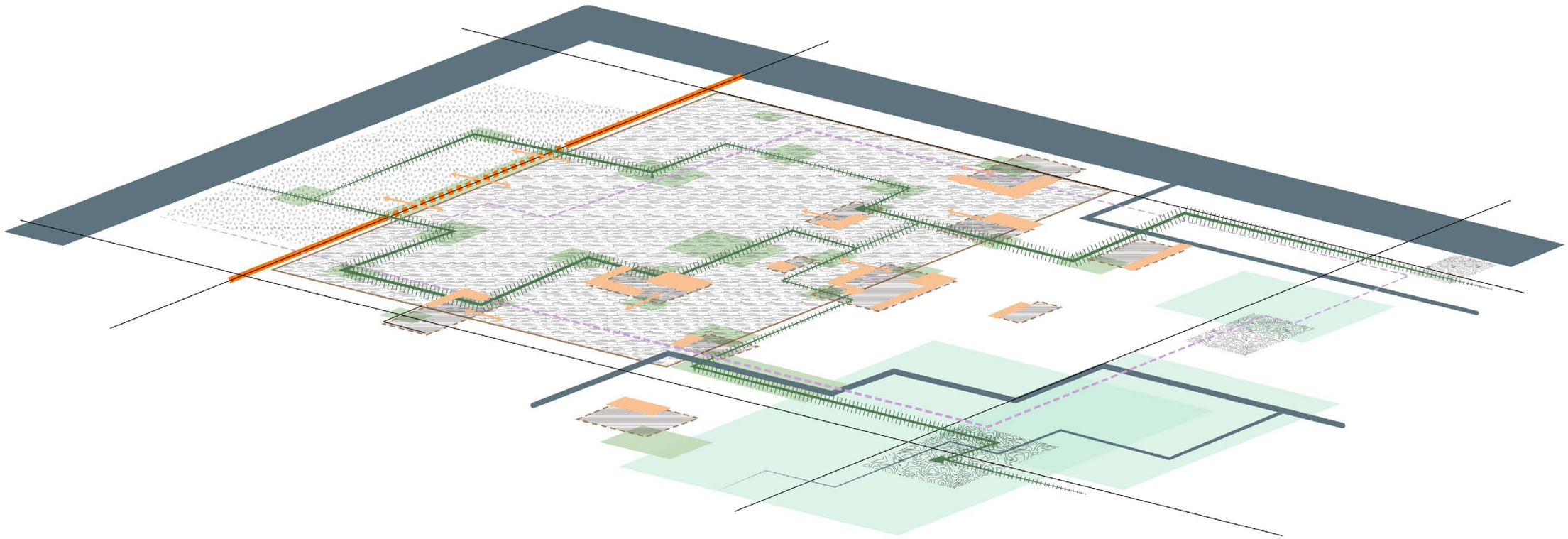

FROM SEGREGATION TO INTEGRATION

Planning and Designing for the Enhancement of Socio-spatial and Ecological Integration in Haizhu District, China

Master Thesis
Adaptive Landscape Transformation Lab
Xinyan Zhao 4843452
6.16.2020

FROM SEGREGATION TO INTEGRATION

Msc Graduate Thesis Report - P5
Flowscapes

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Workshop in Guangzhou with TU Delft Students & Mentors (Source: Steffen Nijhuis)

ACKNOWLEDGEMENT

The process of the whole thesis this year has been through various difficulties and was in a great challenge during the uncertain period in the last four months with the corona situation. But I'm glad to accomplish this big task at the end of June by combining my whole journey and results in this report.

First, I would like to express my gratitude to my two mentors Daniele and Arie who gave me countless helpful ideas and suggestions for my project during the whole year. Their advice helped me reorganize my messy thoughts and gave me a clear direction at the beginning into a more coherent storyline. Daniele always encourages me to be confident in my project and gives me some constructive concepts when I was still confused about my project. And Arie is so considerate to give me guidelines to improve my overall storyline. I am really thankful for the participation of facilitating the project with two generous mentors.

Next, I am also grateful of being a part of this *Adaptive Landscape Transformation* Studio. We had this joint workshop in Guangzhou with students from other colleges to share our different projects which was really amazing and beneficial for us. Besids, we shared our thoughts, study methods, even our personal daily life with other members and mentors in our meetings once a month, which was useful to our work and also decreased our sense of loneliness during the quarantine period. Thanks Steffen for hosting all the meetings in the studio and thanks other members for providing some creative ideas for my projects.

Last, I want to thank my family and my friends for supporting me all along this journey. Although we live far away from each other, our hearts stay together and they supported me constantly when I was struggling and encouraged me when I was stressed. And I have to thank my boyfriend, Ziyulong, for giving me endless support, encouragement and compliment to survive through all the challenges.

I have learned a lot this year with all these adorable people around me. I hope I can continue to conquer different difficulties with their support and love in the future and contribute more to the field of landscape.

CONTENT

HE TERRITORY

on

LES ON REGIONAL SCALE

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05. EXPLORING INTERVENTION ON LOCAL SCALE

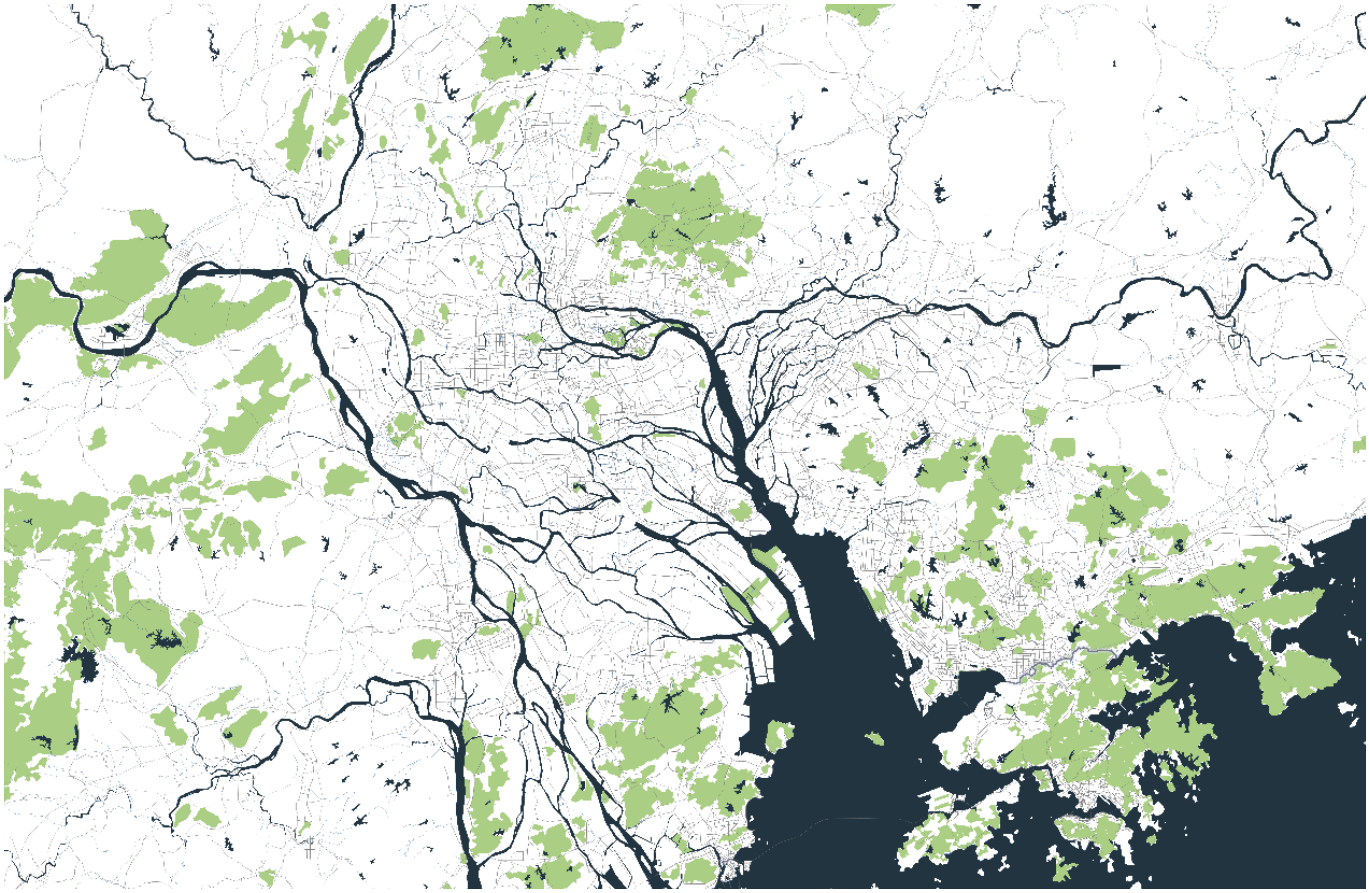
06. CONCLUDING AND REFLECTING

07. REFERENCE

01

Introducing

1.1 BACKGROUND



Pearl River Delta is one of the most developing deltas and has the largest urban areas in size and population in the world. The rapid urbanization in these decades in China has brought various opportunities to both economic and social development. Massive public projects have been built or ongoing to adapt to urbanization. Also, more and more people chose to work and live in the Pearl River Delta which can provide them more possibility to develop their future careerss and better life.

However, this fast expansion of urban built-up areas brings potentials as well as threats. More and more modern communities are built to accommodate the growing population. In the process of rapid urbanization, urban space is expanding to the surrounding suburban countryside area that created a new type of neighborhood, namely “urban village”. The urban village is viewed as an unregulated asset, referring to the village-style neighborhood in urbanized area (Liu et al., 2010). Aside from urban villages, other types of informal settlements with different level of living condition can also be found in the urban area. The heterogeneity between residential areas in the city has been strengthened, with more and more differences between communities in terms of physical facilities, community management services, community culture, spatial layout, etc. (Wang, 2013).

Different types of residential buildings reflect the existing urban social space in modern city. Urban social space in contemporary China is under the process of constant transformation and reconstruction, and the differentiation and polarization of social spaces are the most important characteristics. Due to the fast urbanization, housing problems, class conflicts, community poverty, and employment problems will further exacerbate social disparities. The polarization of social space is harmful to the sustainable development of cities, which may further aggravate the antagoism between classes and spaces (Wang et al., 2013).



1. High-dense area
2. Messy, noisy, crowded
3. Lack of sunlight
4. Mix-use of public space



1. Comfortable living environment
2. Independent garden and management
3. Sufficient public space

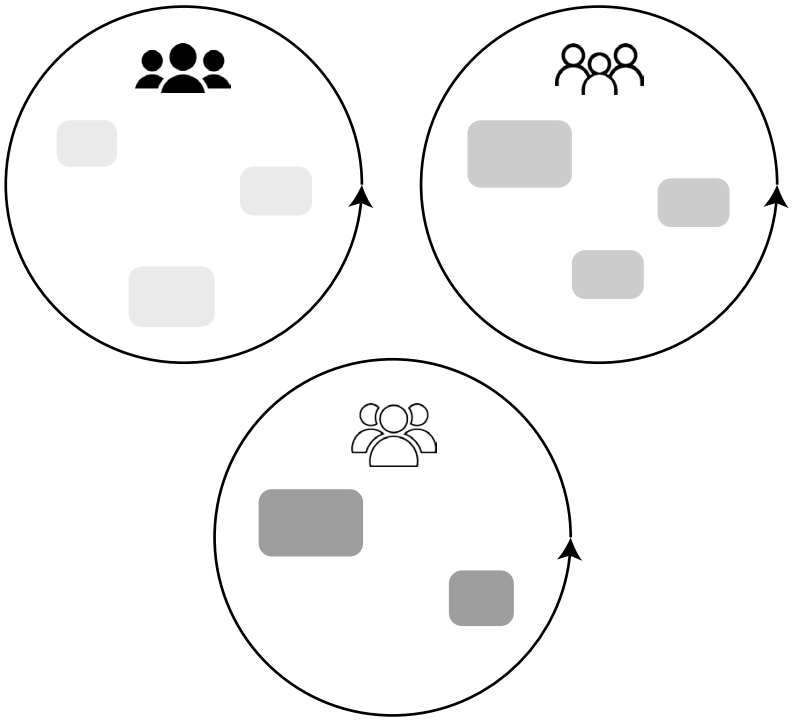
In Guangzhou, urban villages can be seen everywhere surrounded by modern communities.

My fascination also began with my own living environment. After living in the urban village for more than 10 years, the impression that urban village leaves on people is its high-density with many packed apartments and crowed and cluttered streets which can also lead to security and social problems. It is occupied by multifunctional buildings, and public spaces are mix-used, resulting in severe infrastructure deficiency, poor building quality and intensifies social order (Zhang, Zhao, & Tian, 2003). However, the living environment in the modern community where I moved after high school is completely different, with comfortable private gardens, sufficient spaces for social activities and sense of security. People living there are almost well-educated and high-income.

"CITY DIVERSITY"
"URBAN SEGREGATION"

These two residential environments are also a reflection of city diversity and urban segregation. The diversity of neighborhoods could leave different impacts not only in spatial quality but also in the interaction between people. It raises the problem of what landscape architect can do to decrease the negative effect of city diversity to sustainable future development.

Two living environments create two worlds



Different Enclaves

residential spaces, residents, activities...

1.1 BACKGROUND

1950

Land Reclaimation

Decreasing Green a

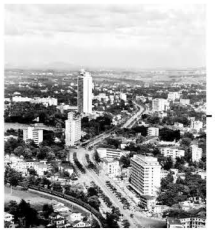
Development of Settlement

rural villages

preservation

population growth

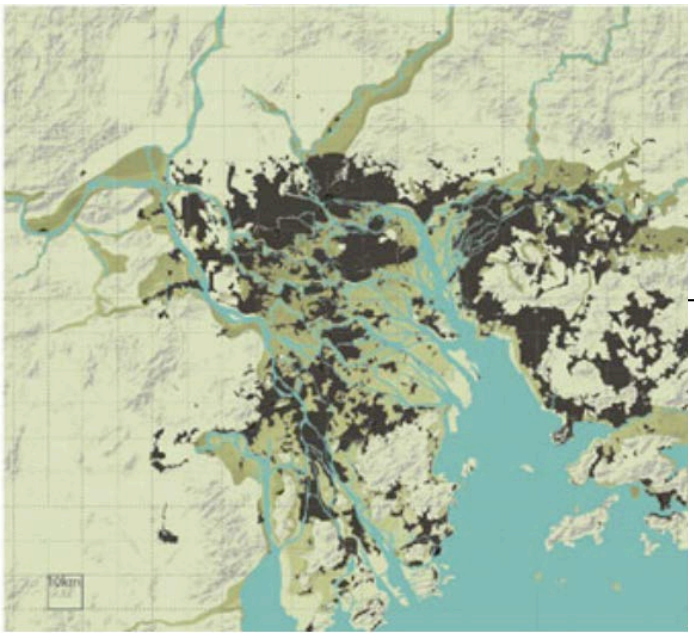
land reclaimation



demolishement

arcade buildings

2019



(Source: Liang & Nijhuis, 2019)

nd Blue Spaces

Diversity of Neighborhoods

population growth

more floors

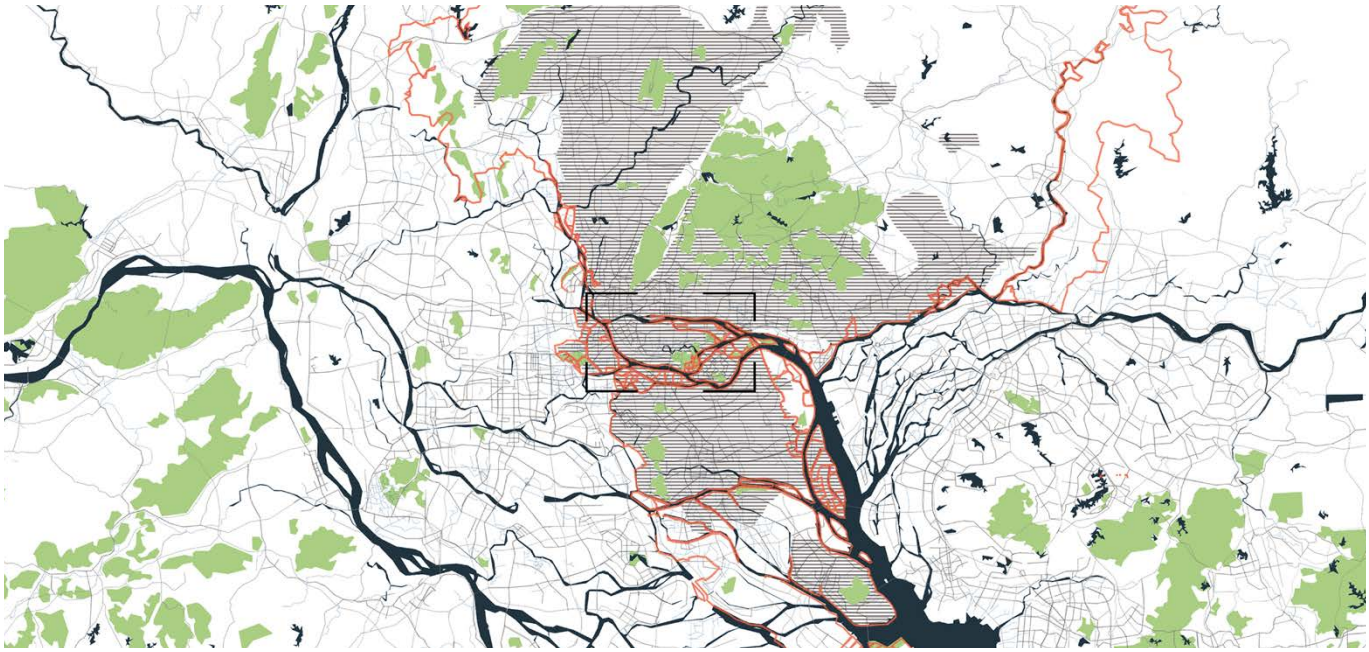
future trend

population growth

preservation

1.1 BACKGROUND

Haizhu District has been chosen as the test site that is located in the central part of Guangzhou with dense water system. It developed on the edge of the city center and then fast covered most of the rural area. Within decades, Haizhu has been built up into a well-developed area, an economic and living center, with good accessibility to other districts, massive important harbors constructed for freight transportation and livable living environment. Nevertheless, Haizhu is also facing the problem in the diversity of neighborhoods led by fast development.



