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Improving Spatial Justice through Urban
Regeneration: In the Case of Guangzhou
Racecourse Redevelopment

Candidate	Huang Min
Degree	Master of Architecture
Supervisor	SCUT-POLITO co-supervisors
Faculty	School of Architecture
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in the case of Guangzhou Racecourse redevelopment**

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Candidate: Huang Min

Supervisor: SCUT-POLITO co-supervisors

South China University of Technology

Guangzhou, China

分类号：TU201

学校代号：10561

学号：202021006461

华南理工大学硕士学位论文

Improving Spatial Justice through urban regeneration: in the case of Guangzhou Racecourse redevelopment

作者姓名：黄敏

指导教师姓名、职称：导师组

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华南理工大学

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作者联系电话：

电子邮箱：

联系地址(含邮编)：

摘要

空间正义是指在空间生产和空间资源分配过程中，以满足不同使用者的需求为目标，通过正确的价值引导、规划设计、制度监管等保障公众公正的享受空间权益。其范畴包括交通空间、居住空间、消费空间、交往空间、生活空间等物质、精神、社会空间。空间正义在于提供一个批判性视角，用以观察、识别和改善公共资源分配不均，弱势群体空间边缘化等非正义现象。

本文立足于空间正义理论，按照“基础研究-理论研究-框架构建-实例验证”的逻辑组织全文。首先，通过对理论与相关文献的回顾，探讨空间正义在城市更新中的内涵与价值。其次，本文通过文献研究与评价要素提取归纳为物质、精神、社会空间正义的价值观准则，并借鉴相关研究成果构建了提升空间正义的框架：观察、匹配、创造。根据提出的价值观准则，从城市、区域、项目三个尺度以及交通空间、居住空间、公共空间、消费空间等不同空间类型，全面分析了城市空间非正义现象。最后，以广州赛马场为研究对象，将方法应用于实践进行检验。通过对马场的背景与现状进行研究，发现马场存在路权分配不均、居住分异、空间公共性缺失以及缺少弱势群体设施等问题。根据马场非正义问题及居民需求在空间正义的价值观原则中匹配最合适的价值观：可达、包容、多样和社区，作为项目的最终愿景。并将其作为价值导向，提出更新策略，分别解决上述的四个方面的问题。包括交通正义，保障行人权益；居住正义，多元混居的社区；公共空间正义，复合功能的公共空间；服务设施正义，完善弱势群体设施。按照城市到街区的尺度提出更新设计策略，为提升马场空间正义提供参考。希望可以城市提升空间正义提供新的思路与方向。

关键词：空间正义；城市更新；规划设计策略； 广州

ABSTRACT

Spatial justice refers to ensure the public's equal rights and interests of space with the aim of meeting the requirements of the different groups of people through proper value guiding, planning, and institutional supervision in the process of space production and space resource allocation. Its scope includes material, spiritual and social spaces such as transportation space, living space, consumption space and interaction space. Spatial justice is defined as providing a critical perspective for observe, identify and ameliorate the injustice phenomena such as unequal distribution of public resources and the spatial marginalization of the disadvantaged.

Based on the theory of spatial justice, this paper is organized according to the logic of "basic research, theoretical research, framework construction, instance verification". Firstly, through the review of related research and literature, this paper explores the connotation and value of spatial justice in urban regeneration. Secondly, this paper summarizes the value guidelines of material, spiritual and social spatial justice through literature research and evaluation elements extraction, and builds a framework for improving spatial justice: observe, match, and create. According to the proposed value guidelines, the urban spatial injustice phenomenon is comprehensively analyzed from three scales: city, region, and neighborhood, as well as different spatial types such as transportation space, residential space, public space, and living space. Finally, the Guangzhou Racecourse will serve as the research object for a study of regeneration strategies. By investigating the background and current situation of the racecourse, it is found that the Racecourse suffers from uneven distribution of rights-of-way, housing disparity, space publicness lacking, facilities for the disadvantaged deficiency. According to the injustice issues and residents' needs, the most appropriate values are matched among the value principles of spatial justice as the project's final vision, include accessibility, inclusion, diversity, and community. Additionally, it serves as a guide when formulating regeneration strategies to address each of the aforementioned four aspects. These include Transport justice, protection of pedestrian rights. Housing justice, a mixed community. Public space justice, public space with complex functions. Facilities justice, high-quality facilities for the disadvantaged. Propose regeneration design strategies according to the city to neighborhood scale to provide a reference for

enhancing the spatial justice of the racecourse. It is intended that it would provide new ideas and directions for the city to improve spatial justice.

Keywords: Spatial Justice, Urban Regeneration, Planning and Design Strategies, Guangzhou

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Chapter1 Introduction

1.1 Research Background

1.1.1 Social Issues

At present, China is still in a period of rapid urbanization. According to statistics, by the end of 2021, China's urbanization rate reached 64.72%. The rapid expansion of the urban scale, while promoting social and economic development, has also triggered a series of intensified conflicts over resources, space, and cities. The following problems mainly exist.

Urban Space Production Result in Deprivation

In the process of urbanization, different kinds of capital constantly compete and expand outward from the inner sources of the city to pursue efficient profits, unceasingly carrying out unjust appropriation and plunder. The original structure of the city is destroyed in the struggle for urban space. Additionally, different capitals, such as industrial, commercial, and real estate, have different spatial forms. Due to this, urban space has become more fragmented and classified, and the allocation of social resources has changed accordingly. As a result, there are inequalities in the quantity, quality, and accessibility of public services and infrastructure in the spaces of different social classes.

Overlooked of the Disadvantaged Needs

As cities continue to expand, the wealthy class will continue to encroach on the space of the disadvantaged class, denying them equitable access to urban public rights. The most extreme example is the compression of rural space by urban expansion, resulting in the destruction of the natural economy, the influx of rural population into the city, and the further decline of the countryside. In the city, it also appears that the space of the disadvantaged is squeezed due to the urban evolution, and the disadvantaged is expelled from the original space and gradually marginalized. Urban villages are one of the cases, which are surrounded and cut down. The injustice of urban space has led to the stratification and fracture of urban space, changing the original urban layout and spatial planning and affecting the urban form.

Unbalanced Development Aggravates Social Injustice

Capital exploitation causes unequal distribution of resources, which is mainly reflected in the differences in the allocation of education, medical care, and facilities. These public resources will gather in the quality space where the elite class is located. And the imbalance in the level of economic development and the treatment of daily life exacerbates social injustice and class differentiation.

1.1.2 Spatial Justice as Urban Vision

In China, the country is undergoing rapid urbanization. The report to the 19th National Congress of the Communist Party of China pointed out that the principal challenge facing Chinese society is the gap between unbalanced and inadequate development and the people's growing expectation for a better life^[1]. After China completes its poverty alleviation goal in 2020, it has introduced a series of political and economic policies such as urban-rural integration, urban regeneration, and a unified national market. These not only show that China currently has problems such as the imbalanced supply of public resources, imbalanced social relations, and social differentiation caused by the gap between the rich and the poor, but also reflect China's core values of "people-centered" development. According to the law of urban development, China has entered an important period of urban regeneration. Because "people" is the core of the future city, it is necessary to meet the people's desire for a better life as the fundamental purpose, continuously improve urban functions, improve the level of urban services, create a just city, and make people feel happy. In the "Key Tasks of New Urbanization and Urban-Rural Integration Development in 2022", it is mentioned that we should promote the equalization of basic public services in cities and towns, orderly promote urban regeneration, and create a space for people to live with high quality.

In 2015, the New York government released "One New York: The Plan for a Strong and Just City", to create a sustainable and resilient city for all New Yorkers to meet future social, economic, and environmental challenges. This plan is divided into four visions for a stronger, more equitable, more sustainable, and more resilient New York City^[2]. The plan follows a "goal-setting-strategy" approach to achieve a vision of equity and

justice in the areas of housing, thriving neighborhoods, culture, transportation, infrastructure planning and management, social services, environmental stewardship, and climate impact.

Other cities, such as London's local planning authority ensures equality and inclusion in planning policy and development through a participatory, open and inclusive planning process, to meet the needs and aspirations of all segments of society^[3].

Building sustainable cities for all is a common global goal. The United Nations Conference on Housing and Sustainable Urban Development (Habitat III) adopted a New Urban Agenda in 2016^[4]. This agenda proposes the concept of the city for all, that is, everyone has an equal right to use and enjoy the city and human settlements. This concept promotes inclusion, reduces inequalities, and builds cities that are just, safe, healthy, accessible, affordable, resilient and sustainable. It is worth noting that some national and local governments have enshrined this vision in legislation, political declarations, and charters as a "right to the City".

1.2 Research Aim and Implication

1.2.1 Research Aim

Since the development of urbanization in China, social stratification has led to the unjust appropriation and use of social resources and high-quality public space resources. Injustice is manifested in "urban diseases" such as traffic congestion, spatial polarization, and gentrification, or in old urban areas with a population explosion and a "dirty, chaotic" environment, or the emergence of urban islands such as urban villages. People-centered is the core value concept of Chinese urban design. However, how the theory and practice of urban planning respond to the phenomenon of social injustice and how to realize the vision of an ideal space with justice, from the guiding concept to the practical operation, still needs to be studied. The research aims of this paper are mainly the following:

Clarify the Meaning and the Value of Spatial Justice in Urban Regeneration

This paper composes the theories related to spatial justice and reviews the related

literature and scholars' research, and finally explores and imports the theories. Firstly, the definition of justice is identified with other related concepts, and then the connotation and theoretical value of spatial justice in urban regeneration are described.

Excavate the Core Values in Spatial Justice

The study of spatial justice should firstly be based on the discovery of the injustice issues. Using Guangzhou Racecourse as an example, this paper analyzes the phenomenon of injustice from different dimensions. A set of core values in spatial justice will be established by combining the content of the evaluation system in the existing research. It will be the core content of spatial justice as a value guide for building ideal space in urban regeneration, which can guide the improvement of justice in urban space in different periods, scales, and fields.

Construct a Framework to Improve Spatial Justice in Urban Regeneration

Proposing a method to improving spatial justice provides a generic framework that can be used for the ultimate vision of achieving justice in spaces of different scales and periods. It mainly includes discovering injustice issues, clarifying project visions, and formulating strategies with a values-based perspective. The framework is also used in case studies to analyze the cases and verify its feasibility through practical operations.

Propose Strategies to Improve Spatial Justice and Use it in the Racecourse Case for Practical Verification

This paper uses the aforementioned framework in the study with Racecourse as the research object. By looking for the current spatial injustice of the Racecourse, the final vision for the regeneration of the Racecourse is determined and targeted strategies are put forward. From the four dimensions of traffic justice, housing justice, public space justice, and facility justice, the specific strategies for improving space justice in the racecourse is proposed.

1.2.2 Research Implication

Theoretical Implication

The concept of spatial justice emerged from the social sciences and philosophy, and many academics have since given it a spatial dimension. Spatial justice provides new ideas for the study of urban regeneration in three dimensions: materiality, spirituality, and sociality^[5]. In China, the concept of spatial justice is still in the development stage and is mostly used in sociology, philosophy, and urban governance, with little emphasis on urban design. In this paper, the theory of spatial justice is summarized and introduced into the field of urban design. With spatial justice as the value orientation, the general framework of urban regeneration is constructed. The application of spatial justice theory is further supplemented and improved in the context of urban regeneration.

Practical Significance

In urban regeneration, less consideration is given to the actual needs of residents and justice in urban life, which can result in a variety of urban diseases and social issues such the marginalization of special people, gentrification, and disparity between the rich and the poor. Spatial justice aims to criticize injustice phenomena. This paper analyzes the injustice in urban space and proposes strategies to solve them. In order to provide widely applicable tools for subsequent research, a core value system of spatial justice and a generic framework for enhancing spatial justice are built on the basis of related literature and case studies. The results of related theoretical research will be applied to practical projects with case studies in this paper. Taking Guangzhou Racecourse as an example, this paper systematically analyzes the current situation of its space and provides suggestions for the regeneration strategies of the Racecourse. Priority is given to improving the regions and individuals with limited resources and urgent needs by precisely identifying the disadvantaged spaces, the disadvantaged people, and the usage requirements of diverse groups of people. Here, suggestions are provided for safeguarding the rights of the disadvantaged on the basis of spatial balance in urban regeneration.

1.3 Research Scope

The research object of this paper is Racecourse, Tianhe District, Guangzhou, which is located in the eastern part of Zhujiang New Town. The Racecourse is located at the

intersection of Huangpu Avenue and Huanan Expressway, which are two main roads in downtown Guangzhou. The south of the Racecourse is to Huacheng Avenue and the west is to Racecourse West Road, with a total land area of 38.4 ha. Due to complex historical reasons and its extremely important location, the Racecourse has remained undeveloped. It is currently the only large-scale vacant area in the CBD, the core area of Guangzhou. Therefore, such an unused plot in the urban core area, which is surrounded by high-density office, residential areas and commercial areas, is bound to cause a series of urban problems. Taking it as an object of study, representative injustice issues can be found.

In addition, the location of the Racecourse is special, belonging to the eastern part of the Zhujiang New Town, which is the most central area and, the most iconic and representative area of Guangzhou. The study of the Racecourse is bound to place it in the context of Zhujiang New Town. Therefore, when studying the Racecourse, it is necessary to expand the scope of the study to Zhujiang New Town and Guangzhou, and to analyze and consider it from a holistic level (Fig.1-1).



Fig.1-1 The Scope of Zhujiang New Town and Racecourse

Zhujiang New Town, as an important part of Guangzhou CBD, is located on the new central axis in the east of Guangzhou, with a total land area of about 6.6 km². It is

connected to Huangpu Avenue in the north, reaching the north bank of Pearl River in the south, Guangzhou Avenue in the west and Huanan Expressway in the east. As a first-tier city, Guangzhou is not only concerned about economic development, but also pays much attention to the healthy development of the city. From the Guangzhou government's proposal to build a child-friendly city in 2020 and the construction of an elderly-friendly community in 2021, it can be seen that Guangzhou has always cared about the needs of children and the elderly. And in the government work report in 2022, it proposes to build an all-age friendly city, which is a step forward compared to the previous policies. It is thus concluded that Guangzhou has started to pay attention to the needs of the disadvantaged at a certain stage of urban development, and targeted to achieve a city friendly to all-age groups through the improvement of spatial environment. Therefore, Guangzhou is a human-centered city, and research on spatial justice is necessary.

In this paper, a systematic research analysis is conducted at three scales: city, region, and neighborhood. The scope of the research will be in the order of Guangzhou, Zhujiang New Town, and Racecourse, to sort out the injustice issues, organize and analyze them systematically and completely, summarize the injustice issues appearing in the city, and put forward suggestions for optimization.

Finally, the research of this paper involves spatial justice and related research is complicated, including sociology, political economy, philosophy and other categories^[6]. Limited by the research focus and space limitations of this paper, it only focuses on the regeneration strategies and its specific design for improving urban spatial justice, and supplements it with theoretical knowledge from other disciplines.

1.4 Research Contents

Spatial justice fits into the context of China's development of the times and social needs, and provides a new research perspective for urban regeneration. This research develops a general framework for improving spatial justice in response to the injustice issues existing in the urban stock using spatial justice as the value orientation. Taking the Racecourse as the research object, it summarizes the site's existing development issues and demands, proposes suitable strategies to enhance spatial justice, and

carries out practical verification of the constructed framework. The following four aspects describe the primary research contents.

1.4.1 Concept of Spatial Justice and Review of Related Research

This paper firstly analyzes justice and related concepts, sorts out the development and evolution process of spatial justice theory, and summarizes the theoretical characteristics, trends and innovations. Afterwards, it reviews the development, research and practice of spatial justice in Chinese and Western cities, and determines the theoretical research scope and conceptual definition of this paper. The theoretical foundation for the subsequent strategies to enhance spatial justice in urban regeneration is laid out.

1.4.2 Exploration of Urban Injustice Issues

The research on spatial justice should first focus on spatial injustice. Therefore, this paper takes the Racecourse and Guangzhou as the research objects, and studies the injustice in the city from different levels (transportation, housing, facilities, public space, etc.) and different scales (city, region, and neighborhood). By revealing the injustice in the central area of the city, we find the urgent issues to be solved in improving the justice of the space, and provide the basis for the subsequent framework construction.

1.4.3 Framework Construction of Urban Spatial Justice

According to the injustice issues in the city and the analysis of the real needs of residents, this paper combines the existing research on the values of space justice, which should be established according to the three dimensions of space justice: material, spiritual, and social. It includes the vision of life of residents at different levels, that is, everyone can enjoy the right to a just city. The general framework for improving spatial justice is further proposed, including observe, match and create. The first step is to find the injustice of the project, then select the core values of the project, and finally lead to specific strategies. The framework is empirically tested through the research cases.

1.4.4 Urban Regeneration Strategies for Spatial Justice

According to the proposed framework, first of all, we have an in-depth understanding of the location, history, and policies of the racecourse, and analyze the current lack of justice in the venue. Then the core values of improving the space justice of the Racecourse are selected to determine the final vision of the project, and specific solutions are proposed from four aspects: transport justice, housing justice, public space justice, and facility justice. Finally, it provides suggestions for improving urban spatial justice strategies.

1.5 Research Framework

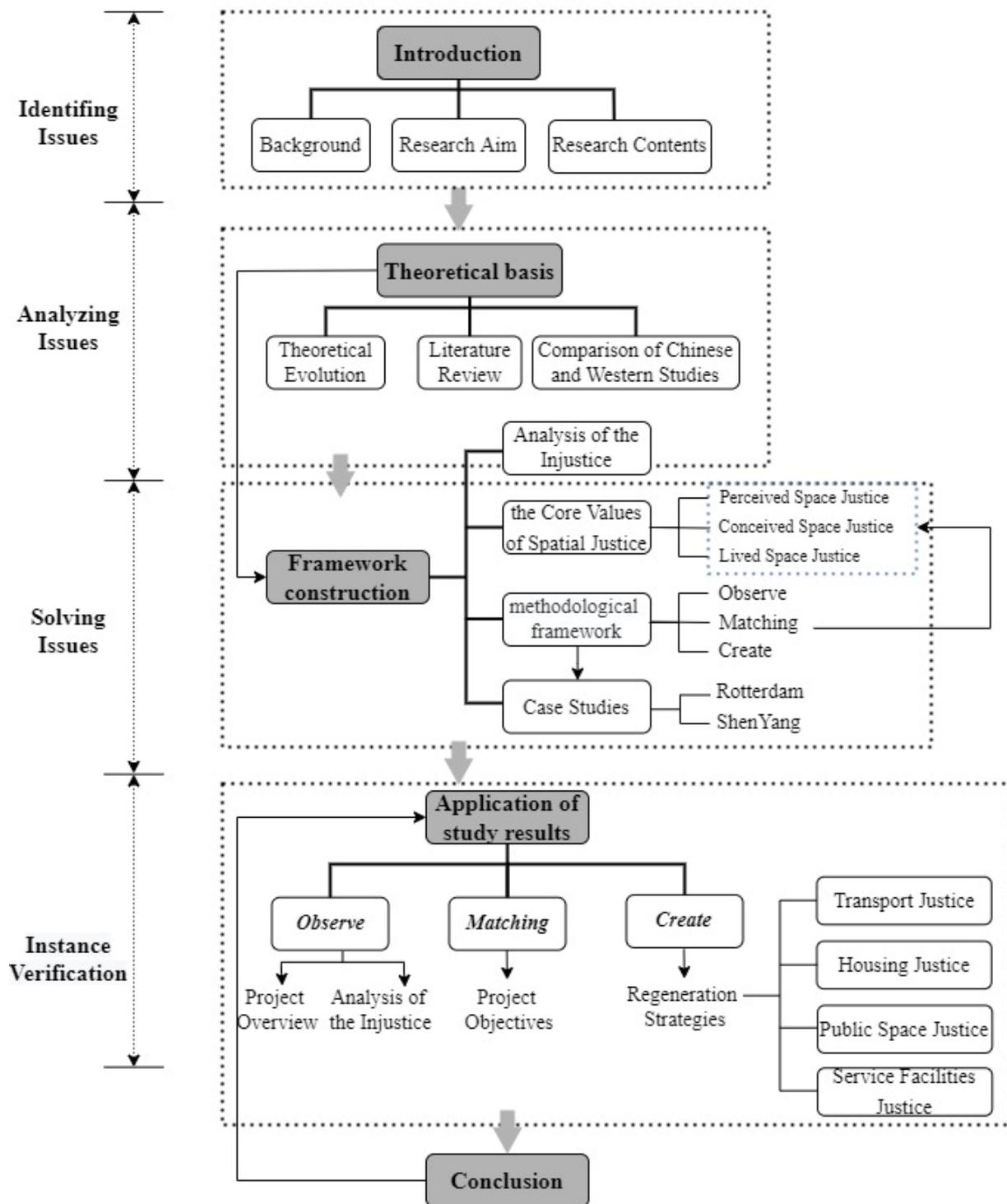


Fig 1-2 Research framework

Chapter2 Theoretical Basis and Related Literature

2.1 Identify Justice and Related Concepts

To understand spatial justice, one must first understand what justice in spatial justice is about. There are other terms with similar meaning like equality, equity. The three terms used to describe the ultimate pursuit of goodness for human beings as a whole. Although they are words with similar meanings, they are in fact very different. To discern them, the first place to start is with inequality (Fig. 2-1).

Inequality is when people have unequal access to resources. Equality is the state of having the same rights and social status. Equality is the provision of the same tools to access resources, that is, evenly distributed tools and assistance. That is, social rules provide people with the same opportunities and help, and everyone follows these rules in an effort to maintain peaceful coexistence in society. However, it's crucial to realize that not all social classes have the same means for accessing resources, for instance, the wealthy or those in positions of authority have easier access to resources than ordinary people. Therefore, the act of treating everyone equally, regardless of any particular attribute, is not always equal to everyone. people have a particular ladder.

As for equity is a custom tool for identifying and addressing inequality. This means that different classes of people will have access to different tools or help, which will need to be individualized to fulfill each individual's needs. But this also means that someone needs to climb more steps to get access to resources.

Justice, on the other hand, is the most important. It means fixing the system and providing equal tools and opportunities to meet people's needs^[7]. When the society can satisfy distributive justice and procedural justice, and realize the justice of process and result, then a just and ideal utopia can be established.

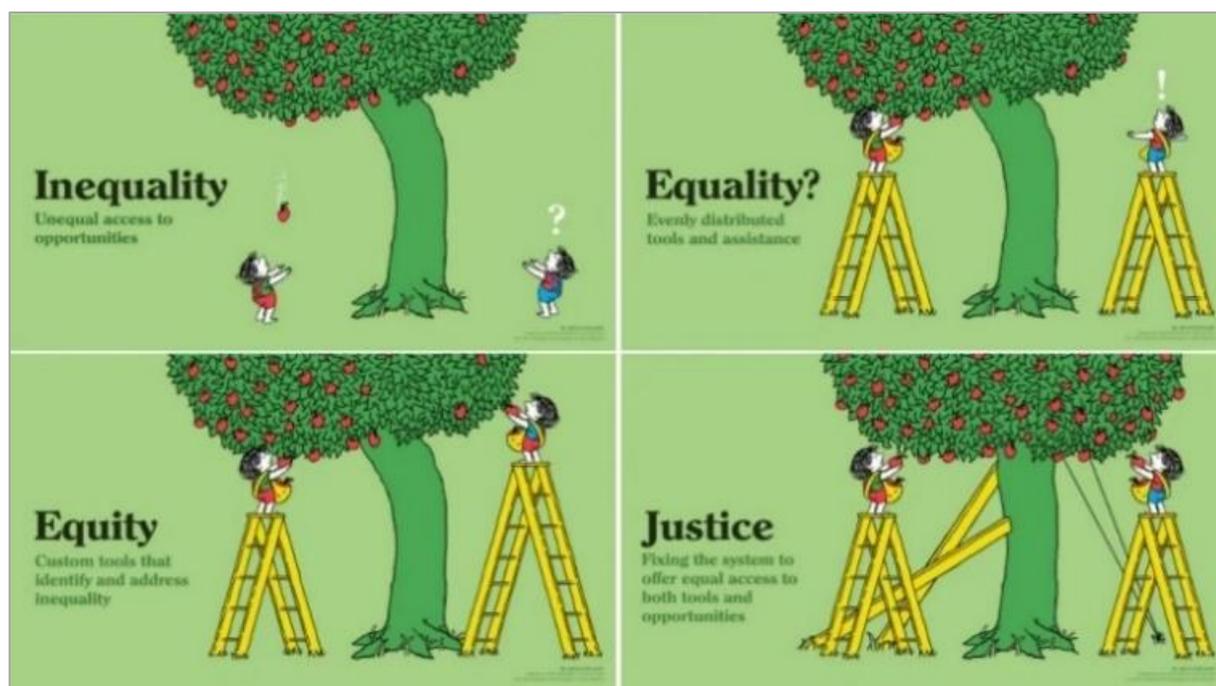


Fig. 2-1. Giving Tree art of justice, equality, equity
(Source: Tony Ruth, 2019)

2.2 Literature Review

After sorting, reading, and summarizing the literature retrieved by keywords such as "spatial justice", "just city", "urban regeneration", and "Planning", it is found that there is much research in China and west on spatial justice. These studies differ in research stage, contents and scales, and will be compared in detail in this section.

2.2.1 Spatial Justice in Western Countries

Spatial justice study has a long and continuous history in Western cities. Based on the theories of Lefebvre, Harvey and Soja, many academics have further developed the theories according to the development of modern cities. The most representative one is Fainstein's theory of just city, which is widely used in the field of urban planning. And the application of spatial justice in urban planning is also more mature. Many countries, such as the Netherlands and Germany, have adopted spatial justice as one of the guiding principles of spatial planning systems. In addition, there are also many academics who construct relevant evaluation frameworks through the study of spatial justice as a tool to assess the justice of areas, so as to help governments, designers, and academics develop design interventions to realize the common vision of spatial

justice.

The Definition of Spatial Justice

Dufaux states that spatial justice is the equitable and democratic distribution of social interests and responsibilities on different scales^[8]. According to Dadashpour, the concept of spatial justice is multifaceted and complicated, and it needs to be developed and studied in a variety of contexts across numerous scientific disciplines, including urban planning, architecture, sociology, and geography. Injustices in cities are recognized using the spatial justice^[9]. Adegeyea constructs the concept of spatial justice as fairness, diversity, democracy, and fair distribution, benefiting the disadvantaged and obtaining necessary resources to meet basic living needs. The necessary resources he proposed include housing, health, education, employment and transportation. At the same time, he proposed that spatial justice can be used as a framework to provide policy guidance for government planning. For example, the South African National Development Plan 2030 recommends the application of spatial justice in all development projects^[10]. Shamaei argues that spatial justice refers to the equitable distribution of facilities and services and the existence of equal opportunities, so that existing regions are not superior to other regions in terms of both spatial advantages and development opportunities^[11].

Spatial Justice Evaluation Framework

JMBC primarily conducts a current situation survey and analysis of New York and assigns value indicators to assess the impact of design on the city and propose interventions to build a more just city. The JMBC and Gehl Studio collaborated for 18 months in 2015 to investigate and evaluate the NYC Plaza Program's positive impact on public life and urban justice^[12]. JMBC proposed Urban Justice Indicators to evaluate indicators that affect society and space, and innovatively combined with the indicators summarized by Gehl's research on people's behavior in the field of public space and public life to establish an overall indicator framework (Table 2-1). This approach allows for a detailed study of the impact of people, behavior, use, movement, and design on the space in public spaces.

Table 2-1 Gehl & JMBC Project Indicators

JMBC Urban Justice Indicators	Gehl Public Life, Public Space Indicators	
	Public Life	Public Space
• Equity	• Pedestrian Volumes	• Land Use
• Choice	• Age	• Mobility Patterns
• Access	• Gender	• Plaza Design
• Connectivity	• Safety	• Plaza Edge
• Diversity	• Time Spent Outside	• Cost
• Ownership	• Stewardship	• Seating Opportunities
• Participation	• Ownership	• Quality Criteria
• Inclusion / Belonging	• Social Connectivity	• Commute Time & Rates
• Beauty	• Who: Income	
• Creative Innovation	• Who: Race & Ethnicity	
• Health and Wellness	• Beauty	
	• Creative Innovation	
	• Health and Wellness	

(Source: Gehl & JMBC, 2015)

Toni L. Griffin, who leads the Just City Lab at the Harvard School of Design, investigates the definition of a just city and examines how design and planning improve justice in public spaces, communities, and cities. Griffin describes equity as the distribution of material or non-material benefits to the disadvantaged such as low-income people, people of color, refugees, etc. Wealth, income, commodities, and possessions belong to the material category, while rights, opportunities, power, self-esteem, decision-making, or culture belong to the latter. In 2017, Just City Lab developed the Just City Index and an indicator framework for assessing justice in public spaces as a tool to measure the impact of design on justice and deploy interventions to minimize injustice (Table 2-2) ^[13]. It is a system of 12 indicators and 50 values designed to help communities conceive their vision of a just city and clarify common goals for future community development. The value of the Just City Index is that its application is not limited to the scale, buildings, public spaces, communities, or entire cities.

Table 2-2. Just City Index

Acceptance	Belonging, Empathy, Inclusion, Reconciliation, Respect, Tolerance, Trust
Aspiration	Creative Innovation, Delight, Happiness, Hope, Inspiration
Choice	Diversity, Spontaneity
Democracy	Conflict, Debate, Protest, Voice
Engagement	Community, Cooperation, Participation, togetherness
Fairness	Equality, Equity, Merit, Transparency
Identity	Authenticity, Beauty, Character, Pride, Spirituality, Vitality
Mobility	Access, Connectivity
Power	Accountability, Agency, Empowerment, Representation
Resilience	Adaptability, Durability, Sustainability
Rights	Freedom, Knowledge, Ownership
Welfare	Healthiness, Prosperity, Protection, Safety, Security

(Source: Griffin & Just City Lab, 2017)

In June 2018, Just City Lab selected four development projects (Hart van Zuid, Feyenoord City, Crooswijk, and Cool-Zuid) in Rotterdam to verify the Just City Index through real-world applications. They intervene from four steps of reflection, mapping justice or injustice, alignment, and creation, and step by step to find solutions to break injustice in the community. This is no longer just an evaluation of the results of Spatial Justice, but a further value-oriented design prototype that is expected to bring tremendous transformative power to the community. Their research is a great progress and innovation in theoretical development, which provides a good idea and direction for follow-up research.

Research on Improving Spatial Justice

In the research on spatial justice, some focus on the justice rights of specific groups, some explore how to improve spatial justice through specific aspects (mobility, accessibility), and others focus on the study of specific spaces, such as the justice of residential spaces, justice in public spaces, etc. From a social science perspective, Strauch studies the transformation of urban planning strategies from a bottom-up to a

top-down development model, which results in the urban poor being affected by the injustice model. And he also analyzes how the poor community in Lima resists the intervention of large-scale projects in the community through collective action^[14]. Bassett observes the role of spatial justice in urban spatial regeneration, using the Netherlands as an example to demonstrate how cities with high spatial quality produce just spaces. This is reflected in the case of a mixed type of housing with a diverse range of public services. With the increase of mixed-use facilities, a more diverse housing stock is provided. The renewed community increased a positive local image^[15]. Wildschut explores how spatial justice is one of the principles guiding spatial planning in both the Netherlands and Germany. His study shows that spatial justice should be achieved by focusing on maintaining mobility and accessibility. However, the study only analyzes and compares the differences between Dutch and German measures of mobility and accessibility in the spatial planning system and does not propose specific measures on how to improve mobility and accessibility^[16]. Using the trialectics of spatiality as a conceptual framework, Van Riel investigates young South Africans' use and perception of public space, how they interact with others in it, and how urban policy is planned for it. Additionally, he proposes the development of urban policy and design guidelines to achieve sustainable urbanism and spatial justice by improving the inclusiveness and quality of public space in urban settlements^[17]. Setianto and Gamal focus on spatial justice in the distribution of public services, suggesting that both horizontal justice and vertical justice can be improved. To guarantee that their needs are satisfied, the disadvantaged must be identified and given special consideration under vertical justice. Vertical justice is based on the different abilities and needs of different social groups. Horizontal justice refers to uniform spatial distribution within a geographical area or the same distance from each resident to public facilities. However, the different population densities in urban areas are ignored here, and there is no assessment of whether all residents need the same level of public services^[18]. Gunnam explores spatial justice through gender-sensitive urban planning. Using women in India as subjects, the study points out their unequal rights in the use of public space. Strategies are proposed to mix land use, provide frequent and well-connected public transportation and safe stations throughout the day, design public spaces that feel safe, and ensure visibility. These interventions can change the character of public spaces to be more inclusive, diverse, and sensitive to women's needs^[19].

2.2.2 Spatial Justice in China

With the rapid development of Chinese cities, the rapid urbanization model has triggered many contradictions and conflicts, and social justice has become an important research topic. The domestic research on spatial justice involves different disciplines. In the field of urban planning, scholars focus on the study of the justice evaluation system of urban space and the study of urban regeneration governance model. And the research objects are very diverse, including public space, landscape planning, parks, residential areas, and service facilities. However, less research has been done on specific design strategies for urban spaces based on spatial justice in urban regeneration contexts.

The Definition of Spatial Justice

The study of spatial justice in China originated from the introduction and analysis of Western ideas on spatial justice, and Feng first proposed to consider spatial justice as a combination of natural spatial justice and social spatial justice^[20]. Ren proposes that urban space is considered as a public resource and spatial justice is the equal distribution of urban spatial resources, which includes justice for the production, possession, use, exchange and consumption of spatial resources and spatial products^[21]. Cao and Zhang analyzed the formation, connotation and significance of spatial justice from both spatial and justice perspectives, and argued that the government's overemphasis on economic benefits and neglect of spatial justice priorities are the causes of spatial injustice^[22]. Dong argued that spatial justice is the fairness and justice of space in the process of production and consumption^[23]. Kong proposed that spatial justice is spatial power from the perspective of spatial dominance and distribution^[24]. Xia proposed to construct an indigenous discourse of spatial justice in urban governance to solve the issues caused by urban-rural spatial imbalance under the urban-rural dualistic system^[25].

Spatial Justice Evaluation Framework

Current research on spatial justice in China focuses on how to analyze the current spatial injustice phenomenon in China using the creation evaluation framework. Cheng pointed out the spatial injustice phenomenon of urban settlement regeneration in China

from the perspective of spatial justice^[26]. Wang used quantitative research methods such as walkability index measurement and POI big data analysis to analyze the injustice phenomenon brought by the built environment problem of urban social housing^[27]. Li and Wu constructed an evaluation system of physical justice, institutional justice, and right to the city for public spaces in historical districts^[28]. Green spatial justice is a typical representative of urban spatial justice. Pei and Kan evaluated green spatial justice of streets in Dongcheng District of Beijing based on streetscape map data^[29]. Yang focused on urban park justice evaluation, judging the injustice problems of parks from four dimensions of accessibility, quantity, area, and quality^[30]. Luo analyzed urban and rural construction land expansion with the help of GIS software and constructed a table of indicators for evaluating urban and rural spatial justice patterns to provide a reference for improving spatial justice in urban and rural areas^[31]. Huang and Hong take Shenzhen as an example and propose the idea of evaluating the justice of medical service allocation^[32]. Feng and Deng take migrant workers as the research object and construct the justice evaluation index system of migrant workers' use of public space from three dimensions: population preference, basic equity and development equity^[33].

In Hong Kong, due to the characteristics of high-density urban space, the study focused on accessibility as an important condition to achieve spatial justice in public space planning. Chang calculated the accessibility of urban parks for each residential area using different transportation modes. The study identifies the impact of public transport on spatial inequalities in urban park accessibility for residents living in private and public housing in Hong Kong. Spatial inequalities in urban park accessibility were proposed to be reduced by improving public transport accessibility and connectivity for public housing residents^[34]. Jian developed a conceptual framework for public open space (POS) spatial justice assessment to provide tools for accessibility and inclusion analysis studies in POS planning. It includes five constructs: access and management, sociability and diversity, demand and provision, social stratum and information, and social inclusion. The proposed framework provides a tool for quantifying the performance of spatial justice in POS^[35].

Research on Improving Spatial Justice

Zhang and Wang pointed out that spatial justice is a value norm and proposed paths and strategies to achieve spatial justice in China's new urbanization path^[36]. Urban village is the main source of land for urban expansion in the context of urban stock. It realizes the right of residence for the disadvantaged of floating population, which allows them to enjoy social public resources and employment opportunities to a certain extent while avoiding the expulsion of high housing rents in the central area. However, its own formation stems from the squeezing and plundering of rural space by the city in the production of space, and the marginalization of villagers and mobile populations. Therefore, many studies have also focused on promoting the formation of spatial justice in urban villages. Duan took urban park green spaces as a research object, developed a method for evaluating the spatial justice performance of park green spaces, and proposed specific strategies to protect the recreation rights of urban disadvantaged groups, put in place a hierarchical network system for urban park green spaces, and promote a low-carbon, enduring mode of transportation^[37]. By using the example of Tokyo's public space revival, Zheng and Xu proposed strategies of viewability, accessibility, participative, emotional and composite design to enhance the justice of public space^[38]. Based on identifying the injustice issues in riverfront landscape planning, Li advocated the following specific strategies: optimizing river control lines, strengthening ecological concept, highlighting the harmony of wholeness and difference, and improving landscape accessibility, etc.^[39]. From the perspective of spatial governance and its analysis of the causes, Liu and Li analyzed the issues of spatial public alienation, increased spatial environmental deterioration, and uneven distribution of spatial benefits in cities affected by the epidemic. The optimization of inclusive governance, improvement of governance standards, development of social governance community, and sound benefit guarantee mechanism are advocated as spatial governance strategies^[40]. Zeng and Yan proposed specific strategies to improve spatial justice from the perspective of social governance, such as encouraging the market to build small social housing units or to carry out an appropriate amount of mixed housing development, and paying attention to housing location, facility support and community building in housing construction^[41]. Zhang suggested specific strategies for integrating space to advance spatial justice. These include providing public services to the entire community, improving the living environment, and

perpetuating advantageous spaces^[42].

2.2.3 Research Summary

State of Art

In order to compare the similarities and differences between Chinese and Western research in this field, this paper summarizes the characteristics of urban spatial justice research in China and the West (Table 2-3).

Table 2-3 Summary of the characteristics of spatial justice research in China and the West

	China	Western countries
Research contents	Spatial justice: housing construction, transportation patterns, spatial governance patterns	Integration of space and social justice: circulation, accessibility, visibility, quality of space, employment opportunities, educational attainment, urban spatial planning
Research scales	Meso	Macro, Meso, Micro
Research perspectives	Urban governance, urban planning, landscape architecture, and sociology are the main areas of study.	Urban planning, geography, political economy, sociology, management, psychology, medicine and many other disciplines
Research objects	Different types of spaces: parks, residential areas, urban-rural dichotomous spaces, historical districts, public service facilities, medical service resources, etc.	Different types of spaces: public spaces, parks, architectural spaces, residential areas, public service facilities, etc. Different population needs: women, poor people, people of color

Research contents

The research on spatial justice in the field of urban planning in western countries does

not only stop at the spatial level, but will comprehensively consider the economic status, income, education level, age, gender, ethnicity and explores the differences in spatial use and needs of different groups of people, i.e., spatial justice is combined with social justice.

In China, although there are many different disciplines studying spatial justice, they are relatively separated from each other. In the field of urban planning, there is a lack of research on the relationship between space and people with different socioeconomic attributes.

Research scales

The scale of research on spatial justice in Western cities ranges from macro to micro. At the macro scale, cities such as the Netherlands are studied to explore how spatial justice affects urban spatial planning systems. Most studies at the meso level focus on specific areas of the city, and at the microscopic scale, such as temporary installations in neighborhoods or one-day labor stations for laborers, both can intervene subtly to improve spatial justice.

In China, the majority of research is conducted at the mesoscopic scale, which includes streets, neighborhoods, public spaces, parks, etc. There are few studies on the macro scale of urban agglomerations or comparative studies between cities, and on the micro scale of communities and individuals. Wang is more concerned with the guiding role of spatial justice in architectural design. Based on the idea of space justice, a "shared table" is placed in the building courtyard as part of his Hutong renovation projects to create a kind of shared space^[43]. However, such micro researches are still uncommon in China.

Research perspectives

In China, research on spatial justice is mostly conducted in the fields of urban planning, landscape architecture, sociology, urban governance, and other urban studies or social disciplines. And they are not integrated with each other.

In Western cities, research integrates urban planning, sociology, psychology, and medicine, and a multidisciplinary perspective allows for a closer integration of the

relationship between different groups of people and justice^[30].

Research objects

The objects of research on spatial justice can be divided into two categories, one is the study of space and the other is the study of the people who use it. The object of research in China focuses on different types of spaces, including public spaces, green parks, public service facilities, medical resource allocation, residential areas, historical districts, urban villages, and the study of the differences between urban and rural dual spaces. On the contrary, the research on the diversity of users is relatively lacking, ignoring the differences in the needs and spatial preferences of the disadvantaged and special groups.

Western studies are more mature in terms of research objects. In addition to the study of different spatial types, it is often refined to the study of the justice of a certain category of people (women, children, the elderly, the poor, people of color, immigrants, etc.).

Research Trends

With the development of cities, the perception of space in the planning field is gradually changing to a human-centered and just space, where social justice, human needs, and residents' happiness will become the focus of urban construction. The future trends of spatial justice research in China are mainly manifested in the following points.

Focus on the differences in the spatial justice needs of different groups of people

Contrary to Western countries, where racial and immigration issues are prevalent, China does not have these issues. However, with the development of socio-economic development, the Chinese population varies greatly in terms of income, education, social status, and urbanization level. Future study on spatial justice will change its emphasis from space to human justice, and the differences in the needs of different groups of people in spatial justice will be studied by refining the types of people.

The core values of spatial justice need to be identified

In China, there are numerous approaches and frameworks for evaluating spatial justice, but no unified system has been formed. The realization of the vision of spatial justice needs to be led by clear, standard core values. To address the existing phenomenon of injustice in Chinese cities, we should summarize and integrate the relevant elements of spatial justice from relevant research results and develop a common framework. The core values of spatial justice can be chosen by various regions to address their unique problems and create various project visions. The ultimate goal of spatial justice can be achieved by having a universal leading framework while being able to target the injustice issues. Future research on spatial justice will need to address this issue.

