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基于共享概念的创意社区设计策略
——以环五山创新策源区长湴片区为例

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Applying Sharing Strategies in the Creative Community——A Case Study of Changban

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摘　　要

“共享”是新时代的城市发展主题之一。从联合国第三次住房与可持续城镇化大会（人居三大会）提出了“人人共享城”的城市愿景，再到我国提出“共享发展理念”，其都蕴含了“共享” 概念的价值取向。在当今经济发展增速放缓，信息技术创新改变了生活，城市市民对于社群观念回归的热衷，同时可持续与绿色低碳的生活方式推广的背景下，共享概念在这样的社会环境下拥有高度的适应性，能对这些问题提出相应的解决方法。

在广州市，城中村问题是一大普遍存在的挑战，其改造进程严峻且具有重要性和必要性。近日，广州市政府发布《广州市支持统筹做地推进高质量发展工作措施》，推进做地政策，做储结合重启城中村更新，其中以城市重点片区为先行区。本文的研究范围长湴村位于环五山创新策源区，为广州推进做地工作的四大重点片区之一。同时，长湴村周边拥有良好的创意产业基础，在未来发展上，片区将利用政策优势，与创意产业结合发展，以此为契机进行更新。在研究范围内，通过共享概念的设计与更新可以从一种新的视角，更加适配地解决这些社会问题。使用共享概念进行设计，可以结合长湴村的村民住宅与产业集群，使得其有潜力成为创意社区，为探索出共享时代下的新型城市形态做出贡献。

本文立足于对共享概念的相关研究诠释，发现关于共享与共享空间的概念界定较为模糊，特别是在空间学科的研究缺乏整体性，往往都是在对单一空间对象进行研究。因此本文以长湴片区为例提出了以下四个关键问题：

1. 什么是共享？共享概念的内涵和特征有哪些？
2. 什么样的空间可以被共享？
3. 如何设计共享？如何通过设计达成共享目标？
4. 针对广州长湴地区的更新建设，可以导出哪些共享策略？

本文分为两个部分来解决以上问题，其中 1-4 章为针对共享设计的方法论的提出与验证，5-7 章为针对长湴片区的共享方法论应用研究。

首先，本文系统性的总结了共享概念的内涵，并针对共享空间的内涵特质进行诠释及分类。在此基础上，本文提出共享系统的设计方法论，对共享的活动设计、空间的布

局与各个共享空间应如何营造提出策略，以此系统性的串联各个共享空间形成完整的共享系统，从而形成完整的方法论。

最后，为了阐明该方法论的实际应用模式，本文针对长涎片区的更新契机，通过场地研究，运用以上的方法论进行检验，充分挖掘场地共享场景问题与共享潜力，在活动设计、制度设计、规划布局、详细空间设计等方面系统性的以有意识的设计方法营造场地的共享氛围。将共享概念运用在街区级城市设计之中，为今后使用共享概念进行的城市设计提供新方法，新思路。

关键词：共享空间；共享；创意社区

Abstract

"Sharing" is one of the themes of urban development in the new era. From the Third United Nations Conference on Housing and Sustainable Urbanization (Habitat III), which put forward the vision of "We share a vision of cities for all", to the "sharing concept development" proposed by Chinese government, all of them contain the value of "sharing". In the context of today's slowing economic growth, the transformative impact of information technology on daily life, the renewed enthusiasm for community spirit among urban citizens and the promotion of sustainable and green low-carbon lifestyles, the sharing concept has a high degree of adaptability in such a social environment and can propose appropriate solutions to these problems.

In Guangzhou, the issues of urban villages is a major and widespread challenge, and the process of its transformation is serious, important and necessary. Recently, the Guangzhou Government issued the "Guangzhou Municipality Supporting the Work Measures of Promoting High-Quality Development through Integrated Land Making" in order to restart the renewal of urban villages, in which the key areas of the city will be the pilot areas.

The research scope of this thesis, Changban village, locates in the Peri-Wushan innovation area, which is one of the four key areas of scope of land making. In terms of future development, the site will utilize the policy advantage as an opportunity for regeneration by combining development with creative industries.

Within the research scope , the design and renewal through the sharing concept can be more suitable to solve these social problems with a new perspective. It can integrate the villagers' residences in Changban village with the industrial parks, which makes it has the potential to become a creative community, and contributes to the exploration of a new urban form in the era of sharing.

This thesis is based on the interpretation of research related to the sharing concept. It is found that the sharing concept is rather vaguely defined, especially in the space discipline where studies lack systematization and are often conducted on a single spatial object. Therefore, this thesis presents the following four key questions in the context of the case study of Changban Village.

1 What is sharing? What are the Objectives and Characteristics of sharing?
2 What kinds of space can be share? What are the characteristics of sharing space?
3 How to design sharing? How can we get the final goals of sharing though design?
4 In Changban, what are the strategies can be raised up?

This thesis is structured into 2 parts, of which chapters 1-4 are for the proposal and validation of the methodology of sharing design, and chapters 5-7 are for the study of the application of the methodology in Changban.

First, this thesis provides a systematic summary of the connotation of the sharing concept. Interpreting the characteristics of sharing spaces and make a classification. On this basis, the thesis proposes a design methodology for sharing systems, offering strategies for the design of sharing activities, space layout, and the creation of each sharing space, aiming to systematically connect various sharing spaces and establish a comprehensive sharing system. This contributes to the formation of a complete methodology.

Finally, to clarify the mode of practical application of this methodology, this thesis applies the above methodology to the case study of Changban district, fully explores the problem of sharing scenarios and sharing potentials of the site, and systematically creates a sharing atmosphere of the site by conscious design methods including activity design, institutional design, planning layout, and detailed space design. The sharing concept is applied to block-level urban design, providing new methods and ideas for future urban design using the sharing concept, and contributing to the exploration of a new urban form in the era of sharing.

KEY WORDS： Sharing space; Sharing concept; Creative community

Content

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Chapter 1 Introduction

1.1 Context

1.1.1 The rising of sharing

(1). The developed concept of sharing

The report of the 19th CPC National Congress proposed to build a social governance pattern of common construction, governance and benefits; the Opinions of the CPC Central Committee and State Council on Further Strengthening Urban Planning and Construction Management issued in February 2016 mentioned "adhering to the concept of shared development, so that the people will have a greater sense of gain in common construction and benefits"; in October 2016 In October 2016, the United Nations Third United Nations Conference on Housing and Sustainable Urbanization (Habitat III) proposed the urban vision of "We share a vision of cities for all", that is, urban social space is an inclusive space shared by all citizens, the rights and interests of all residents in the present and future generations should be respected, and the quality of the living environment should be guaranteed. In this way, the people will have a greater sense of happiness and satisfaction in the process of building a sharing city. It can be seen that the concept of "shared" development is gradually gaining attention and being applied to the process of economic and social development.

(2). The rising of sharing economy

Since Felson proposed the sharing economy in 1978, the internet technologies have promote sharing economy in recent years. The emergence of sharing platforms such as Airbnb Uber, sharing economic travel has become popular in cities. In China, the sharing economy has been developing rapidly. According to the "China Sharing Economy Development Report (2023)" released by the State Information Center, the market transaction scale of China's sharing economy is about RMB 3,832 billion in 2022, and the market scale of the sharing economy continues to expand and has become a new support point for China's sustained economic development[1].

(3). The flourishing of the concept of sharing in the space discipline

The city is a carrier formed by sharing resources, where the sharing concept and lifestyle of sharing have a pervasive influence on various aspects of daily life. The ideas of sharing space, sharing streets, sharing economy, sharing knowledge, and so on involve multiple dimensions of sharing, such as users, space, and time.

Jing He, in her research on "sharing cities" under the concept of sharing development, summarizes the sharing behaviors in four aspects: physical objects, services and facilities, activities and experiences, and space from the economic and sociological dimensions. She proposed that urban governance with sharing is a strategy to improve urban efficiency and equity in the future[2]. Li Zhenyu summarized in the sharing space perspective that in the Internet era, design combined with sharing began to become an important direction. Between the diverse and evolving sharing behaviors and urban sharing spaces influence each other and promote the development[3].

1.1.2 The trend of city-industry integration and community-based industry park

(1). Historical development of industrial parks

Since the establishment of the Shekou Industrial Park in 1979, industrial parks have played the role of boosters of urban economic development in Chinese rapid urbanization process. Zhen Jie, et al. have summarized the development of industrial parks over more than 40 years of reform and opening up, dividing their development into five stages, including the incubation period (1979-1983), the initial cultivation period (1984-1991), the period of rapid development (1992-2002), the period of stabilization and consolidation (2003-2008), and the period of innovative development (2009-present)[4].

Today's rapid development of information technology has promoted the upgrading of industrial structure. China has also seen the transformation of traditional industries, mainly processing and manufacturing, to high-end science and technology industries and modern service industries, mainly innovation and research and development. For example, Shanghai 2035 plan proposes to build a new industrial system led by innovation and strategic emerging industries, with modern service industry as the mainstay and advanced manufacturing industry as the support. The industrial spatial layout system of "industrial base - industrial community - scattered industrial land" will be built. In the global context, the characteristics of industrial parks after industrial upgrading (high value-added, production methods, industrial space back to urban centers, improved spatial quality, the practitioners have diverse backgrounds and high levels of education). [5]The changes in production methods, industrial organization forms and practitioners' needs require new industrial park design concepts to spatially respond to the new needs.

(2). City-industry integration

At the same time, the traditional industrial park needs to re-conceptualize the relationship between "industry, city, and people" in terms of City-Industry Integration. He Chuanjiao suggests that industrial parks are in the stage of "dual transformation of industry and city". In this context, the goals are to meet the needs of both industry and employment to improve urban functions and create quality spaces. [6]Faced with the issues of the connection between the production needs of industry and the functional needs of the city, community-based spatial exploration has become an inevitable trend in the transformation and design of industrial parks.

(3). Community-based industry park

The community-based design of industrial parks is based on industrial space, aims at the synergistic development of industry and urban space, breaks the geographical boundary, integrates into urban living functions, urban community space form, and urban space atmosphere, and creates a new industrial park with open space, diversified enterprise ecology, active community communication, and strong innovation atmosphere. The community-based spatial model can better meet the needs of contemporary industry and urban space eager for communication and information transfer, which can use urban space as a carrier for industrial development. According to that, it will reach the coordinated development of industry and community, and optimize the strategy of resource-sharing and environmental sustainability [7].

1.1.3 Compatibility of creative communities and sharing concept

(1). Sharing concept and Creative Communities are both based on communities as the basic unit.

Creative community takes the community as the renewal unit, combining the creative industry with the community for construction. Promoting the construction of the community is also one of the most important purposes of the concept of sharing. At the same time, the application of sharing can not be separated from the foundation of the community. In the research object, sharing concept and creative community have a good match[8].

(2). Creative community demands for sharing space.

Creative communities require abundant place facilities (including cafes, bars, galleries, etc.), diverse spatial environments, and vibrant urban activities[9]. There is strong demand for sharing spaces, such as co-working and makerspaces, which have become places for the

creative class to meet and for creative activities to take place.

(3). The intersecting social division of labor in creative communities promotes sharing among different groups of people.

Creative communities emphasize the co-production of multiple subjects, and the interaction of different groups blur the boundaries of social division of labor. Through co-participating economic activities and common culture[8]. By sharing resources, culture, living and production space, the creative class and local residents can participate in community construction together, regrouping the sense of community.

(4). The internet promotes creative industries and sharing activities.

It is obvious the internet promotes the stranger matching of sharing economy. Network information technology is also a great promotion for the dissemination and publicity of creative industries[10]. In the network era, the development of sharing and creative communities can be promoted at the same time, and there are lots of opportunities to combine them.

1.2 Research contents

1.2.1 Sharing concept

There is no unified definition of the concept of sharing. Belk said sharing usually defines something as ours instead of distinguishing mine from yours[11]. They are the recirculation of goods, an increase in the utilization of durable assets, exchange of services, and the sharing of productive assets[12].

Sharing possesses various perspectives and definitions in different contexts and disciplines. In economics, sharing is concerned with reducing costs and improving the efficiency of resource utilization through sharing, which is reflected in the efficient allocation of resources through the transfer of rights of use. In sociology, sharing is about rebuilding social trust and rewriting the rules of social interaction, matching strangers with demand and supply, and upgrading the transaction behavior to a social aggregation behavior of emotional exchange and collision of ideas. In urban planning, sharing is about optimizing urban functions and revitalizing urban stock space to solve social equity and justice problems, which embodying a new urban form of humanistic care[13].

Designing a sharing system, on the other hand, requires a comprehensive consideration of the connotations of sharing within a multidisciplinary perspective of learning. The sharing concept in this thesis is based on the three disciplines, which will use them to summarizing the connotation of sharing needed to design a sharing system, combining with the needs of industrial communities, the conception of the future shared life, and the comprehensive conclusion of the sharing goals.

1.2.2 Sharing space

The shared space involved in this research is inherited from the sharing economy and the sharing city. Sharing space can be defined as the shared use of public and private spaces in the city to host a variety of physical spaces for shared activities [14]. According to Chan, J. K. H & Zhang, research on sharing space currently focuses on three aspects and scales-urban sharing, sharing a living space and shared social space. And according to the nature of the space can also be divided into urban public space with Sharability (Will be explained in detail in the next chapter), which means shared nature, private property sharing space under the sharing economy, and other semi-public sharing space which is defined as shared [15].

1.2.3 Creative community

The creative community is a mixed industrial-residential area that emerges from the positive interaction between industrial and residential spaces. It is also described as "an overall ecology jointly constructed by indigenous residents, creative individuals, government, and recipients of creative products"[16,17]. Empirical studies have shown that urban communities with a high concentration of the creative class tend to have abundant facilities such as cafes, bars, galleries, and diverse spatial environments. These communities also feature vibrant urban activities such as art exhibitions and concerts [18].

1.3 Research scope

The research and design area of this thesis is located in Changban Village, Tianhe District, Guangzhou City, Guangdong Province, which is located in the Peri-Wushan innovation area. (环五山创新策源区) It has well location, adjacent to resources from high-level academic institutions such as South China University of Technology. The site is situated near a city subway station, and the land in the site is mainly composed of village residential land and village collective economic land.

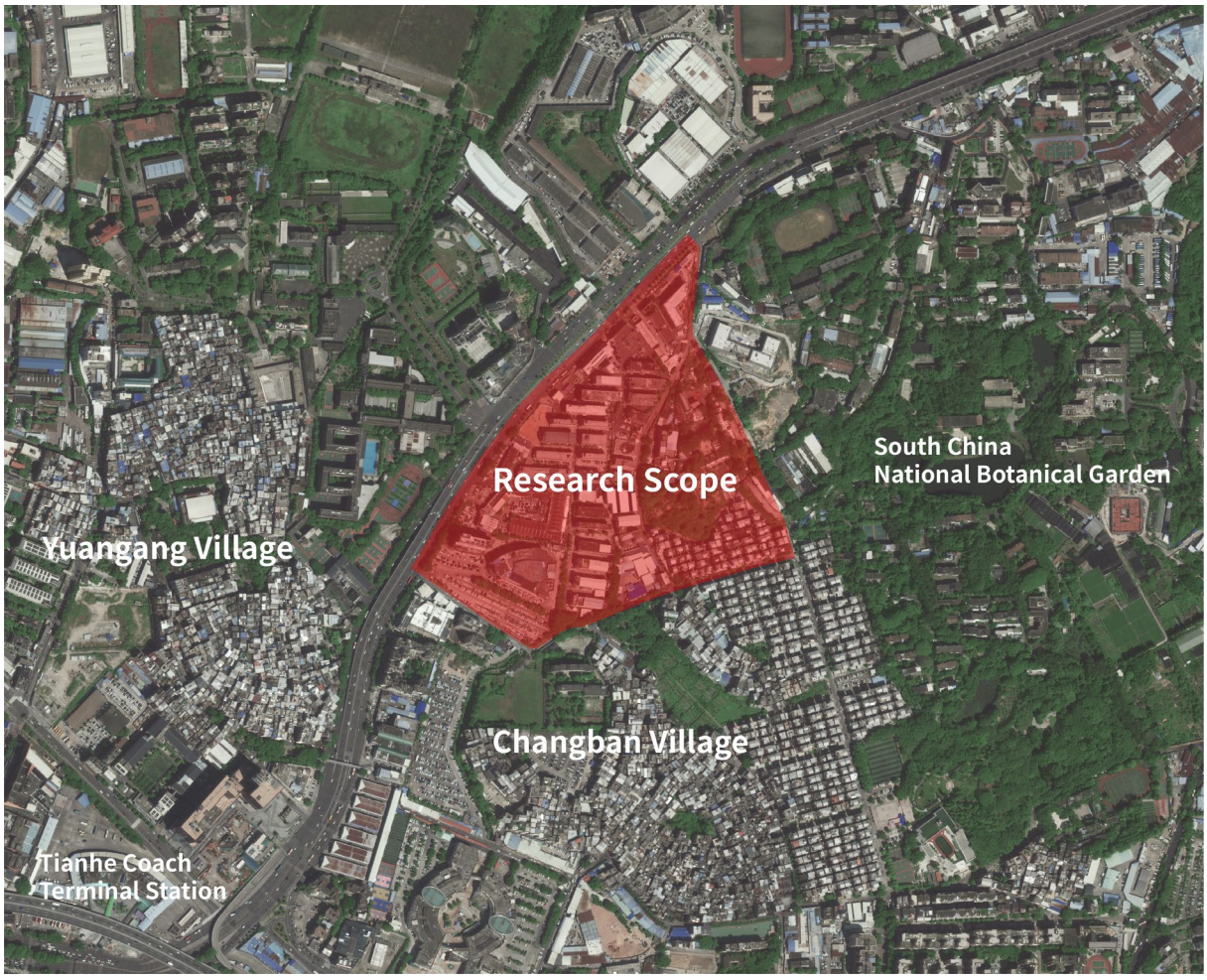


Figure 1-1 Satellite map

1.3.1 Predictable opportunities for regeneration

Recently, according to the policies, the site has been included in the scope of the Guangzhou Municipality's integrated land use, which means it has the opportunity for integrated renewal.

The old industrial park and the old urban village community have become the dominant function of the site, which does not match the advantageous location function of the city center.

1.3.2 Good creative climate provides transformation of creative industries

Because of its good location and early development, many scattered traditional village industrial parks have been converted into creative industry parks one after another. What's

more, the cluster of colleges and universities surrounding the site provides a stable base of creative people. The good community foundation of Changban Village also provides opportunities for creative industry parks to further develop into industrial and creative communities.

In the future it will be dominated by the development of innovative and creative industries to help urban development. Its more stable urban villagers, the increasing creative industry clusters and university talents have natural crowd conditions for forming industrial communities, while the isolation between different groups of people is a good platform for the sharing concept to function.

1.4 Research purposes

The direct purpose of this thesis is to propose a strategy and design method for creating a creative community with sharing concept. For the urban village and village industrial park, a difficult point of urban renewal, the design is carried out by applying the sharing concept at the urban block scale and organizing the sharing system after a deep study of the connotation of sharing. But fundamentally, this study intends to explore the disappearing community spirit in the city and find how the gap between different people in the city may be solved by sharing, so as to promote social justice in the concept of sharing and the resurrection of community consciousness in the city. Taking the Changban district of Guangzhou as an example, the sharing system constructed in this study can, to a certain extent, enhance the interaction between urban villagers and the foreign creative class, and even create an inclusive community sharing culture.

1.5 Significance

1.5.1 The significance of sharing design

There are many design methods in the field of urban renewal today, such as the urban renewal methods under the influence of neo-liberalism that focus on the economic development benefits: mostly demolition and reconstruction, such as the TOD model of transforming commercial business districts, and the market-oriented operation of urban renewal since the 80s under the influence of the land finance policy, which pay more attention to the economic benefits and the enhancement of the physical and spatial environments; whereas the urban renewal methods of the old cities under the influence of new urbanism focus on the interpretation of the concept of community. The urban renewal methods under the influence of New Urbanism focus on the interpretation of the concept of community, including community building in the transformation of old city communities, community-based renewal of old city

industrial parks, such as the renewal of industrial communities, which all reflect humanism, focusing on the interactive relationship between people and space. The concept of shared design in Changban belongs to the latter, and has its unique advantages.

The sharing design strategy focuses on the sharing behavior between people, the living habits of users, and the interaction between different users, which makes the community-based renewal strategy able to be implemented in a wider scope, not only limited to the community, but also more adaptable to the community-based renovation of urban villages and industrial parks, which expands the scope of the concept of community in urban areas and awakens the sense of community.

In the context of today's slowing economic growth, the transformative impact of information technology on daily life, the renewed enthusiasm for community spirit among urban citizens and the promotion of sustainable and green low-carbon lifestyles, the sharing concept for development and sharing cities have become important themes for urban development. By incorporating the design and updating of sharing concept, a new perspective can be proposed to address these social issues and contribute to the exploration of a new urban form in the era of sharing.

1.5.2 Supporting the renewal of industrial parks in Guangzhou's urban villages

In Guangzhou, there are not a few urban villages and industrial parks in the city, and under the current uncertain direction of urban renewal, methods of renewal need to be explored. In the Changban area of the research scope, this thesis eliminates the class divide contradiction between Guangzhou urban village residents and the creative class as outsiders, and explore a sharing design approach to design village industrial communities to integrate the lives of different classes, which can enhance social justice and promote community building. It can provide new ideas for the renewal of village collective property industrial parks in urban center villages in Guangzhou area.

1.6 Research methodology and frameworks

1.6.1 Research methodology

This thesis mainly uses research methods such as literature research method, case study method, inductive-deductive method, field interview method, and observation method. This thesis constructs the overall theoretical research foundation mainly through literature analysis

and case study method. By collecting sharing-related books, journals, and online materials in English and Chinese, the development and theoretical framework of sharing and sharing spaces were clarified, and further summarized and supplemented through related research on shared systems, leading to the methodology for designing sharing space systems. Subsequently, through the utilization of case study methodology, this process is applied to case analysis, further summarizes and deduces the design strategy, and proposes the strategy and design by combining the field investigation and interviews in the site.

1.6.2 Frameworks

By collecting sharing-related books, journals, and online materials in both English and Chinese, the core connotation of sharing is clarified, and it is complemented with the concept of sharing space to derive the content and principles of sharing space designing. Combining with the analysis method of the 'sharing system' to propose guidance on the sharing objectives of the site, forming a complete design method from analysis to design content guidance. The process method is then applied to the case study to derive relevant design strategies and selectively use them in conjunction with the site analysis to understand the needs. Finally, it leads to the strategy and design from sharing concept.

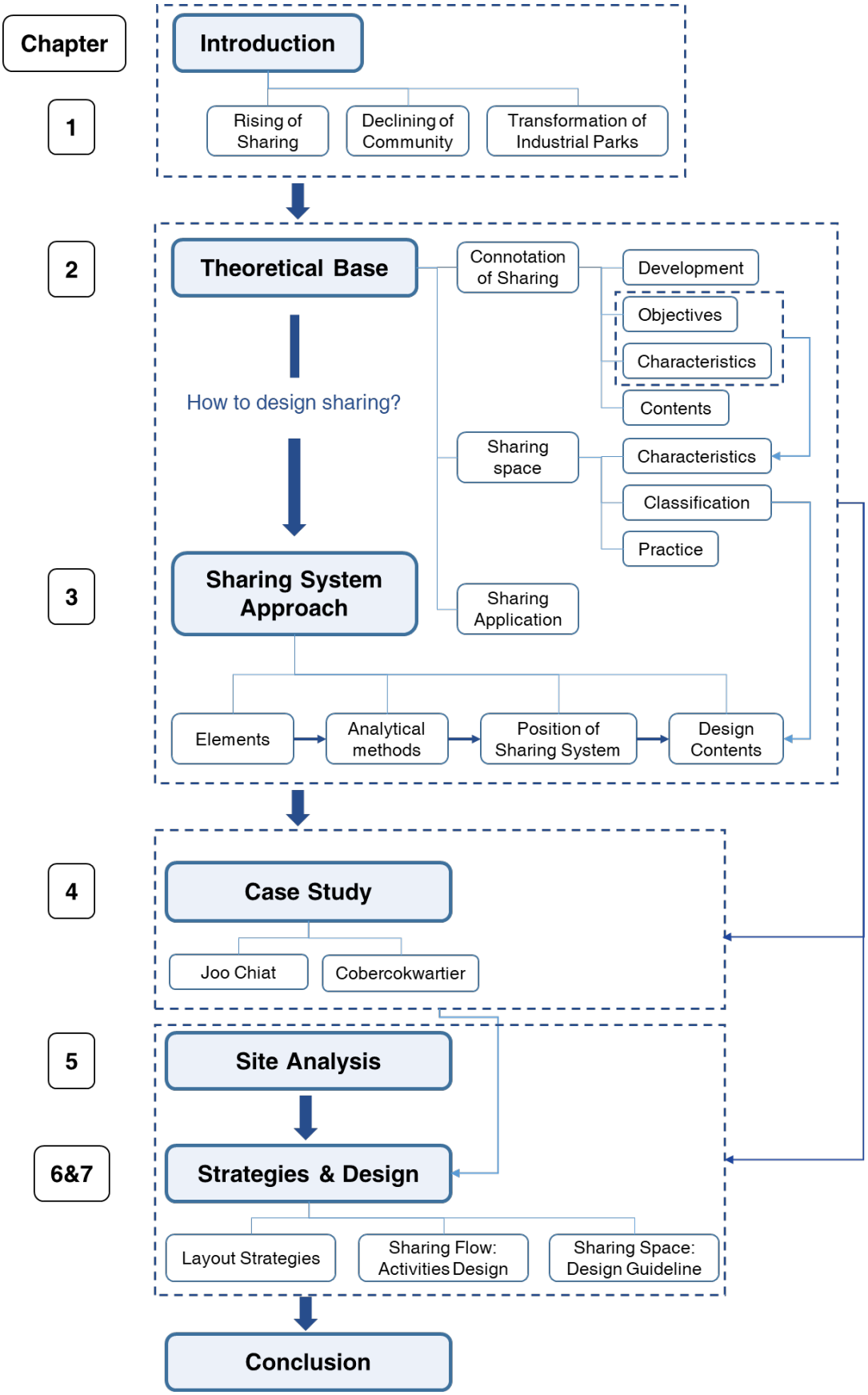


Figure 1-2 Framework of this thesis

Chapter 2 Literature review

2.1 Research on sharing concept

2.1.1 Traceability

(1). Development of sharing in ancient times

World

Felson et al. provide a comprehensive overview of Western philosophical perspectives on sharing, categorizing them into three distinct stages: enlightenment, controversy, and change[19]. Among the earliest proponents of sharing in Western philosophy was Plato, who proposed the concept of communal ownership by advocating for the ideal state where wives and children are held in common. Aristotle proposed in his political science that social property should have both public and private property rights. Cicero, in his treatise on responsibility, proposed that all men should share everything that nature has given them.

In the controversial stage, Hegel and others put forward the argument of the private right to property, arguing with the traditional philosophy of sharing.

In the stage of change, Marxist philosophy proposed that social development is shared by all people and that all people have equal access to social resources, pushing the value of sharing to its peak.

China

In China, sharing has been a revered culture and trait since ancient times. The long history of Chinese sharing culture can be seen in ancient philosophical masterpieces. For example, in Mencius, it is mentioned that respect the elderly as you would respect your own elders, and care for the young as you would care for your own children. The views express the sharing values of co-parenting children and the elderly. In Scripture of the Great Peace, it is said that the property is owned by heaven and earth in order to support people, expressing the idea that property should be shared to support society. In the traditional Chinese society of village settlements, whenever the farming season was busy, the villagers would ask for help from their fellow villagers, and every new housing construction was organized by the villagers themselves to help build. The concept of sharing is deeply rooted in the Chinese DNA.

(2). Development of sharing in modern times

Tracing the philological history of 'sharing', John outlines the range of meanings implied by this word. First, sharing is a way of dividing or distributing resources; this is also an early meaning of sharing. Second, sharing can imply the state of having something common with someone. Third, sharing can be an act of communication, experienced for instance, when we share our feelings or emotions. Fourth and more recently, sharing has been used to exemplify the return to a more morally superior and natural state of being[20].

And extending this list, sharing can be distinguished from gift-giving and commodity exchange[21]. On this, sharing is a practice—it is what people do [22]. Furthermore, it is possible to distinguish between autotelic sharing and telic sharing.[23] In the former, sharing is an end in itself; it is practiced for the inherent enjoyment that it brings. Conversely, in the latter, sharing is practiced as a means to achieve other objectives. This diversity of meanings indicates that there is no singular or privileged ontology of sharing. Instead, the meaning of sharing is shaped by the context in which it occurs.

2.1.2 Research on different disciplines

According to the classification of Zhao Sidong, sharing is divided into three perspectives: sociology, economics, and planning[13], among which the sharing about planning will be explained together in the study of sharing space.

(1). Sociology

Belk states: "Sharing tends to be a communal act that links us to other people[21]. It is not the only way in which we may connect with others, but it is a potentially powerful one that creates feelings of solidarity and bonding. Rather than distinguishing what is mine and yours, sharing defines something as ours. Other similar attempts have defined sharing as one important cooperative approach to address people's everyday needs by co-managing local resources[24]. According to Liu Zhanyong, sociology considers "sharing" as a strategic way to promote the benign and coordinated development of society. The meaning of "sharing" in sociology is that the subsystems of the social system, such as economic, political, cultural and society, should create more resources and distribute them well[25].

In summary, sociological sharing is a strong act of social cohesion that promotes interaction

between strangers and creates solidarity, thereby building a system of trust in a shared society.

(2). Economics

The sharing economy, also known as the collaborative economy, was first conceptualized by Marcus Felson, a professor of sociology at Texas State University, and Joel Spaeth, a professor of sociology at the University of Illinois, in a 1978 paper (Community structure and collaborative consumption: a routine activity approach) [19]. Sharing economy is an economic model based on sharing underutilized assets from spaces to skills to stuff for monetary or non-monetary benefits." [26] Schor said "Coming up with a solid definition of the sharing economy that reflects common usage is nearly impossible…. Sharing economy activities fall into four broad categories: recirculation of goods, increased utilization of durable assets, exchange of services, and sharing of productive assets." [12] Beck said "The sharing of under-used assets through completing peer-to-peer transactions that are only viable through digital intermediation, allowing parties to benefit from usage outside of the primary use of that asset." [27] "consumers granting each other temporary access to under-utilized physical assets ("idle capacity"), possibly for money. But also because of physical proximity, even for-profit platforms promote episodic social activity for purely sharing purposes[28].

In general, sharing in economics refers to the use of modern Internet technology and modern information technology, with the sharing of access rights as the main feature, to integrating traditionally decentralized economic resources to meet the city's more flexible and diverse needs for various economic activities and economic behavior[29].

(3). Urban Planning

The UN Habitat3 conference proposed the shared vision 'We share a vision of cities for all', referring to the equal use and enjoyment of cities and humans ettlements, seeking to promote inclusivity and ensure that all inhabitants, of present and future generations, without discrimination of any kind, are able to inhabit and produce just, safe, healthy, accessible, affordable, resilient and sustainable cities and human settlements to foster prosperity and quality of life for all.

In the field of urban governance. Bernardi and Diamantini have examined the cases of the sharing cities Seoul and Milan from a technological, economic and human dimension ensuring that a participatory and co-management focus among actors is necessary to foster urban sharing[22]. Camboim et al. claim that city governance models need to be oriented

towards a social innovation perspective to integrate technological, environmental and social activities[30]. The scope of management research in this field is wide to achieve co-building and management of cities, including how to manage and implement sustainable infrastructures, community relations and technological development, which can archive co-construction and management of the cities.

Design of sharing in Urban planning is also a key role. Concepts such as social design, placemaking and co-design rethink the collaborative use of space for sharing among governments, residents, entrepreneurs and tourists. The physical space conditions the practices and initiatives that can be carried out, and conversely "… sharing practices are likely to affect urban spaces" [28]. Such as bike sharing in Chicago influence the planning, making the planning aim to redesign roads which more suitable to bike.

In general, within the discipline of urban planning, the study of sharing is focused on the concept of equal rights and inclusive planning, a sharing approach to urban management for all, and the practice of planning and design adapted to sharing activities.

2.1.3 Connotation of sharing concept

(1). Objectives of sharing

The former mentioned that in sociology, the objective of sharing is to re-establish the trust system of society. In economics, the objective of sharing is to increase efficiency and revitalize idleness. In urban planning, the objective of sharing is to change the concept of urban development, to share the benefits of urban development, to achieve solidarity and justice, and ultimately to influence urban form.

Vergara summarizes the objectives of sharing in the city, i) the revival of the community in the city, ii) citizen empowerment, iii) solidarity and social justice, iv) sustainability and efficiency, v) social innovation through new economic arrangements [14].

Table 2-1 Objectives of sharing concept

Objectives of Sharing	Introduction
The revival of the community in the city	Promoting social cohesion
Citizen empowerment	Managing and constructing from bottom-up
Solidarity and social justice	Needing measures to keep relative justice
Sustainability and efficiency	Saving energy/resources, rising efficiency
Social innovation through new economic arrangements	Developing new city/ social forms for future

First of all, the most important purpose is to promote social cohesion, which is particularly important in modern cities where neoliberalism is prevalent. Any activities that can be called sharing contributes to the revitalization of the community and the sense of community more or less. Especially when the sharing activities and practices take place in the local area, which always requires the participation of the local community. For example, the construction of the social street in Milan's sharing community has enabled local communities that were not connected to each other to connect through sharing activities, bringing activity to the street and revitalizing the public space[31].

Secondly, citizen empowerment. We are used to top-down provision of urban public services, such as ready-made city parks, grand plazas, urban shopping centers, etc. But everyone's needs are different, and it is difficult for managers to do everything. Empowering citizens to a certain extent, allowing everyone to participate in the construction of the city, and sharing the power of the city in a bottom-up participation model, will meet the needs of the citizens themselves, and at the same time, stimulate the vitality of the city.

Thirdly, sustainability and efficiency. The efficiency gains brought about by the sharing economy cannot be denied. The emergence of bicycle sharing has solved the problem of the last mile of urban commuting, and the emergence of shared accommodation has greatly increased the utilization rate of unused housing in cities and brought economic benefits to household owners. But from a broader perspective, these sharing practices bring not only efficiency improvement, but also an important guarantee of sustainable urban development. Sharing practices that reduce resource waste become sustainable, virtuous cycle activities in

their own right. For example, Mugion studied the role of bicycle sharing on energy saving and emission reduction for urban travel. This coincides with the goal of building sustainable cities[32].

Fourthly, solidarity and social justice. The low threshold of sharing itself allows people to enjoy the benefits of urban development more equitably, but it also requires certain institutional management. Many sharing economy platforms have become platform economies with negative effects, leading to the rich getting richer and the poor getting poorer [33]We need to be wary of sharing becoming a front for platform capitalism. It is important to think about sharing from the level of efficiency to a higher level, and make preventive actions to ensure the fair and solidarity of sharing.

Last，social innovation through new economic arrangements. Under the arrangement of shared activities, there will be many different ways which refer to sharing to achieve the original needs of people in work, life, education, community development, etc. This will provide a new way of life to enhance the sense of community, such as hoffice. At the same time, with the development of ICT technology, more and more information intelligent platforms and technologies can bring the possibility of future social innovation. The future will shift from the current sharing economic activities, which are mainly based on collaborative consumption, to the social transformation of cooperative production[34].

(2). Characteristics of sharing

Social traits

Belk said sharing usually defines something as ours instead of distinguishing mine from yours[11]. He found that in every sharing system, there are always pure providers and beneficiaries. The motivation of sharing is not to pursue self-interest, but instead to help and give without reciprocal expectations. Therefore, sharing occurs based on altruistic motives and is maintained by relational ties. He also proposes the concept of sharing in and sharing out, pointing out that sharing is easier to form within a community, that is, sharing in is more stable, while outside a community, pure sharing is more difficult to form, that is, sharing out often requires more guarantees and is less likely to form bonds.

Widlok summarized three social traits of sharing, easy access(non-registration)

responsiveness(symmetry between providers and users) and easy giving up (non-hoarding of data and profiles)[35]. Both the threshold and sunk cost are low, which also proves that sharing is more inclusive and has mobility. Zhang Ye has further refined the characteristics of sharing on this basis: prosocial and altruistic motivation; joint possession and associated responsibility; bonds formation and community building[36].

As can be seen, the most explicit characteristic of sharing is the relationship bond of community. It is especially important to develop a sense of trust between people within a community. That means it is necessary to create communication and establish relational bonds among strangers. It is only through these means that building communities can have sharing. In the ideal case, one no longer emphasizes the boundaries that separate self and others and the difference between givers and receivers. This means that sharing with others is like sharing with self.

Sharing comes with responsibility. Sharing requires responsibility, and sharing without responsibility cannot last. This responsibility comes from a sense of belonging to the community, a sense of morality, and a sense that everyone is involved and responsible for it.
Altruistic motivation. The starting point for sharing is a stronger altruistic motivation. Altruistic behavior can be spiritually satisfying and inspire gratitude from others, thus spreading sharing within the community and turning sharing activities into a sustainable behavior.

The moral principles of sharing, such as empathy, fairness, selflessness, and equality, are frequently embodied in widespread sharing practices. For example, many members of GitHub openly share their computing code models without expecting personal gain from others' sharing.

Easy access. Sharing should be inclusive to external and connect to joint possession, otherwise it will become a membership club. Sharing the initial cost makes it a low barrier to entry and a low cost of abandonment.

Resource traits

Apart from analyzing the social characteristics of abstract sharing, it can be observed that

tangible shared resources also exhibit commonality. Zhu Hongbao provides a summary of the characteristics of sharing resources in a broad sense[37]. First, it is often unused and underutilized resources owned by individuals that participate in sharing behavior, such as tool sharing within a community. Such original sharing usually does not have negative impacts on the interests of the owner or the shared resources themselves, but instead improves the utilization of idle resources. Second, sharing resources are also characterized by elasticity and instability. The people who share them tend to be more complex and mobile, making it necessary to maintain the dynamic elasticity of sharing resources that follows demand. Finally, sharing resources are often provided and tapped spontaneously by individuals or small groups, and shared in a bottom-up manner.

2.1.4 Contents of sharing

Many scholars have summarized sharing practices in cities, focusing on food, mobility, objects, spaces, ideas and knowledge and so on[2,36,37]. To name a few examples, at the food level, there is the Incredible Edible Todmordon project in the UK for growing shared vegetable gardens, and the food sharing program in Berlin. At the Mobility level, there is Car sharing by Uber and DiDi, and Bike sharing by Mobike and other platforms. At the Spaces level, there are Co-working space, Makerspace, Fab lab and other sharing spaces around the world, as well as Airbnb, which is the most representative sharing residential space. There are also niche-sharing practices such as co-design workshops in the UK to share ideas and knowledge.

He Jing summarized four major categories of performance types of sharing: physical objects (consumables, discarded goods, durable goods), space(living space, office space, recreation space), facilities and services, and activities and experiences (knowledge and skills, information content, financial services, culture, and entertainment); the subjects of sharing include person, company, and society[2].