1900

1923

1954

1990

1996

1998

1967

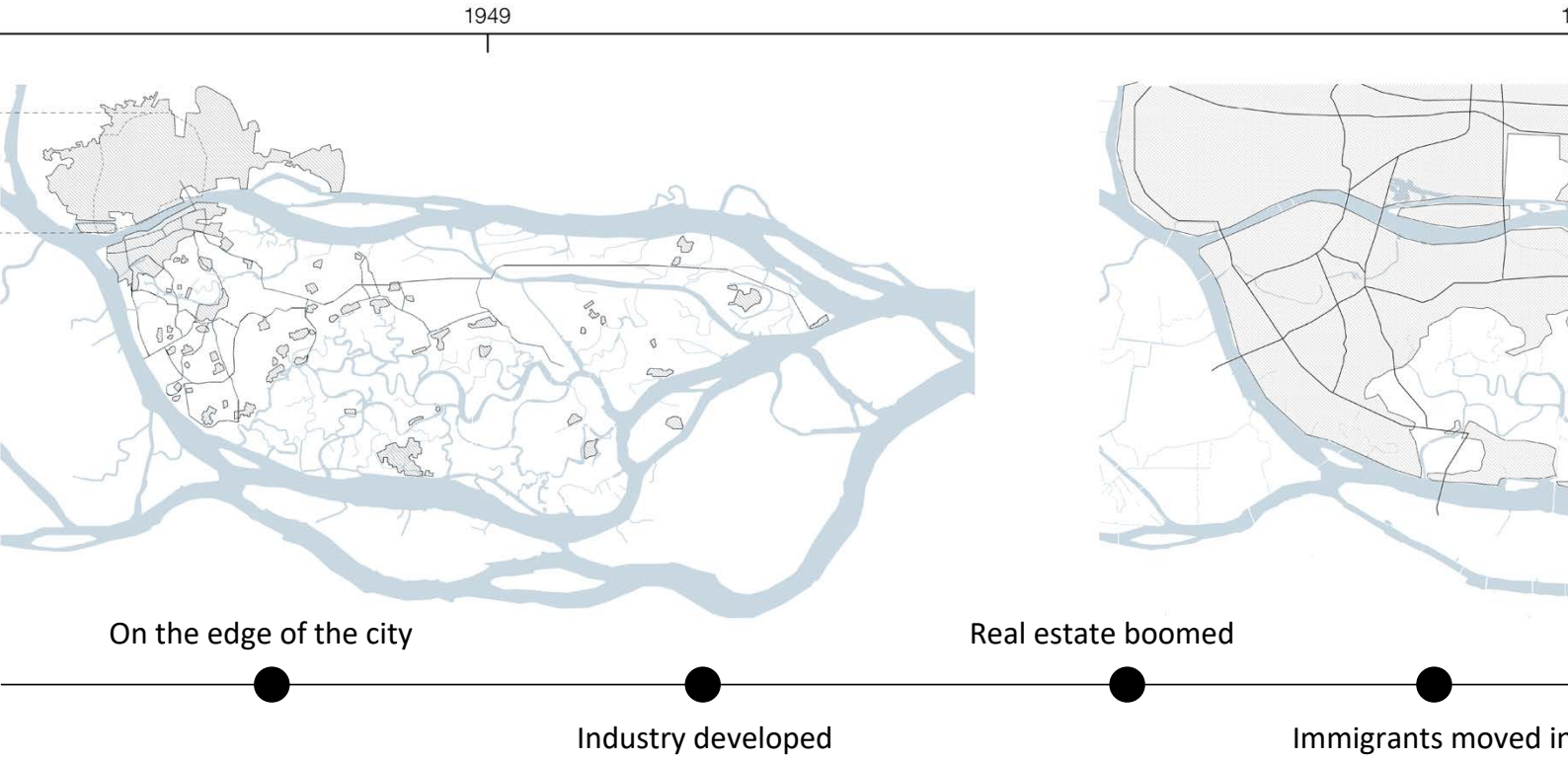
1979

2004

2015

1.1 BACKGROUND

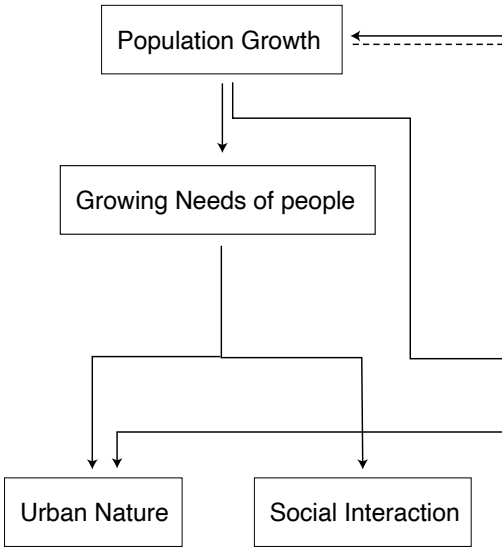
1.2 PROBLEM DIAGNOSIS

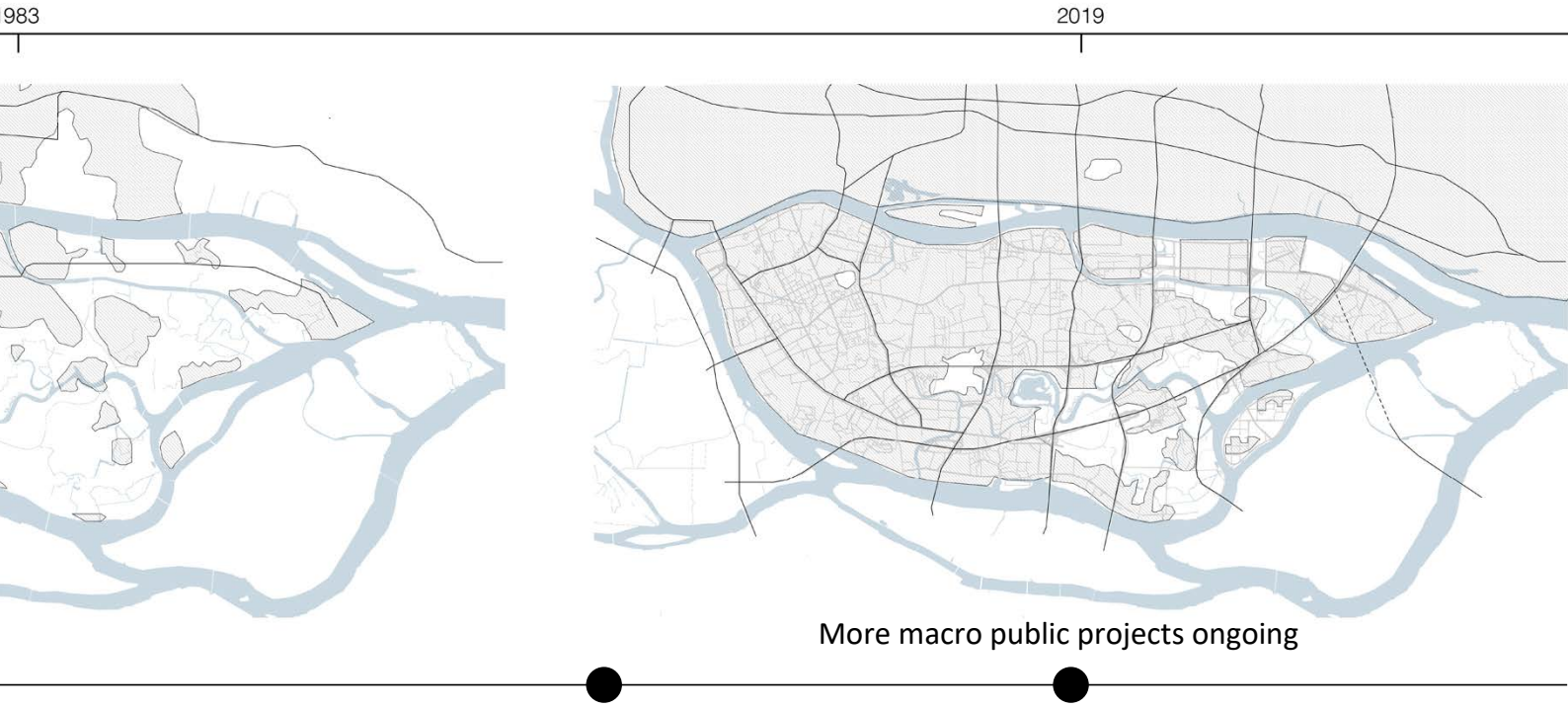


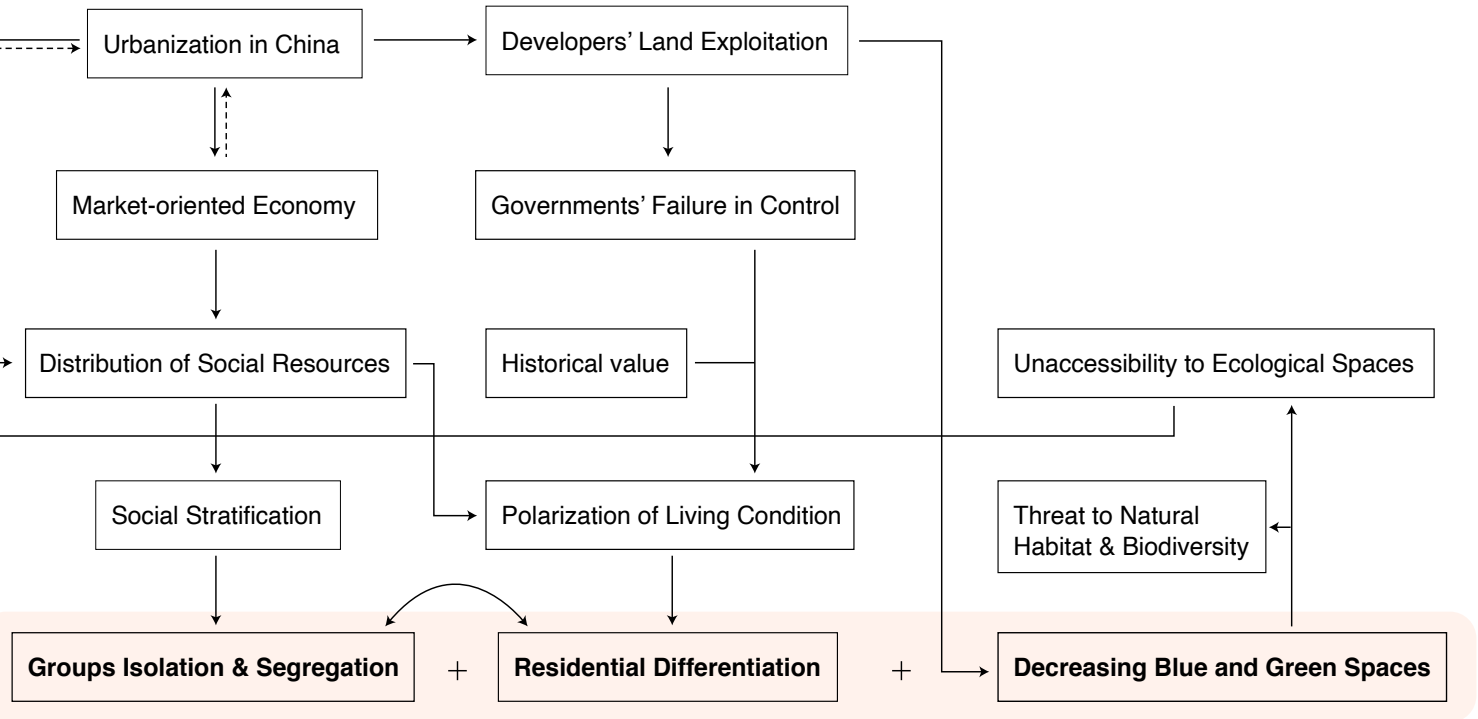
The processes of globalization and urbanization have created a series of consequences such as excessive land exploitation, increasing number of immigrants, the lack of green spaces, unequal accessibility to social resources. **Here I will focus on the two main problems, socio-spatial segregation and decreasing green and blue spaces.**

The market-oriented economy has been in a dominant place in China after 1980s which has caused the imbalance of the distribution of social resources to citizens. Also, due to the failure of the government in controlling the expansion of land exploitation, the polarization of living condition in city was increased. This is a common social phenomenon has become one of challenges in the future sustainable development, especially in urbanized areas. As a result, it caused significant **residential segregation and consequently socio-spatial differentiation** (Wu et al., 2014), which I will elaborate on the next part.

Besides, due to land exploitation, more and more buildings are built leaving out limited and deficient blue and green spaces. Only certain residents can access to them. **Decreasing and deficient green and blue spaces** are a threat to natural habitat and biodiversity and also has negative impact from social perspective. The inaccessiblity to ecological space for residents also affects the reduction of social interaction.