Spatial justice as a value-oriented urban regeneration strategies need to be improved

The current research on spatial justice in China is in the process of dissecting unjust phenomena. More studies have constructed an evaluation system of spatial justice based on quantitative or qualitative methods for evaluating the just or unjust phenomena in space. The majority of the optimization solutions suggested on the basis of this, however, are macro and unable to offer specific implementation strategies. One essential area that has to be improved in the future research on spatial justice in the field of urban planning is the provision of specific urban regeneration strategies.

2.3 Theoretical Foundations of Spatial Justice

2.3.1 The Origin of Spatial Justice

Criticism of Injustice

In the early stage of the development of spatial justice, the concepts of “space” and “justice” were separated. Many academics realized the value of justice in society as urbanization accelerated in Western countries and social injustices such as spatial deprivation emerged. The demand for justice at this time stayed more on the material level as well as the equity of the results. In the mid-1940s, through research, Marx and Engels further realized that the development of capitalism increased productivity, opened the global market, and helped eliminate social limitations. However, while expanding capital for interests, the confrontation between social classes is gradually revealing a crisis in the meantime. Based on the profound conflict of interests between laborers and capital, Marx and Engels began to criticize the production mode and spatial production activities of modern social capital^[44].

The Awareness of Social Justice

The publication of *A Theory of Justice* in 1971 was a major milestone, written by John Rawls. His discussion of social justice is considered the theoretical foundation for the study of spatial justice. He proposed the distributive justice theory to discuss how to assign resources and load equally during the development of spatial. The justice mentioned by Rawls includes two principles, that is equal liberty and difference^[45]. The first is the equal liberty principle, that everyone should enjoy the most basic equal liberty rights and be in harmony with the liberties of others. That is, all people in society have the right to be guaranteed freedom and equality in various respects. However, the freedom that Rawls discusses here refers specifically to political freedom, including voting and running for public office, freedom of assembly and speech, freedom of religion and belief, and freedom of private property. It can be found that Rawls' theory is also limited by the fact that members of society are not completely free to own anything. However, due to the differences in each individual's own conditions and the social environment in which they live, there are differences in the extent to which they have access to and use social resources, which in turn can affect the variability of distribution. Therefore, the second principle is the principle of difference, which states that society allows inequality to exist, but it must be accepted in favor of the disadvantaged in society. This is also a constant principle in the development of Spatial Justice. Justice is not the equal distribution of resources, but the justice that benefits the disadvantaged and the harmonious coexistence of society. According to Rawls' two principles, a just space should be a space that can meet the basic needs of life, the fair distribution of social goods, the realization of basic freedom and equality, and the inequality that favors the interests of socially disadvantaged groups. In this view, theory can be used to allocate goods and guide the fairness of outcomes, such as judging whether the allocation of medical resources satisfies the minimum requirements of all people based on respect for differences. In other words, the distribution of medical facilities is equity and reasonable, and everyone, especially the disadvantaged, can access them so that the distribution of resources can be considered to have achieved justice.

Since Rawls' interpretation of justice is limited to an abstract social ideal state, and does not regard the city as a physical space for research, it is difficult to apply Rawls's

theory of justice to the study of urban space. However, it provides new ideas for the study of urban space. Subsequent scholars introduced the concept of space on the basis of Rawls, taking urban space as a place to study justice.

2.3.2 The Evolution of Spatial Justice

Enhanced Understanding of Spatial Attributes

Before the 20th century, space was always regarded as fixed and non-dialectical^[46]. In the development process of western countries, many urban problems such as social stratification, spatial expulsion and isolation, and unequal resource distribution appeared. Therefore, some scholars began to reflect on the fact that the dimension of "space" in sociology is indeed, and they hope to solve the problem of capitalist cities with the dimension of space. Under the leadership of Foucault, Lefebvre, Harvey, and other scholars, many theorists began to study the "spatial turn" of urban issues from different perspectives. For example, Lefebvre proposed that "space is a product"^[47]. As a neo-Marxist school, Lefebvre continued Marx's research on space thought, began to reflect on the inequality caused by the injustice of space production, and emphasized the profound significance of social space, and people began to pay more attention to the social attributes of space. This means that space is no longer an empty icy container, but a production factor and product where capital competes for benefits.

Lefebvre's "Triad of spatiality" gives space more diverse and complete attributes (Fig. 2-2) ^[5]. Among them, the material space is the space defined in the traditional view, which is the place that accommodates all activities. Including urban roads, housing construction, public facilities construction, etc. The spiritual space is an abstract symbolic space, which is people's conception of space, such as the space described by scholars or designers with language and drawings. The social space is a fusion of the former two, with "residents" and "users" as objects, and is the space where people's daily life takes place.

The triple attribute of "material-spiritual-social" reflects the deepening of people's knowledge about the attributes of space and makes people realize that in urbanization, space is both a carrier of production activities and a product to be produced and consumed^[48]. Therefore, space is the result of production, but also an important

element participating in the production, which produces social relations. Lefebvre regards the right to space as a collective right of citizens and puts forward the theory of the right to the city, which is still a discussion of space from a social-historical perspective^[49]. It should be noted that this is not an individual right, but a right that the entire social group can share fairly. This means that urban residents have the right to participate openly and equitably in the process of urban spatial production, to obtain and enjoy urban resources equitably, to enjoy urban public services that meet basic needs, and to be free from imposed various forms of spatial segregation or restrictions.

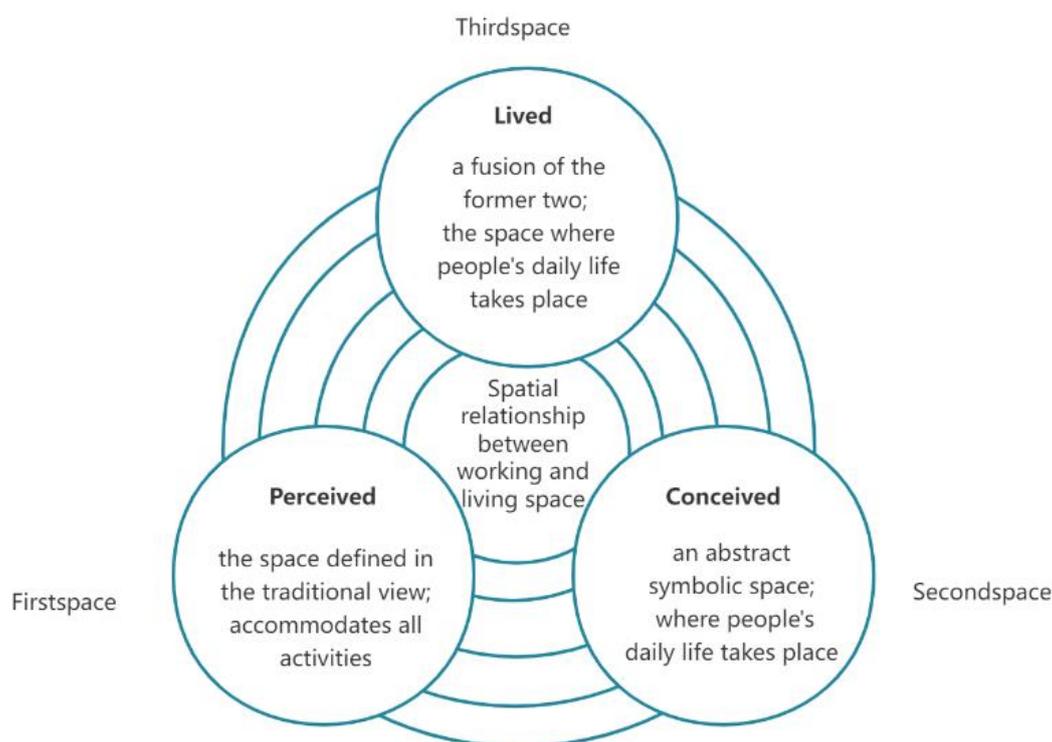


Fig. 2-2 Trialectics of spatiality
(Source: Lefebvre, 1974)

Harvey inherited Lefebvre's space thought conducted in-depth research on Marx's Capital Theory and pointed out that space is a constituent element of society, which not only shapes social relations but also is shaped by social relations, that is, the principle of social justice. He believes that capital and space have a relationship of mutual influence. On the one hand, capital forms and changes urban space, and in pursuit of maximum benefit, urban spaces such as housing, public space, and infrastructure are constantly being updated and transformed. On the other hand, space is also serving the capital, constantly producing social relations that are conducive to

capital accumulation and shaping the spatial form^[50].

During this period, the research on spatial justice paid more attention to social justice, which surpassed the traditional theory of spatial justice, that is, the fair distribution of resources and commodities (distributive justice) proposed by Rawls et al. and realized the transformation of procedural justice. In other words, start focusing on how fair distribution is managed and decided.

Pursue the Value of Spatial Justice

Soja made an in-depth discussion of spatial justice for the first time in "Seeking Spatial Justice", that is the prominent spatial issues in the process of urbanization make spatial justice an important theory and perspective for studying urban issues^[51]. In the context of globalization, capital, power, and class competition for interests have led to spatial production biased towards projects with huge interests, such as real estate, commercial facilities, and recreational facilities. Therefore, there are many injustices in urban space, such as the stratification of social relations, the change in the living land of ordinary residents, and the expulsion of laborers and lower classes from their original land. Soja reflected and criticized spatial injustice such as residential segregation and marginalization of the disadvantaged and put forward the value appeal of Spatial Justice. He constructed the "Third space" theory, breaking the original binary thinking mode that only focuses on the historical and social dimensions, and creatively added the spatial dimension to form the "space-history-society" triadic dialectics. The "First space" and "Second space" here are developed from the material and spiritual space in Lefebvre's "Trialectics of spatiality ". The third space contains the first two, but it is involving all aspects of real and imagined social life, rather than just the result of simple addition. Soja hopes to change the inequality between space and society and achieve true Spatial Justice through the collective action of the third space^[52].

After a long development and evolution of theoretical research, contemporary research on spatial justice has gone deep into the issue of justice in the city. The most representative is Susan Fainstein, who surveyed the work of various theorists in developing a theory of the just city to determine the value of just cities and made a list of urbanists' values for evaluating existing programs (Table 2-4).

Table 2-4 A list of Values

	good	bad
1. public space	heterogeneity	lack of access, homogeneity
2. quality of the built environment	historical accuracy, cutting-edge architecture	inauthenticity, conformist architecture
3. planning	citizen participation	rule of experts
4. social control	Resistance, conflict	Order, domination
5. housing	affordable units	luxury dwellings
6. segregation	mixing, even if conflictual	exclusion
7. mega-projects	popular, incremental, preservation	large, top-down planned
8. social services	collective consumption	privatization, individualization
9. economic development	small business, cooperatives	entrepreneurial state
10. environment	Regulation, green development	laissez-faire

(Source: Susan S. Fainstein, 2006)

Fainstein concluded that the three guiding principles of urban justice are equity, democracy, and diversity. These three principles are equal in urban development, and should not try to eliminate their differences, but should aim to respect group differences as a common goal^[53]. Diverse cities can attract people to gather, be more open to diverse public spaces, and different groups with different lifestyles can coexist peacefully. Fainstein emphasized creating a more just city by ensuring that boundaries between districts remain porous, providing widely accessible and diverse public spaces, and mixing land uses. These three principles serve as criteria for evaluating cities and have been used in the analysis of transportation, education, and public health in New York, London, and Amsterdam in the housing, employment, and public spheres^[54].

2.3.3 Spatial Justice toward Urban Regeneration

As an interdisciplinary concept, contemporary spatial justice is a complex concept with multiple meanings. It has been developed and studied in different forms across several scientific disciplines such as philosophy, sociology, geography, urban planning,

architecture, and space.

Connotation of Spatial Justice

This paper focuses on the spatial dimension of justice. Spatial justice refers to ensure the public's equal rights and interests of space with the aim of meeting the requirements of the different groups of people through proper value guiding, planning and design, and institutional supervision in the process of space production and space resource allocation^[28]. Its scope includes material, spiritual and social spaces such as transportation space, living space, consumption space and interaction space. Spatial justice is defined as offering a critical perspective for observing, identifying and ameliorating deficiencies in spatial justice, like the spatial marginalization of the disadvantaged, the fragmentation of space, and other injustices. In modern society, spatial justice should ensure the balance between efficiency and equity. It is important to ensure both economic growth and harmonious development of the city while ensuring that all people can benefit from urban development and alleviate socio-spatial conflicts.

Characteristics of Spatial Justice

This paper summarizes the connotation and characteristics of spatial justice through the above-mentioned basic study on the theory of spatial justice as follows.

Inclusiveness

Fairness is the primary value demand of spatial justice^[55]. Fairness and justice must be guaranteed in the process of urban development and utilization. The public has equal access to urban space, especially public space and its public resources, should not be affected by factors such as region, wealth, class, race, etc. There is no private appropriation of public space, ensuring the equitable opening of public space. All people and even creatures in the space can be treated correctly and equally, and any form of transformation shall not deprive and destroy the rights and environment of their activities.

Diversity

The service targets of urban construction are people, including people of different age, occupations, physical health levels, and psychological conditions. The New Urban Agenda adopted at the 2016 Habitat III Conference mentions that all people, no matter where they are in the present or the future, regardless of their background, have equal rights to use and enjoy cities. In planning, we should try to meet people's diversified needs for space, and design activity spaces that meet their behavioral needs^[4]. Special attention should be paid to the disadvantaged such as the elderly, children, low-income families, and people with disabilities to provide them with comfortable and quality space. Based on multi-level and multi-faceted analysis of human psychology and behavior, targeted services should be provided precisely for different types of people. In terms of physical space, urban planning should consider the diversity of spatial levels and enrich urban spatial forms, so as to avoid the problem of homogenization.

Differentiation

The justice discussed in this paper is not average, and the pursuit of a completely equal spatial environment can also reduce society's efficiency. Spatial justice requires reducing the encroachment of urban residents' spatial interests and ensuring the greatest interests of the smallest beneficiaries, that is, to accommodate different spaces, groups and cultures to the greatest extent, rather than blindly eliminating such differences^[56].

Integration

The urban regeneration strategies need to break down the spatial barriers, and use refinement methods to connect various communities to reduce the gap between each other. In this way, the problem of spatial fragmentation and social differentiation can be avoided. At the same time, in the era of flexible space, the distinction between places such as work, leisure and daily life is increasingly blurred. Therefore, cities need highly functional mixed regeneration projects to appear in the old city, respecting spatial differences and planning them in an integrated way to give them a sense of wholeness and unity.

Continuity

Urban space usually carries the history and image of the city and forms a unique history and culture due to its different morphology, location, and history^[39]. In the process of urban regeneration, attention should be paid to the historical tradition of the city and the living memory of the aborigines. It is also necessary to retain and renew valuable historical memory, urban texture and the life behavior characteristics of primitive residents, focus on excavating and amplifying regional cultural characteristics, and inheriting cultural context. In this way, residents' right to justice in perpetuating life's memories and behavioral characteristics can be upheld.

Types of Spatial Justice

Justice is primarily concerned with two types of justice: procedure justice and result justice. Procedure justice comes from the legal tradition of Europeans and Americans. There is a well-known legal maxim that justice must not only be done, but must be seen to be done, which essentially refers to the fairness of the process and the equality of rules for all actors in society. Result justice, on the other hand, is concerned with the justice of the outcome, in contrast to the less rigorous justice of the process. Result justice can be thought of as participants in socioeconomic activities should have access to roughly equal resources, and different spaces of the city should be given roughly equal development conditions and development efficiency. These two types of justice are actually the reflection of the distinctions between Chinese and Western cultures. The individualistic values of the Western culture lead to procedure justice and to the social form of democracy and the rule of law. Constitutional amendments and democratic elections are intended to reflect procedure justice, ensure democracy by the rule of law, and enact the rule of law by democracy. Procedure justice in the West requires that in the process, all must be equal. Socialism, on the other hand, is a form of society that seeks more result justice. For instance, the government is less concerned with making the process of policy making public, and the public does not care about the process of policy making as long as the outcome is positive. Procedure justice can occasionally be a tool to an end, and the final result may not be what the people initially expect. Additionally, the process of result justice can occasionally be contentious. The emphasis is on the trade-offs between the two forms of justice rather

than whether they are intrinsically good or bad. For an equal result through an equal procedure, more factors are weighed depending on the situation.

These two types of justice might be considered as distributive justice and procedural justice in the context of spatial justice. On the one hand, distributive justice is sought through the creation, equitable distribution and access to public goods, resources and services throughout the city. Distributive justice refers to the equitable distribution of benefits and burdens in spatial development. This is not only related to the distribution of infrastructure and space, but also to the socio-economic benefits and burdens of urban development. This can be seen as the result of a fair distribution of social resources. On the other hand, justice or injustice can also be found in the way cities and communities are negotiated, planned, designed and managed, i.e. procedural justice. Procedural justice implies agreement in the process of distributing spatial burdens and benefits through professional means such as planning, design, and management, and requires the inclusion of the disadvantaged in dialogue and communication to maximize the chances of reaching just agreements. Spatial justice should be not only result justice but also procedure justice, a value and principle that is constantly and dynamically changing and evolving. Therefore, it is necessary to use urban planning as a tool and a platform to assure justice in spatial production. Result justice of benefit distribution is achieved through inclusive systems and policies that are moderately tilted toward the disadvantaged.

2.4 Summary

This chapter examines the theoretical development and evolution of spatial justice. Additionally, it reviews pertinent domestic and international studies, and discovers that the definition of spatial justice, evaluation framework and enhancement strategies are the main areas of attention for academic research. Spatial justice is still a relatively new concept in urban studies and urban planning. Even though the research on spatial justice in west started earlier and the related theories are relatively mature, its application and solution to urban spatial planning issues have only recently started to take shape. A relatively complete evaluation system and tool methodology have also been developed. For China, the theoretical research on spatial justice is still in its

infancy, and there are related studies in the fields of sociology, philosophy, and urban governance models. In recent years, China's urbanization has developed rapidly, and urban space issues have become increasingly prominent. Chinese academics have explored localized solutions suitable for China from the experience of Western urban space justice. The current research focuses on spatial justice and is still using qualitative or quantitative methods to establish an evaluation system for evaluating the existing spatial justice or injustice in cities. There is little related research on the urban space design strategies under the urban regeneration based on the value orientation of spatial justice. Therefore, how the value appeal of spatial justice guides the practice of urban space design will be the focus of future spatial justice research.

Chapter3 The Theoretical Framework for Improving Spatial Justice

3.1 Establish the Value Principles of Spatial Justice

In this paper, we hope to use spatial justice as a value to guide the generation of urban regeneration strategies. Therefore, it is necessary to systematically consider the factors that influence spatial justice and establish a set of value principles that can be used as a standardization with the goal of having equitable spatial rights for all people. Since different people in various communities experience urban space in various ways, this framework can enable different communities to participate in creating a just city.

There have been studies in China and the West that have established different lists of values, and this paper will collect and organize them (Table 3-1). We will look for common logic among different value systems and consider how subsequent scholars can improve the existing evaluation system.

Table 3-1 Summary of the characteristics of the evaluation system of spatial justice

Authors	Research dimensions	Research Points
Gehl & JMBC, 2015	Urban Justice	Equity, Choice, Access, Connectivity, Diversity, Ownership, Participation, Inclusion / Belonging, Beauty, Creative Innovation, Health and Wellness
	Public Life	Pedestrian Volumes, Age, Gender, Safety, Time Spent Outside, Stewardship, Ownership, Social Connectivity, Beauty, Creative Innovation
	Public Space	Land Use, Mobility Patterns, Plaza Design, Plaza Edge, Cost, Seating Opportunities, Quality Criteria, Commute Time & Rates
Griffin & Just City Lab, 2017	material	Healthiness, Prosperity, Protection, Safety, Security, Adaptability, Durability, Sustainability, Access, Connectivity, Equality, Equity, Merit, Transparency, Diversity, Spontaneity
	non-material benefits	Belonging, Empathy, Inclusion, Reconciliation, Respect, Tolerance, Trust, Creative Innovation, Delight, Happiness, Hope, Inspiration, Democracy, Identity, Power, Freedom, Knowledge,

Li and Wu, 2021	physical justice	Access and Management, Function and Scale, Spatial Quality, Social Activities
	institutional justice	Government role, public policy, development patterns, economic benefits, social benefits, cultural benefits, environmental benefits, sustainable development
	right to the city	Living needs, economic needs, expression of rights
Feng and Deng, 2021	population preference	Accessible leisure time, acceptable travel time, degree of public space use
	basic equity	Number of public spaces, space area per capita, degree of balance between supply and demand, space coverage, accessibility, coverage of population served
	development equity	Activity richness, degree of resident exclusion, degree of participation in community governance
Jian, 2020	access and management	Walkability, Accessibility and Proximity, Affordability, Maintenance and Management, Amenity and Facility, Safety, Service Area
	sociability and diversity	Sociability, Activity Support, Publicness, Space Type
	demand and provision	Number, Size, Acreage
	social stratum and information	Land/Housing Values, Information and Knowledge, Participation and Democracy
	social inclusion	Employment, Income, Age

As a result of the study, it was found that there are some evaluation elements that must be satisfied as the basis of the values that recur in different value systems, whether in China or the West or in different research directions. For example, at the physical space level, accessibility, diversity of facilities, spatial inclusiveness, etc. At the level of spiritual space, sense of community, sense of belonging, and happiness are the basic spiritual needs of residents. The social space level, democracy, participation, etc. In addition, certain elements that are of concern in Western value assessment, such as

racism, do not apply to the Chinese urban context. Therefore, based on the summary study of related literature, the evaluation elements are translated locally by combining the research of relevant Chinese scholars. In this paper, the evaluation elements are summarized and screened in a targeted manner, and the low-impact elements are removed by means of expert evaluation. A value principle in line with Chinese society and humanities will be established.

Based on the study of the theoretical foundation of spatial justice and the interpretation of the ideological connotation with the cognition of spatial injustice, spatial justice refers to ensure the public's equal rights and interests of space with the aim of meeting the requirements of the different groups of people through proper value guiding, planning and design, and institutional supervision in the process of space production and space resource allocation. Therefore, this paper takes Lefebvre's "Trialectics of spatiality" as the basic framework and takes material spatial justice, spiritual spatial justice and social spatial justice as the three dimensions of the core values of spatial justice. Among them, material spatial justice refers to whether space is laid out and allocated in a just way, spiritual spatial justice involves people's ideal vision of space, and social spatial justice requires a combination of humanistic, economic, and political attributes to clarify residents' right to justice in their daily lives. The list of value principles is as follows (Table 3-2).

Table 3-2 The Core Values of Spatial Justice

Values Lists			
Perceived Space	Space Accessibility	Accessibility, Connectivity, Walkability, Mobility	Spatial accessibility reflects the accessibility of space, and the ability of users to easily and quickly access public space for stays and activities is the basis for ensuring spatial justice.
	Space Quality	Authenticity, Integrity, Identifiability, Historical preservation,	Spatial quality is concerned with the user's perception of experience in the space, and high-quality spaces can generate diverse public activities. The justice of space quality also lies in the inheritance of traditional style

		Beauty, Safety	and historical traits of the space.
	Space Activity	Amenity and Facility, Vitality, Creative Innovation, Freedom	Spatial activities are observed to see if the daily activities of users are diversified, and if there is commercial intrusion and spatial segregation.
Conceived Space	Space Inclusion	Inclusion, Respect, Trust, Happiness, Hope, Diversity	Spatial inclusion measures the public nature of space as a shared resource and observes the impact of social context and mobility gaps on the spatial rights of residents. The principle of spatial inclusion is to reflect the care for vulnerable groups.
	Space Demand	Community Identity, Belonging, Pride, Healthiness, Prosperity, Transparency, Ownership	Spatial demand reflects the justice of the distribution of spatial production results. Spatial demand justice should satisfy residents' economic needs, community identity and expression of rights.
Lived Space	Space Production	Engagement, Cooperation, Participation, Togetherness Sociability, Spontaneity, Democracy	Spatial production includes construction behaviors such as renewal and renovation. The public's ownership of program development, decision-making and feedback is a visual representation of spatial production justice.

This study hopes to use spatial justice as a value orientation to guide the generation of urban regeneration strategies. Therefore, it is necessary to systematically consider the factors that influence spatial justice, to have equitable spatial rights for all, and to establish a set of value indicators that can be used as a standardization. Since different people in different communities will experience urban space in different ways, this framework will enable different communities to participate together in creating a just

city. This principle is not only the beginning stage of the study to construct values, but also an important stage of the whole process to determine the goals, which provides the basis for subsequent strategic research.

3.2 Analysis of the Existing Issues of Urban Injustice

With the rapid development of urbanization, the problem of spatial injustice in cities has become increasingly prominent. The theory of spatial justice originated from the criticism and reflection on social injustice^[57]. Research on how to improve spatial justice in urban regeneration needs to be based on an understanding of the issues of urban injustice. This paper hopes to focus on the injustice of urban localization in China and analyze the injustice of urban space from three scales: city, region, and project. By summarizing the analysis of injustice problems and their causes from four aspects of transportation, housing, public space, and service facilities, it provides support for the construction of subsequent research and frameworks.

3.2.1 Transport Issues: Pedestrian Unfriendly

In cities, urban scale expands dramatically and transportation demand continues to expand. The imbalance between traffic supply and demand that led to many traffic issues becoming increasingly prominent. Thus, the expansion of transportation supply and the formation of a motor vehicle-driven transportation system are adopted to relieve congestion and accommodate the high rate of urbanization^[58]. The most prominent manifestation of the traffic injustice issue is the unfriendliness of walking. The unjust distribution of right-of-way is manifested by traffic space alienation, segregation and deprivation. Vehicle-oriented traffic planning divides the urban space into fragments through roads, and turns urban squares or small roads into parking lots, completely ignoring the requirements and visual perception of pedestrians and surrounding residents for the use of space. People lose the right to perceive urban details, to communicate with strangers and to understand local life^[59]. In addition, the wide roads divide the city into segments and become segregated neighborhoods, and people who want to cross the roads need to detour to cross the streets at intersections and look for pedestrian bridges and underground tunnels to cross the streets. Ordinary residents have inconvenient transportation in the city, and have a weak ability to travel,

forming a material isolation of space^[60]. The deprivation of transportation space is mainly the deprivation of the right-of-way for pedestrians and bicycles by cars. Space on pedestrian and bicycle paths is squeezed, which leads to insecurities for the elderly, children and pregnant women crossing the street. The deprivation of road access and safety for non-driving the disadvantaged (elderly, children, visually impaired) is a manifestation of transport injustice.

3.2.1.1 Macro: City Scale - Guangzhou as an Example

All metropolitan cities suffer from traffic congestion and parking difficulties, especially during rush hours. Guangzhou, as an example, has formed an increasingly inhumane vehicle-led transportation system for the rapid development of the city. Guangzhou has reflected on this issue in its urban physical examination work in recent years, and concluded the following injustices in traffic:

Motor vehicles dominate traffic, resulting in insecure pedestrian right-of-way

The more prominent problem in Guangzhou's transportation system planning is that the early urban road planning did not consider the space for non-motorized lanes, and non-motorized vehicles had to mix with pedestrians. The motor vehicle-dominated transportation system not only leads to traffic congestion and insufficient parking space but also deprive the right-of-way of both non-motorized vehicles and pedestrians, ignoring the safety and rights of pedestrians (Fig. 3-1). It poses a great safety hazard to the elderly, the disabled, people with strollers and other travel difficulties.



Fig. 3-1 Non-motorized vehicles occupy the sidewalk

Different grades of roads in Guangzhou were selected for right-of-way allocation research. The research found that motor vehicles and parking space take up more than 50% of the road width, regardless of road class and width (Table 3-3). Non-motorized vehicles are mixed with pedestrians, and even if there are non-motorized lanes planned, they are occupied by car parking. As a result, non-motorized vehicles can only use the pedestrian lanes, posing a threat to pedestrian safety. The remaining street space is also mostly used for parking. The research found that due to the abandonment of some buildings, the travel space of some roads is also occupied by parking spaces. The proportion of street space occupied by walking is only about 30%, and the walking space is also occupied by bicycle parking or store clutter.

Table 3-3 Site Road cross-section

Road name	Width of road	Road grade	Motor vehicle space	Parking space	Pedestrian and non-motorized space	Sections
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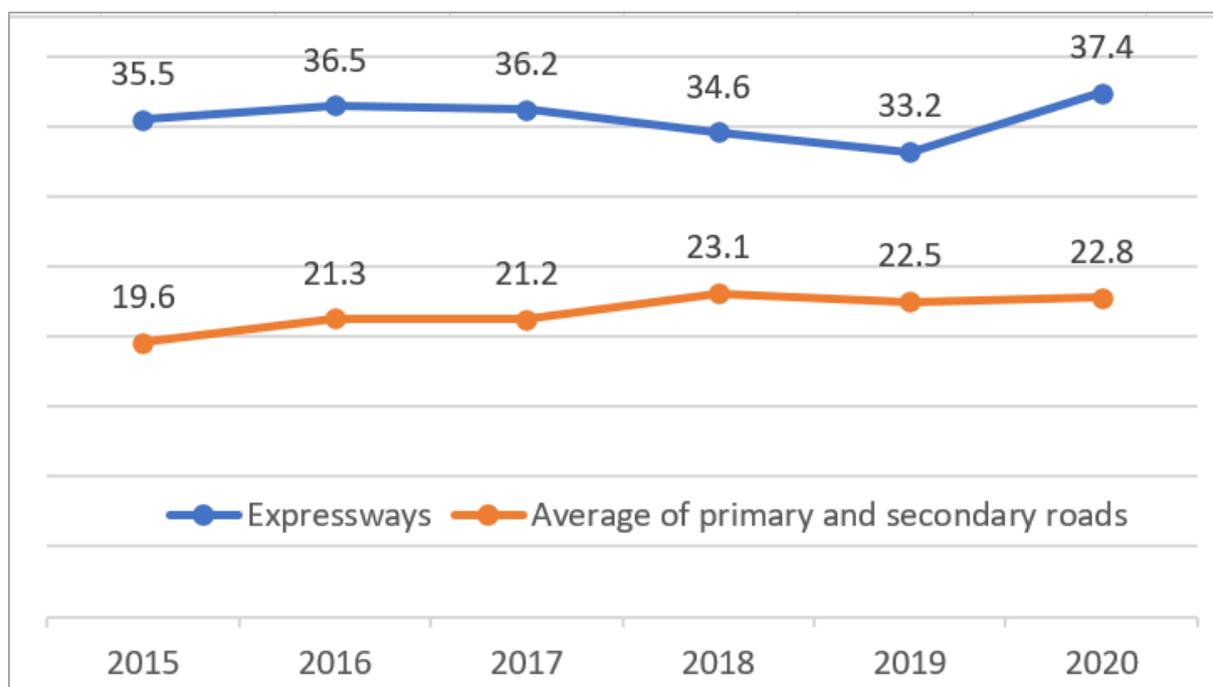


Fig.3-2 The speed of the main road during the evening rush hour in the core area
(Source: Guangzhou Planning and Natural Resources Bureau)

Autos take up valuable street activity space

In recent years, the number of cars in Guangzhou has increased significantly. However, the growth of parking spaces failed to match the growth of vehicles, which led to a prominent contradiction between supply and demand. The ratio of total parking spaces to car ownership in Guangzhou in 2020 is 1:1.04, which is a good level among China's mega-cities, but still fails to meet the national requirement of the ratio^[62]. According to the relevant research study, 80.8% of Guangzhou car owners said parking was difficult and only 3.2% said it was easy (Fig.3-3)^[63]. Especially in the central urban area, the supply and demand of parking is unbalanced, and it is more difficult to park in key areas such as hospitals and schools. At the same time, the ratio of residential parking spaces too small car ownership is low, with a large gap between the required accessory standards in Guangzhou (Fig.3-4). The imbalance between the number of cars and parking spaces leads to the phenomenon of cars occupying the street space for parking, so the movement space of pedestrians is squeezed. It also creates obstacles

for cyclists, the disabled, the elderly and people pushing strollers to travel.

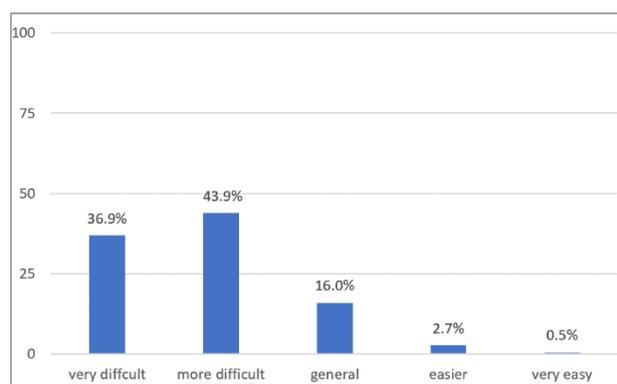


Fig.3-3 Parking feelings of Guangzhou car owners

(Source: Sharpen Research Institute)

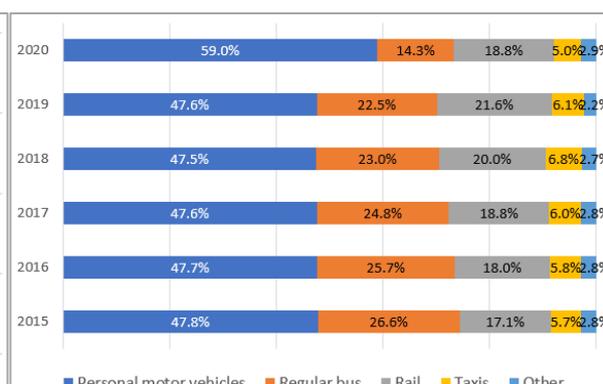


Fig.3-4 City-wide motorized travel mode structure

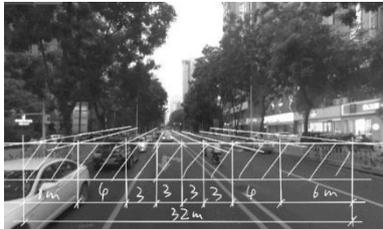
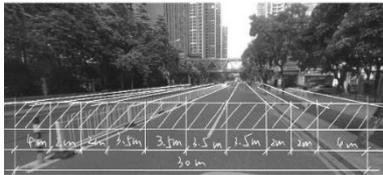
(Source: Guangzhou Daily)

3.2.1.2 Meso: Regional Scale - Zhujiang New Town as an Example

As an urban CBD, in order to pursue efficiency and convenience, the urban space of Zhujiang New Town is occupied by motorized traffic arteries. The occupation of pedestrian and non-motorized space is even more pronounced. The pedestrian environment is obviously fragmented. This creates space barriers to block the communication between communities, and the difficulty for pedestrians in the city to find the space for daily life and communication activities on the street.

The roads in the Zhujiang New Town include five types of roads: motorized lanes, non-motorized lanes, pedestrian lanes, parking spaces and road greenery. The form of the road section is slightly adjusted according to the surrounding environment. However, the proportion of motorized lanes to the street space is about 40%, and the remaining street space is mostly used for parking (Table 3-4). The research found that due to the abandonment of some buildings, the travel space of some roads is also occupied by parking spaces. The proportion of street space occupied by walking is less than 20%. The planned bicycle lane space is only about 10%, which cannot meet the huge non-motorized traffic in Zhujiang New Town. As a result, non-motorized vehicles will use the pedestrian paths, causing further compression of pedestrian space. And most of the roads in the Racecourse do not have facilities for pedestrians to rest and stay, and the street space is only for pedestrians to pass through and cannot provide space for residents to rest and interact.

Table 3-4 Site Road cross-section

Road name	Width of road	Road grade	Motor vehicle space	Parking space	Pedestrian and non-motorized space	Sections
Huacheng Avenue	54m	Trunk road	45%	0	55% (15% for pedestrian, 6% for non-motorized, 37% for green road)	
Huasi Road	32m	Secondary Trunk Road	38%	37%	25% (Mixed traffic of pedestrian and non-motorized vehicles)	
Xingyue Road	30m	branch way	47%	0	53% (27% for pedestrian, 13% for non-motorized, 13% for green road)	

The large-scale public space creates spatial segregation. The public space on the central axis of Zhujiang New Town, Flower City Square affects the connection between the west and central areas of Zhujiang New Town to a certain extent. It is difficult for non-motorized vehicles to cross the Flower City Square, so they need to take a detour around roads such as Huangpu Avenue or take the underpass tunnel to mix with cars, which is very inconvenient. In the Pearl River Park in the eastern part of the Zhujiang New Town is large, so bicycles and pedestrians who want to cross the block in a north-south direction can only take a detour (Fig.3-5).

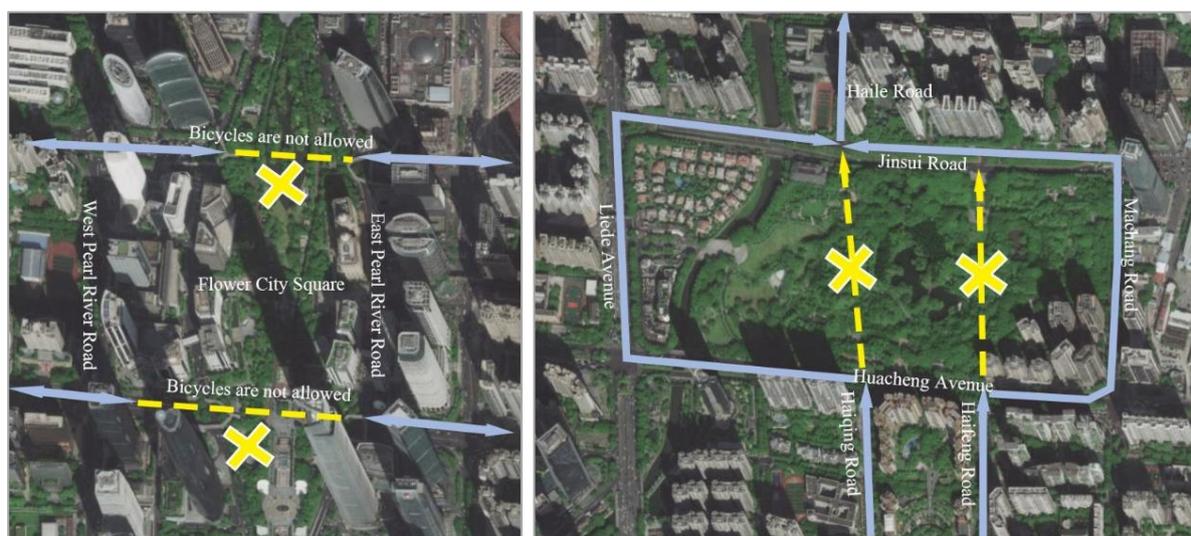


Fig.3-5 Non-motorized crossing space is not convenient

3.2.1.3 Micro: Project Scale - the Example of the Racecourse

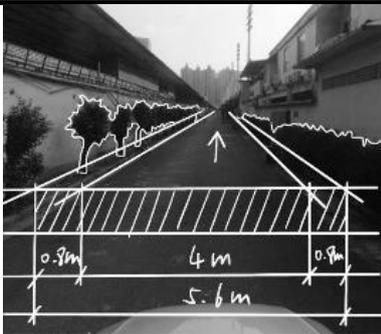
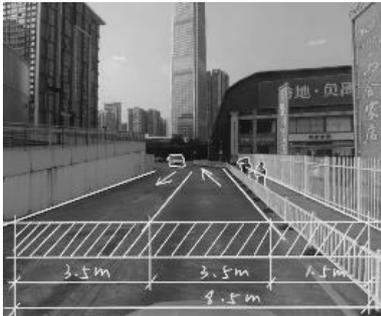
The deprivation of pedestrians' right of way is even more severe in Racecourse. Only motor vehicle lanes are planned in the site, and motor vehicles completely occupy the right-of-way. Since there is no sidewalk in the site, the phenomenon of people and vehicles mixing is serious, resulting in the mixing of motor vehicles, non-motor vehicles and pedestrians. There are problems of chaotic traffic order and poor walking experience. Because the space for walking paths and bicycle paths is crowded, the elderly, children and people with inconvenient travel pose potential safety hazards.

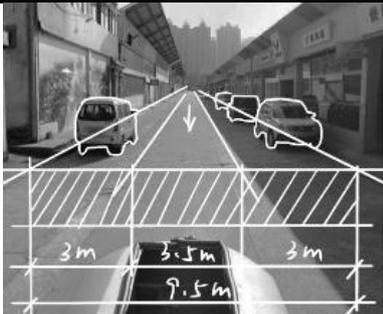
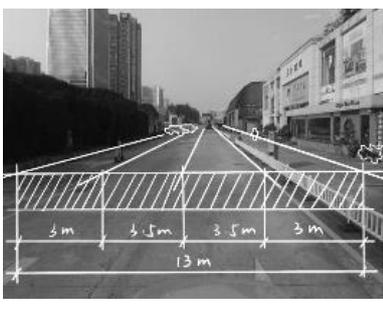
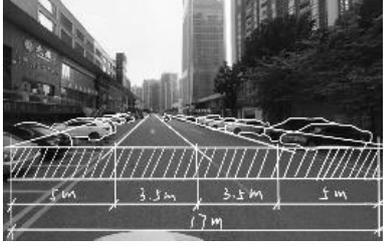
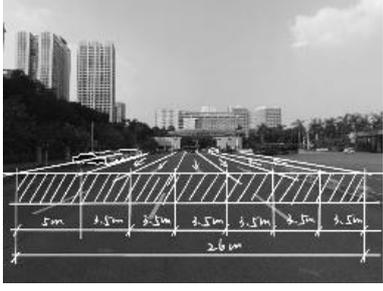
Pedestrian are deprived of their right of way

The site study of the site shows that the width of the road in the racecourse is between 6m and 30m, including four major functions: motorized road, non-motorized road, walking road and parking space. The road section form is slightly adjusted according to the surrounding environment. However, motorized lanes account for 40% to 80% of the street space, while the remaining street space is mostly used for parking (Table 3-5). The survey found that due to the abandonment of some buildings, the driving space of some roads was also occupied by parking spaces, resulting in only about 20% of the street space for pedestrians. The width of the walkway is very narrow, only maintained between 1.5m and 3.0m, which means that the widest one is only enough for two people to pass side by side. However, most roads do not have obvious walking

paths, so pedestrians who lack space can only mix with non-motorized vehicles and motor vehicles. And there are no facilities for pedestrians to rest on the roads in the racecourse, resulting in poor pedestrian space on the street.