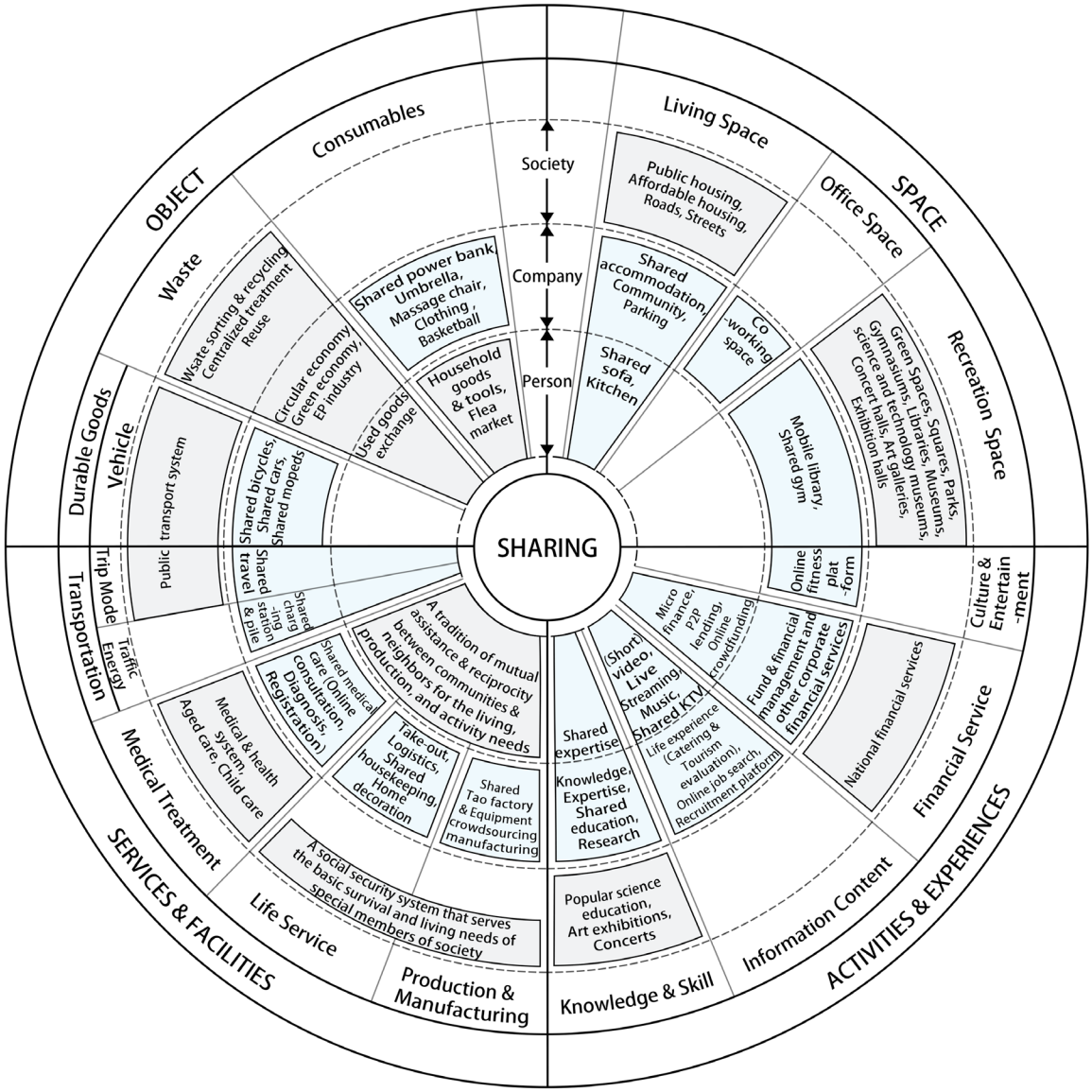


Figure 2-1 Sharing contents (Adapted by the author from sources)[2]

2.2 The relationship between space sharing and publicity

As mentioned earlier, sharing space refers to the sharing usage of public and private spaces

within urban areas. This section will explain the connection and distinction between traditional public spaces and sharing spaces.

The definition of public space should not be determined solely by property rights. Kevin Lynch defines public space as a space where anyone can use freely[38]. Li Ziming proposes that space sharing resolves the birth of publicity of space. The behavior of space sharing is the prerequisite for the birth of publicity, stable space sharing can give birth to public space, and the concept of space sharing should contain the public space. Secondly, she suggests that whether property rights are public or not is independent of whether the space is public or not. Spatial sharing can occur in both private and public property rights, in which stable space sharing will eventually be transformed into public space [39].

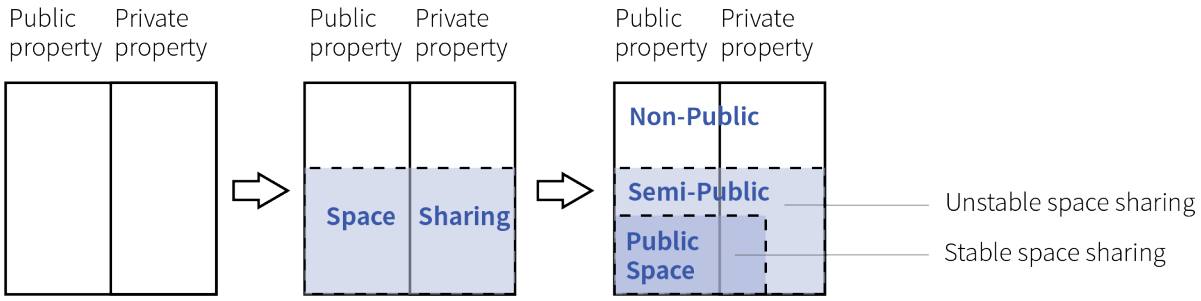


Figure 2-2 Space sharing shaping publicity

(Adapted by the author from sources) [39]

Therefore, spaces with public property rights may not have a publicity, but they can become public space eventually through space sharing. For example, an urban road that prioritizes vehicular traffic does not have public nature, nor is it a public space, but only a space with public property rights. However, by sharing the right of way between pedestrians and motorized vehicles through sharing design, the sharing street gradually gains public character and eventually becomes a public space. The existence of privately owned public space(POPS) in the United States and public open space in private development (POSPD) in Hong Kong are the evidences of the separation of property rights and publicity[40].

There are many scholars making the relevant discussions. Some public spaces have been defined as public spaces only in the process of urban development, and have lost their public attributes in terms of specific uses. Huang Zhongshan suggests that according to Western scholars' research on urban public space, urban public space is not the same as general urban

open space, or there is a determination of "authenticity" of urban public space, and in reality, urban public space has the problem of "public or common but not sharing" [41]. Sharing spaces with authenticity often have sharing values.

For example, Stavros Stavrides has shown in his study that public space in the neoliberal era is just a market infrastructure. These deteriorating public spaces, or rather non-authentic public spaces, are transformed into common spaces through community-led urban commons practices. And conclude from Naples' example that subjects of space-commoning evolve, change and get transformed while they devise rules of sharing, modes of living in common, and habits of mutual care. Common space is being performed by subjects that shape themselves and space at the same time[42].

Through a study of the public space around Wudaokou City Railway Station, Liu Wan argued that public space is not necessarily a sharing space. Public space needs not only material openness, but also richness and diversity in the spirit of place, which makes different groups, interests, and times relatively equal in spatial opportunities[43].

2.3 Research on sharing space

2.3.1 Definition

At present, there is no clear definition of sharing space in academic circles, but a system of research related to sharing space has been formed.

(1). Foreign definition

In the field of transportation, sharing space is the same concept as sharing streets. The specificity of sharing space compared to typical urban public space lies in its design and management of both motorized activities (relatively low-speed operation) and the integration of different space users in the road traffic system. Co-working, co-housing and other dedicated spaces that host sharing economic activities indoors are also referred to as sharing spaces[44].

(2). Domestic definition

From an architectural perspective, Li Zhenyu describes sharing space as the organization,

association, and use of space by people[3].

Huang Zhongshan describes “sharing space" refers to a type of space in which the space owners provide the right of inefficient, negative, and idle land resources to the user or the demander through direct or indirect ways[41].

According to Lin ke, "Sharing space" refers to the design control of public space as the core, breaking the previous rigid guidelines of controlling various land ownership boundaries (such as boundary lines of roads). By improving the openness and composite nature of public space, the public open space inside the building and the public space on the street are efficiently articulated to guide the overall development of the building and space of the plot with innovative ways and types of space use[45].

Finally, I think what most accurately expresses the definition of sharing space in this thesis is the sharing use of public and private space in the city, the physical space that hosts sharing activities [14].

2.3.2 Research development of sharing in spatial field

The study of sharing in the spatial discipline focuses on three scales: Sharing city at the urban scale; sharing urban open space at the mesoscopic scale; and sharing community and architectural space at the microscopic scale, such as sharing street; Co-housing, co-working space (CWS) and so on.

(1). Sharing city

Sharing city is closely related to the sharing economy in academic research. According to Bernardi and Diamantini, the sharing city concept “… denotes a merging of the sharing economy with urban development” [22].

Meanwhile, according to Vith et al, the sharing city is not only focused on the economic aspect of the city, but also an ideal lifestyle, involving various aspects[46]. According to Długosz, the sharing city is a livable city - a place where citizens can share infrastructure, utilize idle (public) resources, gain more access to data, establish and participate in sharing enterprises, advance community interaction, and more[47].

The practice of sharing city is already taking place in various places. In Europe, Malmö in

Switzerland is known as the sharing city, and Milan has released guidelines for building a sharing city. In Asia, Seoul is sharing from housing, transportation, public facilities, and public data to match the construction of a sharing city. Seoul government has also released guidelines such as Seoul Draws a City through Sharing[48].

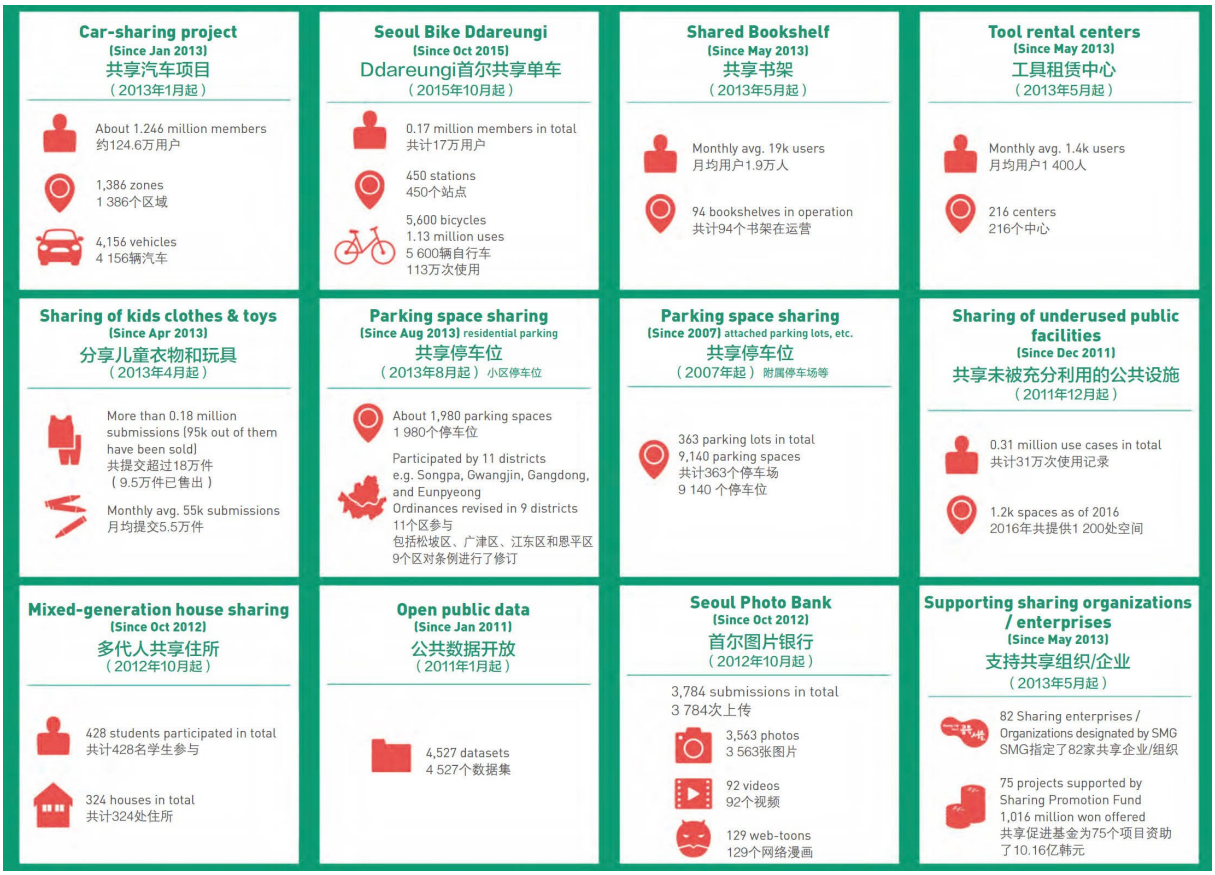


Figure 2-3 Seoul sharing city declaration[48]

(2). Sharing of open space

Sharing street

Sharing streets, also known as sharing space, is a theoretical general term for the sharing use of the same public space by different street users, i.e. the integration of road users. It originated from the concept of "woonerf" (sharing street in a residential area) in Delft, the Netherlands. In this thesis, the author uses sharing street instead of sharing space to describe the concept. Sharing space in this thesis broadly refers to spatial areas characterized by the Sharability.

To describe the concept of sharing street, as summarized in Karndacharuk's research review [44], from a broad philosophical perspective, the concept of sharing streets for road

users integration can be traced back to the introduction of environmental philosophy in Traffic in Towns in the 1960s, also known as the Buchanan Report in the UK. When the broader context of the early motorization era in the UK predicted a massive increase in motor vehicle ownership. Its methodology has influenced traffic engineers around the world. In addition to recognizing the problems posed by transit traffic in the built environment, the study also introduced the concept of Cellular, which describes the relationship between road networks and the environment. Environmental areas must enable people to live, work, shop, and walk in a reasonably safe and comfortable manner. Road networks need to be designed to meet capacity needs and serve the environment, not vice versa. Based on the cellular concept, a collector-distributor road should contain sharing space that has not only mobility and accessibility functions (e.g., the ability to reach adjacent sites), but also functions as a destination or a place to stay and stroll.

Sharing streets have developed differently in each country. In the Netherlands, the concept of sharing streets (Woonerfs) in the residential district was initially proposed by Niek de Boer from Delft University. The experiment was first conducted in low-income residential areas, where traditional traffic signs, barriers, and curbs separating pedestrians and vehicles were removed. Following its success, the Netherlands expanded the woonerf nationwide and influenced neighboring European countries. Denmark created Rest and Play zones where motor vehicles must yield to pedestrians; Germany created Play Streets; Switzerland created Encounter Zones with 20km/h limits; and the UK created Home Zones, etc.

The sharing street concept has had a significant impact on other subsequent street design theories/approaches, including traffic calming; sharing street in shopping areas for commercial areas; living streets; adaptive streets; roadway thinning; completed streets; context-sensitive design; and others. All of these concepts share the same principles and goals as sharing streets, i.e., to reduce the dominance of motor vehicles on the street, and many of the specific design approaches overlap, as described below.

i. Encouraging drivers to consciously take safe actions (especially regarding driving speed) by making judgments based on the visual appearance of the road.
ii. Ensuring that transportation projects and systems are responsive to the context of enhanced community values while maintaining safety and mobility.

iii. Emphasizing the status of the street as the most basic unit of the neighborhood or community, and need to introduce ‘place’ as a third function in addition to the two traditional functions of mobility and accessibility.

iv. Blurring right-of-way(ROW): Sharing streets emphasize pedestrian activity on the street and propose psychological speed bumps for motorists.

v. Sharing streets are designed by continuous paving and space, adding street furniture, clearing vehicular signs, curbs, etc., achieving the objectives of blurring ROW at the physical space level.

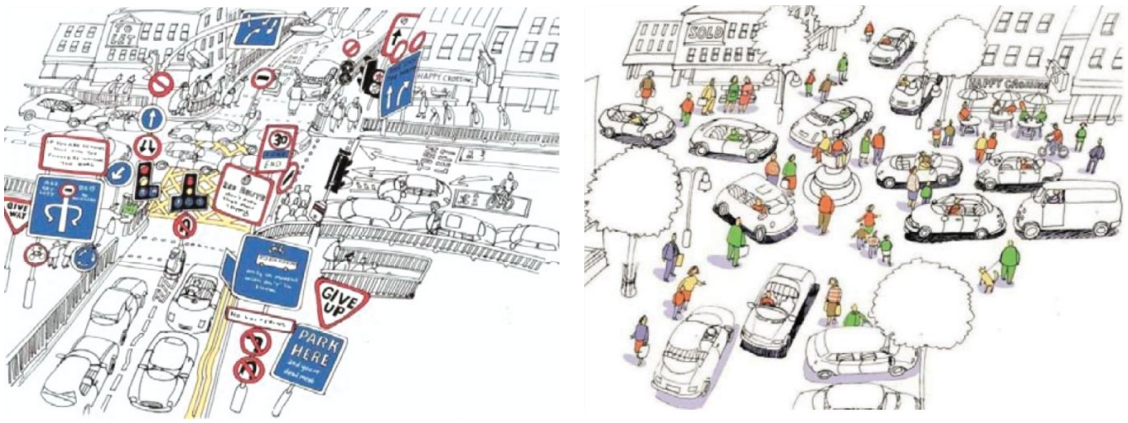


Figure 2-4 Sharing street and regulated roads from the research[49]

(3). Sharing in communities and indoor spaces

Co-housing

The sharing residential space has emerged earlier and has now developed in various forms, deriving research and practices on topics such as sharing communities.

Jan Gudmand-Høyer was the first to propose a model of "Co-housing community", consisting of both private homes and sharing facilities and spaces, with the aim of creating a residential environment that is mutually supportive, sharing, and encouraging interaction. In addition, he published an article in 1968 titled “The Missing Link between Utopia and the Dated One-Family House”, which was one of the earliest articles with the concept of "Co-housing community"[50]. Following this, Denmark witnessed the development of four generations of cooperative housing, which eventually spread globally. For example, in the United States in 2005, Chris Scotthanson and Kelly Scotthanson published The Co-housing Handbook: Building a Place for Community, which summarized the theory and practice of previous

authors and distills the planning and construction characteristics of co-housing. Such as residents' participation in the whole process of construction and management decisions, neighborhood-friendly space design，separation of people and vehicles, sharing public implementation, appropriate community size, and shared dinners[51]. In Asia, intergenerational housing first emerged in Japan, with the aim of sharing the homes of the elderly to young people of low financial means, with the young people moderately taking care of the living of the elderly and living together for mutual profit.

In recent years, sharing residence has emerged with the help of Internet platforms, and the wave of sharing residence started by Airbnb is unstoppable. At the same time, many cases and studies of sharing communities have emerged.

Domestic scholars Chang Mingwei and Yuan Dachang proposed that the sharing residence model in our country needs to reconfigure privacy and publicness, drawing inspiration from the spatial structure of traditional Siheyuan courtyards and configuring functions through the Internet[52]. Yang, Xinwei, and Chen, Yunxia analyzed the sharing community case, Jiyue community in Shenzhen, whose main feature is the complementarity of private and sharing spaces[53]. Sharing spaces in this community includes communal facilities such as sharing kitchen, sharing laundry room, sharing recreation room, and sharing study room, in addition to developing rich community activities based on the sharing space.

Co-working space and Makerspace

The co-working space has been most extensively studied, and nowadays, CWS is appearing all over the world, and although it appeared later, its distribution has become more popular than co-housing.

In the context of a rising sharing economy and the growing knowledge of workers, the last two decades have witnessed the worldwide spread of the phenomenon of new workplaces known as “coworking spaces” .Sharing the same space may provide a collaborative community to those kinds of workers who otherwise would not enjoy the relational component associated with a traditional corporate office.

Co-working spaces are not just the birth of a series of businesses, they can also have an

impact on cities. Mina Akhavan discussed the urban effects of Co-working space, including: (i) the improvement of the surrounding public space; (ii) the wider urban revitalization (from an economic and a spatial point of view); (iii) community building, with the subsequent creation of social streets[54].

Relationship and impact with the community.

Yu Ping suggested a sharing office is not a space concept, but a business model with the advantage of "community operation". The term "community operation" refers to through the operation of sharing office space to create a "community" of knowledge exchange and sharing among multiple teams in the space, and to maintain the atmosphere of the community space[55]. A shared office is a platform for sharing office resources, including space, services, knowledge, and other resources, which brings together different teams and individuals, leading to the formation of a "community" of knowledge and the sharing of innovative resources. Such a sharing office is different from a traditional office in that it can bring together different individuals and teams to maximize their effectiveness. The prerequisite for office workers in the residential community in this thesis to be able to work in the same space is the operational capability of sharing offices.

Research on sharing office users has shown that it has a great effect on community building, and in Italy, a large proportion of sharing office users come from the surrounding community and contribute to community building[31].

Sharing infrastructure

Some spaces called as sharing infrastructure also has the potential of sharing. As Sharp highlights, “sharing cities are a new urban imaginary of the sharing economy grounded in grassroots innovation, municipal provisioning of sharing infrastructure (…) encourage urban experimentation that brings civil society, local government and market actors together to co-produce and co-govern the city as commons”[56]. Hult in Malmo's study of sharing infrastructure defines the joint government, business, and community provision of makerspace, such as STPLN: A socio-technical infrastructure for sharing resources, tools and skills. These facilities can be interpreted as low-budget “hacks” of existing public infrastructure which, through conscious strategies of co-production with users, have come to serve as spaces for sharing, reskilling, making and repairing and, simultaneously, as inclusive

public spaces[57].

(4). Summary

Research on sharing spaces in cities, neighborhoods, and single spaces has a different emphasis. Due to the bottom-up nature of sharing, there is no clear connection between the spatial interpretations of each research on sharing space, but the inherent mechanisms and connotations of sharing are the same.

2.3.3 Characteristics of sharing space

From the previous description, it is evident that specific sharing spaces often possess attributes of sharing (acquisition, altruism, community cohesion, responsibility). The most notable manifestation is the blurring of ownership, thereby diminishing its constraints on users.

As mentioned earlier Zhu Hongbao summarizes the characteristics of sharing resources in a broad sense: resilience/instability, idleness or underutilization, and often bottom-up participation. He Jing described the characteristics of urban sharing spaces, stating that they possess features associated with hybridization, diversity, dispersion, and dynamism. Huang Zhongshan believes that the sharing space has three characteristics: co-construction, complex rights and responsibilities, and balance of interests[2,37,41].

In summary, sharing spaces are closely related to and developed from the characteristics of the concept of sharing, and therefore have these characteristics, as shown in the figure.

After getting the characteristics of sharing spaces, it is possible to use them as a basis for classifying specific sharing spaces and making judgments.

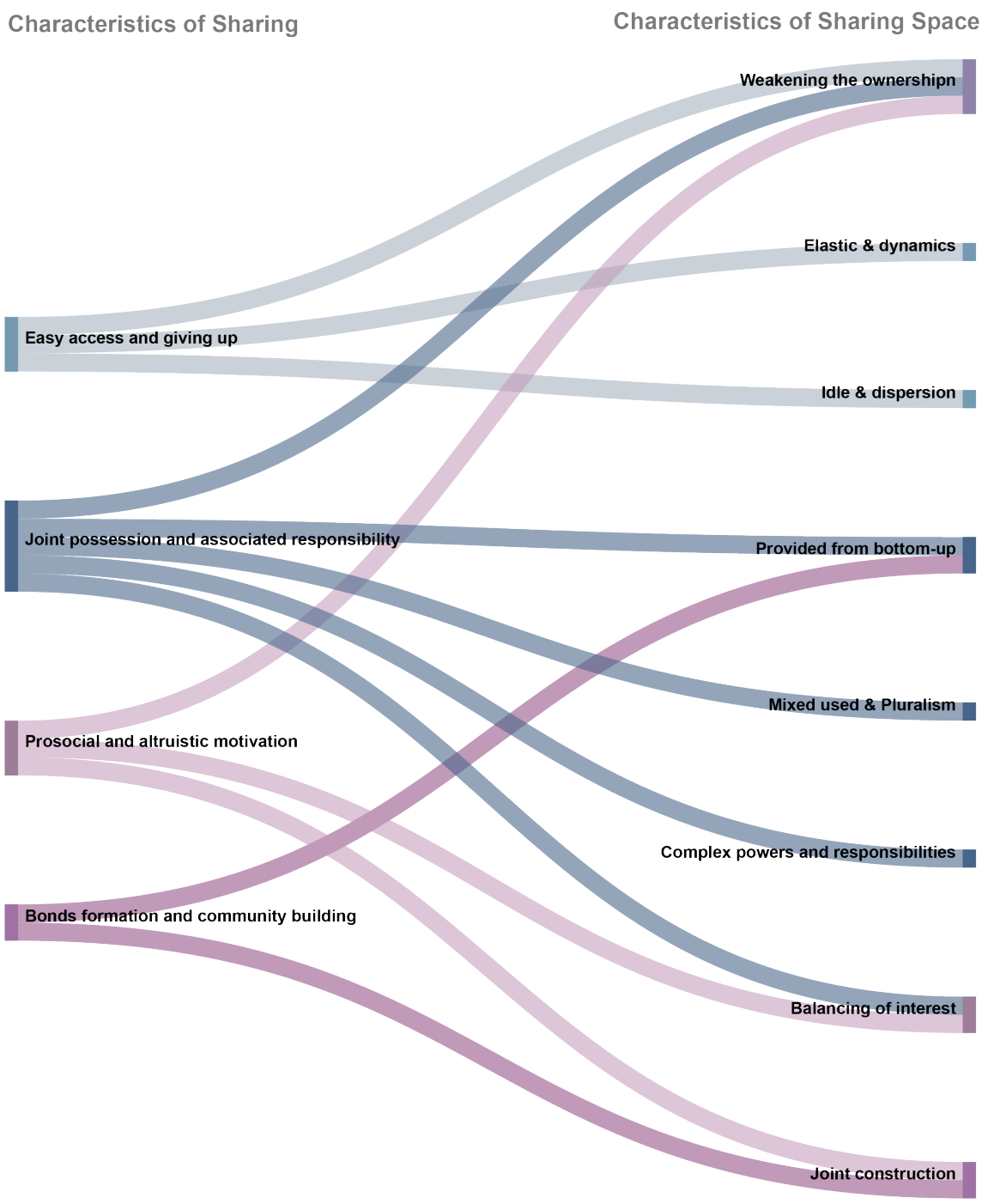


Figure 2-5 The relationship between the characteristics of sharing and sharing space

2.3.4 Classification of sharing spaces

According to Chan and Zhang, he deliver the sharing space into 3 types, which called urban sharing, sharing social space, sharing living space[15]. This thesis will refer to this classification and make some innovation. After reviewing the research on sharing spaces and fully analyzing the characteristics of sharing spaces, we can judge whether the space has the potential to become a sharing space, and make a specific list and classification.

Table 2-2 Classification of sharing spaces

Property type	*Vectors of sharing space*	*Sharing space*	*Example*
Public /Collective	Urban sharing	Sharing infrastructure	STPLN, Malmo
	Urban sharing: Sharing public space	Sharing street	Home zone, UK
		Public open space: Park, square etc.	Communities of reference, Napoli
Private	Sharing social space	Co-working space	Wework, US
		Makerspace	Ucommune, CN
		Hacker space	
		Fab lab	
	Sharing living space	Co-housing	Co-housing, JP
		Parking space	Worldwide
		Hoffice	Stockholm, Sweden
		Kitchen	Union Kitchen, US
Controversial	Digging out for sharing social/ living space	Community green land	Liz Christy, UK
		Roof flat	Superlofts, Dutch
		Edge space	Wisselpoor, Dutch
		Corridor between buildings	Shuiwei, CN
		Foot path	Worldwide

In this thesis, we classify sharing spaces with the most sensitive property rights factors according into public property rights, private property rights, and controversial property rights. It is necessary to clarify that “controversial property rights” refer to those that fall between public property rights and private property rights. Perhaps legally classified as private property rights, but people use them as same as public property space. The most representative examples is community green spaces and idle land.

2.4 Applications of sharing

As mentioned earlier, sharing practices are mainly focused on specific spaces such as communities, streets, and so on, and the following will explore the application of sharing in a wider range of scenarios.

Based on the goals of sharing, the following characteristics of sharing application scenarios can be obtained.

Firstly, the application scenario of sharing in design should have a community base, which means that the residential function is essential.

At the same time, the scenario needs to have enough citizen power to respond to the changing and adjusting sharing needs.

Third, the site should preferably have a certain level of mobility. According to research, people are the initial condition for the formation of sharing, and without sufficient population and density, it is impossible to form sharing, just as it is impossible to form a sharing village[14] . At the same time, the initial threshold should not be too high, which means that the scenario may need to have good transportation conditions and opportunities for external communication.

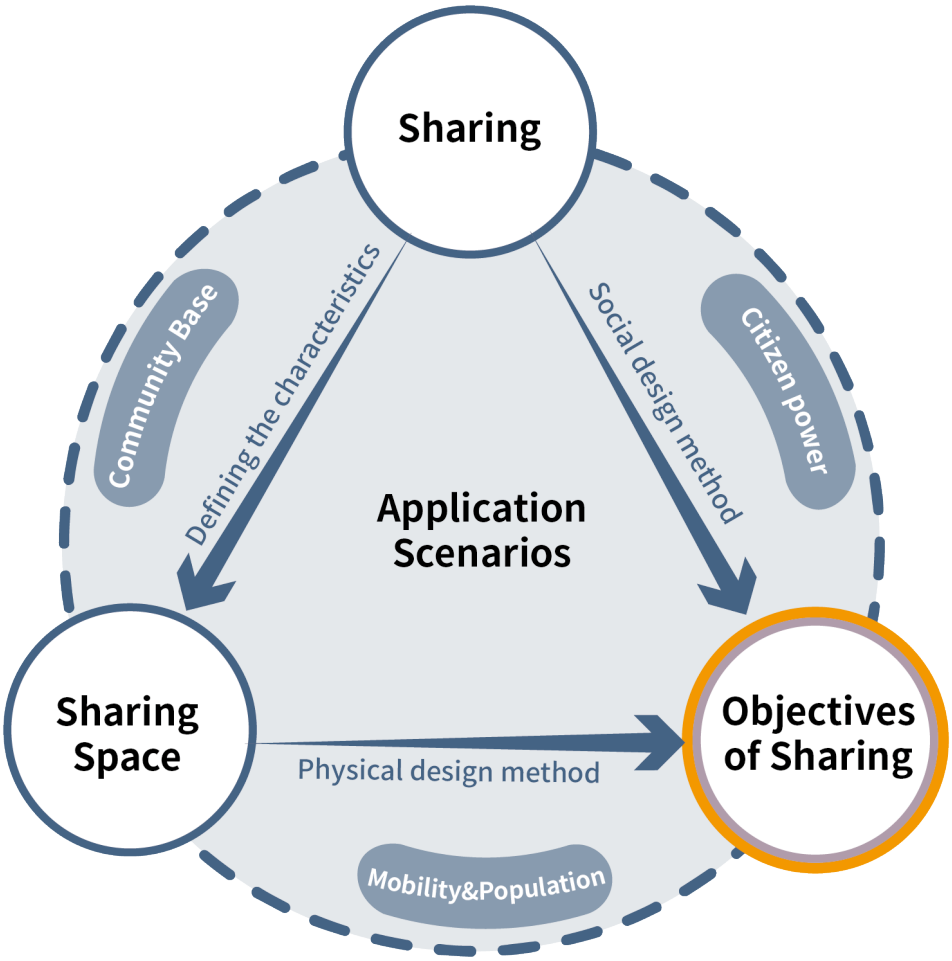


Figure 2-6 The application scenarios of sharing

2.5 Summary

This chapter analyzes the sharing concept and sharing space through domestic and international literature, and clarifies the connotation and characteristics of sharing and sharing space. The general patterns and characteristics of the sharing concept in research and practice in various disciplines are summarized in this chapter. In the field of sharing space, the author organizes the unordered research on sharing space, and summarizes the characteristics and types of sharing space. At the end of this chapter, it analyses the application scenarios suitable for design using the concept of sharing basing on the characteristics of sharing and sharing spaces to assist subsequent designs of sharing.

After a clear understanding of sharing and sharing space, how can sharing be achieved through design? Chan and Zhang used a systematic methodology to propose the design of a sharing system. In the next chapter, this thesis will introduce the analysis and design method of a sharing system to achieve the purpose of designing sharing.

Chapter 3 Sharing by design

3.1 Framework

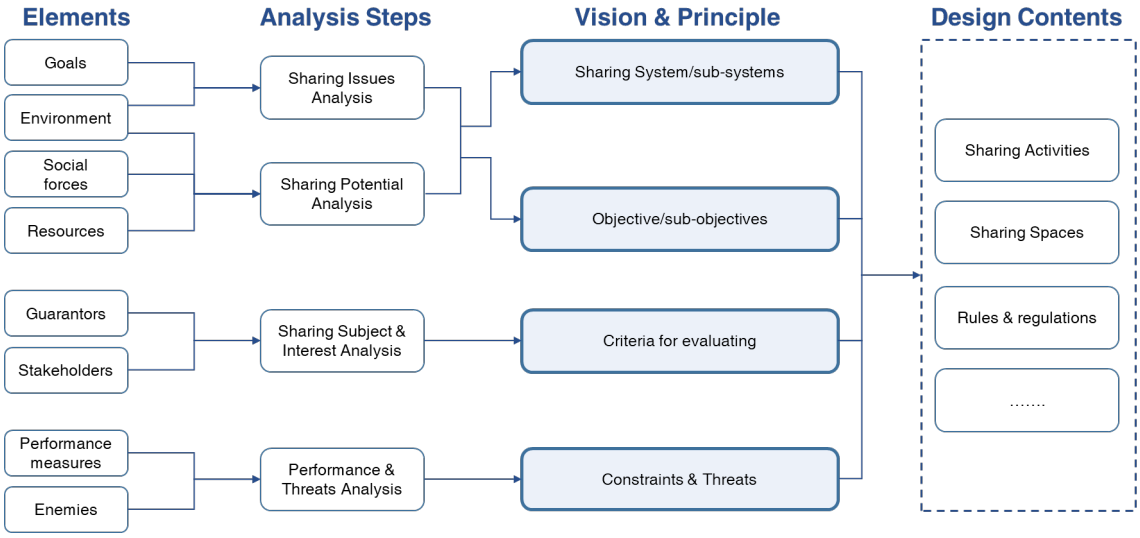


Figure 3-1 Framework of sharing system approach

3.2 Introduction of sharing system

A sharing system is the outcome of design. Sharing system means the 'design by the systems approach' paradigm.

The distinction needs to be made: Shared systems can be defined as systems that provide a broad-based access and usage of a resource that is held in common. Broadly defined, many forms of public infrastructure are shared systems[58]. It has a tendency to suffer from overcrowding and overuse, which can lead to a reluctance to share this common resource. For this reason, a shared system is not yet a sharing system.

Specifically, a sharing system is a social system composed of individuals acting in concert[59]. A sharing system is a structure comprised of interconnected socio-technical components that work together to reinforce and reproduce more resilient sharing behaviors and practices. Chan and Zhang Ye have modeled design method after Churchman's systems approach[60], which is further informed by Meadow's more recent work in systems thinking[61].

In detail, the sharing system encompasses three objectives. Firstly, a sharing system aims to motivate sharing behaviors by developing more effective, efficient, equitable, and

aesthetically pleasing ways to share. Secondly, through the interaction of its components, a sharing system establishes clear and accountable relational procedures—rules, norms, and institutions—to support and sustain enduring sharing relationships. Third, a sharing system enables sharing with, and between, strangers.

3.3 Elements of sharing system

Based on research of Churchman's systems theory, sharing system proposes at least eight general components present in any sufficiently complex sharing system. They are namely, (i) The environment; (ii) Goals; (iii) Guarantors; (iv) Performance measures; (v) Stakeholders; (vi) Resources; (vii) The social forces: major ones include culture, politics and ethics; (viii) Enemies (of the system).

(1). The environment

All systems have a corresponding environment, which is considered an external reality existing beyond the system's boundaries. This environment can vary in terms of stability, complexity, and potential threats[62].

But a sharing system can also respond to its environment proactively. Katrini suggests that a sharing system can leverage on the potentials of a city by making itself more publicly visible near important thoroughfares, or by choosing to situate itself close to other existing amenities that can reinforce sharing[63].

(2). Goals

The goal is the reason of the system, the objective it strives to achieve. Goals can be further categorized into intermediate goals and the final goal. Intermediate goals must be accomplished to reach the final goal, which represents the ultimate purpose of the system.

(3). Guarantors

Guarantors are the failsafe of systems, which can guarantee the persistence of the system. The guarantor can be seeked out or designed. For example, the entity or government overseeing the project can serve as a guarantor or design a deposit system.

(4). Performance measures

It is necessary to establish some kind of measures to evaluate the performance of the system, which can evaluate the system is underperforming, or exceeding the designers' expectation.

(5). Stakeholders

Stakeholders include clients, social groups, the designers of sharing system, the real estate developer and so on

(6). Resources

Shared resources constitute another important component of the sharing system. There are at least three distinctive categories of resources[64]. First, there are resources that are tangible, subtractable, divisible, and also rivalrous in nature. Second, there are resources that are intangible, non-subtractable, non-excludable, and indivisible. For example, sharing news, information, or knowledge are clear instances of such resources. Third, there are resources that fall between the realms of tangible and intangible. An example of this type of resource is physical space. While sharing a limited space typically means having less to share, having more participants share the same space can also bring about a new agency for collectively reshaping the space[65].

(7). The social forces

These 'forces' are actually closer to what Durkheim refers to as 'social facts': ideas, beliefs, and categories that are external to an individual, but can constrain this individual's actions[66]. The social forces include default rules of communities emerging from the system and people's common culture or ethics.

(8). Enemies

Churchman defines 'the enemy' as a consortium of opposites: an enemy is both distrusted and admired; The enemy is, therefore, a legitimate adversary that threatens the system. The enemy represents an opposition to the purpose or the philosophy of a sharing system.

The designers can design for specific defenses by anticipating the enemy's every possible move, or the designers can design for an overall systemic resilience, which can cushion the sharing system against the assaults of the enemy.

3.4 Analytical methods of sharing system

The analysis of how to apply these elements of the sharing system was carried out. According to Chan & Zhang Ye, the following broad design strategies are summarized by using the case of the Joo Chiat community in Singapore as an example[28].

(i) Defining the environment, or the problem scenario.

(ii) Identifying the opportunities for a sharing system within this environment.

(iii) Specifying the goals of this sharing system.

(iv) Identifying the stakeholders of this sharing system.

(v) Identifying the performance measures, and instilling the necessary guarantors for the desired performance.

(vi) Identifying the enemies of the sharing system.

(vii) Mapping out all the above, and, defining how interactions between them could be reinforced with new design interventions, for instance, through the design of a new sharing culture.

This chapter will combine the elements of the sharing system described in the previous section and summarize the design process of the sharing system into the following process.

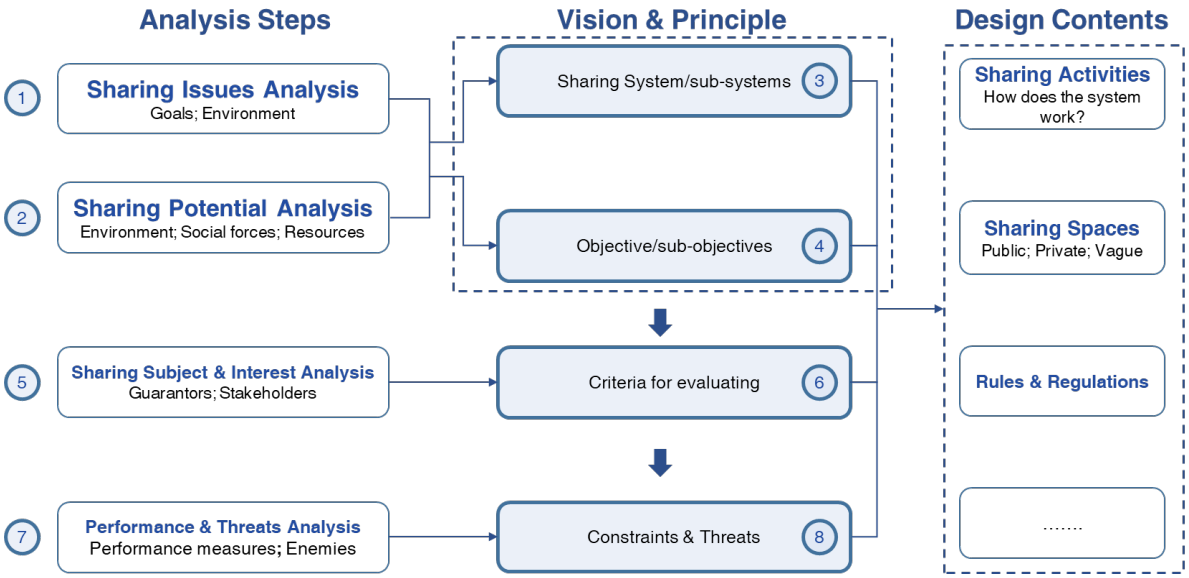


Figure 3-2 Analytical method

First, sharing issues analysis with the elements of goals and environment. Summarize what sharing problems are faced within the site: or what site problems can be solved by sharing. This can be analyzed in several directions of the sharing objectives summarized in Chapter 2, such as inefficient operation of the site, sustainability issues, community construction issues, and so on.

Second, sharing potentials analysis with the elements of environment, social forces and resources. Discovering the elements in the site that are favorable to the generation of sharing

activities, such as environmental elements including good transportation conditions, policy support, etc.; social forces including good community foundation, common culture of the site, etc.; resources including industries with local characteristics, redundant material resources, etc.

After the steps, it can be concluded that the sharing objectives of the site and the intermediate sub-objectives to achieve the final objectives, which solved the sharing issues of the specific site。Also the sharing systems and sub-systems that need to be designed in order to achieve these objective. This is followed by a sharing subject & interest and performance & threats analysis to derive relevant evaluation indicators and considerations to support the operation of the sharing system.

