放
- C** enhance environmental quality by replicating pre-existing hydrologic conditions  
通过重建过去存在的水文系统提高环境的质量。

#### methods 方法

Water management strategies vary by cost and purpose, and must be selected carefully depending on the context. Integrating multiple methods for water treatment is critical to the success of an overall water management system that protects sensitive riparian zones while controlling runoff and erosion.

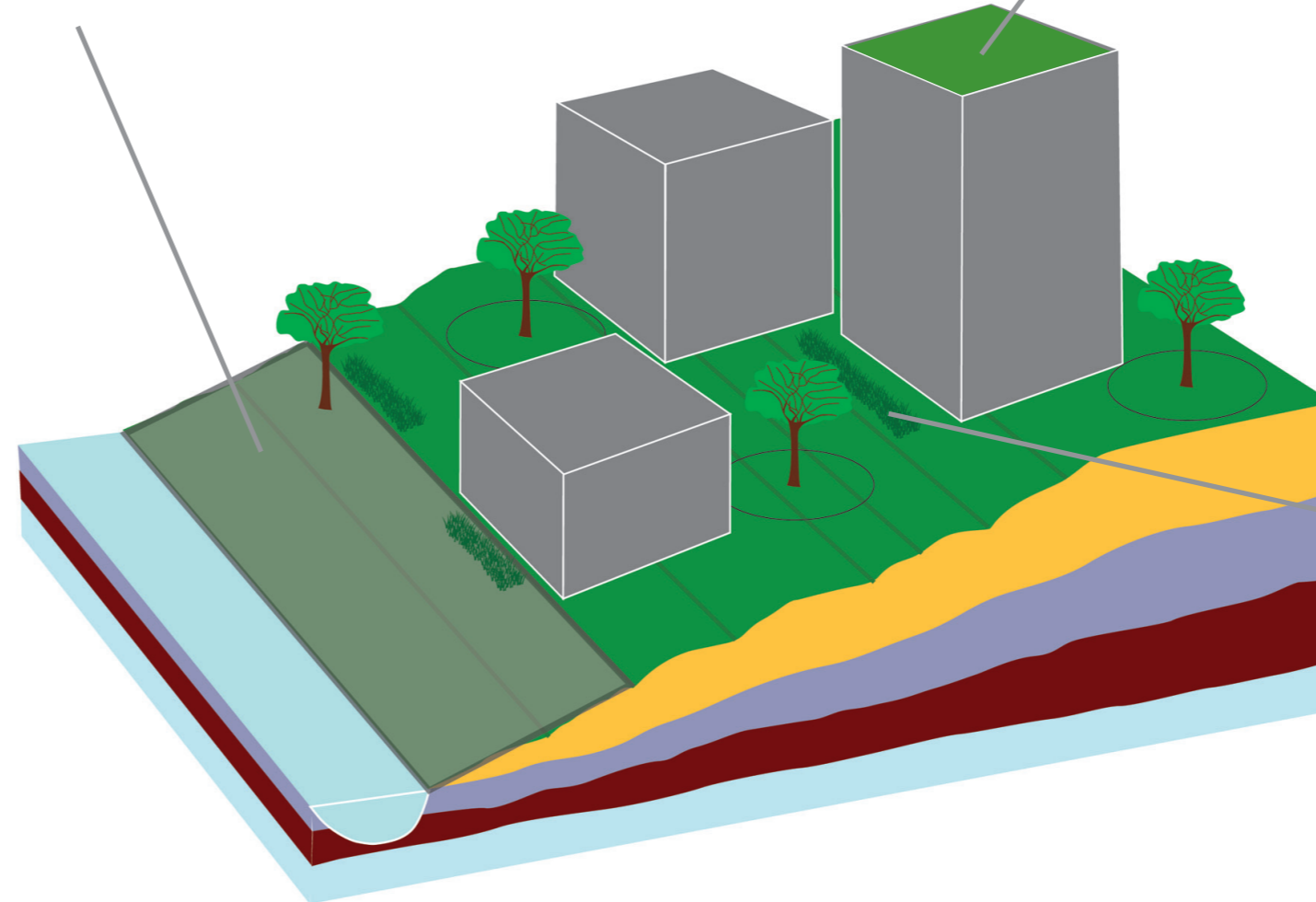
不同的水处理方法目的和成本有差异、必须根据情况精心挑选。整合多种水处理方法是决定整体水资源管理系统的关键、t这样才可以保护敏感的降水带防止水土流失。

**RIPARIAN BUFFER:** No development is allowed within a certain distance of the river's mean water height  
降水缓冲带：河流两侧距离水面一定距离内不准建房

**GREEN ROOF:** Rooftops covered in plants absorb and filter stormwater  
屋顶绿化：屋顶由可以吸收过滤雨水的植物覆盖

**TREE BUFFERS:** For trees over a certain size, no development can infringe upon the buffer  
树木缓冲带：大树缓冲区不允许任何开发

**GRASS SWALES:** Prevent erosion and absorb runoff  
种植草的洼地：防止水土流失、吸纳地表水



**DETENTION BASIN**  
蓄水洼地



**WETLAND BASIN**  
低洼湿地



**WETLAND SWALES**  
湿地水塘



**BIORETENTION**  
生物滞留池



**POROUS PAVEMENT**  
渗水铺装路面

## LINKING OPEN SPACE

### 联系开放空间

#### goals 目标

- A** integrate ecological infrastructure and urban surroundings  
整合生态基础设施和城市环境
- B** plan contextually appropriate park programming  
规划和周边协调适合的公园及其内容

#### methods 方法

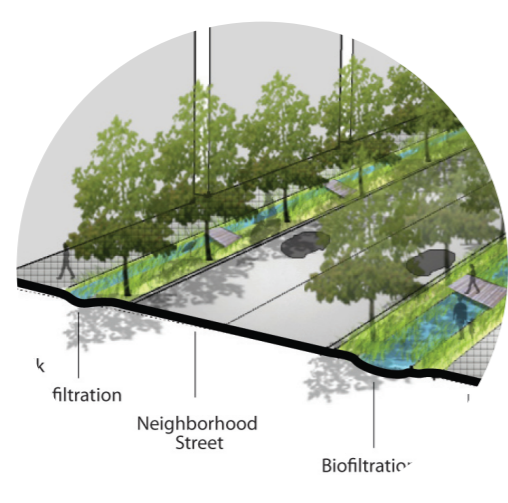
Open space is better-justified when its purpose extends beyond recreation to incorporate water management, transportation, and other multi-scalar issues

只有当开放空间的目标超越休闲娱乐、加入水资源管理、交通等其他作用时、开放空间才会更有用。

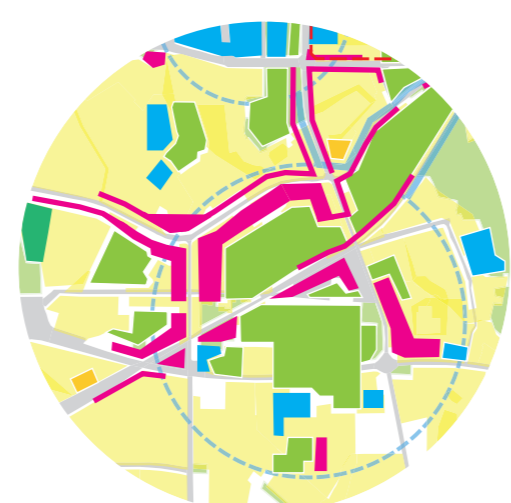
- district/regional park  
区域性公园
- neighborhood park  
社区公园
- linear park/  
boulevard  
带状公园、林蔭大道
- local park  
当地公园
- pocket park/  
playground  
口袋公园、活动场地



**CONNECTIONS**  
联系



**ECO-STREETS**  
生态街道



**DESIGN GUIDELINES**  
设计导则



**PARK HIERARCHIES**  
公园等级

## REDUCING ENERGY USE & WASTE PRODUCTION

### 减少能源的使用和废物的产出

#### goals 目标

- A** incorporate best practices for waste management into all aspects of residential development  
在社区发展的方方面面引入国际上废物管理的最佳实践
- B** minimize energy demand and develop on-site energy production capacities  
最大限度减少能源需求并开发当地能源生产力

#### methods 方法

Sustainable energy and waste practices can be incorporated into all stages of the development practice, from site design and construction to ongoing community education and management.

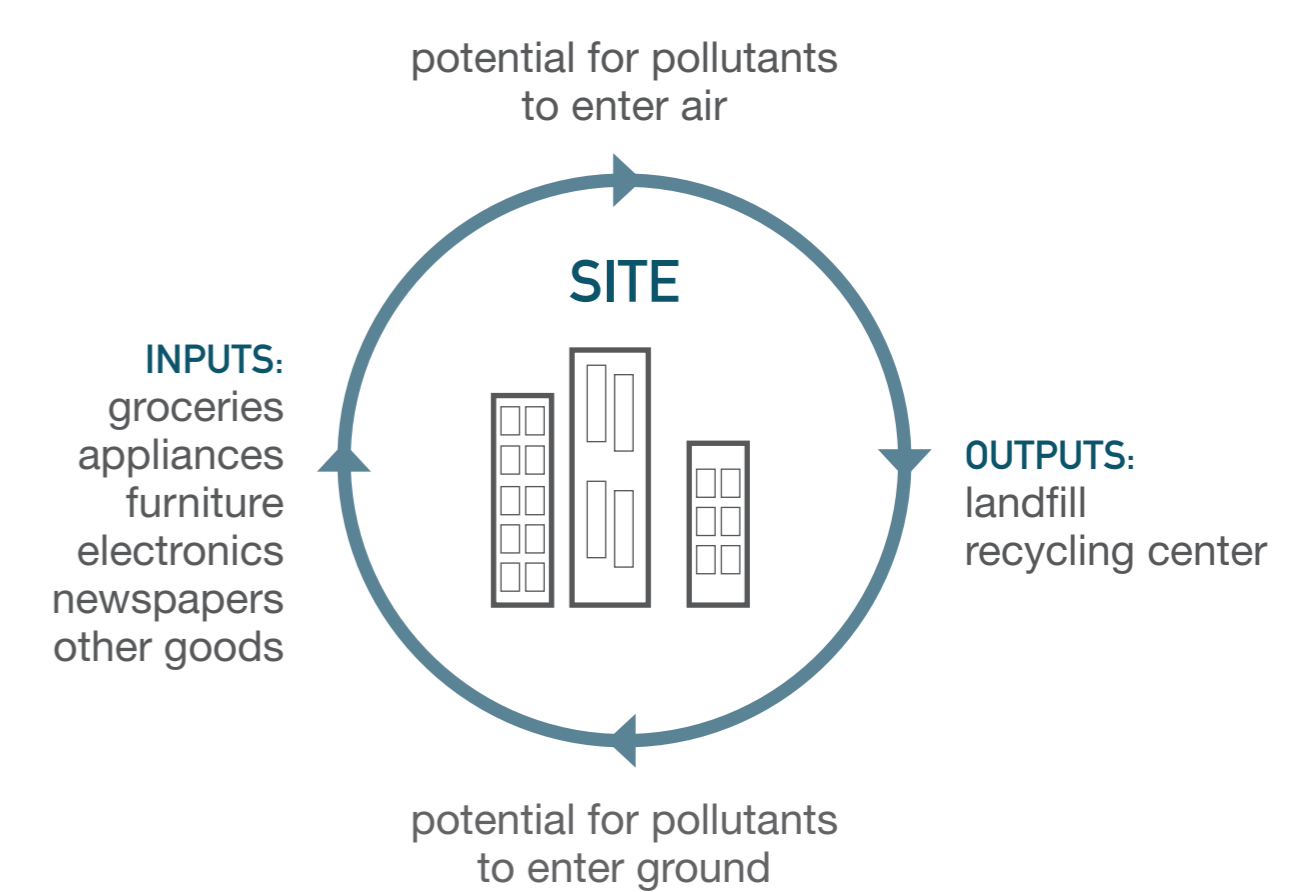
可持续的能源和废物管理实践可以整合进入开发的各个阶段，包括场地规划、土建施工和后期物业管理和社区教育

**DISTRICT-SCALE HEATING & COOLING**  
项目尺度上的制冷与采暖

**RENEWABLE ENERGY SOURCES**  
可再生能源的来源

**REUSE & RECYCLING**  
重复使用和循环利用

**COMMUNITY EDUCATION**  
社区教育



# NATURAL 自然景观

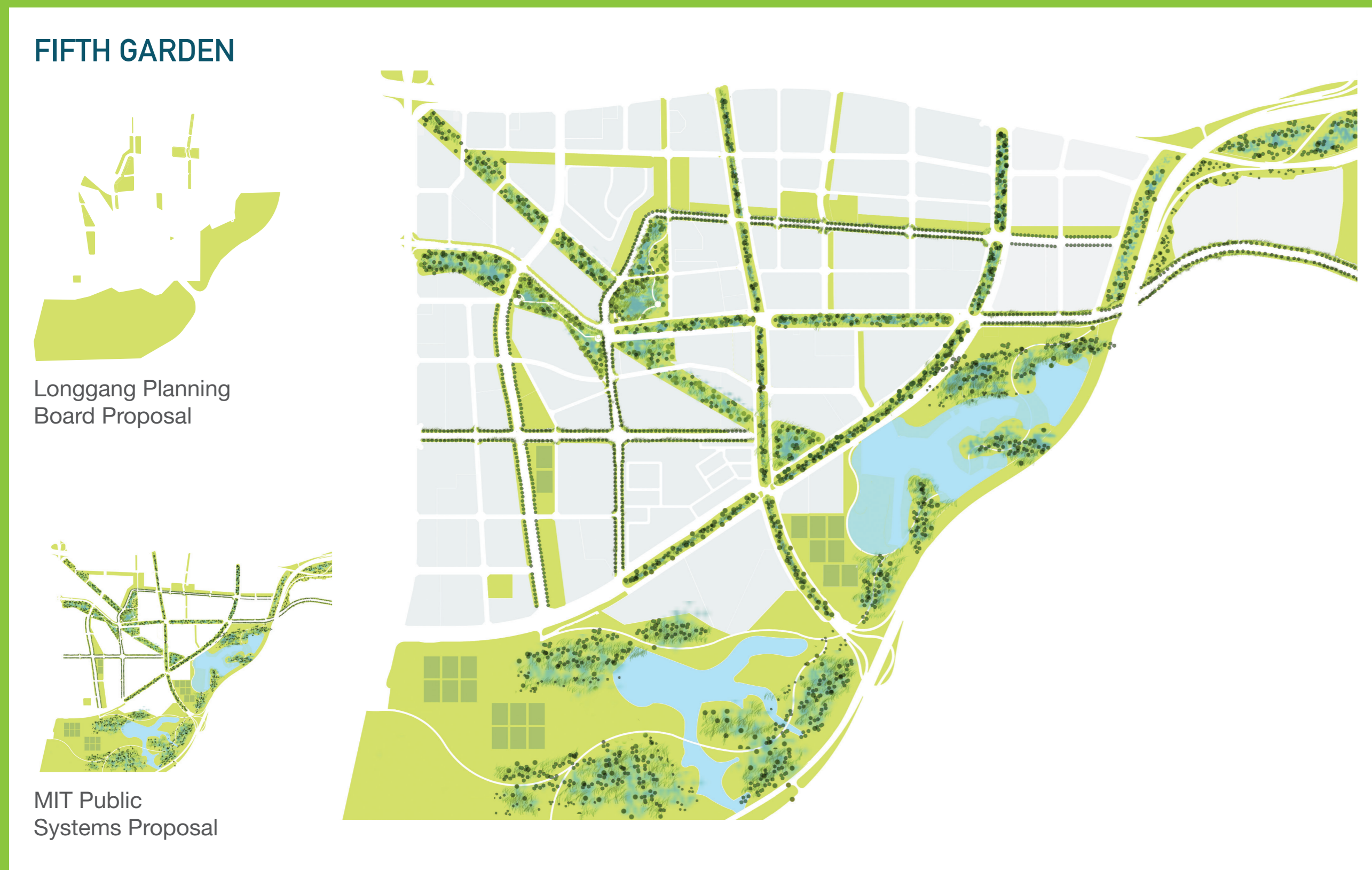
## PLANNING STUDIO PROPOSALS 规划设计小组提出的建议

### Fifth Garden Area District Proposal

#### 第五园周边地区的规划

Site-scale proposal that integrates natural systems with public amenities and transportation, providing more overall open space than the existing planning office proposal for the area.

项目尺度上的规划结合了自然系统，其中包括公共设施和交通站点，并提供更多开放空间。

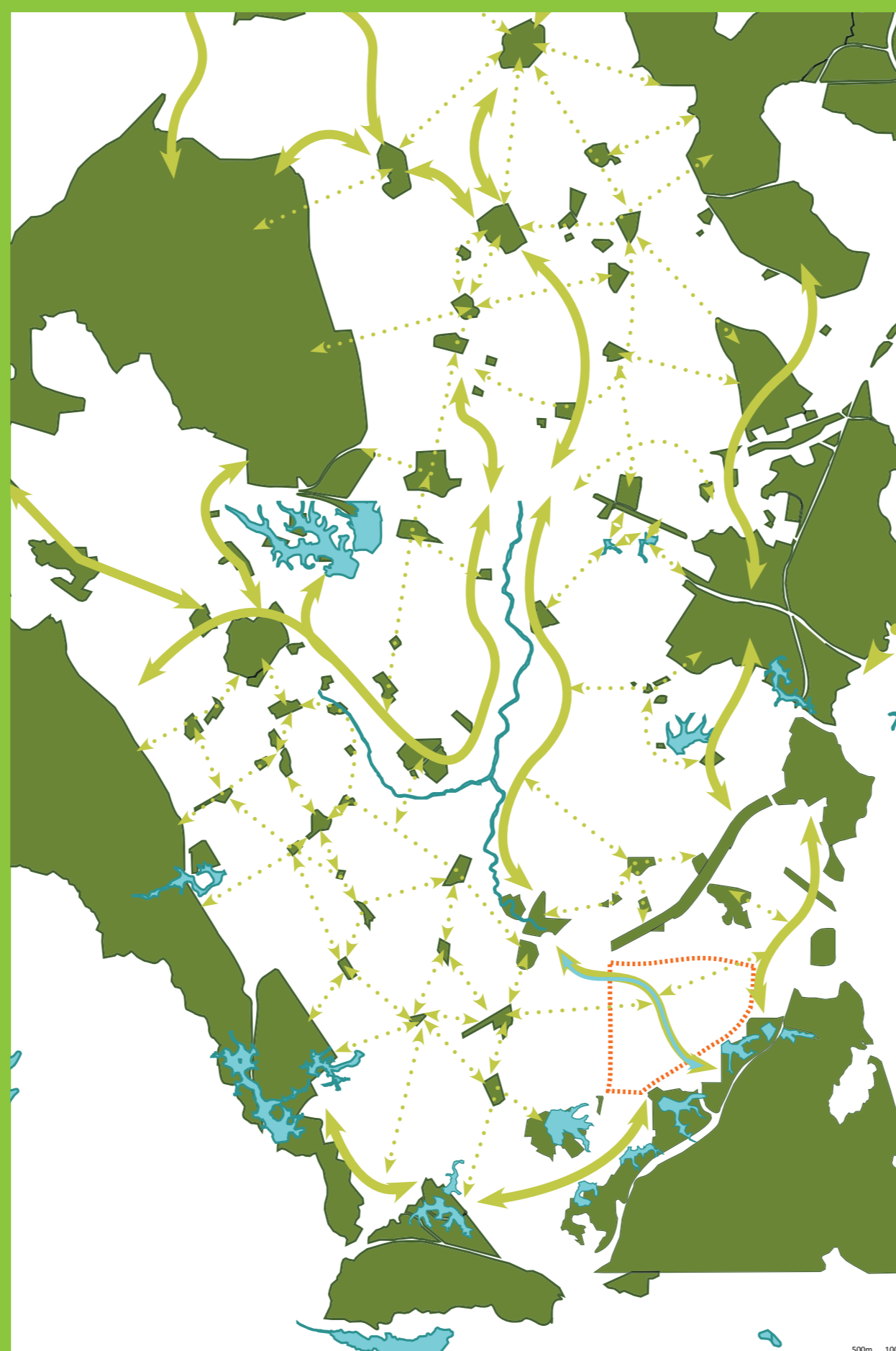
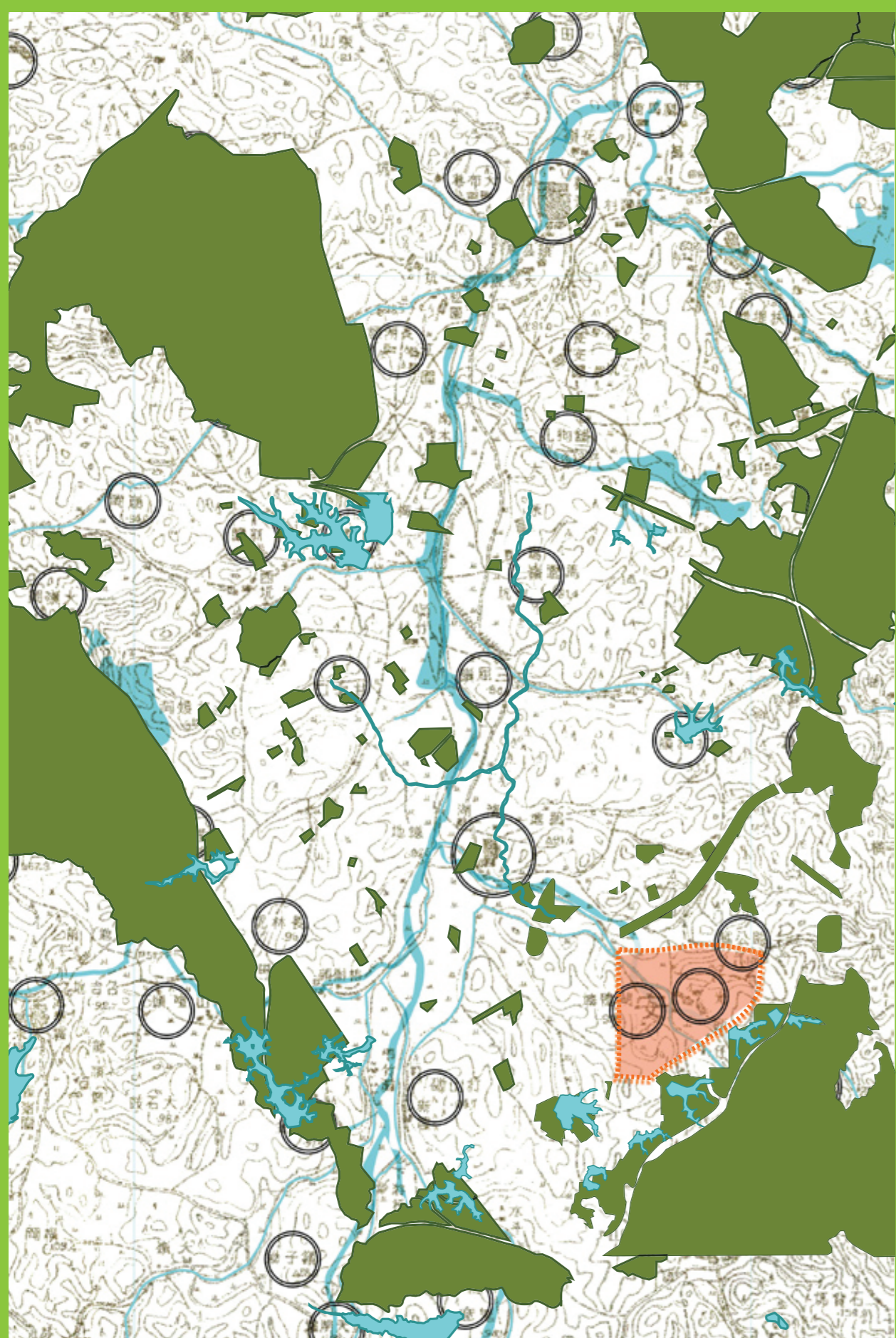


### Longhua Regional Interconnections

#### 龙华地区内的相互联系

Proposed regional open space flows connecting and encircling Bantian (right) are based on the current regional open space plan, topography, and sites of historic or geographic significance (left).