Table 3-5 Site Road cross-section

Width of road	Ratio of motor vehicle space	Ratio of parking space	Ratio of pedestrian and non-motorized space	Sections
5.6m	70%	0	Mixed pedestrian and vehicular traffic, no obvious road space for pedestrians (30% for road greening)	
8.5m	82%	0	18%	
9m	77%	23%	Mixed pedestrian and vehicular traffic, no clear road space for pedestrians	

9.5m	37%	63%	Mixed pedestrian and vehicular traffic, no clear road space for pedestrians	
13m	54%	23%	23%	
17m	41%	59%	Mixed pedestrian and vehicular traffic, no clear road space for pedestrians	
26m	80%	20%	Mixed pedestrian and vehicular traffic, no clear road space for pedestrians	

There are many internal cut-off roads with poor accessibility

Most of the buildings in the plot are in idle state, and most of the roads are closed by fences (Fig.3-6). As well as the golf course has taken the road for its own use, so only those who go to the course will enter. As a result, the internal roads have more cutoffs and poor accessibility, and more space is inaccessible, resulting in wasted space.

Lack of external connections, the block is completely closed

In urban center areas, large blocks are not open enough to serve city dwellers. The

west side of the block is enclosed by a fence and the east side is covered by a wall (Fig.3-7). Access is inconvenient for visitors as there are only a few fixed entrances to the block. The lack of connection with the surrounding neighborhoods creates spatial isolation.

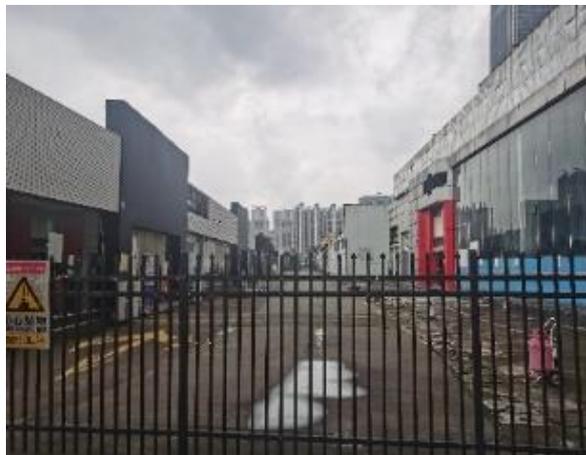


Fig.3-6 Cut-offs within the site



Fig.3-7 East side fence of the racecourse

Lack of connecting roads and blocking of neighborhood space.

The neighborhood has a special geographical location between Huangpu Avenue and Huacheng Avenue, which are the main arteries in the city. These two arterial roads have high road levels and are prone to traffic jams during peak hours. There is only a branch road on the east side of the site to connect the two arterial roads, and there is no crossing road on the west side, which cannot relieve the traffic pressure of the two arterial roads. And there is no east-west traversing type road in the site, causing spatial isolation. Residents on the east and west sides cannot create connections, so it is difficult for residents on the east side to reach the Pearl River Park on the west side.

3.2.2 Housing Issues: Housing Disparity

The current urban housing issue is characterized by a shortage of housing, an imbalance of resources, and alienation. The residential space in the city has shown a relatively obvious phenomenon of rich and poor differentiation, resulting in the corresponding differences in various supporting facilities such as medical care and education^[64]. People of different social classes will choose different ways of living, and some people with similar living conditions and opportunities will live relatively concentrated in some communities with similar living quality. Thus, the phenomenon

of discriminatory residential segregation is formed, so that some people gradually lose the opportunity and ability to obtain good spatial resources. When upscale residential clusters may occupy quality landscapes that should be enjoyed by the public, public resources are exclusively occupied by a few people. This artificially divided and unequal hierarchical living space is one of the concrete manifestations of urban injustice.

3.2.2.1 Macro: City Scale - Guangzhou as an Example

Guangzhou, as a first-tier city in China, has more typical injustice issues in housing, including unmet demand for rental housing, prices much higher than people's income, and unbalanced supply of housing in different regions. These issues are embodied in the following aspects:

The living space per capita is lower than the national average

According to the survey data of "China Census Yearbook, 2020", China's urban housing area per capita is 36.52m², and the average household housing area is 92.17m², according to the per capita housing area, there is still a gap of nearly 40% with the standard of developed countries. The data of Guangdong is the lowest, the average household housing area is only 72.06m², and the per capita housing area is only 29.59m² (Fig.3-8). Among them, Guangzhou and Shenzhen as the two most economically developed cities pull down the level of the province. In 2020, Guangzhou urban residents per capita housing floor area is 34.61m², which is lower than the national average. Guangzhou's limited urban land area carries a large population, which will certainly pull down the per capita area. Therefore, the contradiction between population demand and housing supply is outstanding.

	Average housing floor area per household (sqm/household)	Housing floor space per capita (sqm/person)
Nationwide	92.17	36.52
Beijing	77.84	33.41
Tianjin	82.41	34.97
Hebei	100.77	38.08
Shanxi	93.75	36.61
Inner Mongolia	88.25	36.76
Liaoning	77.9	35.24
Jilin	78.58	34.33
Heilongjiang	76.97	35.49
Shanghai	73.88	30.58
Jiangsu	107.65	40.75
Zhejiang	88.37	36.96
Anhui	98.88	37.7
Fujian	93.93	35.86
Jiangxi	115.46	39.36
Shandong	103.07	37.68
Henan	117.41	41.81
Hubei	109	41.18
Hunan	110.15	41.77
Guangdong	72.06	29.59
Guangxi	103.78	38.08
Hainan	90.19	32.03
Chongqing	89.91	34.79
Sichuan	93.19	37.01
Guizhou	100.03	36.26
Yunnan	100.88	41.08
Tibet	107.26	51.33
Shaanxi	95.9	39.72
Gansu	87.13	34.79
Qinghai	100.79	40.79
Ningxia	96.16	37.9
Xinjiang	91.07	36.07

Note: The data is for households living in ordinary houses

Fig.3-8 Household living area and living area per capita by region (city)

(Source: China Census Yearbook, 2020)

People's income cannot afford the high price of housing

The housing price-to-income ratio in the central area of Guangzhou is more than 20, and the growth rate of this income ratio is relatively fast in recent years (Fig.3-9). Among them, the housing price-to-income ratio in Yuexiu District even reached 30.3, which caused huge pressure on residents to buy houses. Globally, the ideal house price-to-income ratio is between 1.8-5.5 in developed countries, and between 3-6 in developing countries^[65]. The housing price-to-income ratio in Guangzhou in 2020 is 16.7, which is far beyond the above range, exposing the fact that the average citizen's income in China cannot afford the high prices of housing (Table.3-6).

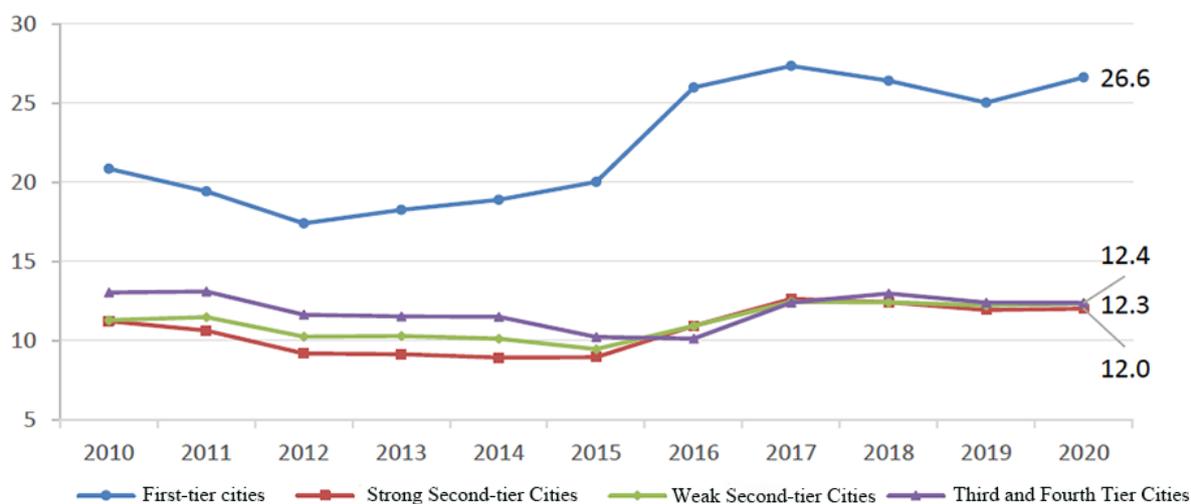


Fig.3-9 Average house price to income ratio by city
(Source: Local statistical bureaus, CRIC, E-House Research)

Table.3-6 House price to income ratio ranking of 50 typical cities in China in 2020

city	House price to income ratio	city	House price to income ratio	city	House price to income ratio
Shenzhen	39.8	Nanning	12.9	Rizhao	10.2
Sanya	27.1	Taiyuan	12.9	Kunming	10.2
Shanghai	26.2	Tianjin	12.8	Chengdu	10.1
Beijing	23.8	Dalian	12.7	Harbin	10.0
Xiamen	23.1	Zhengzhou	12.4	Lanzhou	9.7
Fuzhou	19.5	Wenzhou	12.4	Chongqing	9.6
Hangzhou	18.5	Yangzhou	12.3	Qingdao	9.4
Dongguan	17.3	Wuhu	11.9	Yichang	9.3
Guangzhou	16.7	Wuhan	11.7	Huizhou	9.2
Zhuhai	16.1	Putian	11.7	Shenyang	9.2
Nanjing	15.4	Foshan	11.5	Luoyang	9.0
Shijiazhuang	15.0	Xi'an	11.5	Urumqi	7.8
Suzhou	14.5	Jinan	10.7	Guiyang	7.6
Ningbo	14.3	Wuxi	10.5	Yantai	7.5
Haikou	14.0	Jinhua	10.5	Shaoguan	7.3
Nantong	13.9	Nanchang	10.3	Changsha	6.2

Hefei	13.5	Nanning	10.3	Sunshine	10.2
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(Source: Local statistical bureaus, CRIC, E-House Research Institute)

The rental housing needs of new citizens cannot be met

Although the growth of the resident population in Guangzhou is slowing down, the average annual increase of the resident population in Guangzhou in the past 3 years is still over 200,000. Various groups of people will have a greater demand for urban commercial housing and policy housing in the future, especially new citizens such as graduated college students, young workers of key industries, and various types of shortage talents. They mainly rely on renting to solve their living issues, but the number of urban rental housing cannot meet their large demand^[66]. In addition, the living environment of existing rental housing is relatively poor, with problems such as traffic congestion, close building distance, and difficulty in guaranteeing living safety.

Housing supply is unbalanced

The central city and peripheral areas each have different shortcomings. The central city has an insufficient housing supply but has abundant resources, convenient transportation, and obvious location advantages. The peripheral areas, on the other hand, have a large amount of new housing, but with insufficient supporting facilities and inconvenient transportation^[67]. The central urban area attracts an influx of foreign population due to its adequate resources for education, medical care, elderly care, and other supporting facilities, convenient subway and bus travel, developed commerce, and many employment opportunities. However, the central urban area faces problems such as little incremental land, large-scale housing demand, and difficulty in promoting urban regeneration, resulting in a prominent contradiction between housing supply and demand. On the contrary, although there is a large supply of housing in the peripheral areas, there are deficiencies in service facilities, transportation facilities, and jobs. Therefore, there is still a tendency for the population to gather in the central urban area.

3.2.2.2 Meso: Regional Scale - Zhujiang New Town as an Example

Zhujiang New Town is divided into three areas according to function: West District,

Central Axis District, and East District. It contains 14 blocks (Fig.3-10). The residential areas are mainly concentrated in the four blocks E, G, L and M, accounting for 74% of the total residential construction in the Zhujiang New Town. Taking the core area as the central axis, two major residential areas, east and west, are formed (Fig.3-11)^[68]. The unjust phenomenon of housing is mainly manifested in the unbalanced situation of the two east-west blocks:



Fig.3-10 Zhujiang New Town Plot Code
(Source: Zhujiang New Town Planning Review)



Fig.3-11 Distribution of residential areas in
Zhujiang New Town
(Source: Shuwei Observation)

Disparities between housing conditions

The area of residential land in the western part of Zhujiang New Town accounts for 18% of the total residential land, while the area of residential land in the eastern part accounts for 82% of the total residential land. There are 9 residential areas built before 1999 in Zhujiang New Town, such as Yangji District, and 12 residential areas were built from 2000 to 2004, such as Bihaiwan. Most of the residences built in the early period were concentrated in the west district, while the east district started to build residences gradually after 2000, such as Happy Valley Garden, etc. From 2005 to 2009, the number of residences increased rapidly, as many as 30, and the residences in this period were concentrated in the east district, such as Triumph New World, etc. After 2010, the speed of new residences in Zhujiang New Town slowed down, and they were concentrated in the east district next to Pearl River Park, such as Jinbihua Mansion^[69]. Therefore, it can be found that most of the residences in the west area of Zhujiang New Town are old communities, where the buildings are more than ten years old, and the apartment types of the buildings are relatively backward, making the living environment uncomfortable. The office density and intensity in the west area are high, and the land

use intensity is high, resulting in a poor living atmosphere in many residences (Fig.3-12). On the contrary, the east, especially the riverside area, is the gathering place of luxury. Residents here enjoy high-quality public service resources, and a first-line view of the riverfront, forming a living atmosphere with a greater difference from the west district.

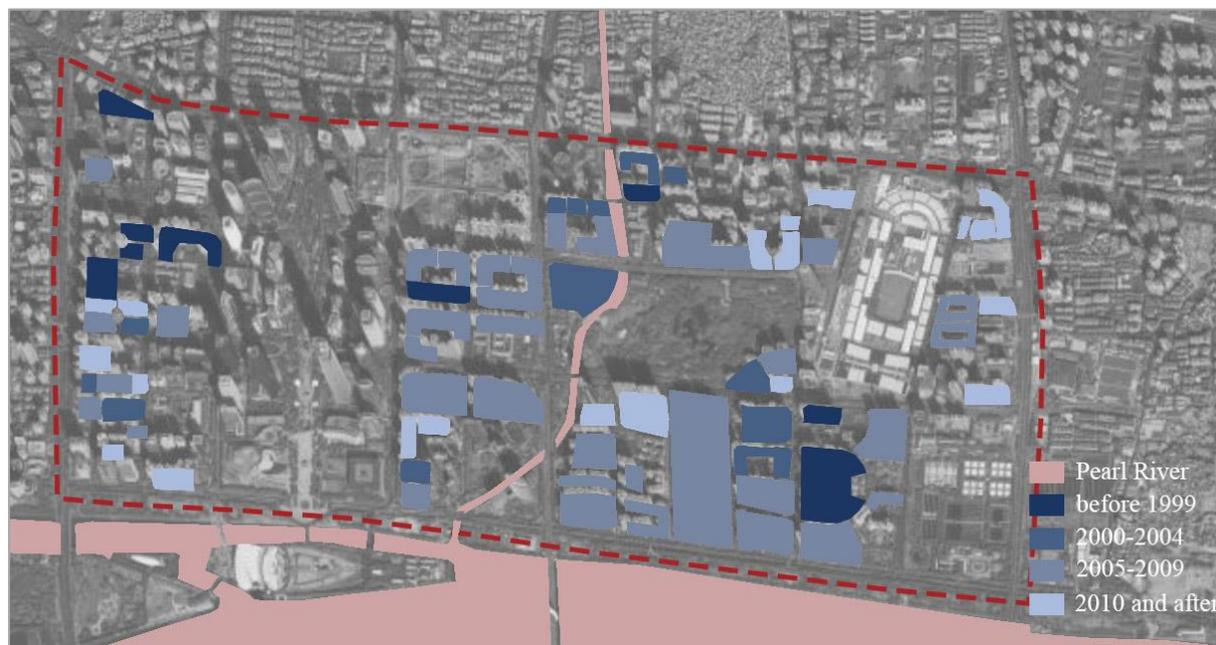


Fig.3-12 Zhujiang New Town Residential District Construction Era

3.2.2.3 Micro: Project Scale - the Example of the Racecourse

As the racecourse is located in the eastern part of the Zhujiang New Town, the surrounding area is a gathering place of luxury residential areas. At the same time, there are also urban villages around the site that have not been updated and developed. Therefore, the residential differentiation in the area is more significant.

The surrounding luxury houses are gathered, and the class differentiation is obvious

Because the neighborhood is in the center of the city and close to the CBD, most of the surrounding residential areas are luxury houses with high prices (Fig.3-13). The price ranges from 60,000 to 250,000. The luxury residential areas have beautiful riverfront views, comfortable living environment, and quality services and facilities, but the very high prices make it difficult for many people to pay and enjoy these great urban spaces.



Fig.3-13 Second-hand house prices around the racecourse
(Source: Anjuke)

Imbalance between supply and demand of rental housing

People who work nearby are in high demand for rental housing (Fig. 3-14). Because the site is on the east side of the CBD, many people who work in the CBD need living space in the neighborhood, so there is a large demand for rental housing here. Field research found that there is a lot of information on housing for rent, which also indicates that there is a large demand for rental housing here. However, the current imbalance between supply and demand of rental housing makes many people who work here live in farther locations and have very long commuting times.



Fig. 3-14 Rental information around the racecourse

The nearby urban village's environment is deplorable

On the northeast side of the neighborhood, there is one of the largest and most populous urban villages in Guangzhou, Shipai Village. It is a concentration camp for foreign workers, with over 50,000 foreigners renting in Shipai Village. It provides inexpensive housing for people, but with poor living environment, high building density and very close building spacing between buildings. The streets are compact and winding, with no sunlight, poor air quality and a dirty environment (Fig.3-15). The living environment is a safety hazard, both in terms of fire problems and crime, which is threatening the residents.



Fig.3-15 Shipai Village

3.2.3 Public Space Issues: Space Publicness Lacking

The injustice of public space is reflected in the lack of publicness. The construction of urban public space lacks consideration for the diversity of urban life and the differences of regions. This has led to the lack of vitality of urban public space. The single use of public space, whether in terms of function or time or crowd restriction, has weakened the social significance of public space. Inappropriate spatial scale, single function, and lack of service facilities make public space lose its vitality and make people feel far

away, and public activities in the space gradually decrease^[70]. It restricts the communication between people and ignores the activity needs of the elderly and children. Part of the space loses its attractiveness and is forced to be transformed into a traffic space, losing the sense of place for interaction and expression.

3.2.3.1 Macro: City Scale - Guangzhou as an Example

The public space in the central area of the city faces injustices such as frequent occupation, poor accessibility, and low space utilization. After the investigation and summary, it is found that the more prominent problems of public space in Guangzhou can be summarized as the loss of publicity. In terms of time of use, the space is only suitable for a single type of activity and lacks the flexibility of time change, resulting in a high usage rate only at certain times, with the rest of the time being idle. On the other hand, from the perspective of using functions, a certain space lacks the inclusiveness of simultaneous use with other functions, which makes residents unable to fully experience the richness and interest of public space^[71]. In addition, from the viewpoint of using people, since 2020, Guangzhou has proposed to build a child-friendly city and an elderly-friendly city, and started to pay attention to building child- and elderly-friendly spaces. As it is still in the development stage, Guangzhou's public spaces generally lack dedicated children's entertainment spaces and inclusive spaces for the disadvantaged.

Uncomfortable walking experience

In December 2021, Guangzhou has experienced destructive "construction" behaviors in which many street trees were felled. This kind of behavior has seriously damaged the natural ecological environment and historical and cultural features of the city, and also hurt the people's good memory and deep feelings for the city^[72]. Municipal facilities transformation occupies the original greening area. With the rapid development of cities, it is unavoidable that infrastructure such as cable burials and road greening compete for space. For example, on Penglai Road, the old trees on the side of Xicheng Duhui were basically cut down, resulting in a lack of shade for the sidewalk, which is very inhumane in the summer climate of Guangzhou (Fig.3-16).

In addition, the greening planning and design of some public spaces such as parks and squares blindly pursue a sense of openness and grandeur, which is completely out of the climatic conditions of Guangzhou and the real needs of the masses. For example, after the transformation of the south gate of Tianhe Park, a large square without cover was formed, with a row of landscape trees at the immediate gate (Fig.3-17)^[73]. The square looks wide and imposing, but with the cost of uncomfortable walking experience, resulting in fewer pedestrians staying here. During most of the year, due to the high temperature in Guangzhou, the grass outside the shade of trees is not an effective leisure activity area for citizens. The squeeze on the green space of the road is actually a squeeze on the comfortable walking environment for pedestrians.



Fig.3-16 Pavement condition of Penglai Road



Fig.3-17 Before and after the transformation of the south gate of Tianhe Park

The leisure space of citizens is crowded

Some pocket parks in the city are located in dirty and sanitary corners, or are occupied by non-motor vehicles and become parking lots (Fig.3-18). Many shops are randomly piled on the roadside, occupying green space. Because the environment is dirty and the space is occupied, the pocket park does not play the function of providing leisure space for the citizens.

Some parks have closed gates and are not open to the public (Fig.3-19). Some parks do not have matching seats, sports facilities, and lighting facilities. These parks were originally public spaces, but now they can only be viewed, not used, and cannot provide residents with spaces for communication, interaction, greening and leisure.



Fig.3-18 Pocket Park near shipai
Primary School is occupied



Fig.3-19 Panfu Road

3.2.3.2 Meso: Regional Scale - Zhujiang New Town as an Example

The public spaces in Zhujiang New Town are designed with different space types and rich planning of civic activities. However, in the process of use, it also reveals the issues of homogenization of functions available to citizens. The public space of Zhujiang New Town can be divided into five types according to the spatial form: public space, building enclosed space, street space, space around building, and waterfront space (Fig.3-20). According to different forms of citizen activities, public space can be divided into: sightseeing-oriented spaces, such as the Flower City Square. Spaces dominated by social gatherings, such as celebration square. Spaces dominated by shopping, leisure, and entertainment, such as the Flower City sunken square, and spaces dominated by traffic, such as elevated pedestrian platforms [74].

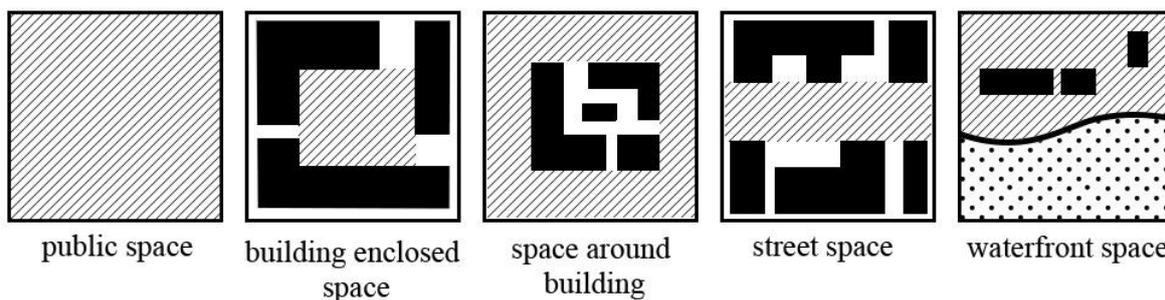


Fig.3-20 Typology of public space in Zhujiang New Town

However, in the actual use of the public, it is found that some public spaces lack rest facilities and service facilities to promote public communication and interaction, facilities needed by children and the elderly, and facilities such as shade and rain. The

humanized design needs are not met (Fig.3-21). As a result, people's willingness to stay in the empty spaces is reduced. Some public spaces only function at specific times, such as the Celebration Square, which can accommodate citizens to watch the light show during major festivals, but is usually a single-function traffic space.



Fig.3-21 The Twin Towers Square

In addition, the surrounding high-rise office buildings show strong exclusivity, and the plaza space in front of the ground floor of the building lacks publicness (Table 3-7). The disproportionate scale of the space and the lack of rest facilities reduce the willingness of people to stay in the open space at the bottom.

Table 3-7 Disproportionate scale of open space at the bottom of high-rise buildings

Name of the building	Space Status	Problem analysis
Yuexiu Financial Tower		Lack of transitional spaces such as landscape and grey space on the ground floor of the building.
Zhujiangcheng Tower		Strange shape of space at the bottom of the building, poor pedestrian space experience.
Fuli Yingkai Building		The space between high-rise buildings is oppressive and does not provide space for people to move around.



Evergrande
Center



Lack of shade and leisure facilities at the bottom of the building, lack of willingness of pedestrians to stay.

3.2.3.3 Micro: Project Scale - the Example of the Racecourse

The Racecourse has very low space utilization and basically no public space because most of the internal buildings are in idle state. And on the west side of the site is Pearl River Park. Pearl River Park covers an area of 28ha, with a south gate, north gate and east gate, and is closed for management. The Pearl River Park is integrated with modern south of the five ridges style architecture and plant landscaping, becoming a model of artificial landscape creation^[75]. However, the west, south and north sides of the park are all major city roads, so people in the surrounding neighborhoods must walk around the intersection to reach the other side of the road. Due to the limitations of the traffic arteries, the shortage of parking spaces and the small number of gates, the frequency of public visits to Pearl River Park is relatively small. There is a relative lack of functionally diverse public activity space within Pearl River Park, with a relatively homogeneous range of activities and a lack of features to attract long-distance visitors. The scale of restaurants within the park is also small and lacks a driving effect. As a result, the public space around the Racecourse is also relatively single-functional, making it difficult for children, the elderly and other people with relatively restricted travel distances to find suitable public activity spaces.

3.2.4 Facilities Injustice: Facilities Deficiency

The injustice of service facilities is manifested in the imbalance between public service facilities and individual needs. Unequal spatial distribution and single type of facilities can lead to differences in accessibility and availability of facilities. The wealthy class will enjoy more quality and adequate social resources. The disadvantaged in cities have unequal rights to service resources. The lack of age-appropriate service facilities for the elderly and inadequate accessibility limits the urban rights of people with limited

mobility, such as people with disabilities.

3.2.4.1 Macro: City Scale - Guangzhou as an Example

Injustice of service facilities are mainly reflected in the lack of public service facilities in the city, the low coverage rate of convenience facilities, and the insufficient types of facilities configurations. In addition, the facility coverage rate of each district deviates greatly, and the central urban area is generally higher than the peripheral urban area, which is very likely to lead to population shift, residents' psychological imbalance, and other unjust phenomena. This paper focuses on the injustice of service facilities for the disadvantaged. The specific issues are reflected in the following aspects:

Inadequate service facilities for the disadvantaged

The facilities for the disadvantaged such as the elderly and children, who depend on community life to a greater extent, are not well equipped. The coverage rate of community elderly facilities in central urban areas is below 80%^[76]. Only some areas have an 80% coverage rate of inclusive kindergartens as required by the state. With the changes in social development trends, there is a greater demand for new facilities such as dining spots for the elderly, college teaching spots for the elderly, and childcare centers. However, the above facilities do not account for a high proportion of the community public service facilities in Guangzhou. With the accelerating aging of the city, the Guangzhou government has issued more than 60 senior care service policy documents to build a senior care service system and create a "10-minute community home-based careservices circle". At present, Guangzhou's elderly service facilities basically cover all communities in terms of quantity, but the problem is that the elderly service resources are relatively scattered and the service radius is too large, and the elderly cannot enjoy the long-distance elderly service facilities due to their limited physical ability.

In addition, the construction of community home-based careservices facilities in Guangzhou is weak, and some of them have not played their proper role in the construction of the elderly homes vigorously promoted in Guangzhou. There is a disconnection between the facilities and the spatial structure of the original community,

and some of the senior care facilities are of unreasonable scale and layout and have a single function. According to the nuclear density hotspot map of Guangzhou in 2020, it can be seen that the existing elderly service facilities in Guangzhou are concentrated in Tianhe District, Yuexiu District, Baiyun District and other downtown areas, while the distribution in the peripheral areas of the city is relatively small (Fig.3-22). However, in Tianhe District, there is still a lack of home-based careservices facilities, i.e. senior apartments and large senior care communities^[77]. The reason is that the high land price in the city center makes it difficult to have new space to develop elderly service facilities in the limited space.

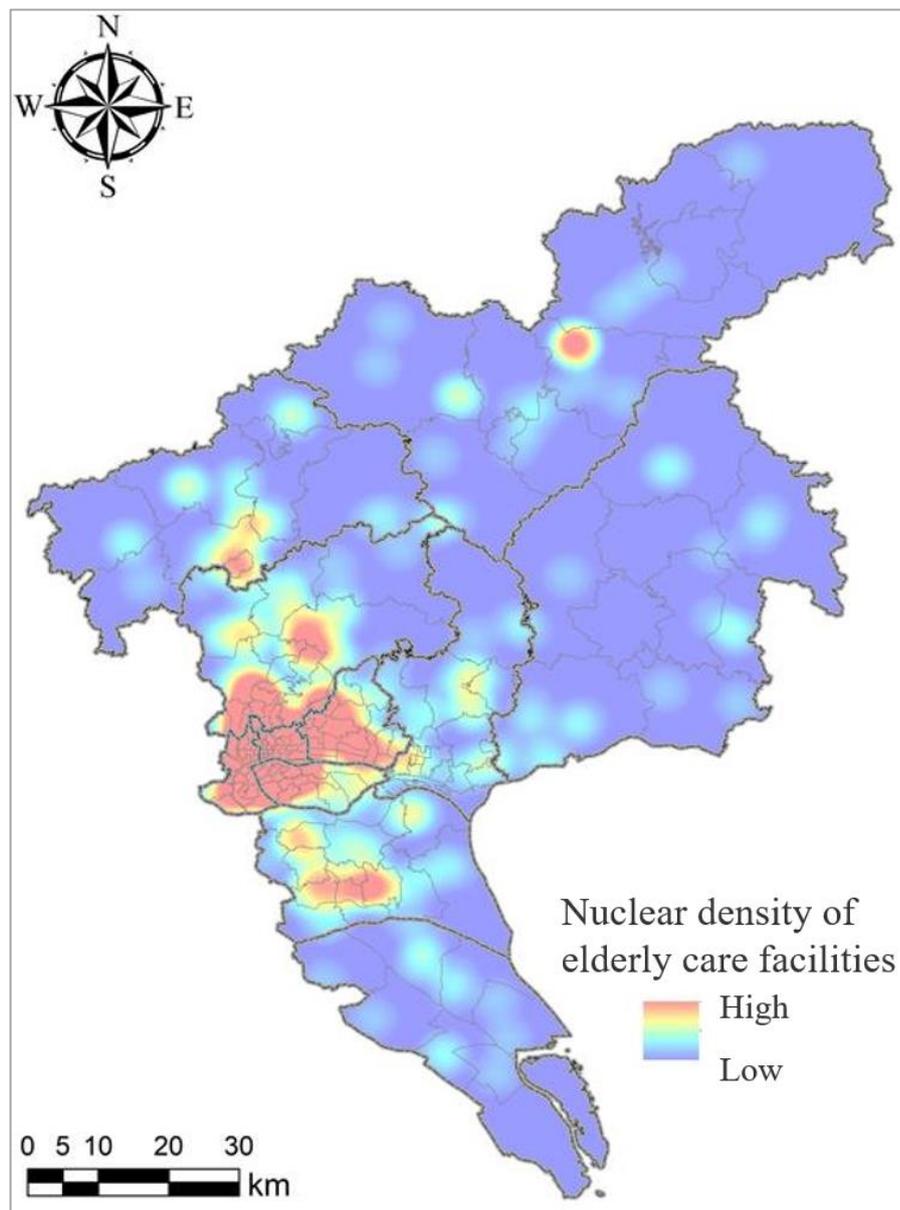


Fig.3-22 Nuclear density of elderly facilities in Guangzhou in 2020
(Source: Ren Tuoyu, 2020)

Uneven distribution of facilities

At present, the 15-minute walkability rate of community public service facilities in Guangzhou varies greatly between regions. The old city and Zhujiang New Town, have the highest walkability rates, while the walkability rates of community public service facilities in peripheral urban areas, have more room for improvement.

Moreover, the coverage rate of facilities varies greatly among districts, such as the coverage rate of convenient service facilities in Tianhe District exceeds 97%, while Nansha District only reaches 60%. Community sports venues, community parks, and other facilities that enhance the quality of life of community residents are unevenly distributed. The per capita area of community sports venues in peripheral urban areas is generally higher than that in central urban areas, such as Conghua District, which is over 2.7m²/person, while Yuexiu District is only about 1/5 of Conghua District^[78].

Inadequate type of facility configuration

Medical and health care and cultural facilities are relatively low in terms of walkability, especially cultural facilities have the lowest walkability rate, making it difficult to meet the growing quality of life requirements of residents.

In addition, among the foreign population in Guangzhou, the proportion of young people aged 21-30 is more than 1/3 and is still increasing. A large number of young employed people are gathered in the "urban villages" and suburban areas, and the demand for urban public service facilities is increasing, especially smart services. The coverage rate of convenient service facilities in the city is over 80%, but there are still some types of facilities such as smart delivery cabinets and smart food pick-up cabinets with low coverage rates. At present, the coverage rate of smart service facilities in Guangzhou can hardly meet the needs of the population.

3.2.4.2 Meso: Regional Scale - Zhujiang New Town as an Example

As most of the people living in Zhujiang New Town are office workers and their age tends to be young, there are relatively few elderly service facilities and less demand. The public service facilities in Zhujiang New Town are relatively adequate compared to

other residential supporting services, but there are still problems such as single type and uneven distribution.

Spatial autocorrelation analysis was conducted to obtain the LISA map of Tianhe District based on the projected aging population data of Guangzhou in 2030 and the elderly service facilities data in 2020 (Fig.3-23). The gaps in the future allocation of elderly service facilities are analyzed through the future development direction of the aging population. According to the figure, Zhujiang New Town shows LH (Low-High), i.e. the mismatch between the elderly service facilities and the density of the aging population in spatial distribution, specifically in the form of scattered elderly service facilities but high population density^[77]. It is thus concluded that the allocation of senior care service facilities in Zhujiang New Town cannot keep up with the development speed of aging population density.

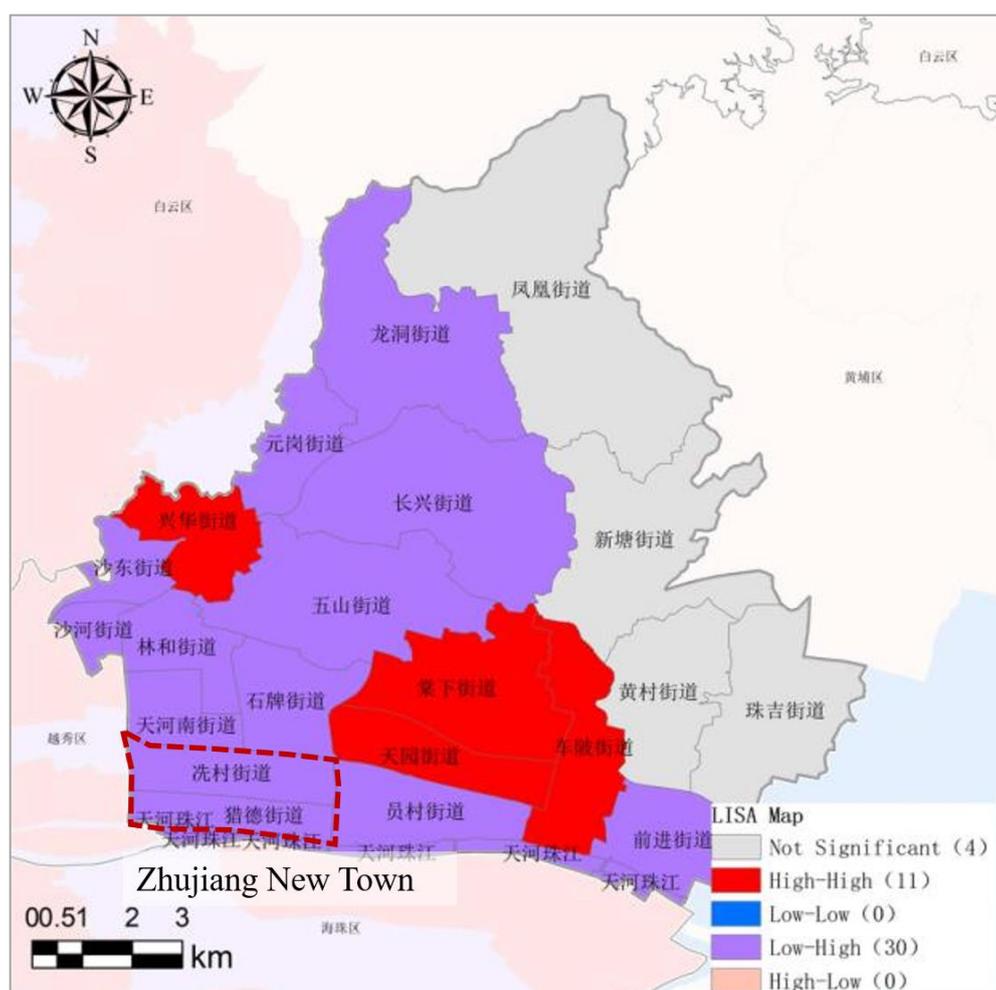


Fig.3-23 LISA map of Tianhe District
(Source: Ren Tuoyu, 2020)

Residents lack daily life

The cultural facilities in Zhujiang New Town are mainly concentrated in the central axis, such as Guangzhou Opera House, Guangzhou Library, and Guangdong Museum. Their service scope is not only for Zhujiang New Town but for the whole of Guangzhou City. There is a lack of community-level cultural and recreational facilities in the residential area. Inability to meet residents' demands for quality of life. The accompanying infrastructure cannot provide citizens' basic demands. The commercial supporting forms in Zhujiang New Town are fewer, such as supermarkets, restaurants, hairdressers, etc. Residents need to go to remote places such as Tianhe City and Gangding to buy daily consumer goods. Businesses in Zhujiang New Town can only meet part of the consumer demand regardless of their scale or distribution and lack comprehensive shopping places. Moreover, the consumer popularity of Zhujiang New Town is not as good as that of nearby Gangding and Tee Mall. However, the Tianhe shopping district, which is located in the north of Zhujiang New Town, cannot spread commercial radiation to the interior of Zhujiang New Town due to road barriers, causing inconvenience to the live of residents.

3.2.4.3 Micro: Project Scale - the Example of the Racecourse

Inadequate living service facilities

There are almost no living service facilities in the neighborhood to support the daily life of the residents in the vicinity. The research found that there are many takeaways in the neighborhood to deliver daily necessities for residents, and there is no place where residents can buy daily necessities near their residences, which leads to inconvenience for residents.

Single type of business

There are restaurants, home furnishing businesses, and sports venues and facilities in the area (Fig.3-24). Other than that, there are few other types of functions in the neighborhood (Fig.3-25). This single type of business makes the neighborhood accessible only to people with special needs, and there is no need for others to enter the area. As a result, not everyone can enjoy the right to space.

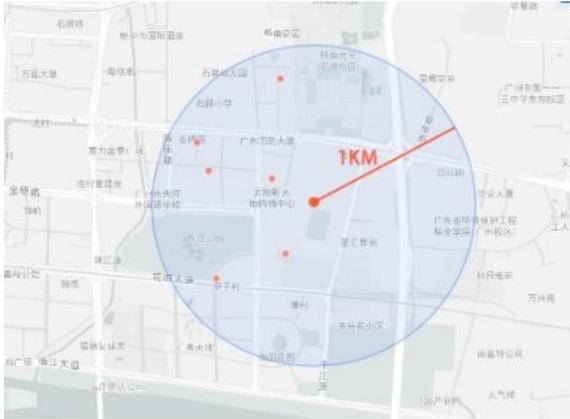


Fig.3-24 Commercial area layout in Racecourse
(Source: Shuwei Observation)

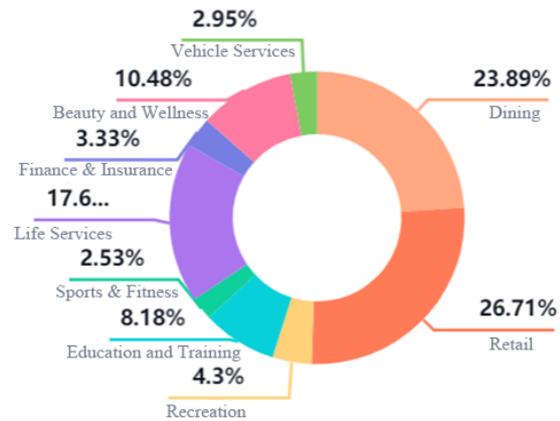


Fig.3-25 Distribution of commercial activities
(Source: Shuwei Observation)

3.3 Build a Framework to Improve Spatial Justice

Through combing of the value principles of spatial justice, the evaluation points and the reference to spatial justice related studies, this paper constructs a framework for enhancing spatial justice, hoping to provide a general framework to guide different communities to achieve their respective spatial justice goals (Fig. 3-26). It consists of three steps: firstly, observe, in-depth research on the project to discover the current problems of the project. The reasons why the problems occur are analyzed through quantitative and qualitative methods. The second is match, which identifies the project's injustice issues, i.e., the problems that the project most urgently needs to address. Matching to the corresponding values in the list of values of spatial justice, determining the final vision of the project, and providing value guidelines for the subsequent design strategy. Finally, create, to propose specific regeneration strategies for the injustice issues with spatial justice as the value guide.