3.5 Design contents of sharing system

In order to better understand how to achieve the objectives and design of a sharing system, this thesis will give some broad examples in this section to illustrate the specific design contents of a sharing system, including the design of the physical space and activities.

3.5.1 Sharing activities design for sharing systems

The creation of a sharing must be supported by stable activities. No matter what kind of sharing space needs to have activities to support its operation. For example, people from different industries communicate with each other in co-working space, and people driven by production activities learn from each other in makerspace. There are also things like sharing gardens that designate different areas to communicate about crop cultivation. The activities are generated through the sharing of the dining room, kitchen, living room, and book resources in the sharing community. These are conscious design of possible sharing activities, and then combine them with sharing space.

3.5.2 Sharing spaces

The Chapter 2 of this thesis has summarized the researches of sharing spaces, and it is a necessary step to select suitable sharing spaces and activities to be combined according to the sharing system and objectives of them predetermined by the site issues [64].

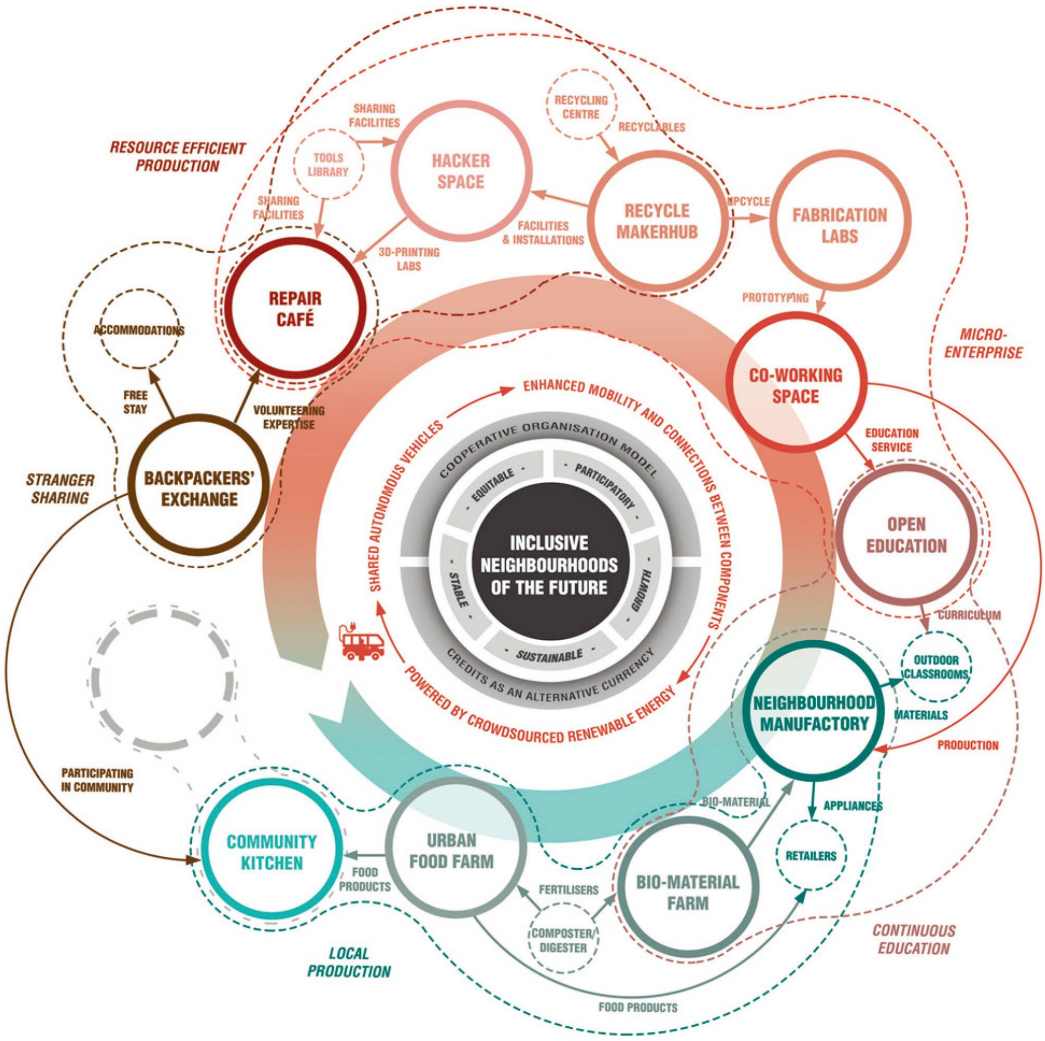


Figure 3-3 A future sharing community or inclusive neighborhood unit[64]

They make a vision of a future sharing community or inclusive neighborhood unit (he argues that there is some connection between sharing and inclusive). They partially classify the connections between existing sharing spaces and abstractly classifies the characteristics of various kinds of unordered sharing spaces. Selecting sharing spaces with the same nature in a suitable site can become a chain effect and agglomeration effect to achieve certain sharing goals. For example, in a community with a sharing working atmosphere, in addition to the core function, co-working space, a repair cafe can be set up to enhance the communication level of the whole community. Fab labs and makerspaces can also be set up according to demands to further strengthen the sharing office atmosphere of the area.

3.5.3 Rules& Regulations

For a sharing system to work well, it needs to be supported by a set of operational mechanisms to ensure a certain level of robustness in the sharing system. The first step is to find guarantors for it and to clarify the responsibility and obligations of each sharing user through rules. Secondly, an evaluation system is needed to assess the operation of the sharing system in due course and adjust it to changing needs.

At the same time, a sharing system often has its own internal credit system. In China's community practice, there is a system like "time banks" that share leisure time and labor to provide mutual assistance and use it when needed. Nowadays, the Internet platform has greatly facilitated the construction of such mechanisms. The popularity of sharing cannot be achieved without the help of the Internet platform, which can catalyze the creation of a sharing atmosphere by making full use of the advantages of the Internet platform, which can be used anytime, anywhere. The use of smart phone APPs, along with the QR code applets that have been widely used in China, can not only improve dissemination efficiency, but also effectively reduce the management and operation costs of sharing spaces. Ensuring fairness and justice within the community in some level.

3.6 Summary

This chapter introduces an analysis and design approach for implementing sharing systems, aiming to address the question of how to achieve sharing through design. It is clear that sharing is more than a purely bottom-up uncontrollable behavior, but can be achieved through design. By analyzing the environment, resources, social forces, guarantees, and other elements of sharing system, conscious design can often achieve more powerful and stable sharing goals. Based on Zhang & Chan's research, this thesis summarizes the steps of commonality analysis for sharing systems in different sites, which summarizes the various elements and aspects of sharing systems that need to be considered. It also summarizes the design elements that need to be carried out to achieve the final goal. This will be a new approach for future sharing design, which will be applied in the case studies and detailed design in Chapters 4 and 5.

Chapter 4 Case study

4.1 Singapore Joo Chiat

4.1.1 Introduction

Joo Chiat is a historically significant mixed-use urban area located near the east coast of Singapore. One notable aspect of the site is the concentration of renowned restaurants and cafés along Joo Chiat Street, which runs north to south through the center of the area. These establishments attract visitors from all over Singapore throughout the year. However, this concentration alone does not indicate economic vibrancy and social conviviality. In fact, Joo Chiat has faced issues such as crime and anti-social behaviors in the past, and it is now a nondescript neighborhood with underutilized historical buildings, neglected amenities, and pocket public spaces. These challenges are further amplified by the increasing gentrification. In essence, the neighborhood is grappling with the need for social cohesion, making it an ideal testing ground for exploring the potential contributions of a sharing system.

The key question underpinning this design inquiry is what kind of sharing system can be created and produced using local resources, in order to transform a historical neighborhood into a socially convivial and environmentally sustainable community

4.1.2 Sharing issues: environment, industries and construction

In terms of the construction environment, Joo Chiat is situated in an old town characterized by a scattered layout of small and underutilized open spaces within the community. As for the transportation environment, the narrow road width resulting from the fabric of small neighborhoods, combined with a bustling commercial setting, leads to high congestion in the area. Moreover, the absence of a metro station exacerbates the traffic issues within the vicinity.

Regarding community sustainability, the restaurant industry in the region generates a significant amount of organic waste. This matter is closely intertwined with food waste and the transportation of ingredients, posing a significant challenge in terms of the proper disposal and management of this organic waste.

Figure 4-1 Narrow streets (Source: Google map)

Community production is in decline. The quantity of local traditional workshops is diminishing, and the traditional production methods that have embodied the town's cultural heritage are dwindling, resulting in the loss of its distinctive cultural qualities. Additionally, the outdated business model of small-scale goods wholesale and retail businesses that once thrived in the area can no longer adequately cater to the demands of a modern city.

Figure 4-2 Joo chiat complex-Traditional market

(Source: Google map)

Based on the above description, it is evident that, firstly, the productive activities conducted within the community have undergone significant changes. The influence of commercialization and gentrification has resulted in the decline of traditional cultural industries and stressing on environmental capacity in the area. Consequently, this has led to a deterioration of the community atmosphere and raised concerns about sustainable environmental issues. Secondly, the historical urban fabric and the construction environment have contributed to more severe problems related to spatial quality and vehicular traffic.

4.1.3 Sharing potentials: tourist, catering, culture

The community boasts a solid foundation. Firstly, the residents in the community share common cultural beliefs, and the presence of numerous religious facilities further strengthens the connection and solidarity among them. Additionally, the community hosts various community groups such as the People's Club, providing ample opportunities for residents to interact and communicate. This cultural cohesion creates a warm and tightly-knit social collective.

Secondly, the community possesses remarkable cultural characteristics and advantageous location. Positioned at the center and recognized as a cultural heritage town, it is gradually gaining popularity as a tourist destination. With cultural museums and specialty local dining establishments, the community offers a rich cultural experience for visitors. These distinctive cultural elements serve as the community's unique calling card, injecting vitality into the area.

Lastly, the community is endowed with abundant resources, particularly in terms of the substantial amount of kitchen waste that can be repurposed. By utilizing these resources in a rational manner, not only is environmental protection promoted, but it also generates economic benefits and employment opportunities for the community. This resource reuse enhances the sustainability of the community and improves the residents' living conditions.

Figure 4-3 Large number of restaurants(Source: Google map)

Figure 4-4 Joo Chiat community center(Source: Google map)

From the above description, it is evident that the transition of the site from a traditional community to a tourist attraction cannot be reversed. However, the site can leverage its abundance of food and catering businesses to design food-themed communities. By utilizing kitchen waste for energy regeneration and establishing community farms to provide relevant ingredients, the community can redefine its productive activities through food-themed sharing activities.

4.1.4 Sharing system: for energy and sustainability

To address the issues of energy waste, traffic congestion, and community decline associated with the site, an analysis of the site's characteristics and potentials is conducted. NUS Arch-Studio proposed the sharing system is a new infrastructure system, whereby food wastes from the entire neighborhood can be recycled and used to produce clean energy to power shared mobility and to activate public spaces. Besides improving energy efficiency and mobility of the neighborhood, the total goal of this system also includes enhancing residents' sense of belonging and fostering community participation by engaging them in both the production and operation of this sharing system. Meanwhile, the production of this system is self-organized within the community, and the credit system based on the Internet platform can enhance participation in community construction.

(1). Sharing subjects and Interests

The community stakeholders are consisting of local residents, artisans, caterers, and tourists. Their interests and demands encompass various aspects, such as the strengthening of community cohesion, the promotion of commercial interests, the preservation of culture, and the enhancement of tourists' recreational experiences. When designing the sharing system, the primary focus is on achieving a balance between cultural preservation and community development, while also establishing a viable commercial framework.

(2). Evaluation system for sharing

To evaluate the performance of the system, the designers judged the sharing system by evaluating the overall energy consumption level of the site afterwards, as well as the level of participation of residents in community involvement.

(3). Threats and Limitations

After formulating the design of a sharing system centered around an energy recovery system, it is important to consider the limitations and challenges that may impact its operation.

Firstly, there are technical constraints to consider, particularly the role of autonomous driving technology and energy reproduction technology in implementing the system effectively.

Secondly, the success of organic waste recycling within the system relies on the willingness of community residents and merchants to actively contribute their organic waste. Ensuring their cooperation is crucial to serving the interests of all parties involved.

Additionally, it is essential to address concerns about the potentials promotion of a wasteful lifestyle once the sharing system is operational. Measures should be implemented to mitigate any counterproductive social effects and prevent the system from inadvertently encouraging wasteful behavior.

(4). Vision & Principle

Table 4-1 Vision & Principle of Joo Chiat

Vision & Principle	*Sharing Infrastructure for Energy*
System	✧ A waste collection system as an integral part of self-driving cars
	✧ An energy generation and distribution system
Sub-systems	✧ A credit system
	✧ A fleet of electrical self-driving cars
Objective	✧ Energy efficiency
	✧ Community participation
Sub-objectives	✧ Enhanced mobility
Constraints & Threats	✧ Waste-to-energy conversion technology
	✧ Battery technology for self-driving cars
	✧ Primarily organic waste
Criteria for evaluation	✧ Overall energy consumption
	✧ Social capital

（Source: Author's transcription from source [64]）

Following the systems approach, 3 sub-systems are proposed. First, a fleet of electric self-driving cars is introduced to provide shared rides for both residents and visitors of the neighborhood. Second, a waste recycling system is conceived that can collect and pre-process food wastes from across the entire neighborhood, and transport them to a centralized digester for electricity generation. Last, the most important is a credit system that allows individuals to cumulate and exchange their credits gained from contributing food waste for free shared rides and free use of public facilities. In the whole system, the credit system plays a central role of incentivizing residents to make sufficient and sustained food waste contributions, so that they can continuously enjoy the communal benefits.

(5). Sharing activities

This case designs a sharing system，which is a waste collection system for energy generation and distribution, in order to achieve the objectives that energy efficiency, community participation and enhanced mobility.

In summary, the primary function of the sharing system is to generate clean energy by recycling organic waste within the community and processing it in the sharing infrastructure, specifically through bioelectricity generation. The second aspect involves utilizing this clean

energy to power shared self-driving cars, thereby enhancing accessibility within the community. The third aspect focuses on utilizing the natural fertilizer derived from the by-products of biopower generation to cultivate produce in the community's unused green spaces, providing natural and local food to the community. Additionally, the sharing system incorporates a credit system within the community, replacing traditional currency as the foundation for transactions within the system.

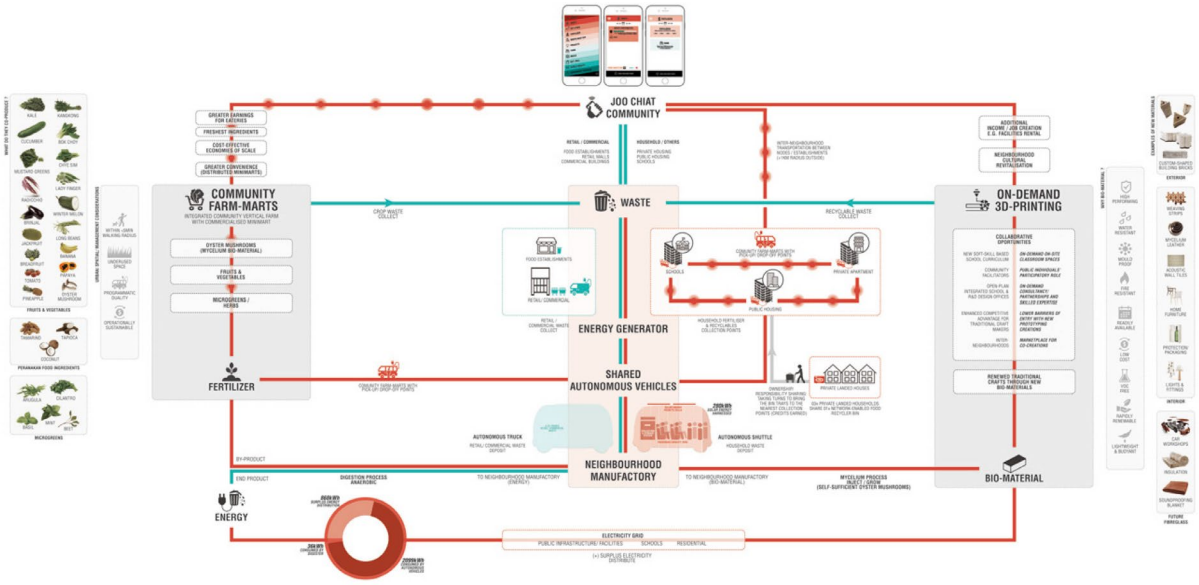


Figure 4-5 Sharing activities of Joo Chiat[64]

Conceptually, the scheme connects waste management, energy generation, shared transport, food production, bio-material production and on-demand manufacture, creating a series of hybrid platforms that link production and consumption programmers (sharing economy activities).

The credit, an alternative currency, is introduced to facilitate exchanges among programs within and across platforms. Community residents have the opportunity to earn credits by contributing bio-waste, assisting in bio-waste collection, and participating in farm cultivation. These credits can be redeemed for various benefits, including access to clean energy, agricultural products, usage of autonomous cars, and more.

4.1.5 Layout of sharing: scatters sharing facilities

In this scheme, the core sharing functions, such as bio-manufacturing laboratories and

bio-power generation centers, are strategically located in centralized areas. The facilities for collecting and distributing sharing resources, such as waste collection points and community farmers' markets, are dispersed throughout the community, utilizing unused spaces within the site. In summary, the layout of sharing spaces revolves around the central sharing infrastructure, with other sharing spaces arranged in a decentralized manner.

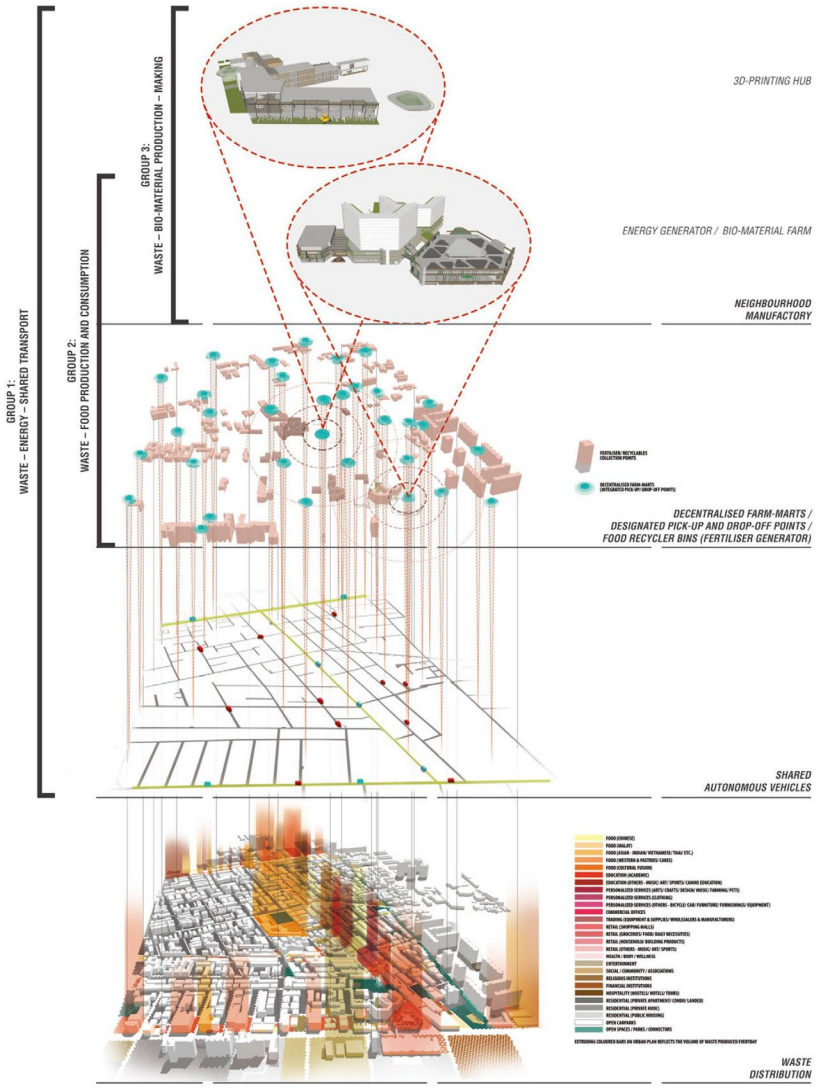


Figure 4-6 Layout of sharing function[64]

4.1.6 Space design: sharing the unused spaces

(1). Public properties

Sharing infrastructure：

At the north end of the site, there is a shopping mall named Joo Chiat complex, known as

Zhanghua Market in the last century, which mainly sold products with local characteristics and gradually became a wholesale market with outdated business as the times progressed. The planning is to eliminate the old and outdated wholesale market with top-down renewal measures, and to transform Joo Chiat Complex into a community factory and farmers' market with energy recovery.

Figure 4-7 Joo Chiat Complex transformation[64]

Street：

The designers designed the flow of the automated vehicle, specifying fixed pick-up stations and routes for picking up visitors and transporting bio-waste.

Figure 4-8 Sharing street in Joo chiat[64]

(2). Explore the controversial property rights space

Community Green Space：

The design makes full use of bio-fertilizer by exploring unused community green space to transform it into community farmland, which is jointly maintained by community members.

Unused space：

By exploring not-well-used pocket public spaces，such as leftover corners of open car parks and empty plots behind public housing blocks. Some are also integrated to public facilities, like temples, mosques, schools and community clubs. Then, place the farm marts on these idle spaces. the farm marts are more or less evenly distributed across the entire neighborhood, forming a network of food production and consumption.

Figure 4-9 Community farm around streets[64]

4.2 Cobercokwartier

4.2.1 Introduction

Cobercokwartier comprises a new mixed-used district at the former Coberco dairy plant in Arnhem, which is a quadrangle area bounded to the north by Westwater Sedic. The area is located outside the Singur area in central Arnhem. This used to be a dairy farm. Most of them have now been demolished. Here, buildings with no concrete future value were demolished, leaving large open spaces. Buildings of cultural and historical value are preserved, awaiting new uses.

At the end of the 18th century, the first industry appeared here in the form of sawmills. The industry existed in various forms throughout the 19th century. In the early 20th century, a power station was built in the southern part of the area. Around 1920, the Camitz Dairy Farm was established in Westwater Seddick. In 1944, the power station buildings were severely damaged and demolished, and the site of the power station was used to expand the dairy farm.

In 2008, an urban planning shown Cobercokwartier offers a diverse living environment for different people groups, with commercial facilities. Part of the existing factory will continue to exist, and a suitable scheme for the creative industrial is being sought. The rest of the area will be re-filled and the new building will consist mainly of residences. In several parts of the building, it is possible to realize commercial functions or a combination of living and working.

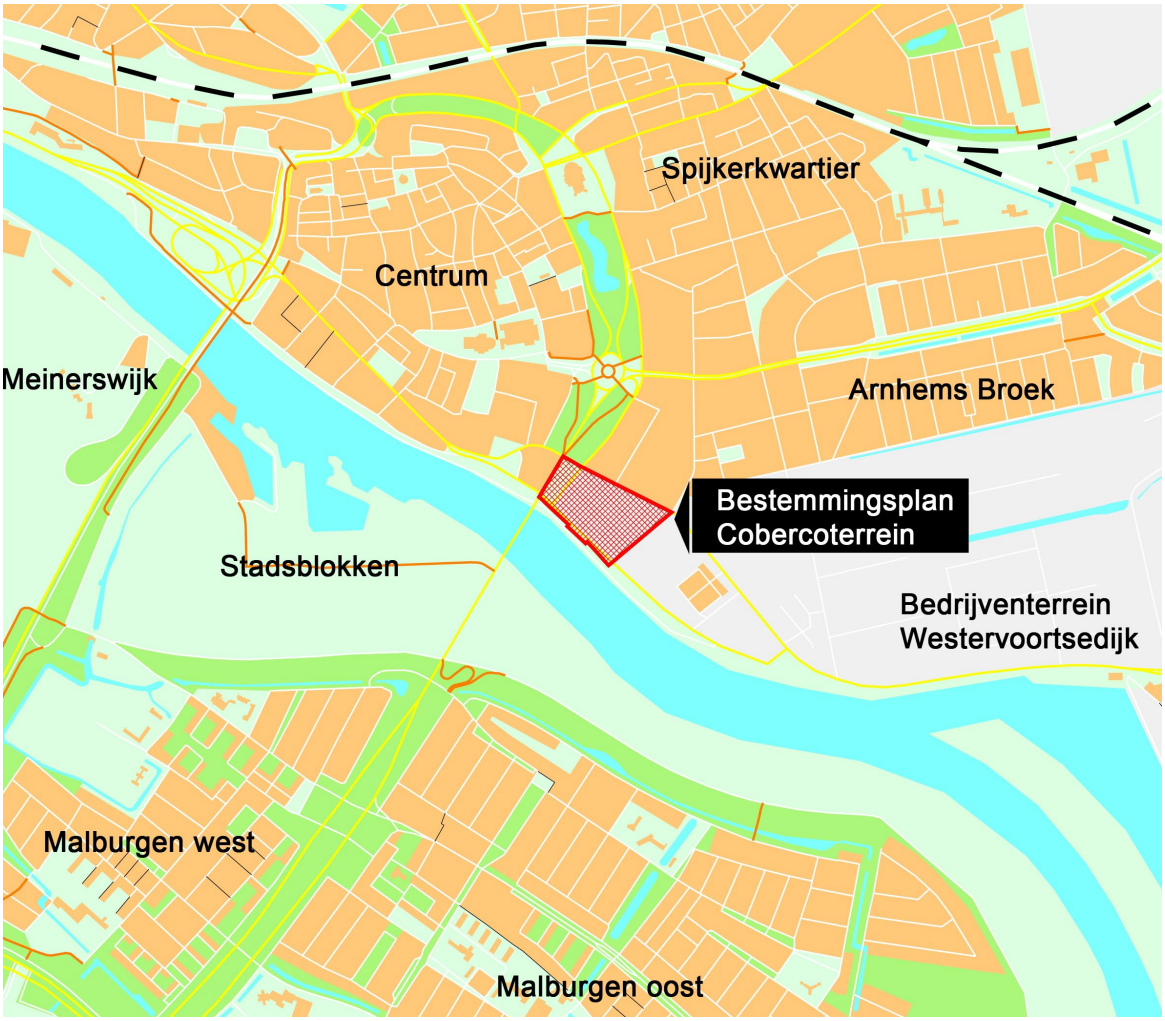


Figure 4-10 Location of Cobercokwartier (Source: https://geo1.arnhem.nl/)

4.2.2 Sharing system: sharing community with industrial heritage

(1). Sharing potentials: creative, heritage, community

Because the project itself primarily involves the construction of a new district, most of the existing buildings have been demolished and there is currently no resident population or established community. As a result, it is challenging to generate a sharing environment among the community at this stage.

However, within the site, the industrial heritage of the milk factory has emerged as a gathering place for the creative class, providing a solid foundation for creative industries. In the development framework, it is proposed that a key focus for the future development of the Coberco area is to create a designated space for the creative class. The old factory can be repurposed to accommodate creative enterprises, with a particular emphasis on attracting

three types of creative industries: creative business services, applied arts, and autonomous arts, with the aim of attracting investment in these areas.

In the future, the site is defined as a mixed community with work, life, and leisure functions, and creative industries will be a very important industrial base.

Figure 4-11 Old milk factory(Source: https://geo1.arnhem.nl/)

(2). Vision & Principle

Table 4-2 Vision & Principle of Cobercokwartier

Vision & Principle	*Sharing Infrastructure for sharing community*
System/ Sub-systems	✧ A sharing community that integrates creative work, leisure and living ✧ A diverse factory that integrates community leisure activities with the creative class ✧ A system of sharing walking space without cars
Objective/ Sub-objectives	✧ Community participation Sustainable transportation/Green transportation
Criteria for evaluation	✧ Amount of carbon emissions ✧ Social capital

（Source: Author）

While providing the required number of residences, the proposal hopes to integrate the highest degree of potential residents with the creative class, while making good use of the industrial heritage to become an urban creative centre.

4.2.3 Mixed used sharing infrastructure

Figure 4-12 Overview(Source: Studioninedots,2017)

Milk factory industrial heritage is transformed into a creative class-sharing center. it can provide a collection of co-working offices and a place to hold art exhibitions. It also provides the community with a creative bazaar and a meeting place for customizable events.

Figure 4-13 Sharing infrastructure(Source: Studioninedots,2017)

4.2.4 Community units filled with sharing space

Mixed sharing community units. For the design of the sharing community, the scheme divides the residential lots into several 100m*100m units and proposes the concept of Cityplot which is a model of sharing community. Cityplot proposes compact, flexible city blocks composed of small-scale, mixed-use developments with differing typologies, users and functions. Not only does it provide the flexibility to accommodate diverse building typologies, but it also

allows for opening up the block from the street as well as internally. This dynamic process combines self-build projects with social housing, work/home units and social hubs, bringing together individuals, collectives, investors and small-scale developers, resulting in a more inclusive and shared form of development. For example, it provides 30% of the apartments for rent and a mix of office and residential lofts to attract the creative class. This means that a significant number of diverse owners will share many spaces in a small lot, with the density of the population ensuring efficient use of space. With its flexible grid and gradual development model, Cityplot is designed to be more receptive and adaptable to change. It can adapt to the changing needs of different people and lays the foundation for space sharing.

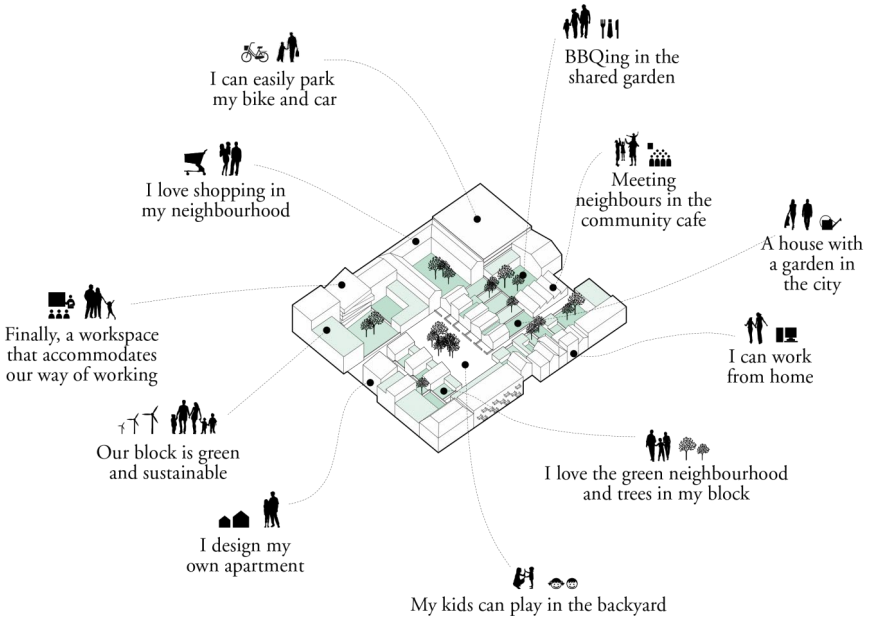


Figure 4-14 Cityplot concept (Source: Studioninedots,2017)

Figure 4-15 Different residential products(Source: Studioninedots,2017)

Edge space

Creating a sharing slow walking system without cars. Since the site is connected to the city only by the north side of the carriageway, the scheme proposes to create a purely slow travel system with no cars on the site. The design of the open space such as the foot path between buildings is shared. After maintaining the minimum width of each pathway, the rest of the space is designed and used by the neighboring owners, which called Margezone, to link the interior and exterior of the building.

Figure 4-16 Street control (Source: Studioninedots,2017)

Landscape design

In addition to the centralized green space along the waterfront, the natural landscape is extended through the sharing use of negative building facades, second floor terraces and other ambiguous property spaces to form a unified green space system.

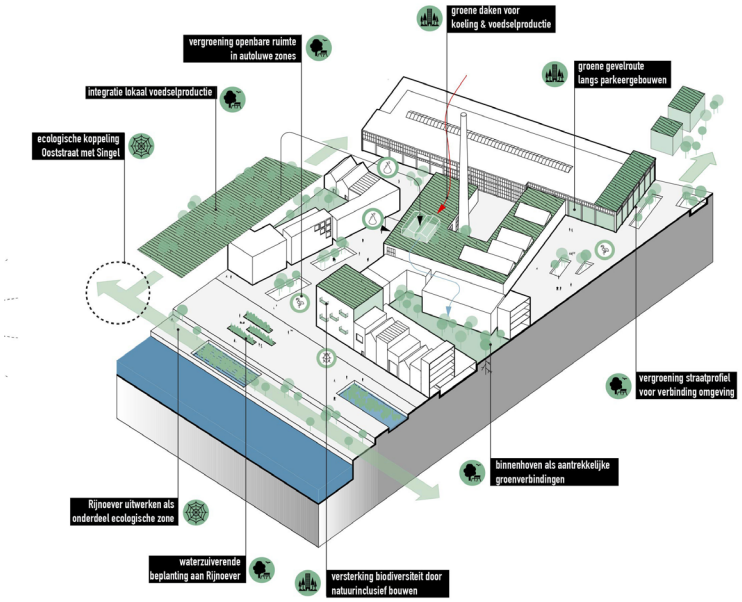


Figure 4-17 Green land system (Source: Studioninedots,2017)

4.3 Summary

The case studies conducted on older and new construction communities demonstrate that the majority of sharing scenarios occur within the community. One of the key objectives of sharing is to strike a balance between the interests of different groups within the community. This ensures that individuals with diverse needs within the site can benefit from the sharing system, thereby promoting social integration to the maximum extent. This is exemplified by the case of Joo Chiat's catering industry and the community's residents, as well as Cobercokwartierr's local creative population and the residents of the new city. Each group employs its unique approaches to achieve their sub-goals, thus contributing to the overarching main goal.

Regarding the system design, the emphasis is placed on establishing an intrinsic implementation mechanism and developing a sharing economy platform within the community through the introduction of a CREDIT system.

In terms of space design, the Joo Chiat case study provides a layout model for sharing functions, emphasizing the centralization of most important sharing facilities and utilizing underutilized spaces as channels for sharing to permeate throughout the community. Similarly, the Cobercokwartier case study offers valuable insights into specific space design considerations, such as the design model implemented within community units.

Table 4-3 Summary of sharing strategy

	Sharing Strategy	Joo chiat	Cobercokwartier
Internal Mechanism	Community sharing production mechanism	The credit of sharing system	—
	Co-construction model	—	Ensure the diversity of functions and people through the subdivision of lot development
Space Design	Layout of sharing facilities	Centralize sharing production facilities and decentralize the facilities used to deliver sharing resources	—
	Sharing Infrastructure	Sharing infrastructure that integrates clean energy production and community farmers' markets	Sharing infrastructure that integrates creative activities and community life
	Utilization of fragmented space	Converting unused space into a sharing market	Ground floor roof shared as open green space
	Sharing Streets	Integrating autonomous driving into sharing streets	Designating car-free streets
	Sharing residential community	—	Cityplot community model

Chapter 5 Applying sharing systems approach in Changban

5.1 Overview

(1). Introduction

The research and design area of this thesis is located in Changban Village, Tianhe District, Guangzhou City, Guangdong Province, which is well located, adjacent to resources from high-level academic institutions such as South China University of Technology, and situated near a city subway station, and the land in the site is mainly composed of village residential land and village collective economic land. The old industrial park and the old urban village community have become the dominant function of the site, which does not match the advantageous location function of the city center. Recently, it has been designated as the area within the Peri-wushan innovation area, and the future will be dominated by the development of innovative and creative industries to help urban development. The region possesses abundant resources of innovative talents, with great potential for development, and holds the potential to become the cradle for high-quality talents in Guangzhou.

Figure 5-1 Location analysis

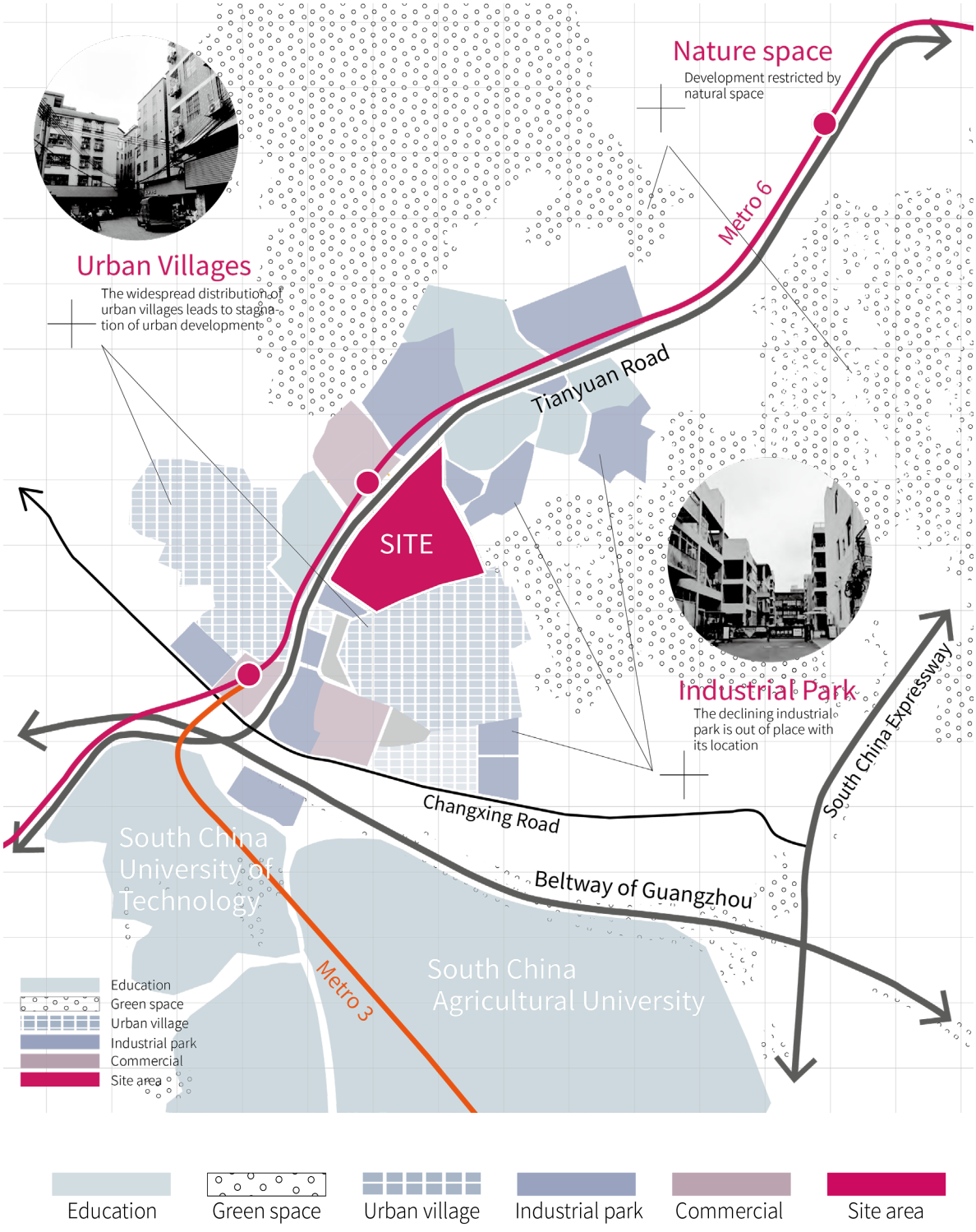


Figure 5-2 Location analysis from mico sacale

Transportation: The area is adjacent to the Tianhe Passenger Terminal, with the two main urban roads of Changyuan Road in the east-west direction and Tianyuan Road in the north-south direction as the main roads for external traffic, among which Changyuan Road overlaps with the Guangzhou Ring Fast Road. The secondary roads are Changxing Road and Yuangang Cross Road, etc. The density of secondary roads is very low and cannot form a network system. Inside the research area, because the land belongs to the village collective property rights, it has disorderly traffic system and poor accessibility.

Function and construction: Compared with Tianhe District, the urban construction level around the site is low and the construction quality is poor. Because it is adjacent to various urban villages, the proportion of village collective industrial land and village residential land is large. At the same time, because of the early development time of the site, there is a general problem of aging buildings. Secondly, a large amount of natural space remains in the surrounding area, such as South China Botanical Garden and Huolu Mountain, which restrict the continued development of the area and make it a fringe area of the urban center. The urban construction quality along the two main roads is better, configured with modern residential communities, commercial plazas, business office buildings, schools, government buildings and other functions. But there are also a large number of industrial areas and urban villages. It is worth mentioning that many old industrial areas in the area have been replaced by creative industrial parks with office functions. In general, the area is relatively negative and inward-looking, and fails to form good interaction with the city.