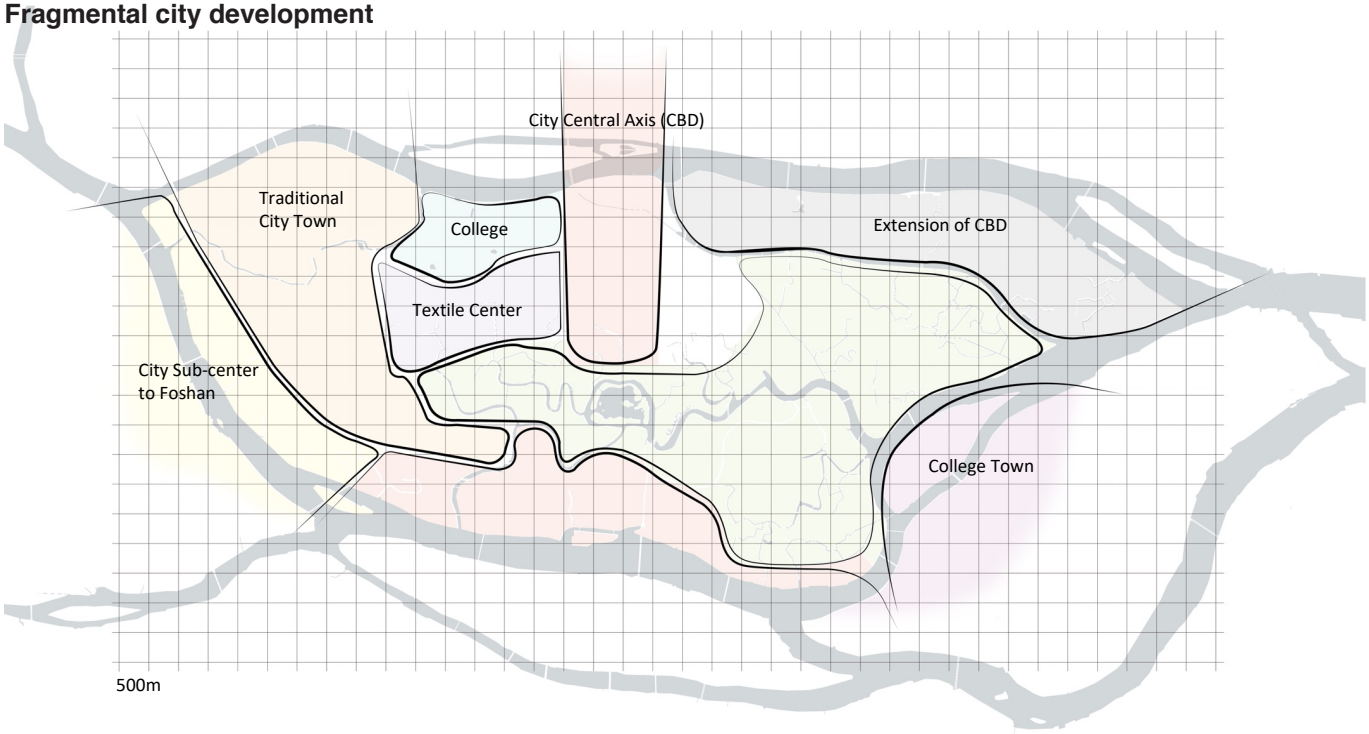

983
2019
More macro public projects ongoing
Exhibition center finished
Transportation developed


Urbanization in China
Developers' Land Exploitation
Market-oriented Economy
Governments' Failure in Control
Distribution of Social Resources
Historical value
Unaccessibility to Ecological Spaces
Social Stratification
Polarization of Living Condition
Threat to Natural Habitat & Biodiversity
Groups Isolation & Segregation
+
Residential Differentiation
+
Decreasing Blue and Green Spaces

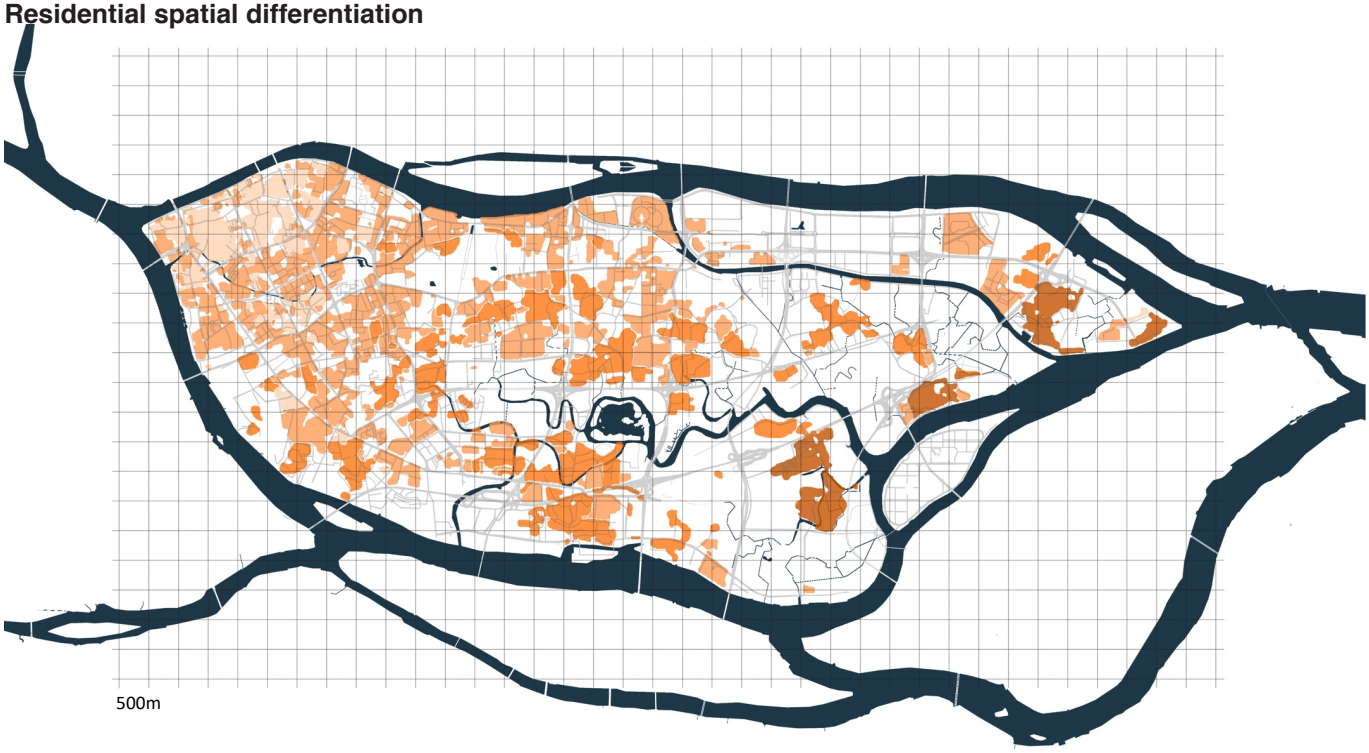
1.2 PROBLEM DIAGNOSIS

1.2.1 Socio-spatial Segregation

Fragmental city development



Residential spatial differentiation

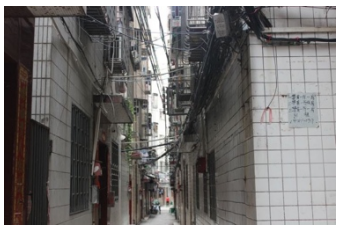


Urban Fabric







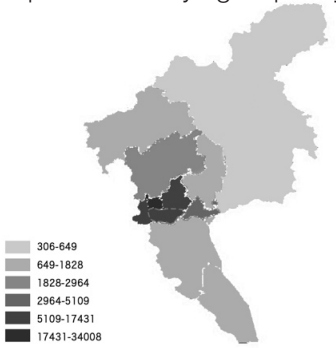

Urban fabric shows cultural societal characteristics and reflects the structure of the regional environment with certain scale and organization rules. It involves all aspects of urban life especially residential areas and is closely related to the urban structure, urban function and urban form (Wang, 2006). In fact, city is dynamic and diverse in Pearl River Delta where other informal and irregular form of fabric is easily found in contrast to the surrounding environment.

Historically, the pattern of settlements can be studied to have a better understanding of the urban segregation (Maffini and Maraschin, 2018). Especially in chinese context, it is a special phenomenon that various types of settlement for the inhabitants which have different spatial features can be found in certain area (Liu et al., 2013). **The different kinds of spatial structure in city is a reflection of segregation and residential differentiation. Therefore, it is essential to understand the different urban forms from this perspective .**

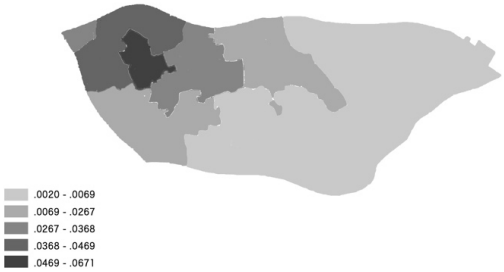
1.2 PROBLEM DIAGNOSIS

1.2.1 Socio-spatial Segregation

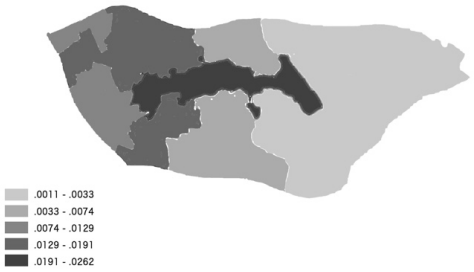
Population Carrying Capacity



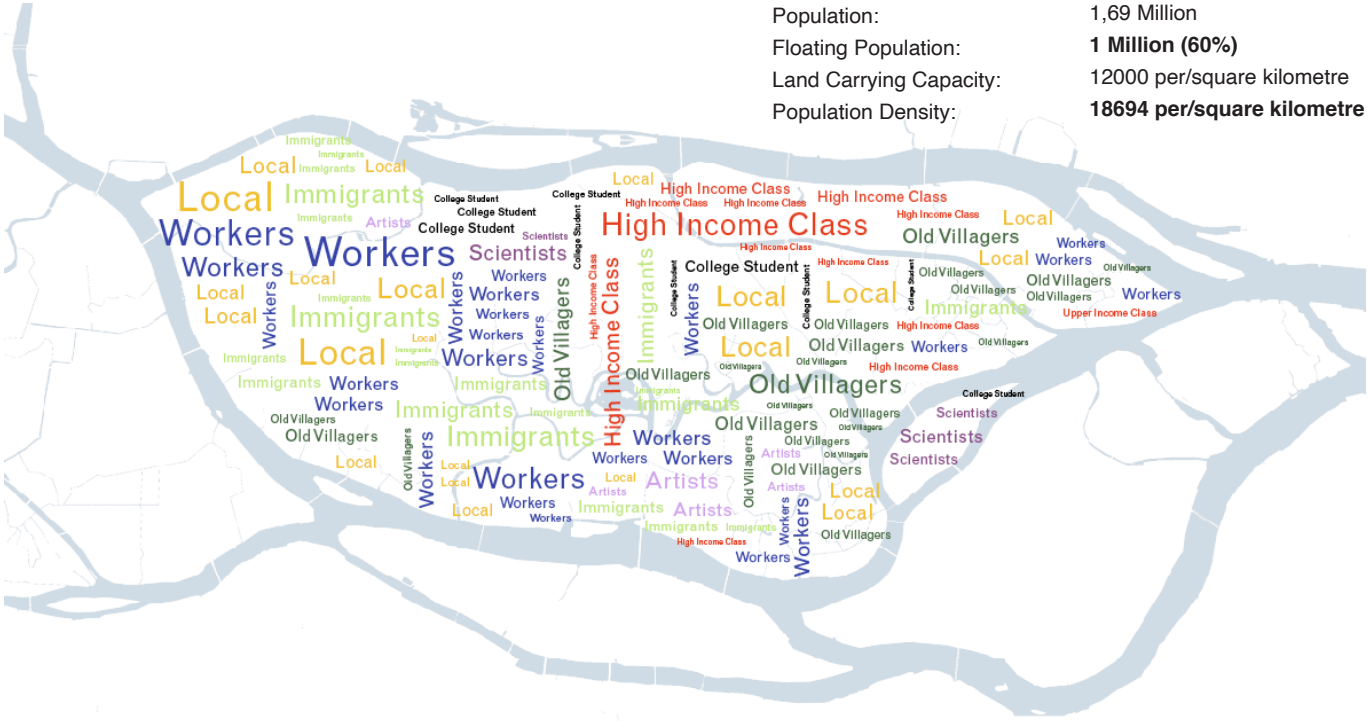
Inhabitants Distribution



Immigrants Distribution



Social Groups



Area:	90.4 square kilometres
Population:	1,69 Million
Floating Population:	**1 Million (60%)**
Land Carrying Capacity:	12000 per/square kilometre
Population Density:	**18694 per/square kilometre**

The population in Haizhu is growing rapidly and the density is beyond the land carrying capacity. The composition of the residents are various, with more high-income class living in the central part, local people living on the west part that used to be the city center. Besides, immigrants occupy a large part of inhabitants in Haizhu district. Different social groups live in different settlements where the interaction with other social groups is restrained.

Due to the increasing relevance of market forces, socio-spatial segregation has a strong influence on urban development (Wu, 2014). If the segregation level becoming higher and higher, it would lead to a series of negative consequences, such as unequal access to public facilities, social exclusion, etc. In order to decrease the negative impacts that informal settlements have such as urban village, the trend in Guangzhou is under the process of demolition of urban village and build more and more modern communities that most of immigrants can not afford and it will exaggerate the segregation and isolation between social groups.

Urbanization

City Diversity → Economic benefits etc.

Segregation level higher

Discrimination, Unequal access to public facilities
Social exclusion
Conflicts, Disorder

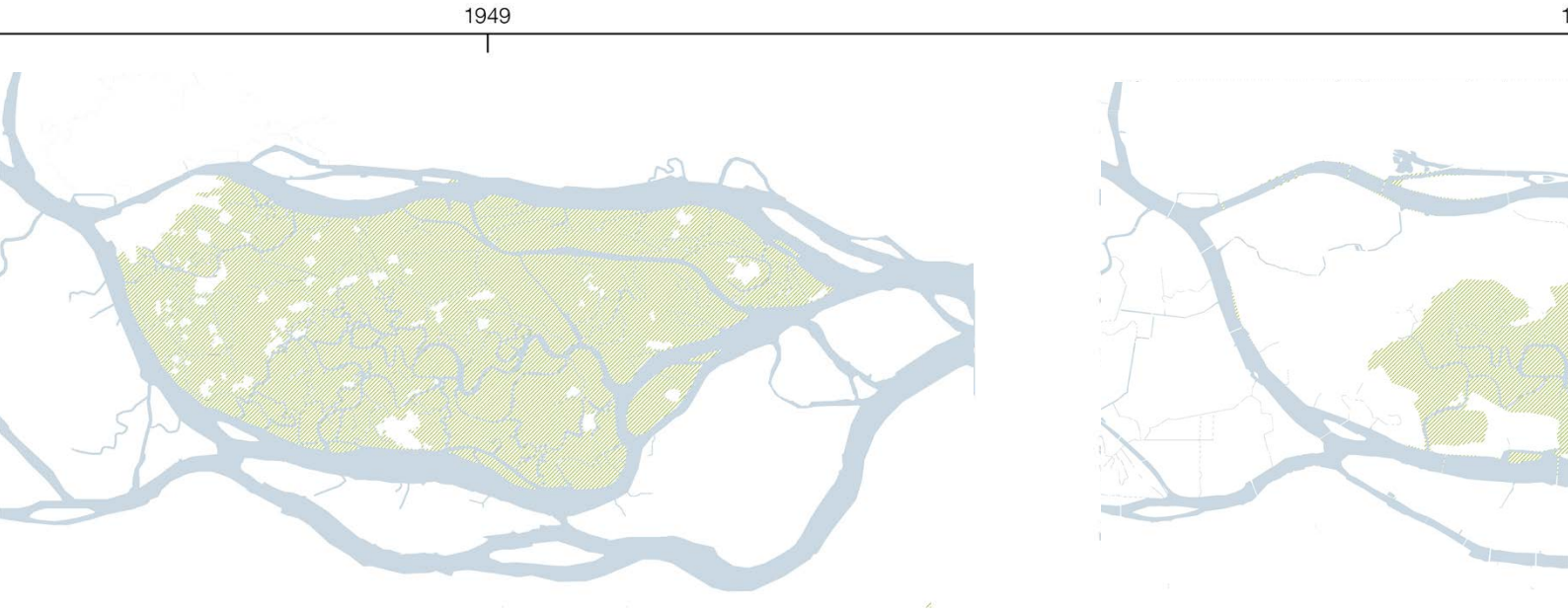
Other Solution?

Demolition of urban village

Unaffordable housing for immigrants

1.2 PROBLEM DIAGNOSIS

1.2.2 Decreasing Green and Blue Spaces

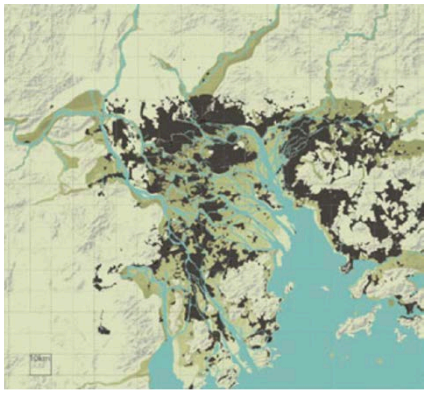


Since the reformation in 1950s, Guangzhou entered a rapid period of urbanization. The economy has been growing rapidly, but the cost of natural resources and environment is significant. The proportion of urban system has increased while the proportion of the natural ecosystem and the semi-natural system has decreased, such as rural village area, farmland, etc. Government has implemented different policies in different times contributing to the special characteristics in urban spatial structure. Certain canals in Haizhu has been filled to give more room for urban construction. Water transport used to be a type of normal transportation, but because of the deducution of the canals, water activities are shrinking and the relationship between people and water is also declining. Because of the deduction of water canals and human activities, flooding and pollution are the main water issues that need to be addressed nowadays. Besides, becuase of the decrease of green spaces, there is a limitation for people to have interaction with the natural environment and other social groups. Especially the uneven distribution of west part and the east part, more people are living in the west part but with less green spaces. There is also a lack of connection between existing green space resulting in the fragmentation of spatial structures.