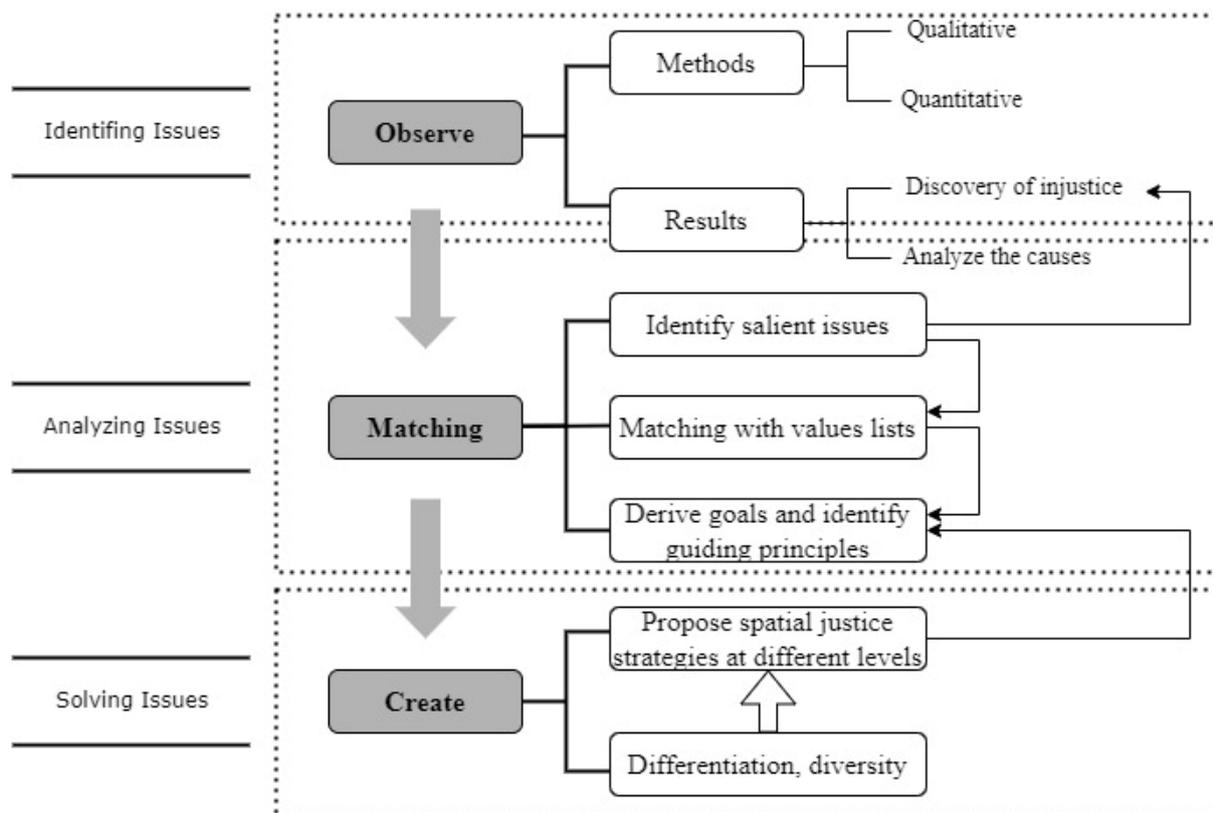


Fig. 3-26 Framework construction logic

Observe

Researchers look for problems by going into the community through field research and interviews, experiencing the space firsthand or collecting residents' life experiences. This is the process of building values through the observation of reality with the perspective of spatial justice. In addition, qualitative and quantitative methods such as demographics and data analysis can be combined to study how community issues occur.

Match

The justice and injustice in the community are identified and analyzed. Injustice issues should be matched with value indicators. Every community cannot and does not need to meet all values, otherwise the final result may be mediocre because of lack of character, and the most prominent issues will not be solved.

Create

Based on the previous process, goals were derived from the problem and a values-oriented design prototype was identified. Developing innovative ideas can realize a shared vision of residents and combat injustice. Each project should identify different goals based on its problems and establish unique and precise problem-solving strategies. This avoids a thousand cities and allows the city to have a rich and diverse community type.

3.4 Case Studies

Two urban regeneration projects in the West and China are selected for the study. They are similar in scale, and both of them propose their respective regeneration strategies with the value-oriented approach of achieving equity and justice. Through the process of applying the constructed framework to the case studies, we test whether the framework is applicable to the project studies and reflect on the possible problems of the framework in practice for improvement and refinement.

3.4.1 Rotterdam Cool-Zuid Development Project**Overview**

There is a culturally vibrant neighborhood in the center of Rotterdam called the Cool-Zuid neighborhood (Fig.3-27). Cool-Zuid is located near important areas such as Museumpark, Kop van Zuid, uitgaanscentrum, and Maritieme District. And it connects busy arterials with prestigious developments such as Coolsingel and Westblaak (Fig.3-28).



Fig.3-27 Satellite image
(Source: Google)



Fig.3-28 Bird's eye view
(Source: Google)

3.4.1.1 Observe

Spatial Segregation Between Neighborhoods

The community is divided into east and west by the Schiedamse Vest, including an old community in the west and a dynamic post-war reconstruction area in the east (Fig.3-29). The Western Community was built in 1860 before the war, with continuity and history. The city's historic street pattern and character survived the bombing of Rotterdam in 1940. The buildings here are townhouses enclosed along the street, forming an independent public space inside. It is framed by vibrant streets such as Schiedamsingel, Kortenaerstraat and Eendrachtsweg, with social housing in the core^[13]. The residents here have lived all their lives, people know each other, and the society is relatively stable. By contrast, the buildings in the eastern neighborhood are temporary, alternating grid patterns. The architectural form of the eastern community is more modern than that of the western community, and the floor height is generally higher than that of the western building. The eastern community is home to more temporary residents, and the resident situation is difficult to predict as future residents remain an unknown factor. The residents, buildings, and communities between the eastern and western parts are quite different, and there is a lack of social cohesion. and plans to build high-rise residential towers on the eastern block, increasing the number of homes from 500 to 1,500 This allows for the addition of a new, more affluent living environment to the area. Therefore, the social divide in the Cool-Zuid community has the potential to widen further.



Fig.3-29 Neighborhood texture
(Source: Stadslab.2017)

The Original Building was Demolished for Future Construction

The Cool-Zuid community is in a period of change, with demolition of existing buildings already underway in some areas. There are many places in the community where people communicate, showing a vibrant community. There are also street arts to express the feelings of people in the community. However, these vibrant street arts were also demolished for future construction (Fig.3-30). The cultural and artistic atmosphere of the community has been destroyed.



Fig.3-30 Block West Building
(Source: Google)

Uneven Distribution of Services and Facilities

As the community has been developing new residential projects in the eastern area since 2016, the area attracts many new residents. Infrastructure in the east is plentiful, but services in the west are dwindling. Residents need to go to places far from the community to buy daily necessities and food, which is inconvenient. In addition, both medical and health service facilities have been eliminated or relocated to a wider range of locations. The drift of service facilities is evident (Fig.3-31).



Fig.3-31 Service and Medical Facilities
(Source: Stadslab, 2017)

Traffic Issues

There are dykes on the south side of the west block and on the east side of the east block, so people hardly pass through here (Fig.3-32). On the one hand, this ensures that the city center is quiet and people can live a peaceful and safe life. On the other hand, many people also feel the inconvenience of travel caused by steps, especially cyclists, people with limited mobility and people with strollers.



Fig.3-32 Western and Eastern dike
(Source: Google)

Parking Space Occupies the Street Space for Activities

Parking in the neighborhood is in high demand, with an average of 84% (the highest standard is 85%), according to the city hall. Rather than driving a few hundred metres to a nearby car park, motorists would rather pay a few extra euros to park closer. The arrival of new residents after the eastern development has further increased the parking pressure. In addition, Cool-Zuid has 300 fewer bicycle parking spaces than the municipal standard, causing bicycle parking to be an issue (Fig.3-33). Because there are too few parking facilities, people can only park their bicycles everywhere. Parking for motor vehicles and bicycles takes up a lot of street space, blocking access and limiting spatial accessibility.

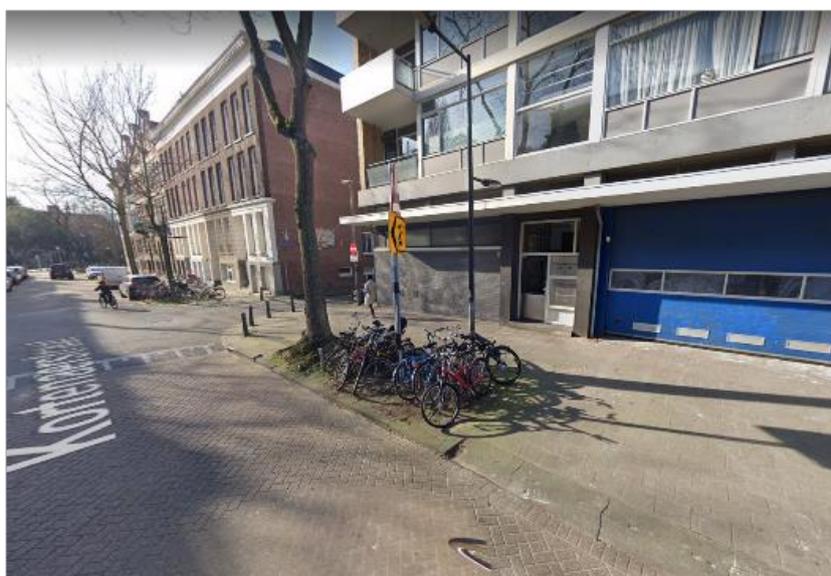


Fig.3-33 Bicycle parking
(Source: Google)

3.4.1.2 Matching

The analysis of the current situation of Cool-Zuid reveals that the square park in the center of the community is a place where residents interact with each other and provide a shared space for the residents of the East and West districts. It has a quiet living atmosphere and is full of artistic vitality. In addition, by identifying the current problems facing the community and the reasons for their creation, the unjust characteristics of the imbalance between the old and new parts of the community due to future development were identified (Table 3-8). The following key points were summarized.

Table 3-8 The Injustice characteristics of cool-zuid

Justice	Injustice
Culturally vibrant	Spatial isolation
An oasis in the heart of downtown	Difficulty for former residents to access new social and physical facilities
A sense of community	Traditional spaces gradually diminish
Shared Space	Limited accessibility
	Difficulty in integrating foreign residents with the previous ones
	Crowding out of street space

The listed elements of injustice were then mapped to value principles, identifying the five key values of Cool-Zuid as: community, inclusion, access, inspiration, and diversity. The community's shared vision for the community is that Cool-Zuid will be an attractive community for everyone. Cool-Zuid provides high quality living and spaces for a diverse population by ensuring good connections, a healthy local economy, safe streets, engaged residents.

3.4.1.3 Create

After being given the values and goals, the design team (Stadslab) adopted five strategies that resulted in Vision 2041 (Fig.3-34).



Fig.3-34 Vision of Cool-Zuid 2041
(Source: Stadslab, 2017)

Shared Spaces Connect Communities

The current plaza park in the center of the community accommodates people of all ages to interact with each other, The design team wanted to help Cool-Zuid end a period known as the grey community. They hope to do this by connecting and expanding the park with the surrounding green space, creating a green lung in the middle of the community. The Plaza Park will feature high levels of greenery, benches, and dining facilities. People can socialize in common areas, including playing, exercising, talking and relaxing (Fig.3-35). The team also has a strong focus on care, health and exercise. The placement of a wide range of community care makes this a center for a healthy community. The square park eliminates the sense of distance between the two parts of the city, allowing all residents to interact and communicate here, enhancing the cohesion of the community.



Fig.3-35 Plaza Park
(Source: Stadslab, 2017)

Amenities to Support Daily Life

Stadslab believes that to attract more families, there needs to be enough services to meet the needs of daily life. There is a need to provide more space for high-quality facilities for all residents of the community, including health centers, classrooms, grocery stores and specialty stores.

Create Beautiful Residential Streets

Open up green streets to provide event space, by reducing parking and better located bike parking. Build parking garages where visitors will park in cheap parking lots on the edge of the area. The team took the example on the north side of the Rotterdam center, which has a lot of space and greenery and planned one-sided parking. The area currently has a differentiated parking permit policy, with more places where parking is only allowed for short periods of time, such as a maximum of 20 minutes. The design team minimized on-street parking for those who live and work there. Tourists, on the other hand, park as much as possible in the parking lots on the edge of the area^[79]. Wider sidewalks and spaces, and the removal of parking spaces, can free up more space for bicycles and solve the problem of bicycle parking (Fig.3-36).

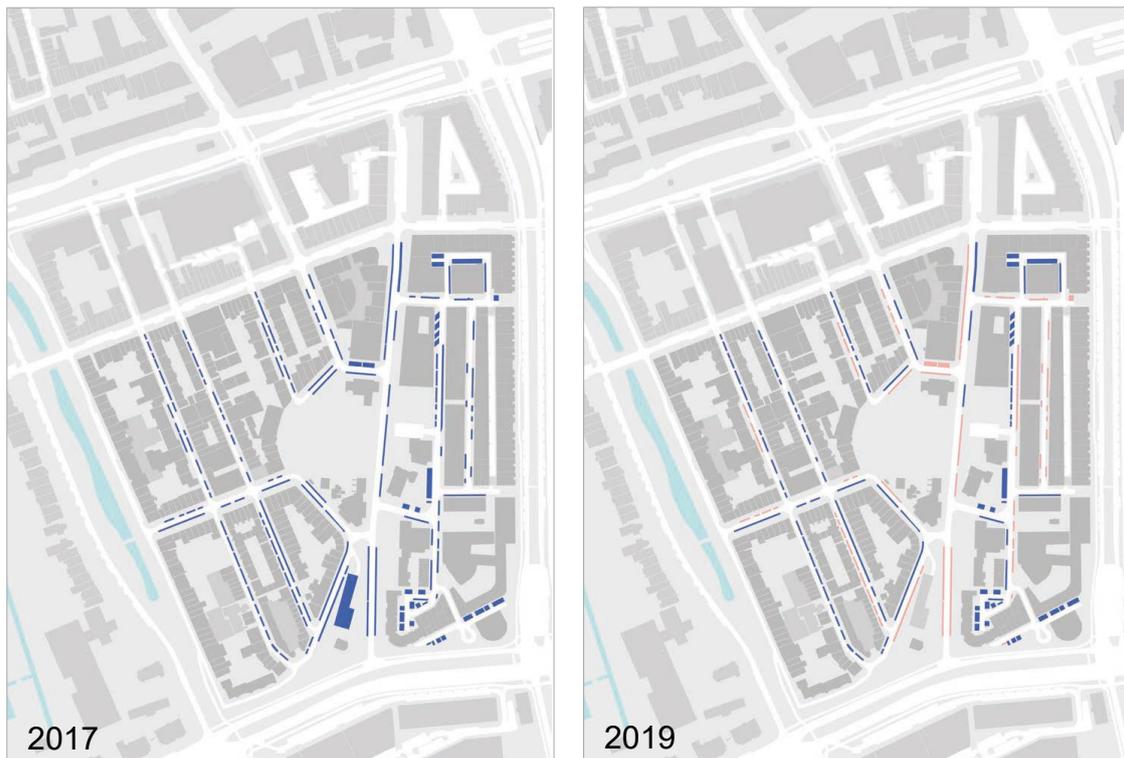


Fig.3-36 Transportation Planning
(Source: Stadslab, 2017)

Communities Suitable for a Variety of Urban Residents

The district hopes to create a mixed-living community in the coming years, accommodating residents on a smaller budget, young and old. Homes built will include a mix of middle- and high-income homes. Even Cooltoren, a high-rise residential project in the eastern suburbs that is unacceptable to local residents, should take on the responsibility of bringing more socio-economic diversity to the area (Fig.3-37). For example, Cooltoren will have houses of different sizes and layouts: from small rental houses of 50 m² to luxury apartments on the top floor, and apartments in between. In order to enable new and old residents to have more opportunities to communicate, the design team has created many interactive functions in Cooltoren, such as roof terrace and garden, swimming pool, community kitchen, climbing wall, art studio, etc (Fig.3-38)^[80]. Visitors can have the opportunity to enter the building and enjoy the service facilities in it.



Fig.3-37 Apartments types
(Source: Top010, 2019)

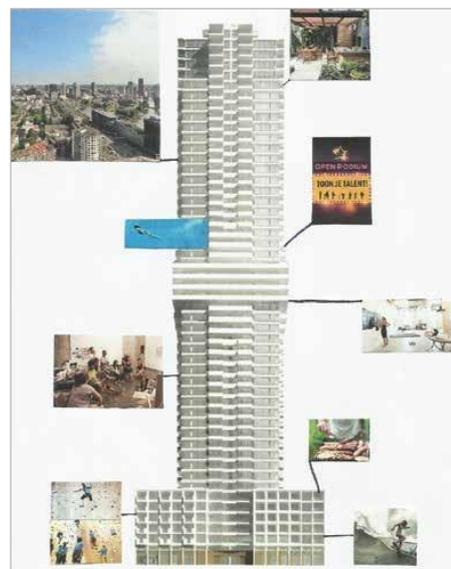


Fig.3-38 Interactive functions
(Source: Top010, 2019)

Table3-9 The House Types of Cooltoren

Types	16 Mid Crown Apartments	66 City-Chic Apartments	9 Penthouses
Floor plans			

A Car-Free Community

The design team adopted a distinction between traffic types to design traffic. Cars are restricted within the community in order to facilitate slow traffic and make cyclists and pedestrians more pleasant and safe to travel through the community (Fig.3-39). In addition, the team expanded the subway hub to encourage people to use public transport more frequently, to avoid car travel caused by congestion or hard to find parking spaces. For example, there are no cars in the eastern part of the community, only pedestrians and cyclists, and suitable routes are specially designed for cyclists. The entrances and exits blocked by the levees are designed with greenery, creating

walking paths and creating seating to attract pedestrians into the area (Fig.3-40).



Fig.3-39 Transport connection
(Source: Stadslab, 2017)



Fig.3-40 Green stairs along the street
(Source: Stadslab, 2017)

3.4.2 The Urban Regeneration Design of Dongmaoku, ShenYang

Overview

Dongmaoku is the largest and best-preserved civil storage complex in Shenyang that has been built since 1950. It is located on the south side of Shenyang East Railway Station and consists of more than 30 single warehouses (Fig.3-41). It is of great value in the research on the development of warehouse buildings in Shenyang^[81]. But for a long time, the cultural relic value of Dongmaoku has not been paid attention to (Fig.3-42).



Fig.3-41 Satellite image
(Source: Google)



Fig.3-42 Aerial view
(Source: Google)

3.4.2.1 Observe

Limitations of Historic Preservation Buildings

As historic preservation buildings that are allowed to have only simple renovations, it is difficult to find suitable use functions for the spaces with closed exterior walls and large depths of entry. These historic buildings do not offer the possibility for the public to enter and use them (Fig.3-43). If industrial heritage is not used properly, it will become a remnant of the city and increase the inequity of space.



Fig.3-43 The warehouse buildings before renovation
(Source: URBANUS, 2020)

Lack of Daily Life of Citizens

As a logistics area for industrial use, the "East Trade Depot" does not interfere with the daily life of the city, and there is no "urban memory" unique to the historical heritage. There are serious shortages of public facilities for the grassroots in the surrounding old communities.

It is Difficult to Integrate the Preserved Buildings into the Urban Space

The preserved buildings do not have a vivid spatial relationship with each other and are easily separated by the new settlement plan. Moreover, since the reserved building volume is too large, if it cannot be organically integrated into the space of the new community, it will become a "foreign object" in the overall space. Residents may have a psychological rejection of preserved buildings.

3.4.2.2 Matching

Through the analysis of the current situation of Dongmaoku, it was found that although the East Trade Bank is rich and valuable in historical resources. They have not been well utilized, and even, have become a problem for the construction of new communities. Therefore, it was determined that the injustice characteristics arise due to the construction of new communities exhibiting the contradiction between historical resources and new communities. The following points were summarized.

Table3-10 The Injustice characteristics of Dongmaoku

Justice	Injustice
Strong sense of architectural group	No memory of everyday life
The scale of the interior space is shocking	Difficulties in reusing historically preserved buildings
Historical value	Fragmentation of preserved buildings from new communities

The listed elements of injustice were then mapped to value principles, identifying three important values for Dongmaoku as community, belonging, history. The goal of the project is to organically integrate the historic building into the new community through the renovation of the East Trade Library. Using historical heritage to reshape the urban cultural landscape can add new vitality and life scenes to the community. The use of cultural landscapes to weaken the inherent differences in social identities allows people from different groups in society to find their identities here and create a community of harmonious communities.

3.4.2.3 Create

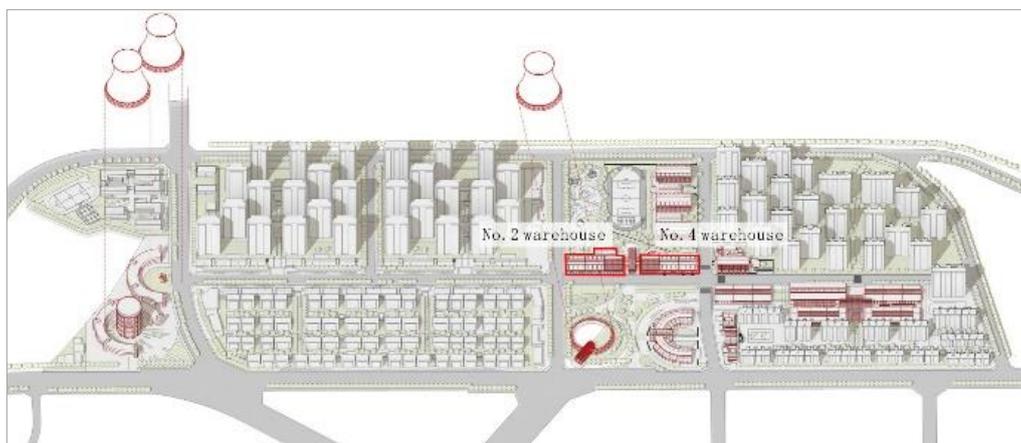


Fig.3-44 Master plan
(Source: URBANUS. 2020)

Finding Historical Genes to Recode in a New Environment

The cultural preservation guidelines stipulate that only minor changes can be made to the facade of the old warehouse. For houses with large depths and small window openings, the first room is transformed into a greenhouse for the harsh local climate, forming a new typology of industrial heritage spaces (Fig.3-45). Each building has a greenhouse garden at the back end of the entry, and then cascades down to the next two spaces^[82]. For example, No.2 warehouse is transformed into a community library (Fig.3-46). The structure of the warehouse lays the foundation for the "reading sanctuary" atmosphere, while the entrance greenhouse concept replaces the traditional reading room with a park-like model. It meets the need of the public to enrich their cultural life. The old warehouse is revitalized as a place for daily leisure activities for the public.

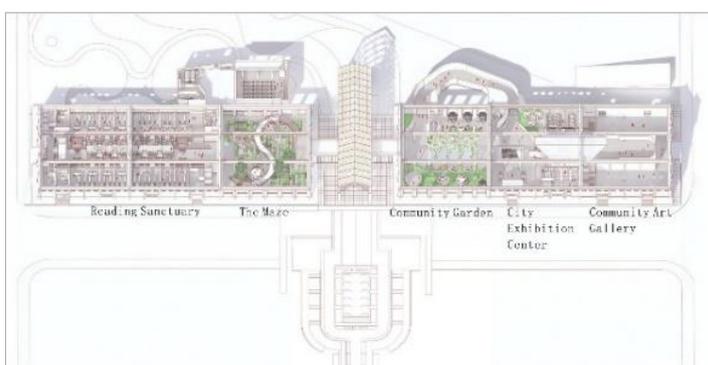


Fig.3-45 The renovated No.2 and No.4 warehouses
(Source: URBANUS, 2020)

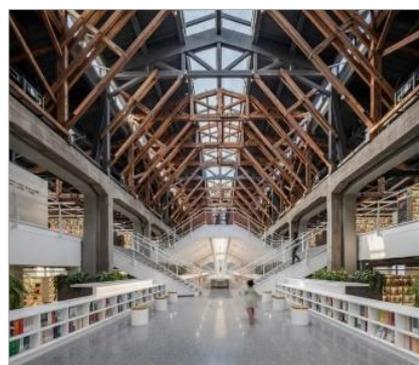


Fig.3-46 Reading Sanctuary
(Source: UK Studio, 2021)

The Old Warehouse has been Placed in the Daily Function

Put daily functions into old warehouses, and transfer high-quality public resources to surrounding neighbors. The design team transformed the old warehouses into public service facilities such as community library, city exhibition hall and community center. The community center will include theater, government affairs hall, exhibition hall and other community service functions. The connection between No. 2 and No. 4 will be transformed into a marriage registration hall and a ceremonial space in daily life, so that the residents' life memories can be generated in this space to better activate and reuse the old warehouse (Fig.3-47). These non-profit places will become catalysts for community building and provide a community platform for people to communicate with each other.



Fig.3-47 Wedding hall
(Source: Tianpei Zeng, 2021)

Transforming the Building by Extracting the Master Theme and Integrating the Old and New Buildings into One

The design team selected the most visually distinctive hill wall of "East Trade Library" as the modality and used morphological variations to deduce new volume shapes, which were applied to new buildings such as elementary schools, kindergartens and community commercial buildings (Fig.3-48)^[81]. In the open neighborhood space, the old and new public buildings are organized through various spatial alignment relationships, which are both unified in form and have their own identity changes, and are integrated into an organic whole. The old warehouses that used to be enclaves are integrated into the urban space, driving the upgrade of the quality of life of the residents in the surrounding communities that are difficult to renew.

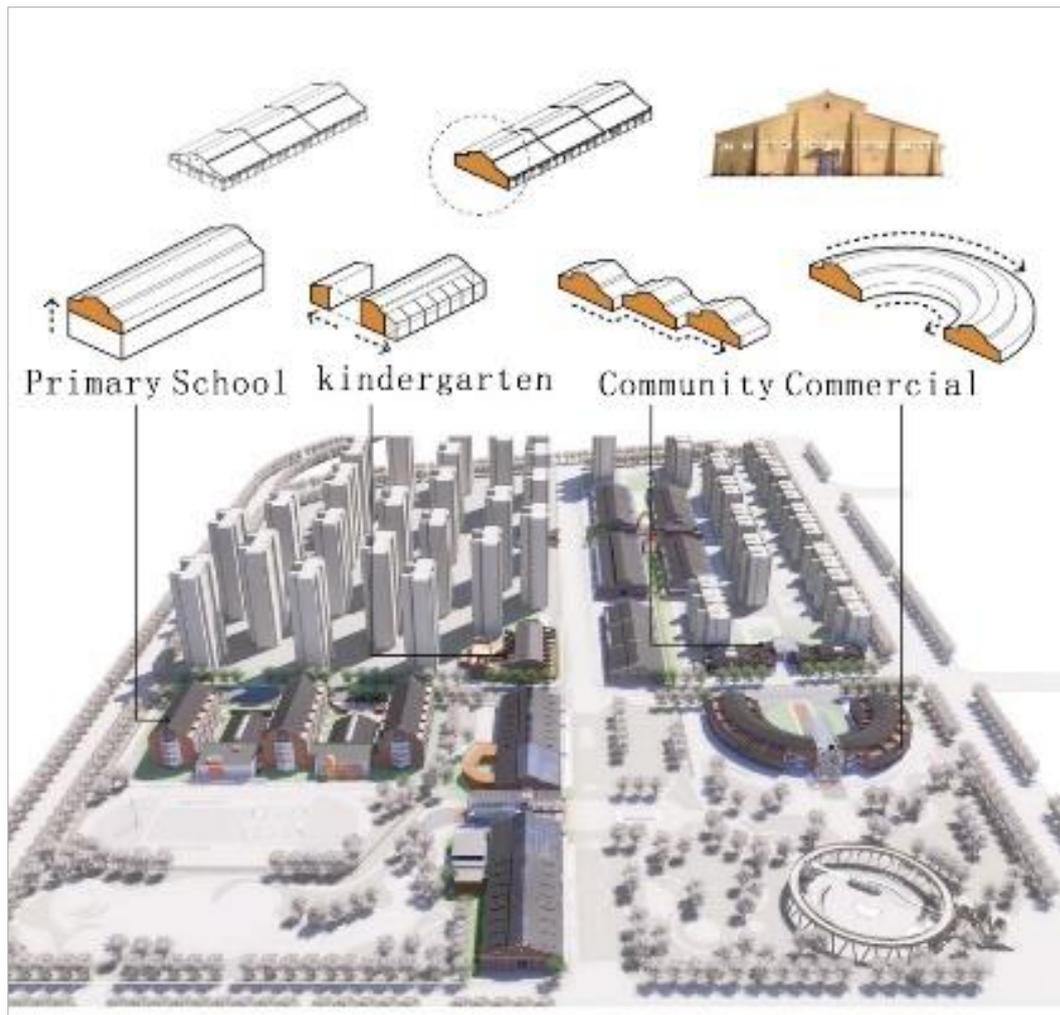


Fig.3-48 Extraction of the wall motif to form a new architectural volume
(Source: URBANUS, 2020)

3.5 Summary

This chapter provides a systematic analysis of the injustice phenomenon in urban space, and the investigation is summarized into four aspects: transportation, housing, public space, and facilities. From the city level - regional level - site level, a systematic study is conducted from large to small. This paper started with the discovery of common problems in the city. In the central areas of the city, the problems may be accentuated by the concentration of population or high economic activities. At the site level, one may begin to think about how to use the site as a pilot project to explore problem-solving strategies. In the case studies, it can be found that most of the problems captured are concentrated in the residential spaces of the residents. Therefore, spatial justice is understood in a broad sense as seeking equal rights for

the disadvantaged in the allocation of urban space, while spatial justice in a narrow sense is found to be finding appropriate grips to overcome spatial discrimination in the residential sphere, as summarized from the real problems. Therefore, urban regeneration projects should be an excellent opportunity to achieve spatial equalization in the city. Through the regeneration strategy, a common outlet is provided for the identity of different social groups: the vitality of the young, the companionship of the old, the low-income people will not feel inferior, and the high-income people will feel decent. This is actually a utopia that generates a harmonious society by weakening the inherent differences of social identity through the urban regeneration strategy.

In addition, by applying the constructed framework to the actual case, the practical exercise confirmed that the framework is feasible and reasonable. By identifying the issues, determining the injustice elements, defining the project values, and finally guiding the design strategy. This framework helps to identify the most important problems to be solved in each project and to develop a unique strategy to avoid homogenization.

However, there are some problems in the implementation process. In the first step of identifying site issues, different people will have different cultural backgrounds and judgment criteria, which can lead to subjectivity or omissions in the issues identified by the participants. Therefore, during this step, participants should be encouraged to visit the site and gather the lived experiences of nearby residents through on-site interviews. This qualitative information is crucial to help participants empathize and respect other members and allow them to reflect on their own cultural biases and values.

Similarly, in the second step of identifying values, the salient question was "how do the chosen values align with the residents" to create a shared community vision. This requires teams of participants to think from different perspectives, with the municipality or developer perhaps more concerned with benefits, social groups with equity, and residents with livelihoods. The values should be weighed against each other, with a focus on achieving equity for each other, in keeping with a shared vision for the community.

Chapter4 Regeneration Strategies to Improve Spatial Justice in The Racecourse

4.1 Observe

4.1.1 Project Overview

Location Overview

Tianhe Racecourse is located at 668 Huangpu Avenue West, Tianhe District, which is the northeastern part of Zhujiang New Town. The racecourse is located at the intersection of Huangpu Avenue and South China Express Trunk Road, the two main roads in the center of Guangzhou, south to Huacheng Avenue and west to Machang West Road. The site covers an area of 38.4 ha.

The site is close to Huangpu Avenue, a major transportation road, and enjoys the convenience of having both the North and South subways (Line 5 Tancun Station and Line 13 Phase II Machang Station under construction) on the edge of the site and is only 3 km from the Zhujiang New Town subway station.

The area has Pearl River Park, Jinan University and other supporting facilities, along Huacheng Avenue and Linjiang Avenue, within one kilometer of the distribution of Zhuguang New Town Royal View, Kaixuan New World, Qiaoxin Huiyuetai and other luxury residential.

The racecourse belongs to the eastern part of Guangzhou CBD, connecting two important areas of Guangzhou, Zhuguang New Town and International Financial City, with excellent geographical advantages (Fig.4-1). In addition, the racecourse is in Zhuguang New Town, International Finance City, Pazhou Convention and Exhibition Business District three large areas, these areas play a leading role in Guangzhou's economy and the future development of intelligent cities. The future development of the racecourse will have an important position.

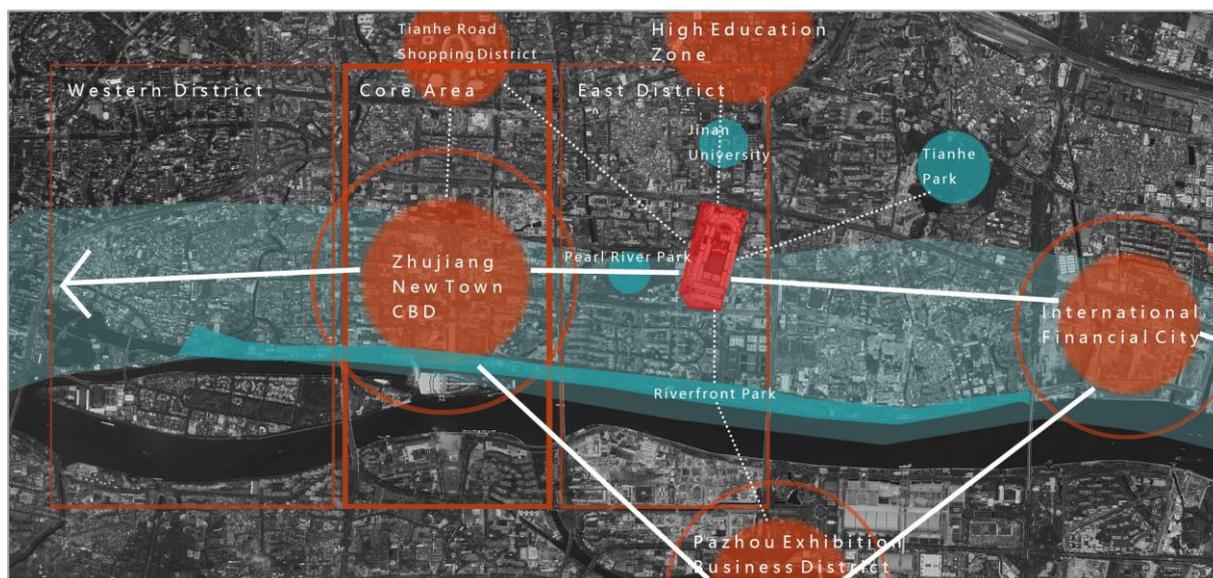


Fig.4-1 Location analysis

Development Stages

The racecourse has undergone many changes in its thirty years of historical development and is a microcosm of the city's development. A study of the history of the racecourse provides insight into the complex background of the parcel and the reasons for the formation of the current situation.

1992-1999, Brilliance-Divine

In 1992, the Guangzhou Jockey Club, a group of four shareholders, invested in the construction of the racecourse. Guangzhou wanted to hold horse racing to raise welfare funds. In January of the following year, the Guangzhou Racecourse, covering an area of 33 ha and with a capacity of 40,000 spectators, was completed on 500 acres of vegetable land in what is now Tianhe Tan Village. It was the only horse racing track with a betting nature in mainland China and the second largest in Asia after the Hong Kong Shatin Racecourse. 1994 was the hottest time for horse racing in Guangzhou, and it was well known in China (Fig.4-2). However, the Chinese government never recognized the legitimacy of horse racing and the management failure led to losses. on December 14, 1999, Guangzhou Racecourse was officially suspended.



Fig.4-2 Guangzhou horse racing in the 1990s
(Source: Yangcheng Evening News)

2002-2008, Transformation

After the termination of the horse racing business, in December 2002, Guangzhou government transformed racecourse into auto dealer. In 2003, the racecourse was leased out and converted into the city's largest auto trading market (Fig.4-3)^[83]. Until 2008, the General Company of Horse Racing regained the racecourse and established auto dealer. Since then, racecourse has gradually formed three major business sectors: catering, recreation and entertainment, and auto dealer, but business has been lukewarm.



Fig.4-3 A large number of autos 4S stores in the racecourse have been deserted

2008-2014, Swing

In May 2012, Tianhe District of Guangzhou proposed that racecourse was leased out for low-end industrial uses such as car sales and catering, with extremely low economic benefits, which was highly incompatible with the functional positioning of the CBD. Tianhe District will seek support from the municipal government to speed up the development and construction of the racecourse and enhance the value of the site. In September 2014, due to policy reasons, most of the auto stores have been withdrawn,

while the food city in the southern section is still operating normally.

Now, Auto Dealer, Furniture Store and Catering Industry

The surrounding part of the racecourse is leased to shops such as home furnishing, catering, sports and entertainment, as well as sports service facilities such as golf driving range and badminton hall (Fig.4-4,5). The buildings in the center of the racecourse are seriously aging and falling off, and the huge space has been left unused. At present, the business of the racecourse is siphoned by high-end shopping malls such as Tianhe City and Sun Xintiandi, and the overall business atmosphere is poor. High-end consumption is seriously "outflowing", and only some catering industries have more customers.

Due to historical reasons, the property rights of the racecourse, which is in an important geographical location, are complicated and involve many interests. As a result, the development of the racecourse has been at a standstill. This has resulted in the existence of a block in Guangzhou CBD with low space utilization and not being renewed.



Fig.4-4 Aerial photo of the racecourse
(Source: Google)



Fig.4-5 Mahui Household

The evolution of Zhujiang New Town spatial morphology

The study of the spatial morphological evolution of the Racecourse is placed in the general context of Zhujiang New Town. The construction of Zhujiang New Town has roughly gone through four stages: the first stage was the initial stage of construction

from 1993 to 1999 (Fig.4-6). At this time, the construction area was mainly concentrated in the east and west districts, with mainly residential and a few office buildings. At this time, the race track was also at its most popular period, maintaining the form of a race track. The second stage was the development adjustment stage from 2000 to 2004. At this stage, the spatial development of Zhujiang New Town was slow, and the construction was still concentrated in the east and west districts. However, the main road network has been basically formed. At this time, the racecourse was in the transformation stage and was transformed into an automobile trading market. During this period, the spatial development of the Racecourse was more rapid. The third phase was the construction phase from 2004 to 2007. In this period, Zhujiang New Town was built with the completion of the subway and the gradual maturity of the surrounding residential development, driving the generation of the core area. And the development of Racecourse was in a declining stage due to the difficulty of attracting crowds and low economic benefits from the automobile industry. The spatial form did not change significantly. The fourth stage is the stage of CBD prototype formation from 2007 to 2010. In this period, the spatial texture of Zhujiang New Town has been basically formed, and the completion of the landmark buildings in the core area and the central square makes the axis space of Zhujiang New Town more obvious^[84]. The main buildings of the Racecourse at this stage were all idle, and only some food and beverage stores on the west side were still operating. In the subsequent period, Zhujiang New Town was gradually supplemented and updated on the basis of the completion of the basic form, and the development of the spatial form of the Racecourse has been in a stagnant state.

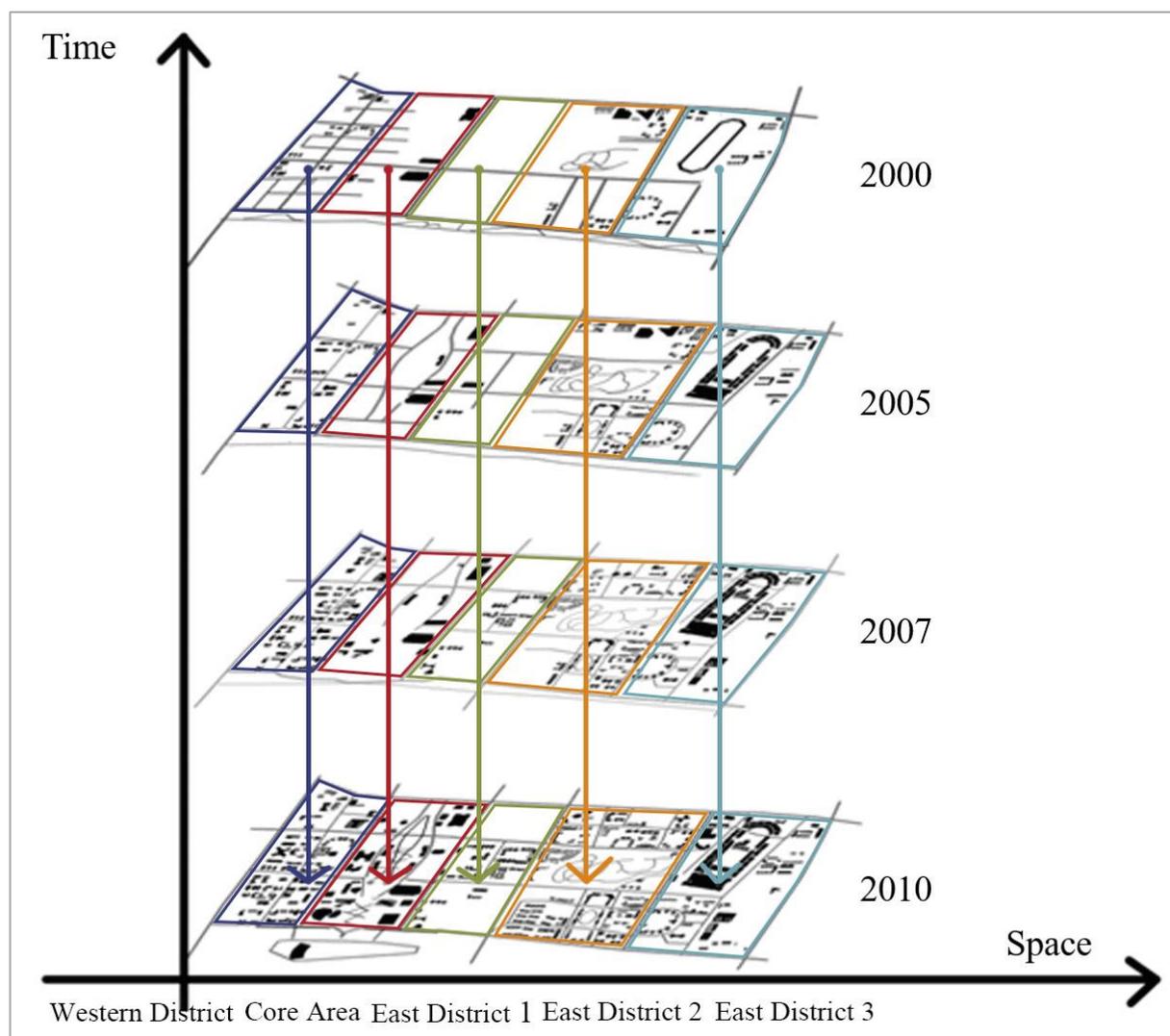


Fig.4-6 Zhujiang New Town Spatial Development
(Source: Lei Zhang, 2011)

Upgrading Planning

On August 19, 2021, the government presented an announcement that it planned to invite tenders for a functional upgrading development planning project for the Racecourse site. The announcement shows that under the development requirements of high-quality development and "old city, new vitality", it is necessary to improve the functions of the low-end and low-efficiency racecourses in the area (Fig.4-7)^[85]. The announcement puts forward three requirements. First of all, according to Guangzhou's development requirements for building a global dynamic city and "new vitality of an old city", scientific positioning of the racecourse area is carried out. Secondly, according to the development plan and the current development situation of the area, the analysis

of the direction of development and functional needs of the area where the land is located, and the proposed functional positioning of comprehensive development. Finally, specific examples were given to benchmark and analyze internationally famous CBD areas such as SKP in Beijing, which is a high-end luxury department store covering a wide area.