建议的区域开放空间系统（右）结合了现有的区域开放空间规划、地形地貌以及有历史、地理重要性的场地（左）。



FIFTH GARDEN

### GOALS 目标

**A identify open space within the initial development and land use planning process**

在开发和土地规划初期就要预留开放空间

**B blend the function and design of multiple natural systems**

混合不同的多种自然系统的功能和设计

**C expand upon physical proposals by considering the challenges posed by implementation and regulation**

在物质规划的基础上考虑实施和法规带来的挑战

### Regulation & Community Education 法规和社区教育

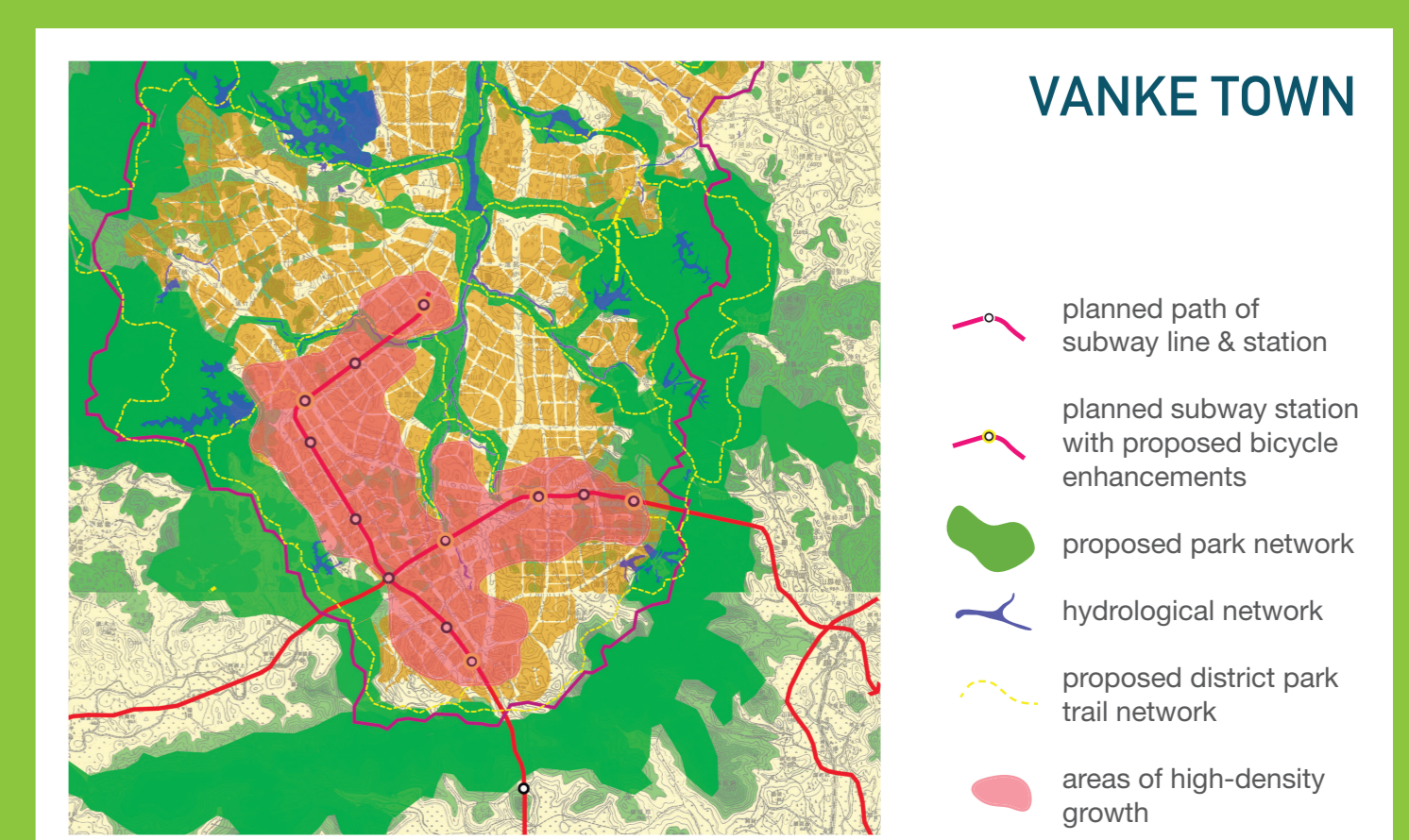
Implementing natural system proposals demands carefully crafted regulations, multiple funding sources, and community cooperation and awareness that can come from public education and programming.

自然系统的实施计划依赖于仔细考虑的法规、多方面的资金来源以及社区的合作、这需要借助公众教育和活动来达成。

### Bantian Jade Necklace 坂田的玉项链

A projected map of Longhua in 2025, depicting restored natural systems, interconnected open space buffers, and growth focused in high-density areas near transit stops.

我们绘制的龙华地区2025年的规划图描述了重新恢复的自然系统、包括相互联系的开放空间缓冲带和围绕地铁站点的高密度开发。



# COMMUNITY SYSTEMS 社区系统

Establish a network of interconnected and highly accessible community facilities to meet resident needs and enhance connections among people and services

建立一个社区服务设施相互联系、高度可达的网络满足居民需要并加强人与人、人与设施之间的联系到达的公共空间。

To be sustainable, residential development must attend to the community need for schools, health care, and public facilities by creating financially sustainable, environmentally responsible, equitable and adaptable community facilities.

可持续住区发展必须满足社区对学校、医疗和其他公共设施的需求、这样才能建立经济上可行、环境友好、平等适宜的社区

## IDENTIFYING INTER-RELATIONSHIPS

找出设施间的相互联系

The various types of community facilities are intertwined by complimentary roles and shared users. Recognizing and taking advantage of these relationships optimizes the functionality of the facilities and enabling them to best serve residents.

不同类型的社区设施互相联系补充并分享客户。认识并利用这种关系可以优化设施的功能使其更好的为居民服务



## LOCATING EXISTING FACILITIES

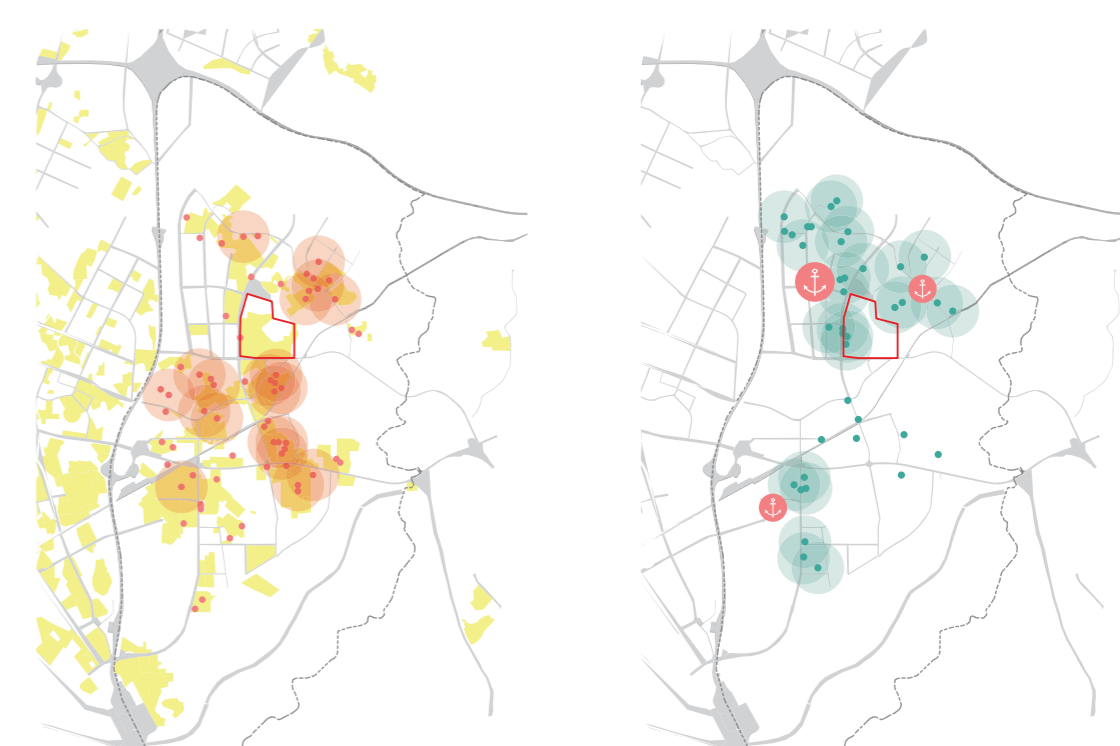
定位现有的设施

Thorough analysis identifies existing retail, service, education, and health facilities on multiple scales. Note the different types of facilities at each scale and the manner in which they are distributed.

深入分析确定现有的零售、服务、教育、卫生设施、多尺度。请注意不同类型的设施在每个规模和以何种方式分配。

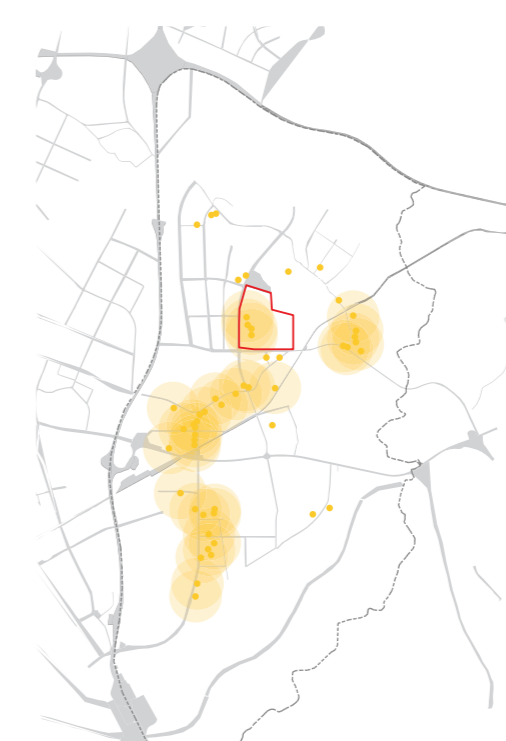


district 地区 (Vanke Town)

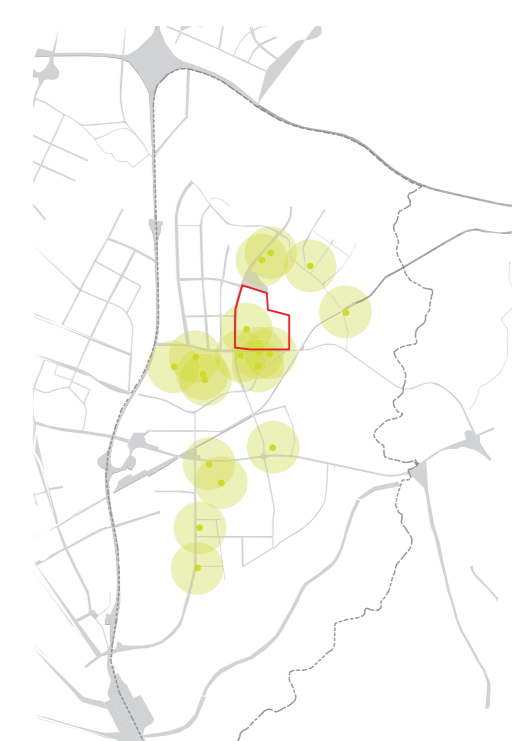


CONVENIENCE STORES  
便利店

RESTAURANT & ENTERTAINMENT  
餐厅和娱乐设施

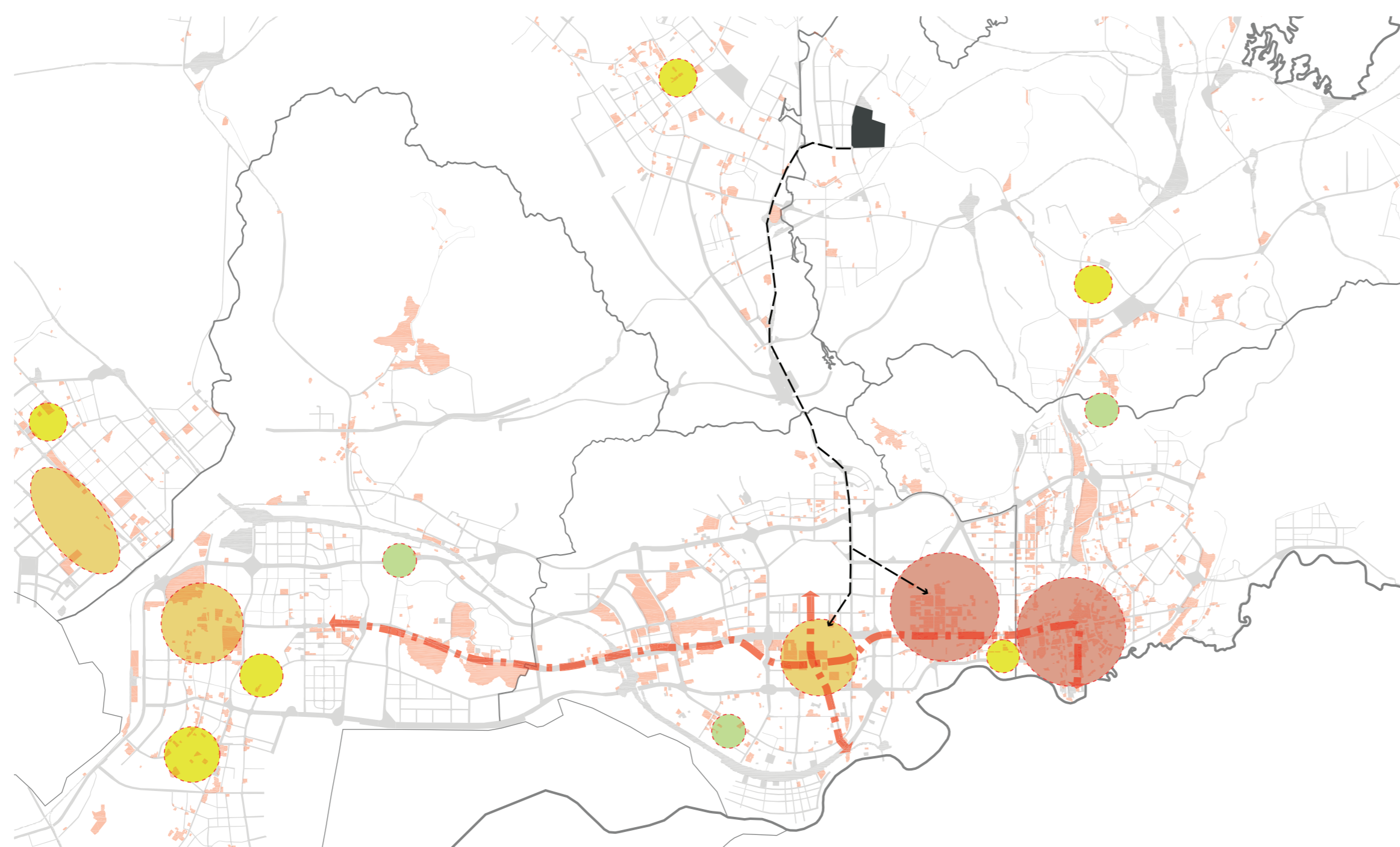


SPECIALTY STORES  
专业商店



SERVICE PROVIDERS  
服务提供店

city 城市 (Vanke Town)



Existing facilities can be mapped by their specific purpose (site), or documented as an entire system (city, district).

可以按照现有设施的功能定位于地图上、也可以在全市或地区范围作为整个系统来记录。

# ANALYZING COMMUNITY SYSTEMS

## 分析社区系统

Creating a sustainable system of community facilities requires thorough analysis of the many types of facilities involved. This analysis needs to not only consider the distribution and functionality of each type of facility on its own, but also how they interact as a system of systems.

建立一个可持续的社区服务系统需要对潜在的设施种类作全面的分析。这个分析不仅需要考虑到每个设施各自的分布和功能、也要考虑它们之间的关系和系统。

## establishing hierarchy 量化计算

Facilities can be logically grouped into clusters that provide different levels of service. A Level 1 cluster is very neighborhood focused and only provides the most basic services, while a Level 5 cluster serves residents from across the city.

设施可以按照其提供的服务等级来分组。例如第一级的设施聚焦于社区的基础性服务；第五级则为全市居民服务。

APPROPRIATE NODE	FACILITY	TYPE
1 Pedestrian Road Intersection	Community Health Worker	Healthcare
	Kindergarten	Education
	Pocket Park ~100 m2	Open Space
2 Local Road Intersection	Neighborhood retail	Retail
	Primary School	Education
	Open space corridor / Green Boulevard	Open Space
3 Collector Road Intersection	Neighborhood Park	Open Space
	Neighborhood Center	Retail
	Community Health Center	Healthcare
4 Transit Stop	Clinic	Healthcare
	Secondary School	Education
	Specialty Retail (District Sub-Center)	Retail
5 Transit/Arterial Road Intersection	Nursing Home	Healthcare
	Community Hospital	Healthcare
	Vocational School	Education
	Destination Park	Open Space
	Large Shopping Center	Retail
	Tertiary Hospital	Healthcare
	College	Education

## calculating quantity 建立等级

The required number of each type of facility in a neighborhood depends on the size of the population to be served.