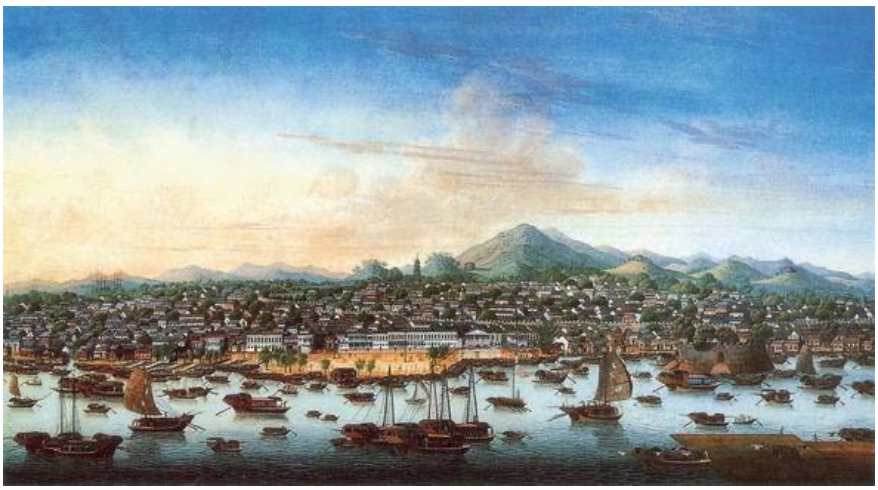
As an important part of urban space, green and blue spaces are of great significance to the improvement of urban environment and the optimization of spatial structure. Ecological space can provide place for residents to increase social interaction and also enhance the diversity of species and natural habitats. While having activities within urban ecological space, people also have the opportunity to make social contact and have interaction. (Lei, 2013) **Therefore, it is important to reconsider the green and blue spaces in the city and build a more intensive connection between people and nature.**

1983

2019



Urbanization in Pearl River Delta



Various water activities in the past (Source: http://nh-gjls.blog.sohu.com/91090799.html)

Flooding in the urban area (Source: https://www.sohu.com/a/234836224_100306)

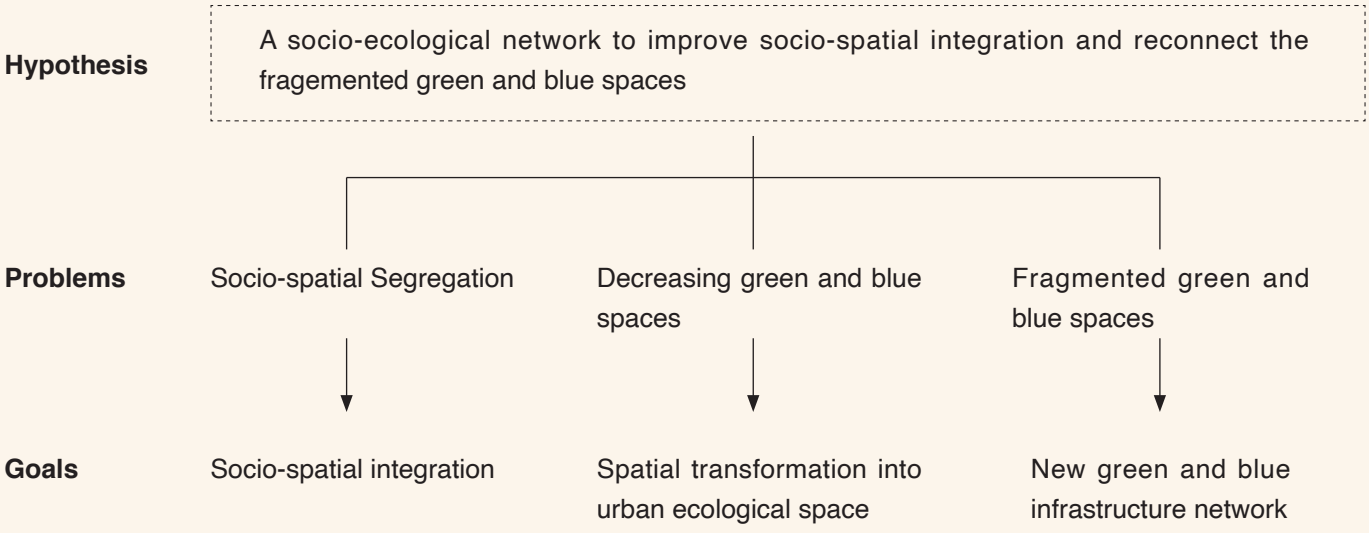
1.2 PROBLEM DISGNOSIS

1.2.3 Problem Statement

In the fast urbanized pearl river delta region, the social and ecological problem are two of the consequences which are also common to be seen. In the case of Haizhu district, the city development is fragmental with various functions in different area in the whole region. **The discontinuities of urban development and city expansion reveal Haizhu a fragmented and diverse area that results in disparity and isolation in different communities and social groups and decreasing green and blue spaces.**

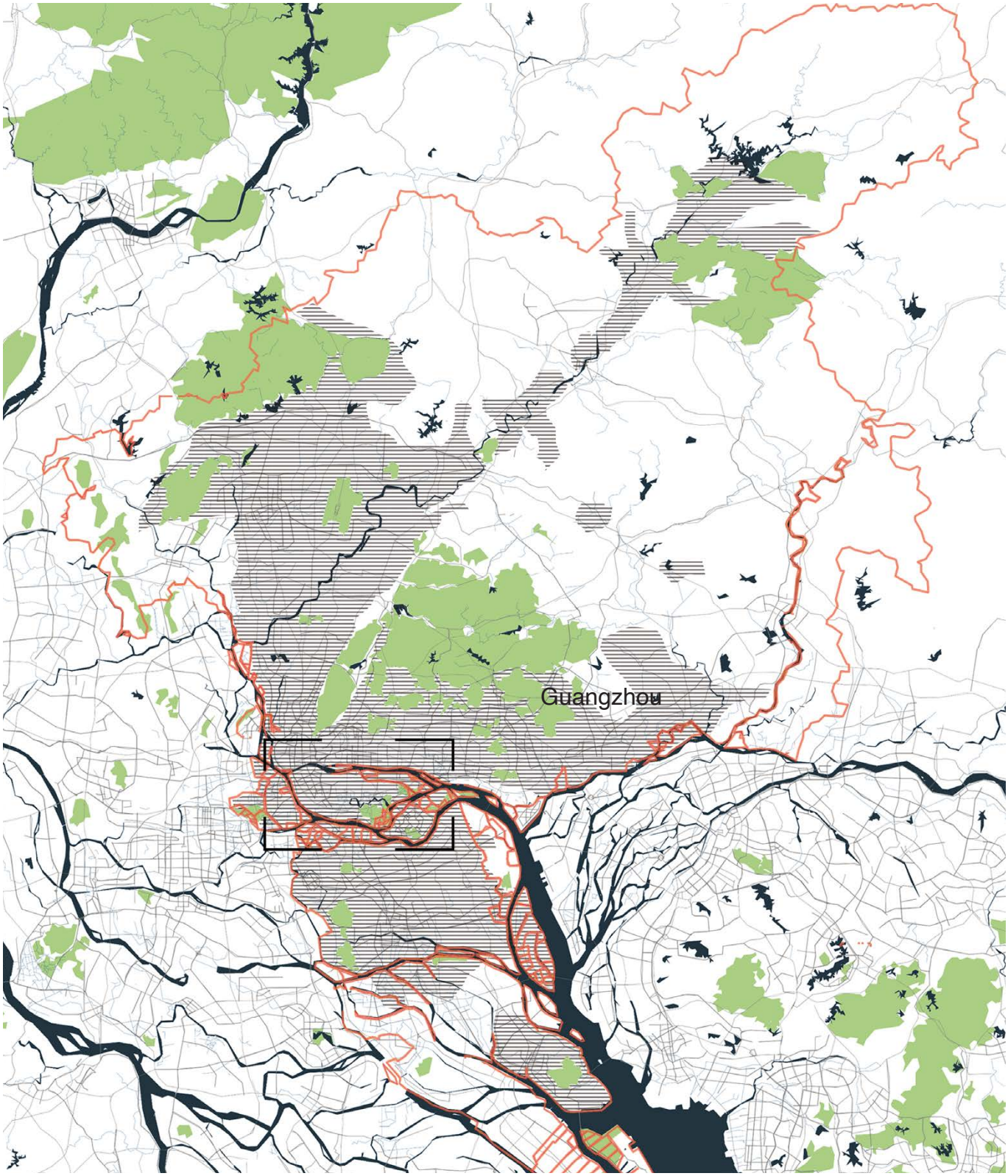
Hence, the general problem in this thesis is addressing the **socio-spatial segregation and decreasing and fragmented green and blue spaces** in Haizhu district. The negative effect of segregation would bring about discrimination, unequal accessibility to public facilities, less interaction between neighborhoods. And decreasing and fragmented green and blue spaces would be a threat to natural habitats and have negative impacts from social perspective, limiting the social interaction.

How to consider the diversity of neighborhoods? How to consider the relationship between the built environment and landscape? How can we landscape architects to address this social and ecological problem by using urban-landscape strategies?



Socio-spatial Segreagtion & Ecological Fragmentation

1.3 OBJECTIVE AND RESEARCH QUESTION



Obejctive:

Create an integrated and comprehensive socio-ecological network in terms of corridor and node at multiple scales that can improve the socio-spatial integration and reconnect the fragmented green and blue spaces for Haizhu district.

Research Question:

Understanding:

SBQ1: What are the existing conditions of socio-spatial segregation in Haizhu district and what are the factors contributing to segregation?

SBQ2: What are the existing conditions of ecological fragmentation at different scales?

Method:

SBQ3: How to create the socio-ecological network based on the current conditions and resources?

Application:

SBQ4: What principles and strategies can be put forwarded to improve the socio-spatial integration and reconnect the fragmented green and blue spaces on different scales?

SBQ5: How can these principles be implemented in a specific complex area with social and ecological problems?

Reflection:

SBQ6: How to evaluate the result of socio-spatial network and design implementation at different scales?

SBQ7: What lessons can be learned of creating the social-ecological network to improve the integration?

1.4 SCOPE

Local Scale - Community

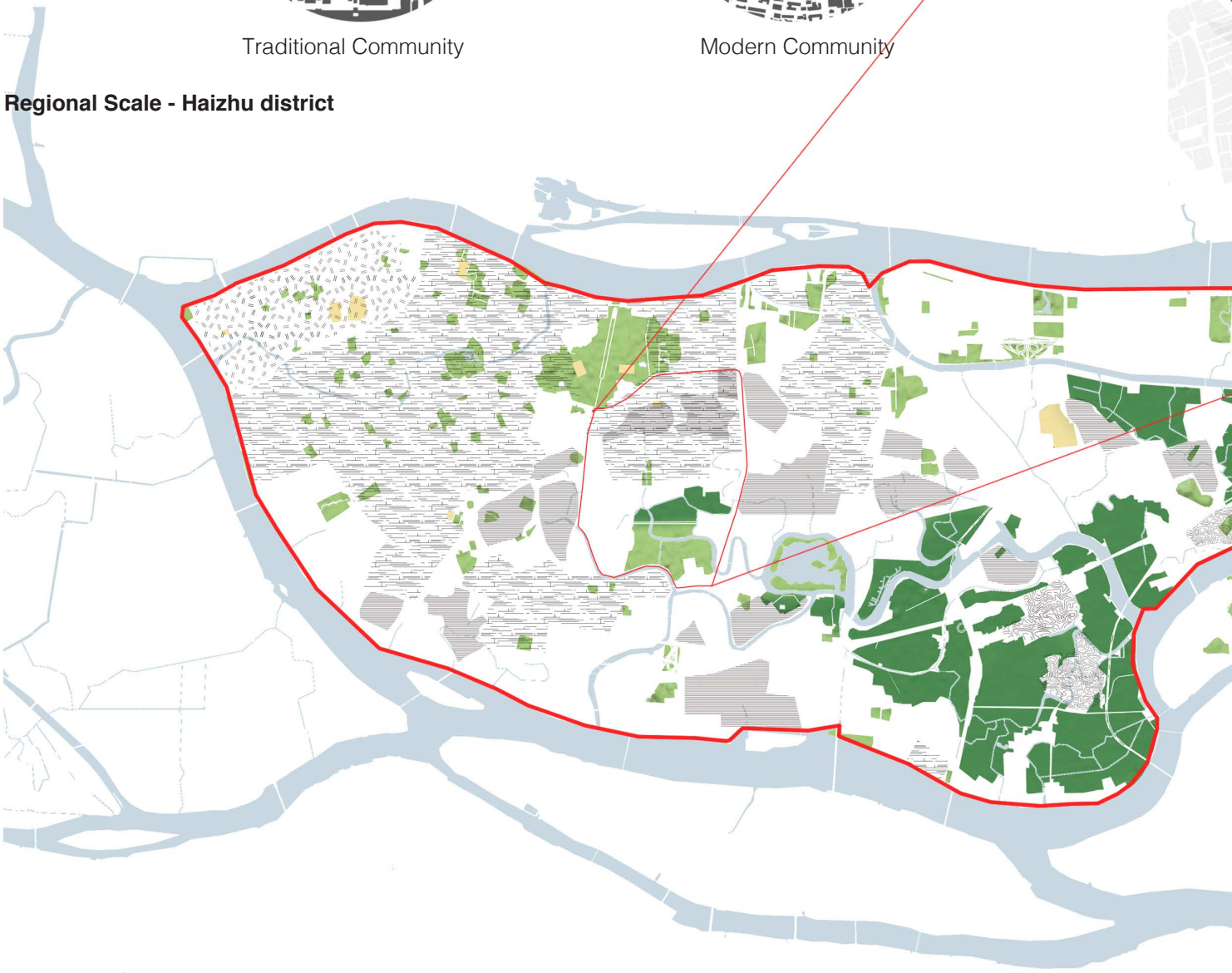
Historical Village

Urban Village

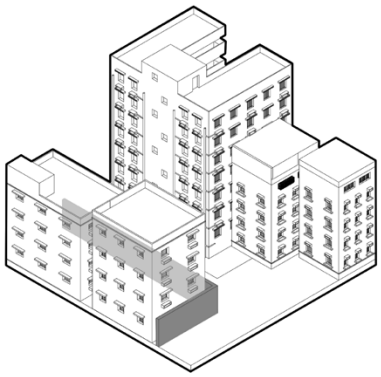
Traditional Community

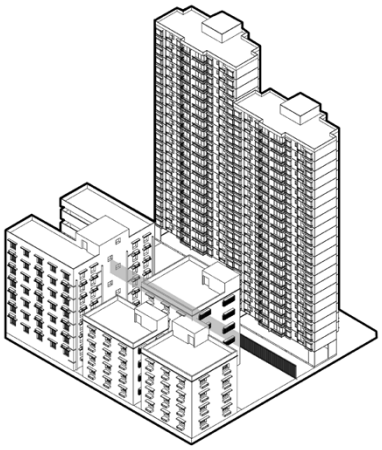
Modern Community

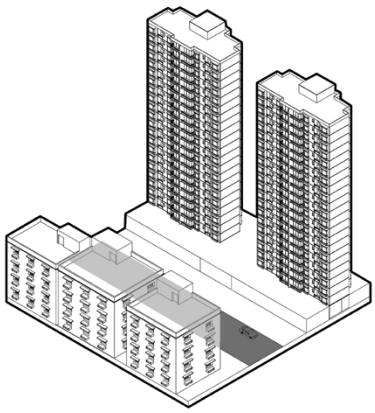
Regional Scale - Haizhu district

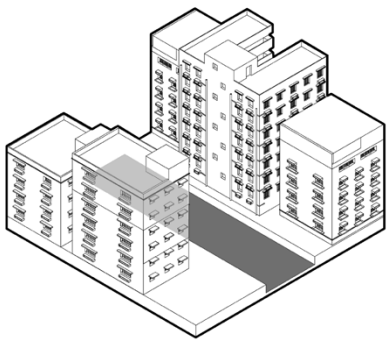


Neighborhood Scale









02

Explaining

2.1 THEORETICAL FRAMEWORK

2.1.1 Socio-spatial Segregation and Integration

Socio-spatial Segregation

The growing difference in socio-economic characteristic between individuals and separated from the original group lead to the segregation which is a dynamic process. From a spatial perspective, it results in the unequal spatial distribution of different social residents (Madrazo and Van Kempen, 2012).