Fig.4-7 Spatial development pattern of Tianhe District
(Source: Tianhe District People's Government)

At present, the top luxury mall in Guangzhou is still the TaiKoo Hui located in the Tianhe Road shopping district. In the announcement, it is proposed that the racetrack site can refer to Beijing SKP to build a high-end commercial consumption circle to fill the shortage of high-end shopping malls in Guangzhou. This is a subversive change to Guangzhou's business landscape. However, because the high-end shopping mall itself serves a limited number of people and is surrounded by luxury houses, the racecourse will become a gathering place for the elite. The disadvantaged, such as low-income families, young students, and the elderly, will find it difficult to enjoy the space right here because they generally have little ability to enter high-end shopping malls. This will create a social class division and may exacerbate existing social and urban injustices.

4.1.2 Analysis of the Injustice Issues of the Racecourse

Traffic Analysis

The roads in Zhujiang New Town are mainly surrounded by two urban expressways and two urban trunk roads, and the density of the road network is higher than the density level of the road network in other areas (Fig.4-8). The main road system of Zhujiang New Town is basically in a checkerboard pattern. Two east-west roads and six north-south roads are planned internally. They divide the site into similarly sized, regular plots according to a certain spacing.

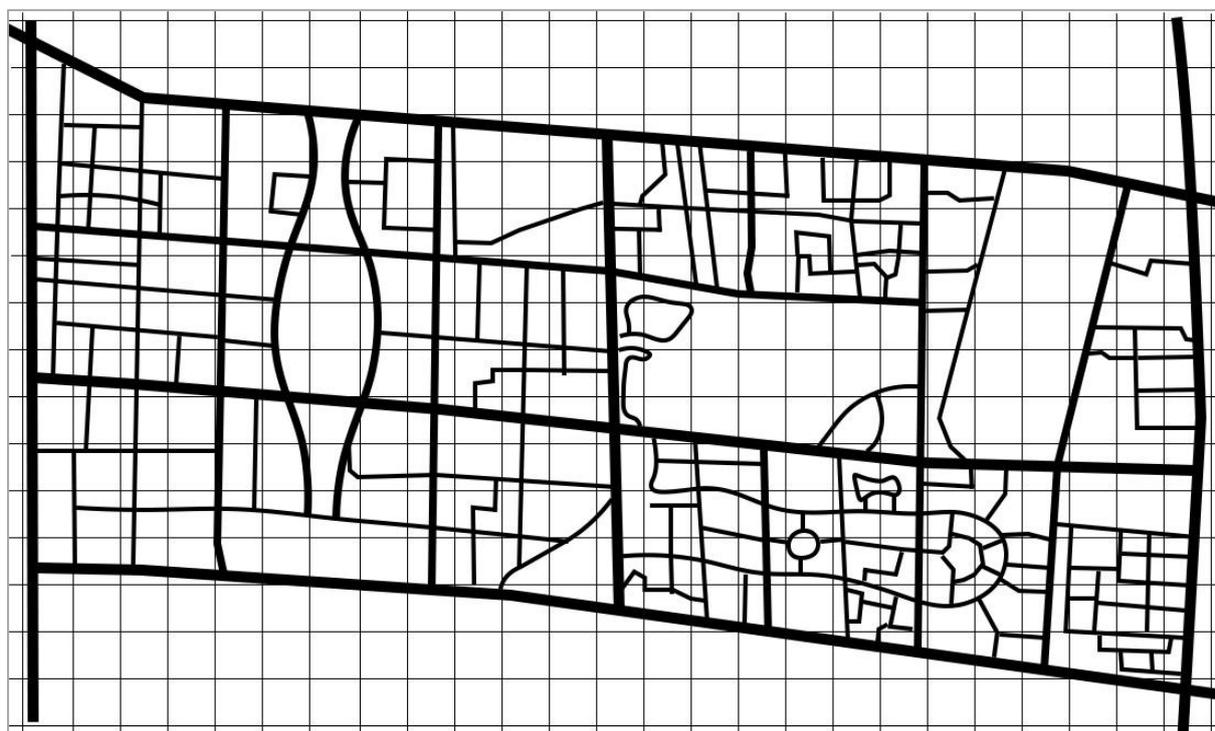


Fig.4-8 Road network structure of Zhujiang New Town

It is obvious from the road network structure of Zhujiang New Town that the Racecourse, a large and largely unused site, blocks the connection between the east and west neighborhoods. The east-west connection of Zhujiang New Town is interrupted here, hindering the residents on the east side to get to Pearl River Park (Fig.4-9). It is difficult for residents on both sides to easily enjoy the services and facilities of each other's neighborhoods. And the large spatial blockage makes it inconvenient for people to cross the neighborhood and may have to take a longer detour, which is more difficult for those who have difficulty in getting around. The physical separation of urban space caused by these traffic blocks not only makes the

residents inconvenient to get around the city and the accessibility of facilities poor, but also, over time, creates psychological differences between residents of different sub-districts and intensifies the segregation of social space.

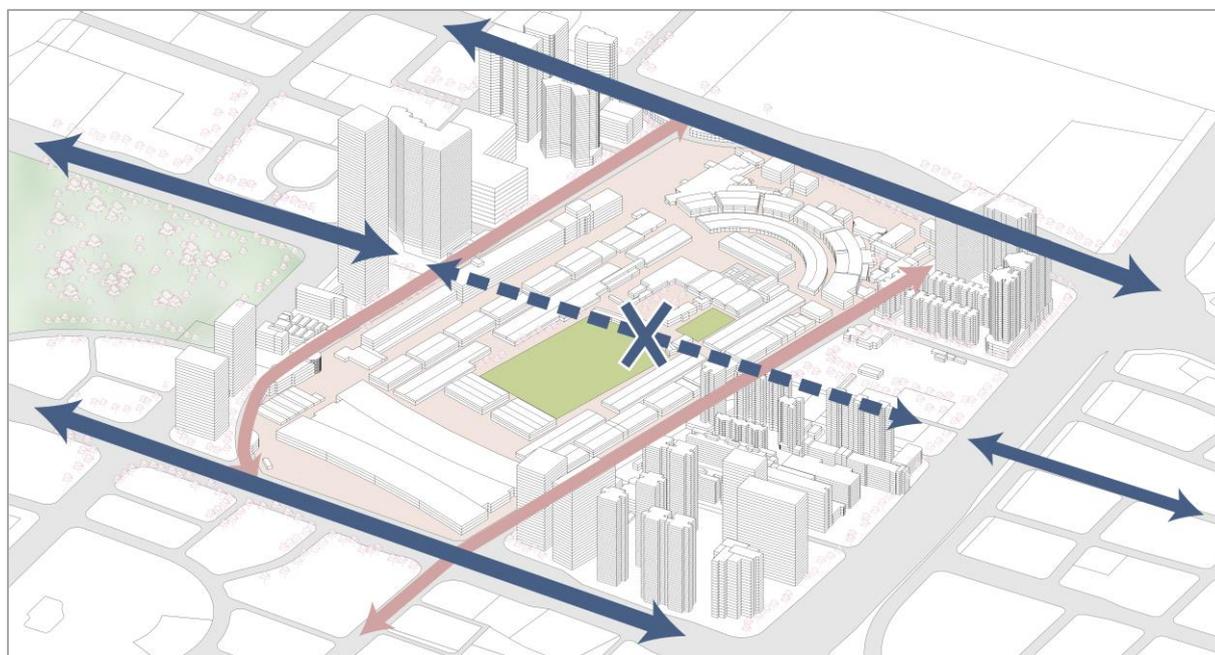


Fig.4-9 Lack of east-west connection in the Racecourse

According to the travel heat analysis of Zhujiang New Town, we can intuitively see that the core area of Zhujiang New Town has relatively good travel conditions and is basically unblocked (Fig.4-10). In contrast, the Pearl River Park, with its large green area and closed management causes a certain spatial barrier. The racecourse also interrupts the connection of the neighborhood in the east-west direction. On the west side of the racecourse, due to the road planning problem, the residents' access in the north-south direction is also not smooth, and they need to take a detour.

There are fences and railings around the Racecourse, with five entrances and exits, and the grounds are relatively closed (Fig.4-11). For those who want to enter, they need to enter through a fixed entrance, which is more inconvenient. The roads inside the site are mainly car lanes, and there are no planned sidewalks and non-motorized lanes, so pedestrians and cars are mixed, which makes it unfriendly to walk. And some of the unused space is closed to cause the road to appear part of the cut-off road.

Block scale analysis

The neighborhood scale of Zhujiang New Town varies significantly in the horizontal direction. The neighborhood scale in the West District ranges from 150m to 300m, among which the residential neighborhood scale is about 150m to 200m (Fig.4-12). The neighborhood scale in the eastern district is basically between 200m and 300m, and overall the neighborhood scale in the eastern district is generally larger than that in the western district. The volume ratio of Zhujiang New Town basically changes according to the law of decreasing from the core area to the outside. The neighborhoods on both sides of the central axis have relatively high plot ratios because of more office buildings, with an average plot ratio of 7 or more. The average floor area ratio in the eastern part of the city is slightly lower because some residential neighborhoods are upscale and are distributed around the Pearl River Park or along the Pearl River, and the neighborhoods are equipped with a high-quality landscape environment.

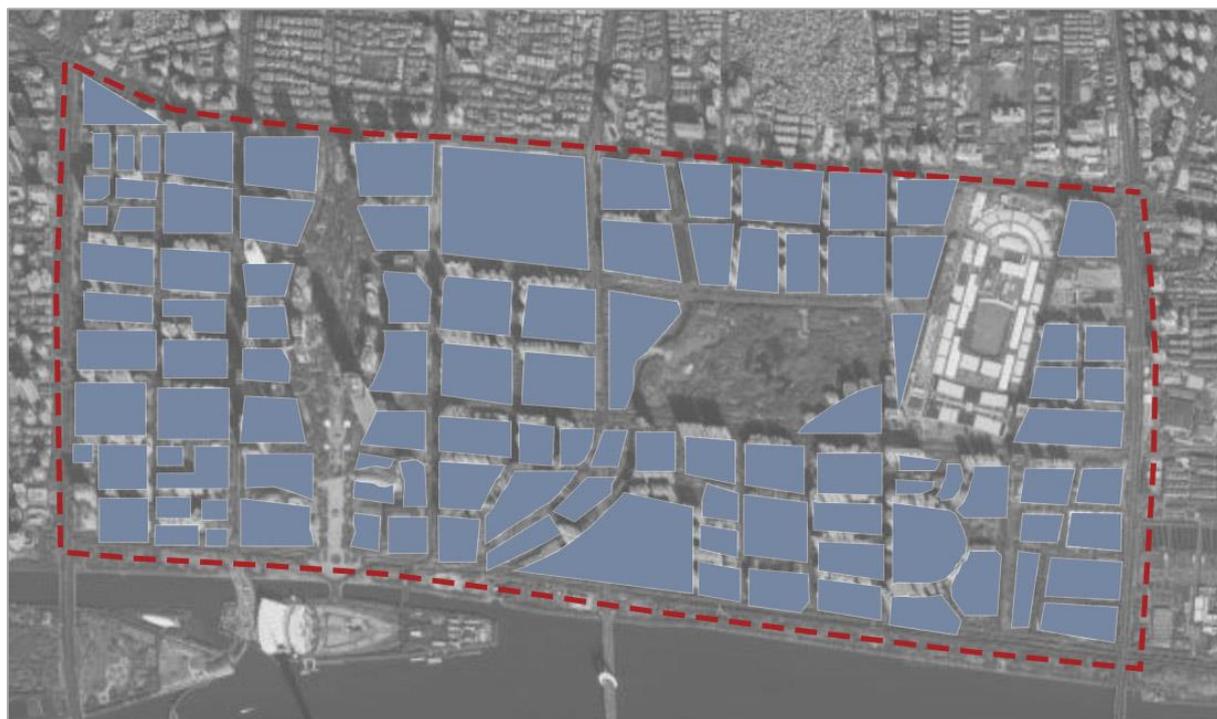


Fig.4-12 Neighborhood texture of Zhujiang New Town

Function Analysis

The current ones in the Racecourse are mainly restaurants on the west side, sports facilities in the central area and a home shopping mall on the south side (Fig.4-13).

The rest of the building, which used to be a car dealership, is currently unused. The food and beverage industry can bring the main crowd vitality to the racecourse, including sports facilities such as golf courses, badminton courts, tennis courts, etc., which also provide a place for the surrounding residents to play sports and visit more people. However, the home shopping mall is less vibrant and does not have many people inside. Besides, there are basically no other functions and activity spaces in the site, which cannot provide diverse activity spaces and service facilities for the surrounding residents, including the elderly and other people who have difficulty in getting around. This will be the part of the regeneration strategies that needs attention.



Fig.4-13 Functional zoning

Building Analysis

The buildings on the site are older, abandoned buildings of average or even some poor quality. The surrounding residential areas and office buildings are of a more recent construction age and of better architectural quality (Fig.4-14). The architectural style of the Racecourse is significantly different from the surrounding neighborhoods. In addition, in terms of building height, most of the surrounding buildings are above 100m. The buildings in the Racecourse are basically multi-story buildings not exceeding 24m, and from the viewpoint of the city skyline, they cannot well connect the building skylines

on the east and west sides (Fig.4-15).

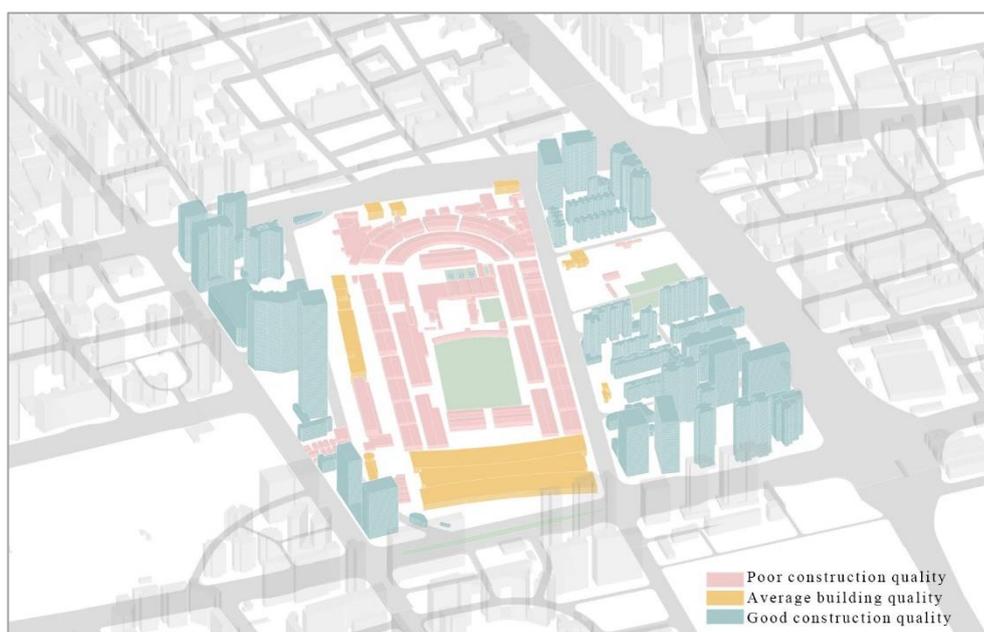


Fig.4-14 Building Quality Analysis

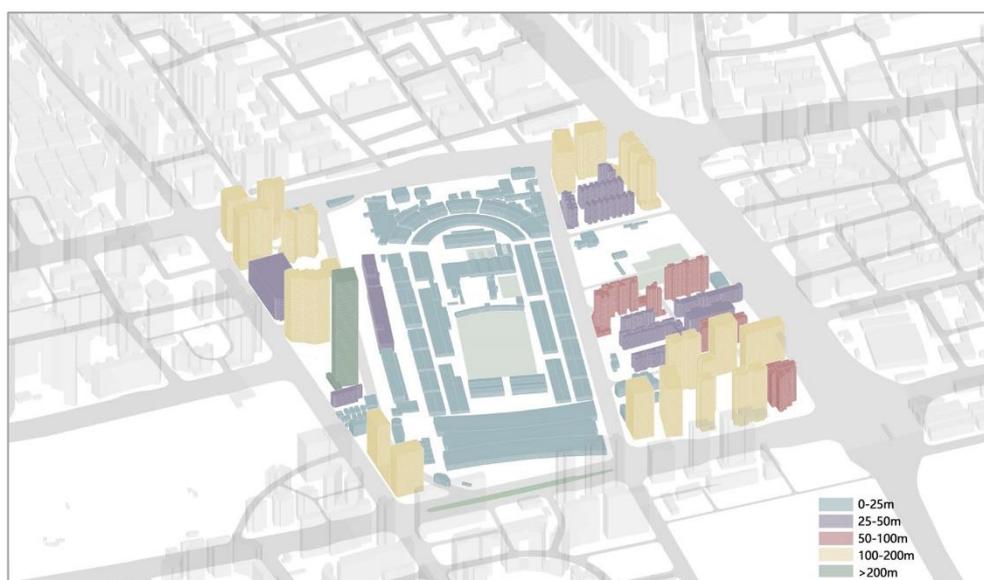


Fig.4-15 Building height analysis

Analysis of the current issues

Based on the analysis of the injustice issues in Chapter 3, it is concluded that there are four injustice issues in racecourse: transport, housing, public space and facilities. The subsequent strategy will aim to solve these pain points to improve the spatial justice of the Racecourse.

Only motor vehicle lanes are planned in Racecourse, and motor vehicles completely

occupy the right-of-way. Since there is no sidewalk in the site, the phenomenon of people and vehicles mixing is serious, resulting in the mixing of motor vehicles, non-motor vehicles and pedestrians. Because the space for walking paths and bicycle paths is crowded, the elderly, children and people with inconvenient travel pose potential safety hazards.

As the racecourse is located in the eastern part of the Zhujiang New Town, the surrounding area is a gathering place of luxury residential areas. At the same time, there are also urban villages around the site that have not been updated and developed. Therefore, the residential differentiation in the area is more significant.

The Racecourse has very low space utilization and basically no public space because most of the internal buildings are in idle state.

Residents living around the site lack stores to buy daily necessities, and they need to go to faraway places to get daily necessities, which causes inconvenience to their lives. Moreover, there are no resting facilities such as benches in the site, so the elderly or people with mobility problems will not stay here.



Fig.4-16 Current Traffic Conditions

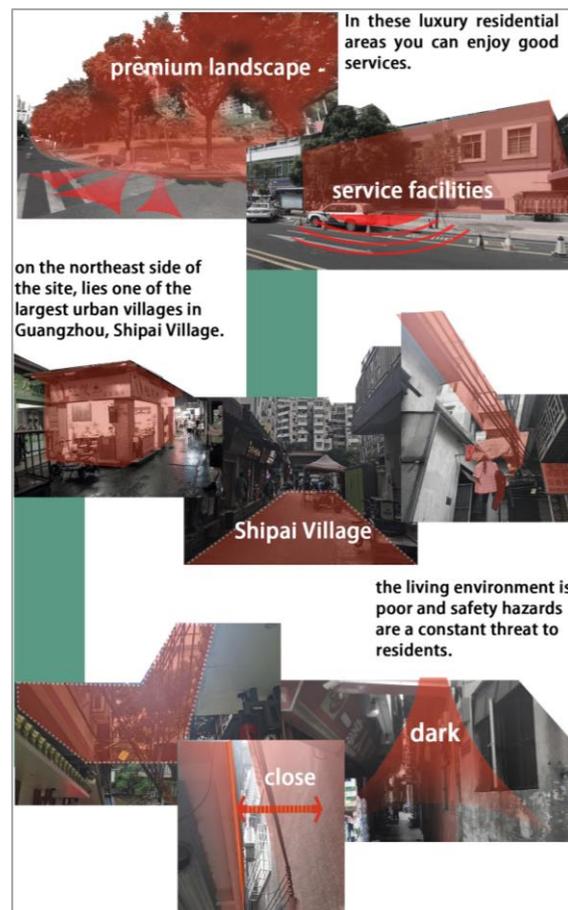


Fig.4-17 Current status of living conditions

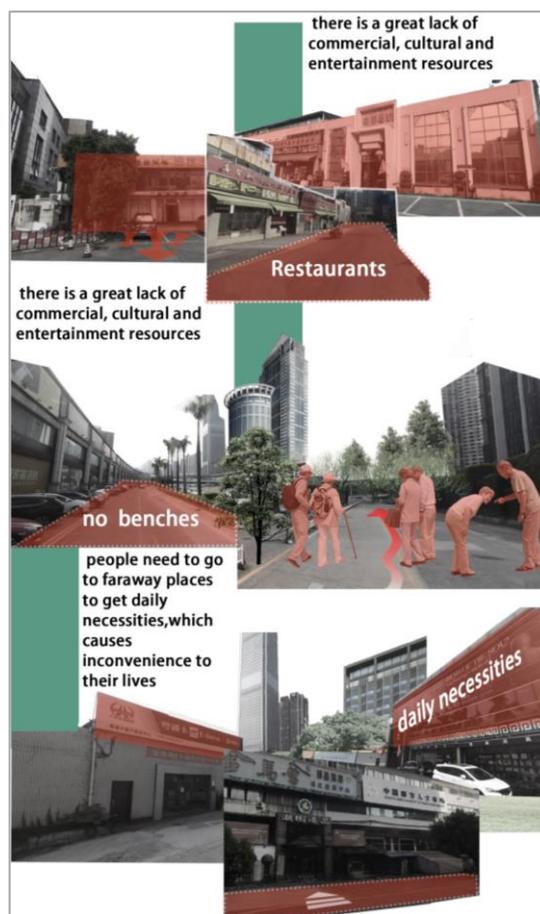
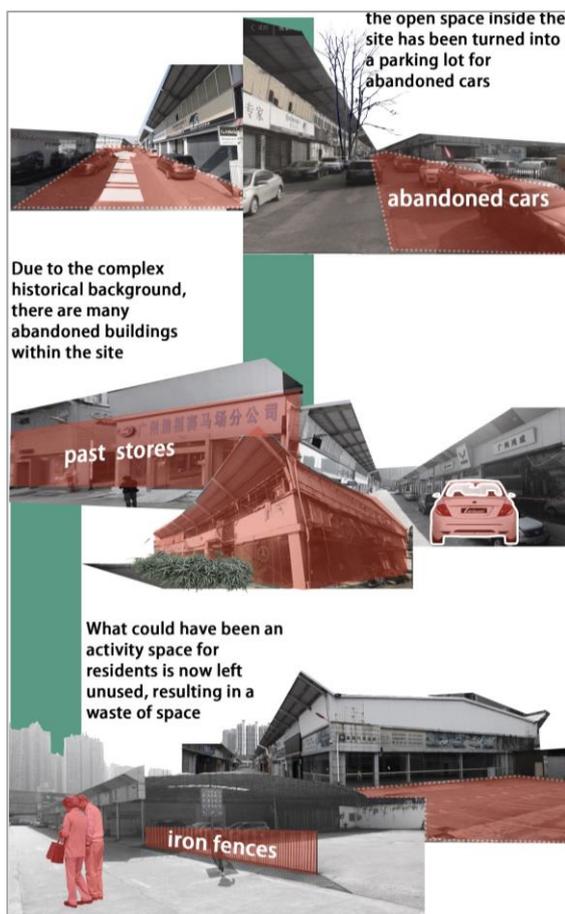


Fig.4-18 Current state of public space Fig.4-19 Current Status of the Service Facilities

4.2 Matching

4.2.1 Sort out the elements of injustice

Based on the current issues of the site found in the research, the just and unjust elements of the site were thus judged (Table4-1). It is found that the site is more activate in terms of restaurants and sports facilities, while the more prominent issues are concentrated in four areas: pedestrian environment, residential environment, public space, and service facilities. The following injustice characteristics were summarized.

Table4-1 Justice and injustice at the racecourse

justice	injustice
Vibrant restaurant industry	Pedestrian unfriendly
Abundant sports facilities	Weak external connections

More parking spaces available	Disparities between housing conditions
Convenient subway access	Encroachment on public space
	Lack of service facilities

4.2.2 Project Objectives

Then, by matching the elements of injustice to the value principle, four important values of the racecourse are selected: accessibility, inclusion, community, and diversity. The final vision for the racecourse regeneration strategies that has been finalized is as follows.

A community will be built for all kinds of city dwellers, including young city dwellers, seniors, singles, couples, healthy, the disadvantaged. Elevate the entire racecourse and surrounding area with safe streets, inclusive spaces, good housing that covers everyone, and great amenities to create an inclusive, diverse, green, and open mixed community.

4.3 Create

Based on the above-mentioned injustices in the site, with a focus on the elderly, youth and low-income families, the following four strategies will be proposed to achieve spatial justice, including transportation justice, housing justice, public space justice and service facility justice.

4.3.1 Transport Justice: Protection of Pedestrian Rights

The core issue in traffic justice is to provide human-centered street space while ensuring efficient urban transportation^[86]. In other words, we can solve the contradiction between the efficiency of urban operation and people's travel experience through the allocation of right-of-way within the limited street space. The humanistic design of streets is based on the needs of the people, and the efficiency of traffic is maximized on the basis of the travel experience of the people. The priority in transportation planning is to give priority to slow-moving traffic, and to choose a way of travel that takes up little space and is sustainable. The realization that all people,

including the disadvantaged, can walk safely and freely on the roads and achieve traffic justice.

Optimize Right-of-Way Allocation, Ensure Pedestrian Priority

Right of way refers to the right of traffic participants, the right to conduct road traffic activities on the road within a certain space and time^[87]. The allocation of road resources is not only unable to meet the needs of groups with limited travel access, but also cannot even meet the travel needs of ordinary residents. The mismatch between road resource allocation and current demand leads to right-of-way competition among people, vehicles and bicycles. It makes the overall slow traffic safety and motor vehicle access less efficient^[88]. Therefore, based on right-of-way optimization and crowd demand orientation, the proportion of space for pedestrian paths and service facilities should be increased (Fig. 4-20). By reducing the width of the car lane, the space for slow traffic is increased. For non-urban arterial roads, it is recommended to adopt a 3m wide motorway, and further reduce the width of the intersection entrance lane to 2.75m. and widening the green buffers to ensure pedestrian safety. In addition, move surface parking away, and use more street space for pedestrian rest, activity and communication. This will improve the efficiency of street use and create a safer and characteristic pedestrian environment (Fig. 4-21).

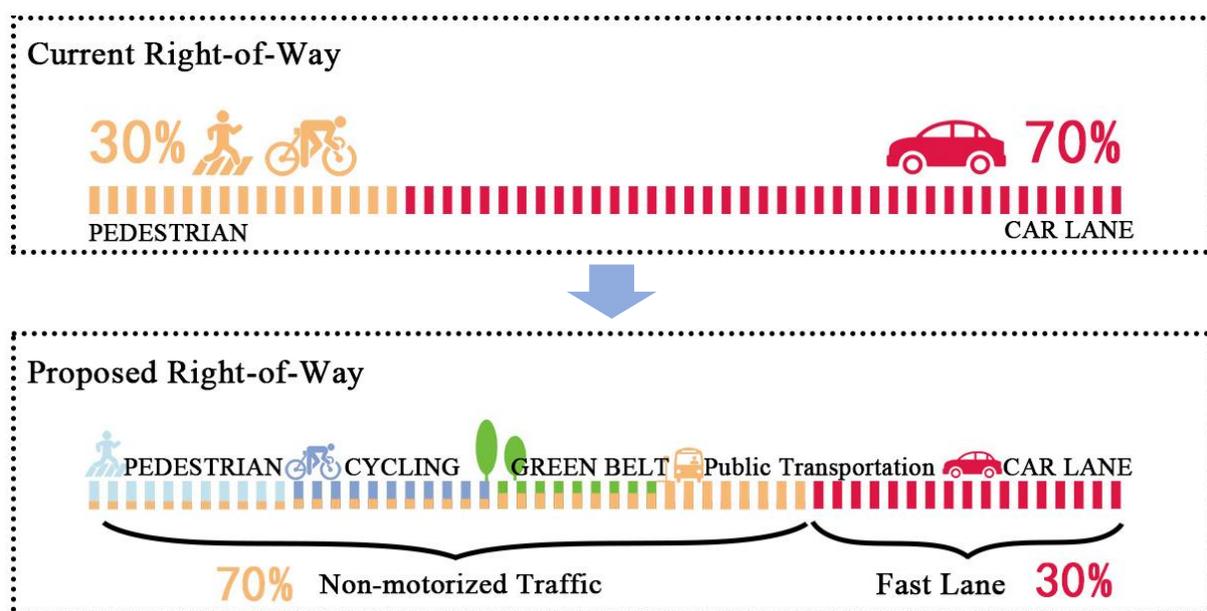


Fig. 4-20 Proposed right- of-way



Fig. 4-21 Road Space Vision

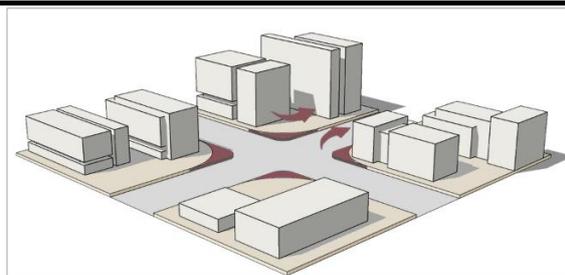
Restrict Speed for Safety

Reduce traffic flow by changing the internal roads in the community from two-way lanes to one-way lanes. At the same time to take static stabilization measures to reduce the speed of motor vehicles, in the pedestrian and non-motorized crossings set up speed reduction painting to remind motor vehicles to slow down. It also restricts the speed of vehicles by narrowing the intersection, narrowing the turning radius and raising it to ensure the safety of pedestrians (Table 4-2).

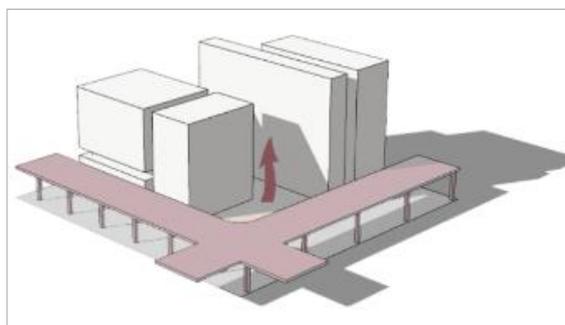
Table 4-2 Speed limiting measures

Measures	Effects	Diagram
Intersection contraction	Limit the speed of traffic and reduce the distance pedestrians can cross the street. Make the street scale more humane.	

Turning radius of intersection reduced
 Reduce pedestrian crossing distances and times. Reduce the turning speed of vehicles. Increase the efficiency of the site.



Intersection elevation
 Increase the continuity and comfort of walking. Arrange accessibility facilities more rationally.



Encourage slow-moving traffic and reduce unnecessary car use

According to the development experience of Western countries, a reduction in car use can increase the development potential of the region. After all, a higher rate of car utility means more traffic pressure. For example, the city of Barcelona is characterized by a compact street plan. But what was once a resident-friendly street design is now dominated by motor vehicles, which take up a lot of public real estate with driveways and parking, as well as noise and air pollution. These problems are like the current state of the racecourse. Therefore, Barcelona is facing the urban challenge to return the urban space to the pedestrians and cyclists, and to make the city closer to the daily life of its inhabitants. Barcelona has launched the "super-illes" urban regeneration program. The traditional nine square blocks were merged together and closed to internal traffic, so that buses and heavy trucks had to bypass the entire block to pass from the outside. The speed limit inside the super-block is 10 km/h, and on-street parking is replaced by underground parking (Fig. 4-22). Similar slowing transformations exist in several cities such as Paris, Milan, and Utrecht. The experience of Western cities tries to prove that modern city dwellers can also live "car-free" through human-scale urban design.

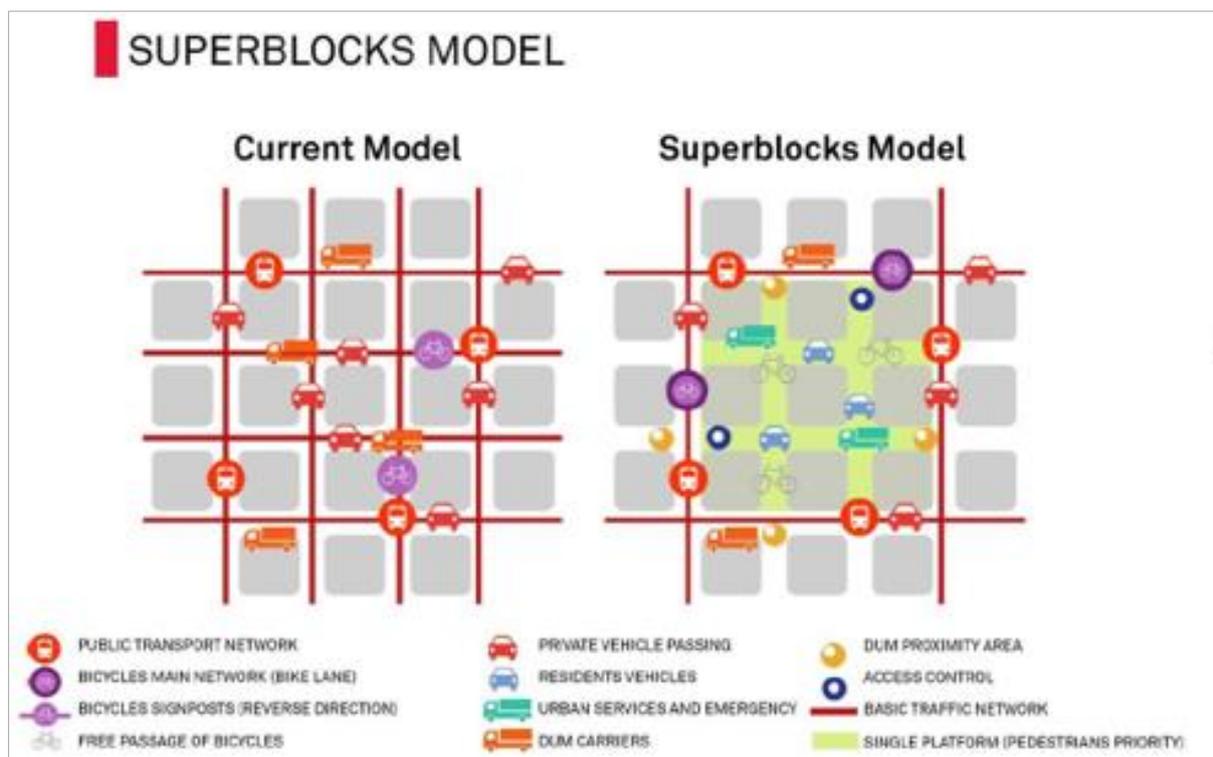


Fig. 4-22 Diagram of the "Superblock" of Barcelona
(Source: Ajuntament de barcelona, 2012)

By optimizing the pedestrian system, increasing bicycle parking facilities, and improving the public transportation network, residents are encouraged to walk, ride, and use public transportation. According to the results of a household survey conducted by the Guangzhou Bureau of Statistics among 5,000 permanent residents, more than half of the citizens believe that "segregation of pedestrians and vehicles, motorized and non-motorized vehicles" and "reasonable installation of crossing facilities" are effective measures to promote people's choice of slow-moving travel (Table 4-3)^[89]. The above-mentioned details are designed to limit the speed of traffic in the community, as well as to reduce the number of lanes and lane widths to ensure that both speed and traffic flow in the community are reduced. In addition, on-street parking in the community is replaced with underground parking. Residents can walk, shop, and hold outdoor activities on these returned roads without worrying about the safety threat of cars around them, enjoying the pleasure of the neighborhood. Such a transportation plan makes it possible for all residents to reach the place of work and life by walking, cycling or public transportation.

Table 4-3 Measures that the public think can encourage slow-moving travel

No.	Contents	Selection rate
1	Separation of pedestrians and vehicles, Separation of motorized and non-motorized traffic	58.5%
2	Reasonable installation of crossing signals, overpasses, and underpasses	55.2%
3	Clear obstructions on non-motorized lanes and sidewalks	48.0%
4	Set up safe bicycle parking spots at bus and subway stations	43.7%
5	Increase the shade facilities for pedestrians	38.1%
6	Install more street seats, public toilets, bicycle maintenance service points, and other convenient facilities	35.8%
7	Increase and improve barrier-free facilities	24.4%
8	Increase public bicycles or shared bicycles	23.0%
9	Improve traffic signs	21.5%
10	Create an attractive streetscape	18.4%

Urban road levels are generally divided into expressways, trunk roads, secondary roads and feeder roads. Among them, feeder roads are the main carriers of slow traffic and public transport networks. The dense network of feeder roads provides the basis for the arrangement of public transportation and bicycle lanes, increasing the depth of access for buses and bicycles and making the slow traffic more complete (Fig. 4-23). For example, the most obvious urban characteristic of Hong Kong is its extremely high urban density. Hong Kong has an extremely dense road network with well-developed feeder roads and slow-moving systems. Open neighborhoods and high-density feeder road networks have greatly improved traffic efficiency and accessibility in Hong Kong^[90]. Measures to refine road classes and classify street types are taken to make the road network more refined and to realize a barrier-free living circle within small neighborhoods. In particular, branch roads are divided into traffic and lifestyle roads. Different road sections will change their street types due to factors such as surrounding buildings, functions, and topography, so the lifestyle roads are further divided into comprehensive roads, commercial roads, landscape and leisure roads, and lifestyle service roads. The activities and demand behaviors of users are considered as the

focus, and the design of different street types is targeted.

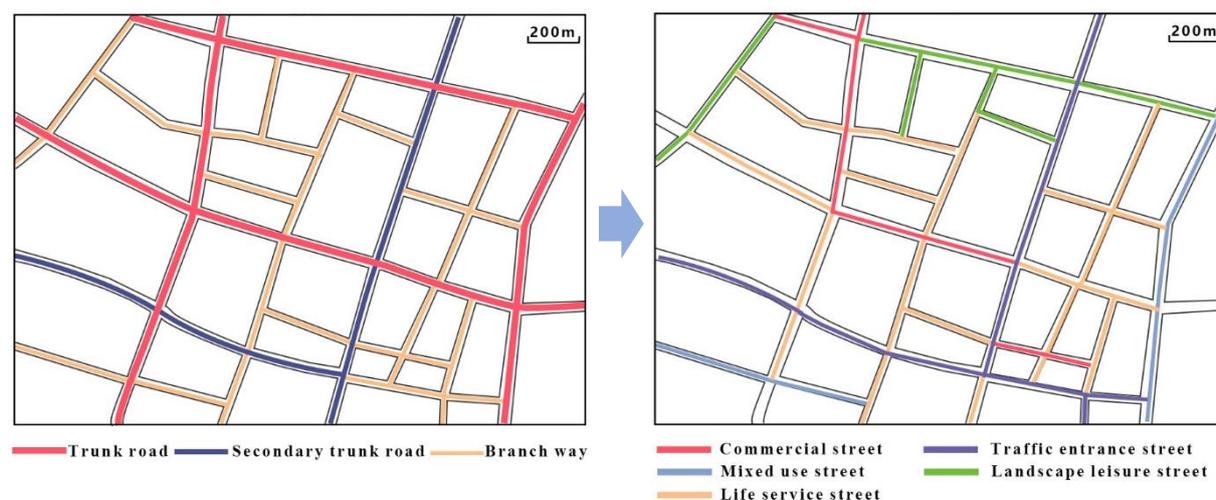


Fig. 4-23 Type of road network

Case Study

Tokyo's urban development has always been limited by its own strange scarcity of land resources. In the 1990s, Tokyo's traffic conditions were dire. Since the number of jobs in Tokyo Ward accounted for 81% of the metropolitan area, a large number of commuters would enter and leave Tokyo Ward during the morning and evening rush hours on weekdays, reaching a daily average of 4,408,000 people^[91]. The large volume of traffic is crammed into the narrow streets, causing severe traffic congestion. The solution strategy adopted in Japan is to improve the accessibility of public transportation to reduce the use of automobiles. Therefore, Tokyo has set the goal of developing an urban public transportation network based on regional public railways, supplemented by surface public transportation^[92]. It also proposes to promote the construction of pedestrian and bicycle priority streets. The balance of right-of-way is not an absolute concept, but a dynamic balance within the system. Through quantitative studies of traffic volumes in different areas, on different roads and at different times of the day, it provides a basis for the equitable distribution of rights-of-way among different modes of transportation, and enhances the rights-of-way of certain modes of transportation according to different usage needs.

In Tokyo, the traffic volume of an intersection near a subway entrance is 64% for pedestrians, 17% for public transportation, 13% for cars and 4% for cabs, and less

4.3.2 Housing Justice: A Mixed Community

A just urban space should be habitable. The injustice of material spatial resource distribution is reflected in the spatial segregation caused by residential stratification, which results in the unjust distribution of social spatial resources^[64]. To solve this dilemma, it is necessary to reasonably coordinate and balance the spatial interests of different strata of residential groups in the allocation of spatial resources. According to the preliminary research on the site and the surrounding area, it was found that the project needs to focus on the disadvantaged living in the urban village within 1 km from the site, the large number of youth groups in the university opposite the site, and the elderly who make up a large proportion of the population. Therefore, considering the characteristics and needs of these groups, we hope to create a community with social housing, youth apartments and an elderly-friendly community living in harmony. In other words, an all-age mixed community that provides diverse housing for all residents and achieves housing justice in the community.