服务人群数量决定每种不同设施的量化指标

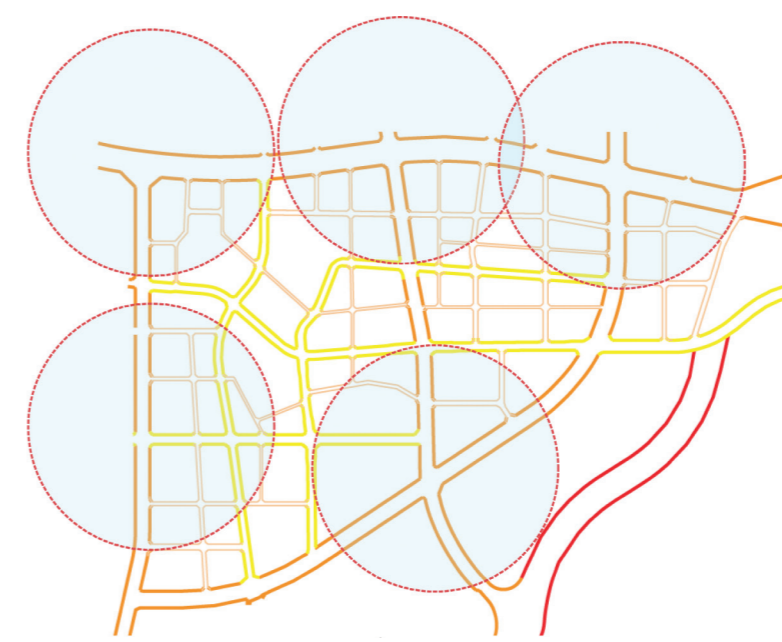
Facility	Type	Lot Size (Sq. Meters)	Catchment Population (People Directly Served / Amount per Person Standard)	Number of Facilities
Community Health Worker	Healthcare	n/a	1,500	70
Kindergarten (幼儿园)	Education	n/a	7,692	14
Pocket Park ~100 m2	Open Space	100	n/a	n/a
Neighborhood retail (日常用品)	Retail	1,500	1,000	105
Primary School (小学)	Education	n/a	18,750	6
Open Space Corridor / Green Boulevard	Open Space	n/a	n/a	n/a
Neighborhood Park	Open Space	500 - 800	n/a	n/a
Neighborhood Center	Retail	5,680	10,000	10
Community Health Center (市区健康服务中心)	Healthcare	n/a	20,000	5
Clinic (门诊部)	Healthcare	n/a	20,000	5
Secondary School (中学)	Education	n/a	65,455	2
Specialty Retail (District Sub-Center)	Retail	14,200	40,000	3
Nursing Home	Healthcare	n/a	n/a	n/a
Community Hospital (社区医院)	Healthcare	n/a	60,606	2
Vocational School	Education	n/a	347,826	0
Destination Park	Open Space	90,000	n/a	n/a
Large Shopping Center (购物园)	Retail	19,880	70,000	1
Tertiary Hospital (医院)	Healthcare	n/a	121,212	1
College (大学)	Education	n/a	347,826	0

## determining location 选址

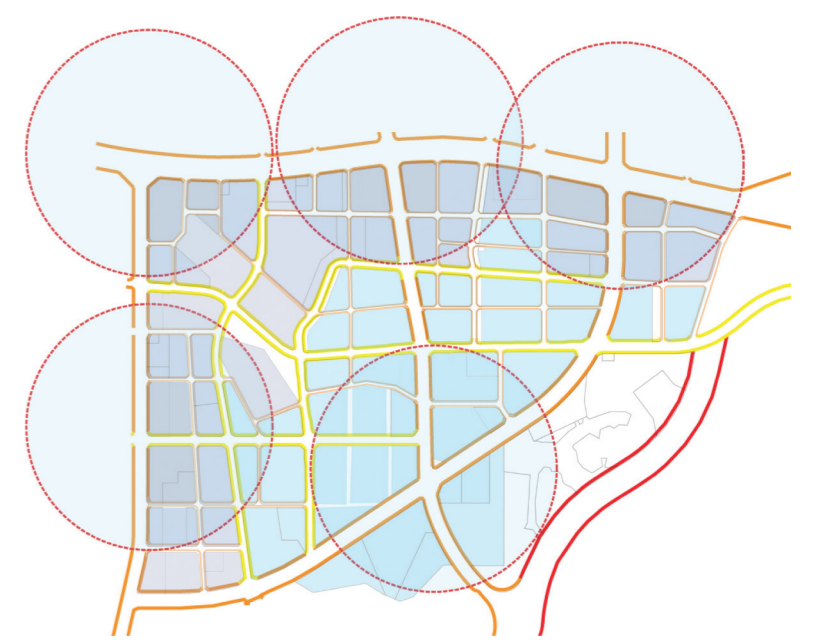
Placing community facilities within a neighborhood requires a thorough understanding of area's fabric. Facilities need to be placed where they are accessible to an appropriate constituency.

在社区中为配套设施选址必须建立在对周边地区完善的理解上。设施的位置必须令合适的人群容易到达。

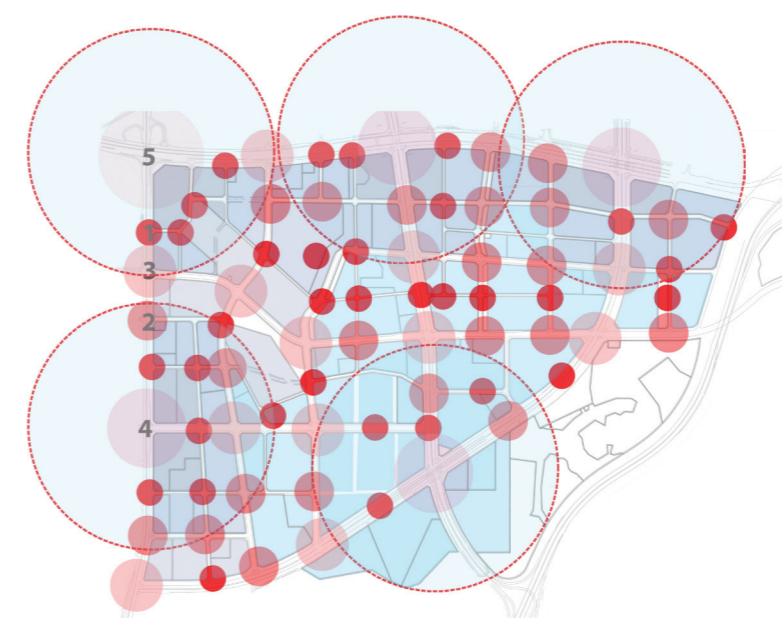
1 Road hierarchy marked with 500m radius distance from transit nodes



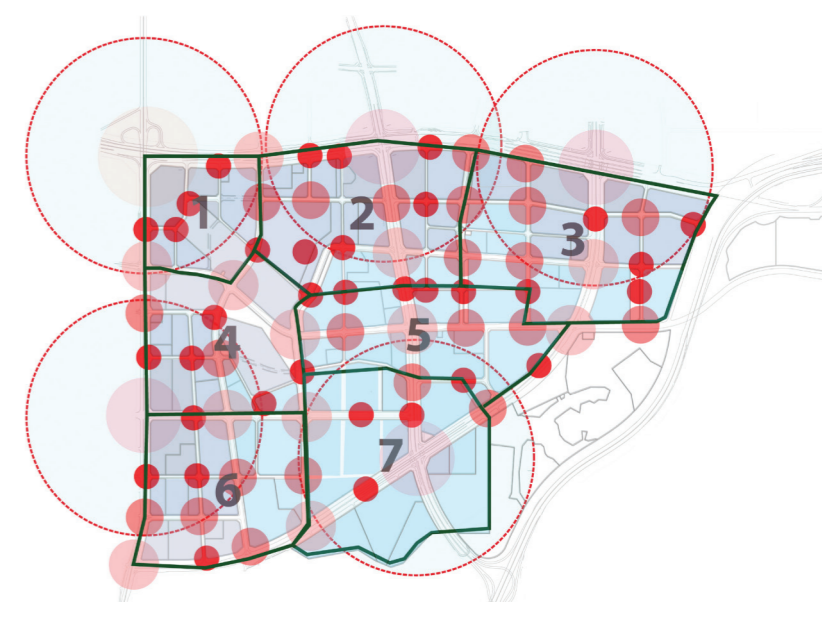
2 Roads and transit distance overlaid with proposed building density



3 Community facilities placed by appropriate size



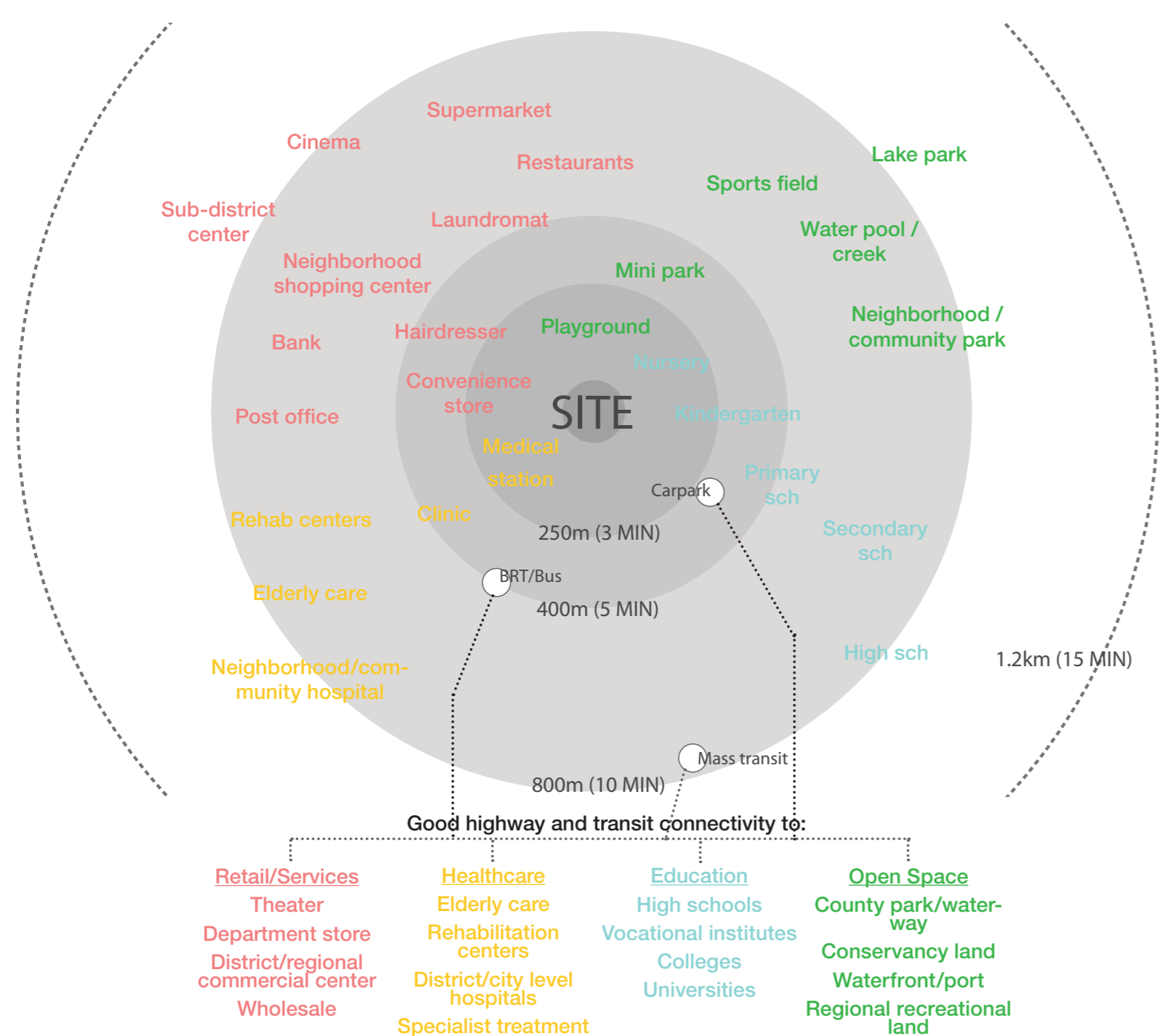
4 Clusters of multiple community facility centers



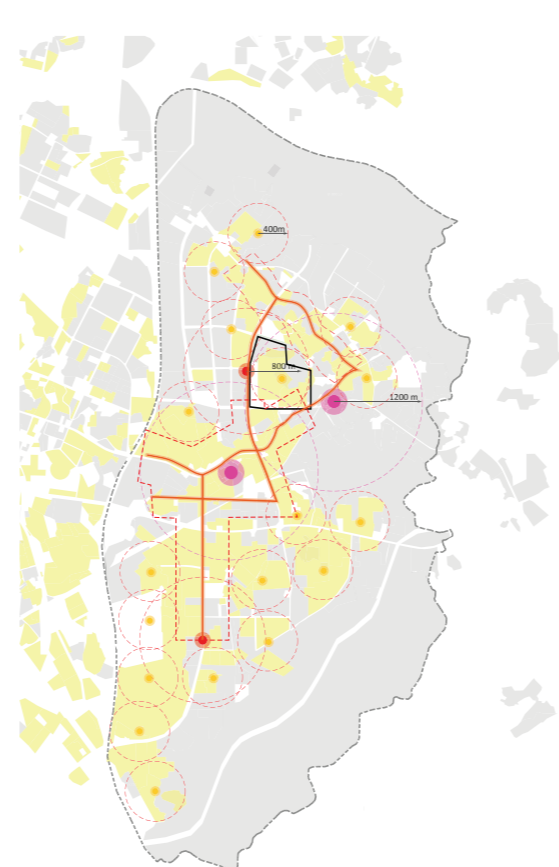
## accessibility 评价可达性

Residents need to be able to reach community facilities using a variety of means, from walking to public transit. Several different types of diagrams can help planners understand how easily people can access the facilities.

居民能够以包括步行、公交等多种交通方式到达社区配套设施、下面不同的分析图可以帮助我们认识居民到达设施的难易程度。



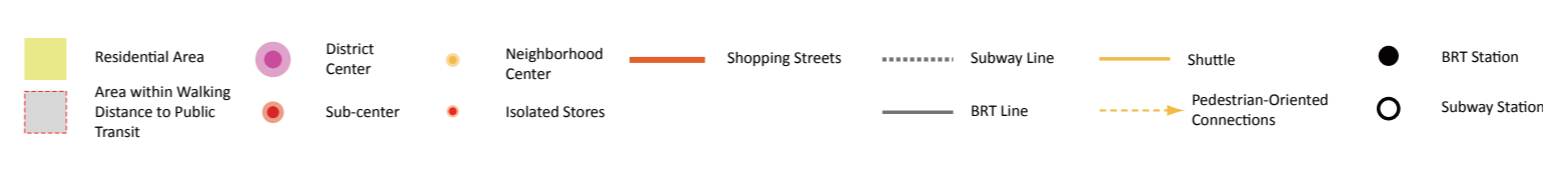
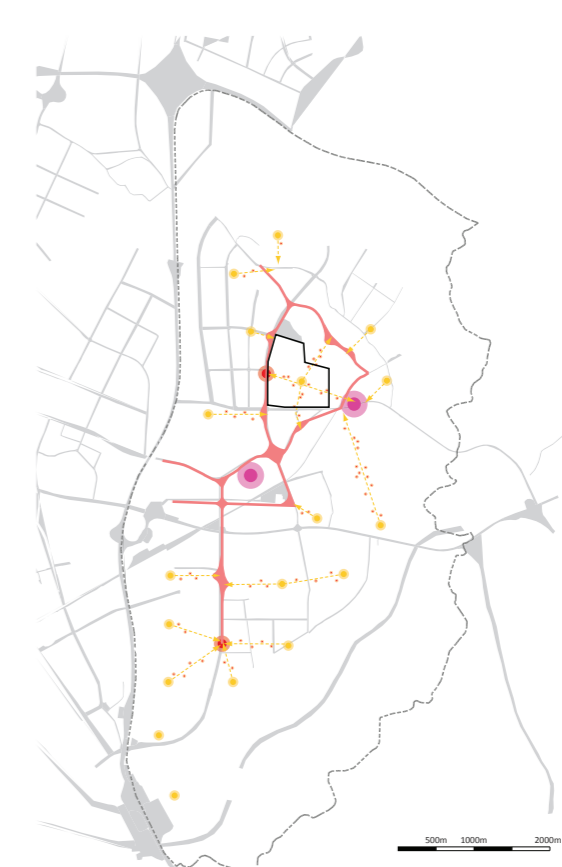
### WALKING DISTANCES



### TRANSIT ACCESS



### ISOLATED RETAIL



# COMMUNITY 社区

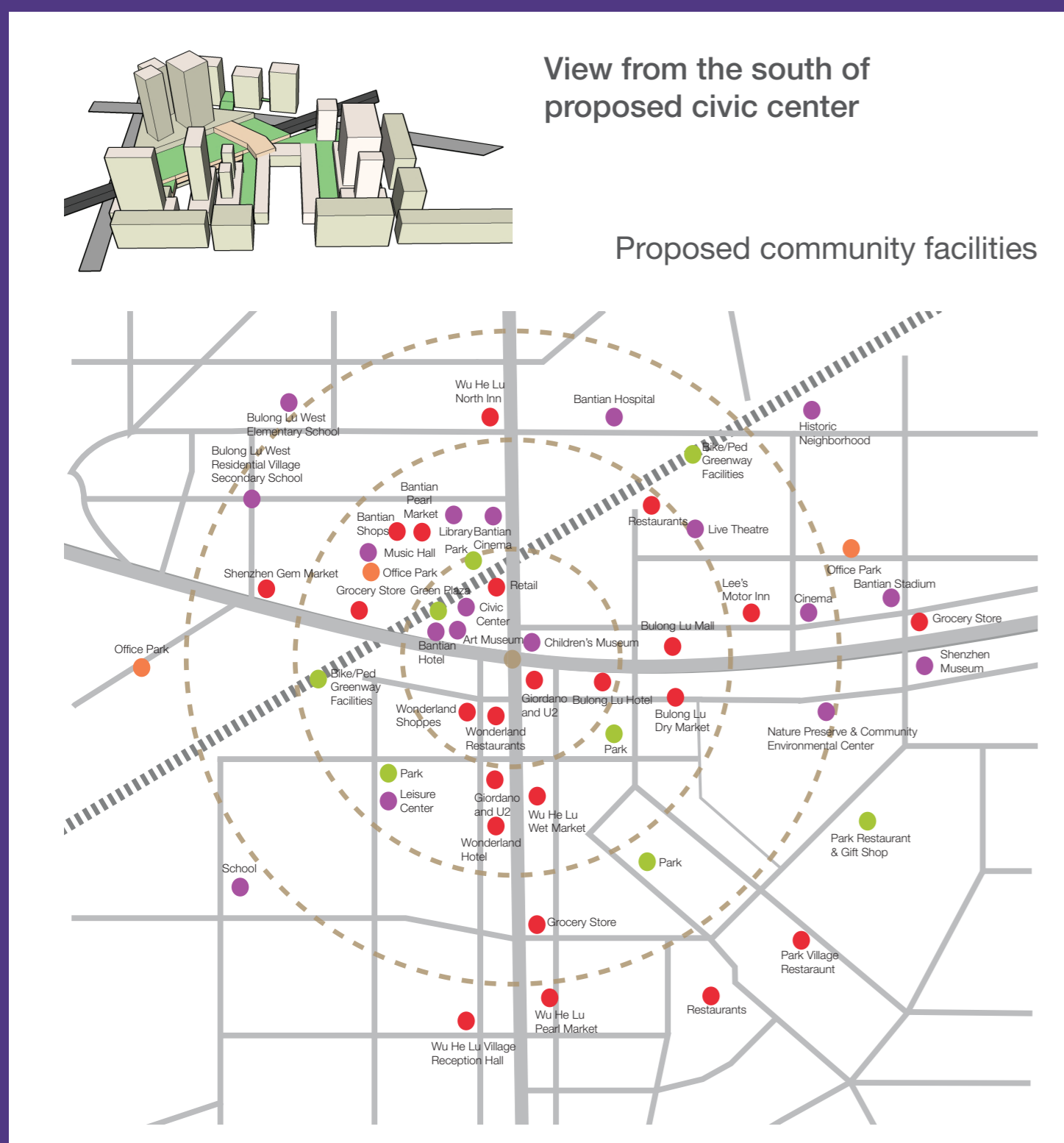
## PLANNING STUDIO PROPOSALS 规划设计小组提出的建议

### GOALS 目标

- A fulfill residents' demand for health care, education, retail and services**  
满足居民对医疗、教育、商业和其他服务的需求
- B maximize the accessibility and spatial equity of shared facilities**  
最大程度拓展设施的可达性和对使用者的公平性
- C strengthen community connections both within and around the development**  
强化社区内外部的空间联系

### Wonderland Civic Center 四季花城边上的城市综合体

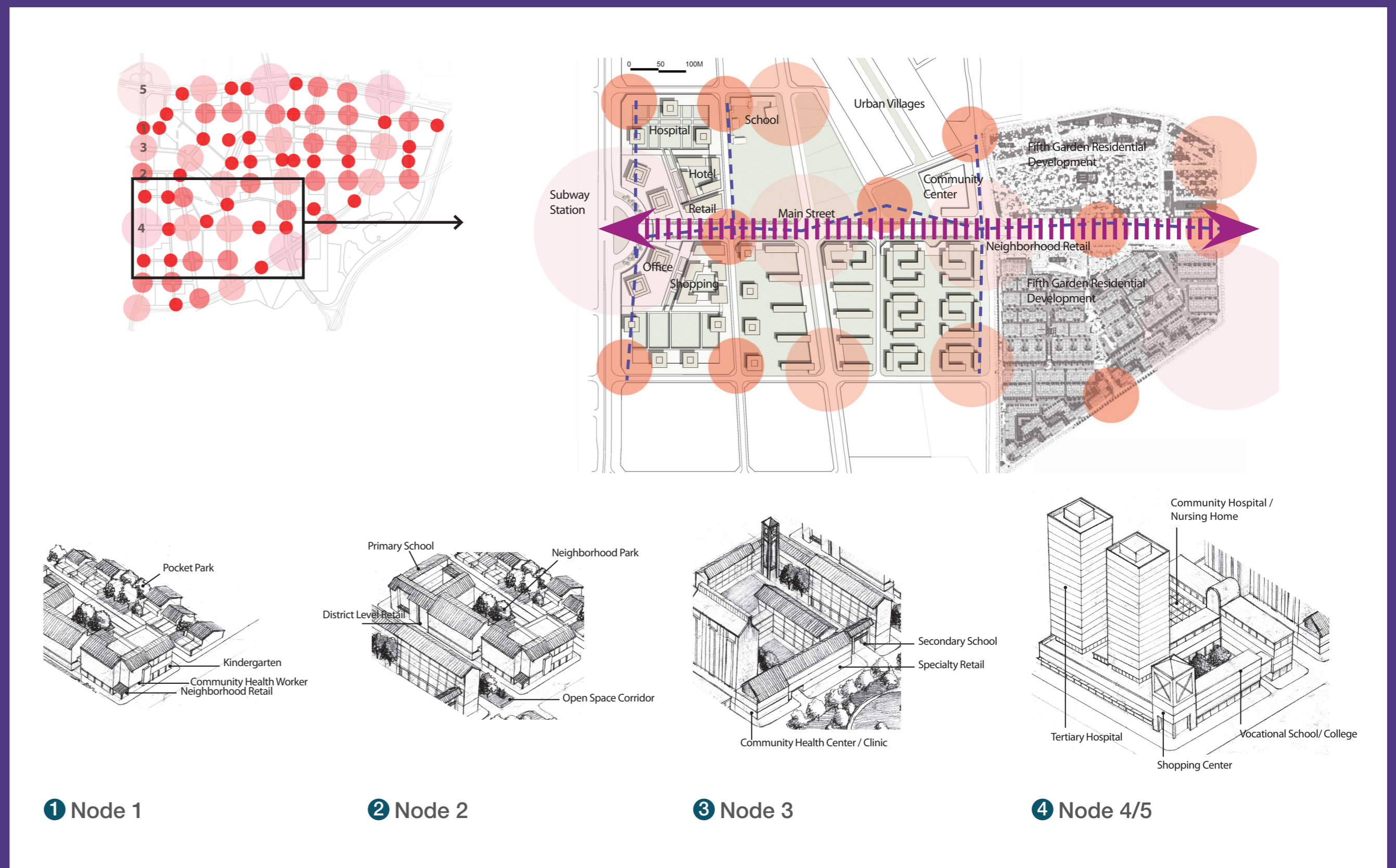
The community facilities portion of this overall site plan highlights the dispersion of parks, cultural centers, and retail establishments, which focus around the proposed Civic Center at the heart of the development. 这个规划强调了围绕着当地市民中心的一系列公园、文化中心、商业零售设施。