The phenomenon of socio-spatial segregation is quite common in Chinese cities, especially under the fast urbanization these years which could have more negative effects than in the past. The imbalance of economic and social benefits are one of the crucial aspects contributing to this social and spatial segregation with serious spatial consequences after the post-reform era (Wu, 2002). Particularly in Pearl River Delta, the high degree of spatial segregation is being a part of reshaping the city structure (Wu, Cheng & Young, 2017). Residential differentiation is one of the representations of socio-spatial segregation in terms of the urban form that is also resulting in the social hierarchy. The social hierarchy determines the distribution of residential areas and if no intervention is involved, segregation will be further expanded, forming a more broken state for living space as well as the social network of various groups (Wang, 2013). Residential spatial differentiation is the most concentrated manifestation of urban socio-spatial differentiation in China (Wang, 2013).

In the case of Guangzhou which is one of the biggest economic and living centers around the country, immigrant plays an important role in the urban development. However, due to the limitation of income, origin, culture and other factors, the basic quality of life, especially the housing condition and the lack of public services, of low-income immigrants is difficult to be realized. There is a certain limitation for these immigrants to access to public facilities and other services that restrains the integration with other residents (Zheng, Song, Sun, 2020). In order to have better integration with immigrants and decrease the segregation, it is necessary to transform the socio-spatial segregation to integration.

Socio-spatial Integration

"Integration is described as 'a process whereby the differences between the ethnic/ racial groups and the reference population gradually decline across a range of domains, including the job market, education, social and cultural differences." (Bolt, Ozuekren, & Phillips, 2010, p.173)

While social integration refers to the inclusion of new residents from social as well as spatial perspective into the society (Alba & Nee, 1997). Guided by the theories of integration and previous studies, social integration is influenced by demographic characteristics, education, occupation and income, places of origin and social networks (Chen & Wang, 2015). Spatial integration by gathering different social groups to share their own experience and history provides a condition for connection with people and the environment (Wu et al., 2014).

Community is the most important spatial scale of socio-spatial integration. Community is considered as the basic entity unit of society or social space. From the perspective of community, there are different ways to realize integration on different scales.

First, on regional scale, the overall development with the balance of public facilities, social services should be concerned. On cross-community scale, the integration should focus on how heterogeneous community residents break through the barriers of space. Next, integration in communities that are mix with different social groups needs to improve the sense of satisfaction, identity. Last but not least, integration among Individuals is often accompanied by the transformation of personal or family residence. To sum up, socio-spatial integration is an important guarantee for the sustainable development of urban society, and it is the basis for different urban strata to share urban services and development opportunities (Wu et al., 2014)

"There are two paths of socio-spatial differentiation and transition, namely the destructive creation of neighborhoods and the creative destruction of neighborhoods." (Wu et al., 2014)

1.destructive creation of neighborhoods:

-pull down buildings and relocate residents

-new build gentrification (Davidson & Lees, 2005)

Result: threaten the diversity of neighborhoods and increases the level of segregation by introducing gated communities in the traditional urban fabric.

2.Creative destruction of neighborhoods:

-spatial transformation through small-scale building maintenance

-influx new residents

In contrast to the demolished neighborhoods, the creative destruction can reserve the existing communities but transform them positively with a better sense of belongings and satisfaction. This approach will be further applied to the principles and design exploration.

2.1 THEORETICAL FRAMEWORK

2.12 Socio-ecological Network

The characteristics of social–ecological systems (SESs) that will have the abilities to adapt to dynamic changes. In order to stablize different systems with their own dynamic changing speeds, three complementary attributes should be emerged into the system: resilience, adaptability, and transformability (Walker, Brian, et al., 2004). By integration these three features, the capacity to create a new urban system with different values in ecological, economic, or social make the existing system untenable (Walker, Brian, et al., 2004).

In order to create the socio-ecological network, the landscape solution should be multifunctional with various ecosystem services as well as social and cultural services. Ecosystem services include the enhancement of biodiversity, ecological spaces and water quality while social and cultural services should concern about the visual quality, human health and recreational functions. By integration these services with human interventions, this multifunctional landscape can better reshape the relationship between natural and built environment realizing the goal of sustainable development. (Yang & Li, 2013).

As inspiration, the case of Yamuna River Project in Delhi is studied to structure the characteristics of the network. The first vision of the project is to understand the existing condition and its elements of the city including public spaces, public facilities, urban ecologies and mobility. The plan integrates three primary layers into Delhi's urban fabric: critical ecologies, slow mobility, and public facilities. Serveal methods are applied to the project:

1. Restoration of Najafgarh corridor as a linear continuous river park and shared public space

2. Socio-ecological water parks with green filters that treat the effluents of the sewage treatment plants

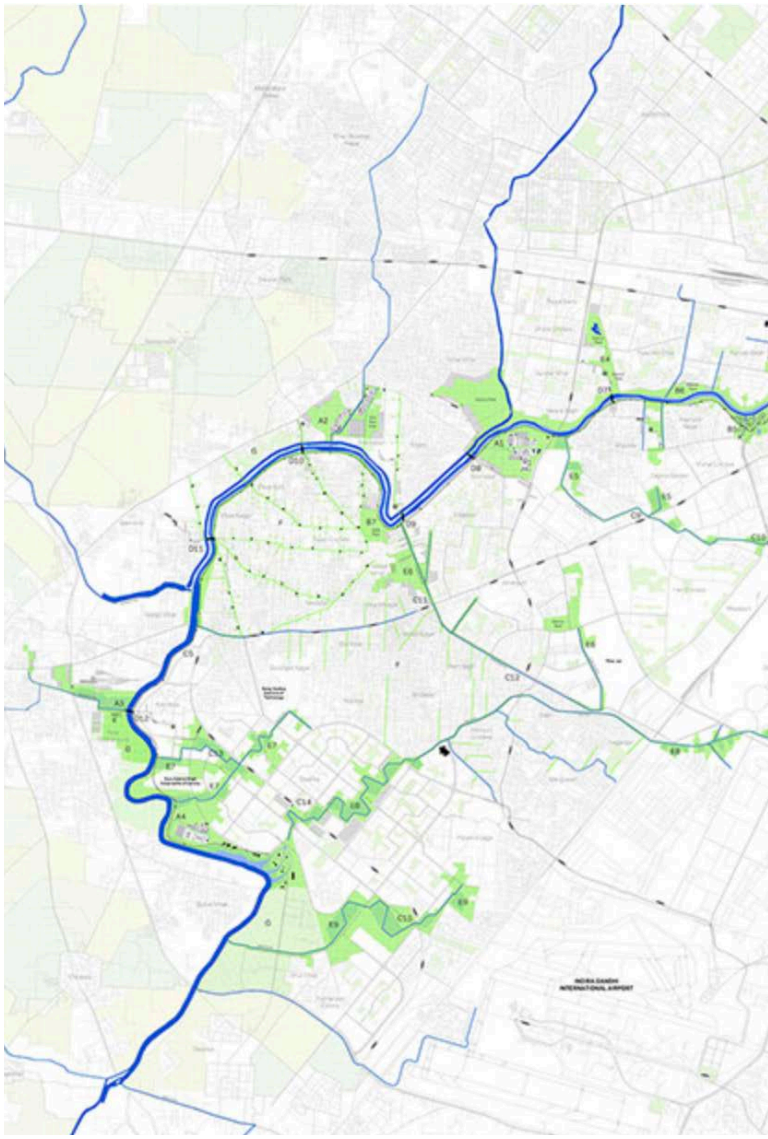
3. New public amenities located on the facade of Najafgarh

4. Pedestrian, bike, tram mobility along the Najafgarh corridor with intermodal connections to the metro

5. New transversal connections between neighborhoods across the Najafgarh

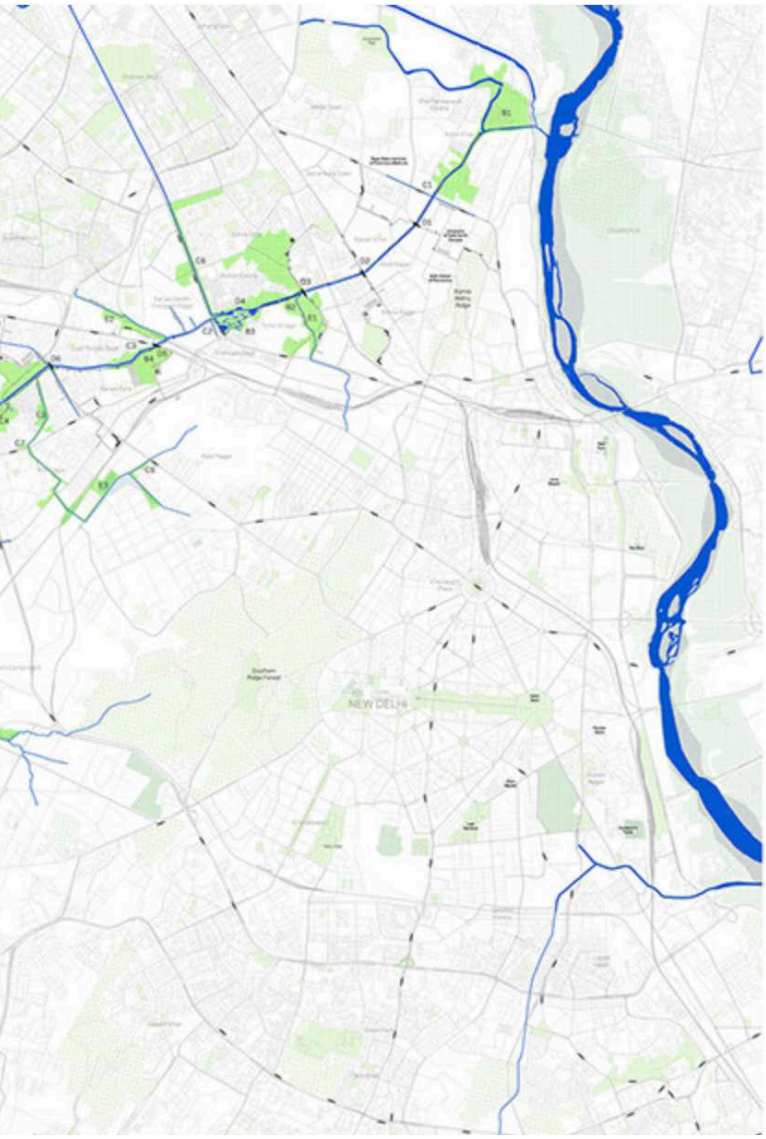
6. Agricultural parks connecting the citizens to their food sources to promote value and respect for the land

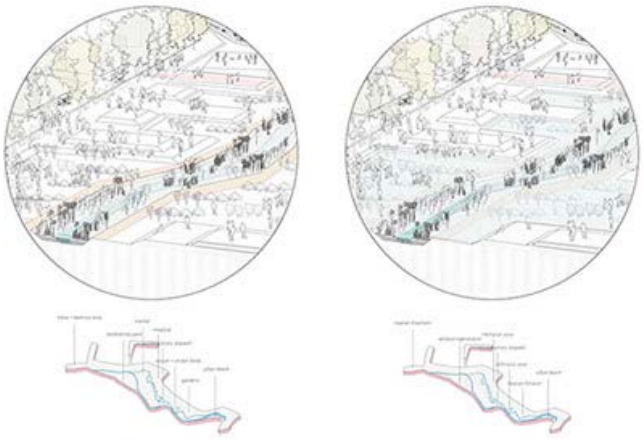
The lessons that can be learned in this case include using different elements (mobility, water etc.) in the city creating corridor to connect fragmented parts of city and increase the recreational value of ecological spaces.



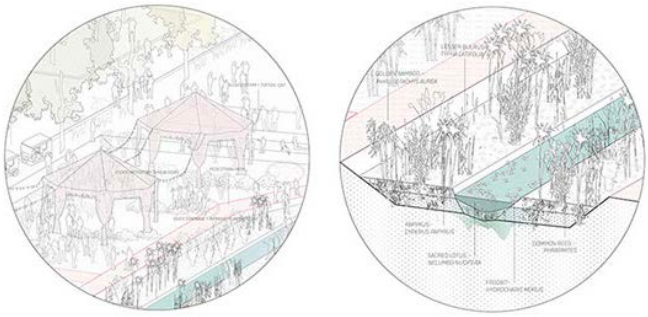
Concerning that Haizhu district is a complex urban context in the Pearl River Delta, layer approaches can be learned in this project to create the strategic socio-ecological network focusing on the public facilities, mobility, ecological spaces. This ecological network, coordinated deeply with the urban development, will bring significant improvement in the socio-spatial integration and positive impact on ecological development in the urban area.

Hybrid Infrastructure

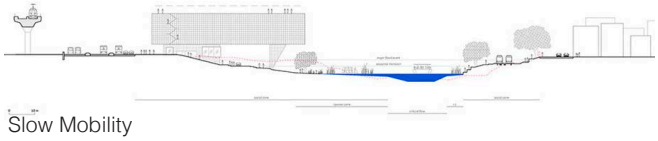




Dynamic Water Level



Flexible public space



Slow Mobility

(http://yamunariverproject.org/hybrid-infrastructures.html)

2.2 RESEARCH METHOD

In order to achieve the main objective and answer the research questions, a series of methods are used to analyze.

Literature review

Understand the history, policy, concepts on the topic of the research project, such as urbanization in China, residential differentiation in China, socio- ecological network, etc. Besides, relevant theories about segregation, social integration and other topics related to the problem statement will be studied.

Case Study

Analyze different cases and their principles based on the three scales I would like to have my design implementation and find out the effective principles which can be transformed on the project. Different scales of cases are studied and identified.

Data Collection

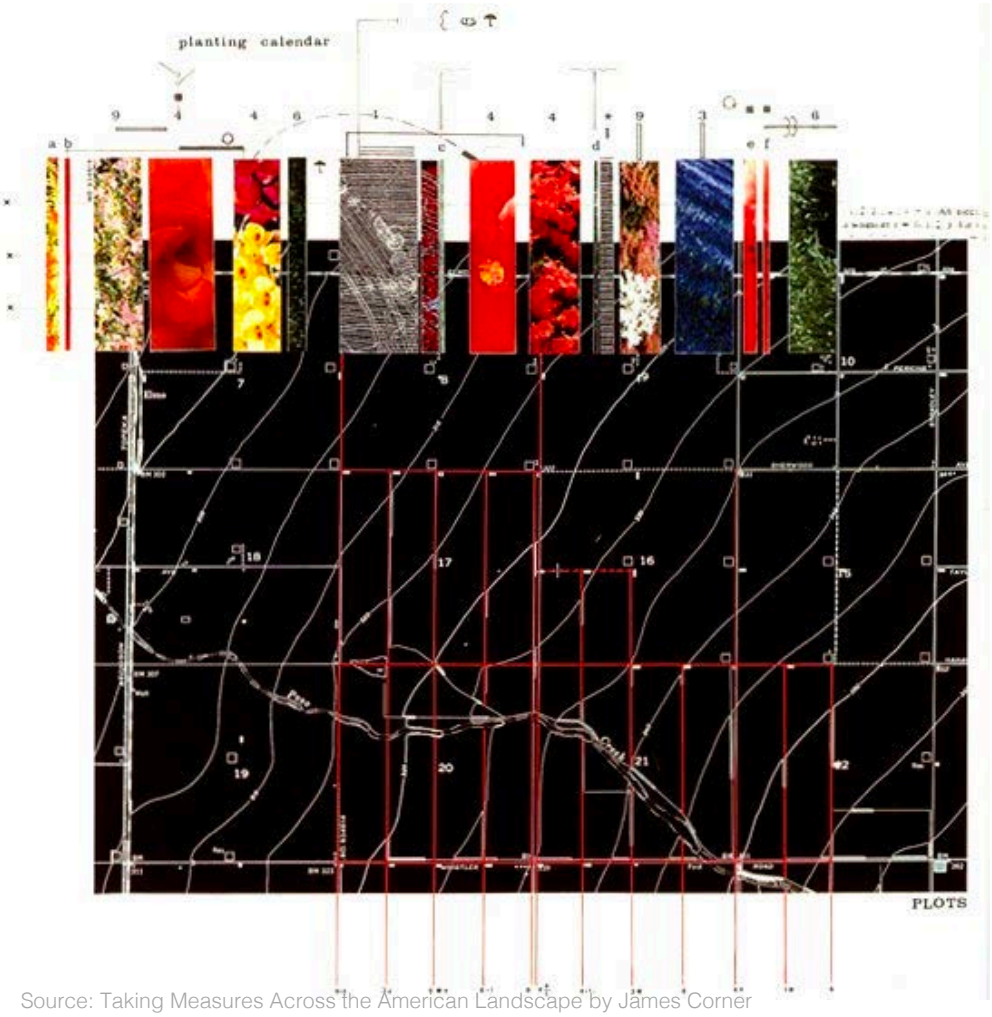
Collect useful data from histo
websites, such as population, ex
etc. Comparison can be made th

Historic analysis

Understand the development of
formation of different settlements
possibility of future development.