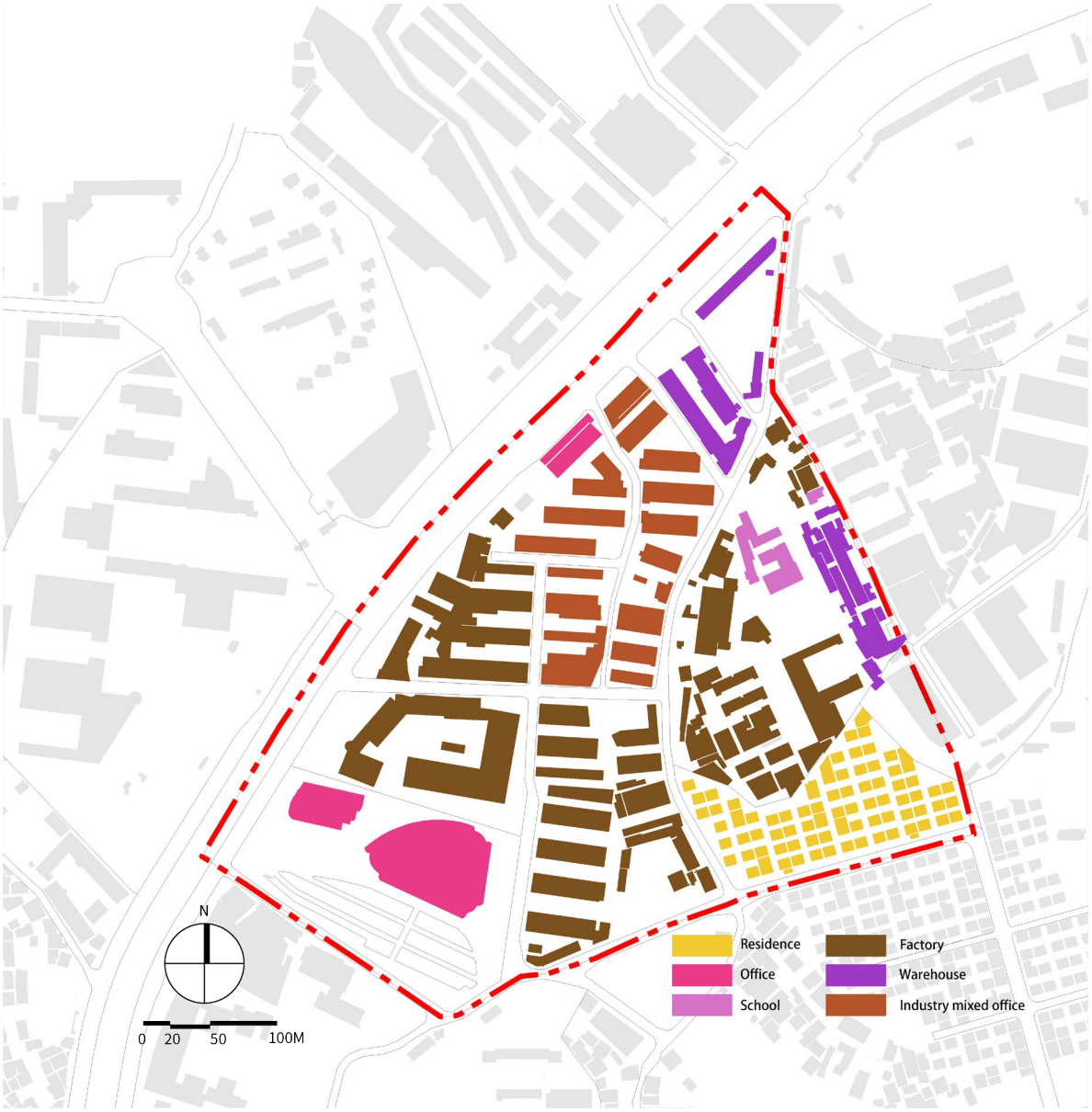


Figure 5-3 Building function

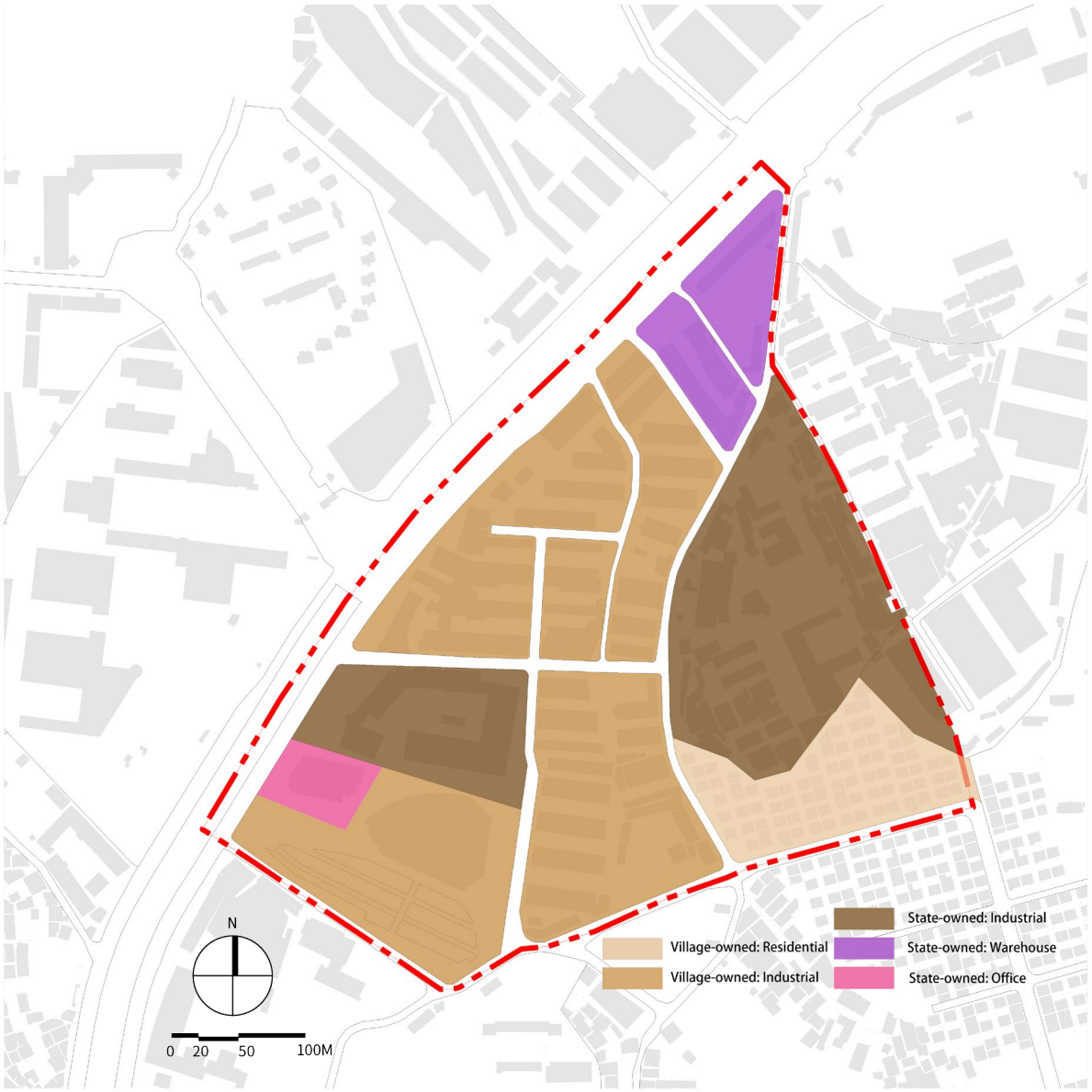


Figure 5-4 Land property analysis

(2). Feasibility analysis

According to the shared application scenario described in Chapter 2, the qualities of the site are initially evaluated. To begin with, it is noteworthy that a considerable proportion of the site's property rights belong to the village collective, which possesses impressive financial reserves and has previously demonstrated its ability to independently renew the site. This provides strong evidence of the site's significant citizen empowerment. Meanwhile, the inhabitants of Changban New Village exhibit greater stability. This is primarily attributed to

the fact that most of the villagers constructed their own residential buildings in Changban

after 2000. According to a survey conducted by Deng Yanhong, the majority of residents in the new village are local villagers, thereby establishing a sense of community and commonality within the area[67]. Additionally, due to its good location, proximity to universities with abundant sources of talent, and affordable rent, the area experiences substantial population mobility and density. In summary, the site conditions are good for sharing application scenarios.

5.2 Issues of sharing scenarios

5.2.1 Inefficient use of land resources: construction quality does not match the locational land value

(1). Low construction quality

The overall building quality is substandard, and the industrial area predominantly comprises of aging factory buildings from the previous century, primarily utilized for storage and foreign trade garments. Other functions in the site, such as the private school that will be abandoned after failing the audit, the abandoned dormitory of Guangzhou Electronic Components Factory, agricultural market, etc., which do not match the future positioning of the site and the advantages of the location. As a part of the urban machine, the site is running extremely inefficiently , so it is urgent that the site needs to be renewed.

Table 5-1 Current construction

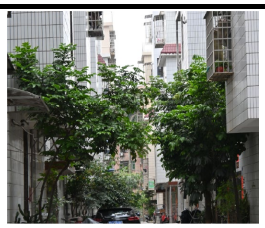
Location	Pictures		Characteristic	Value
			Use: Residence Floor levels: 3-5 High density High price of land	High
			Use: Industry Floor levels: 1-3 Dilapidated Isolated	Very low
			Use: Industry Floor levels: 2-3 Dilapidated Vacant	Low
			Use: Industry & Office Floor levels: 3-4 Industrial heritage Best location	Low
			Use: Office Floor levels: 5-7 High price of land High quality of buildings	High

Figure 5-5 Quality of buildings

(2). Low development intensity

Calculating the current construction intensity, it can be seen that the overall construction intensity is low, with relatively high construction intensity in the northern industrial area, the southwestern office buildings, and the residential buildings in the southeast corner of the urban village, which can be considered for preservation in future development. The low development intensity, combined with the large industrial area, means that the cost of site regeneration is low and the possibility of overall regeneration is high.

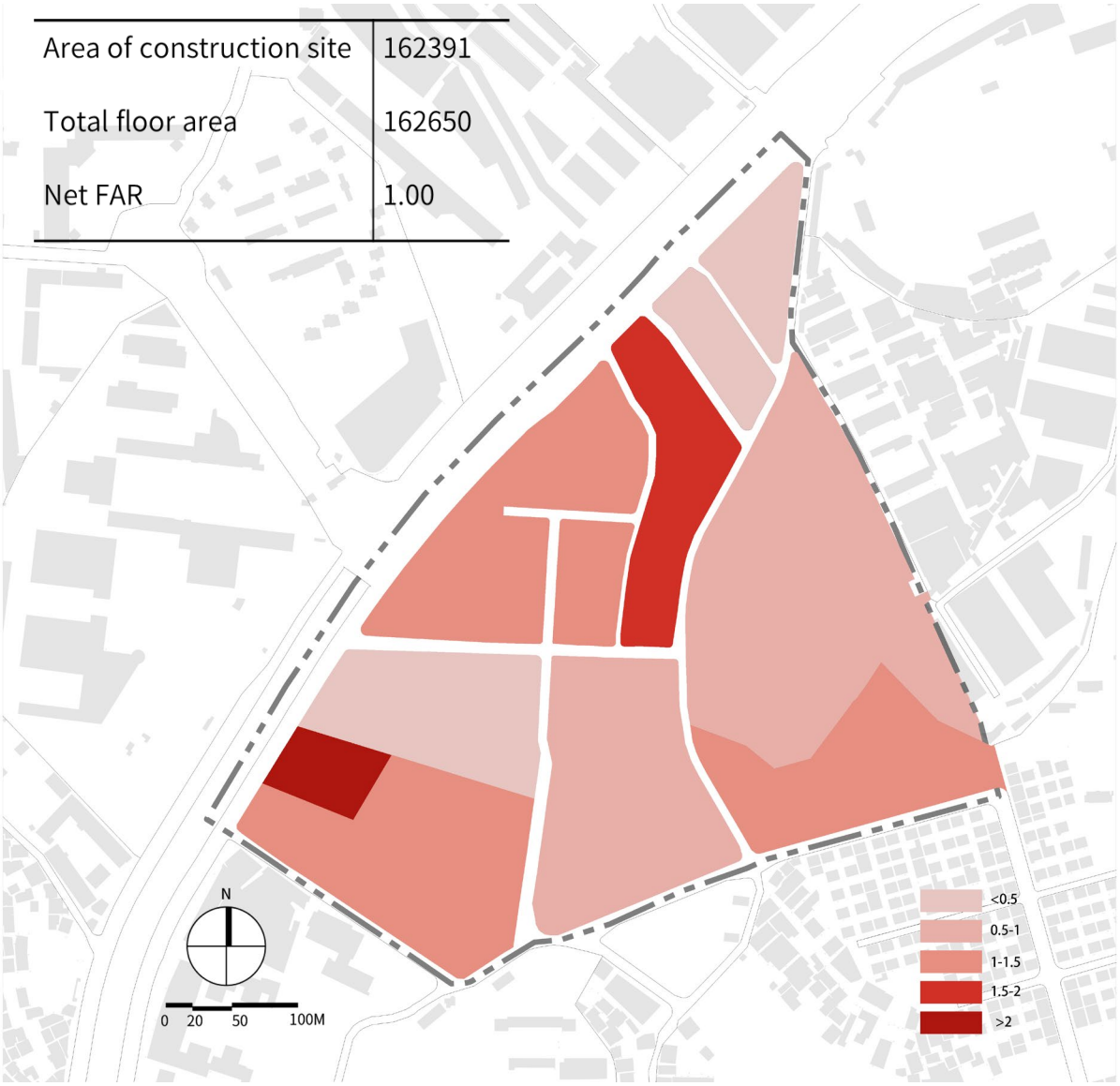


Figure 5-6 Current development intensity

5.2.2 Inefficient use of transportation resources

There is a Changban Station of Guangzhou Metro Line 6 on the site. As we all know, the subway station as an important resource for urban development, since the introduction of the TOD development concept (), urban construction using the subway station to do development has become a consensus. However, the utilization of subway station in the site is extremely low. It is reflected in the poor accessibility of the building groups in the site to the subway station, either the dead end road cannot reach the subway station or it is blocked by the fences. At the same time, the high-value land along the Changyuan Road section is occupied by dilapidated temporary buildings, and separates the industrial area of the site from the city, resulting in a waste of urban traffic and land resources value.

Due to the above traffic problems, the connection between the site and the subway station has also become a great problem, of which the inability to access it by foot being the most prominent problem. In addition, due to the access control system of the industrial park, only pedestrians and cars are allowed to enter, and electric bicycles are not allowed. The problem can be seen from the large number of shared bicycles parked outside the park.

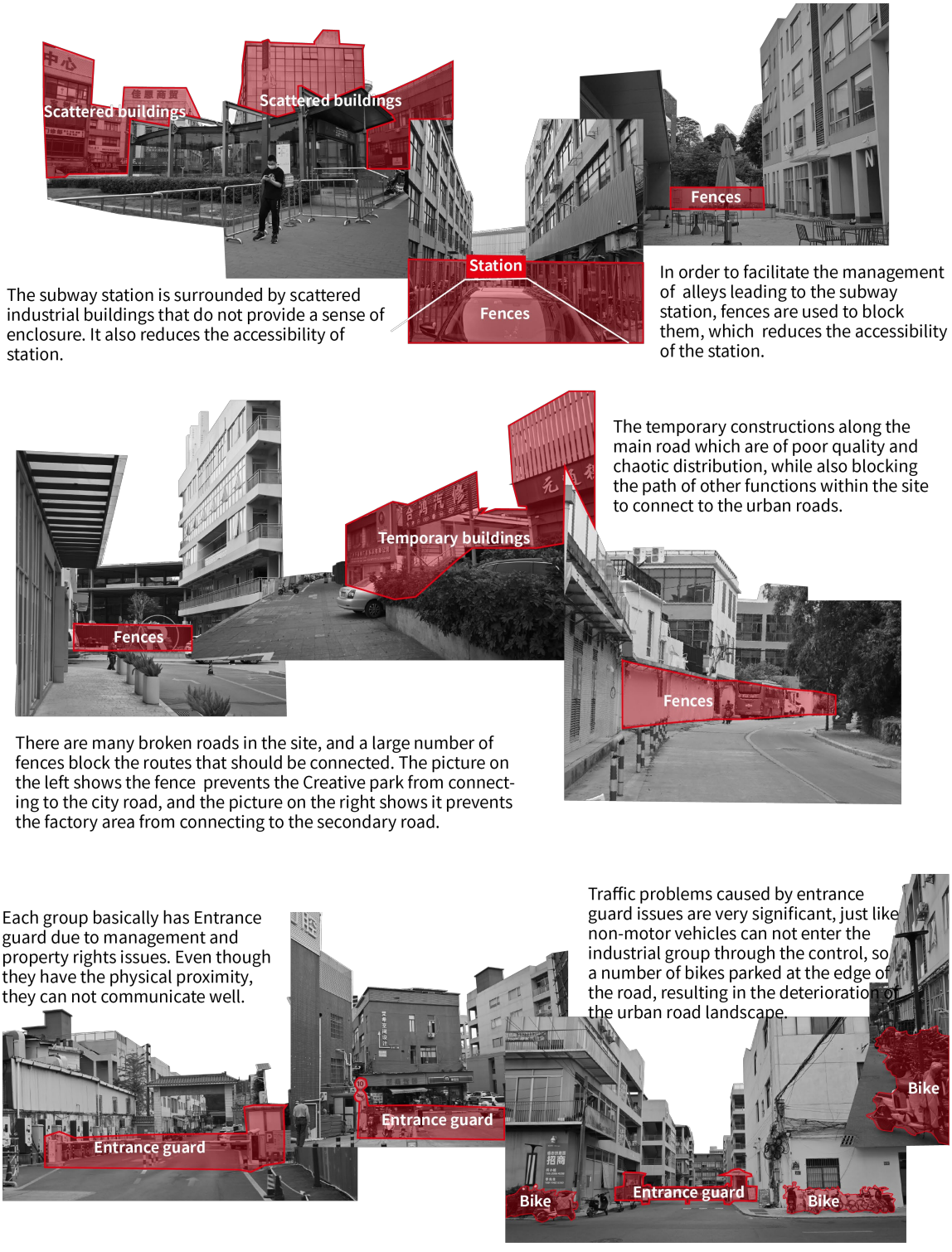


Figure 5-7 Analysis of accessibility

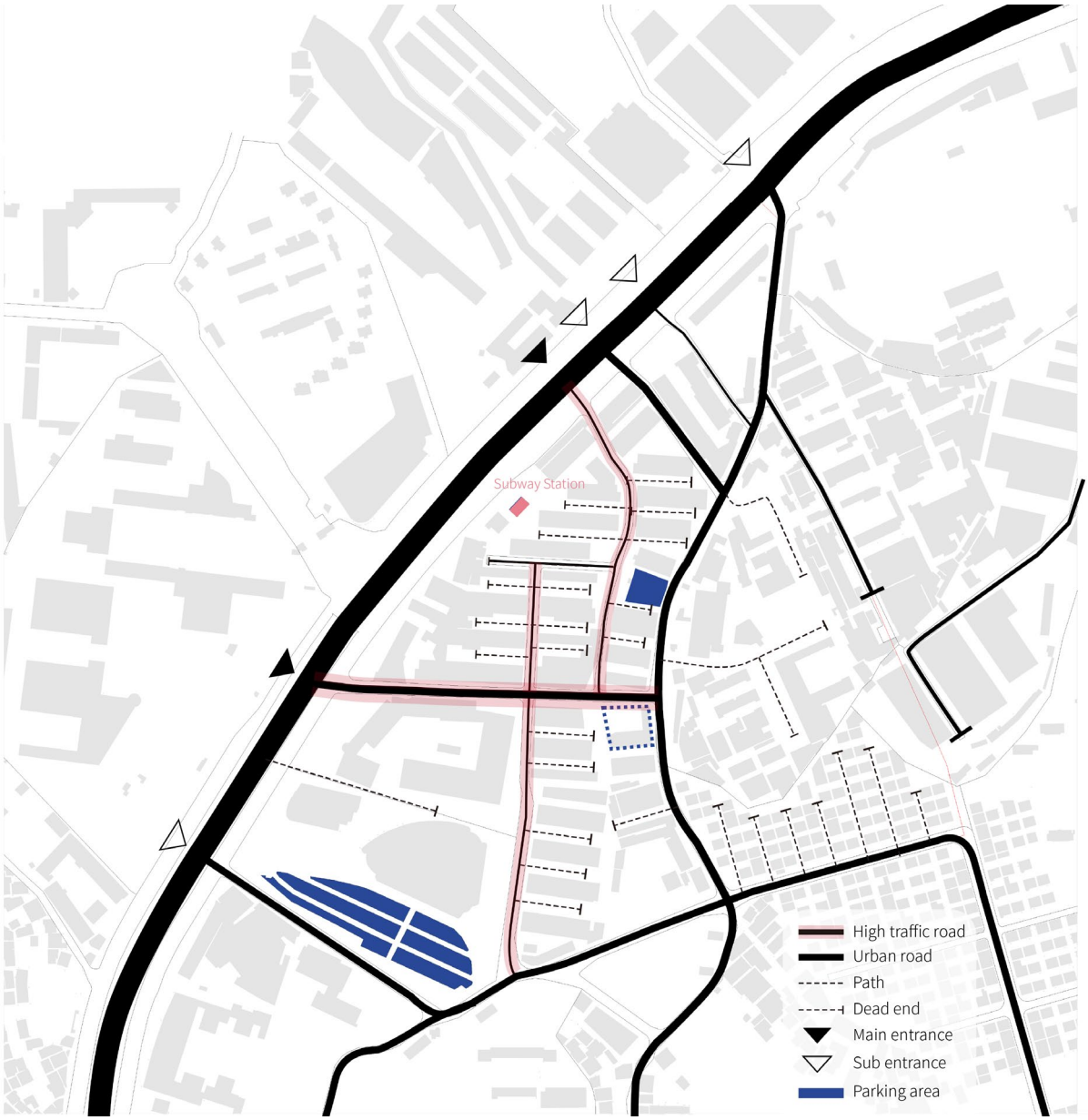


Figure 5-8 Traffic analysis

5.2.3 Community construction issues

The construction and atmosphere of the community is the most serious and obvious problem of the site. First of all, because the village collective leased the village collective economic development land to other properties in a simple rental contract, the Changban village collective was the hands-off manager, resulting in many isolation problems. Firstly, because the access control system of each industrial park prohibits the entry of two-wheeled transportation (which is the main means of transportation for villagers), making the boundary between Changban Village and the industrial park extremely clear and physically isolates the communication between the two groups. At the same time, due to industrial upgraded, there is

a huge gap between the trajectory of daily life activities between the villagers and the creative class that is gradually increasing in the industrial park. The industrial park can only serve as a workplace for the creative class but not as a place where life activities take place. At the same time, there are great differences in the portraits of people, including economic status, lifestyle, education level, and so on. From observing the trajectory of people's daily life, we can see that, on the one hand, villagers enjoy the land dividend, but they cannot actively integrate into the creative industry because of their education level expertise, on the other hand, the creative class can only get the lowest level of living service because of the low land rent.

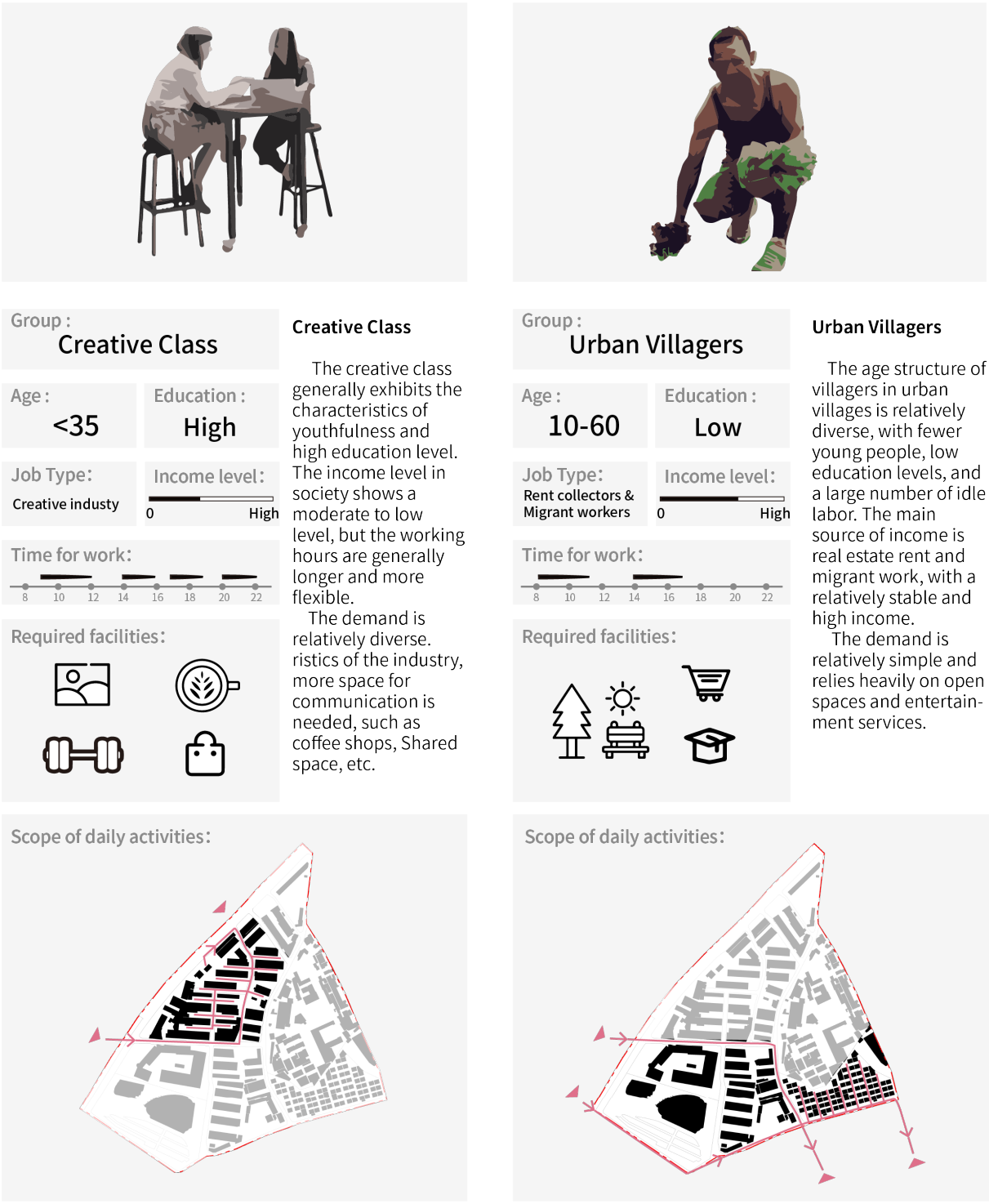


Figure 5-9 Portrait of crowds

In detail, in Changban Village, the foreign population is concentrated in the old village, while in the new village, located in the site are mostly local residents, the age structure is more diverse, fewer young people, low education level, and idle labor. Their income is mainly from estate rentals and working outside. For those landlords, their income is relatively stable and

higher than creative class. The needs are simple, relying on open space and entertainment services. In general, the most distinctive feature is that the villagers' collective is a collective with an amount of capital and idle labor but with a very homogeneous leisure life.

Since the occupancy rate of creative enterprises on the site is not high, it is necessary to study the general characteristics of the creative class in order to have a better grasp of the characteristics of the creative people who will gather on the site in the future. The concept of the creative class was first published in Richard Florida's book "The Rise of the Creative Class". The creative class is comprised of two groups of people: professional creatives who come from business, finance, law, education, and health industries, and they are knowledge-based professionals. The other group, which we refer to as the "creative core," includes scientists, engineers, mechanics, inventors, researchers, as well as artists, designers, writers, and musicians[68]. According to Richard Florida and Xingyue Zhang, from a case study of a new industrial park, the innovative and creative class is characterized by a younger age, higher education, generally higher work pressure, and a greater demand for communication space[7,9,68].

The creative class is typically characterized by their youth and high levels of education. While their income level in society may be low to medium, they tend to work longer and more flexible hours. Their needs are relatively diverse, and based on industry characteristics, they require ample space for communication, such as coffee shops and shared workspaces. Moreover, their demand for living facilities is diverse and avant-garde.

At the same time, by observing the activity routes which shown in the figure, it becomes evident that the travel paths of creative office workers and local residents within the site are almost entirely isolated from each other. This severe physical separation has effectively eliminated opportunities for communication between the two groups.

In conclusion, the distinct characteristics of these two groups and the spatial segregation have contributed to a significant separation between the creative class and the villagers, ultimately resulting in the stagnation and deterioration of community development.

Other common problems

For the residents of Changban New Village, the village primarily serves as a residential area with an extremely high building density, lacking activity spaces and offering a subpar quality of living. Through interviews, we discovered that the only recreational options for villagers during their leisure time are Changban Park located outside the site, as well as the assembly place and mahjong hall in the old village. However, there is a shortage of nearby resting spaces for them.

As for the industrial park, it also suffers from a single-function issue, inadequate industry-related services, and a poorly designed layout that fails to meet the living and production needs of the creative class. There is an urgent need for a transformation of the physical space environment.

5.3 Potentials of sharing in Changban

5.3.1 Facilitating overall regeneration: the upper level planning and policies

(1). Peri-Wushan innovation area

First of all, the policy of the Peri-wushan innovation area is proposed to provide policy support for the transformation of the site into a creative and innovative integrated industrial zone. As part of the future regulatory plan, an urban renewal strategy has been formulated, indicating that the government will provide financial resources for the site's construction.

Furthermore, the presence of abundant knowledge and talent resources from nearby universities will serve as a catalyst for the site's development. For instance, South China University of Technology is gradually relocating established university-affiliated enterprises to surrounding urban areas, facilitating the sharing of knowledge and the release of talent. This presents an opportunity for the site's development and ensures a future influx of the creative class.

Figure 5-10 Peri-Wushan innovation area(Source: Guangzhou government)

(2). Guangzhou Municipality Supporting the Work Measures of Promoting High-Quality Development through Integrated Land Making

In Guangzhou, the issues of urban villages is a major and widespread challenge, and the

process of its transformation is serious, important and necessary. In order to solve these problems, the Guangzhou Municipal Government has implemented a series of renewal programs, but the previous renewal model was costly and unsustainable. The traditional land acquisition model, in which land is traded through tenders in the land market, has many obstacles to the renewal process, as it needs to ensure a balanced and profitable economic performance within each piece of land.

Recently, the Guangzhou Government issued the "Guangzhou Municipality Supporting the Work Measures of Promoting High-Quality Development through Integrated Land Making" (广州市支持统筹做地推进高质量发展工作措施，hereinafter referred to ‘land making policy’)to promote the land making policy and restart the renewal of urban villages, in which the key areas of the city will be the pilot areas. As one of the four key areas, the Peri-Wushan innovation area has now been included in the scope of integrated land making.

Integration of Costs and Benefits within the Key Area.

The key difference between the land making mode and the traditional land acquisition mode lies in the balancing of the costs and benefits in an integrated area, which includes the integrated consideration of resettlement, compensation and financing, without the need to get an economic balance on a single land. In principle, the land making work is carried out in accordance with the land preparation mode of the district, where the district is designated as a relatively independent and well-functioning land development unit with the objective of integrated development. A land development area is led by a land development body. The land-making body is a wholly-owned state-owned enterprise, which ensures the government's ability to coordinate the work.

The mode of land making is divided into four major categories, rail station complex development project, public welfare project, urban renewal project in old villages renovation, and integrated development project. Different projects are allowed to subsidize each other within the area, such as the profit of the station complex project to supplement the funds of the old village regeneration project.

Land making policy significantly unlocked site regeneration opportunities and allowed for flexible overall development within the research scope. As an early demonstration anchor of

the Peri-Wushan innovation area, it can be supported with a certain degree of flexibility in terms of economic feasibility.

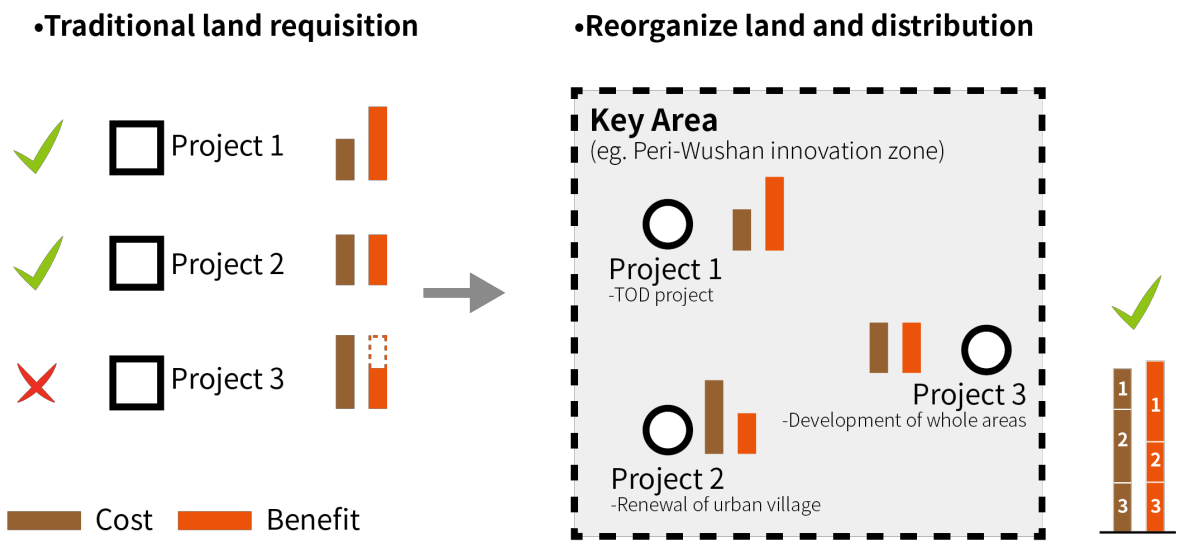


Figure 5-11 Differences between traditional land requisition and land making mode

5.3.2 Foundation for creative industries

Analyzing the business landscape centered around the site, it can observe an abundance of creative industrial parks in close proximity, indicating a high density. The power of clusters is great for any industry. The result is indicating that the site has a good population base of creative class, and a good creative and innovative atmosphere, which is very suitable for the production and life of the creative class.

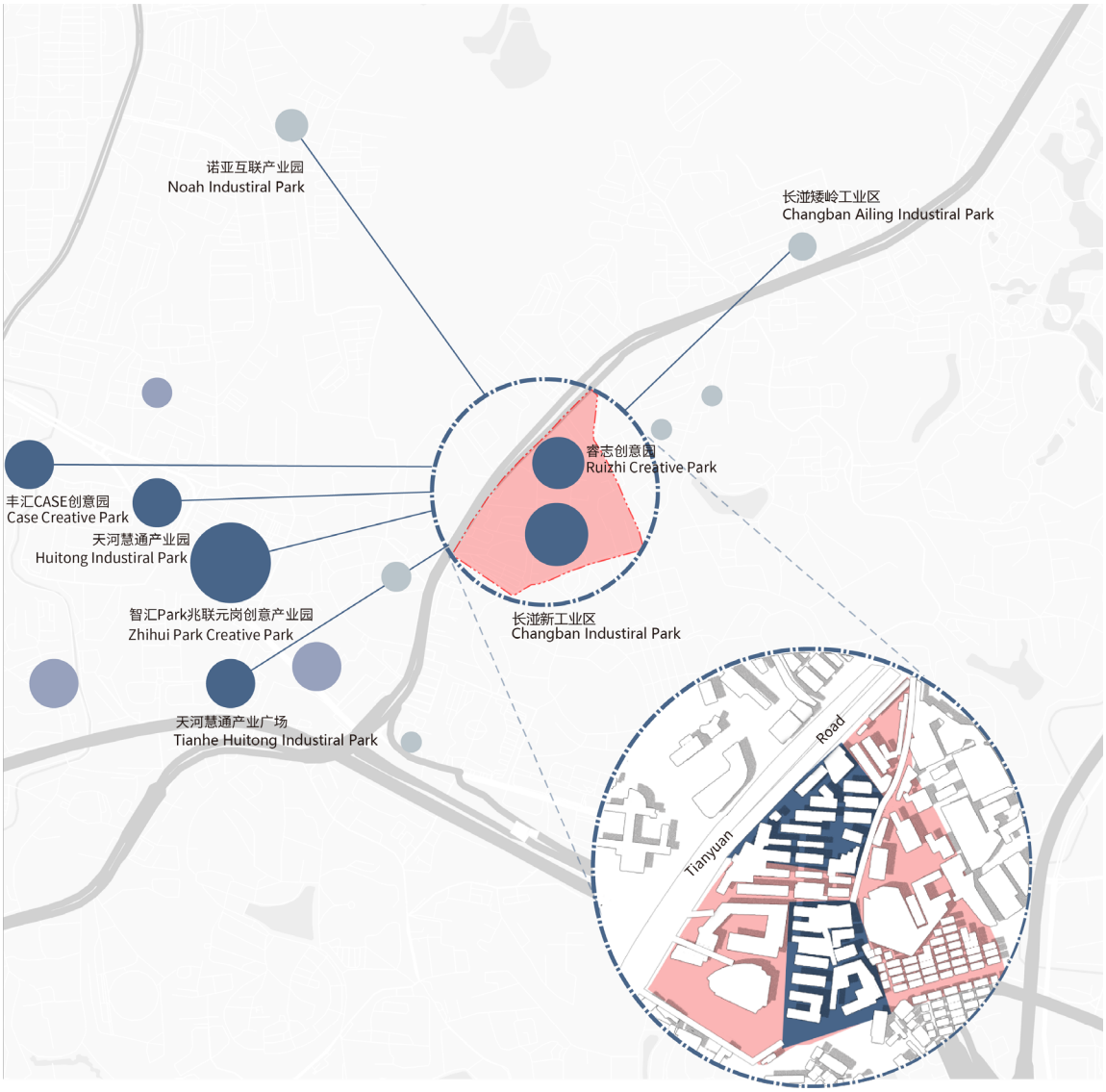


Figure 5-12 Distribution of creative industry parks

Analyzing the business landscape centered around the site, it can observe an abundance of creative industrial parks in close proximity, indicating a high density. The power of clusters is great for any industry. The result is indicating that the site has a good population base of creative class, and a good creative and innovative atmosphere, which is very suitable for the production and life of the creative class.

5.3.3 Unlocking the sharing potentials of different crowds

(1). Overview

The research on the sharing needs of different on the site is combined with an analysis of the sharing needs of the creative class found in literature worldwide. It can be concluded that both

the creative class and villagers have sharing needs, along with unique sharing needs and . Among them, the sharing of knowledge and technology by the creative class and the villagers' surplus labor are the most distinctive sharing resources of the site.

Some scholars have suggested, based on their research, that knowledge sharing attract creative industries and enhance the concentration of such industries. Through sharing knowledge and sharing activities, tacit knowledge can be shared in large quantities[69]. It can be acquired through experiments, field observations, mentorship, self-directed learning, learning from others, experience accumulation, organizational training, and similar methods. By engaging in formal and informal sharing of tacit knowledge, the creative class can not only enhance its own knowledge absorption capabilities but also stimulate idea generation.