### Nodes of Interaction 道路交叉口节点

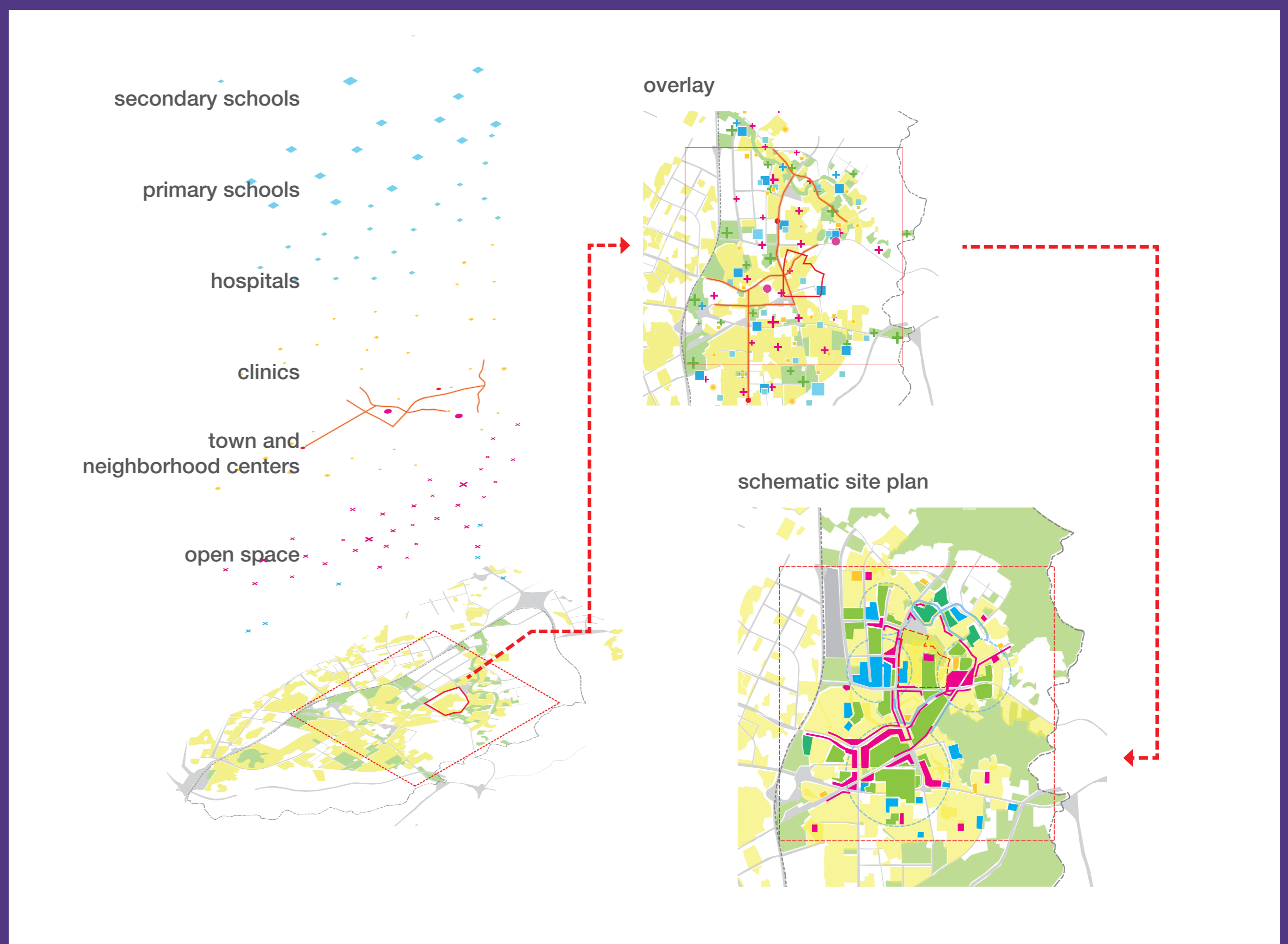
At a somewhat finer scale than the other proposals, these diagrams show how community facilities can be clustered to form nodes of service. Depending on the population and needs of the surrounding residents, some nodes provide only basic facilities such as kindergartens or community health workers while other nodes have higher-level service, such as secondary schools and a health clinic.

在比上一个规划案更小的尺度上、下面的示意图表达社区设施如何组合并形成服务节点。根据周边的人口和需求、有的节点只提供诸如幼儿园和社区医疗站这样的基本服务、而另一些节点则提供更高等级的设施、如中学和诊所。



### Four Clusters of Facilities 四个组的设施

Overlaying the separate analyses of educational, health, commercial, and open space facilities led to this overall plan of four clusters, each with a different focus: (from north to south) district park, educational cluster, district commercial cluster, and mixed use cluster. 堆焊单独分析教育、卫生、商业、开放空间设施导致这一总体规划四组、每一个不同的重点：（从北到南）地区公园、教育组、区商业集群、集群和混合使用。



# MOBILITY SYSTEMS 可移动性系统

Connect people and places with a transportation network that emphasizes walkability and bikeability, providing equal access to all residents

借助一个交通网络把不同的人 and 地点联系起来、这个网络强调的是步行和自行车的使用、并且能够为所有居民提供平等的机会。

Rapid economic growth has led to equally rapid transitions in city structures, urban form and, consequently, urban mobility patterns, necessitating more and more roads and highways. However, recently built infrastructure has threatened non-motorized transportation facilities such as bicycle lanes and sidewalks, has resulted in road networks that correspond poorly with actual travel behaviors, and - if left unchecked - is likely to result in a Western-style pattern of extreme sprawl and congestion.

经济的快速发展导致了城市结构、形态以及相应的交通方式变化。也需要更多的道路和高速公路建设。但是近期建设的基础设施威胁到了非机动车设施、比如自行车道和人行道、这样导致了道路基础设施和人们的实际出行模式的离。如果没有改变、最终会形成西方式的过度城市膨胀和交通拥堵。

## SHENZHEN MOBILITY 深圳可移动性

### depicting accessibility 描述可达性

Accessibility refers to how many destinations one can reach in a given amount of time, regardless of distance or mode of travel. These diagrams suggest that the fine-grained street network of Boston, Amsterdam, Barcelona and Vienna allows for much greater accessibility than that of Fifth Garden in Shenzhen.

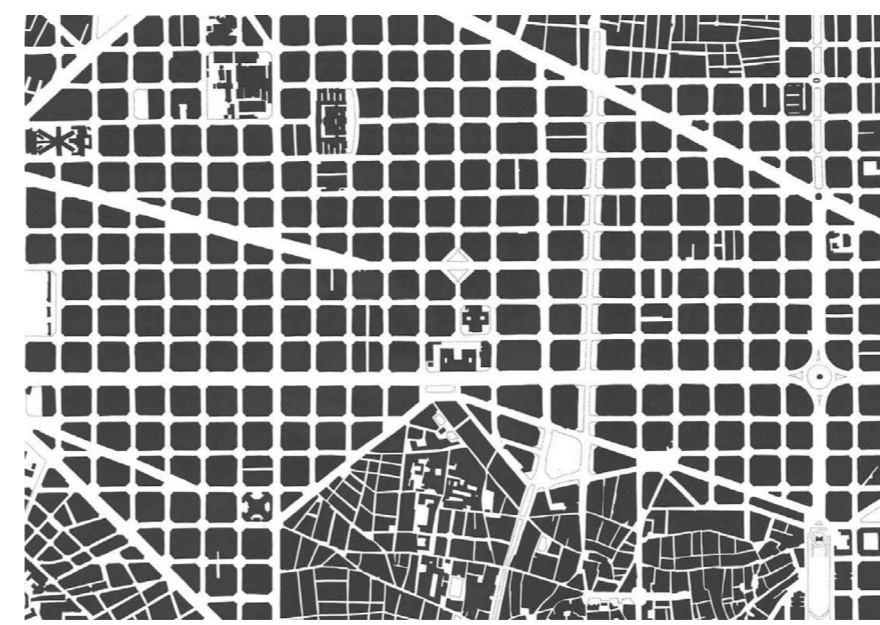
可达性指的是每个人在一定的时间内可以到达的目的地的数量、不论距离远近和采取的交通工具。这些示意图展示了波士顿、阿姆斯特丹、巴塞罗那和维也纳采用了密集的路网从而比深圳第五园地区有更好的可达性。



Boston



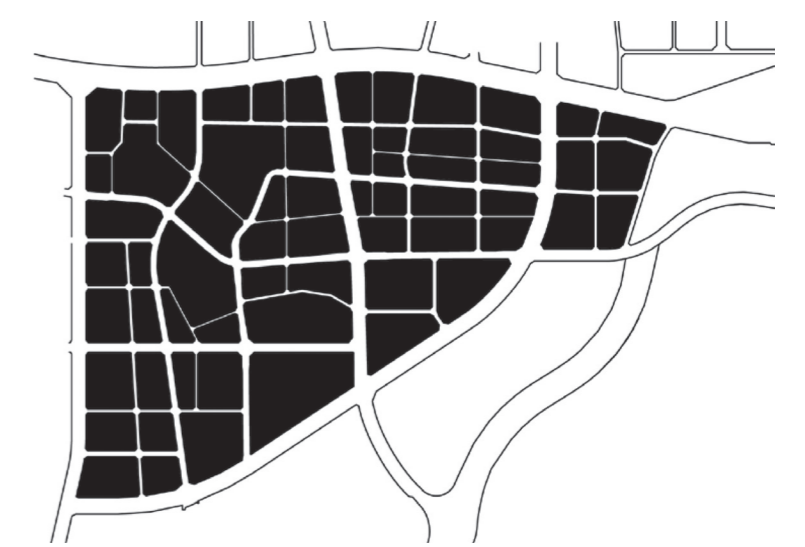
Amsterdam



Barcelona



Vienna



Fifth Garden 0 1 km

Sources: Michael Dennis (Boston, Amsterdam, Barcelona and Vienna), Ruifeng Tian and Eric Minikel (South Bantian)

### identifying users 确定使用者

Children, grandparents, young professionals, and everyone in between has different mobility patterns and needs - variations that must be weighed in the design of a mobility system.

可达性指的是每个人在一定的时间内可以到达的目的地的数量、不论距离远近和采取的交通工具。这些示意图展示了波士顿、阿姆斯特丹、巴塞罗那和维也纳采用了密集的路网从而比深圳第五园地区有更好的可达性。

User	Destination	Frequency (trips per month)	Maximum distance (km)	Mode
Couple (with children)	work	20	42	walking, bicycle, car, bus, subway, train
	basic services dry cleaning groceries	4 15	0.7 1.5	walking, bicycle
	other shopping	2	12	car, bus, subway, train
	restaurants	1	1	walking, bicycle, car
	visit family	1	50	car, bus, subway, train
	recreation	2	3	walking, bicycle, car, bus, subway, train

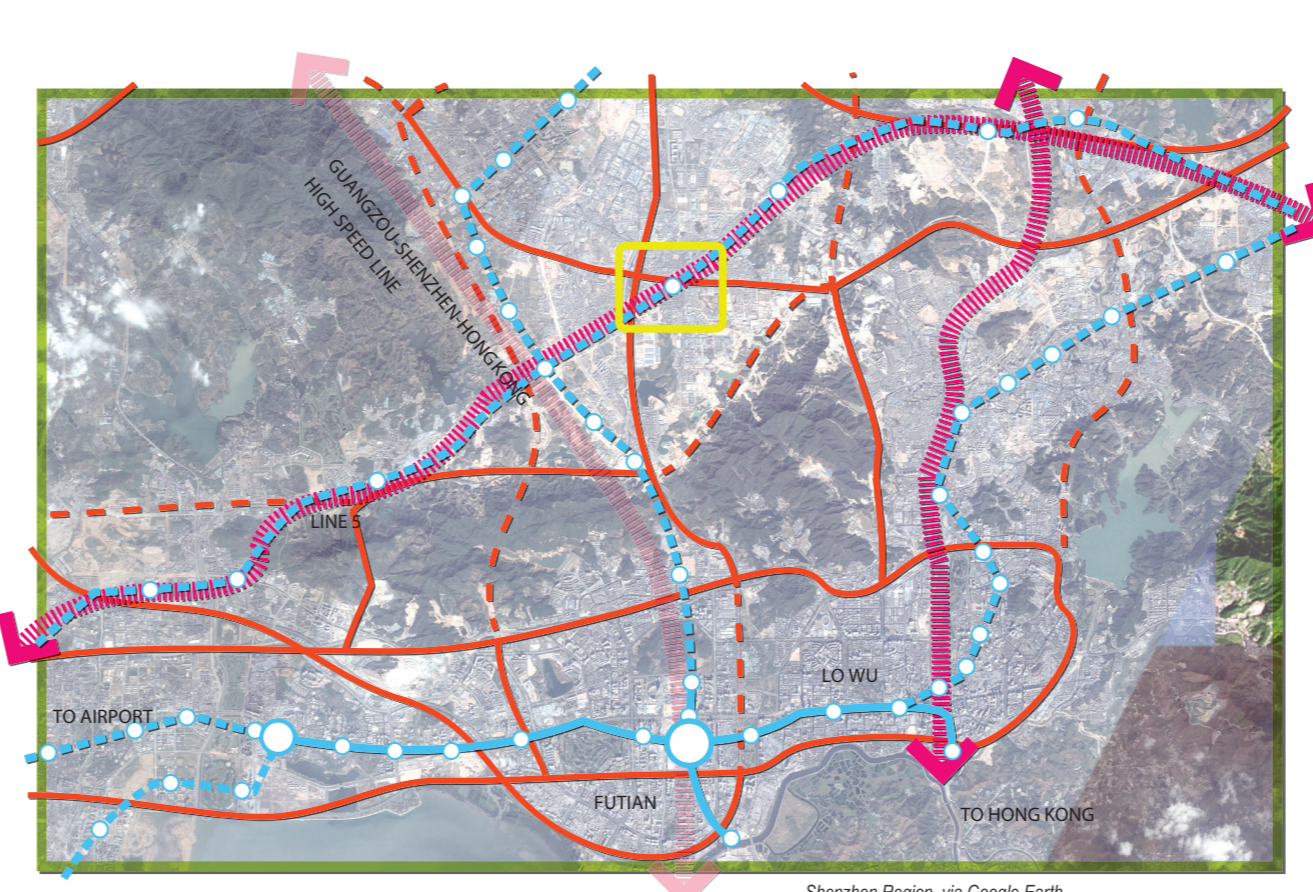
primary transit mode(s) used to reach destination  
 walking, bicycle, car, bus, subway, train

### evaluating context 评价周边情况

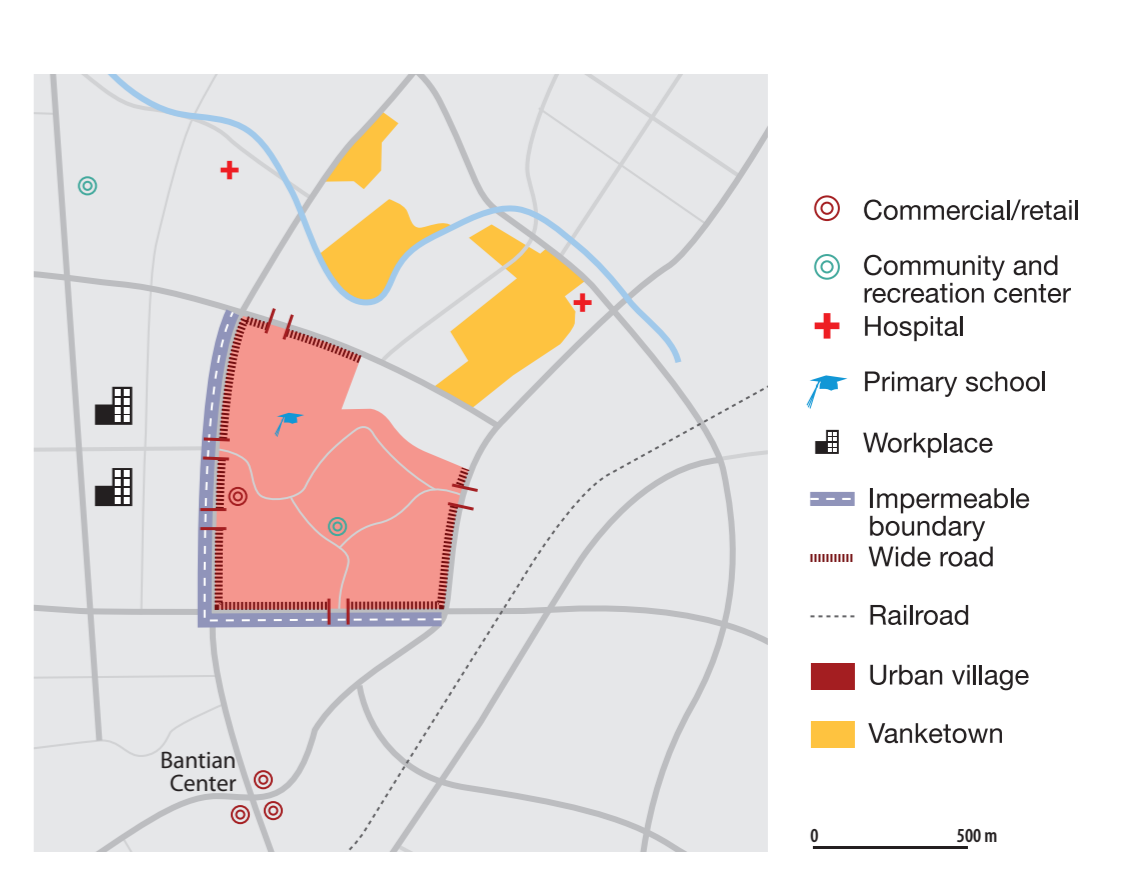
Transportation and land use are inherently linked, meaning that any analysis of mobility requires an assessment of existing transportation infrastructure as well as the many facilities and amenities that rely on it for access.

交通和土地利用实质上是相互联系的、所以任何可移动性的研究都要求分析已有的交通基础设施、以及依靠这些交通设施才能达到的服务设施。

#### REGIONAL CONTEXT - Shenzhen



#### SITE CONTEXT Vanke Town



#### IMPROVED MOBILITY

改善了的可达性

**ENVIRONMENT** 环境  
reduced carbon emissions  
减少碳排放

minimized energy consumption  
能源消耗最小化

**ECONOMY** 经济  
more efficient use of existing roads  
对现有道路更加高效的使用  
minimized need for public expenditure on new roads  
减少新建道路公共支出

**EQUITY** 社会公正  
amenities are accessible to a wider segment of the population  
更多人们可以达到服务设施

#### SUSTAINABILITY

可持续性

# UNDERSTANDING MOBILITY

理解可移动性

Infrastructure, land use and policy join together to influence the specifics of mobility in any given place. Thus, any effort to understand mobility must consider each of these three components, and even more importantly, the manner in which they interact.

基础设施、土地利用和政策一起影响当地的可移动性的具体细节。因此要理解可移动性就必须考虑这三个要素以及他们之间的相互作用。

## policy 政策

Mobility policy is the overarching set of ideas and priorities that forms the basis for a community's approach to the movement of people. Intangible policies eventually take a physical form, and can be either incentives or disincentives for use.