Use Appropriate and Comfortable Neighborhood Scale

Establish open human scale neighborhoods and maintain a certain scale of residential neighborhoods. According to the research on the scale of the current CBD sites in China, it is found that they are within certain parameters. The general site is more regular, and the residential plots are divided into rectangular shapes. The plot area is from 1ha to 5ha. For relatively concentrated plots with an area of 1-3 ha, the scale of the block is more suitable between 100 and 200m. 200m is the maximum distance that the pedestrians in the residential area can bear visually and psychologically. It is also the maximum distance that the elderly and other people with travel difficulties feel comfortable walking. Therefore, the block layout of this value is relatively stable^[94].

By providing more urban public space within the appropriate neighborhood scale, the street interface is more dynamic. Elderly, disabled or mobility impaired people are relatively unsuitable for moving long distances. Therefore, it is necessary to provide them with public space, public services, public transportation facilities and other barrier-free environment within their comfortable range of activities and paths for daily life. After analyzing the activity characteristics and needs of the residents, the barrier-

free paths and activity networks are organized within the appropriate neighborhood scale, and the necessary services, public buildings, public space nodes and public transportation stations are linked within the slow-moving road network to form a highly functional mixed neighborhood (Fig. 4-25).

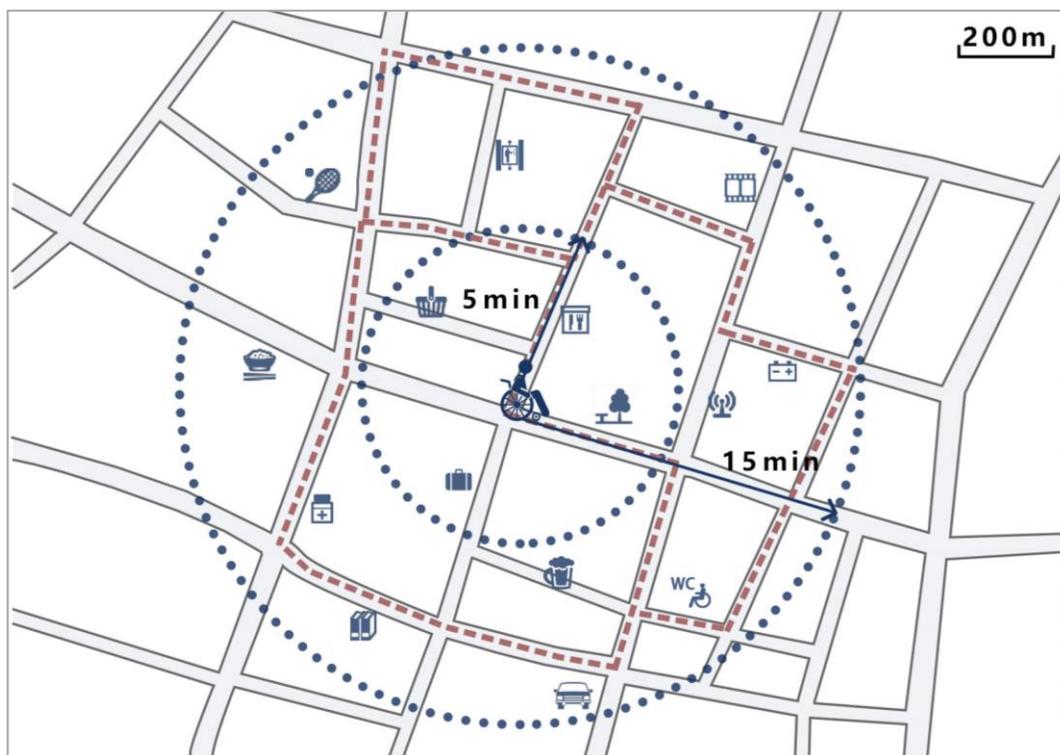


Fig. 4-25 Example of suitable neighborhood scale

Increase the proportion of social housing

In Europe, social housing is similar in nature to public rental housing, which refers to non-profit housing provided by the government for rental purposes^[95]. Social housing in China includes indemnificatory housing and public rental housing. Affordable house in the United States is a generic term for housing that is guaranteed in the United States. However, social housing in any country has faced the problem of suburbanization and concentration of poverty. In order to increase the supply of social housing while releasing the overcrowded population in the urban centers, settlements are always located in the peripheral suburbs. However, the lack of rapid transportation systems and employment opportunities has resulted in a massive concentration of poverty among the lower- and middle-income classes and a rapid expansion of social problems.

For example, in the early days of the U.S. government, in order to solve the immigration problem and provide shelters for the homeless. However, "public housing" gradually became synonymous with crime, poverty and racial problems. The infamous Cabrini-Green Homes, located next to two of Chicago's most affluent neighborhoods, Lincoln Park and the Gold Coast, was designed to demonstrate the government's desire to make the best areas available to low-income people. However, the surrounding high-rise housing projects surround the neighborhood, creating a closed "superblock" (Fig. 4-26)^[96]. Public transportation does not reach the neighborhoods, making it difficult for people to commute to work in the suburbs. Employment opportunities are reduced and unemployment in the neighborhoods is on the rise. Residents are also denied access to public services. The neighborhood was a dirty and unkempt environment with a high crime rate. Eventually, Cabrini-Green Homes was demolished. Like the fate of many public housing communities.

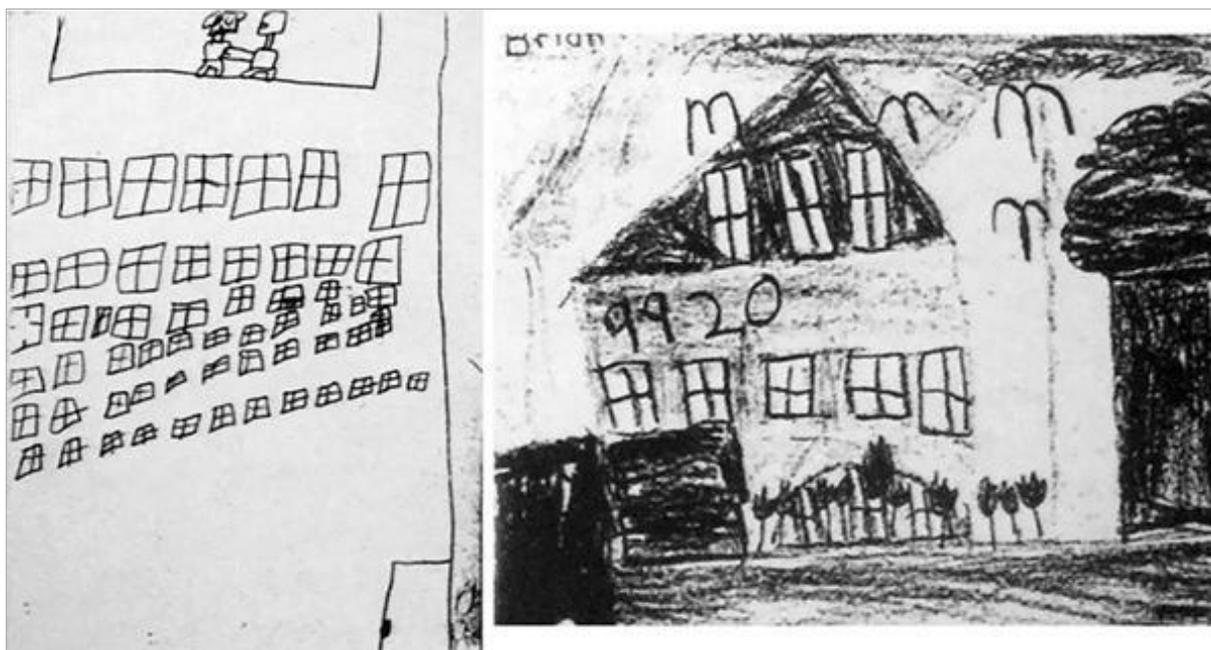


Fig. 4-26 Drawing of a child in a Chicago neighborhood
(Source: Tingwei Zhang, 2018)

As a result, Western countries have adopted the strategy of mixed housing in the face of the housing disparity caused by the construction of social housing. Chinese scholars also advocate the implementation of the mixed housing model to alleviate the phenomenon of residential segregation. The mixed housing model means that residents from different social classes live together in a specific area. However, it is

necessary to consider the scale of mixing, otherwise simple mixing will only intensify the tendency of living space differentiation^[97]. In the scale of mixed living, there should be a certain amount of space for separation, but also to form an integrated community (Table 4-4). Differences in the needs of different classes of residents should also be taken into account. It is recommended to use the service radius of public service facilities as the scale of mixed communities. The use of the service radius of service facilities as a division criterion is motivated by the consideration that residents of different income classes can share the realization of service facilities. In the mixed communities, the housing problem of new citizens and youth groups is solved by increasing the proportion of social housing in the residential area. Social housing includes public rental housing, subsidized housing and talent apartments. According to the requirements of Guangzhou's policy, the floor area of social housing should occupy no less than 20% of the plot^[98]. A certain percentage of social housing is allocated through comprehensive consideration of the surrounding industry, the proportion of the residential population, the balance of occupancy and housing, and the affordability of rent.

Table 4-4 Scale of mixed living

Scale	Effect	Diagram
Large Scale	Large spatial distance makes it difficult for residents to communicate effectively and to form a residential divergence phenomenon	
Medium Scale	The size is suitable for residents to communicate with each other	
Small Scale	Small space makes it easy to create conflicts among residents	

In a mixed community, different segments of the population have different needs, including how they travel and the services and facilities they need. Therefore, these differences need to be met in a mixed community. In terms of transportation facilities, the low- and middle-income households are extremely dependent on public transportation, and public transportation is the most important way for them to travel. As for middle- and high-income families, in addition to public transportation, private cars are also their main mode of travel. Therefore, in the transportation planning of the community, different transportation systems should be taken into account to meet the needs of different people and different travel distances.

In terms of service facilities, the public service facilities are necessary for residents of different classes to have to guarantee basic daily life. However, for low- and middle-income families, because of the limitation of consumption ability, they are more concerned about the facilities for general use needs, such as schools, hospitals, supermarkets^[99]. And middle- and high-income families can meet these basic requirements, so they have higher requirements for the type and quality of facilities (Fig. 4-27). Therefore, the configuration of diversified service facilities should be considered in mixed residential communities.

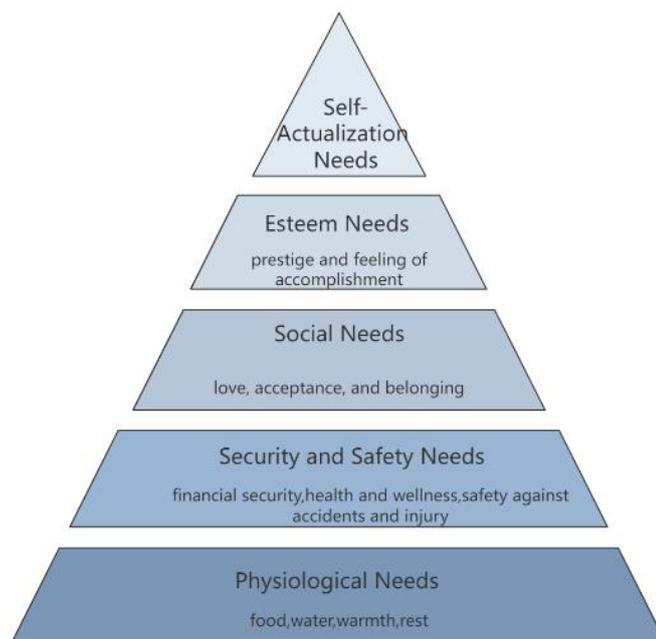


Fig. 4-27 Maslow's hierarchy of needs

(Source: Maslow, 1943)

Therefore, public space in mixed communities will be an important place to integrate different residents. The problem of mixed communities is the psychological barriers between different social classes, and the creation of public space is important to remove these barriers. The need for public space is common to both high-income and low-income people. Commercial and recreational facilities, plazas, parks, and other public spaces allow residents to have full access to other people and learn more about each other through interaction. Low-income people can learn from the middle and upper classes and get more social information. The middle and high income groups can learn about the living conditions of the low income group and reduce discrimination and prejudice. Therefore, the creation of public space not only provides a place for activities and communication, which facilitates the life of residents and enhances the vitality of the community, but also integrates the residents and forms a united and harmonious community.

Create all-age communities

According to the seventh census of the National Bureau of Statistics, the total number of people aged 60 and above is 264 million, accounting for 18.7% of the total population. According to the United Nations standard, an aging society is defined as one in which the percentage of people over 65 years old exceeds 7%^[100]. China has already entered the aging society, and the scale, degree and speed of population aging in China are large, deep and fast^[101]. In the future, China will face many aging problems. Therefore, paying attention to the elderly will be an important topic.

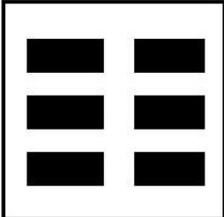
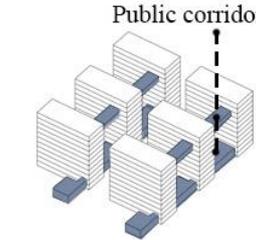
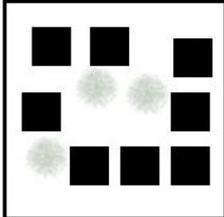
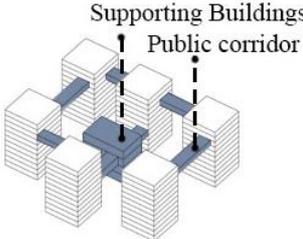
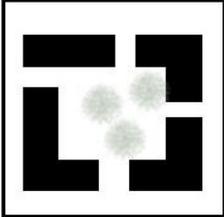
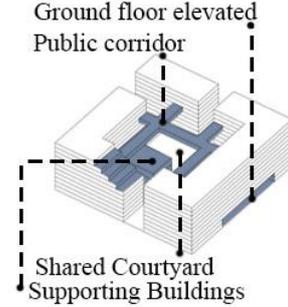
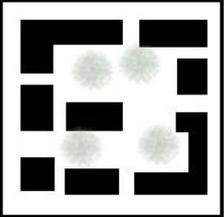
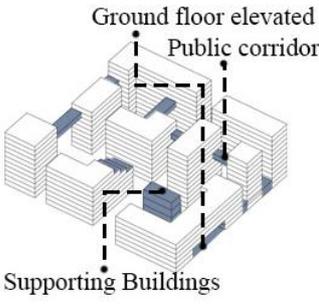
Older people are eager for companionship and socialization, and it is easier to make them feel lonely when they are too closed and quiet. However, the current ordinary residence lacks barrier-free design and elderly care service facilities to meet the needs of the elderly. In addition, the adoption of an independent living pension model will cause the elderly to have less contact with the outside world and be isolated from the society. Therefore, more and more scholars are opposed to the concentrated living of the elderly, and instead advocate the intergenerational living model of the elderly and the young.

The research objects of this paper include young people aged 18 to 35 with high

education level, who include students in colleges and universities, recent job graduates, and self-employed entrepreneurs. They have a good education and are receptive to new things. They generally pay attention to living security, need a certain amount of personal space and public space with diverse functions, and are willing to accept the concept of sharing.

In recent years, some countries have started to try to mix people of all ages to live together. It forms a community model of mixed living for all age groups of senior citizens, young and middle-aged people and children. By combining senior apartments with youth apartments, the rent is reduced by work, young people can participate in cleaning, simple care, cooking, and companionship in senior apartments in exchange for a lower rent. After summarizing the analysis of the cases of mixed living, the groups of residential buildings are often divided into four types: slab, point, courtyard and hybrid^[102]. Mixed communities imply the organization, association and use of space by different people. The slab layout is a widespread arrangement of residential areas. In mixed communities, the shared space of slab type houses generally takes the form of public connecting corridors to link the buildings together, but there will be longer distance of connection and weaker connection between residents. The point layout form has the characteristic of flexibility and freedom. The buildings can be organized in such a way as sharing activity space, sharing supporting buildings or sharing transportation space to make a whole that promotes residents' interaction. The courtyard layout can provide sufficient activity space for residents to facilitate interaction activities. Since the internal space of courtyard is relatively closed, the ground floor of the building is usually elevated to enhance the connection with the outside world. At the same time, increasing the number of connecting corridors in the courtyard can also increase the connection between residents and public activity space. The last type is the hybrid type. The above three types of layout are combined according to the project situation. Because of its flexibility, the hybrid layout can be well adapted to different terrains and can have a variety of designs in terms of the type, scale and level of public space. Therefore, it has certain advantages in catering to the needs of different residents (Table 4-5).

Table 4-5 Building layout form of mixed community

Building group layout	Plan view	Public space
Rows		
Point		
Courtyard		
Hybrid		

Parklife, completed in 2011, is located in the Rennes district of Salzburg, Austria, and is the largest mixed residential community in the city of Salzburg (Fig. 4-28). The community has a nursing home, a kindergarten and daily stores such as a supermarket. The elderly, youth and children not only have their own separate living spaces, but also can be connected through the shared plaza on the roof of the podium^[103]. The community uses children as a bridge, many of whom are the children of low-income young couples living in youth apartments. The community's kindergarten is open to the

community, and through a number of activities, it effectively promotes the intergenerational integration of the three age groups. The community is more like a mixture of a nursing home and a large dormitory, with the goal of living together for the mutual benefit of members of different age groups. An all-age mixed community where the life experiences of the elderly can help the young and the life skills of the young can help the elderly, who can then realize their self-worth and gain a sense of satisfaction.



Fig. 4-28 Parklife, a mixed residential community in Salzburg
(Source: www.gbd.group, 2011)

4.3.3 Public Space Justice: Public Space with Complex Functions

In mixed-use communities, public spaces play an important role in integrating different residents and creating a sense of community belonging. Inclusive design, or universal design, is an approach to design for people of all ages and abilities, meeting the needs of the general public while accommodating the needs of special groups and the elderly^[104]. This design attitude focuses on formulating design strategies for the needs of different groups, so that everyone can enjoy fair rights while reap the benefits of living in the city. This idea is in line with the idea of space justice and helps to achieve justice in public space.

Creating Multi-Level Space Patterns for Good Accessibility

The spatial structure planning of public spaces should take into account the balanced

arrangement of spaces, the maximum accessibility between spaces of different levels and functions, and try to reduce the overlap of service areas in the layout to ensure a wider coverage of the site (Fig. 4-29). Considering that the fatigue limit of walking for the elderly is 300m to 450m, the walking limit of other age groups is mostly above the elderly^[105]. Therefore, based on the mobility of the elderly, the service radius of the comprehensive public space should be controlled within 300m, which can serve different groups of people to the greatest extent. In addition, the service radius of public spaces between groups should be controlled within 200m, and the service radius of semi-private public spaces within groups should be controlled within 100m. There should be a convenient and efficient walking system between different spatial systems to improve the accessibility of each space.

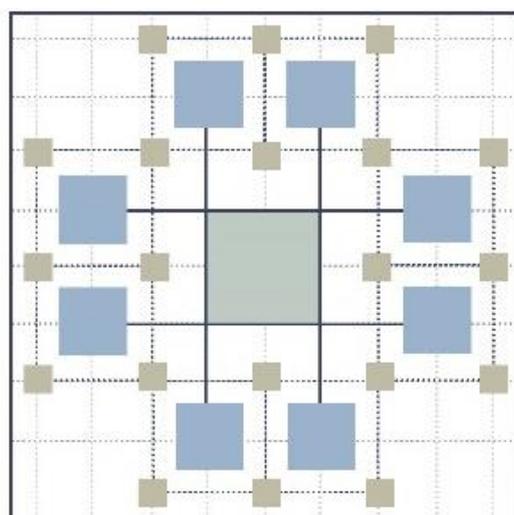


Fig. 4-29 Diagram of public space layout structure

Provide Functionally Diverse Space to Meet the Flexible Use of Different People

The composite use of space can avoid the waste of space resources, maximize the use of space, and avoid the injustice caused by the unavailability of certain groups of people due to a single function that can only serve specific groups of people. The compound use of space can realize the diversified use of space at different times from the three levels of time compounding, functional compounding and crowd compounding, so that everyone can enjoy fair space rights.

Use of Public Space at Different Times

The activity characteristics of the population change according to time. For example, during the daytime on weekdays, young people go to work and mostly elderly people use public space for fitness and exercise, leisure and communication activities. While in the evening and holidays young people will want to do activities such as sports, recreation and socializing, and older people will do evening walks or communication (Fig. 4-30). Different groups with different needs should reach the shared space at different times of the same space. Therefore, the function of public space should be flexible for different times.

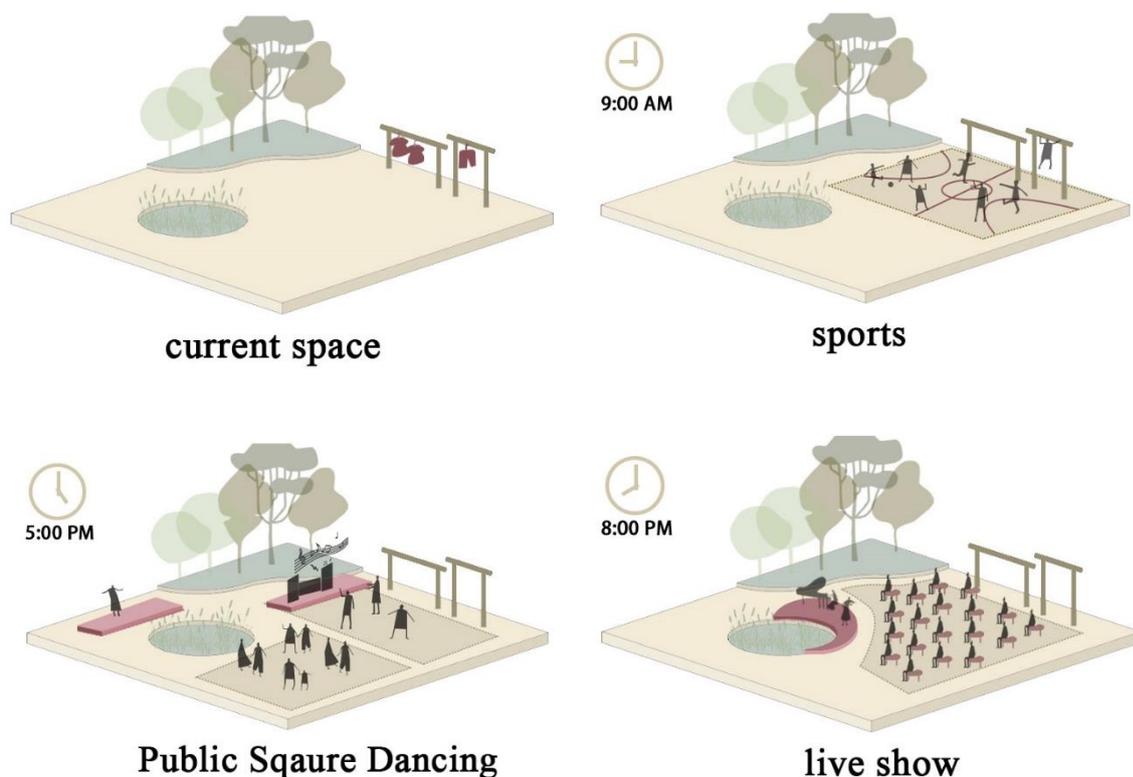


Fig. 4-30 Diagram of time composite use of public space

Different Use Functions of Public Space

From the perspective of inclusiveness, the functional compound of space should enable different groups of people to freely choose sites of different scales, creating different levels of communication and interaction, which can promote intergenerational communication and integration of community residents. The proportion of space for different functions is determined according to the function of surrounding buildings, the

size of the site, the configuration of facilities, and the main participating groups. The dynamic activity space is the core, and different static activity spaces are allocated around it. For example, sports field or children's recreation facilities as the core space, around which can be distributed leisure seats, fitness equipment, chess and card entertainment space. When some groups are using the core space, other groups can stay to watch, relax and interact (Fig. 4-31). It creates opportunities for people of different ages to use the same space together and promotes intergenerational communication.

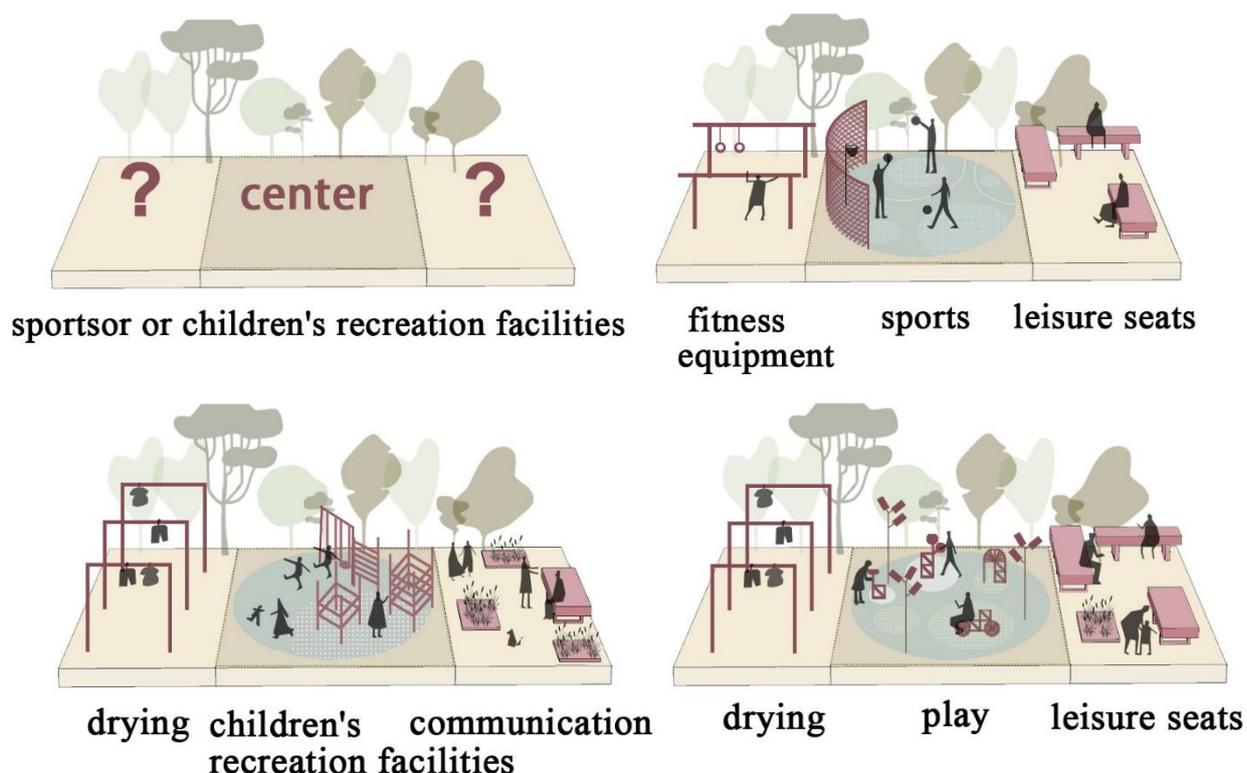


Fig. 4-31 Diagram of the composite use of public space

Different People Use Public Space

Crowd compounding refers to the composite use of space by people of different age groups. However, there are certain dangers due to the activities that youth groups participate in, such as basketball, skateboarding and other sports. And the outdoor activities of different groups may have a greater impact on other groups, such as performances of youth groups and square dances of the elderly. Therefore, in addition

to time-sharing space for different groups, spaces for young and old should be arranged adjacent to each other while maintaining independence.

In addition, the elderly watching and accompanying children in outdoor activities is one of the most effective intergenerational communication activities. By combining the children's activity area with the elderly's rest area, the elderly and their parents can meet their own activities and communication needs while taking care of the children. It is also necessary to set up intergenerational shared facilities in the space, such as swings, fitness equipment, rest seats, etc.

4.3.4 Facilities Justice: High-quality Facilities for The Disadvantaged

Service facilities should meet the needs of different groups of people, such as nursing centers for the elderly, nurseries for children. It also focuses on the balanced layout of facilities and builds a 5-minute living circle and a 15-minute living circle. It meets the needs of residents at different travel distances and different facility levels. In addition to stores that support daily life, some service facilities needed by special people should also be equipped. According to Guangzhou city regulations by 2022, new urban areas and new residential areas will be equipped with elderly service facilities at a standard of not less than 25 m² of floor space per 100 households^[106]. This standard should be appropriately increased in communities with a high proportion of elderly people. In order to maintain the living support of community spatial justice, about 15% of the floor area is determined for service and commercial facilities based on relevant cases. The service facilities under this percentage can meet the needs of the community residents for self-sufficient daily life.

Create A Balanced Layout of Facilities for Accessibility

Calculate the area ratio of related service facilities according to the population ratio of the community, and then arrange the living facilities according to the 5-minute living circle to ensure that the distance and time for residents to reach the facilities are relatively optimal. The 5-minute living circle means that residents can meet their basic living needs within a walking distance of 300m. Medical and health facilities, elderly care facilities, nurseries and other facilities are set up in this area to meet the corresponding needs. Daily shops such as community service facilities, cultural and

sports facilities and supermarkets need to be centrally arranged within a range of 200 meters to 300 meters because of the common demand. Some convenience stores, fruit stores, laundry rooms, reading rooms and other small facilities are set up on the ground floor of the residence to facilitate the daily life of residents.

Increase Facilities for The Disadvantaged

The service facility system should also be configured according to the three-tier spatial system, with the comprehensive neighborhood center as the core, and the second tier of facilities such as education, medical care, culture, and sports distributed within the service area. Daily stores, laundry and other daily small living service facilities are then densely arranged on the ground floor of the residence. It completes the formation of a network of public service facilities in the community (Fig. 4-32).

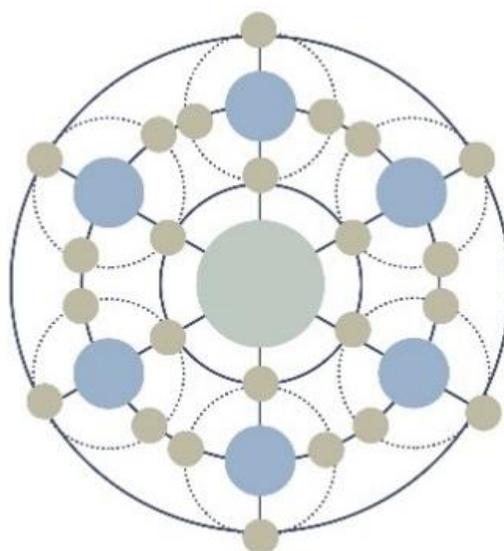


Fig. 4-32 Public Service Facilities Network

Barrier-free travel will be the foundation of a healthy life. The design of barrier-free facilities is crucial to the smooth connection and switching between various travel scenarios. To ensure that people with all kinds of disabilities can travel safely and conveniently. To create a barrier-free waiting, riding, and passing travel scene (Fig. 4-33). In addition, in order to ensure the continuity of slow-moving traffic, we should pay attention to the setting of barrier-free facilities connection nodes. Usually, when connecting pedestrian bridges with ramps and barrier-free elevators, it is necessary to ensure that there is enough effective walking space on the ground level, and the width

of passage is not less than 15m^[107]. At the same time, the design of the articulation node should be combined with the street section, and for efficient use of space, it can usually be combined with the building setback space, buildings along the street and green space (Fig. 4-34).

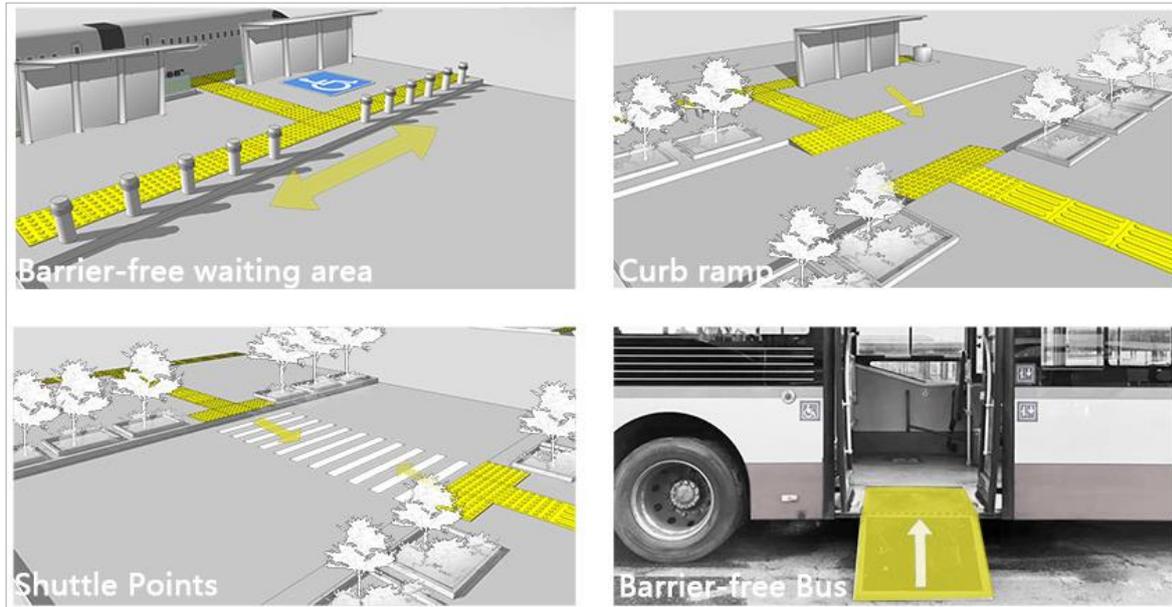
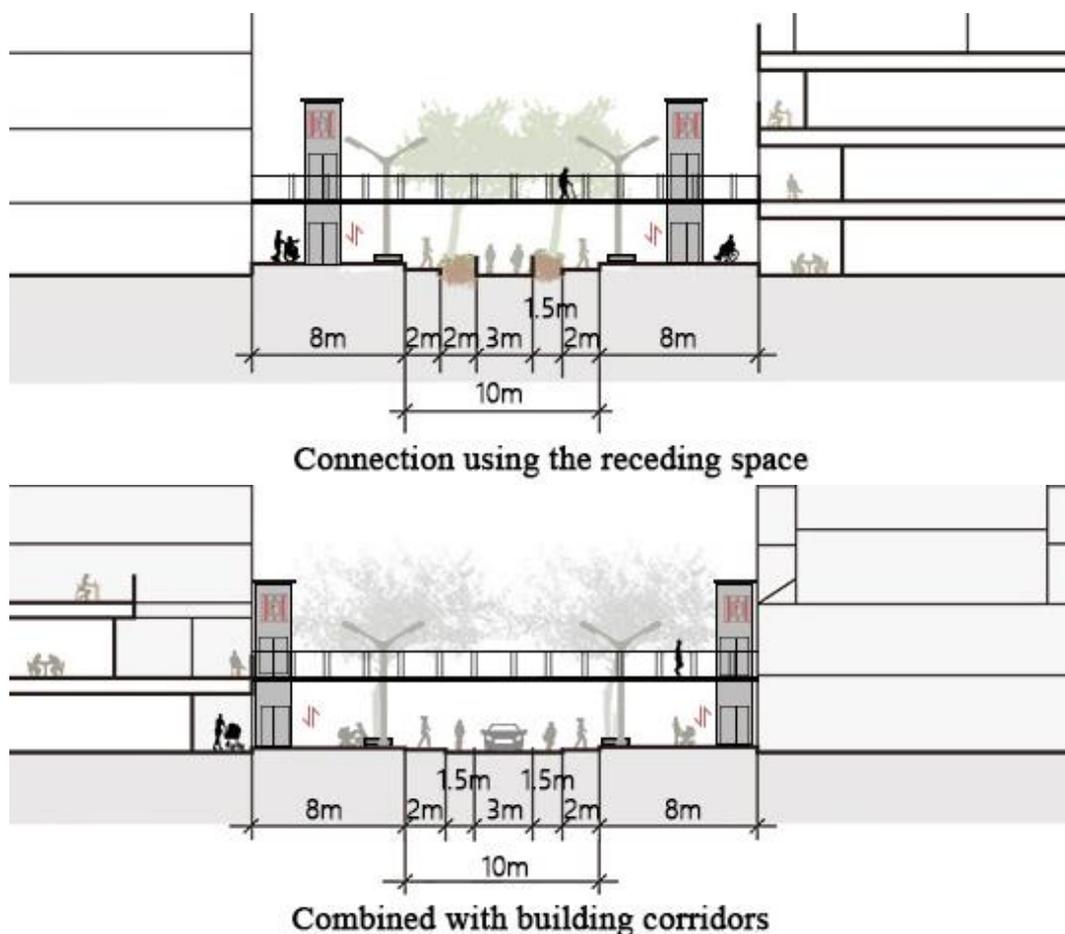


Fig. 4-33 Traveling scene diagram



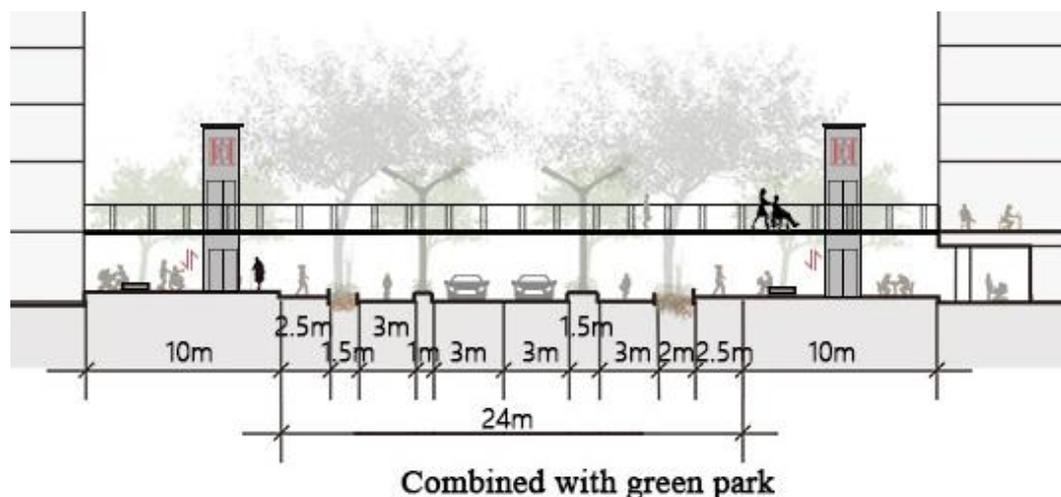


Fig. 4-34 Accessible articulation of the connecting corridor to the ground

4.3.5 Institutional Justice

Create a modern public service-oriented government

China is currently in a critical period of comprehensive economic and social transformation, and is also accelerating the transformation of government functions and actively building a modern public service-oriented government. A modern service-oriented government takes the public as its service target, provides fundamental and guaranteed public products and effective public services for the whole society, and continuously meets the growing general populace's demands and aspirations in the public interest. This can be done by incorporating social value assessment into the performance appraisal system and increasing livelihood assessment indicators such as employment rate and happiness index. The government should make reasonable use of various means of governance to regulate the order of public resource supply, keep the process procedural and rationalized, and ensure that public interests are not neglected.

Balance the power of different interest subjects

To actualize the equal rights of the public, spatial justice should be a balance of choices among various value orientations and games among various interest subjects. One of the primary causes of spatial injustice is the imbalance between the voice of capital and the voice of social power. Therefore, the public should be a participant in urban

planning and construction, not just a passive recipient. It is necessary to balance the power weights of each interest body, change the role positioning and reconstruct the collaboration connection. As the leading and coordinator, the government should play the role of regulation and control to ensure the reasonable operation of public policies. At the same time, it should establish an effective consultation and participation mechanism to give the disadvantaged the right to participate, speak and negotiate, and ensure that their interests are not infringed upon. The depth and breadth of citizen participation in planning in China are still in their infancy and are far from sufficient to effectively reflect the public's true demands. The establishment of the public participation system should break the current rule that the government and experts play a dominant role, so that the public can actively participate in the stages of urban spatial planning such as project creation, evaluation and operation, and balance the interests of the government, experts and the public. First of all, a mechanism for collecting information on public needs should be established. Relevant departments are responsible for collecting public demand opinions through questionnaires and interviews, and using them as an important basis for planning projects. Secondly, refine the methods of public participation in urban spatial planning. For instance, at the project establishment stage, public opinion polls and other methods are used to comprehend the actual needs of residents as a basis for planning, and residents still have the right to evaluate and monitor the operation of the community after the project is completed. Capital, as a beneficiary and cooperator, needs to expand the cooperation target to both government and public. Capital should take the initiative to assume some of the social goals and avoid the hostile relationship with the public that raises input costs and time costs. This helps to form a sustainable cooperative relationship with both parties and achieve stable and considerable long-term benefits.

Improve the market mechanism

There is a trend toward a varied combination of supplying subjects for urban public resources under the influence of market mechanisms. It is possible to optimize the interests of multiple participants and provide urban public resources more effectively by combining government departments, profit-making organizations and social non-profit organizations. For instance, compulsory education facilities are public goods and are generally not profit-making in nature. For the supply of such resources, real estate

developers should work with government departments rather than following standard government supply practices. Education facilities can bring more additional value-added revenue, so developers and government departments can gradually create a community of interests in the process of supporting education facilities.

4.4 Summary

This chapter studies the actual case, the Guangzhou racecourse, and systematically analyzes the injustice issues in racecourses and the specific solutions. The current state of the racecourse, the injustice in the distribution of space, and specific solutions are systematically analyzed. Follow the three steps of observe, match, create to study the racecourse.

First, in-depth research and interpretation of the location, historical development and policy planning of the racecourse were conducted. The spatial evolution of the racecourse within the Zhujiang New Town area, the traffic situation, etc. were investigated. Through the preliminary understanding of the project to find the current injustice in the racecourse.

Secondly, matching the injustice that needs to be addressed with the values principles, and select accessibility, inclusion, community, and diversity as the final vision of the racecourse's regeneration strategy. The goal of the identified racecourse is to build a community that is suitable for all kinds of residents and is an inclusive, diverse, green, and open mixed community.