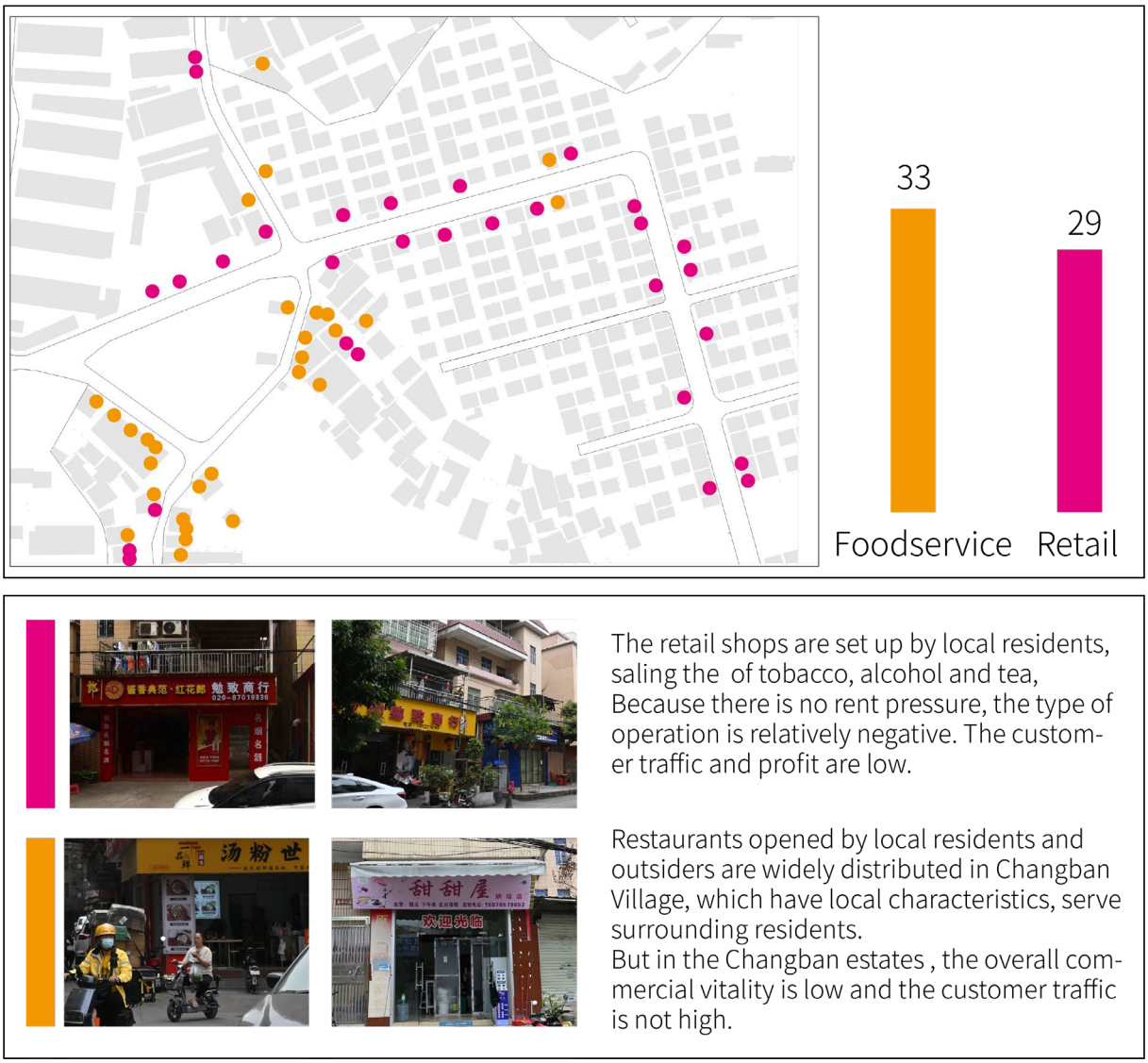


Figure 5-13 Business analysis of Changban new village

(2). Supply & Demand analysis

Through the interviews, it can see that long-time residents of Changban new village generally have more flexible times and are willing to see new sharing activities happen within the village, which means more opportunities for work and living entertainment. Those who work here have a greater need for complementary services and facilities. At the same time there is no rejection of living with the villagers.

Table 5-2 Contents of interviews on sharing needs and supply

Interviewees	Key of interviews
Villager A **Male 40s** **Store owner**	*"Of course is willing to (more communication) , there will be more guests ..... usually we are also relatively free, if there is an activity organized here is also good, life will be more interesting."*
Villager B **Female 50s** **Housewife**	*"Would be willing to do a little part time work if it's just in the neighborhood. i am usually just renting out houses and taking care of my family ..... (willing to share some resources?)Yes, i could share food or help manage the rental of houses in the village."*
Villager C **Male 50s** **Security guard**	*"Willing to participate in creative training if I get the opportunity, and interested in participating in the activities and work of these college students, and happy to be able to get some small rewards for helping out."*
Creative Class D **Male 20s** **Creative worker**	*"Basically, I will not go to Changban New Village, I will only occasionally go to Changban Village to eat or order takeout ..... lack of service facilities, monotonous function, because it is not possible to ride a bicycle, and the transportation is not very convenient. I am willing to see some exercise facilities (gym) here, it is necessary."*
Creative Class E **Male 20s** **Creative worker**	*"Acceptable (shared living/ living with villagers), but the key is to have the right price and quality. There are not a lot of businesses that have moved in here ..... Each business is independent of each other and there is not much connection. There is a need for a cafe and other communication spaces."*

Based on interviews and observations of the creative class and villagers on the site, together with an analysis of the sharing needs and shareable resources of possible tourists and other people, it is clear that:

It can be divided into four population subjects:
Villager/ Changban Village Collective
Creative class: Work/Workers and enterprises
Creative class: Live/Residents
Tourist/Citizens

Finally, there is a presumed public subject added to this thesis, which can be the government, to complement the site's demand for some of the resources.

At the outset, it is to identify the specific type of sharing resources needed for analysis on the site. The basis for selecting these resources is outlined below. Firstly, consideration is primarily given to whether the resource or function aligns with the site's future orientation. For instance, shared medical care, being a specialized function, is not taken into account when it is highly unlikely that the site will have sufficient medical resources. Secondly, the evaluation considers whether the sharing content competes with established urban sharing economy platforms that are already popular. For example, shared rechargeable batteries and bicycle sharing are not suitable to be proposed as separate sharing resources within the site.

Thirdly, the chosen shared resources should not overlap with urban public services and infrastructure provisions. For instance, some scholars have suggested that public housing and public transportation can also be considered as part of the sharing economy and sharing spaces. However, categorizing such resources, which have a significant state-owned nature, as sharing resources within the site would lead to ambiguity.

Afterwards, the selected sharing resources are categorized into four groups: physical objects, spaces, activity experiences, and service facilities. Each sharing resource is then further divided into three levels based on the level of demand or shareable for each group. The details can be seen in the table below.

Table 5-3 Demand and supply of sharing

Types of Sharing	Sharing contents	Changbang Village		Creative Class: Work		Creative Class： Live		Tourists/Citizens		Public
		Need	Share	Need	Share	Need	Share	Need	Share	Support
Entities	**Waste recycling**									
	Idle items exchanging									
	Clothings									
	Shared home furnishing									
	Shared Tools									
	Shared Car									
Spaces	**Co-housing**									
	Shared Parking									
	Shared Kitchen									
	Co-working/Maker space									
	Shared open space									
	Sports Facilities									
	Exhibition Space									
	Shared Gym									
	Mobile Library									
Experience	**Online Fitness Platform**									
	Shared Singing/Dance Studio									
	Platform for life experiences									
	Shard subjects									
	Sharing knowledge and skills									
	Shared Education									
Facilities	Shared Charging Station									
	Shared Childcare									
	Shared aged care									
	Shared domestic service									
	Shared Factory									
	Shared equipment									

The table shows that among the sites, there is a greater demand for sharing knowledge and education, shared park, shared open space, and sports equipment. This means that knowledge sharing needs a certain spatial carrier.

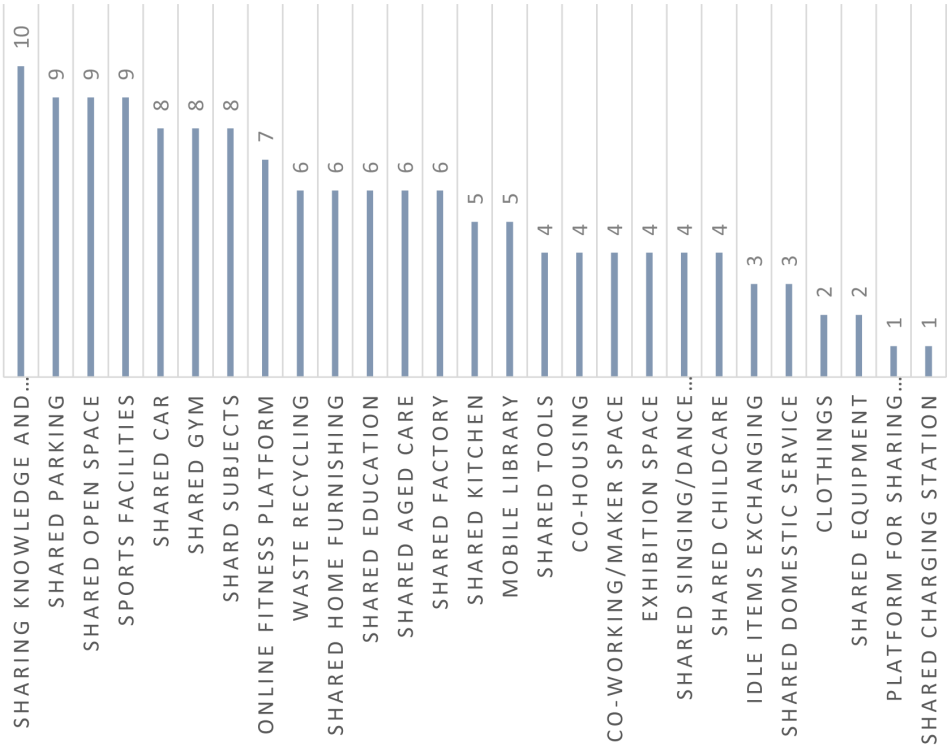


Figure 5-14 Demand of sharing

Following that, this thesis summarizes the demand and capacity to share different resources for the various groups on the site and presents the following two graphs. It is evident that there is some overlap in the demand and supply levels of sharing resources between the two groups, although there are significant overall differences. While the affluent shareable resources may not currently align with the needs of others, it is essential to analyze future possibilities. For instance, the sharing of tacit knowledge by the creative class could potentially have a profound impact on the current monotonous lifestyle of the Changban villagers and flourish in the next generation.

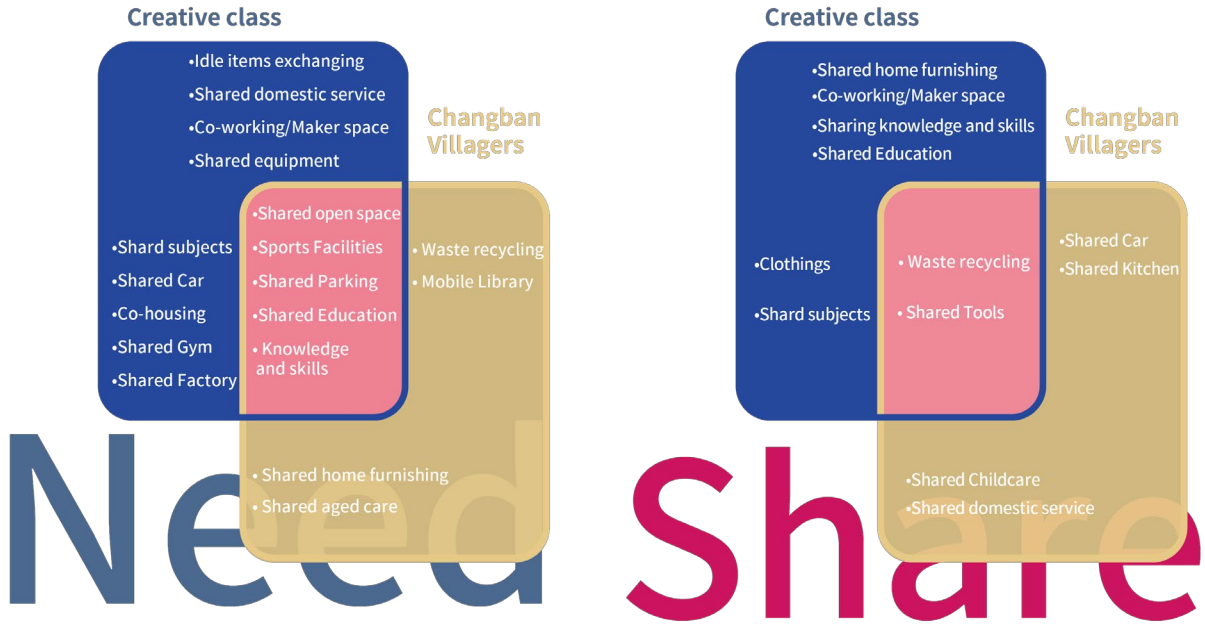


Figure 5-15 Similarities and differences of the two groups of people

By analyzing the supply and demand of shared resources for the two groups of people, we can further draw the following chart, which illustrates the balance between the supply and demand of various types of shared resources between the two groups within the site.

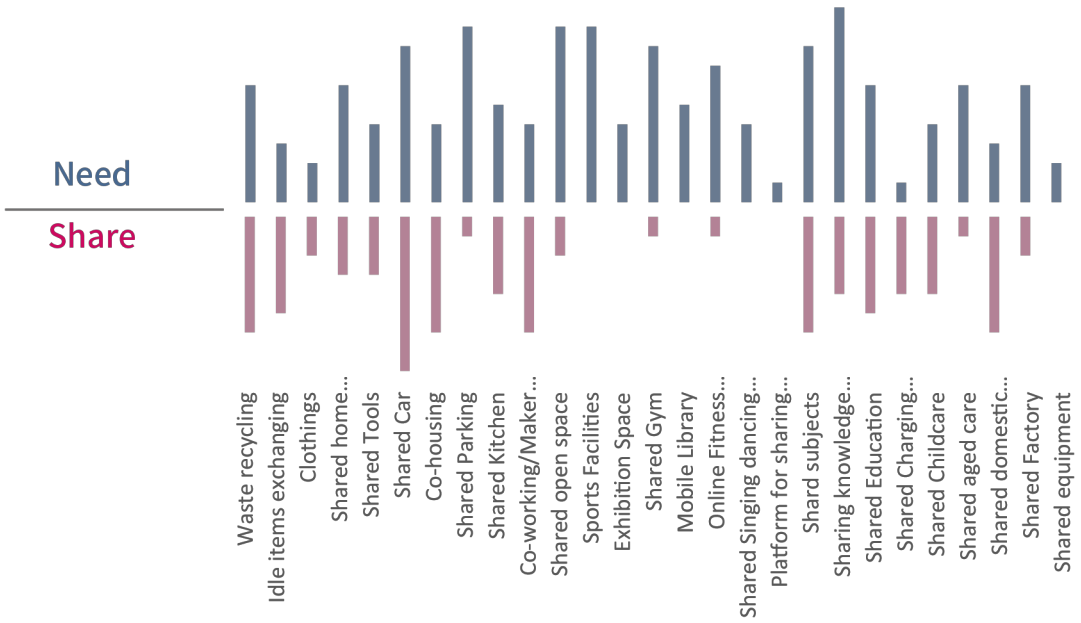


Figure 5-16 The relationship of demand and supple of each sharing function

By analyzing the demand and supply of sharing resources for the two groups, we can further analyze and present the following chart, which illustrates the balance between the supply and demand of various types of sharing resources on the site. Sharing resources marked in red have the potential for sharing among individuals within the site to achieve balance. Lastly, sharing resources marked in blue are in high demand but challenging to balance within the site, requiring top-down planning and design with support from the public sector to meet the demand. A summary is provided in the table below.

Table 5-4 Supply and demand balance or no

Banlance	Need Support
Waste recycling	Shared home furnishing
Idle items exchanging	**Shared Parking**
Clothings	**Shared open space**
Shared Tools	**Sports Facilities**
Shared Car	Exhibition Space
Co-housing	**Shared Gym**
Shared Kitchen	**Mobile Library**
Co-working/Maker space	Online Fitness Platform
Platform for sharing life experiences	Shared Singing/Dance Studio
Shared Education	Shard subjects
Shared Charging Station	**Sharing knowledge and skills**
Shared Childcare	Shared aged care
Shared domestic service	Shared Factory
	Shared equipment

This section establishes a strong foundation for subsequent design by examining the supply and demand of sharing resources among the community and identifying potential sharing activities on the site. Notably, the sharing activities facilitated between the two groups hold significant importance and serve as a key factor in bridging the gap and constructing an integrated community. Additionally, the top-down supplementation of sharing resources will contribute to the creation of further sharing activities and foster the construction of sharing communities.

5.3.4 Deriving sharing systems and sharing objectives

By analyzing the sharing scenario issues and sharing potentials. It can be concluded like the table shown.

Table 5-5 Sharing issues and potential

Sharing scenario issues	Sharing potentials
Inefficient use of land resources: locational land value/construction quality	Peri-wushan innovation area: positioning support / development of dual innovation / financial support (C&D) renewal power
Inefficient use of transportation resources: subway/main roads	Good foundation for creative industries
Community construction decay: population disconnect / no community construction behavior by residents	Resource alignment of the creative class and villagers: Creative class: knowledge and technology Changban residents: labor/funding and practice sites

This thesis applies a system approach to design a comprehensive sharing system that fully harnesses the knowledge sharing potentials of the site's creative class. The core of this system is an integrated sharing factory, which incorporates functions such as makerspaces, co-working spaces, and integrated community services. These facilities provide the creative class with spaces and amenities for production, education, meetings, offices, and communication. Through the activities that take place within these spaces, creative knowledge is disseminated throughout the entire community and even extends to the broader city. The promotion of creative activities facilitates the sharing and flow of various resources within the site, while establishing a connection between the creative class and the Changban villagers. This, in turn, achieves the ultimate objective of social innovation and integration by

establishing a sharing creative community that bridges the two classes of people.

To enhance this sharing system and accomplish the ultimate goal, it is also necessary to achieve it through the design of subsystems. In this thesis, a model of a shared creative community is proposed to demonstrate how living and production can be interconnected within a shared space in the community. The aim is to enhance living services, improve the quality of residence, and establish standardized designs within specific spatial arrangements.

5.4 Vision: Sharing creative community

5.4.1 Overview

Table 5-6 Vision & Principle of Changban

Vision & Principle	*Sharing Creative Community in Changban*
System	✧ A sharing Maker factory with CWSs spreading creative ideas and knowledge.
Sub-systems	✧ A creative community model fusing creative life and production. ✧ A local community model fusing sharing life.
Objective	✧ Social innovation and cohesion between creative class and town villagers
Sub-objectives	✧ Community construction between them ✧ Citizen empowerment for collective construction
Constraints & Threats	✧ Construction fund ✧ Dynamic needs of creative class ✧ Evening planning of Maker Factory
Criteria for evaluation	✧ Social capital ✧ The number/rate of creative class ✧ The number of job advancement

（Source: Author）

As mentioned earlier, this section provides a summary of the site orientation and vision based on the analysis of sharing. It is important to note the relationship between the subsystems/objectives and the main system/objective. The proposed subsystem, the model of a creative community, aims to offer a replicable model that facilitates the spread of a sharing atmosphere. This is achieved through the design of smaller-scale community units and more detailed sharing space arrangements. Similarly, community construction is ultimately aimed at

fulfilling a sub-objective of social integration between the two classes of people.

5.4.2 Threats analysis

The threats of sharing system faced by this design primarily centers on several aspects.

The first issue concerns construction funding. Given the poor quality of the buildings, it is inevitable that the site will require significant demolition and reconstruction for future renewal. However, if the renewal efforts are solely led by the village collective, the available funds would be insufficient. The government has a compelling reason to provide assistance for the urban renewal in the area, considering the support for the policy of the Peri-wushan innovation area. Hence, it is necessary for the government to participate and support the area's renewal by reclaiming some of the village collective's industrial land for state-owned renewal. This condition would enable economic support to be provided to the area.

Secondly, the creative class, being the new generation at the forefront, possesses diverse and ever-changing needs. As a result, the corresponding space design must be flexible to accommodate potential future changes. This places additional demands on space design.

Thirdly, the creative class typically has a limited income level and primarily focuses their energy on creative production. They are sensitive to the cost of living. For example, they are often unable to pay high rents and their mode of transportation is mainly on walking and public transportation. Therefore, it is crucial to avoid excessive gentrification during the regeneration process. Consideration should be given to the cost and selling/rental prices of the final product during the regeneration, and supplementing the process with public housing and other means to control price, otherwise it will cause a significant increase in land prices, forcing the creative class to move out. It will be counterproductive result.

Finally, sharing activities require hosts to serve as guarantors. Most sharing activities emerge from bottom-up behavior. However, activities need to be organized by a host once a certain scale is reached. This can be a challenge in a community that is otherwise poorly connected. Therefore, it may be necessary to consider implementing a vetting mechanism for residents and companies initially. This would involve selecting members who are willing to take turns as event hosts and actively participate in the community, ensuring the continuous operation of the sharing system. Simultaneously, the community can provide certain incentives to foster a

sharing atmosphere, facilitating the development of a sharing culture and promoting social cohesion.

5.4.3 Performance measures

In order to evaluate the success of the sharing system, according to the analysis method which is mentioned in Chapter 3, several evaluation indicators are introduced as reference points.

Considering the objectives of the sharing system, namely social innovation, social cohesion, and community construction. The most crucial evaluation indicator is the improvement in social capital resulting from the operation of the sharing system. This can be assessed through questionnaires distributed to residents and enterprises every six months, with specific indicators including the formation of new connections among individuals in the Creative Community, participation rates in sharing activities, and frequency of utilizing sharing facilities.

Secondly, the growth in numbers and proportion of the creative class serves as a data point for evaluating the project's success in the short term, particularly during the pre-completion phase. This indicator demonstrates that the sharing community atmosphere contributes to attracting the creative class and forms the foundation of the community.

Thirdly, the increasing in the number of jobs from the site should be considered. The design concept emphasizes interactions between Changban villagers and the creative class through various sharing activities, thereby utilizing available labor and providing both part-time and full-time employment opportunities to support the sharing system.

5.5 Activities of sharing system

To sum up, it is the orientation of this sharing system to combine sharing space and sharing concept to construct creative community. Creative community is a mixed industrial-residential area formed by the benign interaction between industrial space and residential area; it is also "an overall human ecology jointly constructed by indigenous residents, creative people, government and service recipients of creative products" [16,17].

Empirical studies have revealed a strong correlation between creative industries and communities. Urban communities with a high concentration of the creative class tend to have

a rich array of place facilities such as cafes, bars, galleries, and diverse spatial environments. These communities also exhibit vibrant urban activities such as art exhibitions and concerts[68]. These places and facilities not only support the daily lives of the creative class but also play a crucial role in fostering their creative work.

Regarding activity participation, cultural and creative-related activities have been found to facilitate communication between the creative class and residents, thereby enhancing the organizational strength and creative atmosphere of creative communities [70,71].In a long-term follow-up study of the creative community in Bristol, UK, Frenzel and Beverungen observed that the creative class and residents formed alliances to promote industry development and engage in place branding activities. Sharing acts as a connecting force between the creative class and community residents, leading to the development of a shared sense of identity and common values [72].Various studies have consistently demonstrated the high compatibility between the creative class and the community, suggesting that sharing design between these two groups is feasible.

5.6 Digging out sharing spaces

(1). Public property rights space

Urban sharing：Sharing infrastructure

Based on the main sharing system, it is necessary to establish a sharing factory as the core sharing infrastructure of the site, providing a dedicated space for the production activities of the creative class. Additionally, it should integrate various functions to ensure that both the villagers and the creative class within the site's boundaries, as well as other creative classes in the city, can fully utilize the sharing infrastructure.

Urban sharing：Open space

Sharing street：For road systems where the site currently exists with poor traffic and is dominated by vehicular traffic, it is necessary to introduce the design of shared streets to enhance pedestrian and non-motorized right-of-way, while leaving facilities and spaces required for sharing creativity, living and activities on the sharing streets, with linear space penetration sharing to the whole community.

Green land & square: The site lacks of open space. To address this, it is necessary to allocate a

certain percentage of land from the village collective's economic development area as the site's POPS (Private Owned Public Space). Community co-management measures should be implemented within these spaces to facilitate activities related to the sharing system, such as hosting regular outdoor exhibitions for the creative factory. Additionally, the layout of POPS should be divided into smaller pieces and scattered throughout the site, resembling pocket parks.

(2). Private property rights space

Sharing social space

Studies have demonstrated that sharing social spaces such as coworking spaces, fablabs, and the like can have a certain impact on the urban environment. For instance, the DTP project in Las Vegas, which features scattered co-working spaces throughout Downtown, has transformed the area into a creative and innovative hub, essentially a sharing block.

Therefore, it is crucial to scatter sharing social spaces within the community, including the utilization of the ground floor spaces in each community group. Specifically, there should be an emphasis on repurposing the ground floor construction spaces within the residential land in Changban Village, transforming them into sharing social spaces. By introducing a creative atmosphere and hosting various activities in the new village, it will foster better integration between classes and promote unity within the community.

Sharing living space

Sharing Kitchen: Considering the characteristics of the business in Changban Village, the main industry revolves around the traditional catering industry. This industry has a low entry barrier and offers a wide variety of local cuisine with distinct characteristics. Given the limited per capita living space in Changban New Village, it is feasible to incorporate a shared restaurant and kitchen concept into the sharing system. This would allow the creative class within the village to share local cuisine.

Parking Space: The issue of parking space affects both non-motorized and motorized vehicles on the site. However, due to the nomadic nature of the creative class, their demand for car ownership and parking spaces is relatively low. In contrast, the villagers of Changban tend to have a larger number of cars. Therefore, implementing car and parking space sharing initiatives can be beneficial. Additionally, non-motorized vehicles should be prioritized to

meet the site's needs and facilitate connectivity with the subway. It is essential to ensure that parking facilities cater to the requirements of non-motorized vehicles as well.

(3). Digging out controversial property rights spaces

In the design of new communities and the renewal of old communities, we should consciously plan for the use of ambiguous property spaces. In particular, roof spaces, boundary spaces, corridors and community courtyards are underutilized spaces.

5.7 Summary

This chapter focuses on analyzing the sharing issues and sharing potentials of Changban, and comprehensively analyzes the built environment, the population, and the development policies to arrive at the vision for the site's development. After which the chapter summarizes what needs to be designed in order to reach this vision, including activities and spaces. The next chapter will elaborate on the strategies of sharing design.

Chapter 6 Strategies for sharing design

6.1 Overall layout strategies of sharing function

6.1.1 Land use layout

For the issues within the site, there is a notable lack of public service facilities and public spaces, leading to a strong demand for leisure and sports areas from the community. To address these needs, the planning proposes adding sharing spaces, both public and private, while also incorporating essential public service functions and public spaces. In this regard, the layout strategy for sharing spaces should be carefully considered. This includes the establishment of sharing infrastructure, a Sharing Creative Factory, sharing street, CWS, and other sharing spaces in various forms such as points, lines, and planes, as mentioned in the vision at the end of Chapter 5.

Based on the analysis of the Joo Chiat community in Chapter 4, a layout strategy for the sharing space can be formulated. The sharing space within the community should be divided into smaller sections and dispersed across each lot to ensure the effective operation of the sharing system throughout the entire community. However, certain sharing functions that require centralization, such as the sharing infrastructure, should be placed in a relatively centralized manner to serve as the core of the sharing system. Additionally, establishing linear spatial connections is crucial. In the case of the Joo Chiat scheme, sharing streets dedicated to autonomous driving are utilized to connect important nodes within the community.

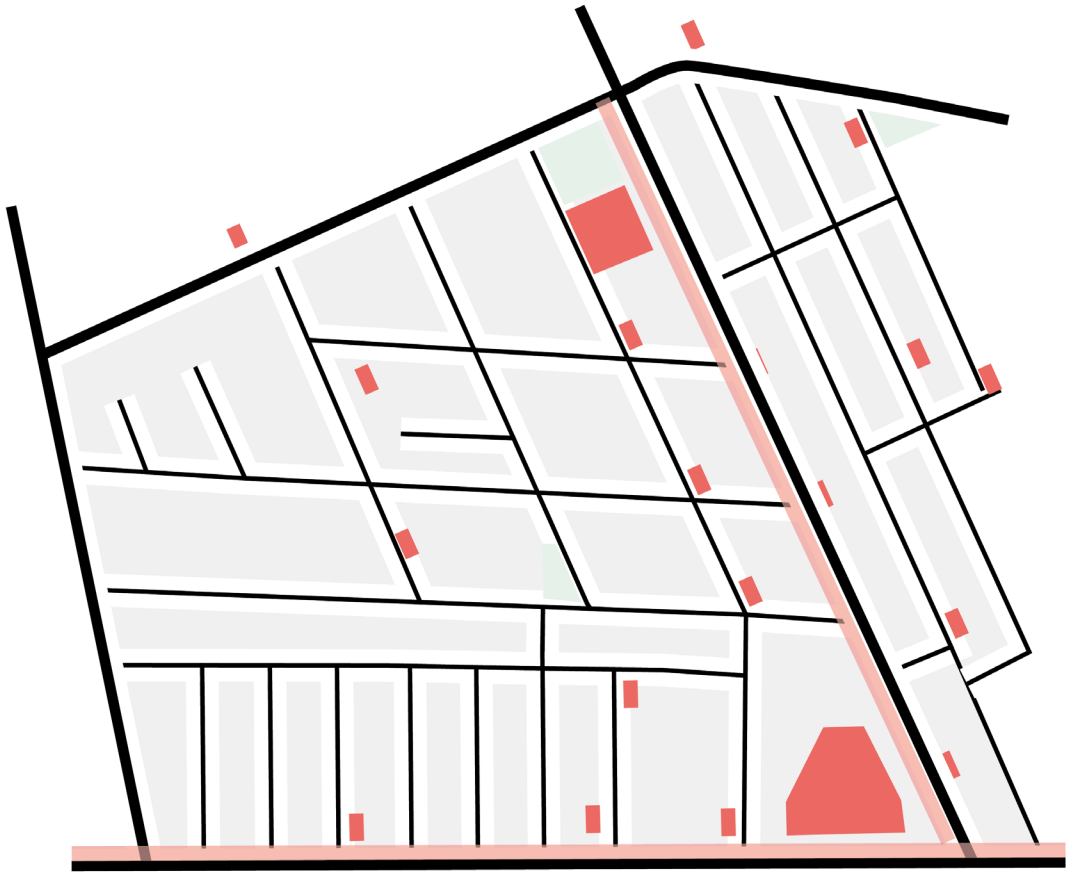


Figure 6-1 Analysis of Joo Chiat sharing layout

It can be concluded that the functional layout of the sharing system needs to shift from the centralized layout of traditional planning for public service facilities to a moderately decentralized layout, while still maintaining a certain level of linear connection within the sharing space. It is important to incorporate a certain degree of functional diversity within the lots to accommodate the diverse needs of the community and maximize the sharing potentials. The design of specific sharing spaces, such as outdoor sharing spaces, should be flexible. For instance, pop-up facilities can be introduced to facilitate time-sharing usage of the sharing spaces, and specific functional activity zones can be delineated for particular areas to ensure the occurrence of shared activities. The details are illustrated in the figure below.

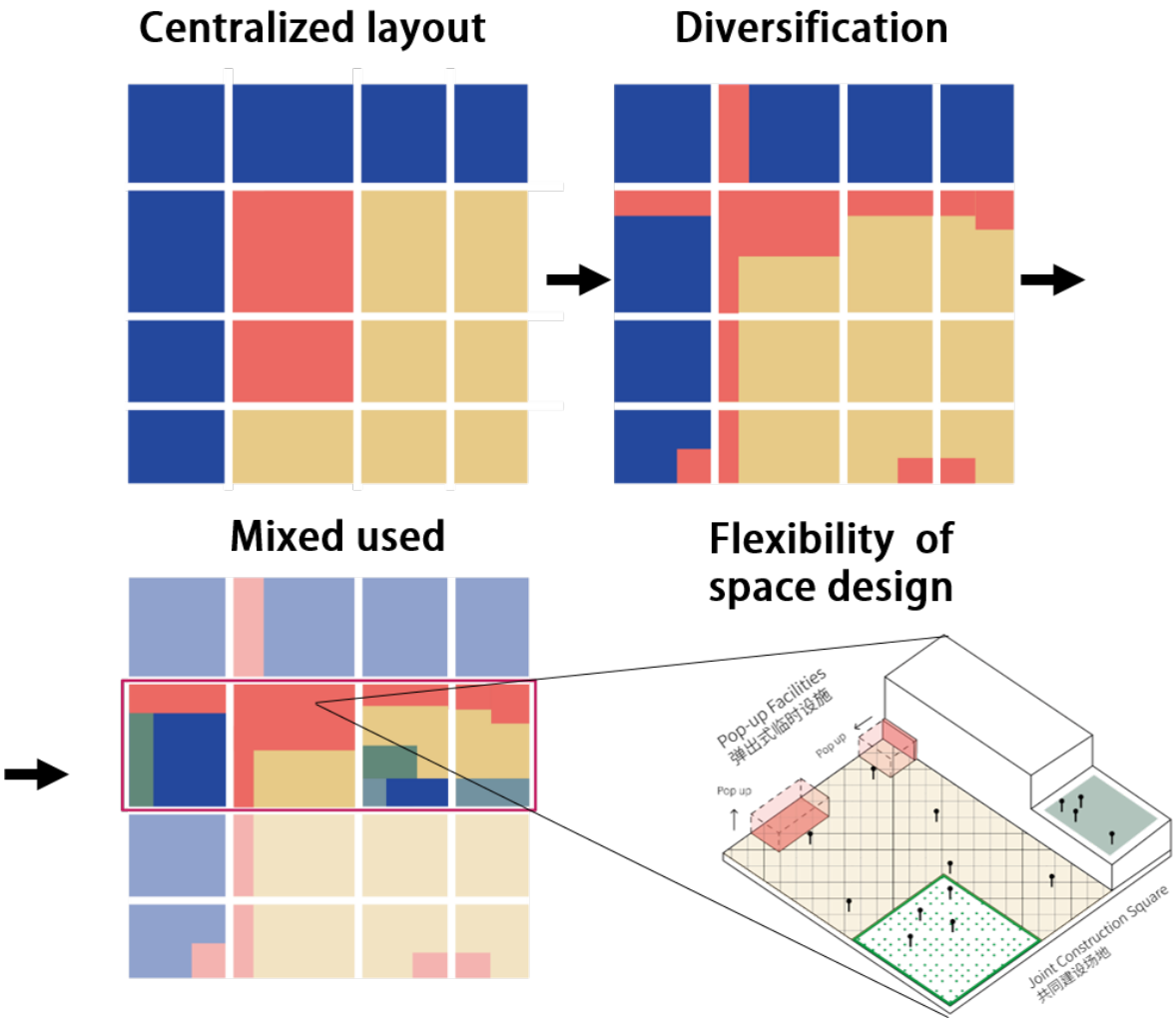


Figure 6-2 Layout strategies

6.1.2 Layout principles for various types of sharing space

After defining the overall layout of the sharing spaces, a detailed layout strategy is required for each type of sharing space to be arranged within the site. Mainly focused on the following aspects: the layout pattern and location requirements of each type of sharing space, the spatial relationship between each type of sharing and other functions, etc. This is shown in the table below.

Table 6-1 The layout strategies of every sharing spaces

Sharing space	*Layout pattern and location distribution*	*Function connection*
sharing infrastructure	*Concentration* *Best location* *Share with city*	*Connect with co-working and creative industries park*
Shared dining-room & kitchen	*Concentration* *Relatively introverted*	*Highly related to the inherent business of the urban village*
Sharing parking	*Concentration* *High accessibility*	*Share between industrial park and community*
Co-working space	*Decentralization* *Sub-optimal location*	*Combine with community* *Combine with sharing infrastructure*
Sharing street, Square & Park	*Decentralization*	*Combine with community*
Sharing commercial space	*Decentralization*	*Combine with community*
Sharing open space (Garden, Roof platform, Corridors)	*Moderate dispersion*	*Combine with other sharing features*

The sharing infrastructure, represented by the sharing creative factory within the site, serves as the primary centralized sharing space and has the potential to extend its influence to the city. Therefore, it should be well located, such as in close proximity to the subway station. Furthermore, since the creative class who use the sharing creative factory significantly overlaps with the target group of co-working, it is important to establish a connection between these two spaces and integrate them.

On the other hand, facilities such as the sharing kitchen & dining room and co-working spaces should be dispersed throughout the community and serve as hubs for daily community activities. These facilities can become a carrier of social interaction with communities.

6.2 Sharing flow: Activities design

6.2.1 Selecting suitable resources to share

According to the analysis of Changban's sharing demand and supply in Chapter 5, it can be

concluded that the villagers of Changban and the new creative class can share resources with each other to achieve a balance in sharing certain contents. For example, Changban villagers can share resources such as redundant houses and cars, as well as provide services like domestic service and childcare to the community. However, some functions that cannot be fulfilled through sharing within the site need to be supplemented by public provisions. The figure below provides illustrative examples.

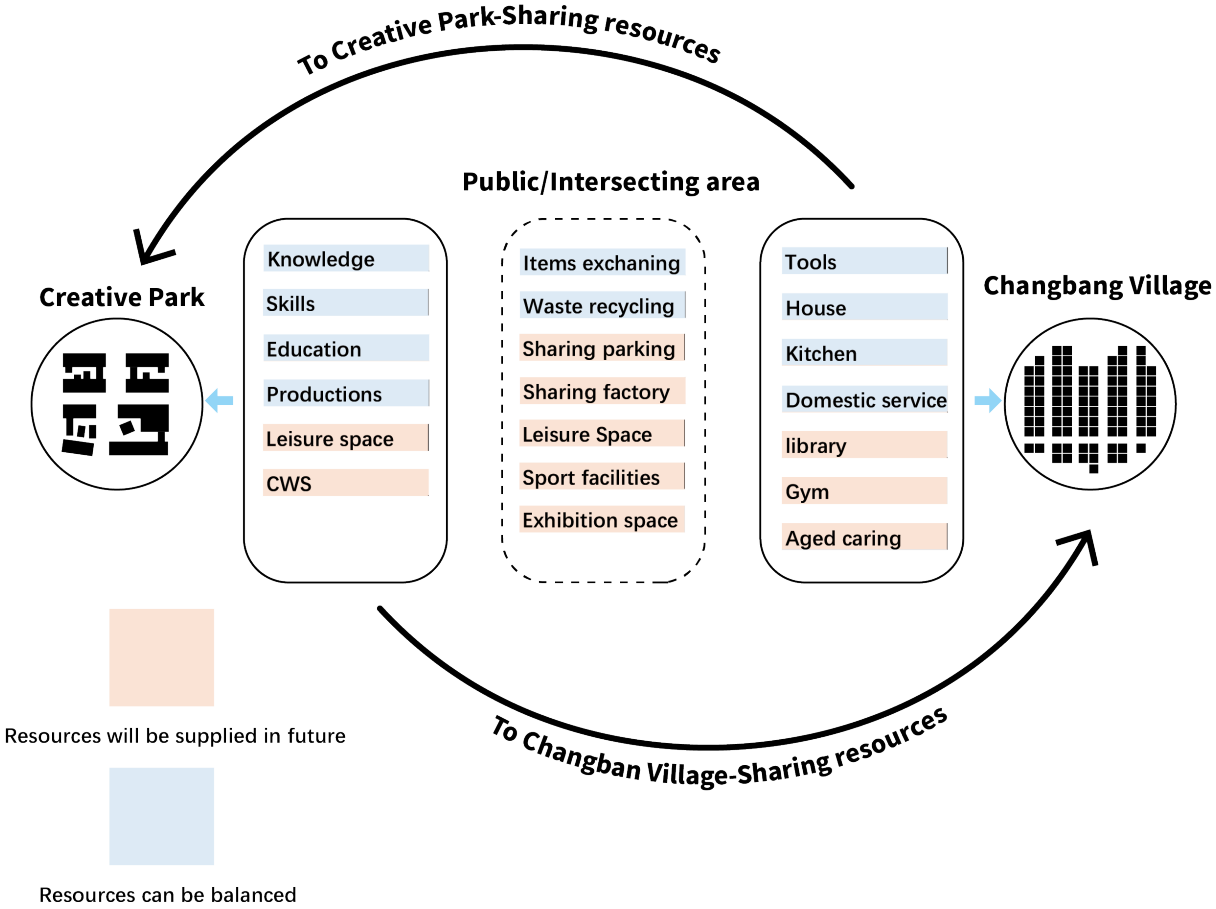


Figure 6-3 The spatial relationship of sharing resources

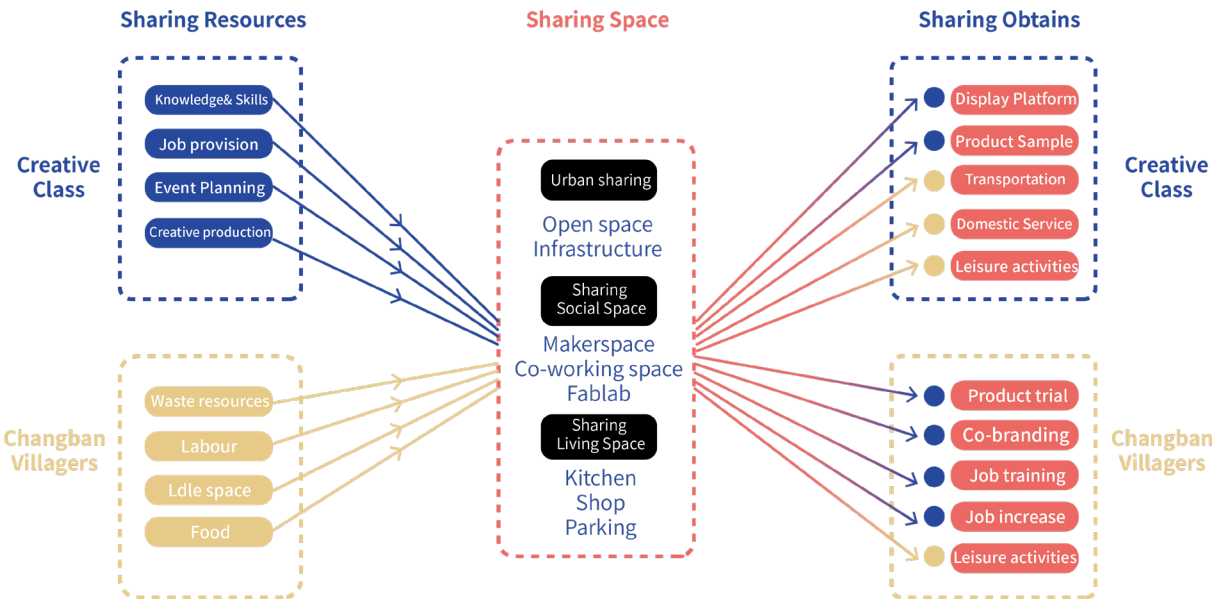


Figure 6-4 Sharing resources and obtains

In short, the two types of people provide the sharing resources that they own and use the sharing space as a carrier in which they can exchange resources and gain benefits. Such benefits are not economic in nature and need to be distinguished from the primitive market-oriented behavior of material exchange. The underlying motivation behind sharing should be rooted in altruism, thus fostering a sense of community cohesion through sharing activities.