可移动性的政策是一系列思想和价值排序，它们形成基础来指导社区人群移动。抽象的政策最终形成物质形态，或者奖惩措施。

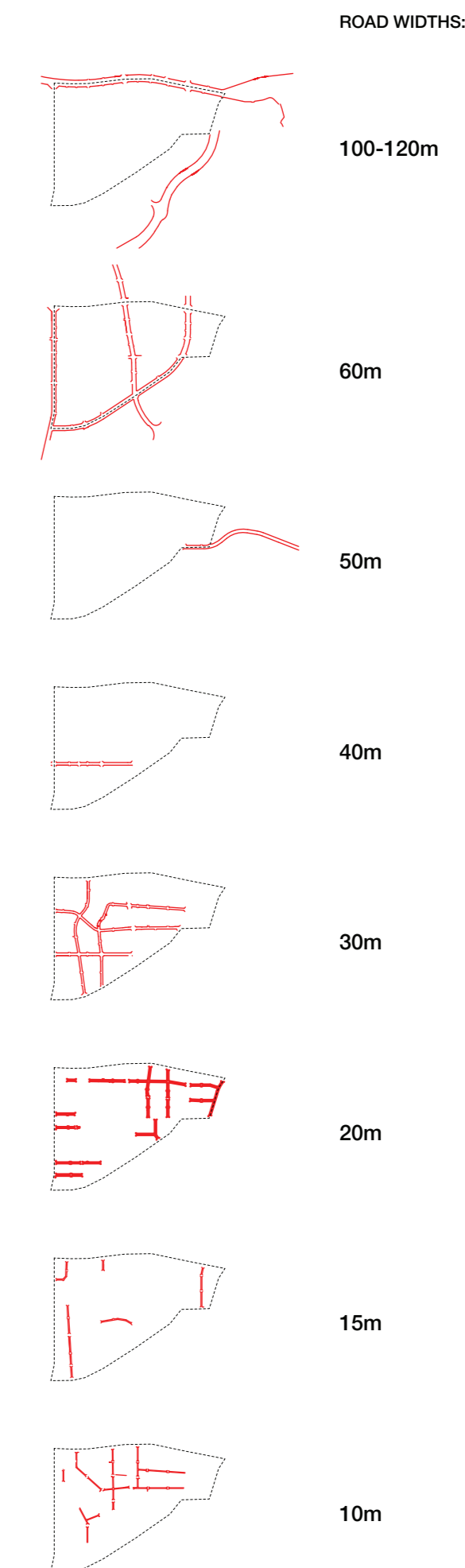
	Incentives (Carrots)	Disincentives (Sticks)
Policy	<ul style="list-style-type: none"> <li>National government promotion of urban transportation planning</li> <li>Education of transportation and land use planners</li> <li>Tiered (demographic-based) fare pricing</li> <li>Transit-oriented property tax capitalization funding</li> <li>Location efficient mortgages (LEMs)</li> <li>Provision of employee housing</li> </ul>	<ul style="list-style-type: none"> <li>Dynamic fuel pricing</li> <li>Maximum age driving limits</li> <li>Impact fees</li> <li>Congestion pricing</li> <li>Odd/even driving days</li> <li>Congestion pricing for parking</li> </ul>
Form	<ul style="list-style-type: none"> <li>Maintenance subsidy for non-motorized transit paths</li> <li>Design guidelines for non-motorized transit paths</li> </ul>	<ul style="list-style-type: none"> <li>Minimum FAR requirements</li> <li>Minimum connectivity index score</li> <li>Pedestrian overlay district (POD)</li> <li>Minimum diversity index score</li> <li>Maximum parking allowances</li> <li>Satellite parking network</li> </ul>

## infrastructure 基础设施

Streets are a physical determinant of mobility. The many sizes and types of streets can be understood as a hierarchy of interconnected networks, as depicted in the diagrams below.

基础设施、土地利用和政策一起影响当地的可移动性的具体细节。因此要理解可移动性就必须考虑这三个要素以及他们之间的相互作用

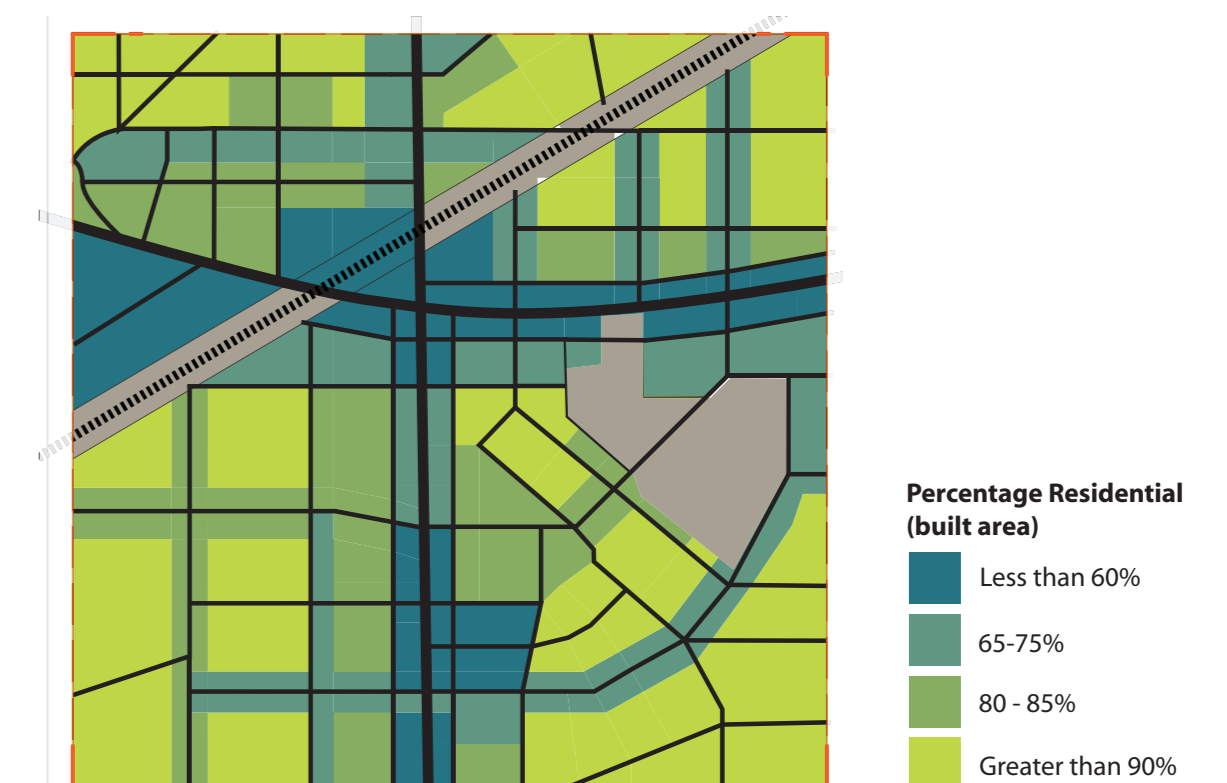
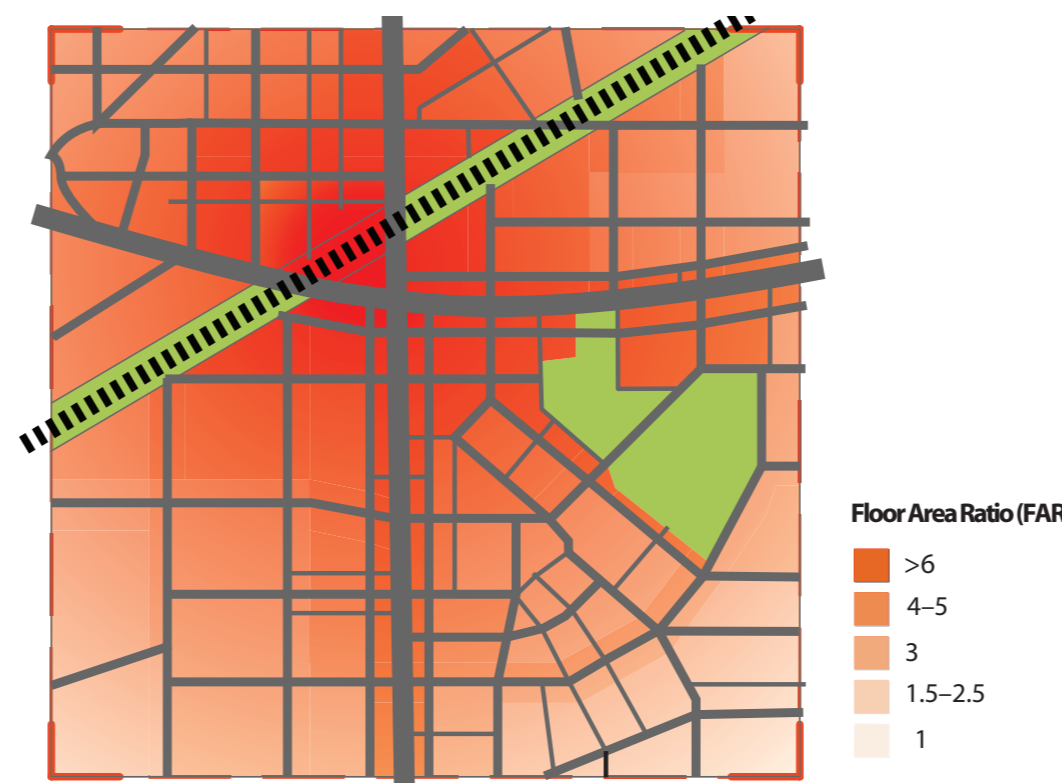
	ARTERIAL	ECO - ARTERIAL	BOULEVARD	ECO - BOULEVARD	COMMUNITY	XIANG - SHARED	XIANG - BIKE & PED
CAR LANES	6	6	4	4	2	1	0
BUS	●	●	●	●	●	X	X
BIKES	separated lanes at sidewalk level 4m wide	separated lanes at sidewalk level 4m wide	separated lanes at sidewalk level 3m wide	separated lanes at sidewalk level 3m wide	separated lanes at sidewalk level 3m wide	marked lanes at sidewalk level 3m wide	whole street
PARKING	X	X	garage access	garage access	parallel garage access	parallel garage access	X
CURB CUTS	X	X	infrequent	infrequent	frequent	frequent	X
LANDSCAPE	street trees edge medians median strips	street trees edge medians median strips	street trees edge medians median strips	street trees edge medians median strips	street trees edge medians median strips	street trees edge medians	street trees
WIDTH	50m	65m	41m	57m	32m	8m	8m



## land use 土地利用

Mobility is as much about destinations as the methods for getting to them, and thus is intrinsically tied to land use. Ideally, land use and mobility planning are integrated in order to provide optimal access to the most frequently used and densely populated areas. The diagrams below indicate how this might be accomplished.

可移动性一方面关于目的地另一方面关于如何到达它们、因而和土地利用内在相关。最理想的是土地利用和可移动性规划整合在一起为最常用的设施和密集的公共场所提供可达性。下图展示了如何做到一点。



# EVALUATING MOBILITY

评价可移动性

The measures of mobility are countless, but can be generally grouped into assessments of circulation and assessments of connection. Circulation deals with the movement of people and vehicles within a network of paths, while connection looks at the barriers (real or perceived) that might prevent movement from one area to another. Taken together, the two measures can help identify congestion points and poorly functioning stretches of roads, helping planners direct their mobility-improvement efforts.

评价可移动性的手段数不胜数、但总的来说分为对动线的评价和对联系的评价。动线处理人和车辆在一一定的路网中的移动；联系则关注妨碍点到点运动中的真实和感知中的障碍。结合这两者就可以帮助判定拥堵点和功能失效的路段、帮助规划师提出可移动性的改进计划。

## circulation 动线

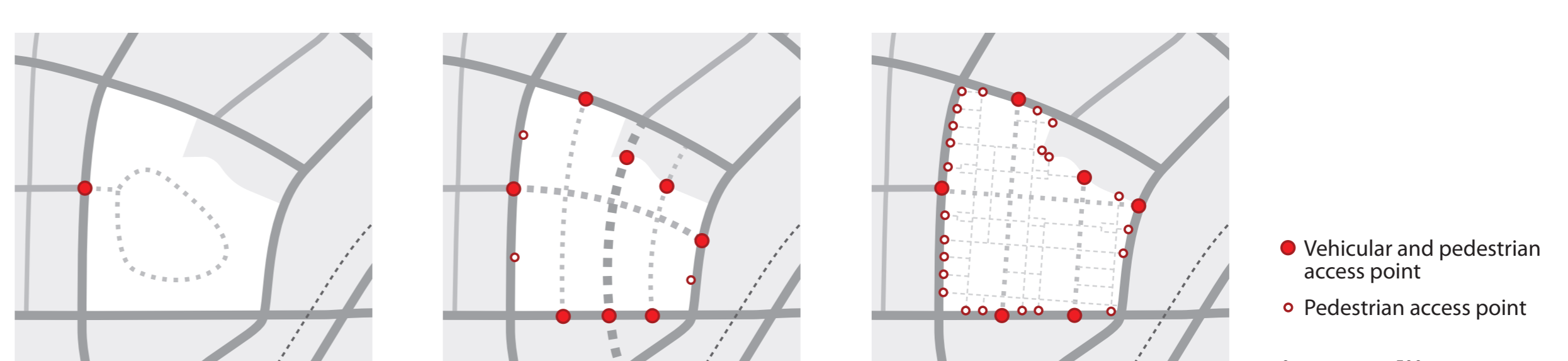
Vectors depict both the direction and the intensity of movement in this diagram of an ideal circulation pattern.

右面理想的动线图中表示出移动的方向和运动强度。

## connection 联系

This set of diagrams considers the degree of connection provided by three different street network types.

下面这组示意图考虑三种可能的道路系统带来的连接程度。



# MOBILITY 可移动性

## PLANNING STUDIO PROPOSALS 规划设计小组提出的建议

### GOALS 目标

**A provide equitable access to transportation systems**

平等的向每个人提供交通系统服务

**B reduce environmental impacts of transportation**

减少交通对环境的冲击

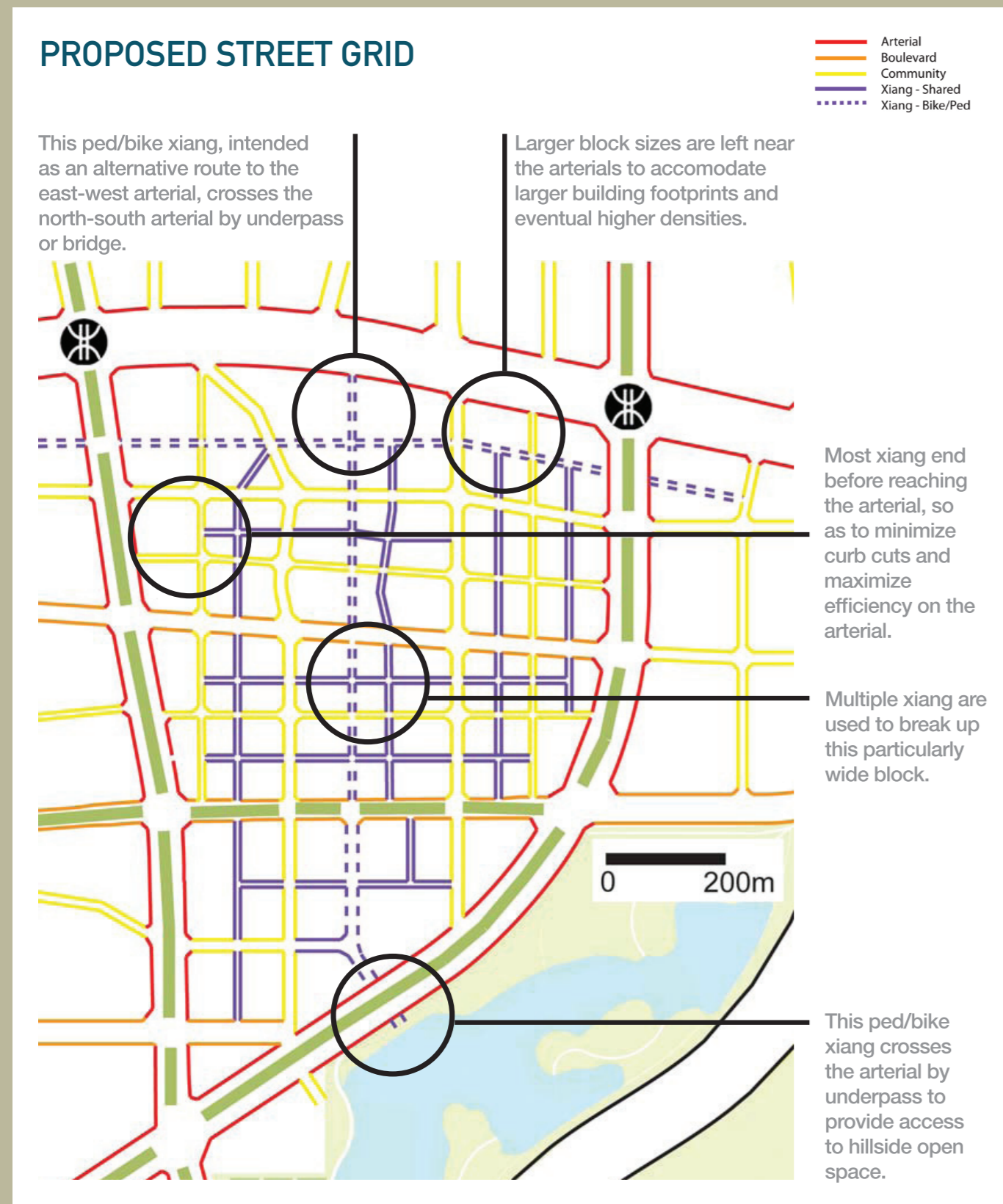
**C increase multi-modal transit usage and decrease automobile usage**

增加多种模式的公共交通使用并减少小汽车的使用

### A, B, C, X Street Hierarchy 道路等级规划

This proposal focuses on developing a hierarchy of Arterial streets, Boulevards, Community streets and Xiang (A, B, C, X) to improve accessibility throughout the site. The diagram to the far right shows how this approach provides a finer grain of accessibility than allowed for in the current plan.

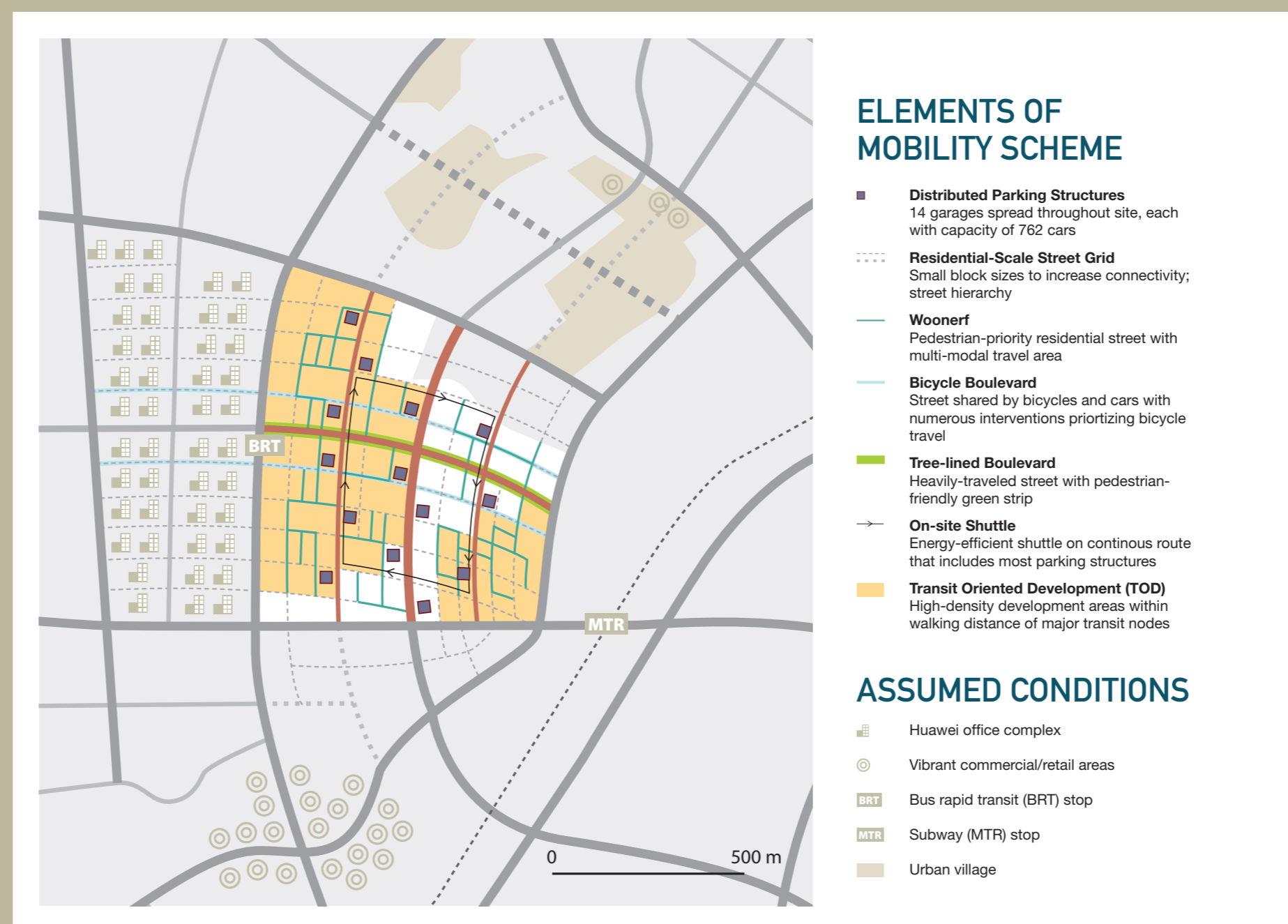
这部分建议聚焦于发展一套干道、景观大道、社区道路和街巷的ABCX道路等级系统、用来提高整个地区的可达性。右面的示意图展示了这一建议如何比现有规划提供更好的可达性。



### Developing a Proposal 提出再开发建议

Most proposals depend on a blend of site analysis and lessons gleaned from similar cases in other locations. The diagram below sketches out the basic elements of a proposed mobility system, which would then be further developed into tangible urban design as shown in the Wonderland and Fifth Garden proposals below. The Regent's Park case study (right) is an example of a key component of the proposal: breaking large blocks into smaller ones.