Mapping

Analyze the invisible spatial rela
such as transportation, urban are
analysis, further spatial relationsh



Source: Taking Measures Across the American Landscape by James Corner

rical books and government's
isting and future urban planning,
routh the information.

the whole Haizhu district and the
s in a timeframe and discover the
.

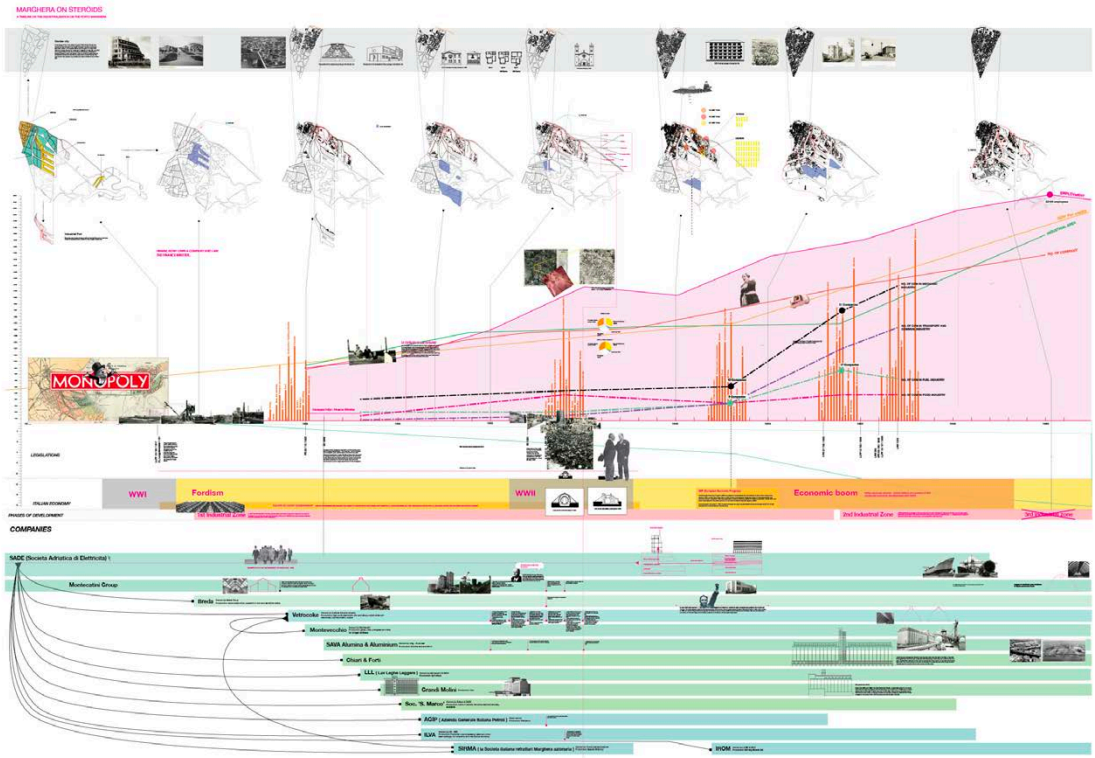
tionship between different layers,
ea, ecological area. Based on this
ips could be found out.

Comparative analysis:

Understand the differences between residential typologies and make comparison among them in order to find out the crucial aspects in typology that need to improve in the design.

Field trip (survey, interview, observation)

Explore the actual life in various residential communities, such as the identity of residents in different settlements, the actual form of pattern, the usage in public space, the living environment, relevant stakeholders, etc. By survey, interviewing, observing, public participation and behavior can be learned.



Source: https://pr2016.aaschool.ac.uk/submission/uploaded_files/INTER-15/kevin.leung-Kevin%20Leung_Porto%20Marghera%20timeline_20151215.jpg

2.2 RESEARCH METHOD

Urban Landscape Infrastructure

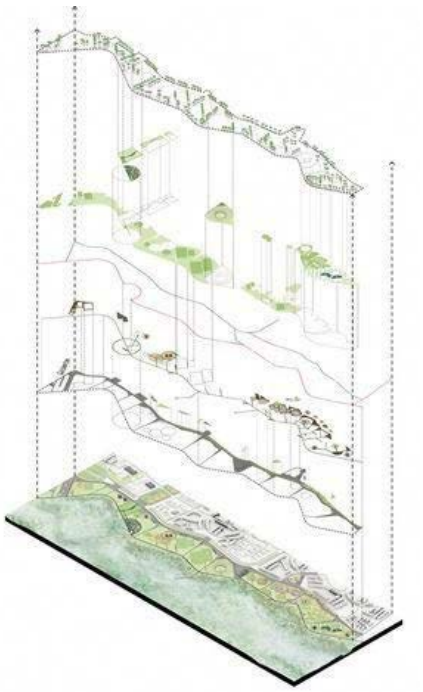
"Landscpae as infrastructure: landscape is treated as an operative field that defines and sustains the urban development and ecological and economic processes are employed as formative design tools." (Nijhuis, 2013)

1)Transport landscape infrastructures (includes the spatial design of vehicular, rail, and air systems, as well as ports and waterways)

2)Green landscape infrastructures (consisting of green patches, corridors and matrices)

3)Water landscape infrastructures (including river modifications, seawalls and floodgates etc.)

It is important to understand the existing condition in these three layers when dealing with the ecological spaces in urban area and landscape architect should **work through scales from regional, local to neighborhood and build up interconnection between them**.



Social Ecolo

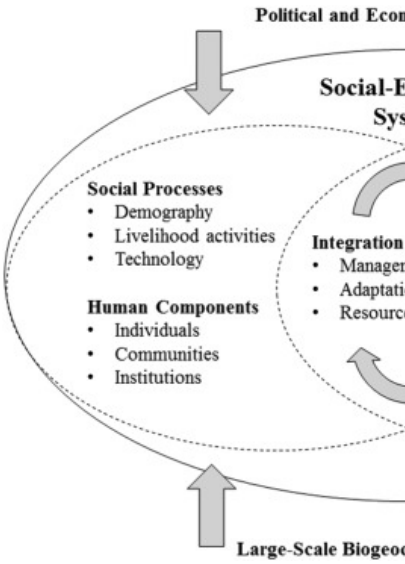
In order to create the social ecc
consider the theory of social ecol
three related attributes of social
adaptability, and transformability.

Resilience: the capacity of a sy
reorganize while undergoing chan

Adaptability: the collective capa
system to manage resilience.

Transformability: the capacity o
system with enhancement of e
conditions.

These three attributes should als
ecological network that has the
from dynamics of change in the



gical System

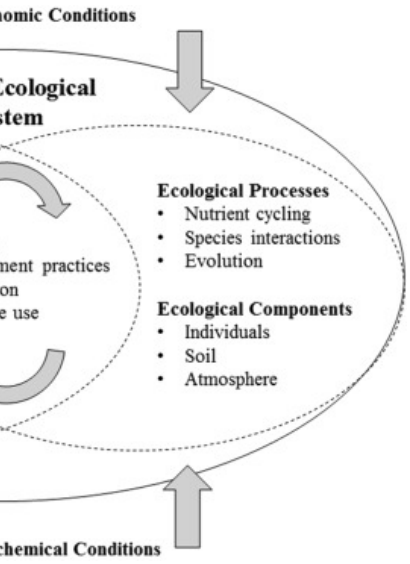
logical network, it is essential to ogical systems (SESs). There are l–ecological systems: resilience, (Walker et al., 2004).

stem to absorb disturbance and nge

acity of the human actors in the

f creating a multifunctional new ecological, economic, or social

o be applied to the further social ability to **adapt and sustainable system of human and nature.**



Urban Renewal

Due to the rapid unbanization in China these days, many challenges facing cities in terms of spatial fabric, human living condition are enormous (Huang et al., 2020). Therefore, urban renewal could be an opportunity to transform the existing deteriorated suituation into a more sustainable one. Urban renewal has developed with different aims through the whole process of urbanization and has evolved to concern urban redevelopment, urban rehabilitation and urban conservation. To deal with complex urban problems, various stakeholders should be involved in urban renewal with integrated, coordinated strategies (Zhuang et al., 2019).

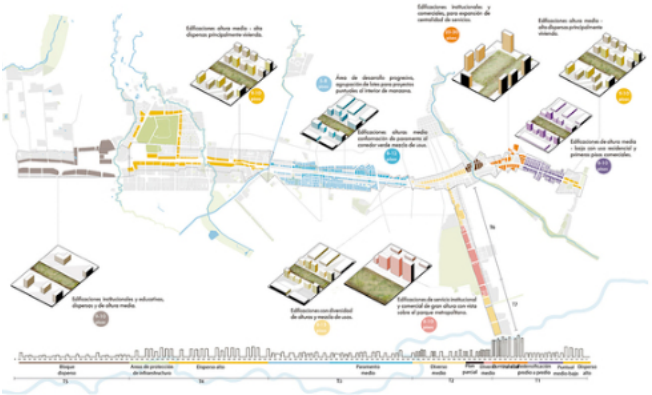
Urban renewal should be based on the existing condition including the redeveloped site and area nearby and should also benefit the urban environment. At the same time, since the project is dealing with socio-spatial segregation, **various of social groups (stakeholders)** should be concerned into the renewal project.

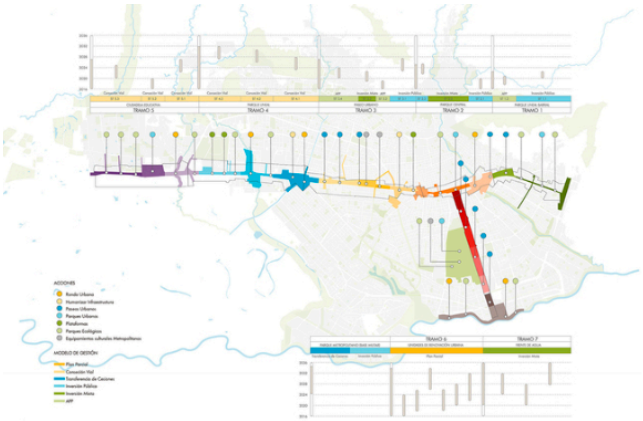
2.3 CASE STUDY

The Cali Green Corridor in Colombia

https://www.archdaily.com.br/br/781254/assim-sera-a-segunda-fase-do-corredor-verde-de-cali-em-colombia?ad_medium=gallery

Objective: generate a large central and linear city park where recreational, cultural and recreational activities will converge along with a cycle path that will function as a clean mobility system.



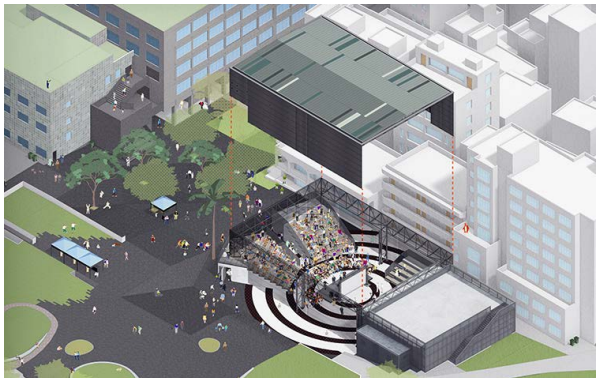


1. Recompose an urban ecological network
2. Socially and spatially integrate the city
3. Balance connectivity with a clean green transit corridor
4. Renew the city with strategic projects that trigger transformation processes from the central area

Nantou Old Town Urban Regeneration in Shenzhen

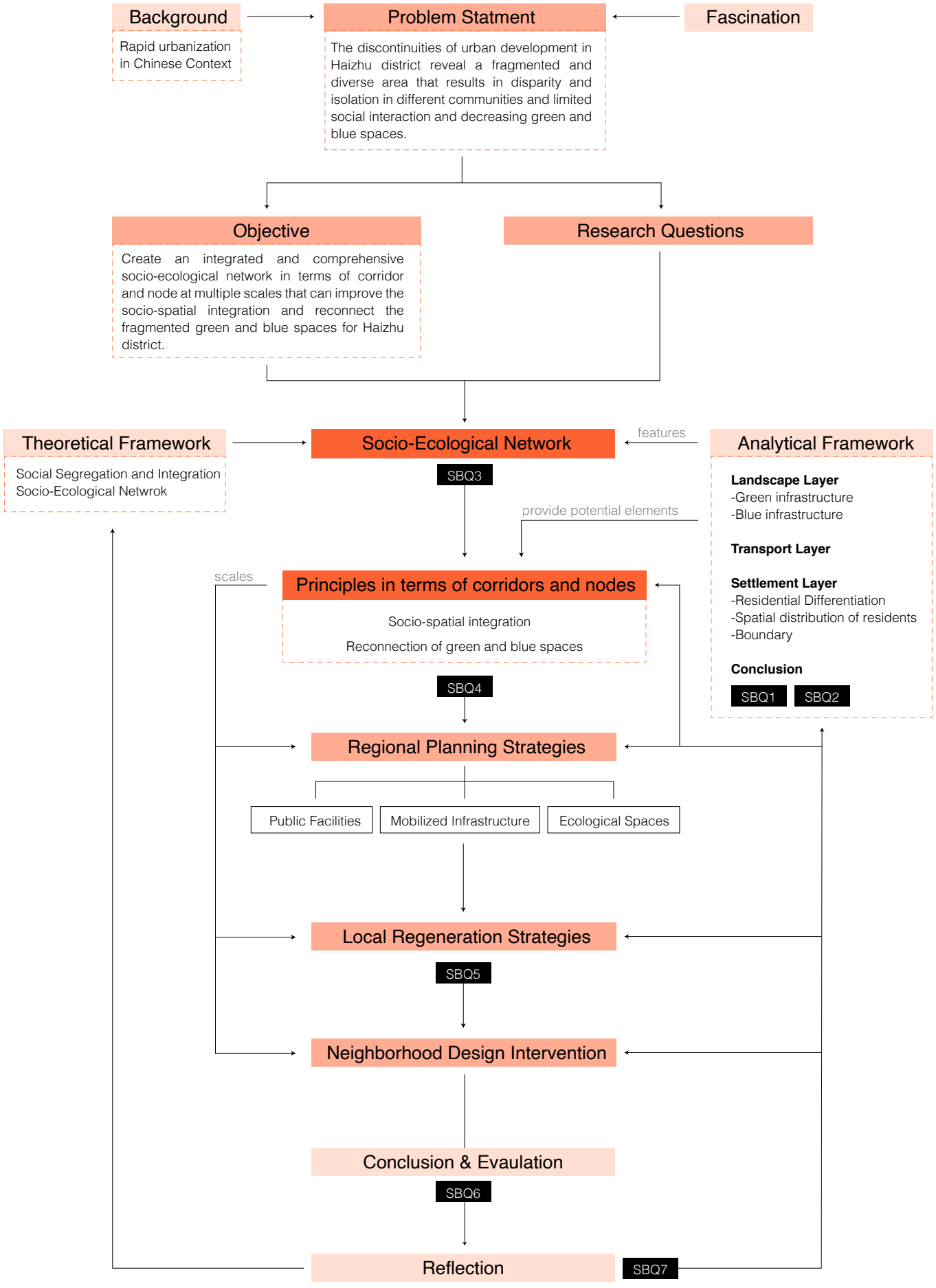
http://www.urbanus.com.cn/projects/nantou-old-town/?lang=en

Objective: Implement urban spatial strategies to enhance environmental quality of public space with less disturbance to residents and save enough space for future development