Specifically, it is mainly reflected in stringing different people together with creative activities. Creative class: 1) provide creative manufacturing techniques, such as art and design, 2) organize creative activities such as exhibitions and product trials. 3) provide popular science and technology education. Other hand, village collectives that: 1) provide idle labor, 2) provide centralized B&B and hotels for design to create branding landmarks. (Giving designers space to play while charging low design fees to create B&Bs and spaces co-branded by designers and artists.)

From the perspective of physical space, this kind of exchange behavior of sharing resources, which can also be called sharing flow, will break the difference of class and close the relationship within the community. The sharing space is the bridge to connect people.

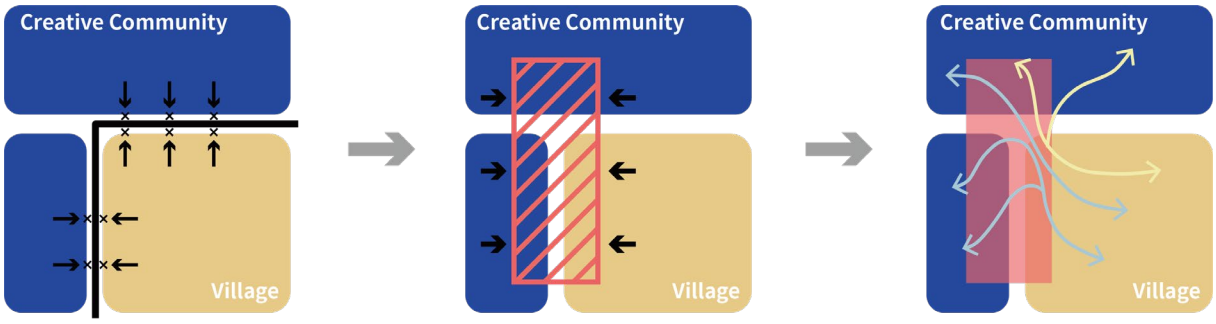


Figure 6-5 Influence on space of Sharing flow

6.2.2 The credit system

Table 6-2 Sharing behaviours of people of credit system

Creative Class	*Changban Villagers*
Hold lectures	Provide waste resources
Technology Training	Provide labor
Organize community activities	Provide creative landing sites
Provide finished products	Provide food
Provide creative schemes	Provide housekeeping services

In summary, through the flow of sharing elements and the support of credit system, many communicative activities can be generated between Changban villagers and the creative class through sharing design. As a specific example, the sharing creative factory provides production space and sharing equipment for the suitable creative class to use at will. This enables different groups of people, including tourists, creative classes from the city, creative classes within the site, and Changban villagers, to collaborate within the creative factory, engaging in production activities and promoting social interactions. The specific diagram is presented below.

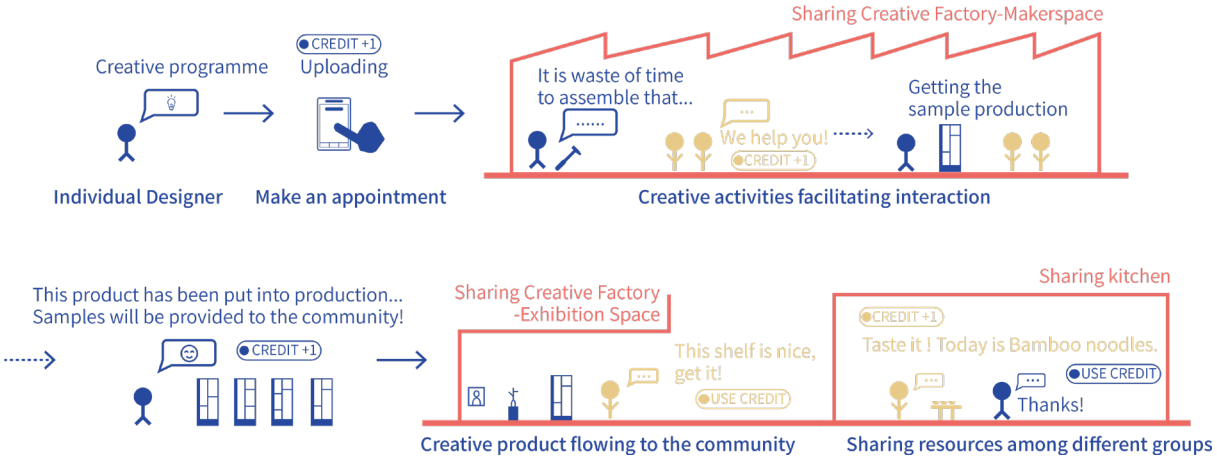


Figure 6-6 The sample of sharing activities

6.3 Sharing spaces: Design guideline

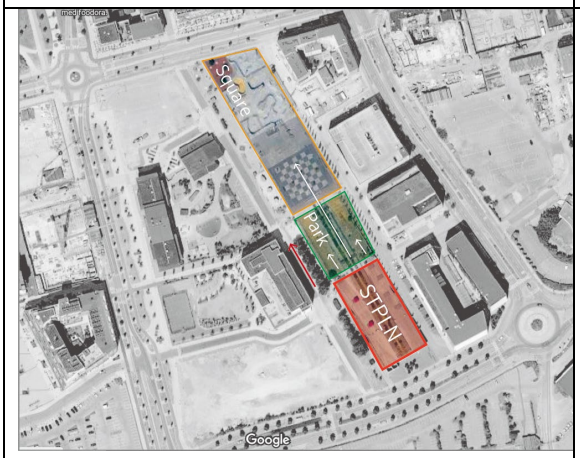
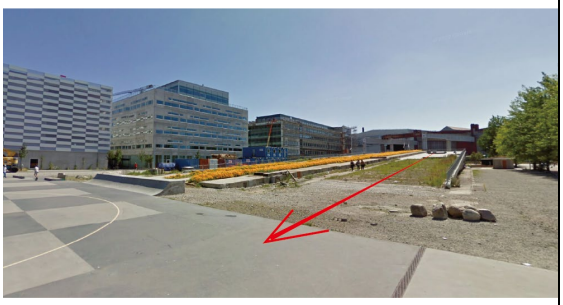
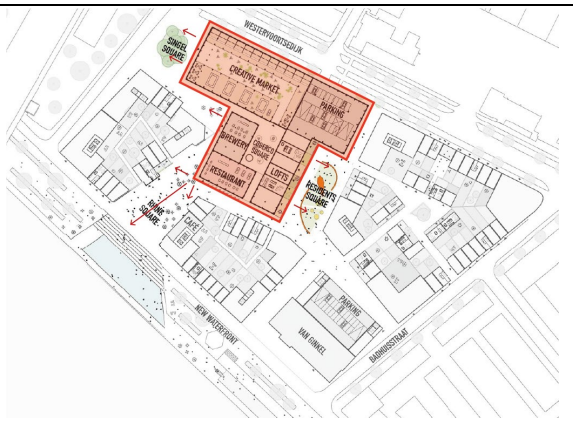
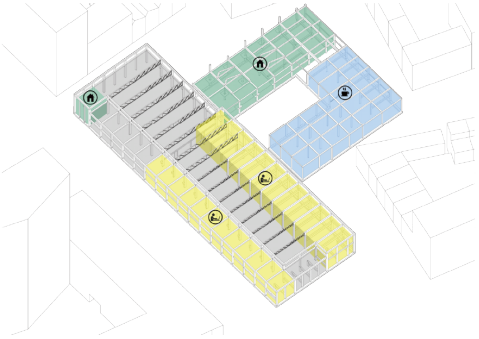
6.3.1 Public property: urban sharing

Publicly owned sharing spaces have the following characteristics: their construction massing is generally large, and unlike the bottom-up characteristics of the other privately owned sharing spaces, it is often appropriate and necessary to have top-down planning measures to guide construction. Such as sharing infrastructure and sharing streets.

(1). Sharing infrastructure

Sharing infrastructure is a top-down product. Sharing infrastructure is a low-cost hack of urban public service facilities, as it can achieve a higher level of service at a lower cost [57]. It has the following core characteristics: it integrates multiple functions, serves as a central hub within the community, and is integrated with public spaces. The following will be illustrated in detail with case studies.

Table 6-3 Design guideline of sharing infrastructure

	STPLN， Makerspace Center	De Melkfabriek, ‘Urban Activator’
Case-Sharing infrastructure	 	 
Design strategies	✧ It is located in the core of the community and becomes a community landmark. ✧ Integrated with public spaces within the community. ✧ Very mixed function.	

(Source: adapted by author)

From the case of STPLN, it can be found that the sharing infrastructure is a Makerspace built next to the community's public development space to serve the community and the city. The architectural design of it uses a large sloping roof to integrate with the park, also transforming STPLN into a large landscape infrastructure.

In De Melkfabriek's project, it can be seen that the sharing infrastructure can integrate many functions, such as housing, parking, and creative market, combing with the usual functions

like Makerspace and CWS space, to attract different people to come to the activity.

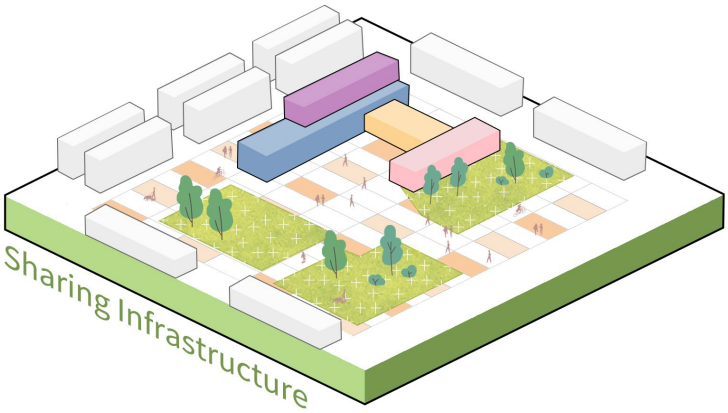


Figure 6-7 Model of sharing infrastructure

(2). Sharing open Space-Greenland

Sharing courtyards and other sharing designs about green space have been practiced in many places. The core of the design is to guide the public to participate the transform the public space in small-scale spaces for various activities, such as free planting for citizens and fun gardening. It fulfills the potential of public space without sharability. At the design level, methods such as dividing detailed zoning in the original space and arranging flexible, low-cost urban furniture facilities are usually used.

Table 6-4 Design guideline of sharing greenland

	Shanghai KIC Garden	Via Fondazza Social Street
Case-Sharing open space	 1. Service facilities 2. Public area 3. Experimental Farm 4.1m² Farm 5. Public Farm 6. Gardening area  Gardening area  Experimental Farm (Source: adapted by author [73])	 Reconstructing idle square  Activing green land  (Source: Social street.it)
Design strategies	✧ Detailed zoning add-on activities. ✧ Flexible facilities. ✧ Necessity of public participation.	

Specifically, in Shanghai KIC Garden, the community's long, unused green space is revitalized through sharing design. It is divided into six zones, except for the public area, all of which are full of interactive facilities, either allowing the community to plant freely or providing flexible play facilities. Likewise, the Social Street, a Facebook group created by the local community and involving the community's residents, is also practiced in Bologna, Italy, where it is a regular rotating event[31]. In Via Fondazza's Social Street, it has completed a review of the surrounding negative squares and green spaces, creating a sharing space through community planting and voluntary mowing.

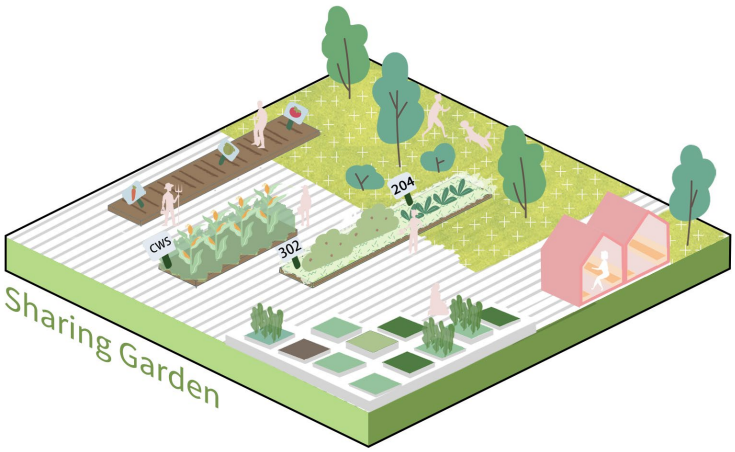
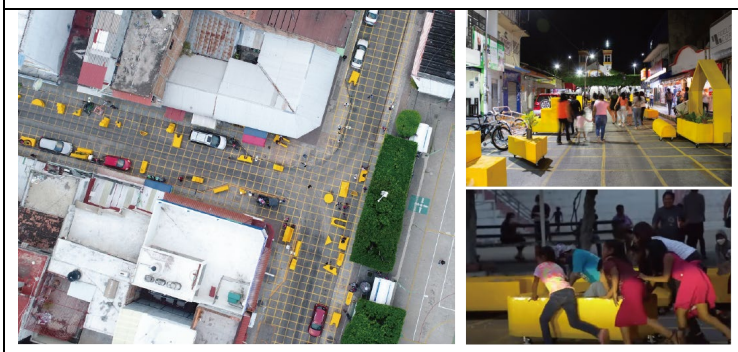


Figure 6-8 Model of sharing greenland

(3). Sharing open space -Sharing street

The development of sharing streets has become more mature, and many guidelines already exist on how to design sharing streets, such as UK and Netherlands. The core of this can be described as blurring the right-of-way, increasing pedestrian activity and the vitality of the street. There are also various types of sharing streets in practice. Two typical types of sharing streets are selected here, namely community-based sharing streets and shopping-based sharing streets.

Table 6-5 Design guideline of sharing street

	Case-Sharing street	Design strategies
San Roque, Tuxtla Gutiérrez	 Source: Dérive LAB	Community sharing street ✧ Blurring driveways with patterns ✧ Flexible placement of street furniture ✧ Extended architectural functions, external Activities

Broadway Flatiron Plaza	 Source: NYC Government	Shopping sharing street ✧ Compress right-of-way for motor vehicles ✧ Combine with commercial facilities ✧ Time-sharing space utilization
Superblock, Amsterdam	 Source: Author	Community sharing street ✧ Uniform paving for blurring rights-of-way ✧ Road Calming: changing vertical curves ✧ Flexible placement of features in front of building areas

It is clear shown that the core approach to designing sharing streets is to blur the right-of-way by eliminating the height difference of road cross-sections, unifying the pavement, and traffic calming design. The street furniture is also used to add interest to the street. In the case of San Roque, the flexible street furniture increases the probability that the residents of the community will participate in street activities.

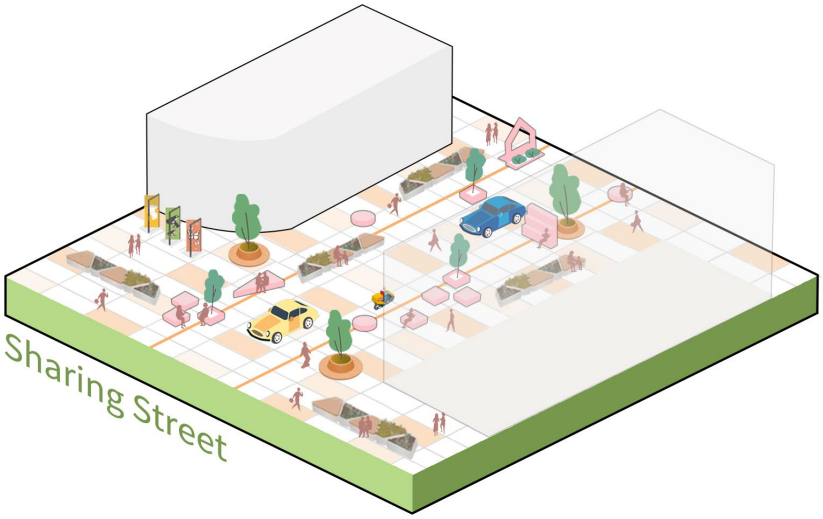


Figure 6-9 Model of sharing street

6.3.2 Private property, sharing social &living space

There are many sharing spaces in private ownership, and based on the classification in Chapter 2, they are divided into sharing social space and sharing living space according to the properties. Among them, typical spaces include CWS, sharing community hall, sharing kitchen and so on.

(1). CWS, sharing dining room, kitchen

Based on the large number of sharing office cases that exist, it can be concluded that most of the CWS have an open external image and flexible internal space layout for communication. In contrast, the layout of sharing living rooms in communities is more introverted and mostly located on the first floor of the cluster. In addition, they are very mixed in function, and can combine various functions such as sharing living room, kitchen, library, and activity room.

Table 6-6 Design guideline of sharing indoor spaces

	Case	Design strategies
San Roque, Tuxtla Gutiérrez	Co-working space  (Source: Gooood.hk)	✧ Open external image ✧ Flexible and loose layout of the interior space ✧ Plenty of informal office and communication space
Broadway Flatiron Plaza	Sharing community hall  (Source: Gooood.hk)	✧ Mix of multiple functions ✧ Connect the space of the first floor ✧ Time-sharing space utilization

(2). Time-sharing utilization of private sharing space

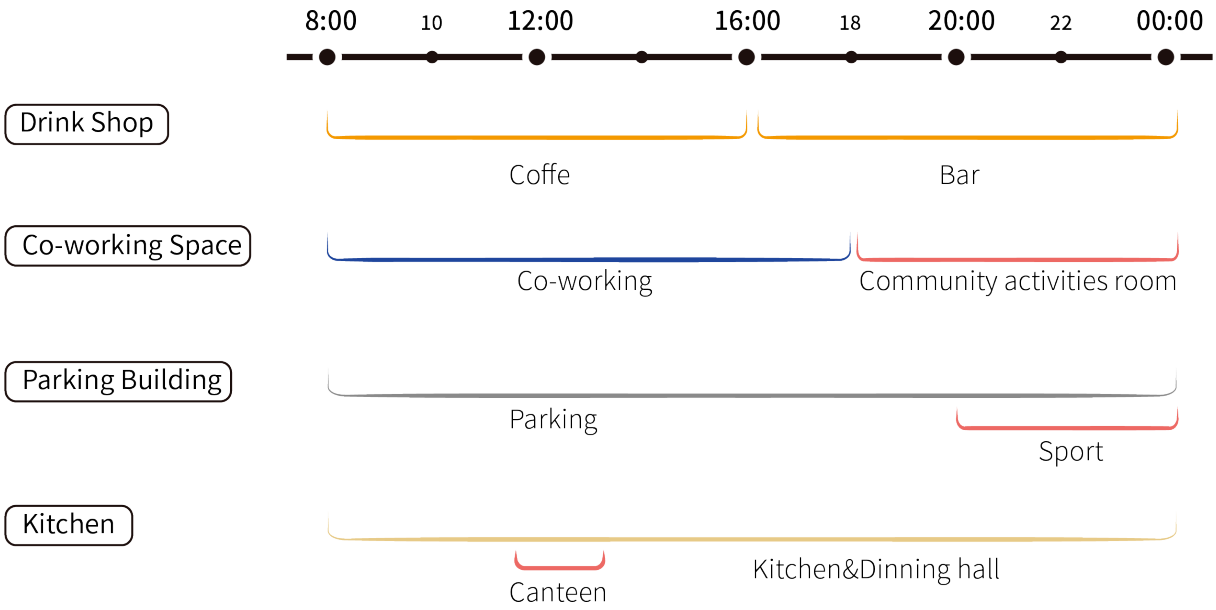


Figure 6-10 Time sharing of different spaces

For functions such as sharing office space, sharing parking space, sharing kitchen, etc., all have the potential to be shared in different time periods and can present different functions in the morning and evening to improve space utilization.

Commercial sharing: The commercial space on the first floor can be flexibly operated in the morning and evening, such as: the business mode of morning cafe and evening wine.
Office sharing: Co-working space can become a community activity room in the evening, such as painting room, musical instrument room, reading room.

Parking sharing: Indoor parking building can be converted into indoor sport area in the rest of the time.

Dining room & kitchen: It can temporarily function as a canteen for creative industry community during noontime.

6.3.3 Sharing communities and the controversial property spaces within them

In the case of Cobercokwartier in Chapter 4, the approach of creating a sharing community, CITYPLOT, is proposed to mix multiple functions in a community unit, i.e., integrating residential, office and commercial functions in one community. The design takes the interactions between the different functions into account and enhances the social and cooperative atmosphere within the community by planning the proportion of sharing spaces. In addition, the community offers a variety of residential types to meet the diverse needs of the creative class, such as rental-type talent apartments, Loft-type individual studios, and general for-sale residences. This design aims to create a multi-functional, diverse and vibrant community that offers more choices and opportunities for a diverse population.

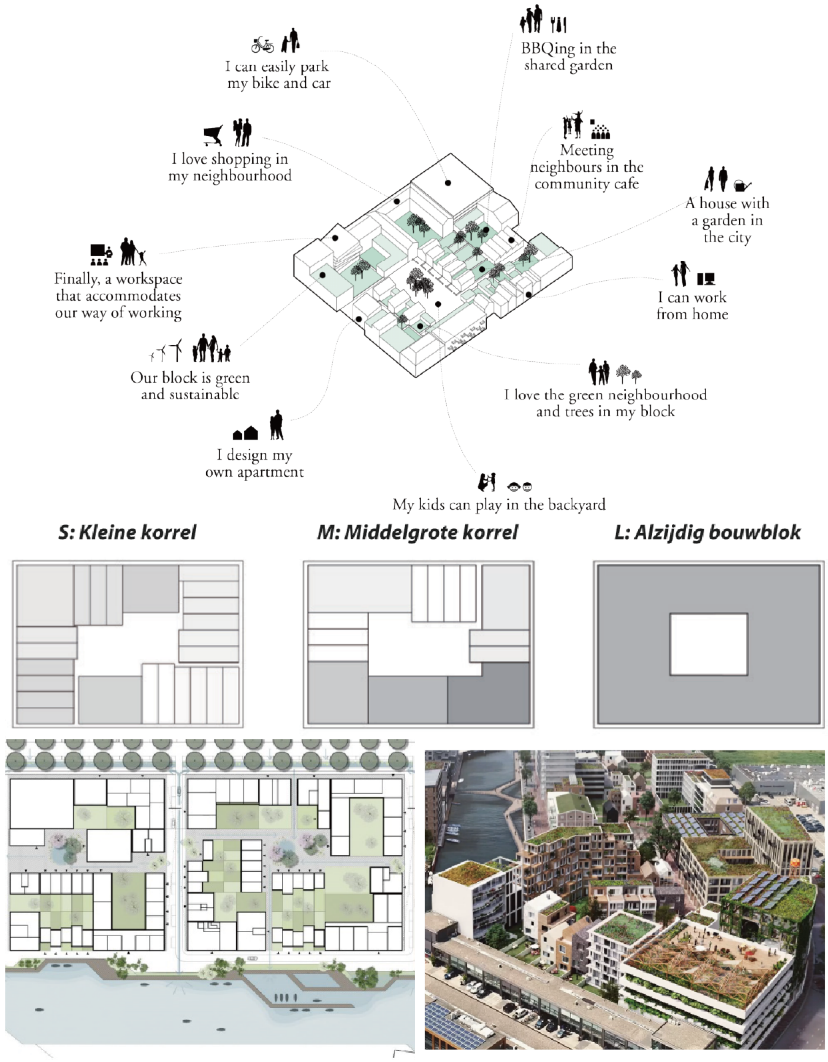


Figure 6-11 Cityplot concept to forming sharing community (Source: Studioninedots,2020)

A community model based on this theory in Changban creative community is proposed. In each community model, in addition to the mixed part of sharing functions, the sharing space is controlled to be partially concentrated along the street area, which helps the whole block to form a linear space.。

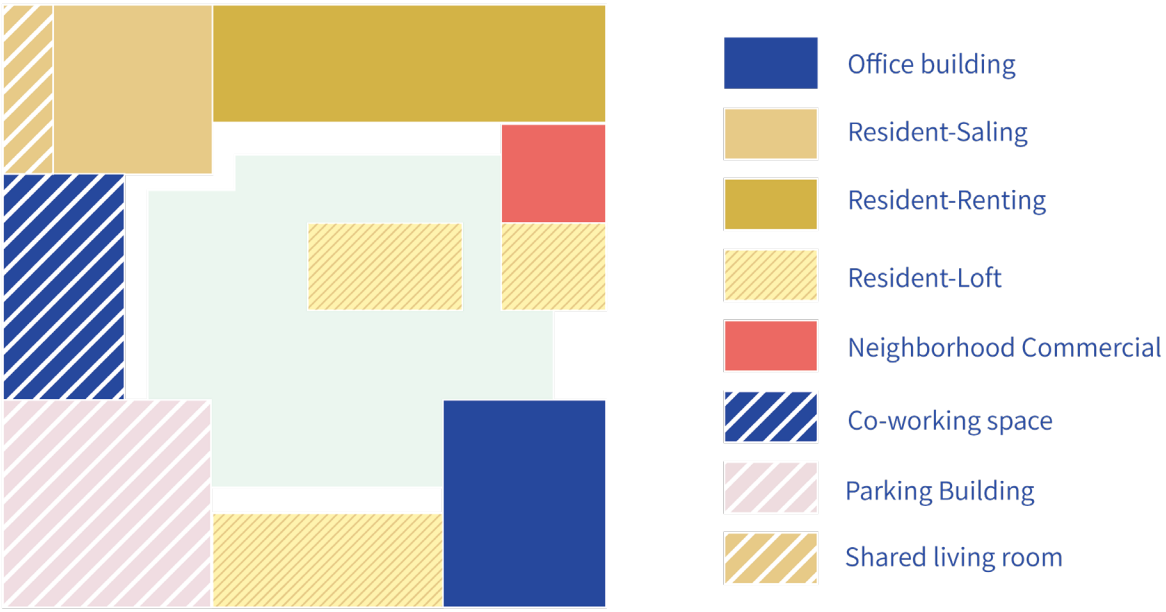
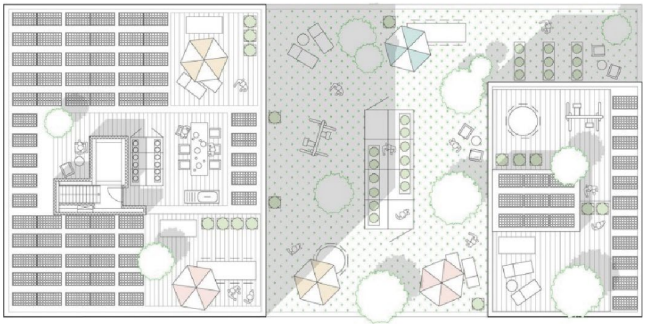
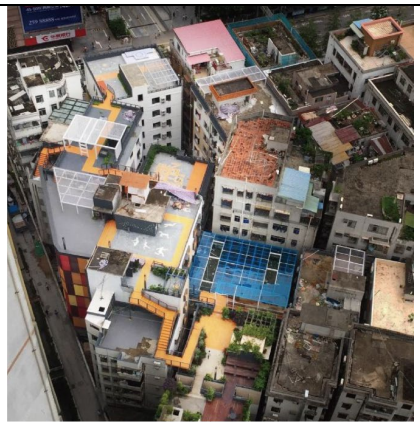


Figure 6-12 Function of sharing creative community model

For the ambiguous property right spaces in the community, the planning needs to control the location and form of such spaces through design to ensure that they can be used as sharing spaces for the community. For example, the roof platform is the main space, which can become a continuous open space through the corridor system to supplement the demand of the site for open space function. As shown in the example below, the Superloft community has created a continuous and accessible second-floor roof garden within the community by designing a continuous roof platform to create a coherent landscape system. In the case of the Shui Wai Village renovation, the design creates a sharing roof by adding a continuous roof corridor system to alleviate the extreme lack of public space in the local urban village.

Table 6-7 Design guideline of controversial spaces

	Superloft, Amsterdam	Shuiwei Village
Case-Digging out Controversial Spaces	  (Source: Gooood.hk)	  (Source: Gooood.hk)
Design strategies	✧ Detailed zoning add-on activities. ✧ Flexible facilities. ✧ Necessity of public participation.	

In the proposed community model, the building floor heights of the sharing spaces along the sharing streets are controlled, and the corridor system and outdoor stairs are used to form a continuous accessible second-floor platform. In this way, the spaces of ambiguous property rights can be fully utilized to form a sharing open space system.

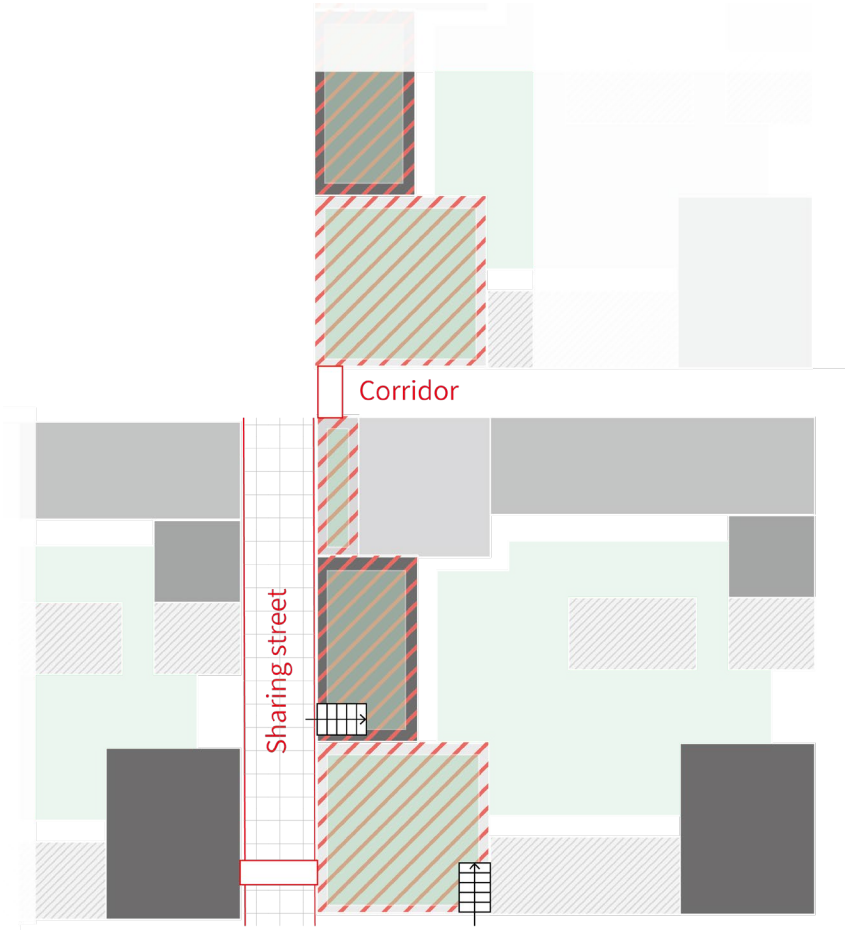


Figure 6-13 Stratagies for controversial spaces within community

6.4 Summary

This chapter proposes design guidelines for the Changban sharing creative community from the layout of the sharing space, and the design of sharing activities, to the detailed sharing space design approach, which will directly guide the generation of design schemes in the next chapter.

Chapter 7 Design sharing in Changban

7.1 Overview

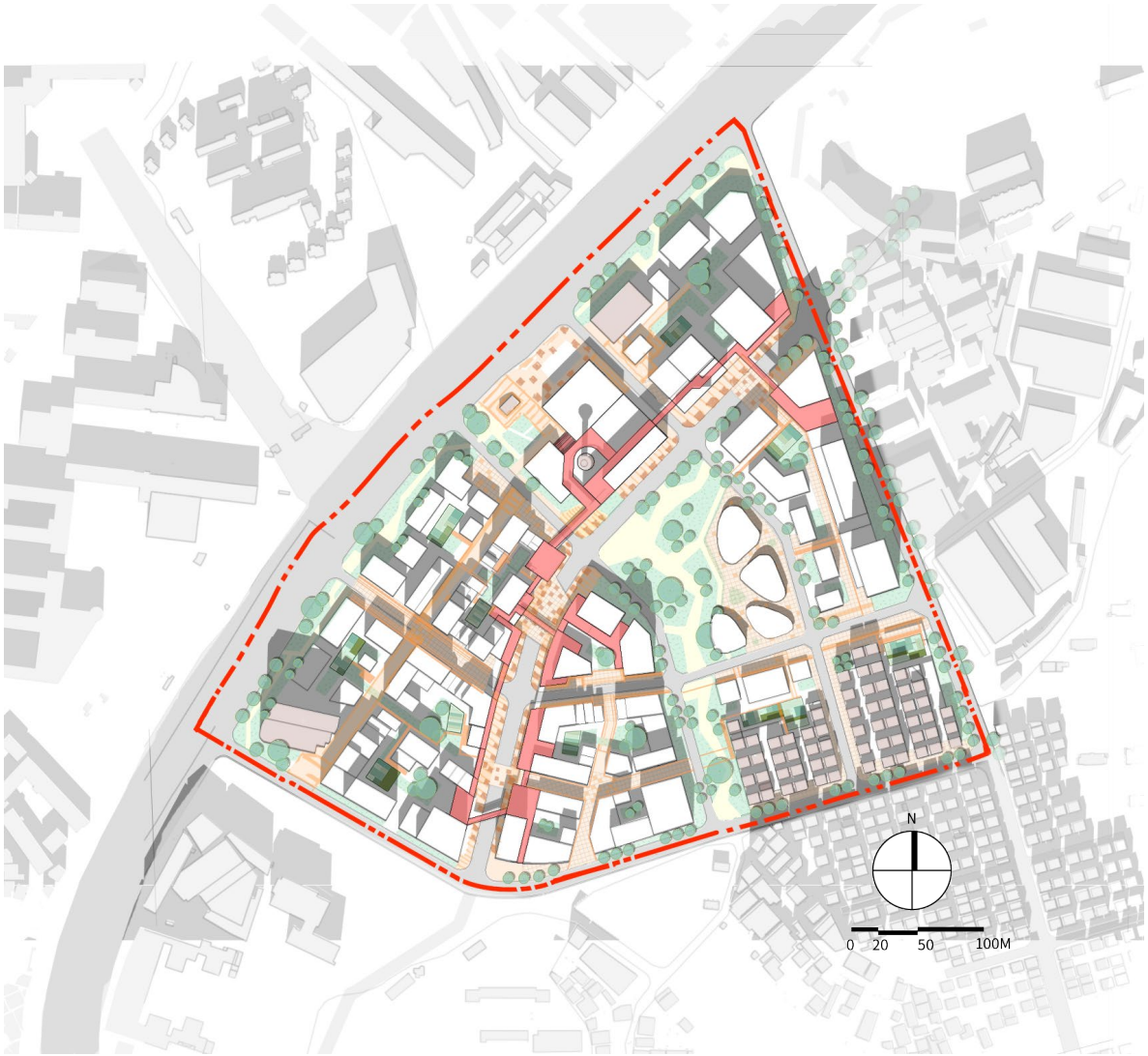


Figure 7-1 Master plan

Figure 7-2 Bird view

Figure 7-3 Master plan with annotates

This design forming a sharing axis comprising one sharing ring. The first axis is a sharing corridor running north and south of the site, connecting the shared functions of each community. This corridor is linked by shared corridors and sharing street, forming a cohesive pathway. Additionally, a sharing street connects the east-west axis of the site, linking the shared cores in each community and forming a shared ring.