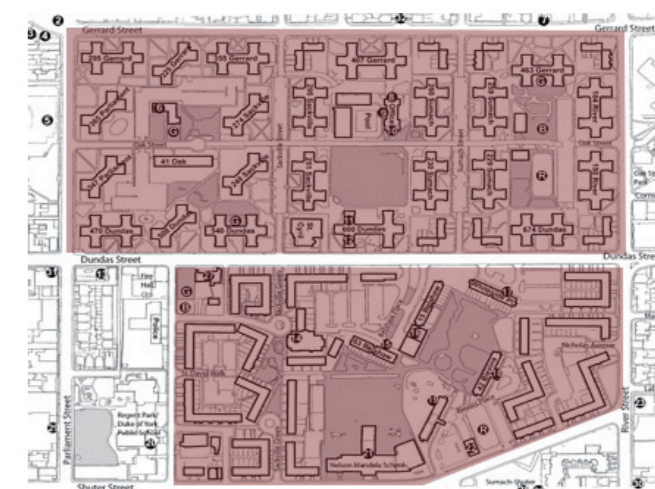
建议的提出依赖于对场地的分析以及其他地方类似案例的总结。下图中表示出对万科城地区的可移动性建议、这些基本元素会发展成为可操作的城市设计方案。右图是摄政公园的案例、说明把大街区分割成小块街区的重要性。



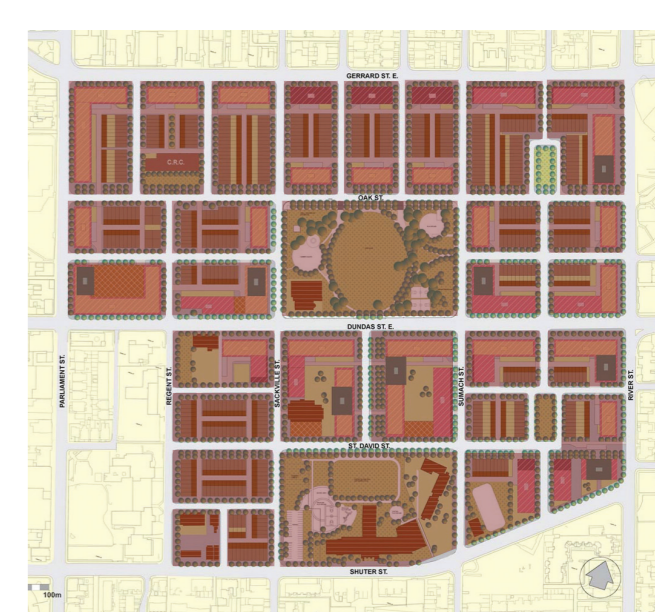
### Case Study: REGENT'S PARK, TORONTO



**CONTEXT:** Regent Park, shown in red, is surrounded by a fine-grained street grid. Source: Google Earth.



**BEFORE:** Site plan of Regent Park in Toronto, Canada before revitalization. Source: Toronto Community Housing.

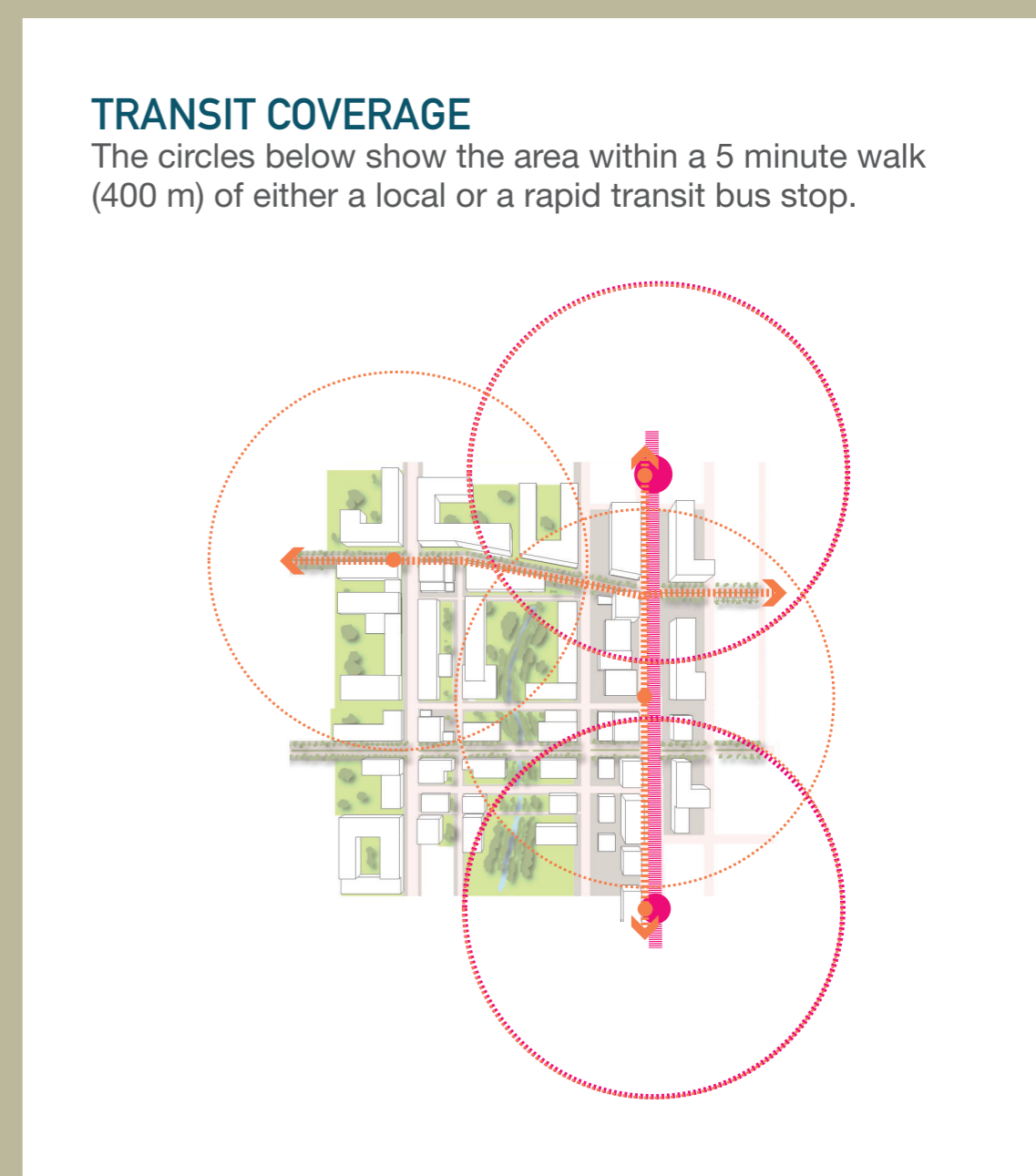
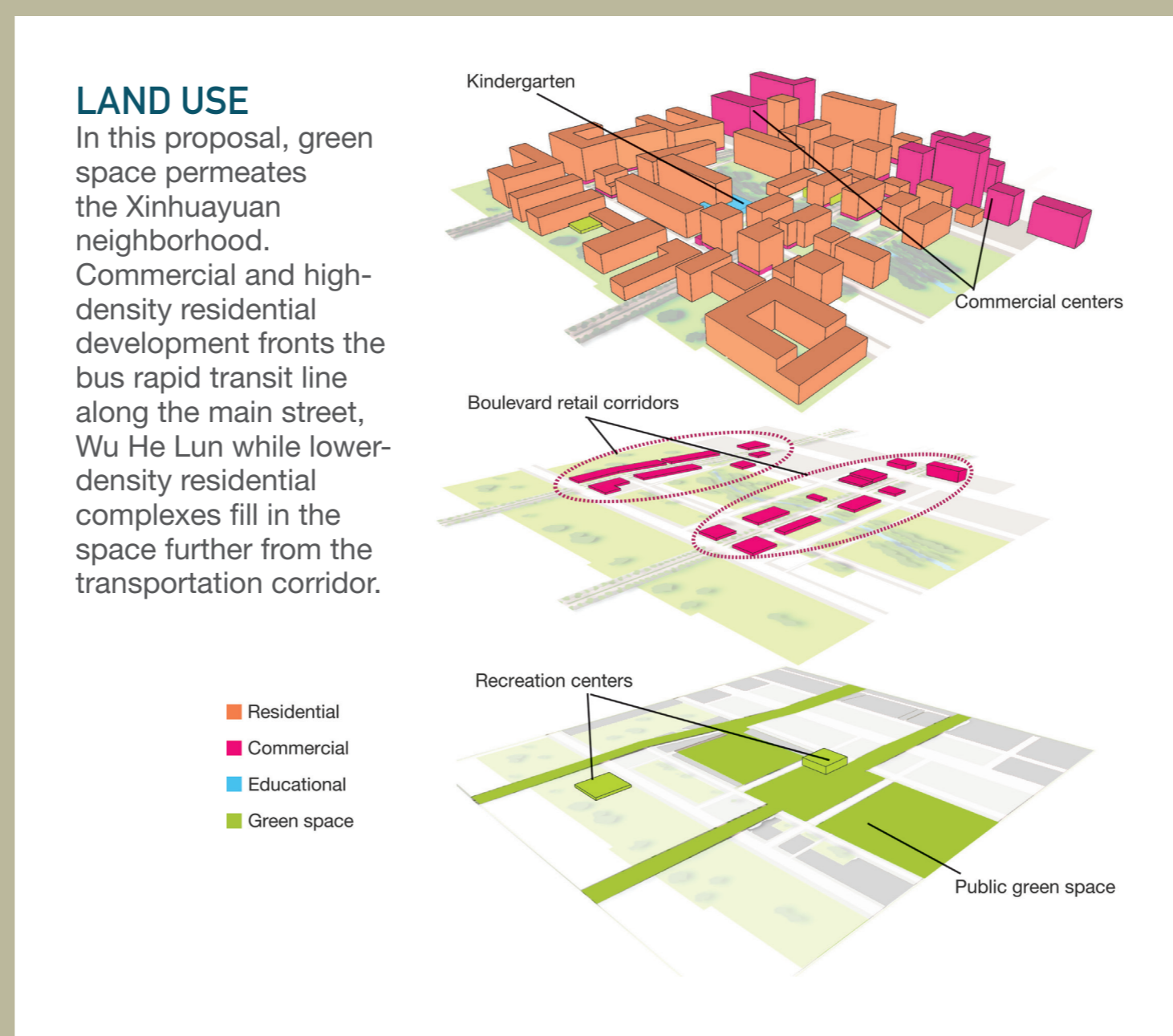


**AFTER:** Site plan of Regent Park in Toronto, Canada after revitalization. Source: Toronto Community Housing.

### Xinhuayuan Residential Community 新华苑住宅

The Xinhuayuan proposal envisions a neighborhood highly accessible by transit, with active life on the streets and an enhanced pedestrian experience. Ground level shops, local restaurants, and shade trees help make walking more appealing, reducing the use of cars and other motorized forms of transportation. A linear park uses green space to tie together the neighborhood by creating a pathway and recreation area accessible to all.

新华苑的提案描述了一个高度公交可达的社区、有丰富的街道生活和步行体验。首层设置商铺、餐饮以及有树荫的大树使得散步更加吸引人、也有效的减少了机动车的使用。一个带状公园利用绿色空间把不同的社区联系起来、所有人都可以藉由公园里的步道很容易达到休闲娱乐空间。



# HOUSING SYSTEMS 住宅系统

Ensure universal access to housing and utilize the residential fabric as a tool for connecting people and forming community

确定居者有其屋并且利用居住区的肌理联系人群和塑造社区。

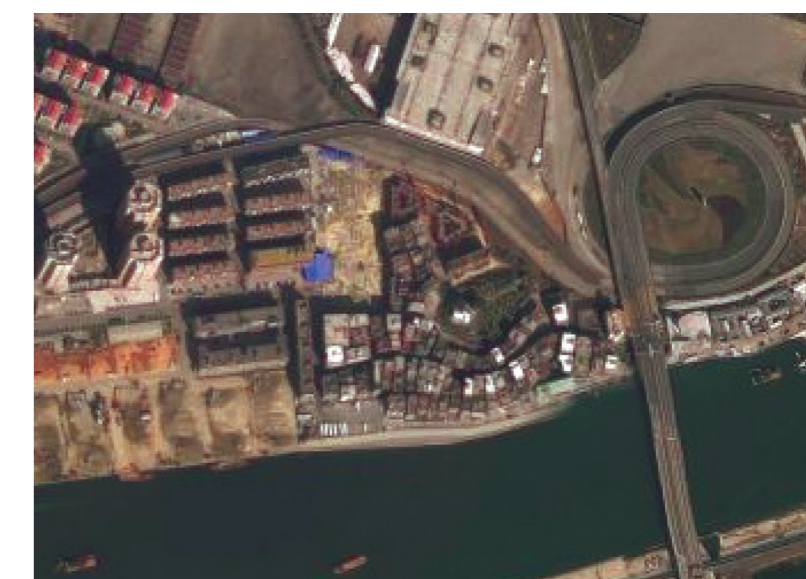
Creative approaches to dealing with housing density and affordability are critical to developing a more sustainable housing stock and ensuring economic growth. Workers in growing industries require affordable and accessible housing, and continued population growth and demographic change will only increase housing demand.

而创造性的处理住宅密度和可负担性对于发展可持续住宅至关重要和确保经济增长。发展中的产业工人需要可负担住宅、持续增长的人口变化也会增加住宅需求。

## URBAN VILLAGE REDEVELOPMENT 城中村改造

Long a form of low-cost housing, many urban villages are now being razed to make way for new, pricey apartment complexes. While this type of redevelopment can improve the city's image in the short term, it can be unsustainable as it reduces the supply of affordable housing.

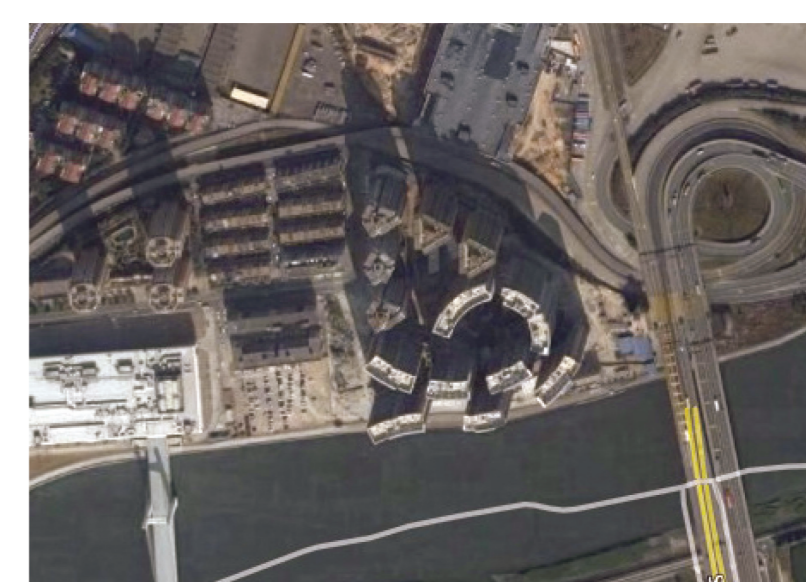
城中村长期以来提供了廉价的住宅、现在他们面临拆除并代之以新的高档住宅。虽然这种发展可以短期提升城市形象、但从减少可负担住宅供应方面看这种做法是不可持续的。



Before



During



After

### temporal resolution 時間分辨率

These aerial photographs, taken only months apart, demonstrate the drastic redevelopment of Shenzhen's Yunong Village.

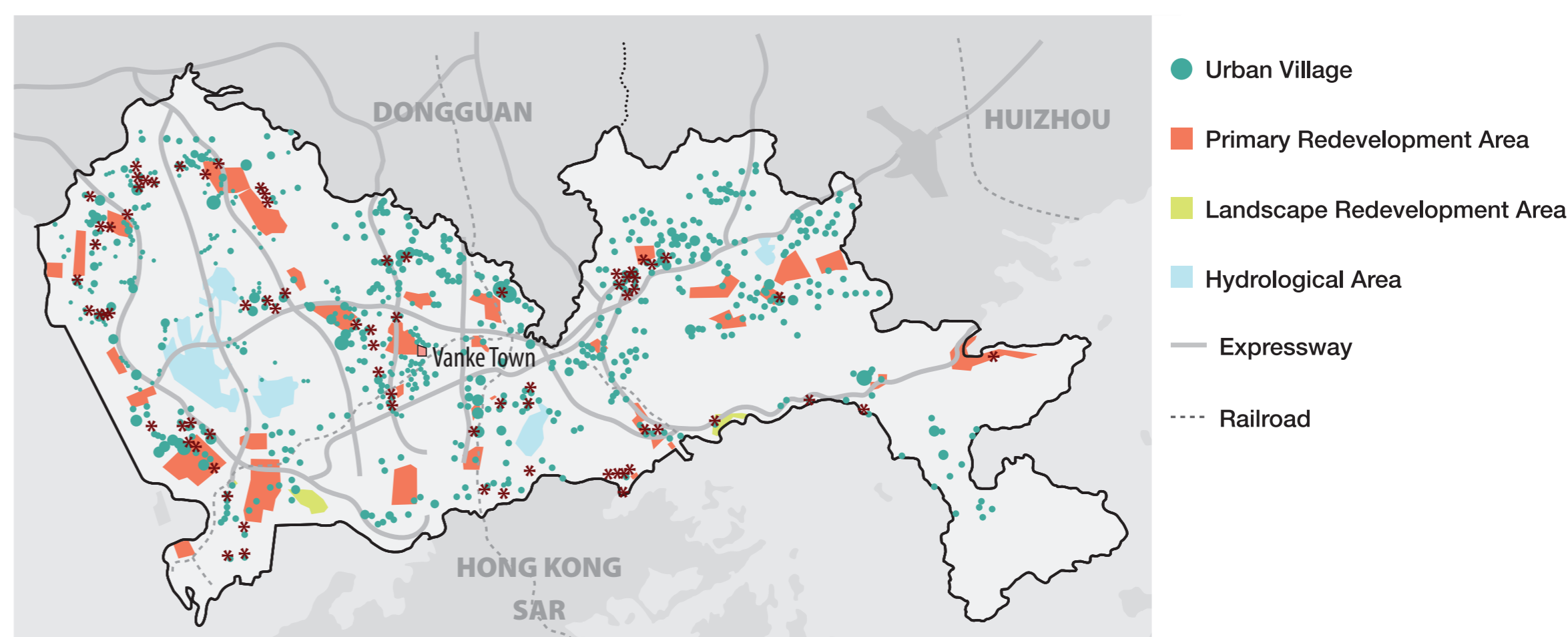
这些航空照片拍摄时间仅仅相隔几个月、展示了深圳某城中村的巨大变迁。

### spatial distribution 空间分配

The physical proximity of urban village redevelopment projects and upscale housing developments illustrates the pressure on urban villages to redevelop. These figures use a variety of graphic forms - maps, aerial imagery, diagrams, and photography - to highlight this proximity.