Finally, based on the four values, four levels of strategies are created: transportation, housing, public space, and facilities, and justice strategies of different dimensions are used to finally realize spatial justice. In the transport justice strategy, aiming at protecting pedestrian rights, it proposes strategies such as optimizing the allocation of road rights, limiting the speed of traffic flow, and giving priority to non-motorized traffic. The housing justice strategies including use appropriate and comfortable neighborhood scale, increase the proportion of social housing, create all-age communities, create a mixed community. In the dimension of public space, connect surrounding residents through public space with complex functions, create a multi-level space model, and provide composite public spaces to improve the accessibility and flexibility of space, so that everyone can enjoy equitable space rights and realize public

space justice. In the service facility justice strategy, aiming at high-quality facilities for the disadvantaged. To ensure a balanced layout of facilities and a diversified system of facilities to protect the rights of the disadvantaged and achieve justice in community services.

Chapter5 Urban Design of the Racecourse

5.1 Overall Framework



Fig. 5-1 Site plan

The specific solution for this project places the Racecourse in the wider context of the

city and surrounding communities, looking for opportunities for the regeneration and development of the site itself while fostering links between new residents and those who already live there. This solution can also play a role in the areas of accessibility, inclusion, community, diversity and more in the wider urban context. To improve the spatial justice of the Racecourse, the design will consider how to achieve justice in each of the four dimensions of transportation, housing, public space, and services. Each of the levels will be considered at three scales: the integration of the site with the surrounding community, the overall enhancement strategy of the Racecourse, and the detailed design of the local area. Through four levels and three scales of strategies to improve the spatial justice of the Racecourse itself and in the urban environment (Fig. 5-1).

Spatial justice is a values-oriented determination of strategy. Based on the research of the Racecourse and the summary and analysis of the injustice issues, the general framework of the Racecourse with the values of accessibility, inclusion, community and diversity was clarified. The strategy of the Racecourse can be summarized in four themes.

Transportation Justice: Residents of the Racecourse have priority given to pedestrians and are guaranteed a safe, comfortable and healthy walking environment, even for the disadvantaged without worrying about threats from cars.

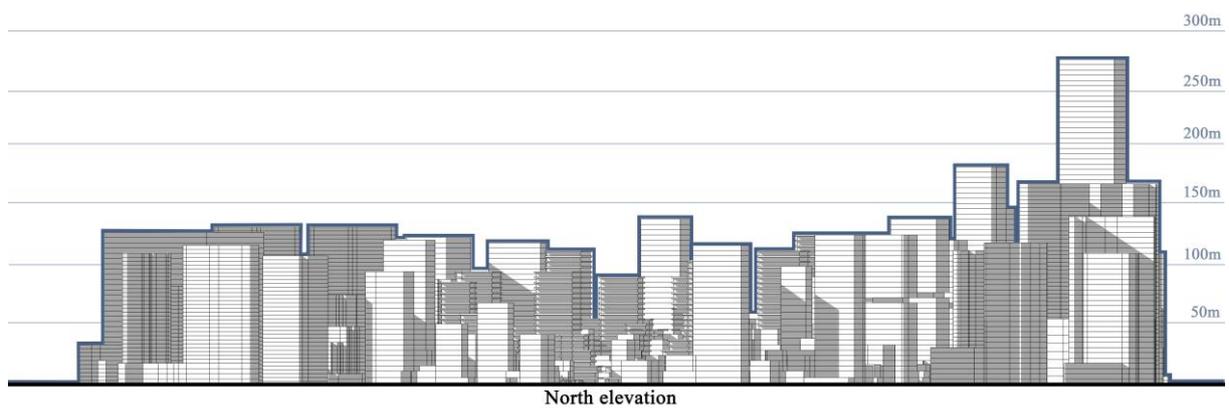
Housing Justice: Racecourses provide a livable environment for all, including guaranteed social housing for low-income families, all-age communities that benefits both young and old, and comfortable apartments for middle- and upper-income families. Anyone may feel the vitality of the city here.

Public Space Justice: The inclusive and diverse public space can accommodate people with a variety of activities, providing residents with not only semi-private and independent spaces for activities, but also having public spaces where they can interact and communicate with neighboring residents, enhancing community integration.

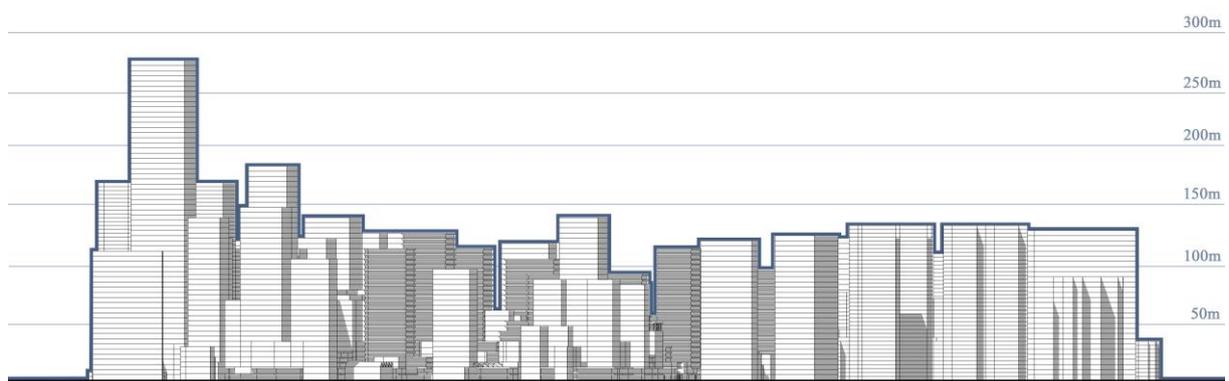
Service facilities justice: Service facilities are available all throughout the Racecourse, and those that are 300 m walking distance not only serve the daily life of residents, but

also provide convenience for the elderly or those who have difficulty in getting around.

The new buildings in the racecourse will play an articulation role in the site's building height control, which will be determined by the height of the existing building complex on both sides. Therefore, the height of the business office building in the site is about 110-160m, the apartment building is about 80-100m, and the senior citizen apartment in the all-age community is about 50m (Fig. 5-2). The building height at the periphery of the site is relatively high, which plays a better transition role in the surrounding neighborhood and the internal community. The building heights in the inner neighborhoods are relatively low in order to create a human scale for the residents. While ensuring that the city skyline can be smooth and continuous, the rhythmic city skyline is formed through the changes of the skyline at various levels and angles.



North elevation



South elevation

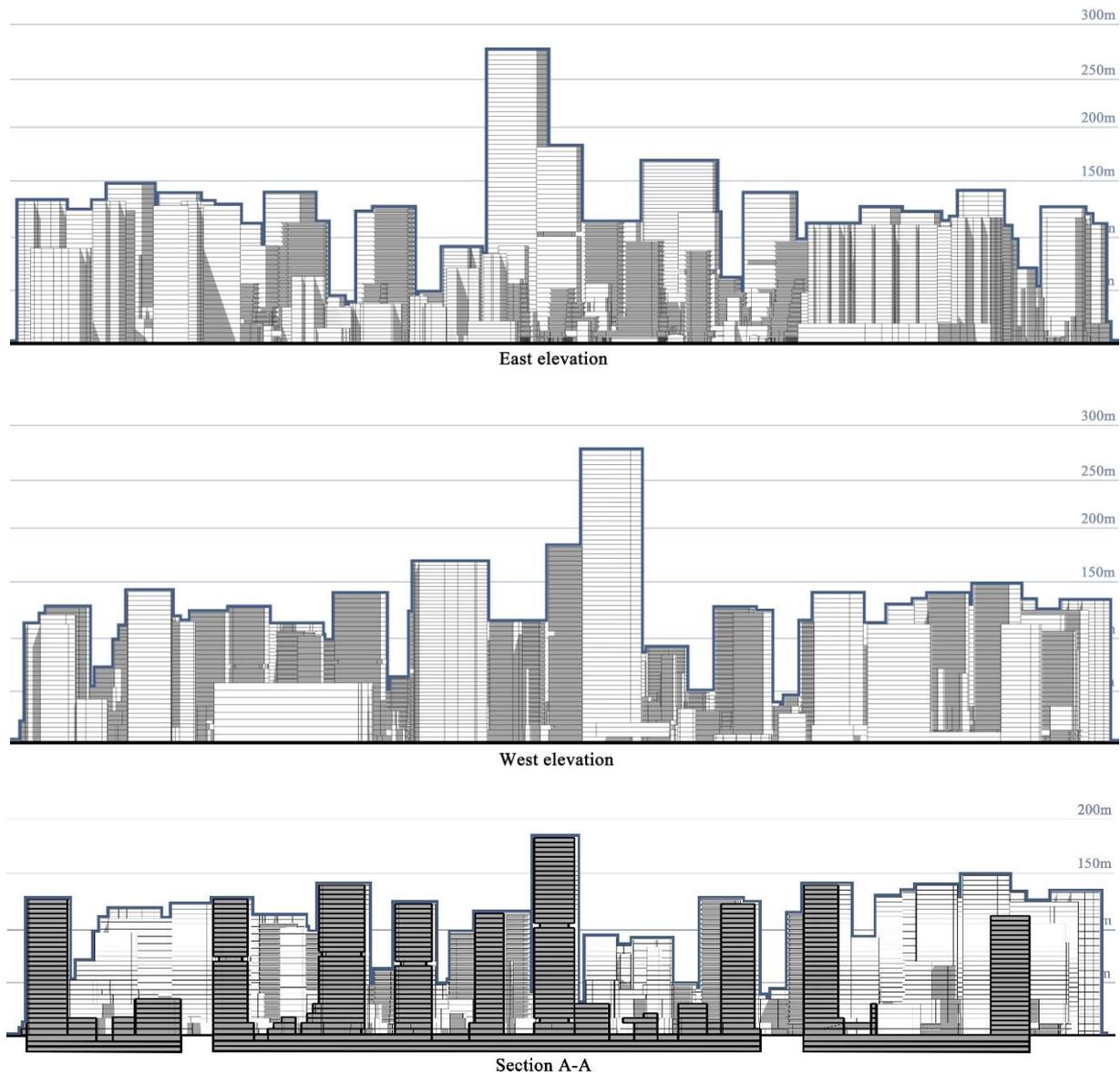


Fig. 5-2 Elevation and Section

The core area of the site is an all-age community that provides comfortable housing for a diverse group of people including seniors, youth, low-income families and ordinary residents. The eastern side of the community is open to the neighboring community, and the surrounding residents can also enjoy the service facilities on the ground floor of the building, which improves their daily life and strengthens the connection with the surrounding community. On the north side of the site is the Youth Innovation Space, which provides a free entrepreneurial area for the student community in the university town across the street and includes certain service facilities to accommodate creative activities and office space. To the west of the site are commercial street, business office

buildings, as well as a hotel and luxury apartments. Form a business circle with the existing shopping mall on the west side of the site to shape the business atmosphere. It provides shopping, leisure and entertainment for the residents in this area. The southern side will retain the existing auto and home industries and combine with the office buildings to create an auto exhibition and home exhibition to attract foot traffic. These areas will be linked by a leisurely pedestrian corridor on the central axis. The corridor is distributed with various public space nodes, as well as community public spaces connected by scattered, fishbone-shaped walking paths. These spaces integrate the entire neighborhood and provide a space for residents to interact and get to know each other (Fig. 5-3).



Fig. 5-3 Axonometric view

5.2 Transport Justice

5.2.1 Connect the surrounding communities

Good accessibility, with an emphasis on walking, bicycling, and using public transportation, coupled with a variety of amenities, is a prerequisite for the success of the community. Therefore, in the urban scale, the Racecourse is planned with two roads connecting north and south to relieve the traffic pressure on the main urban roads during peak hours. In order to connect the communities on the east and west sides and allow residents to enjoy each other's facilities, three access roads are also planned for east-west passage (Fig. 5-4). Solve the issues of blockage of urban space and poor traffic caused by the presence of the Racecourse. The accessibility of Pearl

River Park on the west side of the site will be enhanced to allow residents of the east side of the community to reach Pearl River Park more easily and equitable access to public resources (Fig. 5-5).

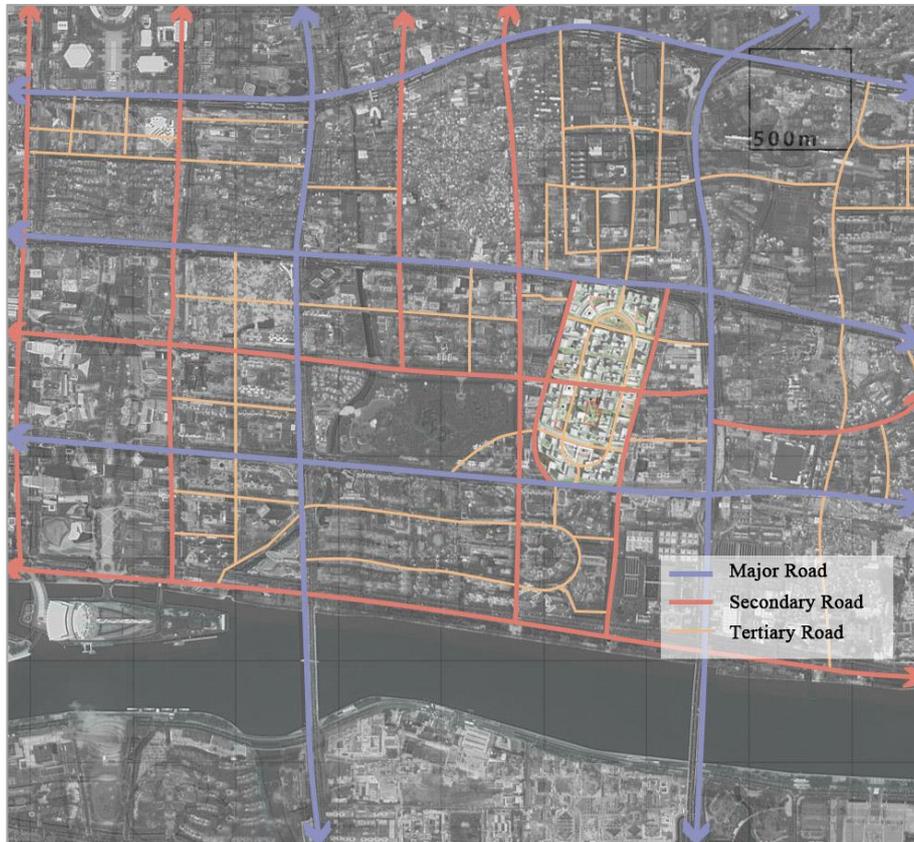


Fig. 5-4 Transportation System



Fig. 5-5 Connection with neighborhoods

5.2.2 Prioritize Non-motorized Traffic

Residents are encouraged to walk, cycle, and take transportation inside the racecourse, and the right-of-way allocation is optimized by limiting speed and flow, enabling a chronic-first traffic strategy. Through specific measures, the main public areas of the Racecourse will be car-free and green, ideal for walking, bicycling and activity, and especially friendly to people with limited mobility, such as the elderly and stroller pushers.

The Racecourse's Transport Justice Strategy will achieve the following goals:

Enhancing good accessibility to life, work and facilities.

Optimizing right-of-way allocation to ensure the dominant role of slow-moving traffic, contributing to vitality and safety on the streets.

Limiting unnecessary car use, saving space in parking facilities and ensuring quality urban space quality.

Reducing car traffic in the Racecourse can be achieved through specific measures:

Efficient Non-motorized Traffic planning

The road classes within the site are subdivided to clarify the limits of traffic flow and speed. The streets are also classified according to spatial atmosphere and architectural functions to create comprehensive streets, living streets, commercial streets and landscaped recreational streets. By combining the two, a road network skeleton based on pedestrian activity and behavior needs could be constructed. The dense road network can realize efficient non-motorized traffic and barrier-free living circle, and improve the convenience and safety of residents' life (Fig. 5-6).



Fig. 5-6 Road network

The pedestrian and bicycle routes in the Racecourse form an complicated network with grid widths of 50m and 200m, which means that residents can walk no more than 50 meters from any building to the main road (Fig. 5-7). The maximum bicycle grid width within the Racecourse is less than 200 meters at any one location, which provides pedestrians and cyclists with the opportunity to choose different routes depending on time and demand (Fig. 5-8). The Racecourse's finely meshed slow traffic plan establishes direct, short-distance connections that will serve as the foundation in the Racecourse's transportation network.

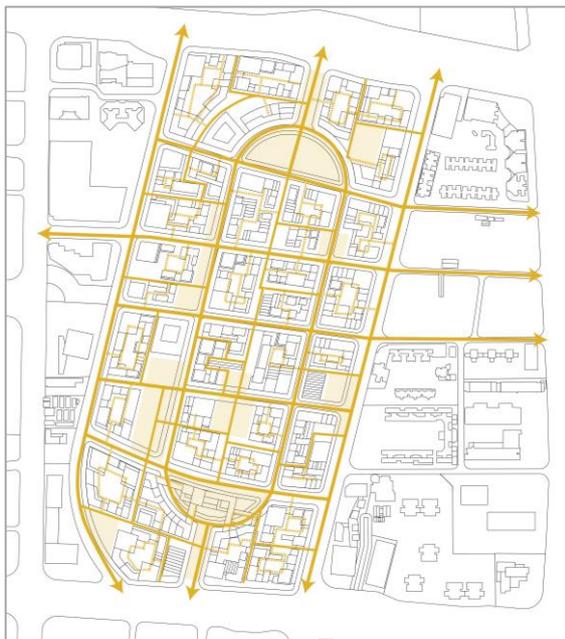


Fig. 5-7 Traffic Analysis -Pedestrian

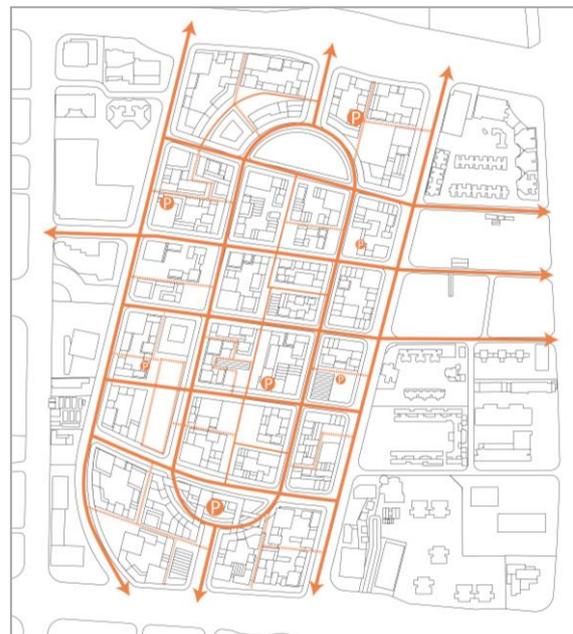


Fig. 5-8 Traffic Analysis -Cyclist

Full-coverage public transportation system: The area around the Racecourse already has convenient public transportation resources. The nearby public transportation stations are all within a walking distance of 450 to 500 meters, and the site itself contains the metro transportation hubs to the north and south. The loop inside the Racecourse could be used in the future as a rail line for the community, with a loop length of 2,000m to provide internal access to the community (Fig. 5-9). Residents are encouraged to use public transit because the site has a good public transportation system both inside and outside.

Limiting speed and traffic flow: The traffic plan for the Racecourse only limits unnecessary automobile use. In addition to the original roads on the east and west sides of the site, two north-south roads are planned internally to relieve the traffic pressure in the city center. These roads are essential for ensuring the use of necessary cars, such as emergency services like fire trucks and ambulances, as well as relocation and logistics use. However, both roads are set up as one-way streets, as well as to limit the speed and flow of traffic within the site by contracting the intersection. Additionally, three east-west roads, at the south, north, and middle ensure that residents on the east and west sides of the Racecourse may use each other's facilities, and also improve the accessibility of the Pearl River Park on the west side (Fig. 5-10).

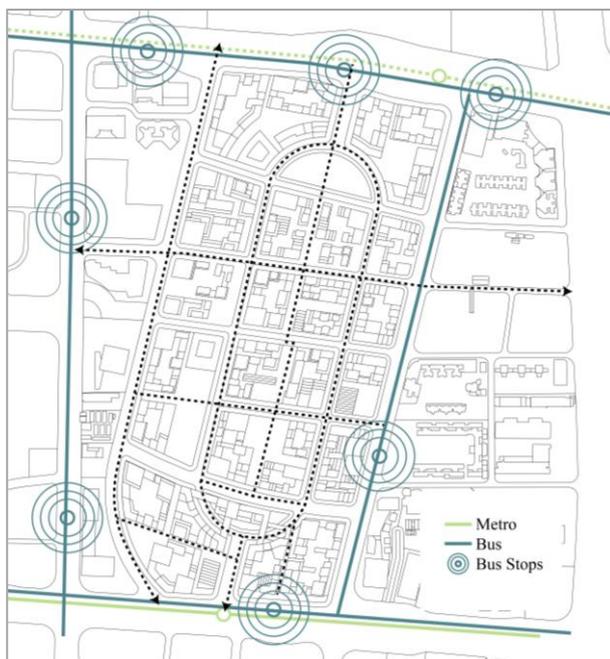


Fig. 5-9 Traffic analysis - Public transport

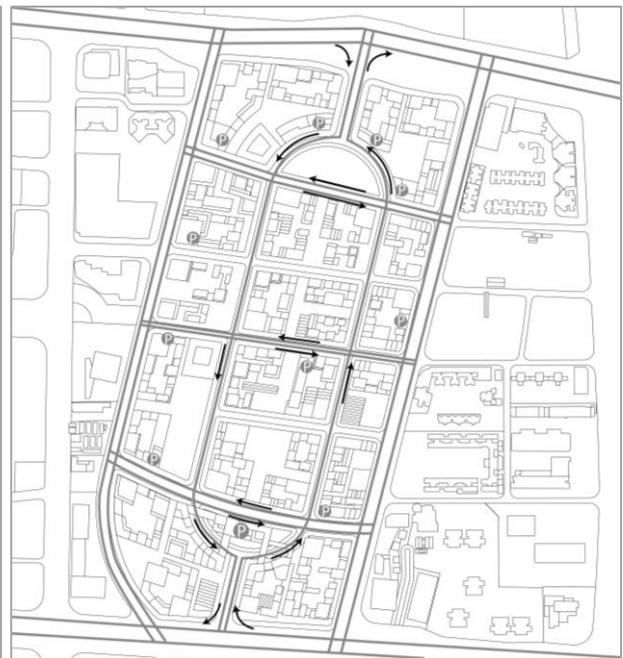


Fig. 5-10 Traffic Analysis – Car

Adequate parking facilities: There are always plenty of bicycle parking facilities, good walking and bicycle paths, and public transportation stops within walking distance on the ground floor of the Racecourse buildings (Fig. 5-11). For the convenience of bicycle travel, the bicycle shed is located on the ground as much as possible, so that each building block can meet the needs of the internal residents for bicycle parking. People who need a bike for short-term use can use shared bikes that can be parked in public areas and in parking spaces scattered throughout the community. Well-established facilities make walking and cycling more attractive and people no longer need to use a car. And for necessary car parking needs, such as visitors, parking will be in underground garages. At present, the parking standard in Guangzhou is 1.0 to 1.2 parking spaces per 100m², and the measures to reduce the traffic flow of the racecourse can be expected to reduce the parking demand by 30%^[108]. Therefore, while ensuring that 0.7 private parking spaces are provided per 100 m², 0.3 parking spaces will be provided for the disabled, women and visitors in need.

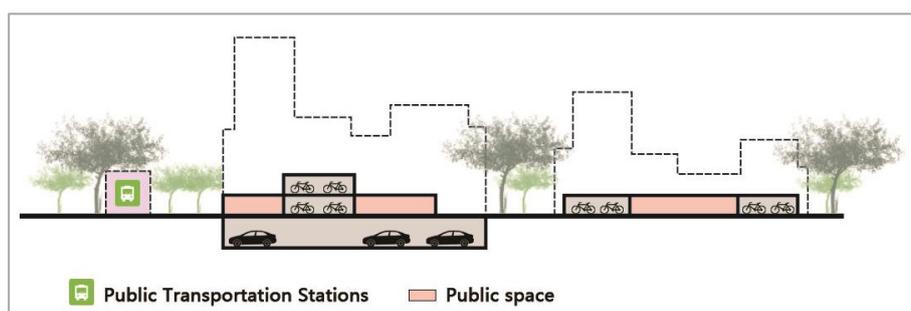


Fig. 5-11 Car and bicycle parking

5.2.3 Optimize Right-of-Way Allocation

An important part of the traffic justice strategy to ensure the dominant role of slow-moving traffic is the optimization of spatial right-of-way allocation. Based on crowd demand-oriented right-of-way optimization, a more human-centered street space is designed. There are three main road widths in the Racecourse: a 24m wide two-way single lane, a 10m wide one-way lane, and a 10m wide car-free road for pedestrians and bicycles only.

In the 24m wide road, a total of 7m wide car lanes is set in the middle of the road, separated from the bicycle lane by a 1m to 1.5m green belt. The width of the bicycle lane is 3m, the width of the sidewalk is 2.5m, and a 1.5m to 2m facility belt and green

belt are set in the middle, so that pedestrians could walk on the street under the shade of trees and improve the walking comfort. At the same time, bicycle parking spaces are provided in the facility zone. Next to the pedestrian path is the building setback distance of 10 meters, which will be combined with rest facilities and retail space to increase the interesting experience of walking (Fig. 5-12). After the optimization of the right-of-way allocation, the motor vehicle space accounts for 30% of the total width of the road, the pedestrian space, non-motorized space and non-motorized parking space accounts for 55% of the total width of the road, and the remaining 15% is the space of the green belt and road facilities. Compared to the current situation, the designed right-of-way allocation gives more space for slow-moving traffic after ensuring the necessary space for automobile traffic, providing a safe, relaxed and comfortable street space for pedestrians, cyclists and people with travel difficulties (Fig. 5-13).

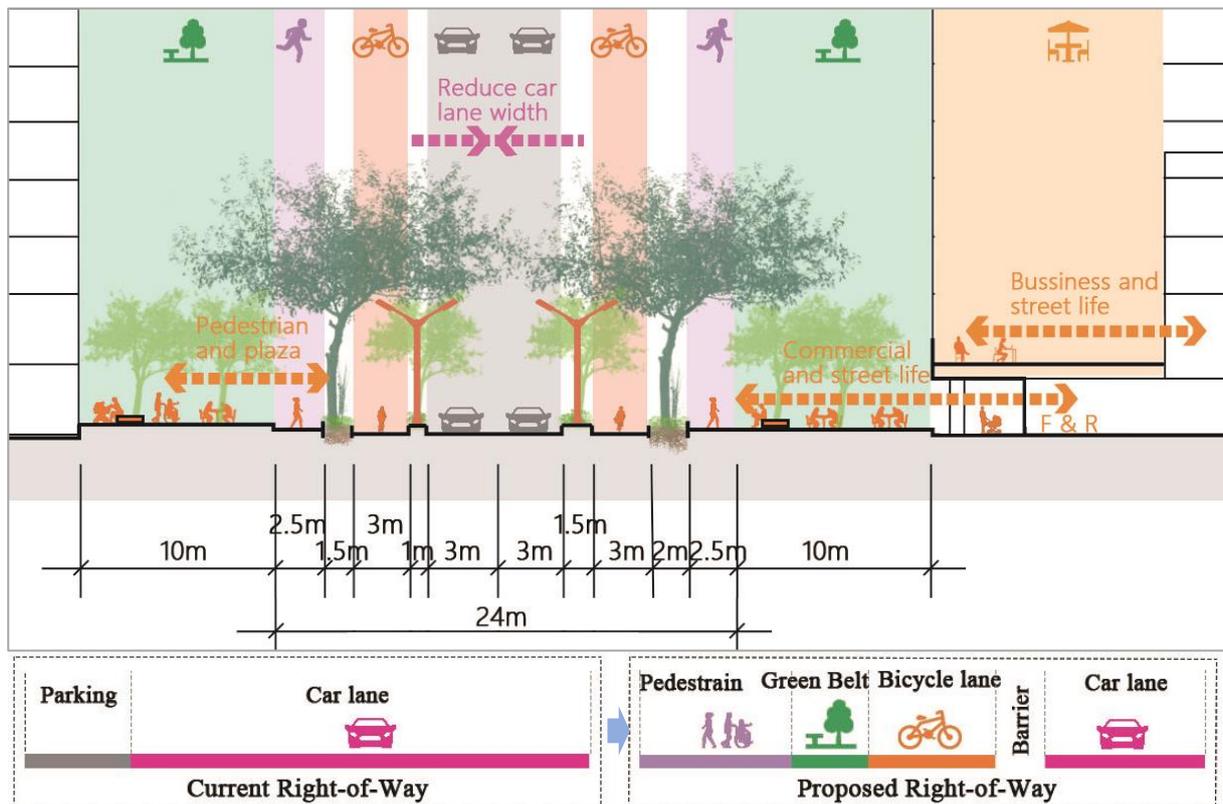


Fig. 5-12 24m wide road

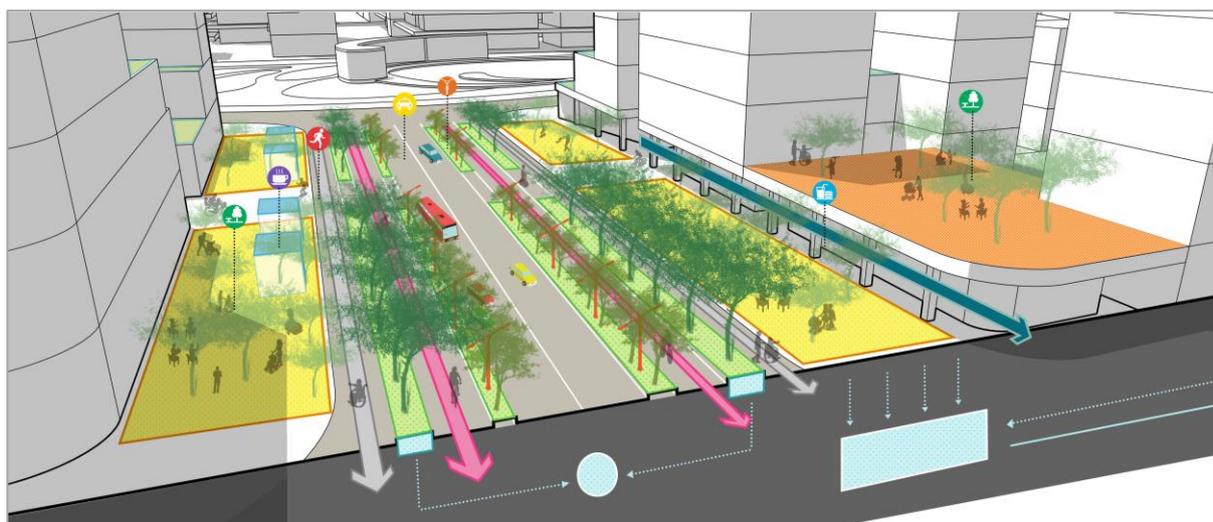


Fig. 5-13 Road section

As for the 10m wide one-way road, due to the low road grade, the width of the car lanes could be reduced to increase the space for slow traffic. A 3m wide car lane is recommended. The car lane is flanked by a 1.5m bicycle lane, which ensures a more comfortable space for cyclists. The edges of the road are flanked by 2m wide pedestrian paths with street trees arranged in the building setback space to provide shade for pedestrians and cyclists. Non-motorized parking spaces are also included in conjunction with the street trees (Fig. 5-14). In a one-way roadway, motorized travel space accounts for 30% of the roadway space, non-motorized vehicles own 30% of the space, and pedestrian space accounts for 40% of the total width of the roadway. Within the Racecourse regardless of road class or road width, motor vehicle space basically accounts for 30% of road space, and pedestrians and non-motorized vehicles have more street space, ensuring the right of way for them who are themselves in a vulnerable position to achieve traffic justice.

For the car-free road, a 1.5m wide bicycle lane and a 2.5m wide pedestrian lane are provided, with a 1m wide green belt between the pedestrian lane and the bicycle lane (Fig. 5-15). Pedestrians can walk safely and easily on the street without considering the impact of cars and could have a variety of activities and communication in the street.

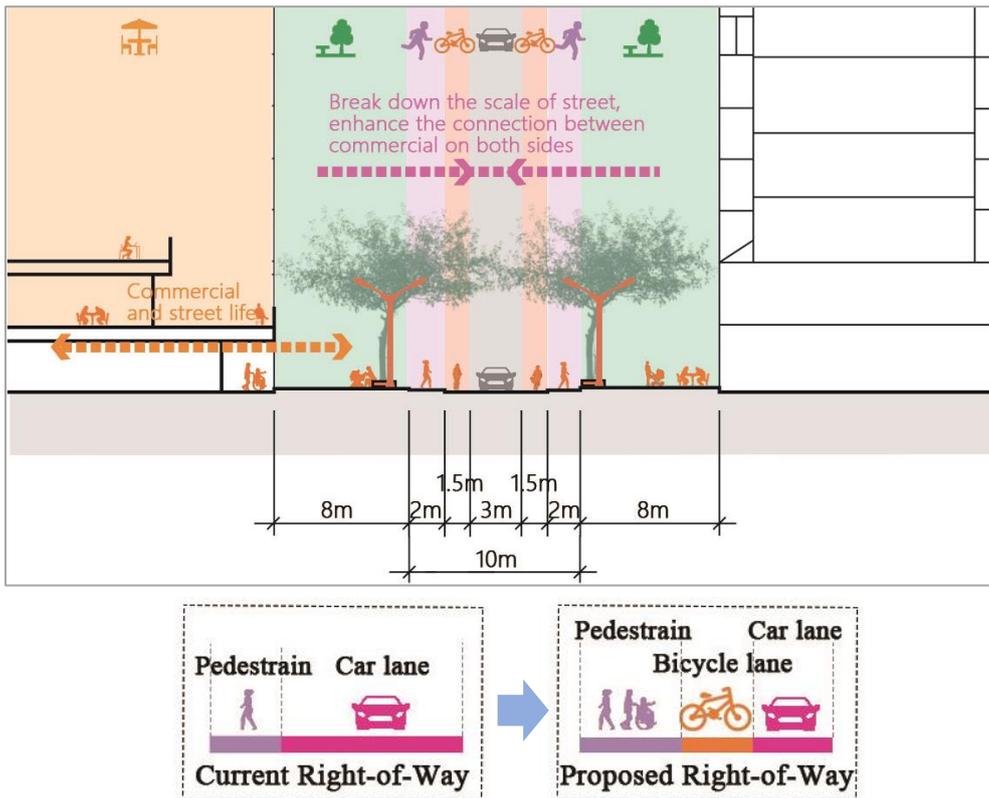


Fig. 5-14 10m wide one-way car road

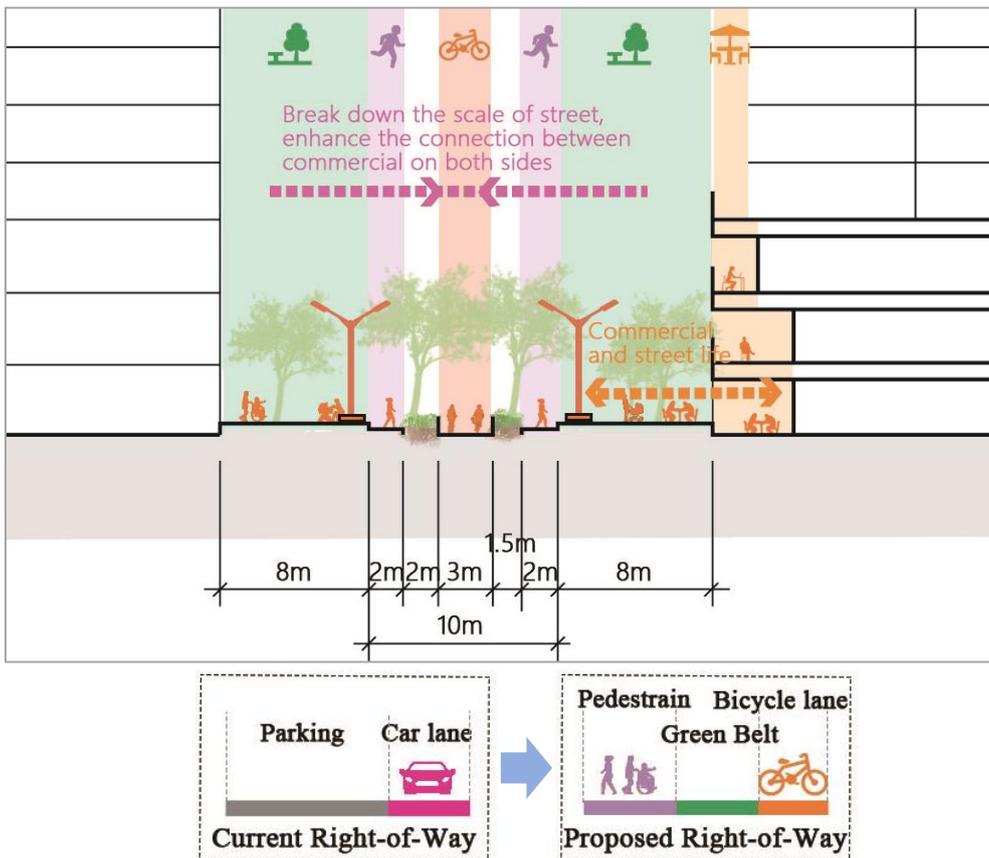


Fig. 5-15 10m wide car-free road

5.3 Housing Justice

The Racecourse mixed residential community, a community for all, is hoped to promote just urban living. The core value of a mixed community is the encounter and inclusion of a wide variety of people. It is a community where diversity and inclusion are vital, with a wide range of target groups include young students or recent job graduates, seniors, low-income foreign residents, and middle-income families. They have the facilities available to them and to develop their own work, enough space to meet others and affordable rent.

5.3.1 Integrate with the urban fabric

In the previous analysis of the neighborhood scale of Zhujiang New Town, we found that the neighborhood scale of the west district is between 150 and 300m, among which the scale of residential neighborhood is about 150m to 200m. The neighborhood scale of the East District is basically between 200m and 300m, and the overall neighborhood scale of Zhujiang New Town gradually increases from the West District to the East District. According to the research on the scale of the current CBD sites in China, it is found that the scale of neighborhoods between 100 and 200m is more comfortable for pedestrians in residential areas. It is easier to establish open and humanized neighborhoods with a neighborhood layout within this value. Therefore, the block layout of the Racecourse is divided according to 100m to 200m, with 15 blocks, and the plot sizes ranging from 0.8 and 3.6ha. The scale of the outer plots is between 150 and 200m, and the scale of the inner community is around 100m (Fig. 5-16). This allows for a better integration with the existing urban fabric and is more suitable for creating human-scale neighborhoods, providing more vibrant street interfaces and public spaces (Fig. 5-17). Such small-scale neighborhoods can meet the dense slow road network arrangement and have good accessibility. Additionally, it may provide more street interfaces, which, combined with the open ground floor of the building or commercial buildings along the street, can enhance the vitality of the street. Communication between inside and outside the neighborhood is easier. This pattern is more conducive to the formation of well-connected, vibrant mixed neighborhoods.

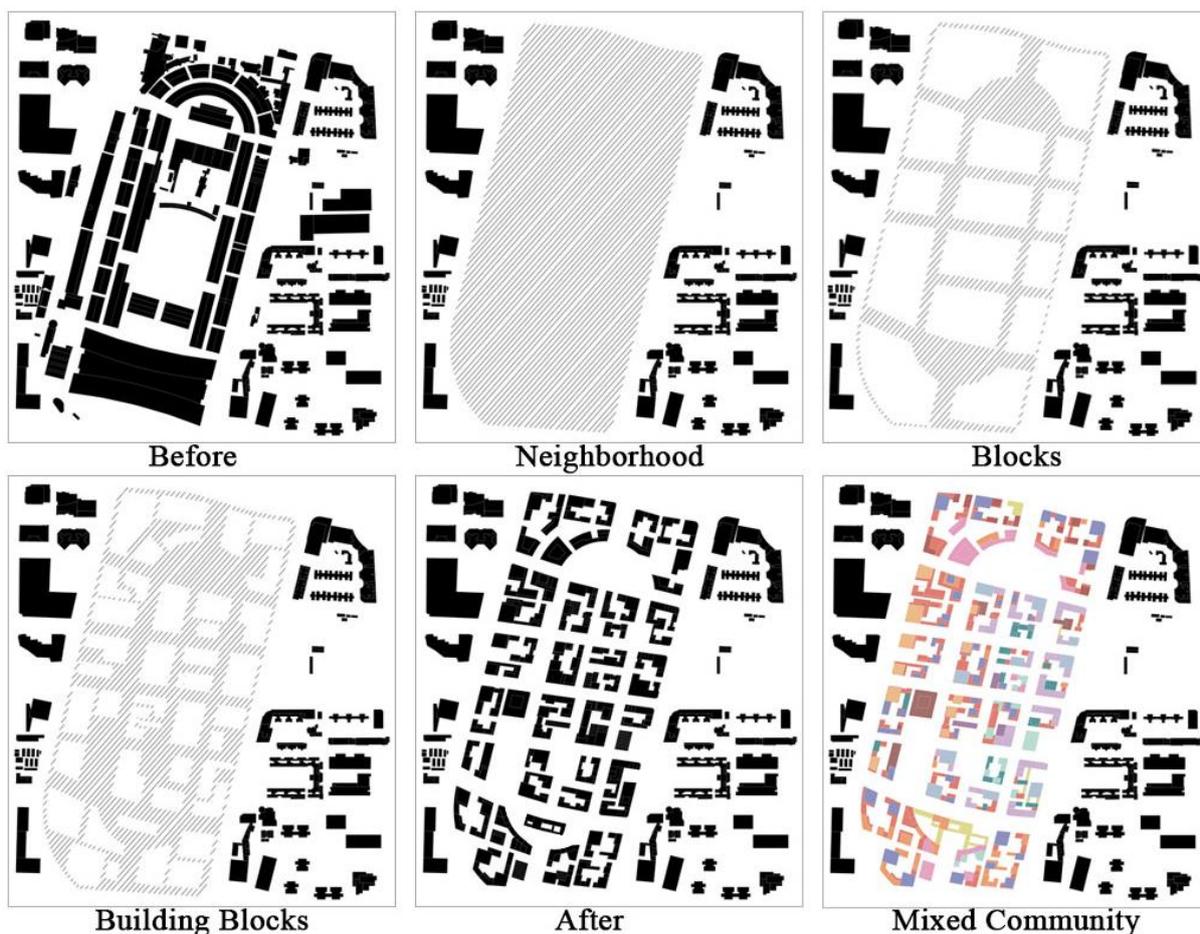


Fig. 5-16 Neighborhood texture evolution



Fig. 5-17 Contrast of texture in Zhujiang New Town

5.3.2 Create a mixed community

The Racecourse Housing Justice Strategy helps to achieve the following goals:

Providing different types of housing to accommodate the housing needs of various groups of people.