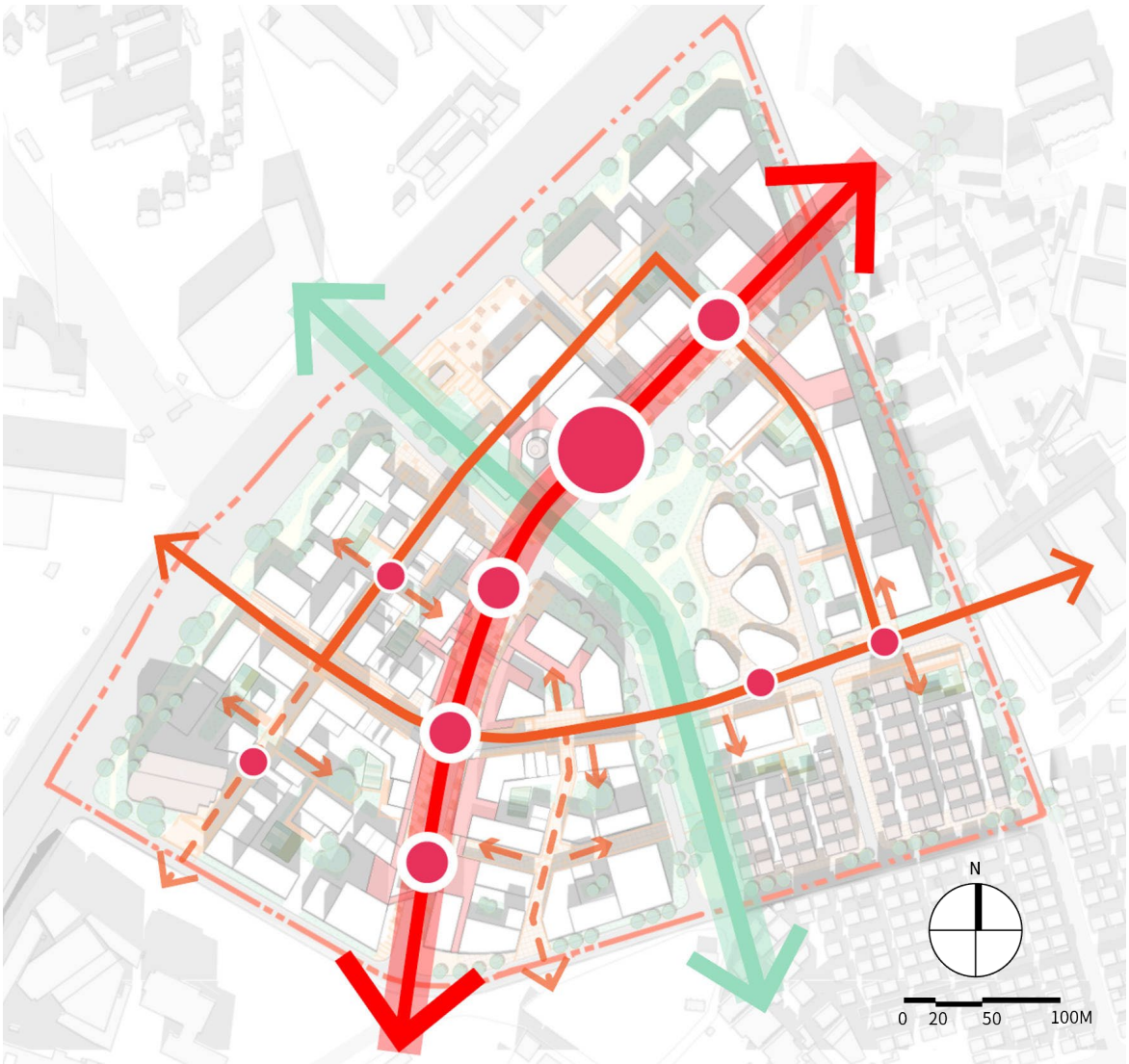


Figure 7-4 Spatial structure

7.1.1 Functional layout: integrating a variety of sharing spaces

(1). Land use

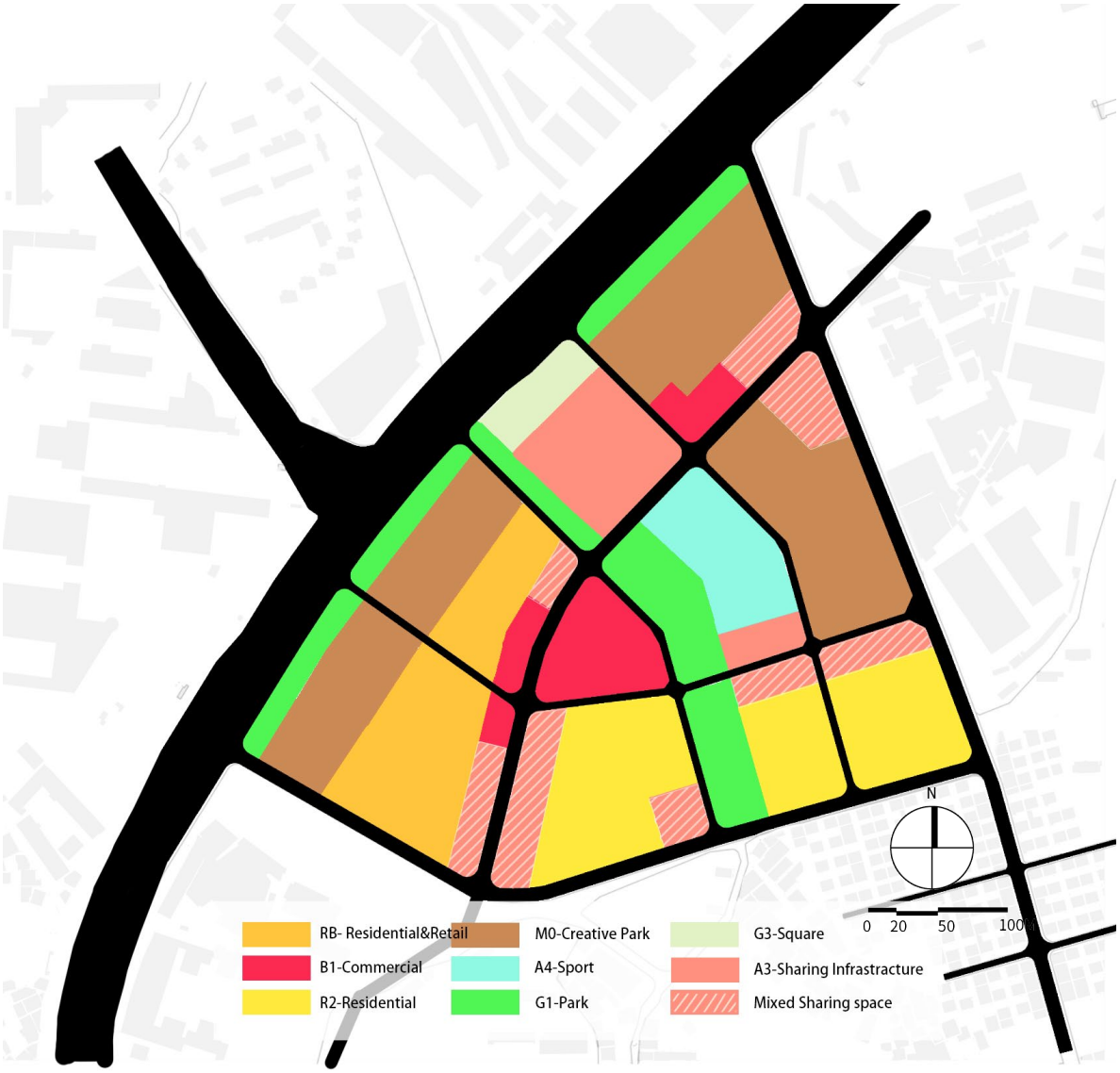


Figure 7-5 Land use

The following figure shown the analysis of building functions, which is used to interpret the specific layout of sharing functions. Based on the sharing function layout strategy proposed in Chapter 6, there is diverse mixed functions within the sharing communities. Many of these shared functions are arranged along the sharing corridors, indicating a high level of sharing along these corridors. Additionally, each community tends to have sub shared cores, such as a sharing hall in each community. When combining with the community sharing garden, these areas become the focal points for shared activities within the community.

(2). Function of buildings

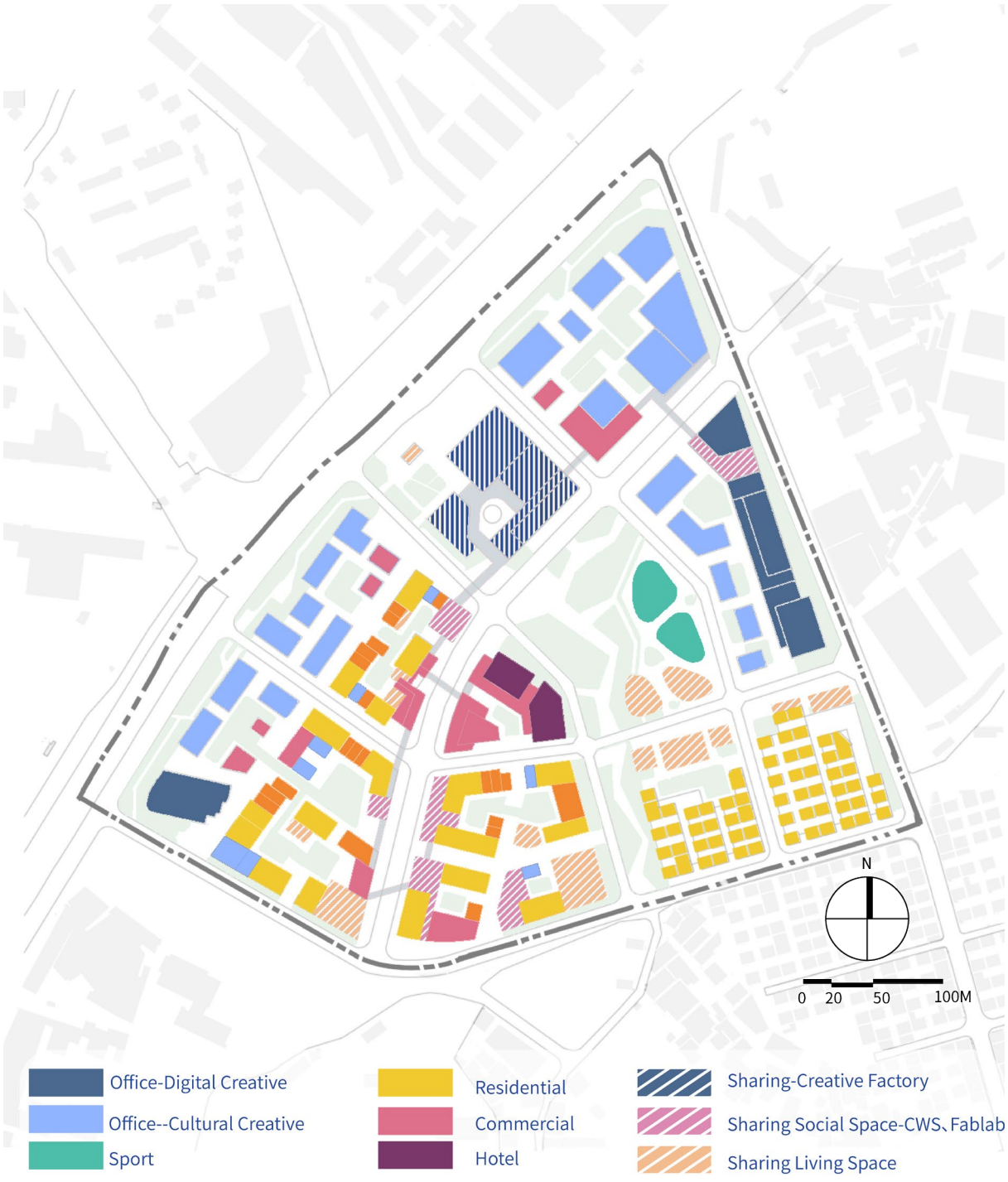


Figure 7-6 Function of buildings

According to the functional layout described above, the following planning structure diagram can be derived.

At the aspect of green system, the structure consists of one axis and one belt. The linear green land suround Changyuan Road serves as the belt of green space, enhancing the area's image and addressing the previously chaotic urban streetscape. A green axis extends into the site, connecting Changban Park and the subway station, creating an open corridor that enhances the district's landscape.

(3). Development intensity

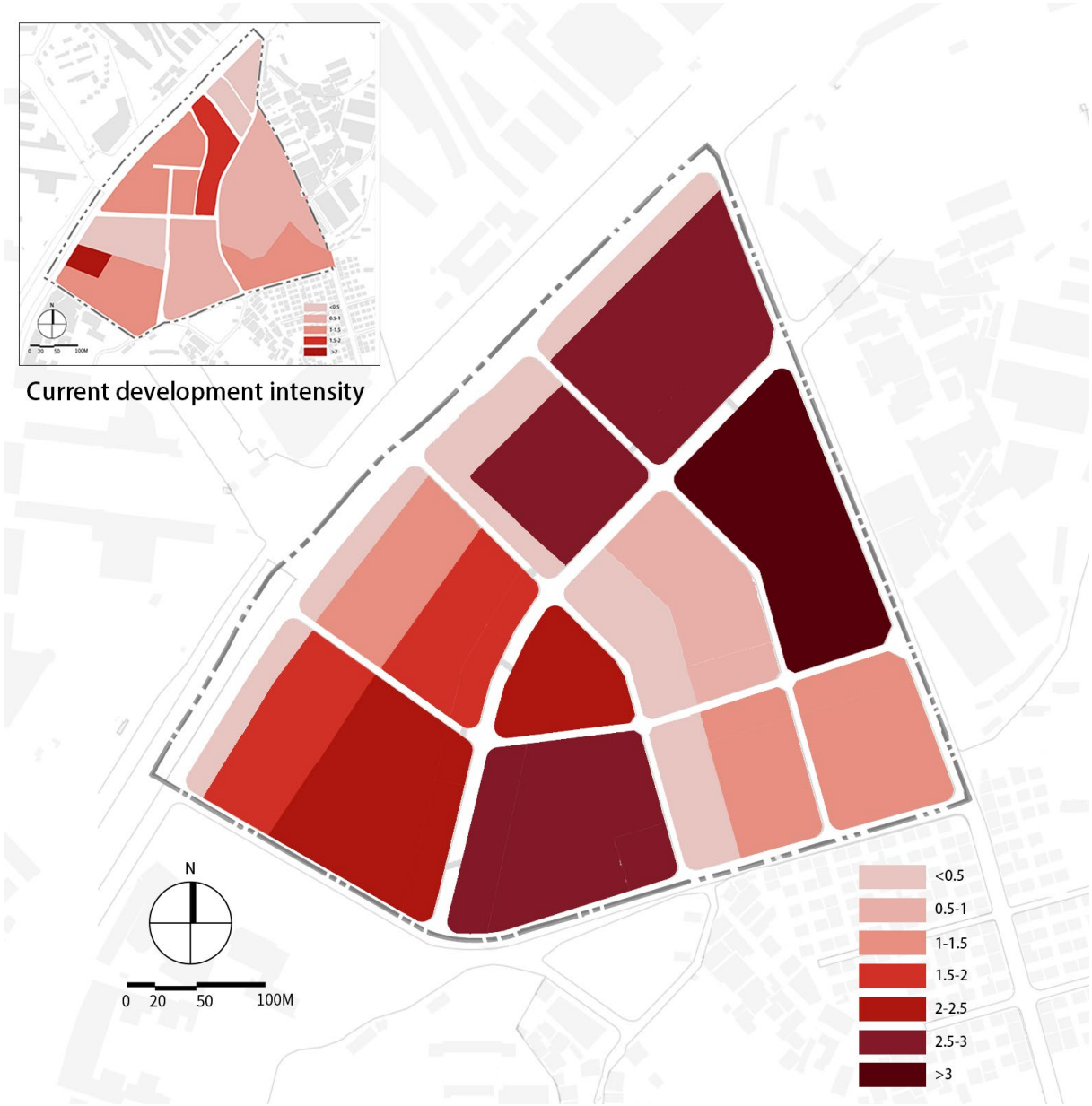


Figure 7-7 Development intensity

Although the regeneration of the site is supported by the policies, the regeneration still needs to ensure a certain level of development intensity in order to secure the development benefits. The net floor area ratio of the site has increased from 1.0 to 2.17, and the overall floor area has increased by 116k square meters, making the development intensity economically feasible.

In terms of specific functions, the overall area for production functions (industrial, office) remains unchanged, accounting for the largest proportion of the site, ensuring a solid foundation for creative industries. Secondly, residential, commercial and service functions have been increased, making the functional ratio of the creative community more suitable.

Table 7-1 Comparison of development intensity

Function	Current/m^2	Plan/m^2	+/-
Office/Industiral	133800	133426	- 374
Residential	19450	84600	+65150
Retail/Hotel	6600	26970	+20370
Cultre/Service/Leisure	2800	38713	+35913
Total floor area	162650	279309	+116659
Net FAR	1.00	2.17	-

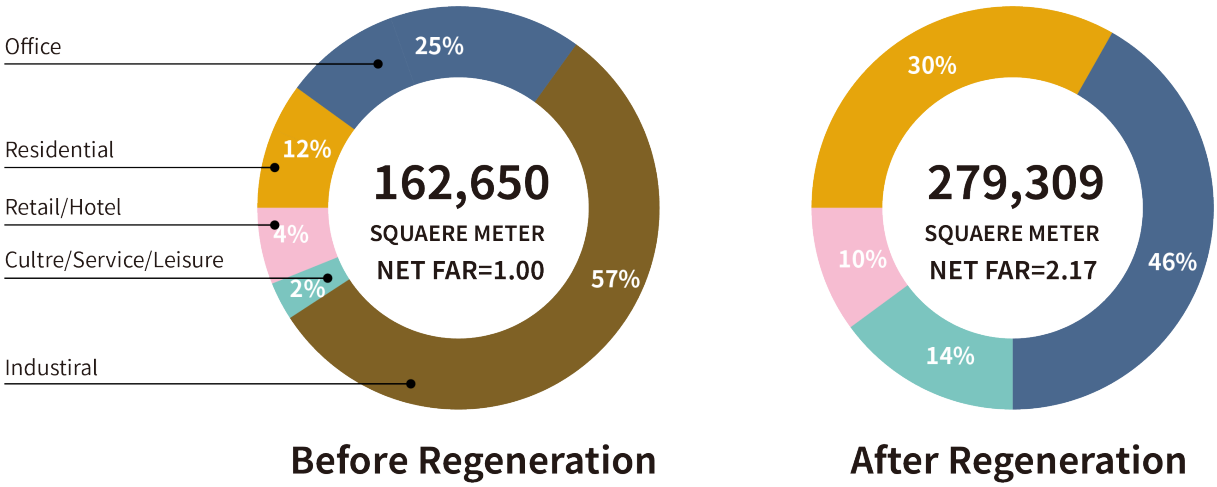


Figure 7-8 Comparison of functional ratio

7.1.2 Traffic: linking by sharing streets

In terms of traffic system, the plan solves the preexisting traffic issues on the site. The road network has been redesigned to increase its density and accessibility. The width of the roads within the site is also regulated to prevent excessive transit traffic. Internal roads are all less than 15m wide, except for the roads along the perimeter of the site, which have a width of 18m or more, meeting the minimum standard for motorize vehicles traffic. To resolve the parking problem, parking buildings or underground parking lots are established at the site's edges.

Regarding pedestrian traffic, various scales of sharing streets are created throughout the site, connecting the building clusters. Additionally, sharing plazas are incorporated under the sharing corridor, employing vertical curve design that reduce traffic speed and enhance the liveliness of the streets.

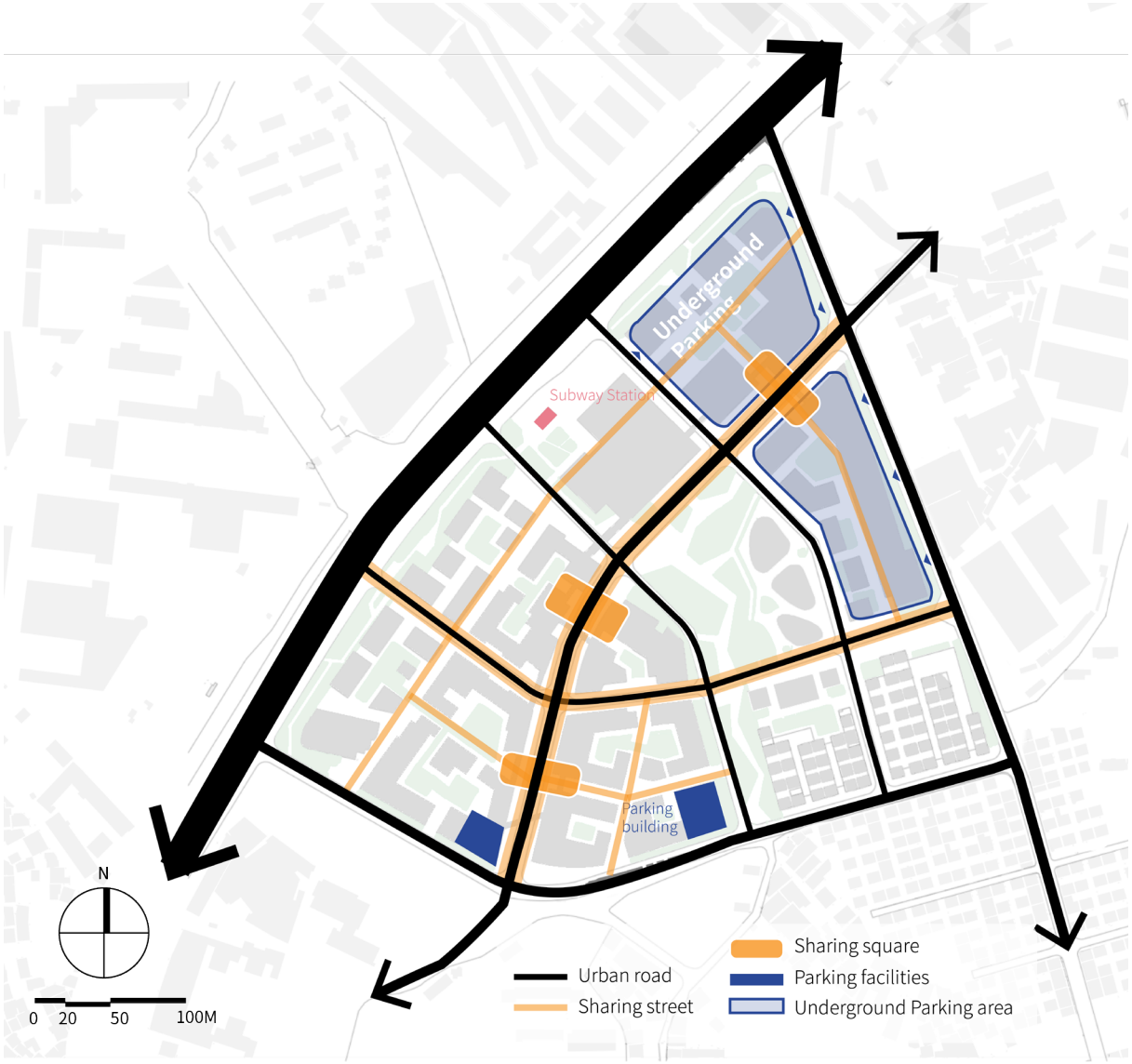


Figure 7-9 Traffic analysis

7.1.3 Development mode: controlling boundaries to form continuous sharing spaces

In order to better control the site's development, the plan incorporates further subdivision of the site development units. Each lot is intended to be sold separately to different property owners during the construction phase, ensuring the diversity of the site. Detailed control plans and urban design plans govern the shared street paths, ensuring adherence to the building line ratio along these streets and preserving the vitality of the sharing streets. In order to regulate the sharing of roofs. Building height control above the sharing corridor is also essential, along with a requirement for a certain percentage of sharing roofs to provide additional open space

in the vertical direction.

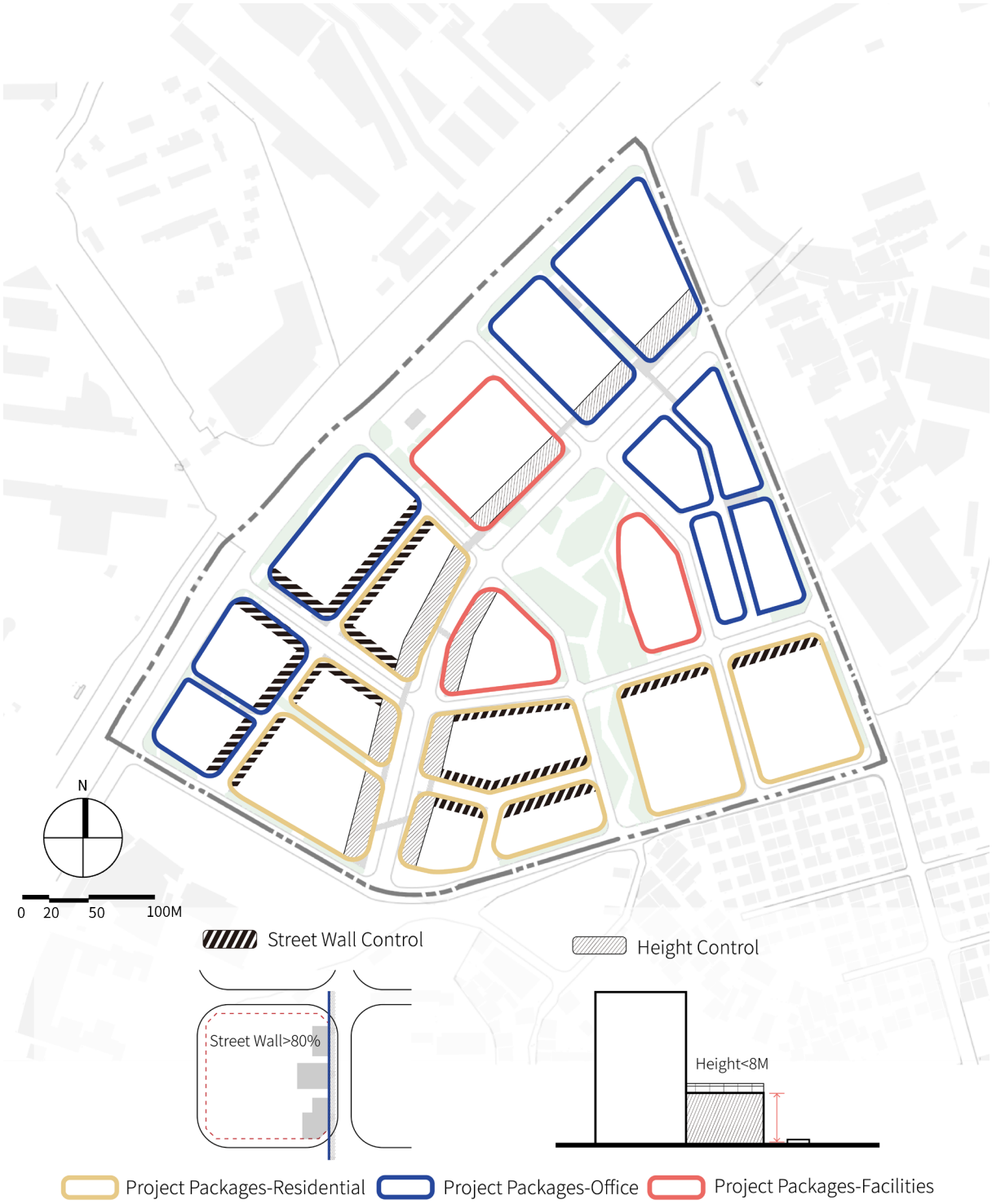


Figure 7-10 Project packages

7.1.4 Relationship between public and sharing space

In addition, to better explain the relationship between public and shared functions in the

program. This diagram shows the location of public spaces or sharing space. It can be seen that sharing overrides property rights and can be overlapped on both public and private sites. Spaces that belong to public property rights, such as urban main road, are not need for sharing, while street-level green spaces, which enhance the image of urban streetscapes, are not suitable for sharing. In contrast, open spaces within the site, whether they are courtyard green spaces or parts of centralized green spaces, can be shared as needed. Similarly, as with external spaces, at the architectural level, both public and private buildings can be shared. They can share all or part of their space, such as roof decks, courtyards, front areas, etc.

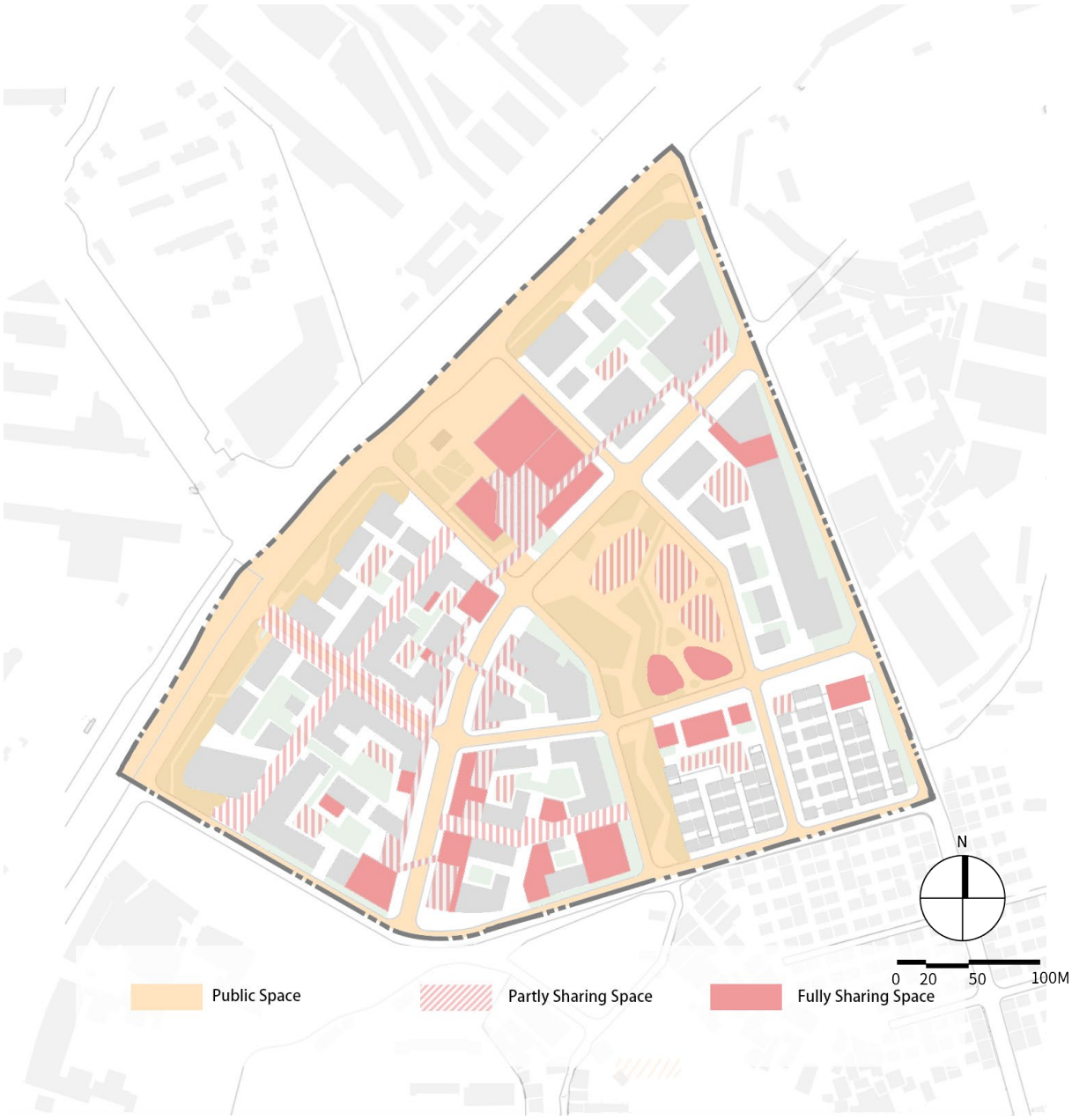


Figure 7-11 Relation of public and sharing spaces

7.2 Node 1. Sharing creative factory

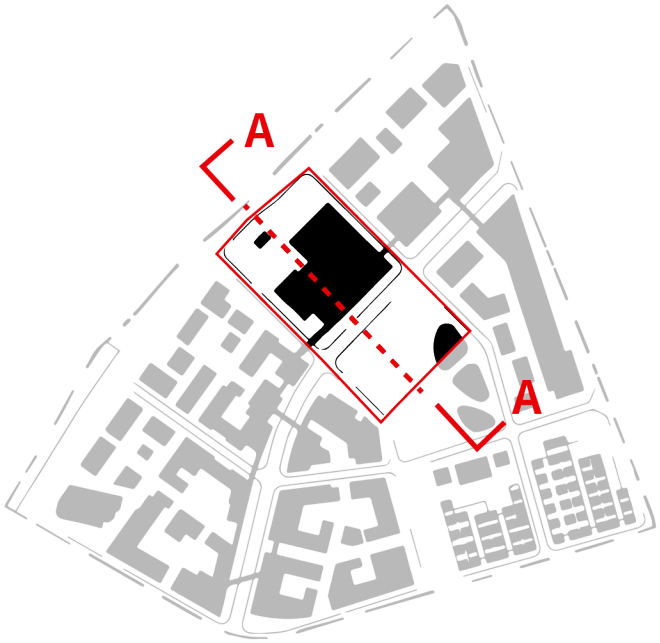


Figure 7-12 Location of Node1

In the creation of the sharing infrastructure - Sharing Creation Factory, it needs to be illustrated by the detailed node design. As shown in the figure below, the layout combines the city subway station, the park within the site, and a lot of combination with open space. The architectural design incorporates an industrial water tower to create a creative atmosphere and create a community gateway image.

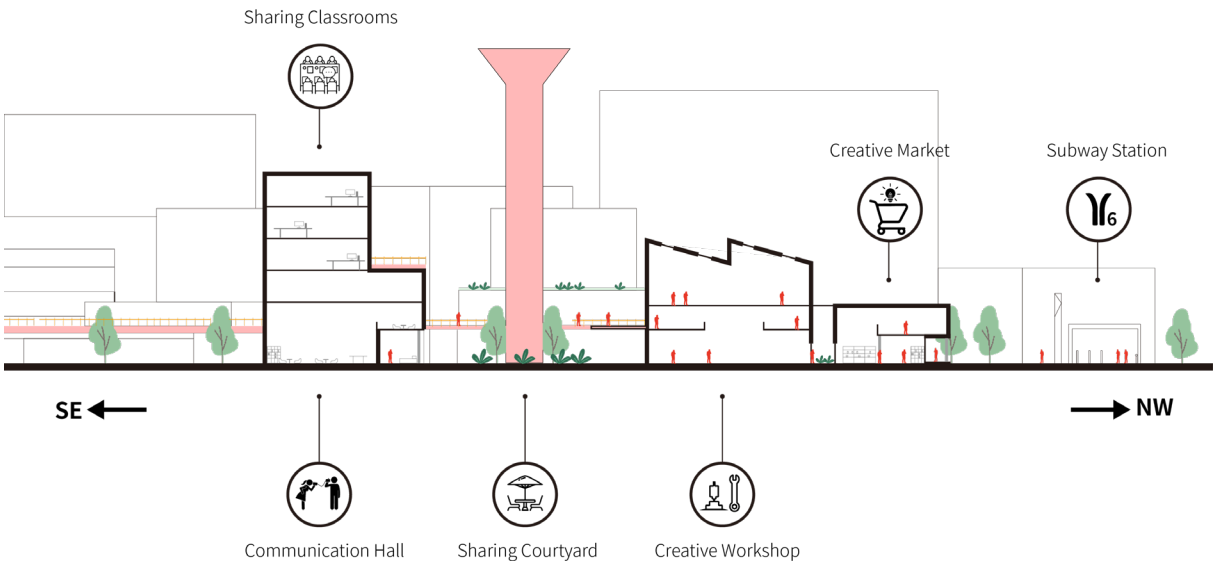


Figure 7-13 Section of Node 1

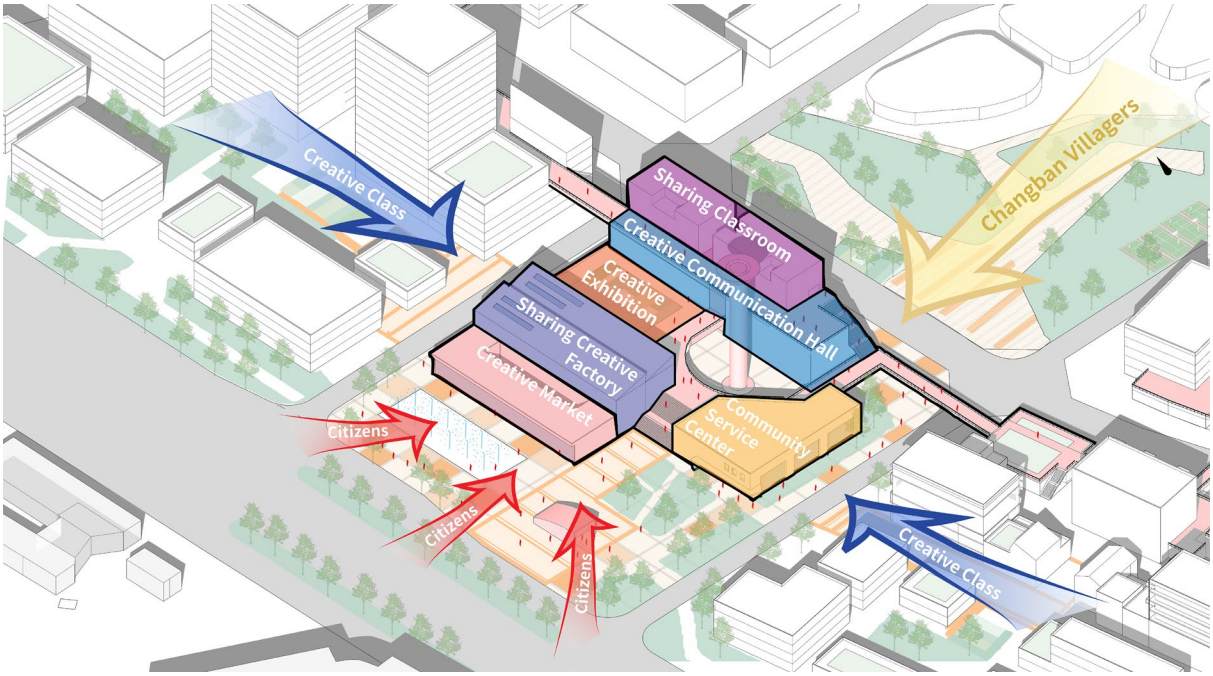


Figure 7-14 Function and flow analysis

According to the sharing flow strategy in Chapter 5: Sharing Creative Factory is heavily mixed in function. There are production functions: serving the creative class and providing various kinds of equipment for product prototyping; creative bazaar: displaying and selling creative products in the community, and also serving as an exchange center for bartering in the community; creative exhibition hall: displaying creative products in the community, and also serving as an external exhibition hall for rent; creative exchange hall: receiving daily activities, providing visiting services, and serving as an exchange between the creative class and the villagers of Changban Sharing classroom: a place to provide vocational training or cultural lectures, the hosts can be Changban villagers and creative class; Sharing community service center: a collection center to provide various shared services for Changban villagers, such as domestic service center, as the community's office hall.

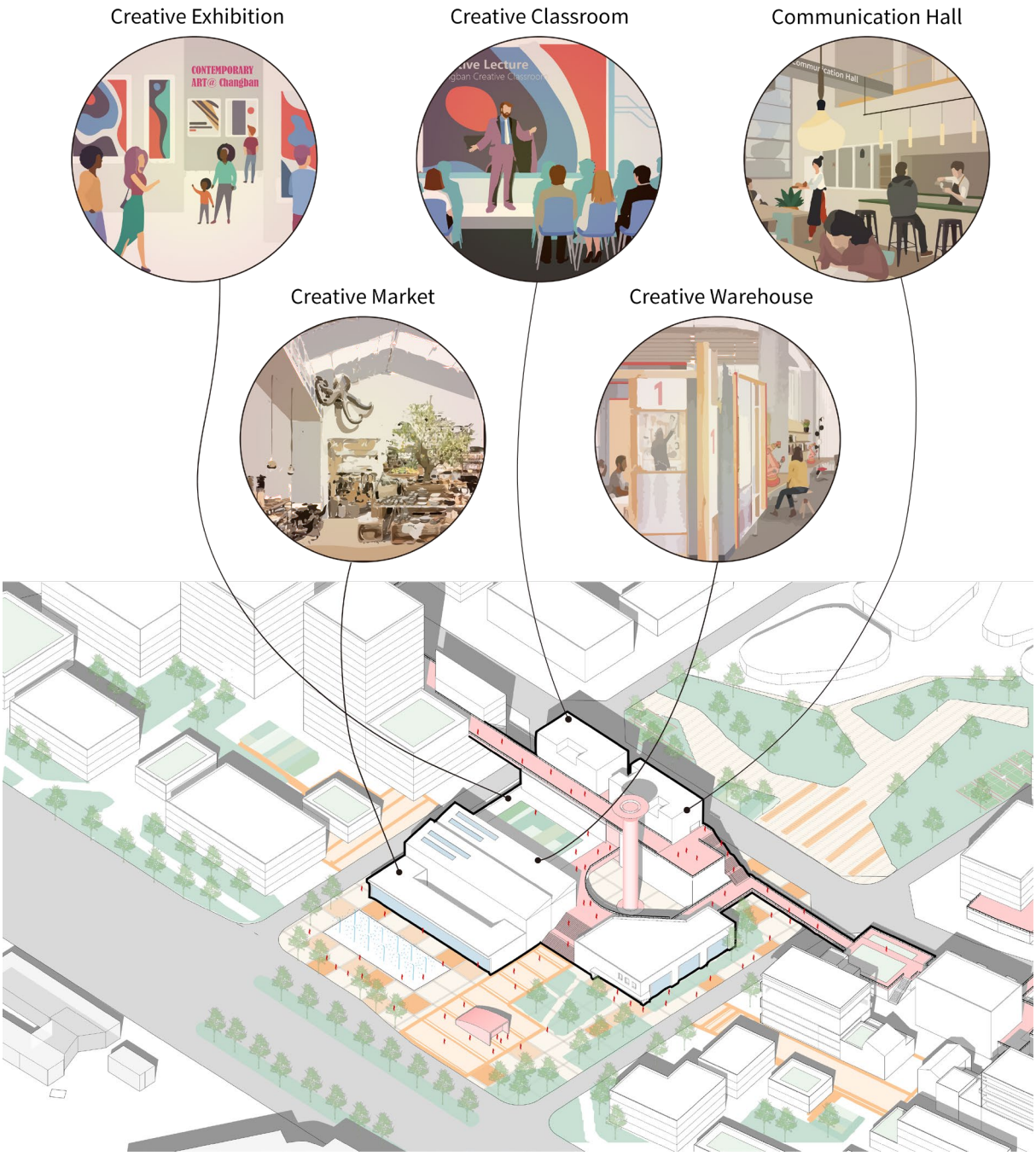


Figure 7-15 Axonometric drawings and sharing activities of Node1

7.3 Node 2. Sharing creative communities

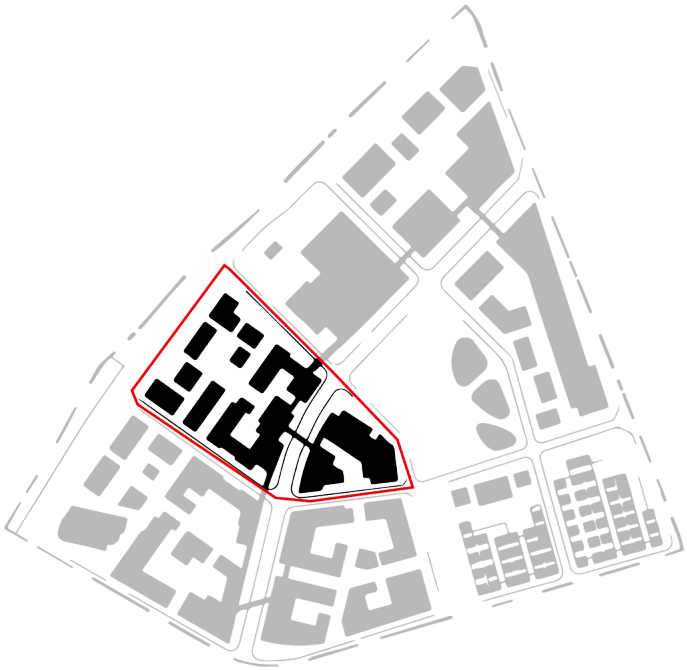


Figure 7-16 Location of Node2

The creation of a sharing creative community needs to be illustrated by a detailed node design, too. As shown in the figure below, the community incorporates residential buildings of different scales, including multi-levels apartment buildings, Lofts combining office and living, public rental apartment buildings, etc. The different scales of buildings create a sense of community enclosure. At the same time, some office and commercial functions are moderately integrated.