上图展现出深圳城中村和城市更新项目的关系、可以看出城中村面临的开发压力。

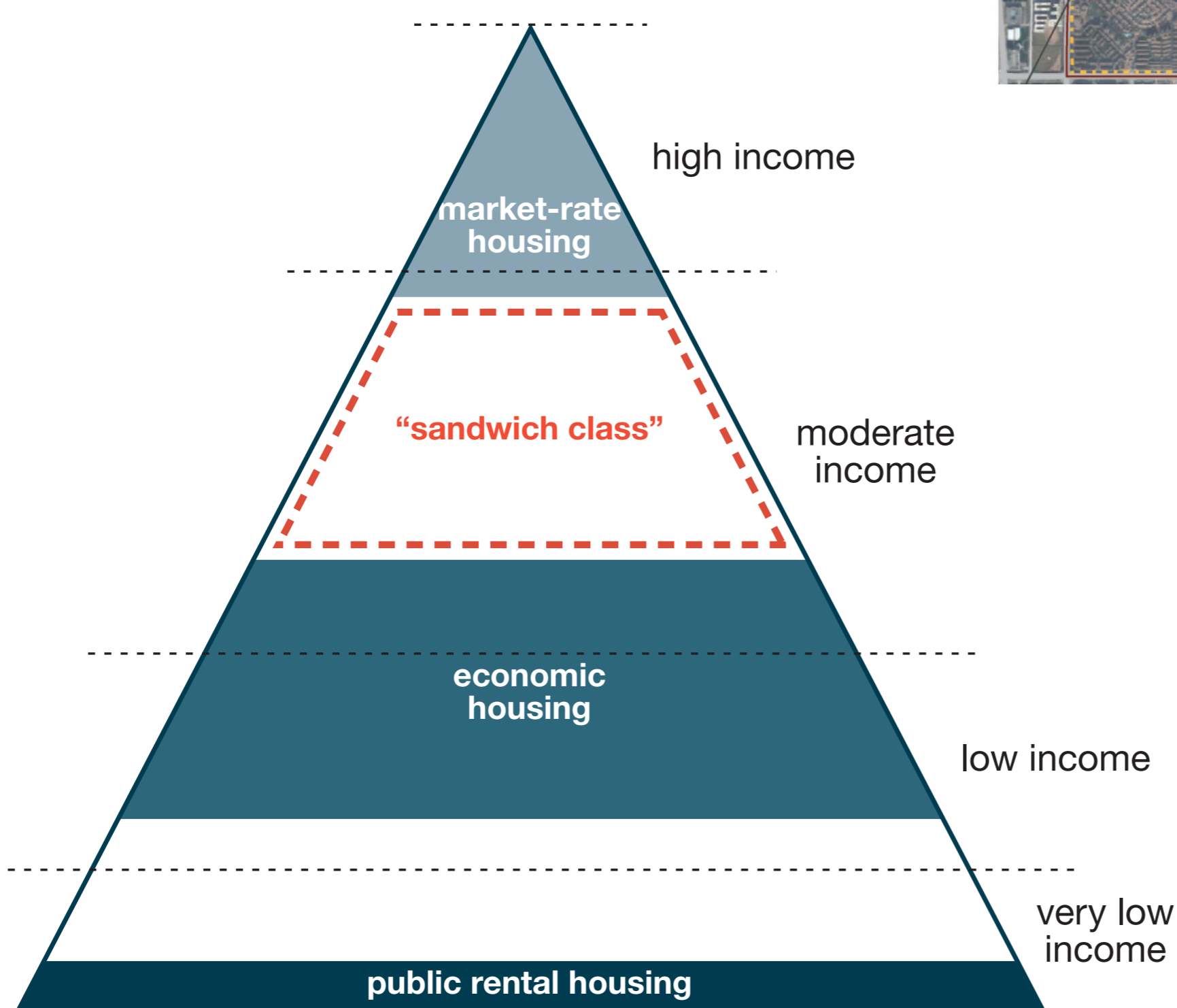
SHENZHEN'S URBAN VILLAGES AND REDEVELOPMENT AREAS



PROXIMITY BETWEEN URBAN VILLAGES AND UPSCALE HOUSING REDEVELOPMENT

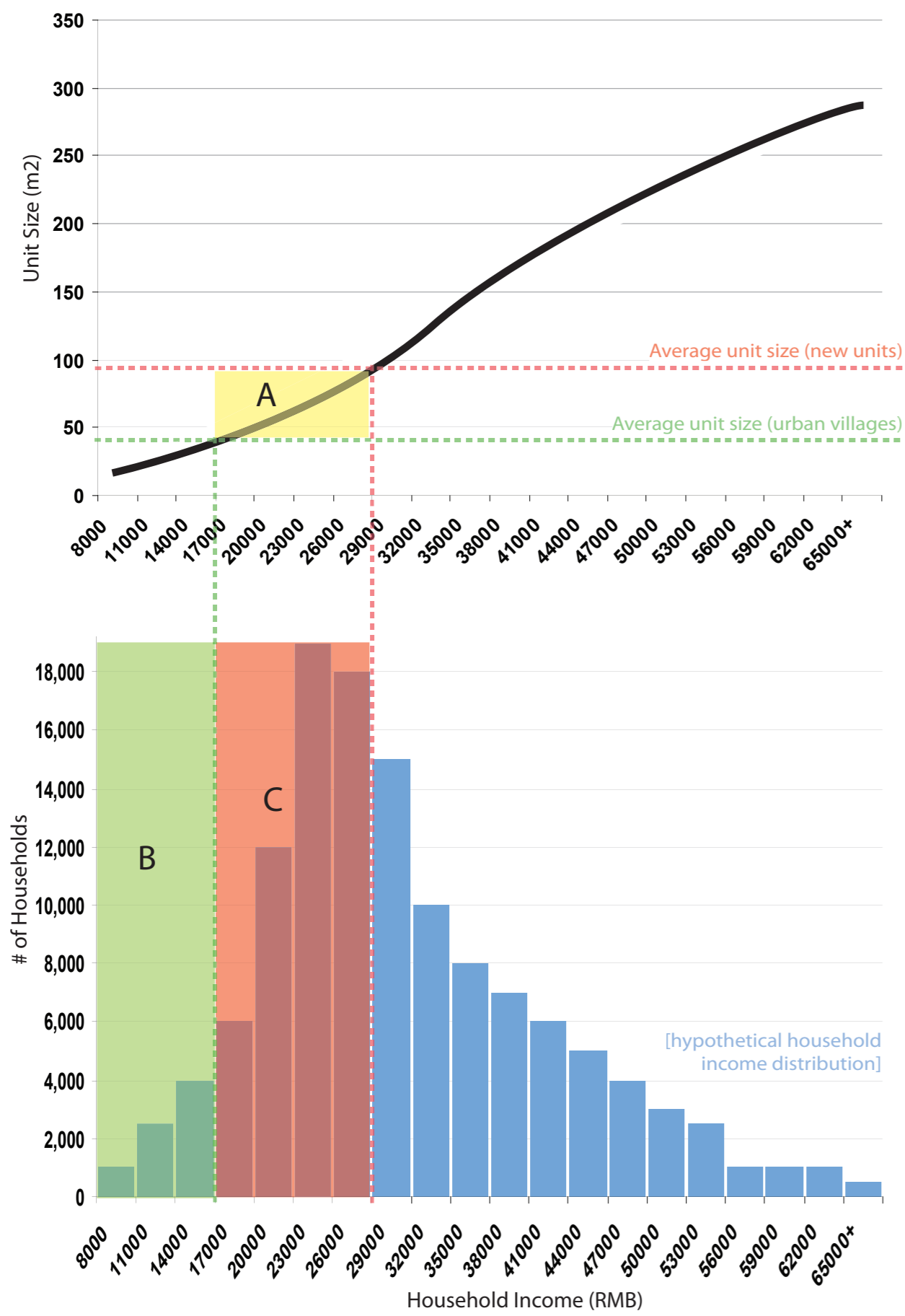


## SOCIAL HOUSING PROGRAMS 社会住宅



Since market reforms in the 1970s, the Chinese government has developed a series of programs to address the affordable housing crunch. At present, the three major government-sponsored initiatives are Public Rental Housing, Economic Housing, and Limited-Price Housing. While these programs have helped to make housing affordable to a wider spectrum of the population, they must be continually updated and improved to meet future demand.

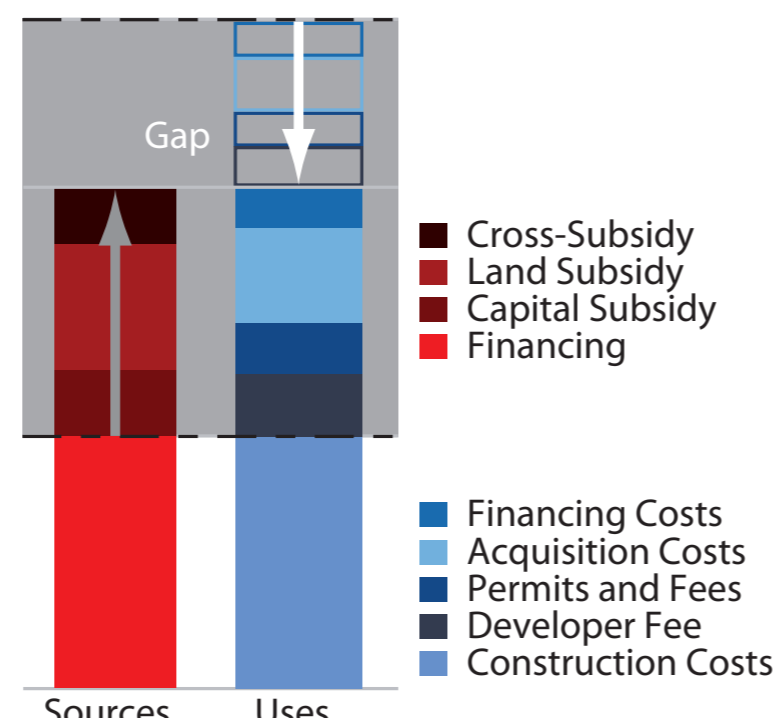
自从70年代改革开放以来、中国政府已经发展了一系列政策来解决可负担住宅问题。今天三个主要的政策是廉租房、经济适用房和限价房。这些政策虽然解决了更多的人的可负担居住问题、但是还需要继续发展以适应未来的需要。



## envision the financial gap 了解资金缺口

The left-hand graphs identify the population affected by the housing affordability gap, while the right-hand graphs indicate a combination of strategies a developer might use to close that gap.

左边的图表表示出住宅资金缺口影响到的人群。右图表示一系列措施的组合可以减小甚至弥补这一缺口。

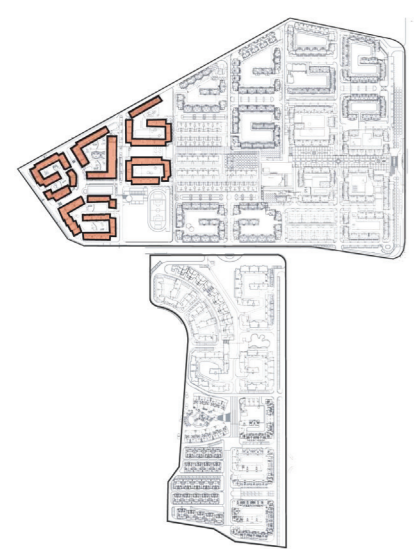


## AFFORDABILITY 可负担性

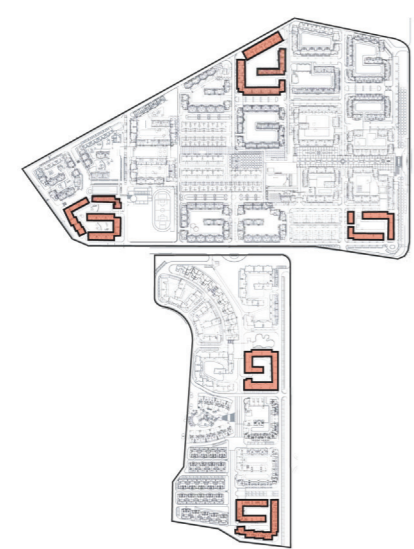
While social housing programs can help make housing more affordable to residents, developers must meet the challenge of closing the affordability gap in order to make social housing available to the public. There are numerous financial strategies that can be used to help close the gap. Many involve mixing affordable and market-rate housing within a single development, requiring careful consideration of the physical patterns of integrating the different housing types.

虽然社会住宅计划可以使得住宅更加可负担、但是开发商建造这些住宅时需要面对资金缺口。有很多财务手段可以帮助解决这一缺口。很多例子把可负担住宅和商品房混合在同一社区内、这要求认真研究如何整合不同住宅种类的物质形态。

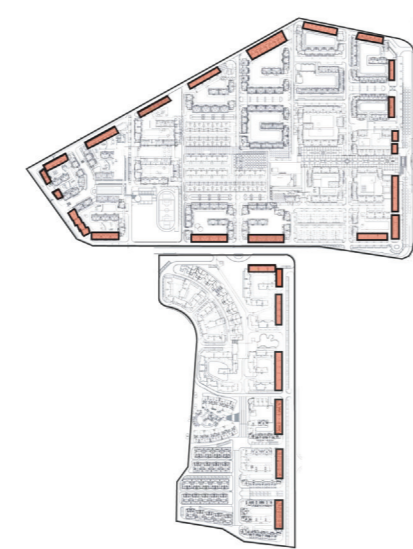
clustered sub-neighborhood



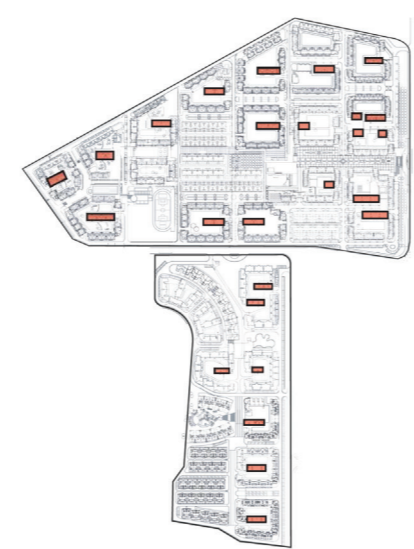
clustered courtyards



buildings by busy roads



center courtyard stacked units



randomly dispersed stacked units



## integrate income groups 整合不同收入阶层

Affordable and market-rate units within a mixed-income housing development can be integrated in countless ways. These diagrams depict some of the possibilities. 可负担住宅和商品房住宅共存于一个混合收入住区的方式有很多种。下图展示了一些可能性。

## DENSITY 密度

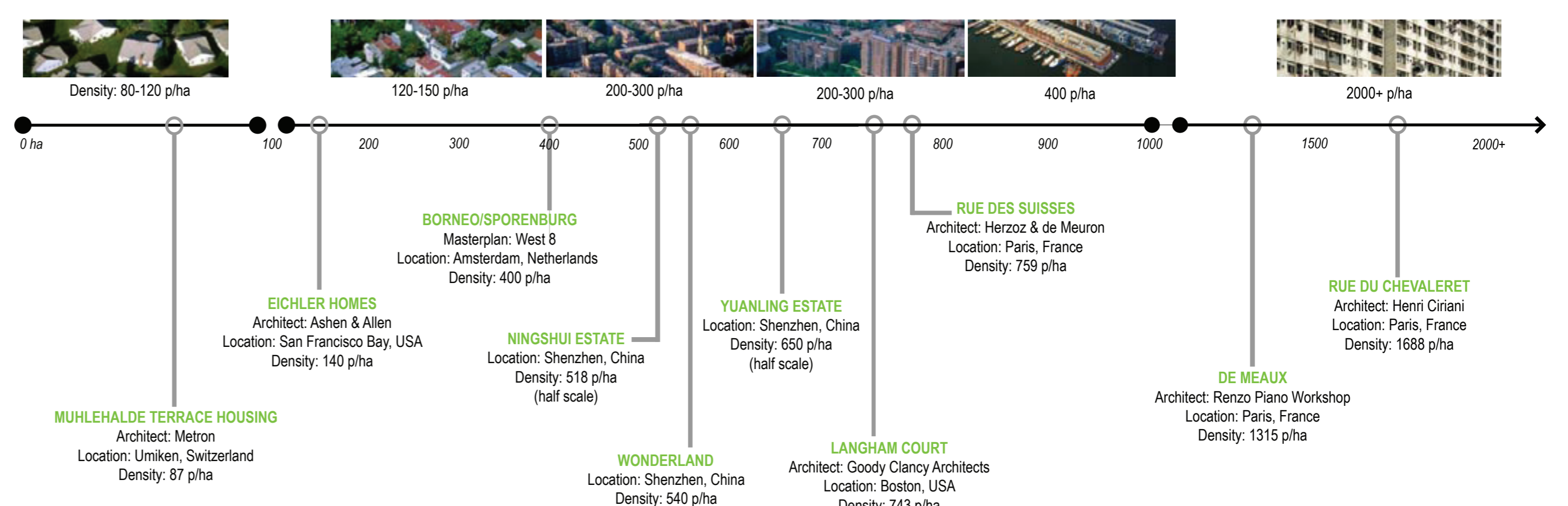
The quantity and cost of housing in any development is directly influenced by the allowed density. Density in turn is determined by planning officials, and varies depending on the perceived needs of the population, the capacity of infrastructure to serve new growth, and market pressures. It is critical that planners understand the implications of increasing density and the opportunities that it can provide. A continuum of density imagery can help planners with this understanding at a large scale, while closer examination of the character of existing individual developments works well at a smaller scale.

住宅的数量和造价受到允许密度的影响。密度又受到规划师对人口、基础设施和市场压力感受等的影响。因此规划师对密度内涵以及对由此带来的机会的了解变得至关重要。用图示的方法表示密度的变化可以帮助规划师在不同尺度上把握开发项目的特点。

## establish continuum 密度的变化图谱

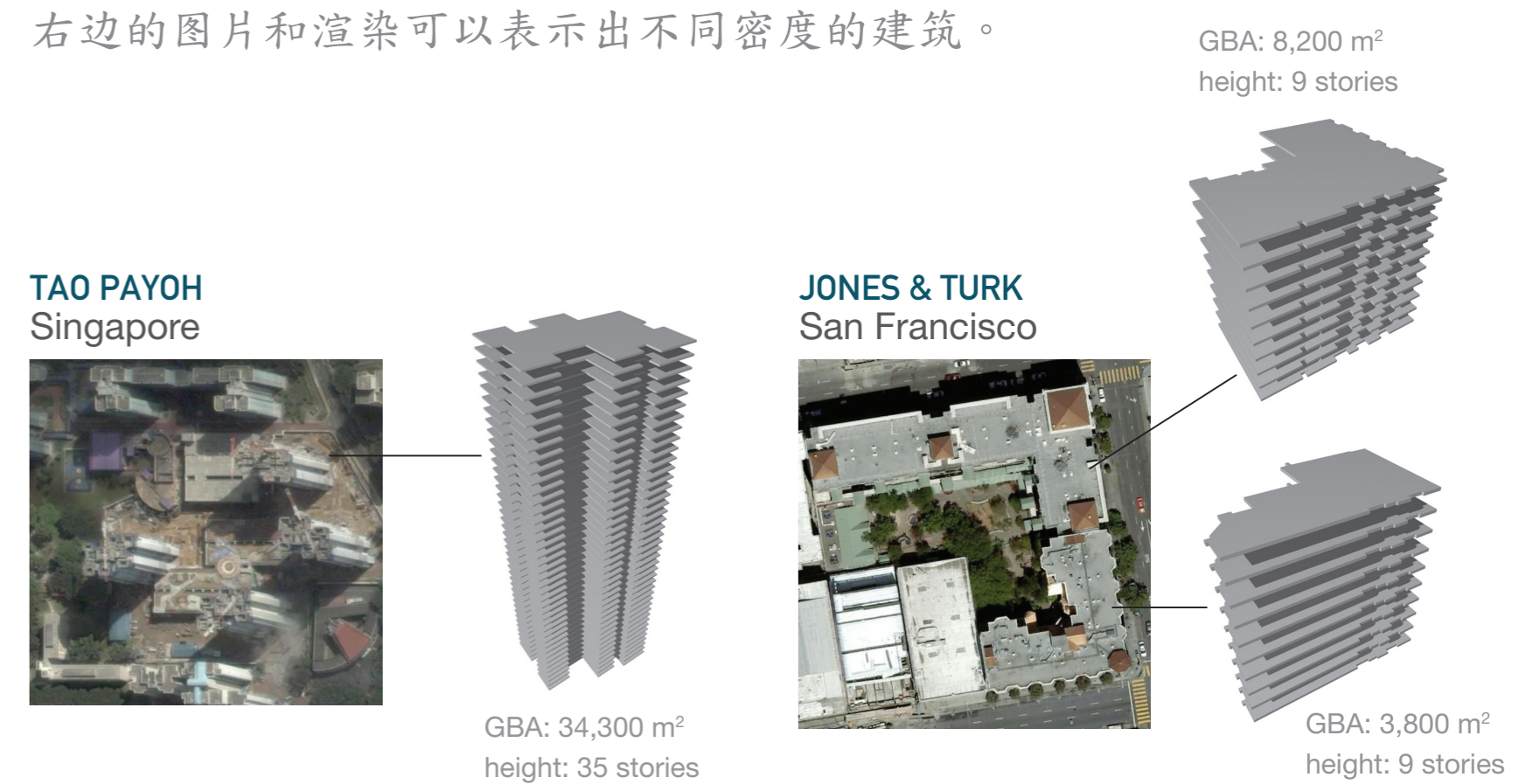
A continuum that compares images and data for existing developments can help planners understand how the density of a proposed project might compare.

张可以对照不同项目照片和数据的密度图谱可以帮助规划师理解和比较未来项目的密度可能。



## recognize character 认识建筑的特征

More detailed images and renderings can show how buildings might appear at various densities. 右边的图片和渲染可以表示出不同密度的建筑。



# HOUSING 住宅系统

## PLANNING STUDIO PROPOSALS 规划设计小组提出的建议

### GOALS 目标

- A create a vibrant, mixed-income community**  
创建一个活跃的混合收入社区
- B provide decent, safe and sanitary housing to all income groups**  
为所有人提供优质、安全、卫生的住宅
- C allow for economic growth by adequately supporting the city's diverse and evolving workforce**  
支持城市的多样化和成长中的职工队伍，进而支持经济增长
- D enable developers to make a reasonable profit in order to guarantee the continued construction of high quality housing products**  
允许开发商获得合理的利润从而保证高品质住宅的长期供应

### Transit Oriented Development 交通主导的开发

This proposal takes advantage of the emerging transit stations on the site of Vanke's existing Fifth Garden residential complex to facilitate mixed-income housing development. Transit-oriented development (TOD) concentrates commercial and residential activity around transit nodes in order to enable car-free living. The density boost around stations allows developers an additional profit that can be used to cross-subsidize affordable housing units or paid into a linkage fund.

这个提案利用了万科第五园项目附近的轨道交通站点来支撑混合收入住宅开发。TOD倡导将商业和居住聚焦在交通站点周围并创造“无汽车”生活。站点周围的高密度人群为开发商提供了额外的利润、这些利润可以用来交叉补贴可负担住宅项目或存入LINKAGE补贴基金。



### Generating a Redevelopment Proposal 提出再开发建议

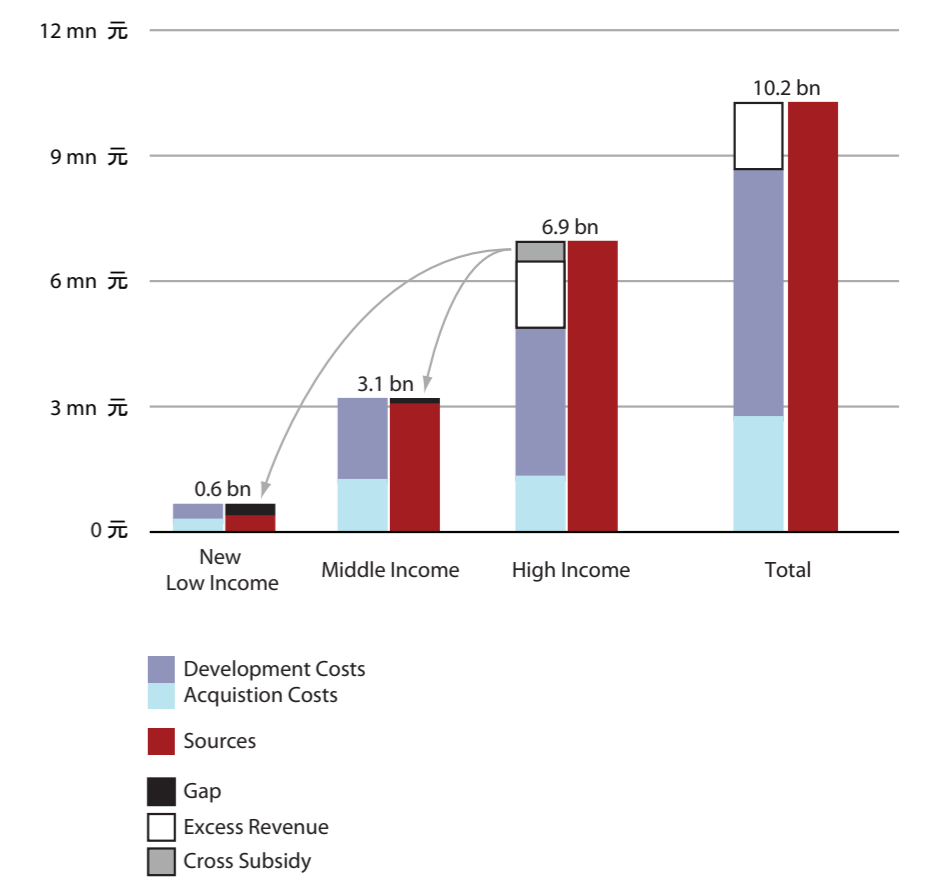
Any affordable housing proposal must give adequate attention to the process and financing of the development. From here, the distribution and density of affordable and market rate units can be tested, as shown in the diagrams below.