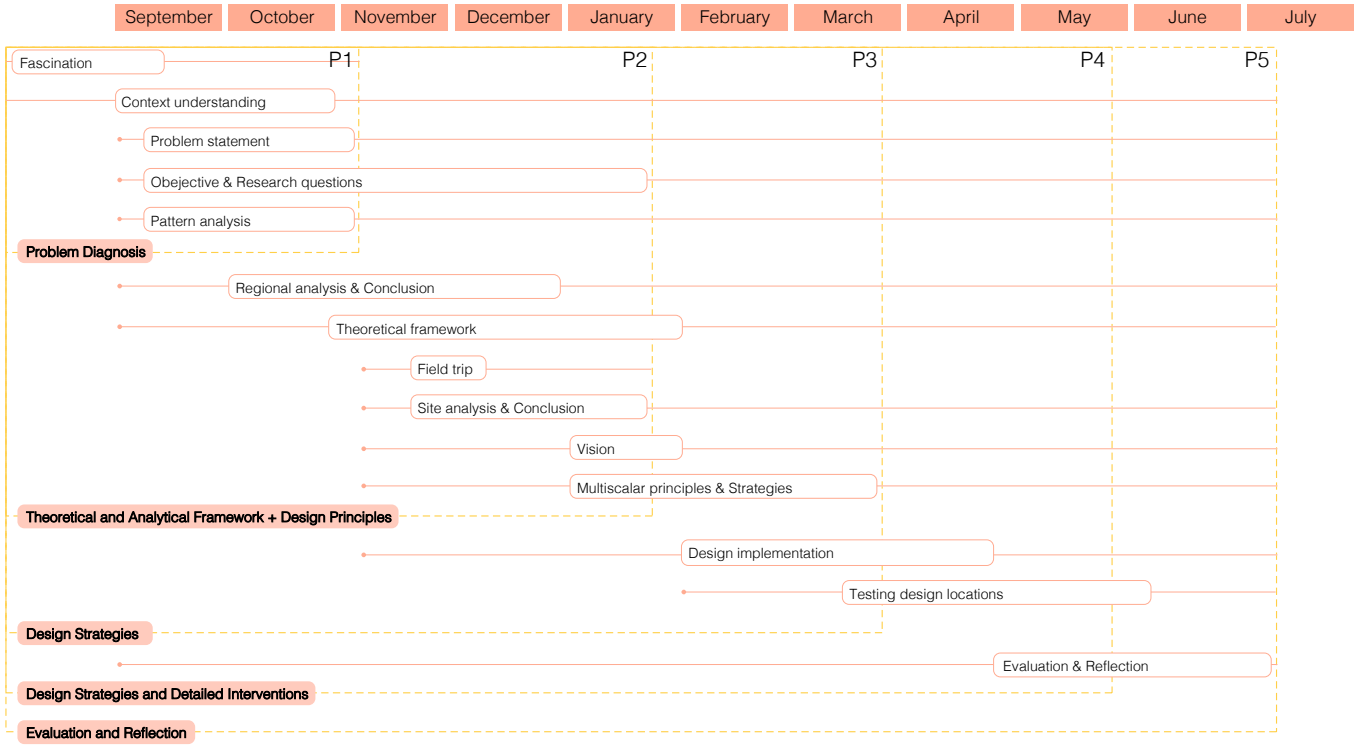


1. Import some public cultural event like UABB as catalyst of community renewal
2. Turn negative space into vigorous public space with high accessibility
3. Use of vacant buildings and space for public
4. Limited financial support, heuristic private living space renewal

2.4 RESEARCH STRUCTURE



2.5 RESEARCH STRUCTURE



03

Understanding

OVERVIEW

Historical Village

Tradtional Community

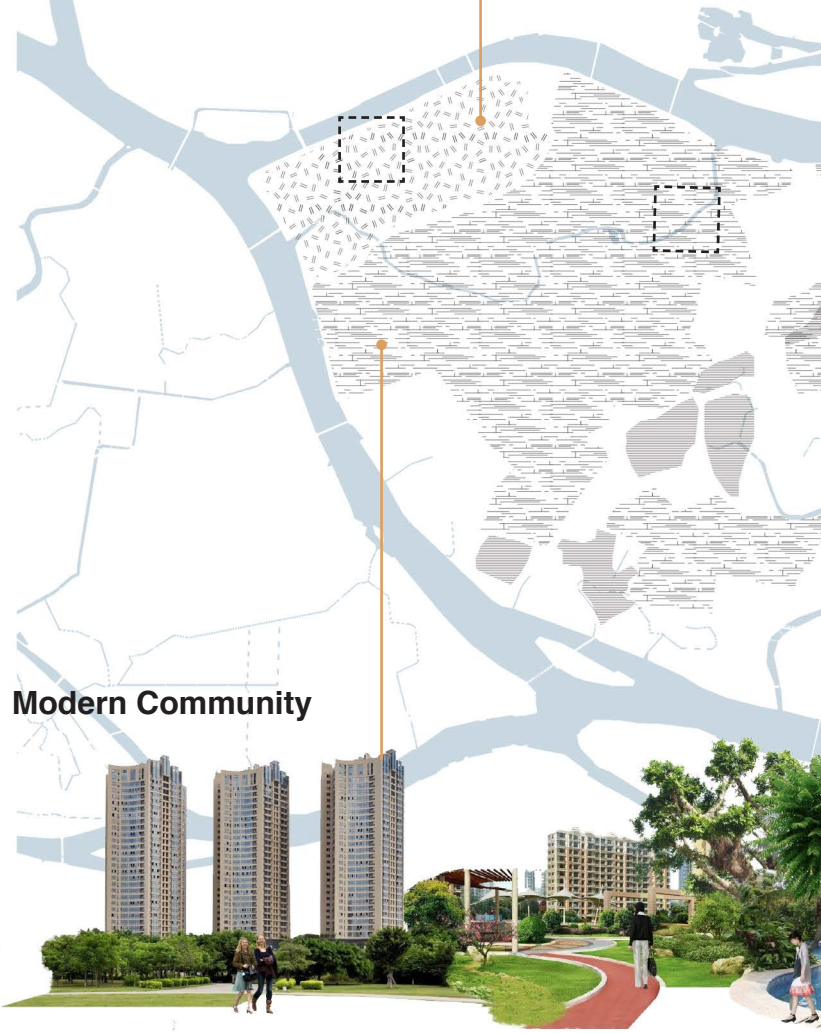
Urban Village

Modern Community

Time

Built in 1800, locate in old city town, including old residential work u
traditional buildings (arcade-house), poor building quality, multi-storey

Tradtional Community



Modern Community

Built after 21st century, good building quality, high rise

nits since 1900, has many
y

Built in 1400, has historic and cultural value, cultural reserve, located in agricultural area based on agricultural economy, low rise, waterside villages

Historical Village

Urban Village

Used to be farmer's residence, poor building quality, multifunctional buildings, multi-storey

Traditional Community
Modern Community
Urban Village
Historical Village

OVERVIEW

First, as an overview, we know that there is a diversity of neighborhood in Haizhu district and it is essential to understand its existing condition and features in the first place. Therefore, the classification of different settlements is made in timeframe - namely, historical village, traditional community, urban village and modern community.

Historical village was first built in 1400, has historic and cultural value, located in agricultural area and depending on agricultural economy. Traditional community was built in 1800s located in old city town center, including old residential work units since 1900. It has many traditional buildings (arcade-house) with historic value but most of the buildings are in poor quality. Urban village used to be farmer's residence, and now has the biggest population of immigrants because of its low rent price. Buildings are in poor quality with multifuncational value. Modern community is the common residential form after 21st century, with buildings in good quality.

From a regional perspective, traditional community is located at the northwestern part of Haizhu district which used to be the old city center area. Modern community is next to it and urban villages are some patches surrounded by the modern community. Historical village is located in the eastern agricultural area that is far from the urban area.

In order to have a better understanding of the spatial quality of different typologies in various contexts. The pattern of different settlements in four locations is chosen to be analyzed their spatial configuration.

Historical Village

buildings

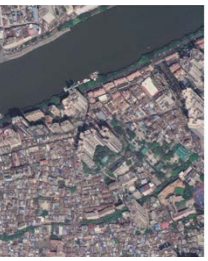
road

water

open space

Trad

itional Community



Urban Village

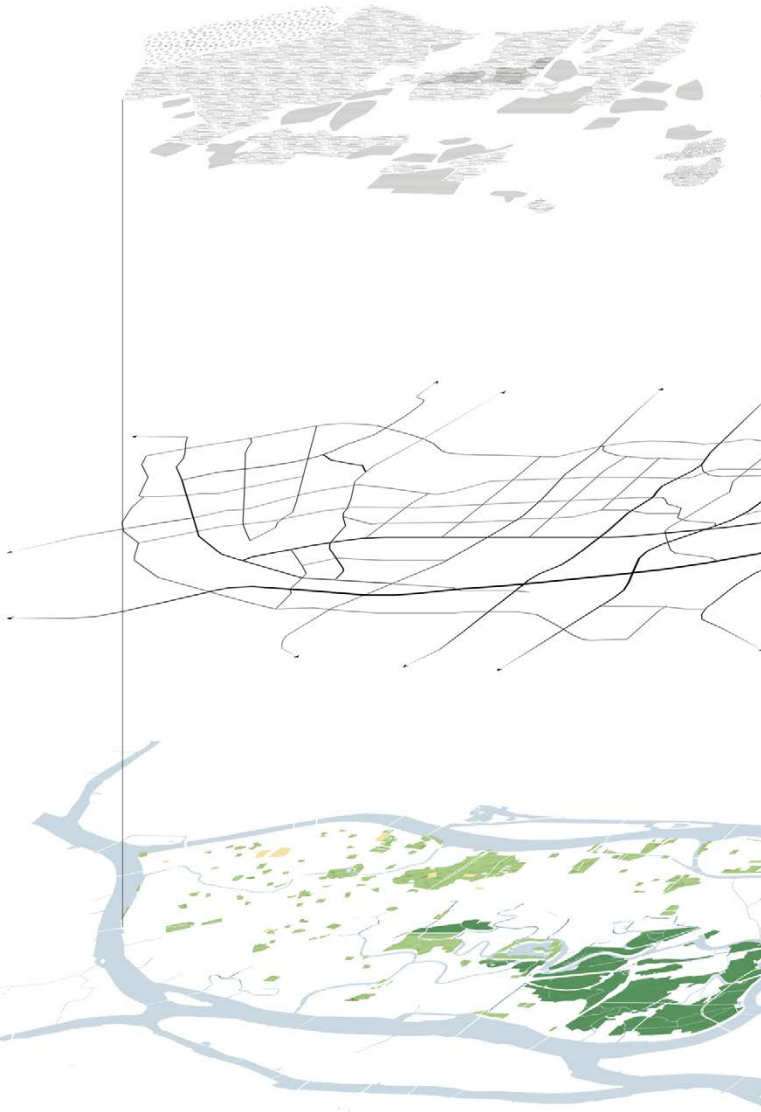
Modern Community

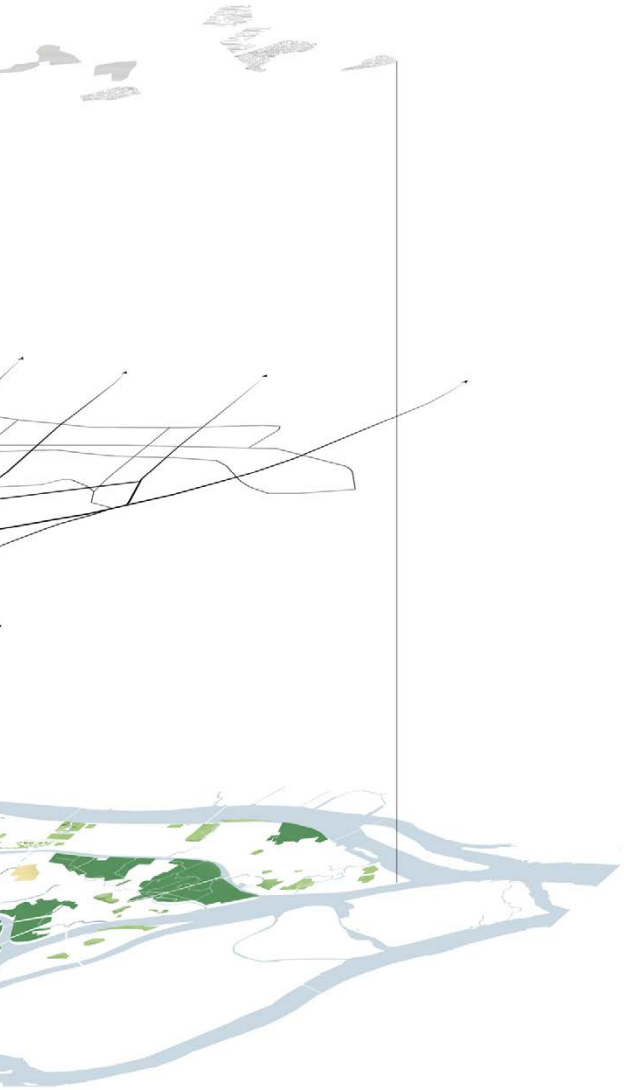
OVERVIEW

However, the zoom-in analysis is not sufficient to understand the complex with social and ecological values. The understanding of the whole territory with related features is essential as well. Therefore, the layer approach is utilized to gain knowledge of the whole context of different features in various settlements at both regional and local scale. Then from these three layers (settlement layer, transport layer, landscape layer), the potential elements could be discovered that can further be developed into corridor and node and reshape the connection between neighborhoods and ecological spaces.

The understanding part will start with the landscape layer, then transport layer and settlement layer. Landscape layer and transport layer will be analyzed at regional and local scale and settlement layer will focus on the local and neighborhood scale.

Landscape layer provides a basic condition for the human activities that can acted as a backbone for the landscape-based design solution. Based on transport layer, it is important to understand tranport system and gain knowledge of the accessibility of different neighborhoods. As for the settlement layer, the factors of socio-spatial segregation are analyzed that are divided into three parts: residential differentiation, spatial distribution and boundary.





Settlement Layer

understand the factors contributing to socio-spatial segregation in terms of urban patterns, activities.
(regional, local, neighborhood scale)

Transport Layer

understand connection and accessibility of settlements
(regional, local scale)

Landscape Layer

understand the existing territory and landscape features
(regional, local scale)

3.1 LANDSCAPE LAYER

Rural landscape in the past (Source: https://baike.baidu.com/item/10632673)

Rural village reclaimation (Source: http://news.jstv.com/a/20150506/86167.shtml)

Since the reformation, the pearl river delta has taken the lead in taking advantage of regional policies along the coast given by the state. The economy has been growing rapidly, but the cost of natural resources and environment is significant. The proportion of urban system has increase while the propotion of natural ecosystem and semi-natural system has decreased, such as rural village area, farmland, etc. Nowadays, certain mountains are eroded. The green belt was damaged to a certain extent. For Haizhu, from 1995 to 2005, nearly 6,000 acres of orchards were invaded in these 10 years.

Urban landscape resource (Source: http://bbs.zol.com.cn/dcbbs/d17_6582.html)

Ecological pollution (Source: http://news.jstv.com/a/20150506/86167.shtml)

In the history of Guangzhou's urban construction, many unique sections have been formed, including Beijing Road Commercial Street, Shamian Concession Area, etc. that reflect Guangzhou's historical style. There are also some prominent modern urban landscape resources such as Baiyun Mountain, Pearl River, etc. However, the rapid urban construction in recent years has led to the loss of traditional urban features and certain landscape resources.

3.1 LANDSCAPE LAYER

3.1.1 Green Infrastructure

The existing ecological green space system in Haizhu district is mainly composed of recreational park, protective green land, agricultural and forest green land. From the current condition, the distribution of green lands is extremely uneven with more green in the east while less green in the west. Since the popluation in the west part is larger than in the east part, there arises the phenomenon of lacking green spaces for citizens. As a whole, the patches of green area is highly fragmented. Most of the patches are divided by roads and small patches are scattered.

From a regional perspective, the main problems of the ecological green spaces in Haizhu district are unevenly distributed in the west and east part, fragmentation and low efficiency.

From a local perspective, there is limited and fragmented public open space in different kinds of settlements. By calculating the amount of open space through Autocad, the difference between different neighborhoods is significant, especially the difference between high-dense urban village and low-dense modern community.