The community interface along the sharing corridor is the most mixed part. In terms of external space, there are CWS, commercial and other functions with high value arranged on the first floor of the buildings, and the roof platforms of these buildings are formed as a system with connecting corridors by controlling the height of buildings. The northern part of the site is a creative industry park area, which is not separated by urban roads, but by controlling the building Street Wall rate to create a sharing street between the two building groups, while opening up their respective atrium spaces. On the west side of the site, a sharing street is constructed to connect the city roads and serve as a window to the city. On the south side of the site, in order to get an ambiguous right of way and slow the traffic speed. The design uses a continuous brick paving and vertical curve control to form a square overlapping the road. It that can be used as a exhibition space during necessary events. (See master plan.)

Inside the community, some of the green areas are divided into sharing gardens, which is available for planting by community residents. Some areas are designated as community sharing stages, and urban furniture is arranged and combined with sharing living rooms in the community to ensure that sharing permeates each other inside and outside the community. (See the ground floor plan)

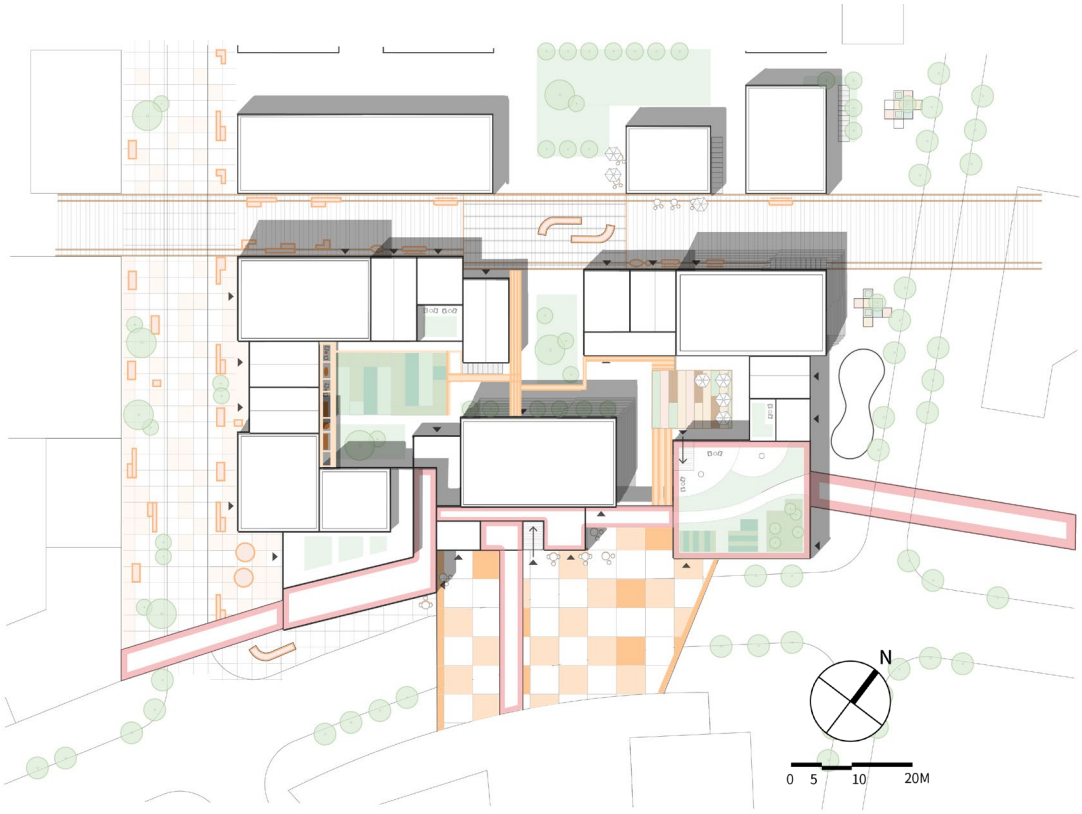


Figure 7-17 Master Plan of Sharing Creative Community

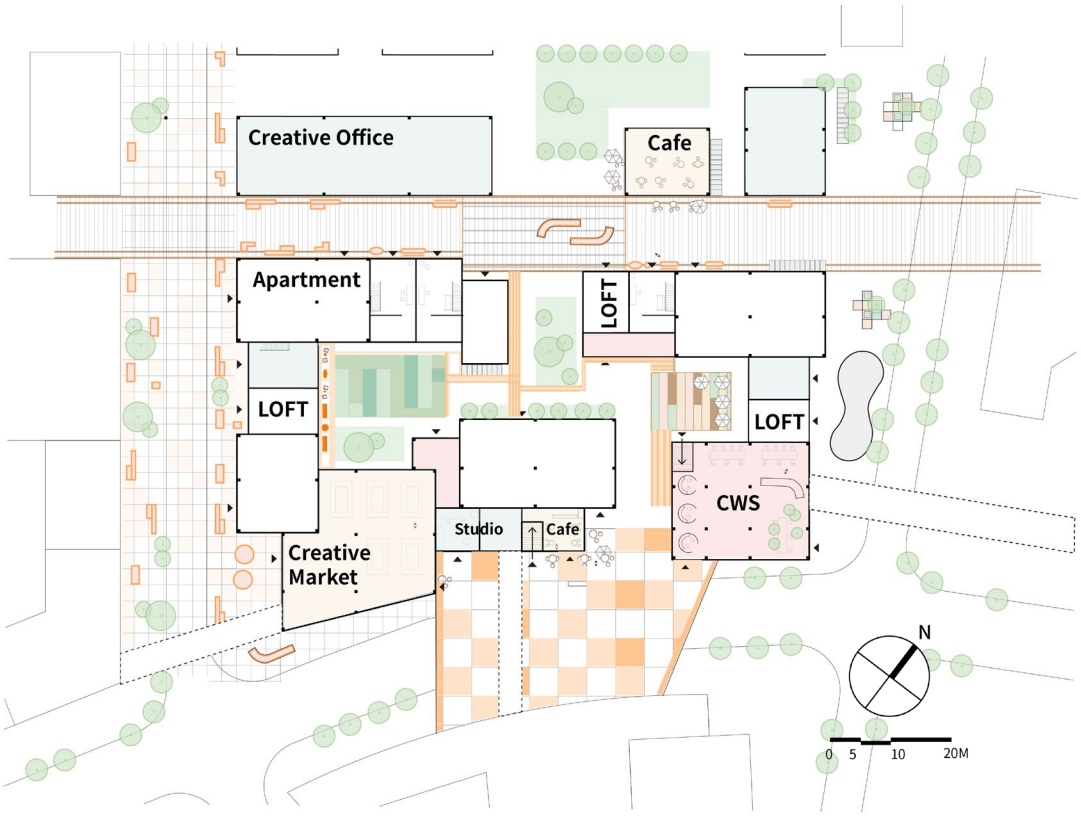


Figure 7-18 Ground floor plan of sharing creative community

From this scenario diagram, it can be seen that at the ground level and the second floor roof platform are the main spaces where activities occur. The commercial and sharing spaces of the single floor building ensure the mobility of the crowd, and the combination of the community intersection and the external sharing space allows the crowd to interact and communicate in the sharing space inside and outside the community.

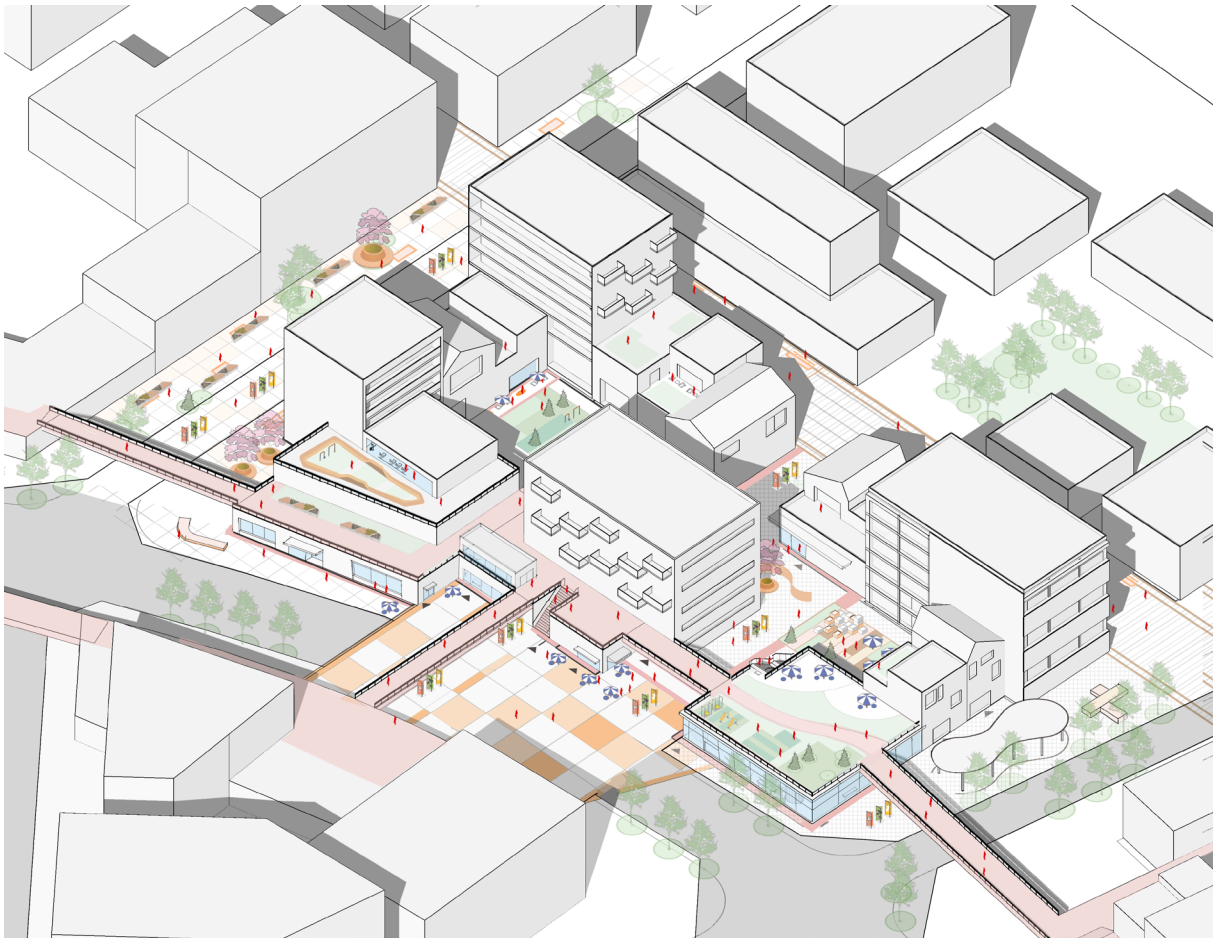


Figure 7-19 Axonometric drawing of sharing creative community

Let's start with an example of a node in the sharing corridor. As mentioned earlier, the time-sharing utilization of sharing spaces is an important strategy. During the daytime, the sharing corridor is filled with beverage stores selling products such as coffee and milk tea, while CWS serves as an office for the independent creative crowd inside and outside the site. And at night, these coffee shops can be converted into Bar, providing a place for neighborhood nightlife. The CWS can be used as a community room, a flexible space where a variety of activities can take place.

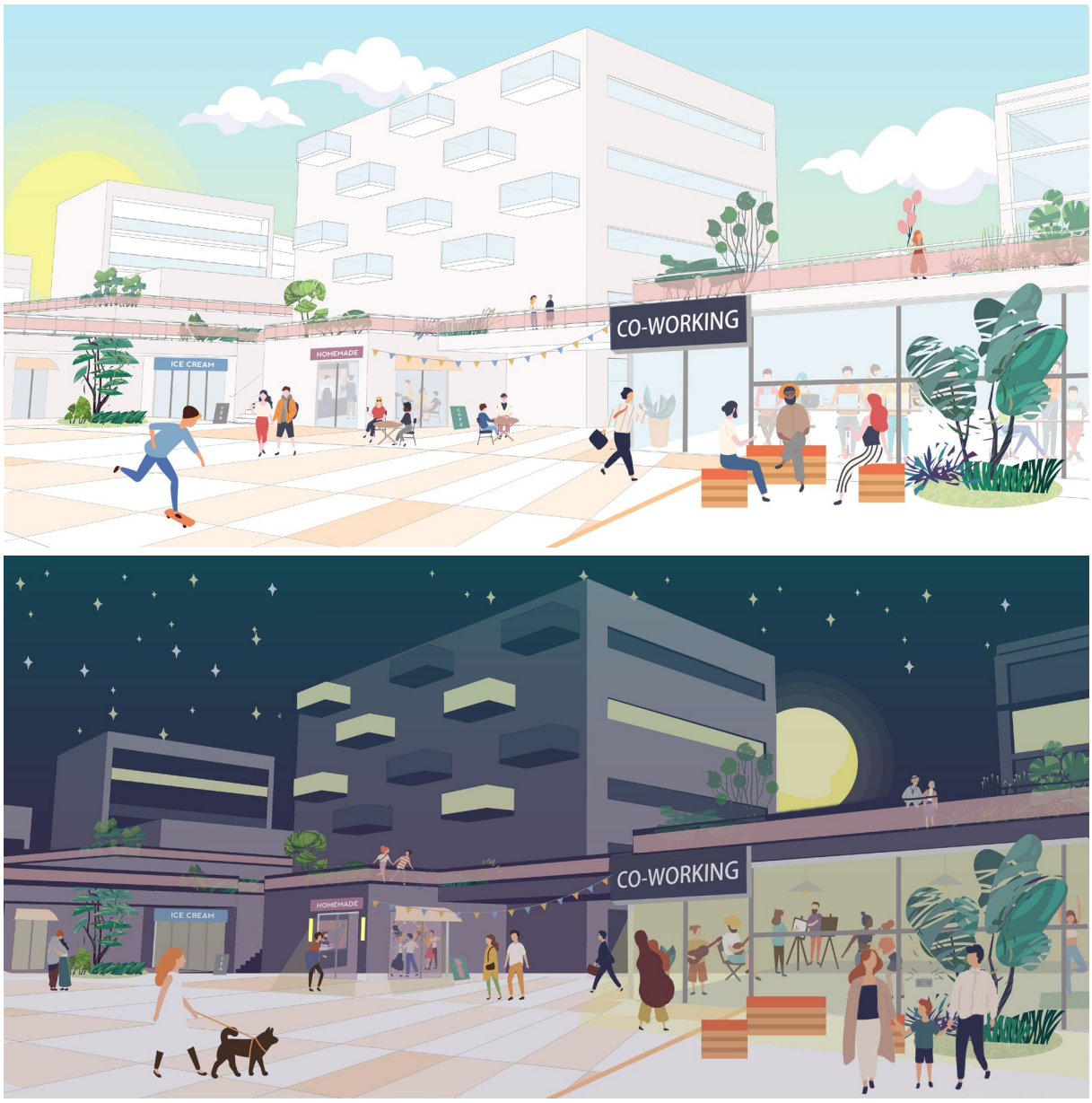


Figure 7-20 Sharing corridor in daytime and night

The following figure shows a scenario of a sharing courtyard in a community, using the sharing green space model, which subdivided the right to use the green space in the community and enabled residents to participate in shaping the community landscape, as shown in the specific scenario in the figure.

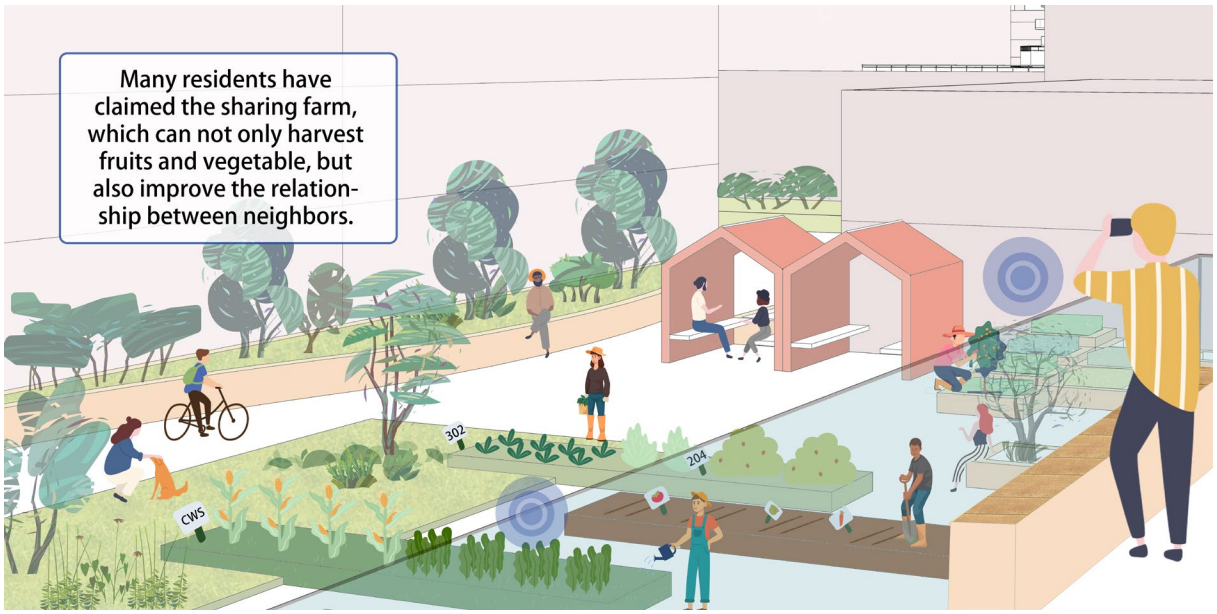


Figure 7-21 Sharing garden

7.4 Node 3. Sharing urban village

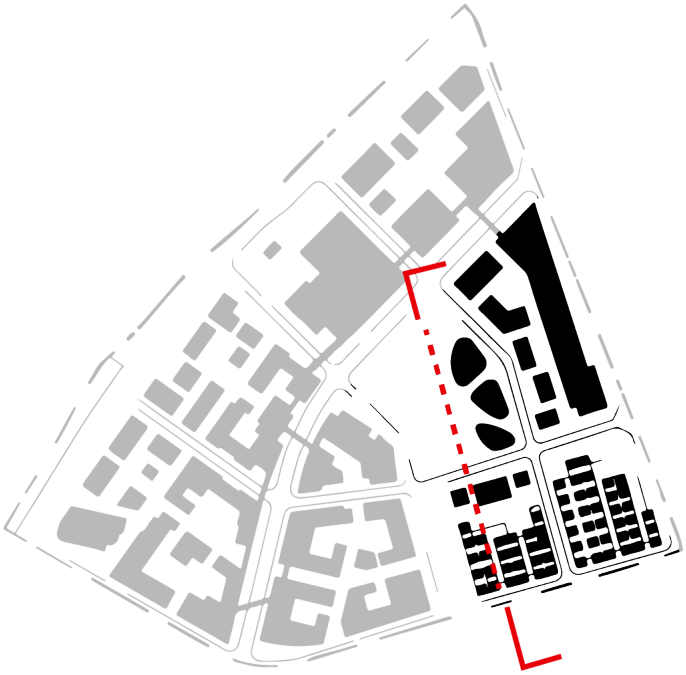


Figure 7-22 Location of node3

To address the lack of open space and high building density in Changban Village, the plan is optimized in two ways. Firstly, the new green public space added by the plan is integrated with the residential area of Changban Village to ensure easy accessibility of open space.

Secondly, it renews the community and finding out the potential sharing space. The original building density of Changban Village was extremely high, and no new residential buildings will be added after adjusting the road net structure. The use of a continuous first floor space integrates the broken texture, thus creating a sharing community hall. Finally, the utilization rate of controversial property rights space is improved. Sharing design is carried out on the roof space and other fragmented spaces with controversial property rights.

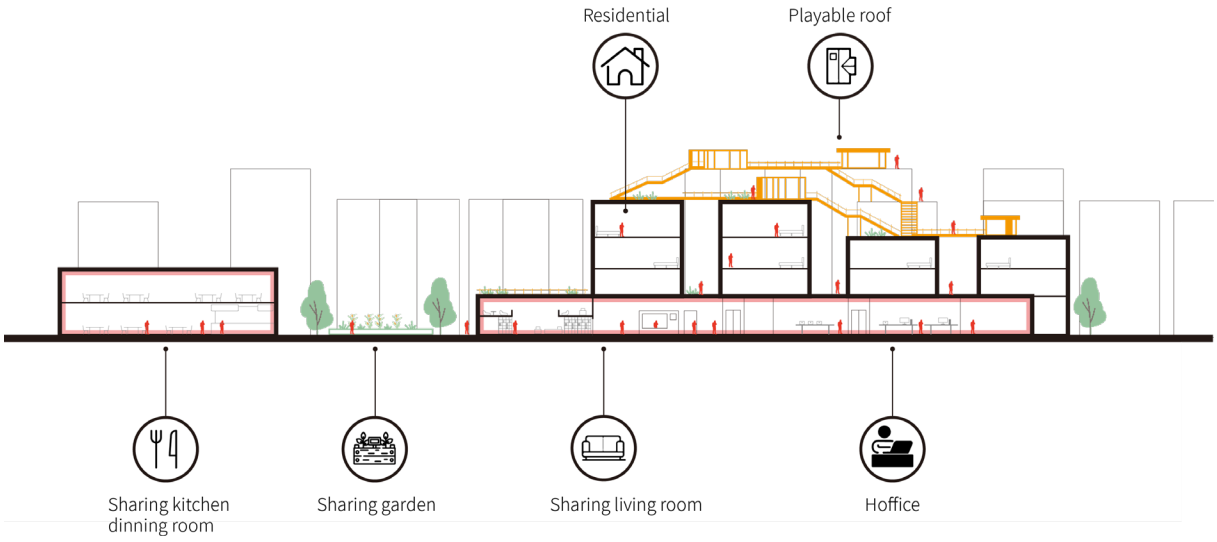


Figure 7-23 Section of sharing urban village

It can be seen that in the community, through the integration of the space on the first floor, the formation of a system of corridors on top of the buildings, the arrangement of sharing courtyards and other techniques. This has greatly increased the sharing space in Changban New Village, giving residents more choices in their spare time activities.

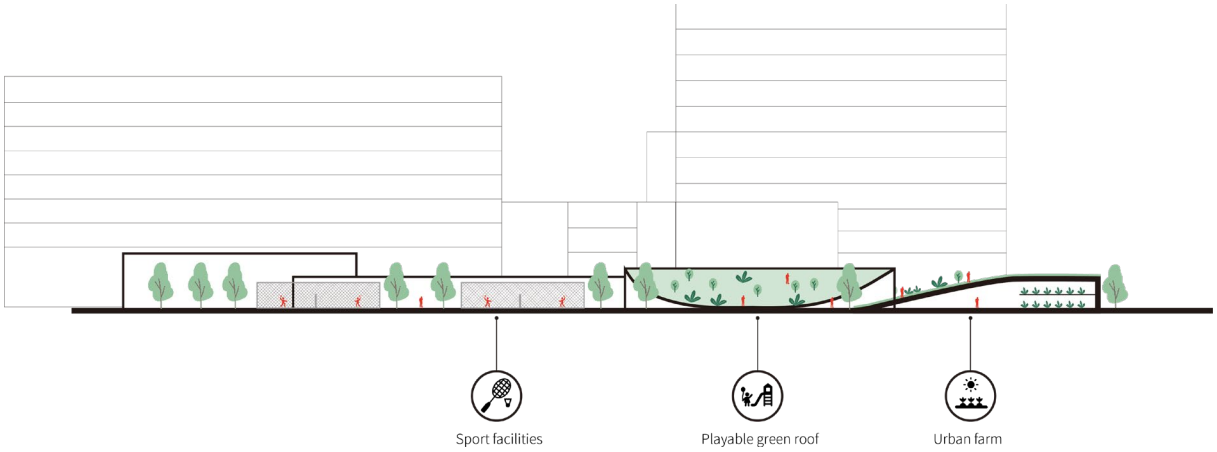


Figure 7-24 Section of sharing park

In the city park, the site is supplemented with sports facilities, which are in short supply, and

urban farms and other spaces are used to realize the skills of the villagers of Changban. The architectural design of the park connects the roofs of the park to form a continuous urban landscape.

Figure 7-25 Image of sharing urban village

Conclusion

(1). Research conclusion

This thesis is a study of sharing design at the urban block scale. This thesis follows the logical framework of theoretical research and cases verification to solve the four issues raised at the beginning of the thesis are addressed.

1. What is sharing? What are the objectives and characteristics of sharing?
2. What kinds of space can be share? What are the characteristics of sharing space?
3. How to design sharing? How can we get the final goals of sharing though design?
4. In Changban, what are the strategies can be raised up?

This thesis summarizes that the abstract connotation of the sharing concept includes the objectives and the characteristics of sharing based on multidisciplinary research on sharing concept. That is, sharing is for the revival of the community in the city, citizen empowerment, solidarity and social justice, sustainability and efficiency and social innovation through new economic arrangements. The sharing concept is characterized by community ties, responsibility, altruistic motives, and easy access. The content with these characteristics and purposes of sharing is defined as shareability. Practices of sharing are active in terms of spaces, entities, services & facilities, activities & experience.

Regarding the research on sharing in the spatial field, sharing space is broadly defined in this thesis as the sharing of public and private space use in the city. Through the literature review of sharing space, from macro-scale sharing cities, to research on the shareability of public property spaces, such as sharing streets and sharing infrastructure, and finally to micro-scale research on cohousing and co-working space. It is concluded that spaces with shareability can be called sharing spaces, regardless of whether they originally belong to public or private property spaces. Based on the shareability, this thesis summarizes the characteristics of sharing spaces. These include weaking the ownership, elastic & dynamics, Idle &dispersion, provided from bottom-up, mixed-used &pluralism, complex powers & responsibilities, balancing of interest, and joint construction. Meanwhile, in this thesis, ownership and vectors of sharing spaces are also used to classify the sharing spaces in detail.

After clarifying the sharing concept and shared space, this thesis introduces the sharing system approach in order to know how to design sharing. The core of this concept is that sharing can be enhanced by design through a systematic analysis approach to understand the sharing issues and potential of each site. This thesis summarizes the analysis method of sharing system based on the previous research. The specific process is as following. Firstly, through sharing issues analysis, sharing potentials analysis, and drive the sharing system/subsystem and the objectives of them. Secondly, the sharing subject & interest analysis is used to derive the criteria for evaluating. Finally, the performance & threats analysis is used to make a defense mechanism against the limitations and threats of the system. Finally, to design for sharing, it is necessary to design for sharing activities, sharing spaces, rules& regulations.

After exploring the methodology of sharing design, the results of this study are also applicable to the design of the Changban creative community. In this thesis, the following strategies are proposed for the Changban creative community.

For the functional layout of sharing functions, the strategy of partial concentration and overall decentralization is proposed. For the flow of sharing elements, the combination of relevant sharing activities and space is designed and the corresponding system is proposed to support. For the respective sharing spaces that appear in the sharing system of Changban, the relevant design strategies are proposed according to the case study.

(2). Contribution

Research on sharing in space design has mostly focused on architecture or single community scale, but there is no systematic summary of sharing design methods in urban block scale space design. This thesis summarizes previous research and use the sharing concept to design at a macro scale of cities and blocks. By linking various types of sharing spaces together innovatively using spatial strategies to achieve a sharing system which can support stable sharing behaviors. The design can enhance the sharing level of the whole neighborhood and create the sharing atmosphere of the community. Finally, in Changban, this thesis proposes a sharing design plan to forming a sharing creative community.

(3). Inadequacy

The sharing concept is not universal in design. First of all, sharing needs to be based on a community in order to have a certain degree of community acceptance. Then the operation of the sharing system needs a detailed management mechanism to assist the operation, which is not explored in depth in this thesis. At the same time, as the sharing economy may become platform economy with traps, it is also necessary to be wary of the sharing concept becoming a gimmick and a marketing tool in the design.

(4). Gap and future researches

In the future, we can conduct more in-depth research on how the sharing spaces are connected by design. In this study, the author mainly used qualitative and empirical judgment, which is far less accurate than constructing a scientific and rational value judgment system. In addition, the evaluation and feedback mechanism of sharing activities is also one of the key directions to be studied in the future. Finally, the operation and management mechanism of sharing spaces is also a point for future research.

Bibliography

[1]中国国家信息中心. 中国共享经济发展报告（2023）[R]. 北京: 中国国家信息中心, 2023.

[2]何婧, 周恺. 从"追求效率"走向"承载公平"——共享城市研究进展[J]. 城市规划, 2021, 45(4): 12.

[3]李振宇, 朱怡晨. 迈向共享建筑学[J]. 建筑学报, 2017(12): 60-65.

[4]甄杰, 任浩, 唐开翼. 中国产业园区持续发展：历程、形态与逻辑[J]. 城市规划学刊, 2022(01): 66-73.

[5]袁芯. 从产业园区向产业社区转型的创新战略路径研究——以紫竹国家高新技术产业开发区研发基地二期为例[J]. 上海城市规划, 2022(06): 140-145.

[6]贺传皎, 王旭, 李江. 产城融合目标下的产业园区规划编制方法探讨——以深圳市为例[J]. 城市规划, 2017, 41(04): 27-32.

[7]张馨月. 产城融合模式下新型产业园社区化设计策略研究[D]. 华南理工大学, 2020.

[8]王亚云, 夏雨禾. 创意社区:概念、发展议题和建构模式[J]. 江西青年职业学院学报, 2015, 25(04): 65-68.

[9]王兰, 吴志强, 邱松. 城市更新背景下的创意社区规划:基于创意阶层和居民空间需求研究 %J 城市规划学刊[J], 2016(04): 54-61.

[10]范黎丽, 王文姬, 任丹. 从创意园区到创意社区——论中国城市创意产业的模式转型[J]. 智能城市, 2018, 4(04): 3-4.

[11]Belk R. Why Not Share Rather Than Own?[J]. The ANNALS of the American Academy of Political and Social Science, 2007, 611(1): 126-140.

[12]Schor J. Debating the sharing economy. Great transition initiative[J]. Tellus Institute: Cambridge, MA, USA, 2014.

[13]赵四东, 王兴平. 共享经济驱动的共享城市规划策略[J]. 规划师, 2018, 34(05): 12-17.

[14]Sánchez-Vergara J I, Ginieis M, Papaoikonomou E. The emergence of the sharing city: A systematic literature review to understand the notion of the sharing city and explore future research paths[J]. Journal of Cleaner Production, 2021, 295.

[15]Chan J K H, Zhang Y. Sharing Space: Urban Sharing, Sharing a Living Space, and Shared Social Spaces[J]. Space and Culture, 2018, 24(1): 157-169.

[16]胡沂佳. 从“创意园区”到“创意社区” 山水杭州的创意之道[J]. 时代建筑, 2010(06):

68-69.

[17]施玮. 基于地方特色文化的创意社区发展模式研究[J]. 长春理工大学学报(社会科学版), 2014, 27(10): 70-73.

[18]Florida R The rise of the creative class[M]. 9. Basic books New York, 2002.

[19]Felson M, Spaeth J L. Community Structure and Collaborative Consumption: A Routine Activity Approach[J]. American Behavioral Scientist, 1978, 21(4): 614-624.

[20]Carr J, Dionisio M R. Flexible spaces as a “third way” forward for planning urban shared spaces[J]. Cities, 2017, 70: 73-82.

[21]Belk R. Sharing[J]. Journal of Consumer Research, 2009, 36(5): 715-734.

[22]Bernardi M, Diamantini D. Shaping the sharing city: An exploratory study on Seoul and Milan[J]. Journal of Cleaner Production, 2018, 203: 30-42.

[23]Widlok T. Sharing by Default?:Outline of an Anthropology of Virtue[J]. Anthropological Theory, 2004, 4(1): 53-70.

[24]Katrini E. Sharing Culture: On definitions, values, and emergence[J]. The Sociological Review, 2018, 66(2): 425-446.

[25]刘占勇. “共享发展”的社会学研究[J]. 理论与现代化, 2017(05): 121-126.

[26]Botsman R, Rogers R. What’s mine is yours[J]. The rise of collaborative consumption, 2010, 1.

[27]Berg J C. Sharing cities: A case for truly smart and sustainable cities: Taylor & Francis, 2017.

[28]Jeffrey Kok Hui Chan Y Z. Sharing by Design[M]. Springer Cham, 2020: XIII, 100.

[29]林羲和. 共享经济背景下的青年共享社区设计研究[D]. 华侨大学, 2022.

[30]Camboim G F, Zawislak P A, Pufal N A. Driving elements to make cities smarter: Evidences from European projects[J]. Technological Forecasting and Social Change, 2019, 142: 154-167.

[31]Akhavan M, Mariotti I, Astolfi L, et al. Coworking Spaces and New Social Relations: A Focus on the Social Streets in Italy[J]. Urban Science, 2018, 3(1).

[32]Mugion R G, Toni M, Raharjo H, et al. Does the service quality of urban public transport enhance sustainable mobility?[J]. Journal of Cleaner Production, 2018, 174: 1566-1587.

[33]Frenken K, Pelzer P. Reverse Technology Assessment in the Age of the Platform Economy[J]. Built Environment, 2020, 46(1): 22-27.

[34] Agyeman J, Mclaren D. Sharing cities[J]. Environment: Science and Policy for Sustainable Development, 2017, 59(3): 22-27.

[35]Widlok T. Anthropology and the Economy of Sharing[M]. Taylor & Francis, 2016.

[36]Zhang Y, Chan J K H. Space-Sharing Practices in the City[J]. Built Environment, 2020, 46(1): 5-10.

[37]朱洪宝, 孟海星. 国外共享城市理论与实践研究分析及启示[J]. 城市发展研究, 2020, 27(04): 90-96+103.

[38]Lynch K. The image of the city[M]. MIT press, 1964.

[39]黎子铭, 王世福. 共享城市发展理念下的空间转型及规划前瞻[J]. 城市发展研究, 2021, 28(09): 26-32+41.

[40]简祎, 罗洁梅, 王安琪, et al. 私有公共空间与空间正义之博弈——以香港为例[J]. 国际城市规划, 2023, 38(03): 73-82+98.

[41]黄中山. 基于开放空间体系构建的城市中心区“共享空间”研究[D]. 合肥工业大学, 2020.

[42]Stavrides S. Reclaiming public space as commons: learning from Latin American movements[J]. Revista INVI, 2022, 37(106).

[43]刘宛. 共享空间——“城市人”与城市公共空间的营造[J]. 城市设计, 2019(01): 52-57.

[44]Karndacharuk A, Wilson D J, Dunn R. A Review of the Evolution of Shared (Street) Space Concepts in Urban Environments[J]. Transport Reviews, 2014, 34(2): 190-220.

[45]林珂. 共享和创新导向的中心区街道设计演进研究[D]. 华南理工大学, 2020.

[46]Vith S, Oberg A, Höllerer M A, et al. Envisioning the ‘Sharing City’: Governance Strategies for the Sharing Economy[J]. Journal of Business Ethics, 2019, 159(4): 1023-1046.

[47]Dlugosz P. The rise of the sharing city: Examining origins and futures of urban sharing[J]. IIIEE Master thesis, 2014.

[48]知识共享韩国. 首尔共享城市:依托共享解决社会与城市问题[J]. 景观设计学, 2017, 5(03): 52-59.

[49]施雯, 王勇. 欧洲空间规划实施机制及其启示[J]. 规划师, 2013, 29(03): 98-102.

[50]Vestbro D U. FROM COLLECTIVE HOUSING TO COHOUSING — A SUMMARY OF RESEARCH[J]. Journal of Architectural and Planning Research, 2000, 17(2): 164-178.

[51]Hanson C. The cohousing handbook: Building a place for community[J], 2000.

[52]常铭玮, 袁大昌. 共享经济视角下居住空间与居住模式探索[C]. 2017 中国城市规划年会, 2017: 387-395.

[53]杨心蔚, 陈云霞. 存量规划背景下青年共享社区居住模式初探——以深圳集悦城为例[C]. 2017 中国城市规划年会, 2017: 1016-1027.

[54]Akhavan M, Mariotti I. The effects of coworking spaces on local communities in the Italian context[J]. The effects of coworking spaces on local communities in the Italian context, 2018: 85-92.

[55]于平. 社区共享办公空间发展模式探析[D]. 天津大学, 2020.

[56]Sharp D. Sharing cities: new urban imaginaries for diverse economies[J]. The handbook of diverse economies, 2020: 262.

[57]Hult A, Bradley K. Planning for Sharing – Providing Infrastructure for Citizens to be Makers and Sharers[J]. Planning Theory & Practice, 2017, 18(4): 597-615.

[58]Frischmann B M. Infrastructure: The social value of shared resources[M]. Oxford University Press, 2012.

[59]Banathy B H. Designing social systems in a changing world[M]. Springer Science & Business Media, 2013.

[60]Churchman C W. The design of inquiring systems basic concepts of systems and organization[J], 1971.

[61]Meadows D H. Thinking in systems: A primer[M]. chelsea green publishing, 2008.

[62]Scott W R. Organizations: Rational, natural, and open systems[J]. (No Title), 1987.

[63]Katrini E. Creating the everyday commons: spatial patterns of sharing culture[D]. Carnegie Mellon University. School of Architecture, 2019.

[64]Zhang Y, Chen K H T. How inclusive is the sharing economy? And what is the implication for neighbourhood design?[J]. Proceedings of the Institution of Civil Engineers - Urban Design and Planning, 2018, 171(6): 247-257.

[65]Sargisson L: Swimming against the tide: collaborative housing and practices of sharing, Sharing Economies in Times of Crisis: Routledge, 2017: 145-159.

[66]Durkheim E. What is a social fact? In the rules of sociological method (pp. 50–59): London: Palgrave, 1982.

[67]邓燕红. 基于环境行为学的城中村公共空间设计研究[D]. 华南农业大学, 2020.

[68]Florida R L. Cities and the creative class[M]. Psychology Press, 2005.

[69]黎健豪. 分享经济视角下隐性知识共享对创意产业集聚的影响研究[D]. 重庆理工大学, 2018.

[70]Currid E. How Art and Culture Happen in New York[J]. Journal of the American Planning Association, 2007, 73(4): 454-467.

[71] Comunian R. Rethinking the creative city: the role of complexity, networks and interactions in the urban creative economy[J]. Urban studies, 2011, 48(6): 1157-1179.

[72]Frenzel F, Beverungen A. Value struggles in the creative city: A People's Republic of Stokes Croft?[J]. Urban Studies, 2015, 52(6): 1020-1036.

[73]刘悦来, 尹科娈, 魏闽, et al. 高密度城市社区花园实施机制探索——以上海创智农园为例[J]. 上海城市规划, 2017(02): 29-33.

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攻读硕士学位期间取得的研究成果

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（主要内容包括：1.对论文的综合评价；2.对论文主要工作和创造性成果的简要介绍；3.对作者掌握基础理论、专业知识程度、独立从事科研工作能力以及在答辩中表现的评价；4.存在的不足之处和建议；5.答辩委员会结论意见等）

硕士研究生陈攀新所完成的题为《基于共享概念的创意社区设计策略——以环五山创新策源区长湴片区为例》的学位论文，选题具有一定的理论意义和较好的实用价值。

作者较全面的归纳和评述了一定量的有关文献，较好的掌握了该领域国内外的研究现状和发展方向。论文研究内容较深入，研究方法较正确，完成了下列研究成果：1、梳理了共享概念与共享空间在各学科的研究，明晰了在空间学科视角下共享与共享空间的内涵、特征与分类，分析了共享概念应用于广州地区城中村产业园的创意社区化转型过程中的适应性；2

3、以长湴地区为例，对长湴地区面对的共享议题与共享潜力进行分析，采取上述策略对其创意社区提出设计提案，为城中村产业园的创意社区化转型提供了参考。研究成果具有一定的理论价值与实用价值。

论文概念较清晰，结构较完整，叙述适当，分析较充分。答辩中作者较好的回答了提出的问题。

答辩委员会同意通过硕士学位论文答辩，同意毕业，并建议授予硕士学位。

论文答辩日期：2023 年 9 月 4 日　　答辩委员会委员 6 人

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