任何可负担住宅的提案必须对开发的过程和融资给予足够的重视。只有这样可负担住宅与商品房之间的密度与分配才能被检验。下面的示意图表示了这一过程。

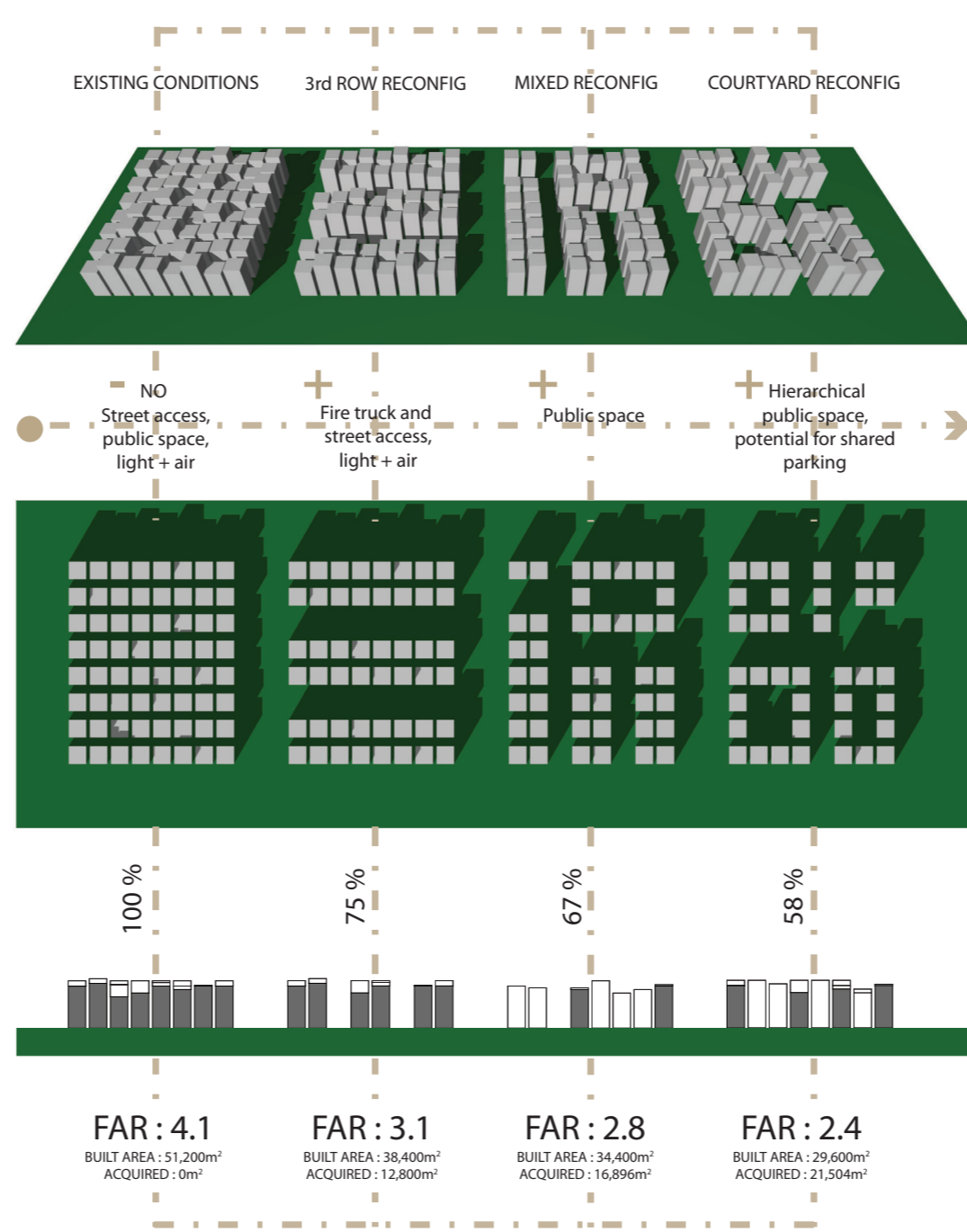
#### PROCESS 过程



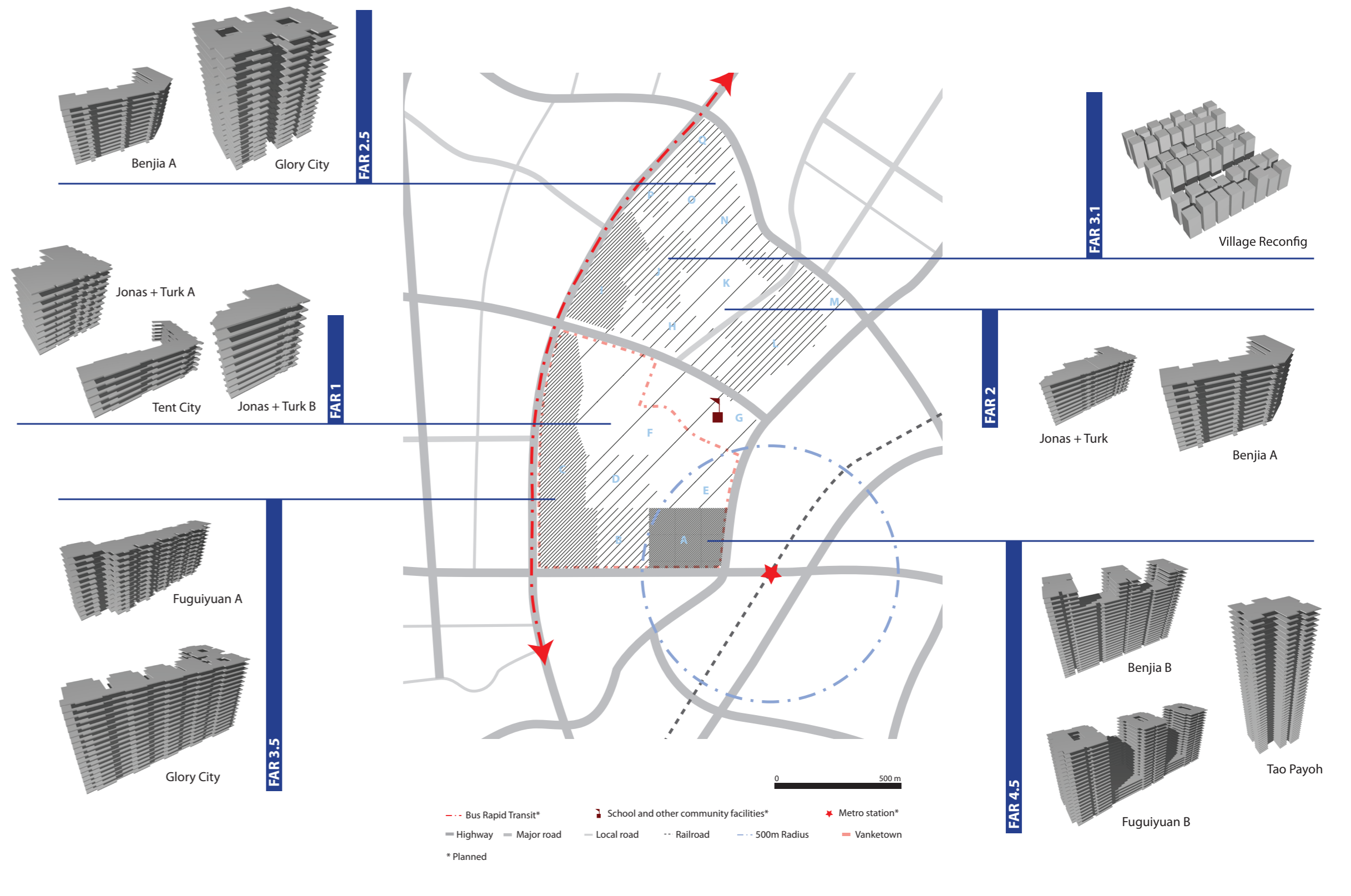
#### FINANCING 融资



#### AFFORDABILITY 可负担性



#### DENSITY 密度



# STUDIO PROCESS 设计课过程

## pedagogy 教学思路

Given that sustainability is a multi-disciplinary concept and that we are in the School of Architecture and Planning, the students come from a variety of backgrounds with a wide variety of skills and interests. Many such studios run into problems of conflict over the respective roles of design/physical planning vs. social/economic factors.

Yet, one of the pedagogical goals for the studios is practice in working in teams with people from other disciplines and whose approaches to problem solving may be different. This is essential in the analysis of people/place and offering sustainable solutions in complex social, economic and political.

Thus, the studio balanced the benefits of specialized expertise and a coherent plan proposal by requiring both an individual tool on a topic of interest to the student and teamwork. This had the additional advantage of giving the opportunity to each student to demonstrate their mastery of a particular planning tool that would be of value to the team-work. As a result, the team-work in the studios have been very productive.

由於可持續發展是一個多學科的概念、我們在建築與城市規劃學院、學生來自各種不同的背景與各種各樣的技能和興趣。許多這樣的工作室遇到問題的衝突在各自的角色設計/物理規劃主場迎戰社會/經濟因素。

然而、其中一個教學目標的工作室是在工作實踐中的各隊從其他學科和解決問題的辦法可能會有所不同。這是必需的分析人/地方、並提供可持續的解決方案在複雜的社會、經濟和政治。

因此、均衡的好處工作室專門知識和連貫的計劃建議、要求既是單獨的工具某個主題感興趣的學生和團隊合作。這有額外的優勢、讓每個學生的機會、展示他們掌握特定的規劃工具、將是有價值的團隊工作。因此、在團隊工作的工作室已經非常有成效的。



## sponsor 資助者



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[WWW.VANKE.COM](http://WWW.VANKE.COM)

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## credits 學分

Hope Stege, *Editor*  
Jenni Won | [cloudtheory.com](http://cloudtheory.com), *Graphic Design*

2006

**BAI MA/QI BAO**  
Shanghai

### studio members 学生

Christine Caine, Carolyn Choy, Patrick Curran, Amy Deora, Junfeng Ding, Ezra Goldman, Lillian Lew-Hailer, Ting Li, Edward Rice, Alice Savage, Na Sun, Tegin Leigh Teich, Timothy Terway, Thatcher Tiffany, Kristy Wang

Marlon Aranda & Hui Deng, *Teaching Assistants* 助教

2007

**WONDERLAND**  
Shenzhen

### studio members 学生

Shutsu Chai, Stephen Crim, Justin Fay, Kristen Hall, Kumar Kintala, Sophie Martin, Molly Mowery, Benjamin Solomon-Schwartz, Amy Stitely, Claudine Stuchell, Jase Wilson, Astrid Wood

Kai-yan Lee, *Teaching Assistant* 助教

2008

**VANKE TOWN**  
Shenzhen

### studio members 学生

Jie Bai, Jeff Beam, Connie Chung, Omari Davis, Victor Eskinazi, Yew Chin Leow, Haley Peckett, Kanda Song, Hope Stege, Andrew Trueblood, Torrey Wolff, Mimi Zhang

Justin Fay, *Teaching Assistant* 助教

2009

**FIFTH GARDEN**  
Shenzhen

### studio members 学生

Gordon Hansen, Haley Heard, Yang Liu, James Madden, Pedram Mahdavi, Aditi Mehta, Eric Minikel, Gary Shu, Kristin Simonson, Ruifeng Tian, Feifei Zhao

Kanda Song, *Teaching Assistant* 助教

## additional resources 其他研究成果

### NATURAL SYSTEMS

#### Innovative Wastewater Treatment 创造性地废水处理

Treating wastewater at the site or neighborhood scale, especially through the use of sustainable, restorative natural systems in order to preserve national water resources (Fuzhou in Fujian Province)

#### Stormwater Management 雨水管理

Applying Low Impact Development (LID) best practices such as vegetated buffers, filter strips, dry bioretention ponds, permeable pavement and site design can be combined to help reduce and manage stormwater runoff (Portland, Oregon; Seattle, Washington)

#### Waste Management & Recycling 废水管理和循环

Developers and residents using a variety of strategies to help minimize waste production and to increase the reuse, recycling and composting of waste that is produced (Chicago, Illinois; Vancouver, British Columbia, Canada; Toronto, Ontario, Canada; Thousand Oaks, California)

#### Community Education 社区教育

Using education programs and incentives to teach residents how to apply various resource management tools (Maryland Association for Environmental and Outdoor Education, Green School Program; The Heidelberg Project in Detroit, Michigan; Chesapeake Bay Foundation Storm Drain Stenciling; Rainwater Harvesting Rebates in Austin, Texas)

#### Financing Green Development 为绿色开发融资

Funding opportunities, such as energy efficient mortgages and third-party financing, to provide for the additional up-front costs of energy efficient construction (Transcend Equity Development Corporation in Dallas, Texas; Ameresco)

### COMMUNITY SYSTEMS

#### District Heating & Cooling 区域制冷制热

Networked power generation that uses otherwise wasted heat for heating and cooling in order to reduce emissions from energy production (Southampton, UK; Kotka, Finland; Reykjavik, Iceland; Charlottetown, Prince Edward Island, Canada; MIT in Cambridge, Massachusetts)

#### Integrated Utility & Resource Management Organizations 综合设施资源管理组织

Allowing for organizations that optimize resource use and minimize environmental impact by providing a combination of electricity, natural gas, gasoline, heating/cooling, landscaping, local environmental management, potable water and trash removal services

#### Developing an Integrated Health Care System 发展综合医疗系统

Establishing a network of health care that considers the needs of both consumers and providers, providing well-defined access to the right care at the right time

#### Community Schools 社区学校

Using schools as places for building social capital through programs and services for students, parents and others (East Elementary School in Kings Mountain, North Carolina; Elliot Elementary School in Lincoln, Nebraska; Carson High School in Carson, California)

#### Building Community Facilities 建设社区设施

Combining awareness of the lack of community facilities with financial incentives for for-profit developers, a regulatory system and good design in order to align multiple constituencies (Silver Spring, Maryland; Providence, Rhode Island; National Mall in Washington, DC)

#### Community Facility Management 社区设施管理

Innovative financing tools and management methods for recreation facilities, open space, interior common areas, and utilities within a development (Rollins Square in Boston, Massachusetts; Harbor Point in Boston, Massachusetts; Atkinson Housing in Toronto, Ontario, Canada)

#### Shrinking Cities 收缩的城市

Allowing comparatively rapid local industrial development while still upgrading the industrial sector in order to avoid the sharp transition in economic and population base that can cause a city to quickly decrease in size (biotech industry in Boston, Massachusetts; cultural and creative industries in London, UK)

#### Applying Memory in the Urban Environment 城市环境记忆

Using tools such as landbanking, park planning and programming, historic preservation and adaptive re-use to harness local history and shared memory in order to distinguish a place from its neighbors (Qiaonan Village, Quanzhou City, Fujian; Incentives for Adaptive Reuse in Los Angeles, California; Landbanking Cultural Assets in Portland, Oregon)

### MOBILITY SYSTEMS

#### Land & Transit Planning 土地和公共交通规划

Managing the growth of auto usage through coordinated land use and transportation planning at the regional, city, and district levels through methods such as growth limits, strategic land takings, and development incentives (Singapore; Sha Tin, Hong Kong; Munich, Germany)

#### Auto Use Reduction for Healthy Cities 减少汽车使用创建健康城市

Combining policy tools (demand pricing, transit-focused spending, emissions caps) and design tools (traffic calming, bicycling and walking networks, green street networks) to help shift away from automobile dependence, increase individual physical activity, and improve air quality (London, UK; Hong Kong; European Union; Delft, Netherlands; Portland, Oregon; Melbourne, Australia)

#### Eco-Streets 生态街道

Redesigning Shenzhen's streetscape to treat the water, create connections to open spaces and create a vibrant and economically viable public realm (UrbanLab Proposal for Chicago, Illinois)

#### Street Types for Pedestrians & Cyclists 适合行人和自行车的街道

Applying a palette of street types that prioritize walking and bicycling in order to encourage the use of non-motorized transportation options (Commonwealth Avenue in Boston, Massachusetts; Rambla de Catalunya in Barcelona, Spain; Mountain View, California)

#### Bicycle-Friendly Street Design 自行车友善的街道设计

Integrating spaces that allow for improved bicycle movement (bike paths, xiang, bicycle boulevards, sidewalk-level bike lanes, street-level bike lanes) with the rest of the transportation network

#### Xiang 巷

Introducing xiang as a fine-grained component of the street network, allowing for greater pedestrian mobility and breaking up what would otherwise be super-blocks (woonerf in the Netherlands; Tianzifang in Shanghai, China; Motomachi in Yokohama, Japan)

#### Electric Bikes (E-Bikes) 电动自行车

Increasing mobility and accessibility, expanding user group, improving affordability and conserving urban land devoted to streets and parking by developing a cohesive policy towards electric bikes as an alternative form of transportation (Kunming)

### HOUSING SYSTEMS

#### Mass Customization 大规模定制

Customizing and personalizing products and services for individual consumers at mass production price ([Y]our House—Digital Design Fabrication Group at MIT)

#### Inclusive Design 通用设计

Low- to no-cost ways methods for simplifying the built environment in order to make them more usable by all—including the disabled, the elderly, and families with small children (Center for Universal Design standards)

#### Mixed Use Development 混合功能开发

Creating value for residents, developer and surrounding community by developing vibrant places that serve a variety of purposes for all members of society (Millennium Place in Boston, Massachusetts; Market Common in Arlington, Virginia)

#### Mixed-Use Development & Design 混合功能开发

Reallocating urban infrastructure and services more efficiently by mixing land uses through careful urban design, with special attention to pedestrian connections and promoting human activity (Kowloon Station Development, Hong Kong)

#### Designing for Density 密度设计

Increasing the density of development in strategic locations by identifying locations for maximizing density and strategically orienting buildings on a site

#### Vertical Mixed Use 竖向混合功能

Stacking land uses to better serve residents, take full advantage of transit linkages and provide more different revenue stream for developer (AOL Time Warner Center in New York, New York; One Franklin in Boston, Massachusetts)

#### Mixed Income Housing I 混合收入住宅I

Deconcentrating poverty and promoting economic diversity by distributing affordable housing units within market-price developments (Local Initiative Program 40B in Massachusetts; Chelsea Centro in New York, New York; Langham Court in Boston, Massachusetts; Spring View Housing Project in San Antonio, Texas; Lake Parc Place in Chicago, Illinois)

#### Mixed Income Housing II 混合收入住宅II

Planning building types and site layouts that encourage comfortable interaction between members of different income groups in a mixed-income development (Wo Che in Hong Kong; Glory City in Beijing; Tent City in Boston, Massachusetts)

#### Planning for Affordable Housing 规划可负担住宅

Ensuring that new affordable housing developments positively impact the communities by paying careful attention to establishing partnerships, conducting a needs assessment, designing to fit in the urban context, and implementing effective property management practices (Yonkers, New York; Renaissance Place at Grand in St. Louis, Missouri)

#### Financing Affordable Housing 为可负担住宅融资

Increasing the affordable housing options for Shenzhen residents through a combination of project cross-subsidy, interest rate subsidy, rent subsidy and land subsidy (The Metropolitan in Boston, Massachusetts; Community Investment Program at the Federal Home Loan Bank; Section 8 Voucher Program in US; Wenzhou Housing Cooperative)

#### Developing Affordable Housing 开发可负担住宅

Establishing government policies to help raise sources of funding for developing affordable housing or lowering the cost of development (Arthur Capper/Carrollburg HOPE VI in Washington, DC)

#### The Partnership Approach for Affordable Housing Development 可负担住宅的协作开发

Establishing public and private entities share the risks and responsibilities of developing affordable housing with each party contributing to the project as best suits their own resources, expertise and access to funding (The Metropolitan and the Asian Community Development Corporation in Boston, Massachusetts)

#### Financing Housing Aspirations 为住宅新思路融资

Recognizing the important factors in determining peoples' decisions about where they live and how happy they are so the government can set housing policy in order to fulfill these needs (Singapore)

#### Urban Village Regeneration 城中村更新

Retaining urban villages as a gateway to Shenzhen but improving their safety and better-integrating them with the rest of the urban context (Hillside Terrace Complex in Shibuya, Tokyo, Japan; Lafayette Park in Detroit, Michigan; Hong Kong Urban Renewal Authority)