Creating all-age communities that integrate different residents.

Allowing all people to meet and be included in the living space.

The Racecourse will be a mixed-use community for all. The site provides about 390,000 m² of living area. According to the relevant regulations of Guangzhou City, the average residential floor area per capita for ordinary housing is 31 m², with an average household size of 3.2 persons. For social housing, the residential floor area per capita is 25 m², and the average household size is 2.4 persons^[109]. Based on this standard, the Racecourse can accommodate approximately 15,000 residents and many more people who work, play and enjoy the facilities and culture there (Fig. 5-18). The Racecourse will appeal to target groups such as seniors, low-income families and young students by providing differentiated services to people of different jobs, backgrounds and incomes. The Racecourse can provide about 1,700 social housing units, and low-income families and youth can live in social housing supported by government policies and enjoy good service facilities. Whether it is by public transportation or cycling, they can easily reach their workplaces in the city center. In addition, the racecourse provides approximately 1,100 senior apartments and 1,500 youth apartments in the same building block to create a characteristic all-age community, sharing service facilities and public space. Young people can exchange their services for the elderly for their own low rent, such as nursing, cooking, shopping, and companionship work. At the same time the elderly and the young people can get along with each other to relieve the loneliness of the elderly. Of course, the Racecourse will also provide nearly 1,400 apartments for middle-income families to live in.

The floor area ratio of social housing in the site is about 28%, which is 8% higher compared to the policy requirement in Guangzhou. According to the proportion of the residential population around the site, the high demand for rental housing in the vicinity of the CBD and the near-saturation residential status in the existing urban villages are taken into account. In order to meet the housing needs of those who work here and to accommodate the rental affordability of the low-income population in the vicinity, the proportion of social housing has been increased accordingly. The proportion of the elderly among the population living in the site is 18%, which is closer to the current proportion of the elderly in the area, 12.65%^[110]. It also leaves room for future growth in the elderly population and for accommodating the elderly in the neighborhood to come and live here.

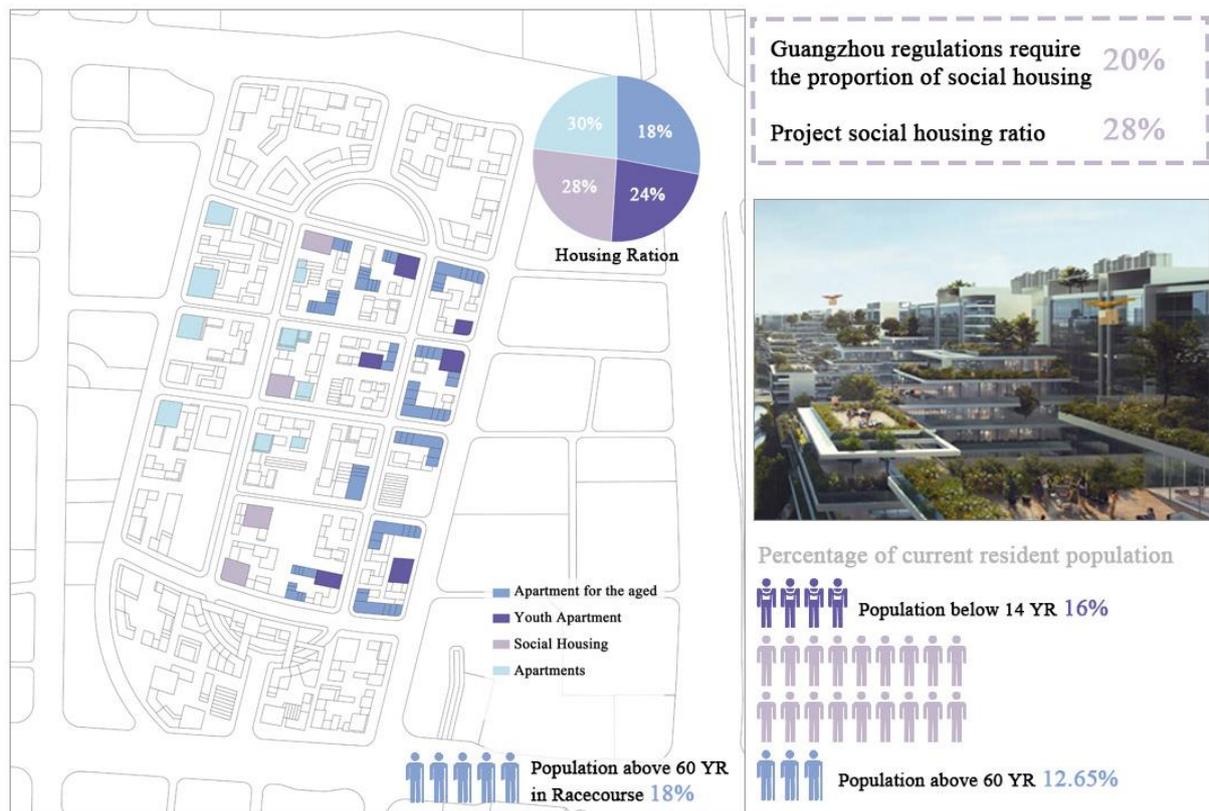


Fig. 5-18 Housing Ration

5.3.3 Design for All-age Community

Within a building block, the youth and senior apartments are set up relatively independently of each other, but are connected to each other. The connection is further strengthened by a connecting corridor. This ensures that both the elderly and the young people have separate, undisturbed private spaces. However, the connected part of the building serves as a shared space where the elderly can move and communicate together, and the youth can meet. In addition, it is also a space for seniors and young people to participate in community activities together.

To meet the different needs of the elderly, in addition to setting up centralized facilities such as nursing centers and activity centers in the community, the ground floor of each building block is fully open, and there are shops, pharmacies and shared shops within walking distance that can be used for daily shopping for the elderly. Facilities (laundry, communal kitchen, restaurant, games room, gym, etc.) and other public facilities in proximity (retail, sports, dining, etc.). The semi-private courtyard enclosed by the building will be the best place for the elderly to rest quietly and interact with the youth.

Different functions will be installed, such as fitness equipment, benches, children's play facilities, etc., to meet the different needs of the residents (Fig. 5-19). The residential area is not only equipped with perfect service facilities to meet the needs of different people, but also by creating diverse courtyard spaces, people with different identities living together can get to know each other and help each other in their daily lives, thus forming a community atmosphere and truly integrating together.



Fig. 5-19 All Age Community

5.4 Public Space Justice

5.4.1 Strengthen the connection with Urban Space

The Racecourse is a part of the city, so it should be closely connected with the city in terms of spatial structure. The current spatial characteristics of the Racecourse are very obvious, but the spatial connection with the surrounding areas is weak. Therefore, create two axes, horizontal and vertical, to strengthen the connection with urban space. On the vertical axis, there should be no buildings or structures that seriously block the view line within the view corridor of the axis to ensure the penetration of the north-south landscape. There are three important public nodes distributed on the vertical axis of the Racecourse. The north and south areas are connected in series through the central axis, which is not blocked by the line of sight and can see the occurrence of different spatial activities. On the horizontal axis, the connection of the space of Zhujiang New Town is continued, with Flower City Square, Pearl River Park and Racecourse forming the connection of public space horizontally, extending eastward toward the residential area. Horizontally, the racecourse is linked with the Pearl River Park on the west side through the market square and the sports park. From west to east, there are green parks, healthy sports, and lively daily life. The different functions are linked together to serve many surrounding residents and meet their daily needs for various spatial activities (Fig. 5-20).



Fig. 5-20 Spatial System

5.4.2 Coverage the Public Space Networks throughout the Community evenly

The racecourse's public space justice strategy hopes to achieve the following goals.

Good accessibility of all public spaces.

Complex use functions to form inclusive public spaces.

Excellent community atmosphere.

In order to avoid injustice caused by the unbalanced layout of public spaces or spaces of different qualities, multi-level and different functional spaces are considered in the spatial structure planning to form a balanced network covering the entire community to ensure maximum accessibility of the space. The comprehensive public spaces of the Racecourse are Lawn Park, Market Square, Sports Park and Station Square, which contain different functions of green space, life, sports and transportation. And the service range of each is no more than 800m away from the Racecourse, so that various people can be served to the maximum extent within this range. These four comprehensive spaces are connected by a pedestrian and leisure corridor in the middle of the Racecourse, allowing residents to experience different spatial experiences through this attractive corridor, and provide various complex walking routes as a connection to the community.

In addition, neighborhood squares are staggered on both sides of the axis between groups. They serve the residents within a radius of 200m, which is a comfortable walking distance for people with limited mobility, such as the elderly. These neighborhood squares are the spaces where residents stay the most in their daily lives, allowing them to exercise, entertain, rest, communicate with surrounding residents, and help form a sense of community. The buildings surrounding the neighborhood squares are enclosed with their own courtyards, which are semi-private spaces where residents can rest and move around quietly under their own homes. The courtyards are scattered around the neighborhood squares, forming a dense network that is the most basic of the spatial structure. Thus, the public spaces in the Racecourse form a three-tiered network that covers the entire community in a balanced way, allowing all residents to reach it easily and quickly by foot and to use it for different activities (Fig. 5-21).

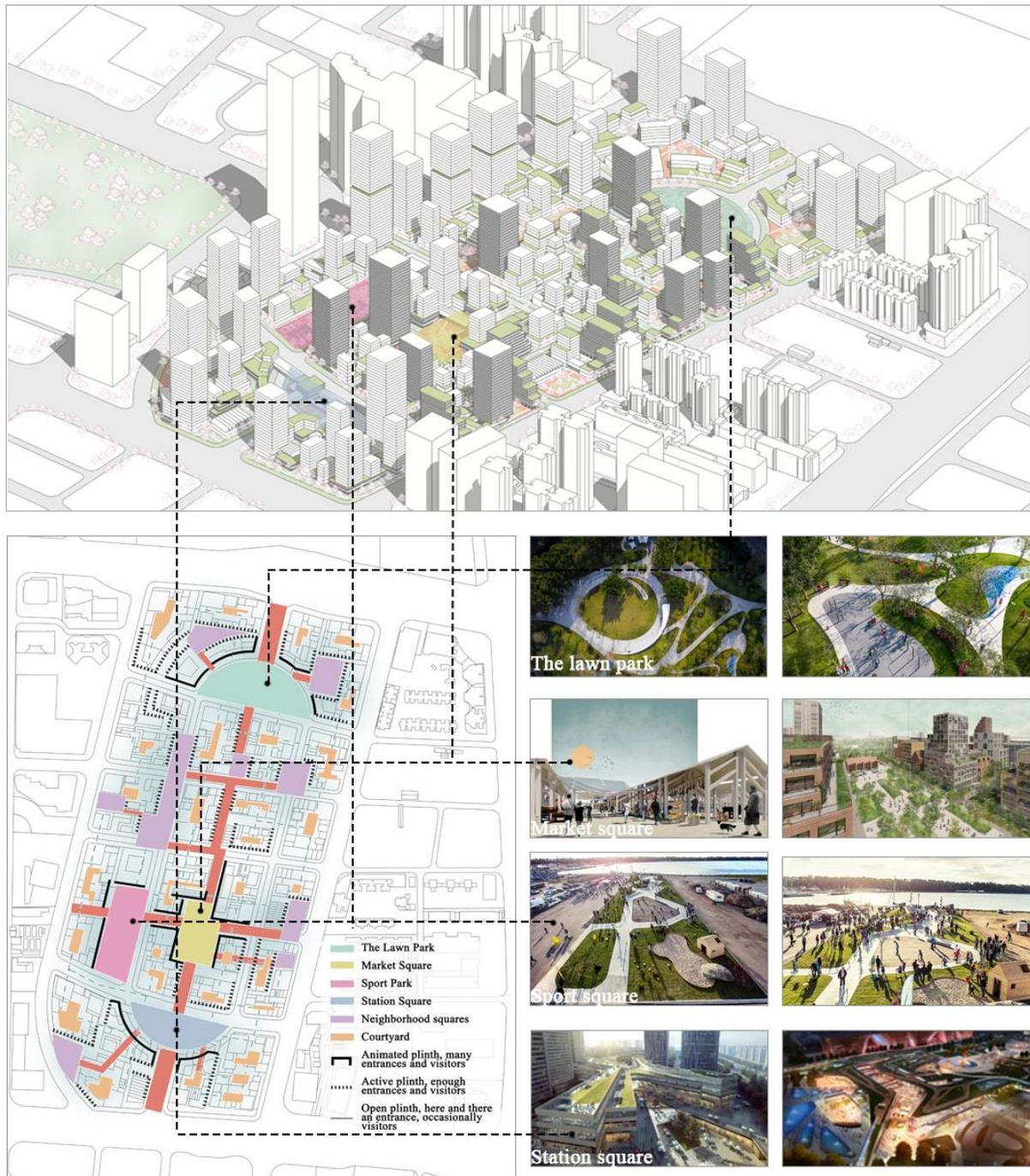


Fig. 5-21 Spatial structure analysis

5.4.3 Apply Public Space Nodes with Complex Functions

The Racecourse provides a variety of public spaces, which can be used at different times, by various groups of people, and with different functions, so that everyone can enjoy fair space rights. For example, the lawn park can be used for resting, camping, picnics, dog walking, strolling, performances and other activities. The market square

hosts markets at fixed times, where residents can not only buy items, but also get to know and learn about other residents. Community events are also held regularly to increase residents' participation and sense of belonging. In the sports park, residents can play different sports, such as basketball, skateboarding, badminton, etc. At the same time, the surrounding benches also provide a space for the elderly or parents to rest and communicate with their children. As the transportation hub of the racecourse, the station square has subway stations and garages underground, and public transportation stations on the ground. Residents can go to further parts of the city through here or change bicycles to pass through the community here. Of course, the station plaza also has shopping malls, cafes, community libraries and other diverse spaces distributed in the above-ground and underground building spaces (Fig. 5-22).

Therefore, everyone at the Racecourse can find a convenient and accessible event space that suits them. The Racecourse will not have single-function or inaccessible public spaces to avoid injustices where spaces cannot be used by certain groups of people.



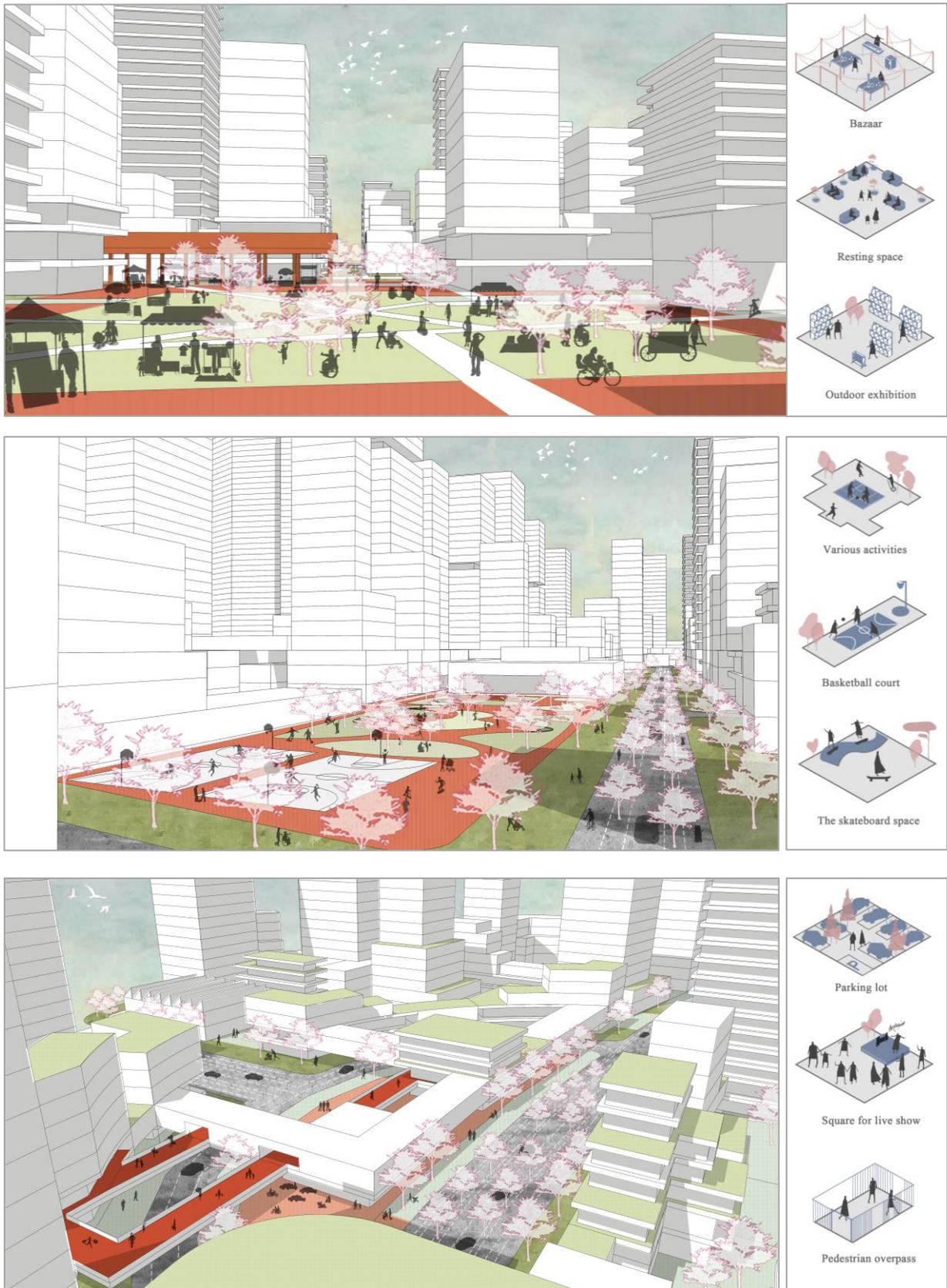


Fig. 5-22 Perspective view of the public space

5.5 Facilities Justice

5.5.1 Fill the lack of facilities in the city

The Racecourse will fill the situation where there are not enough commercial facilities and daily life services within the city limits. The Racecourse has shared facilities that meet the daily needs of residents (laundry room, fruit shop, grocery store, activity room, etc.), as well as facilities that meet the special needs of specific groups of people, such as nursing centers for the elderly and nurseries for children. There are also comprehensive facilities (gymnasiums, theaters, cultural centers, etc.) that can serve the needs of the surrounding community (Fig. 5-23). The service facilities of the racecourse will fill the gap of the surrounding community facilities and maintain the justice of urban life.

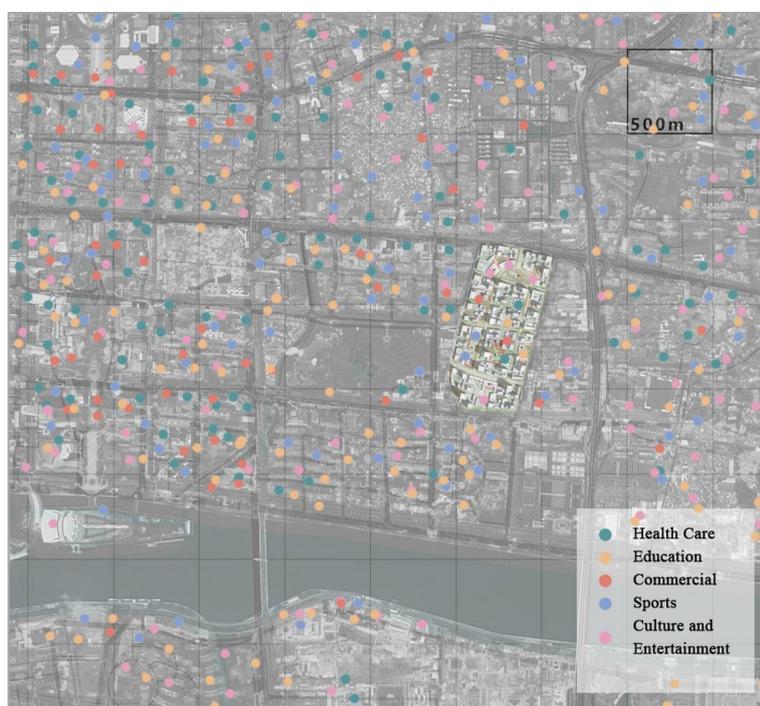


Fig. 5-23 Service Area Diagram

5.5.2 Create A Balanced Layout of Facilities

Facility justice strategies for the Racecourse hopes to achieve the following goals:

Self-sufficient residents within the community

Strong social community

Accessible facilities for everyone

The right to a healthy city life.

The total above-ground area of the Racecourse is approximately 70,000 m². In addition to 6,000 suites, approximately 15% of the floor space is dedicated to service facilities. The total area of the facilities will be no less than the basic level of 90,000m². The layout of the service facilities is arranged with different levels of intensity according to the frequency of crowd activity, which means the density of facilities is increased accordingly in the areas where the crowd is most dense (Fig. 5-24). According to Guangzhou city regulations, by 2022, new urban areas and new residential areas will be supported by the construction of elderly service facilities at a standard of not less than 25 m² of floor space per 100 households. This standard should be appropriately increased in communities with a high proportion of elderly people. Because the proportion of the elderly population in the site's residential population is 18%, the elderly service facilities also appropriately raise the standard, and the current standard for the area of elderly service facilities in the site is about 30 m² per 100 households of construction area. It can better meet the needs of the future growth of the elderly population as well as accommodate the neighboring elderly people to live here.



Fig. 5-24 Facilities layout

The layout of the facilities will emphasize three areas, namely three high-traffic public spaces on the axis, where there is a high concentration of urban functions and facilities. The building complex in the north of the racecourse is mainly a creative space, where young students who are engaged in Internet, high-tech and creative work, as well as

some small businesses that are incubating, work here. This area is equipped with creative activity facilities and cultural facilities, which can provide cultural entertainment and inspirational spaces for office workers and residents. At the same time, by temporarily providing space for some valuable but financially weak special groups in these buildings with creative activities at lower rents. In addition, the creative event space here will have additional functions, such as research and education centers, catering, supermarkets, etc., to enhance the functionality of the area.

The market square at the center of the racecourse is also another key area, a meeting point of horizontal and vertical connections. Green pedestrian corridors and neighborhood squares, where large-scale daily neighborhood events can take place, stimulate social interaction among residents and provide important places to get to know each other and foster community unity. Therefore, the facilities around the market square have more commercial and service functions and meet most of the residents' daily needs, such as hotels, supermarkets, retail, restaurants, kindergartens, health centers, gyms, children's playgrounds, and more.

Station plaza is the third important area of the Racecourse. As the most concentrated transportation hub in the venue, it undertakes transportation functions such as subway and public transportation stations, private car parking, bicycle transfer and so on. Therefore, it is also a place with dense traffic, combining above-ground and underground spaces to arrange commercial, cultural and service functions, such as restaurants, supermarkets, creative bookstores, etc.

There are also some small-scale and frequently used facilities, such as neighborhood facilities and restaurants, laundry, delivery lockers and other convenience facilities, and daily grocery facilities scattered in the ground floor of the residence (Fig. 5-25).

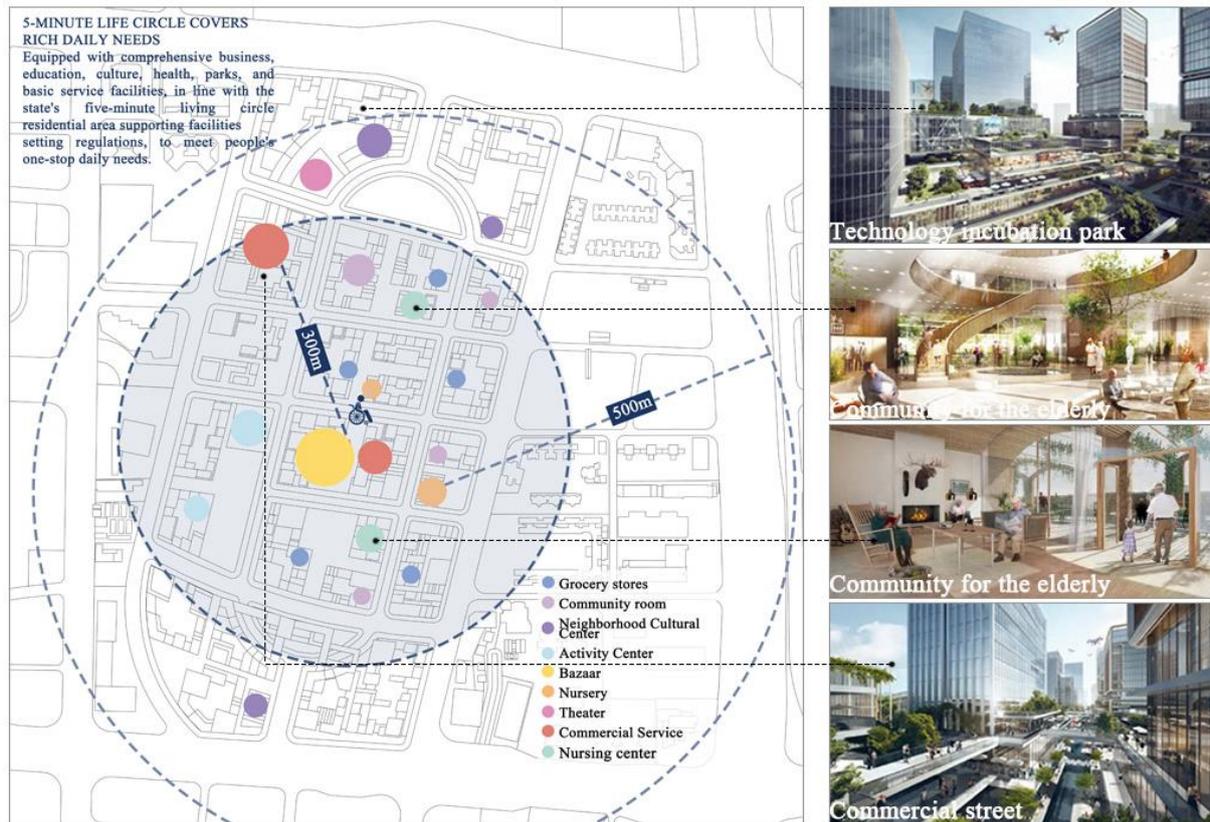


Fig. 5-25 5-minute life circle

5.5.3 Increase Facilities for The Disadvantaged

The Racecourse is designed to allow residents of all ages to enjoy a healthy life at here through well-designed accessible facilities, building an inclusive, safe, caring and livable environment. Accessible mobility will be the foundation of healthy living. The design focuses on the smooth connection and switching between various travel scenarios to ensure that people with various disabilities can travel safely and conveniently to create barrier-free waiting, riding, passing and other travel scenarios. Also take static stabilization measures to reduce the speed of motor vehicles, set up speed reduction painting in the pedestrian and non-motorized crossings to remind motor vehicles to slow down. And through the intersection contraction, the speed of vehicles is limited to reduce the pedestrian crossing distance. It makes the street scale more humane. Turning radius of the intersection is reduced to shorten the distance and time for pedestrians to cross the street. Reduce the turning speed of vehicles. Increase the efficiency of the site. Raise intersections to increase walking continuity and comfort. More rational arrangement of accessibility facilities (Fig. 5-26).

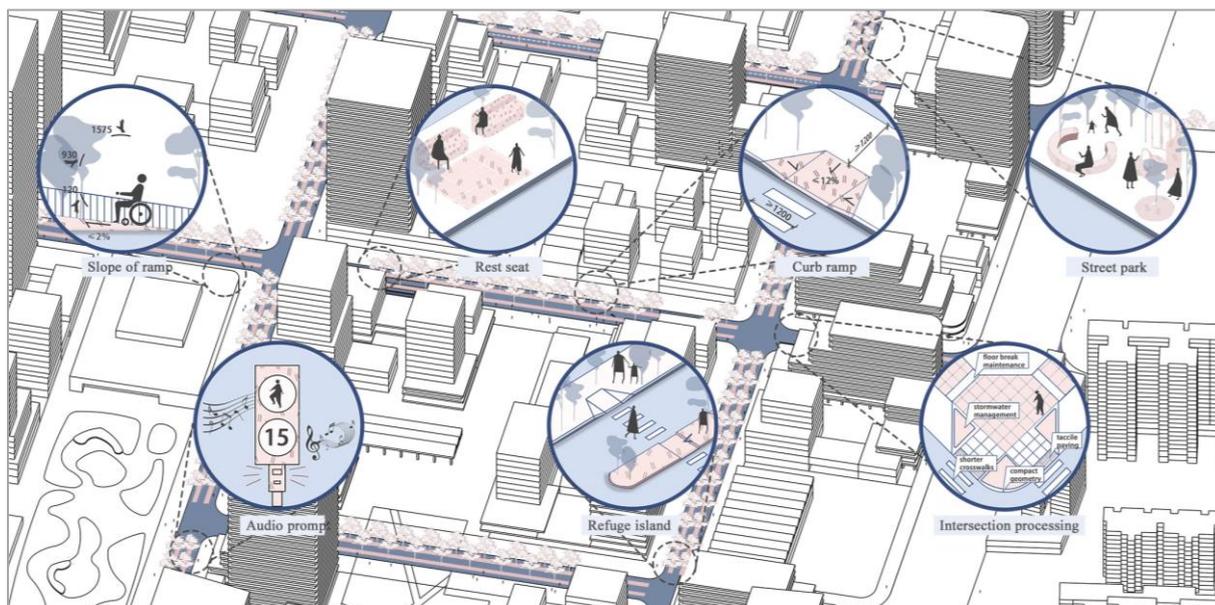


Fig. 5-26 Barrier-free facilities

The disadvantaged should enjoy the right to participate in social life and work in a free, equal and dignified manner, and to create their own value. Targeted barrier-free design should be improved in architectural spaces and public spaces, such as recreational spaces for children, parks and care centers for the elderly, etc. In important public buildings, such as station plazas, we should improve the design of vertical transportation and barrier-free parking spaces to meet the needs of people with disabilities (Fig. 5-27).

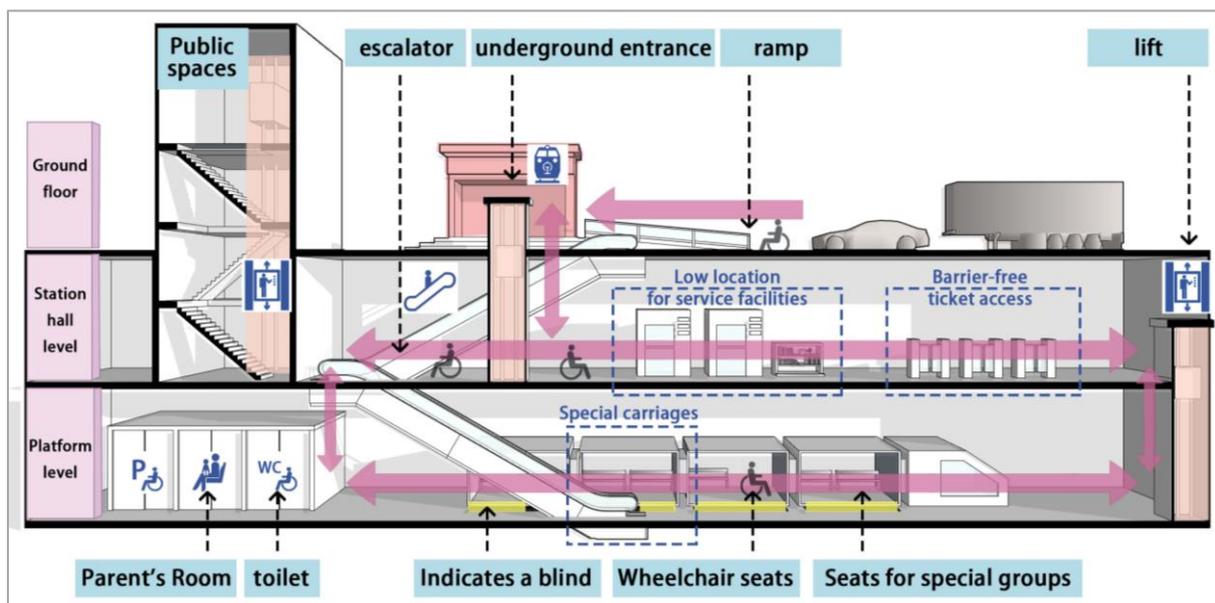


Fig. 5-27 Diagram of facility nodes

5.6 Summary

This chapter provides a concrete demonstration of the regeneration strategy for the Racecourse. The solution specifies the general framework of the Racecourse with the values of accessibility, inclusion, community, and diversity. The thesis discusses four themes: transportation, housing, public space, and service facilities, and considers how to improve the spatial justice of the racecourse and the spatial justice of the surrounding city at three scales: the urban area, the overall community of the racecourse, and the local details.

The first theme is transport justice. At the city level, the road optimization of the Racecourse will relieve the traffic pressure on the surrounding urban roads and use the traffic planning to connect the residents of the surrounding communities, allowing them to share public space and facilities. The interior of the Racecourse is dominated by non-motorized traffic, guaranteeing the right of way for pedestrians, restricting the use of unnecessary cars, and providing residents with a safe, relaxed and comfortable street space. The detailed design is mainly about the transformation of the street space, such as changing the two-way street to one-way street to restrict traffic flow, reducing the width of the lane, increasing the space for pedestrians, and increasing the building connections on both sides of the road.

The second theme is residential justice. At the urban level, the design of open neighborhoods at a human scale, through appropriate neighborhood distances, will meet the arrangement of slow traffic and enhance the vitality of the street interface. The Racecourse will provide a percentage of government-supported housing for those with housing needs in the city center, attempting to alleviate the enormous housing pressure in the area. It will be a community where all people can meet and be included, including low-income families, seniors, young students, and middle- and upper-income people. Not only is the residential area well-equipped with services to meet the needs of various people, but by creating diverse courtyard spaces, people with different identities living together can get to know each other and help each other in their daily lives, thus creating a community atmosphere and truly integrating together.

The third theme is public space justice. At the urban level, the spatial structure of the Racecourse has two axes. The longitudinal axis connects Jinan University to the north, the Pearl River to the south, and Riverside Park through three different types of public space nodes on the leisure corridor. It extends horizontally from Flower City Square, Pearl River Park to the market square in the Racecourse to the residential area on the east side, forming a service connection for many communities. In the Racecourse, the public space forms a three-level spatial network covering the entire community, allowing residents to reach different types of public spaces within walking distance to meet various needs of daily life. Specifically, at different space nodes, at different times, different groups of people can enjoy fair space rights, whether it is camping on the lawn, picnicking, or participating in community activities in the square, or fitness, sports, etc. on the sports ground.

The final theme is facility justice. At the city level, the Racecourse will fill the shortage of commercial, cultural and recreational facilities in the surrounding communities. At the Racecourse, everyone can meet the needs of daily life within walking distance, especially the needs of the elderly for care and activities. The Racecourse has set up service facilities of different levels and intensities according to the activity frequency of different groups of people, and arranges corresponding facility clusters in combination with the functions of the building space to ensure that everyone enjoys the right to a healthy urban life. The barrier-free traffic of the racecourse is realized through specific barrier-free design, including strategies such as creating barrier-free travel, improving vertical traffic, and increasing barrier-free parking spaces.

Chapter6 Discussion and Conclusion

6.1 Conclusion

With the rapid development of urbanization in China, and has achieved certain results. Nowadays, Chinese cities are facing many new challenges, including gentrification, imbalanced supply of public resources, obvious gap between rich and poor, and other social stratification phenomena. Therefore, it is very necessary to guarantee spatial justice in urban construction and to realize equal urban rights for all.

This paper is organized according to the logic of "basic research-theoretical research-framework construction-instance verification". Through the study of relevant literature and excellent cases at home and abroad on how to improve spatial justice in urban regeneration, the paper analyzes the phenomenon of spatial injustice in cities, identifies the core values of spatial justice, constructs an overall framework for improving spatial justice and proposes a solution strategy. The research results are also applied to the urban regeneration design of Guangzhou Racecourse. The following four factors are suggested as part of the specific solutions to improve spatial justice, which could address the existing injustice issues on the racecourse:

Transport Justice

The fundamental prerequisites for achieving spatial justice are ensuring good accessibility to all spaces and ensuring equitable access for all persons to all areas, including the following three aspects.

Optimize right-of-way allocation and protect pedestrian rights. Increase the space for pedestrian activities by reducing the width of lanes and increasing the proportion of space for facilities such as bicycle parking and rest seats. Ensure that road resources are allocated to meet the needs of the elderly and other people who have difficulty getting around, and create safe and comfortable street spaces.

Limit vehicle speed to ensure pedestrian safety. Adopt measures such as changing two-way lanes to single lanes and constricting intersections to limit traffic speed, reduce traffic flow, and protect pedestrian safety.

Encourage non-motorized traffic and reduce unnecessary car use. Encourage all

residents to walk, bike, and take public transportation to travel to work and live, by optimizing the roadway walking system, increasing the number of bicycle parking spaces available, and improving the public transportation network.

Housing Justice

Spatial justice can be narrowly understood as overcoming spatial discrimination in the residential sphere. Ensuring residential justice is the key to forming harmonious communities, and spatial justice strategies include the following two aspects.

Creating diverse and mixed residential communities. Focus on the living environment of the disadvantaged. A certain percentage of policy-supported social housing is provided for low-income families in the community, and all-age communities are created where youth apartments are mixed with senior apartments and share service facilities and public spaces. There are also some apartments for middle-income families.

Design of public space in all-age communities. The public space will be the most important space in the mixed community because it will be a place for residents with various identities to interact and get to know each other. The ground floor of the building is accessible to the elderly, giving them access to stores for daily shopping, pharmacies, and shared services (laundry, gym, common kitchen, etc.). The semi-private courtyard enclosed by the building will serve as a quiet resting place for the elderly and a playground for kids or young people.

Public Space Justice

Public space is an important spatial component of the city, where people's lives, activities and interactions will take place. Therefore, it is very important to ensure equitable rights to public space for all, as reflected in the following three aspects.

Create a multi-level spatial network for good accessibility that is laid out in accordance with different functions and service scopes to achieve a balanced coverage of the entire community in the public space network. Make sure that services are accessible within walking distance for the elderly and other people who have difficulty in getting around in various public spaces.

Provide composite and diversified spaces. Adapt to the needs of various people, times and functional needs for public space. Achieve flexible use of space and maximize the use of space.

Facilities Justice

Service facilities are the basis for supporting the urban life of residents. The justice of service facilities can maintain the equal rights of residents to have a healthy urban life. Balanced layout for service facility accessibility. Layout of service facilities in the community according to the 5-minute living circle to ensure that the distance and time for residents to reach the facilities are relatively optimal.

A multi-functional facility system. With comprehensive service facilities as the center, large facilities such as education, medical, cultural and sports as the second tier, and small living service facilities such as grocery stores are densely arranged around the residence. A complete network of service facilities is formed to realize that residents can be self-sufficient in their daily lives in the community.

Create barrier-free facilities. We will create a smooth transition of barrier-free travel scenarios through specific measures such as barrier-free public transportation and barrier-free waiting areas. Including the improvement of vertical transportation, and other specific barrier-free design measures for the building space.

6.2 Research gaps and suggestions for further research

The study of spatial justice involves a multidisciplinary intersection with a complex and challenging range of value structures and theoretical studies. This paper throws light on the future research and practice of planning cities with spatial justice as a values-based approach. There are some shortcomings in this paper as well as elements that can be further studied in the future.

Methodology: There is a lack of quantitative analysis of spatial justice. Due to limitations in obtaining data on the socioeconomic attributes of the population, no objective quantitative evaluation of spatial justice has been conducted in this paper. In future research, we could rely on big data resources to analyze and evaluate the justice of various spaces in the same city, or the justice evaluation of the same attribute space

in different cities, which can help to compare policies and the impact and effect of planning on spatial justice from a macro perspective more clearly.

Research scale: This paper has tried to study the injustice in cities from city-region-neighborhood scale. However, due to the limited capacity as well as the large volume of research, it does not compare the impact of spatial justice on the spatial planning system in various Chinese cities. This paper only takes Guangzhou Racecourse as an example and propose suggestions to improve spatial justice at meso-scale and micro-scale. In future research, with more openness and improvement of data platform and government information, the research data can be improved to provide suggestions on how to improve spatial justice in China's urban spatial planning system at macro scale.

Framework construction: Spatial justice serves as a value-oriented guide for developing regeneration strategies, and the values it contains are crucial. The list of values proposed in this paper is a summary of the results of the existing related studies, and is not explored in depth due to the limited space. Future research needs to further expand the research content of the value system of spatial justice. We need to build a value system from different perspectives and scales to meet the needs of Chinese cities and citizens.

The construction of a righteous city is a dynamic process. The realization of urban spatial justice is a process of continuous optimization of justice. Spatial justice is achieved through the joint efforts of various planning methods, governance models, and policy guidance in multiple fields. Its improvement and optimization need to take into account the demands of various social classes and promote the diversification and differentiation of urban resource allocation. Although the value of people has been given increasing consideration in the contemporary urban construction, there are still many issues that need to be resolved. Spatial justice, as an ideal utopia, is neither a starting point nor will it be an end point. More research and practice will be required in the future to continuously converge toward justice.

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攻读博士/硕士学位期间取得的研究成果

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二、与学位内容相关的其它成果（包括专利、著作、获奖项目等）

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