Regional Scale

Local Scale

Historical Village

Open space area / Total Area

34%

Traditional Community

Open space area / Total Area

19%

ocket Park

Open Lawn

Wetland

Argicultural Area

Traditional Community
Modern Community
Urban Village
Historical Village
Agricultural Land
Recreational Park
Playground

Urban Village

Open space area / Total Area

9%

Modern Community

Open space area / Total Area

36%

3.1 LANDSCAPE LAYER

3.1.1 Green Infrastructure

Urban Greenway (Source: http://www.ahatrip.net/wechat.php?m=line&a=view&id=101196)

Elements can be identified in the landscape layer which can further be explored in o socio-ecological network as corridor and node. First, it is the existing urban greenway. Generally speaking, greenway refers to all kinds of linear open spaces for connection from community bicycle trails to habitat corridors that guide seasonal migration of wild animals. Different kinds of greenway are composing the greenway network, including regional greenway, urban greenway and community greenway (Zheng & Fang, 2014) . It integrates environmental protection, leisure, sports, etc. Thus, greenway could be an effective corridor for combining people's livelihood and natural spaces.

Ecological park in urban area (Source: http://www.shidi.org/sf_737075AAB7EB4761A78D2C0B8001FDB1_151_37B2B541446.html)

Second, it is the existing urban ecological and recreational park. Urban park becomes the largest green ecological path in urban green space system which can alleviate the urban heat effect and improve environmental pollution and maintain the ecological balance. Besides, city park serves as the main leisure and recreational place for urban residents. Its active spaces and facilities provide citizens with possibilities for outdoor activities and social contact. Therefore, it is beneficial to develop urban ecological and recreational parks into interactive nodes between people and nature.

3.3 LANDSCAPE LAYER

3.3.2 Water Infrastructure

Dynamic water cultural acitvities in the past

Transportation
Passenger transport
Freight trasport

Production
Fishery (dan people)
Aquaculture
Lumbering

Recreation
Cruise
Dragon boat match
Cantonese Opera

Land transportation was not developed before in Guangzhou and the main approach of mobility depended on water transportation including passenger transport and freight transport. A series of water activities were common to be seen everywhere such as productive activities on water, dragon boat match as recreational activity and open market as commercial activity. The water system not only forms the basic urban pattern of Guangzhou, but many streets also are reflecting their close relationship with water. Therefore, Guangzhou used to be called "Harbor City" because of the fast development of the dense water system.

By the end of Qing Dynasty, when the ancient city walls were demolished and roads were opened up, water transportation gradually declined, and rivers in the urban city gradually disappeared to give more land for modern buildings. There is also a decrease of water cultural activities, but new activities along the water and new transport way appeared.

Commerce

Open markets

Tea house

Pearl river

Canal inland

Stages	Main Activities	Meaning
Origin	Production, Transportation	The origin of water culture, the formation of harbor city
Developing	Production, Transportation, Recreation, Commerce, Religion	The development of the harbor promoted recreational activities
Prosperous	Production, Transportation, Recreation, Commerce, Religion, Dragon boat, Cantonese Opera	Various kinds of water activities covered the whole city
Transitional	Production, Transportation, Dragon boat, Cantonese Opera	Decrease of the traditional water cultural activities, new activities along the water and new transport way appeared

3.1 LANDSCAPE LAYER

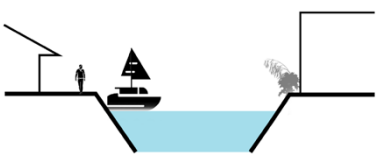
3.1.2 Water Infrastructure

Nowadays, the internal water system of Haizhu district is well-developed. The density of the water system increases from west to east. In terms of water quality, the main canal is responsible for landscape functions where the water quality is high; the secondary and small canals are responsible for not only landscape but also drainage, production where the water quality is generally polluted. The water system of Haizhu has the characteristics of good quality in the main canal and deterioration of the secondary canal. What's more, many truncated canals can be easily seen in the urban area. However, there are still various of water activities that could improve the connection between water and people. Also, ecological green spaces and water systems in the agricultural area are closely combined, which is an opportunity for the ecological environment.

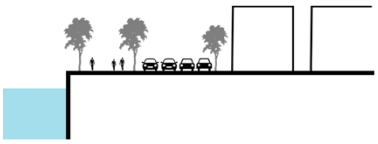
From a local perspective, the relationship between settlements and water can be seen through sections. Historical village has a better relationship with water than urban village and modern community.

Local Scale

Historical Village



Traditional Community



Cruise c

Regional Scale

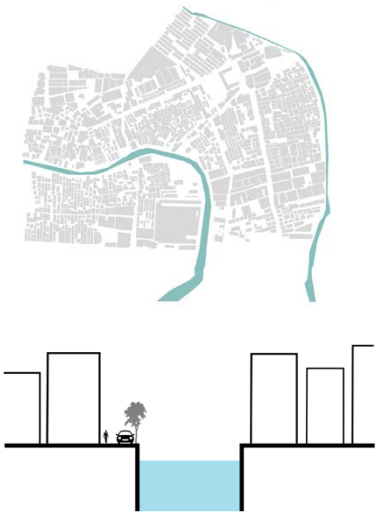
on th canal

Wetland Park

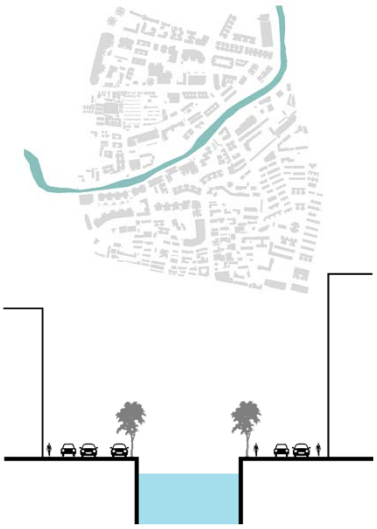
Living along canal

Traditional Community
Modern Community
Urban Village
Historical Village
River
Main Canal
Samll Canal

Urban Village

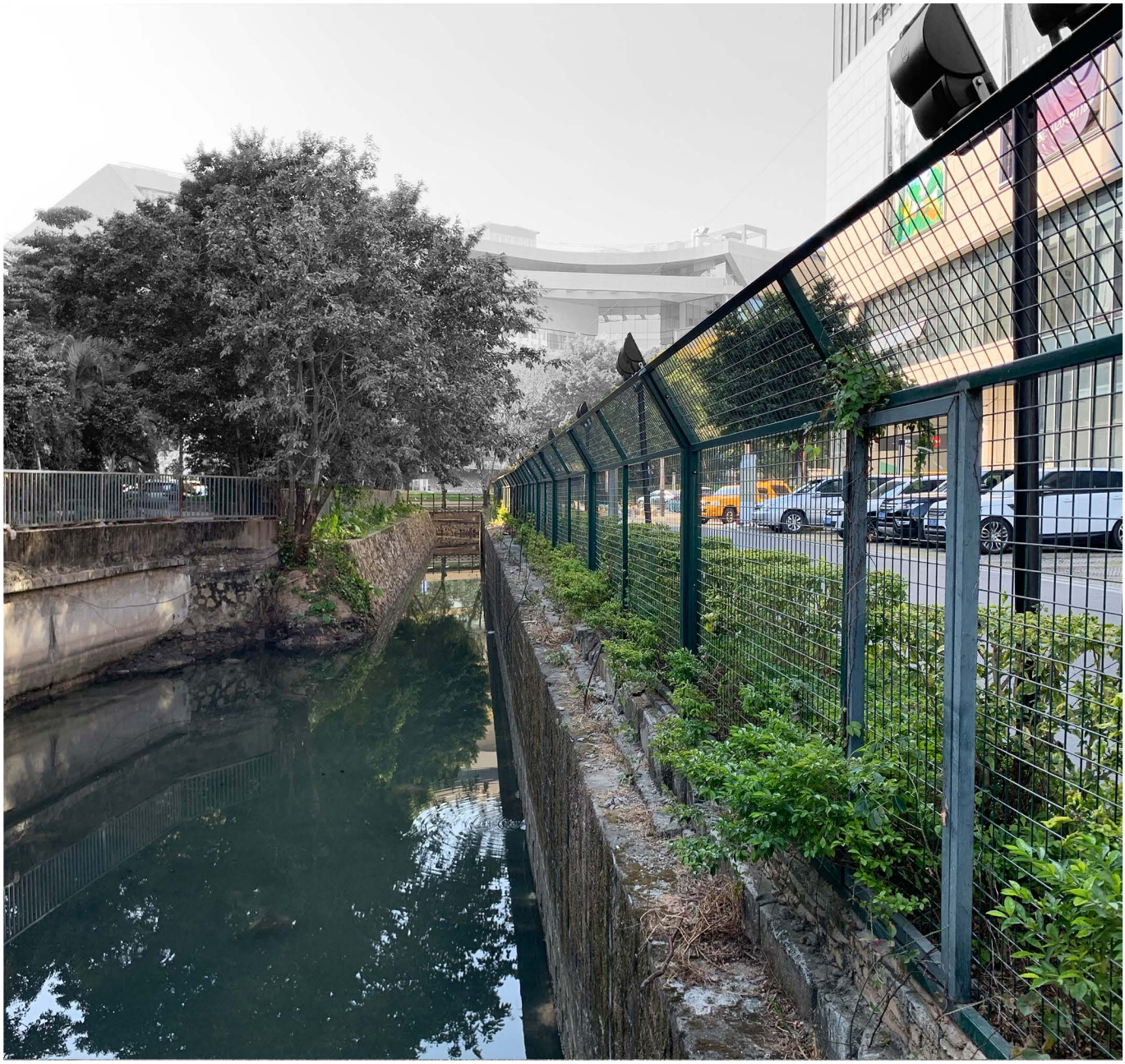


Modern Community

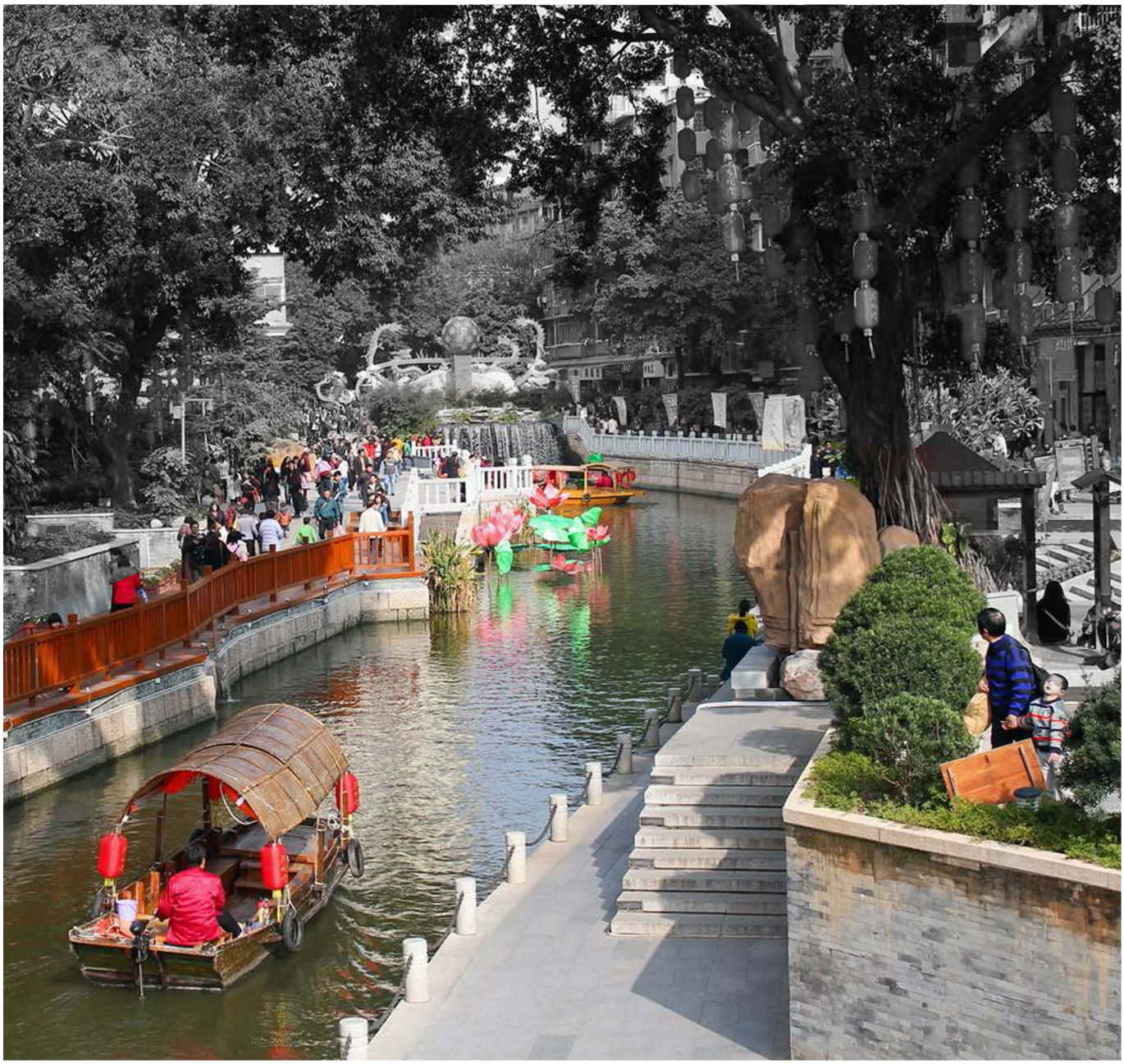


3.1 LANDSCAPE LAYER

3.1.2 Water Infrastructure



Barrier between water and surrounding environment (Source: author)



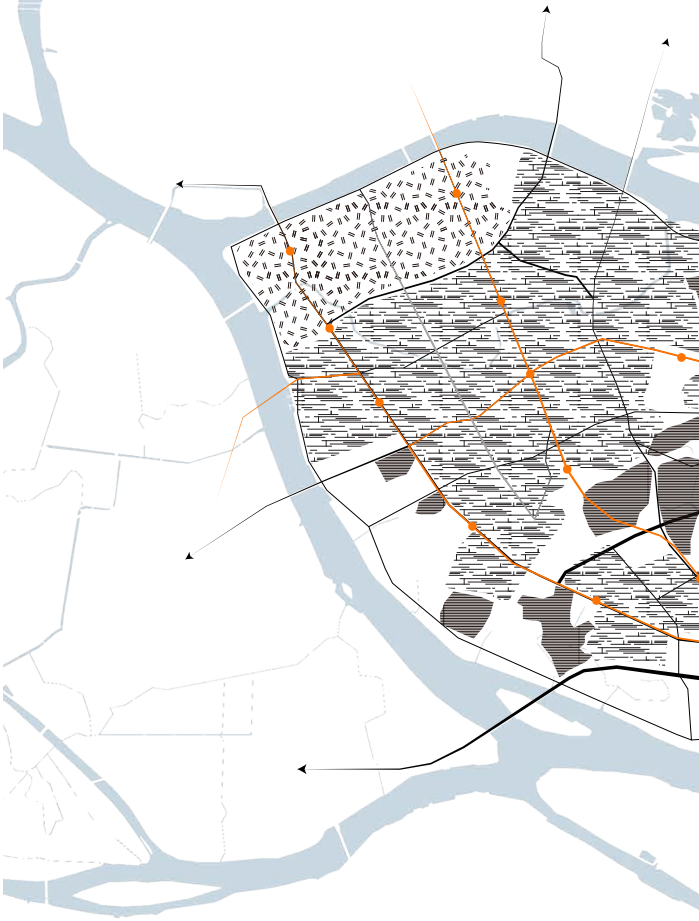
Livable waterfront area with diverse social activities (Source: http://dy.163.com/v2/article/detail/DENU5FNC05258DCP.html)

Due to the dense water system in Pearl River Delta, many canals are running through communities in the urban area. However, in certain areas, some barriers are created to block the connection between water and surrounding environment (left figure), which, from this perspective, water is acting as a boundary between environment on both sides. On the other hand, there are also some waterfront areas with diverse social activities along the canal, in which the relationship between water and surrounding context is enhanced. In this case, water becomes a corridor to integrate people and the environment.

3.2 TRANSPORT LAYER

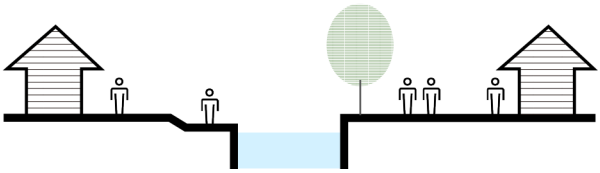
As it was mentioned in the settlement layer, road could be a physical boundary segregation differnt communities. From a regional perspective, road is a physcial border isolate the traditional community and modern community. Urban villages are in the from of patches surrounded by modern community, the accessibility of which is less convenient than modern community. As for the historical village in the eastern side, only two highways are crossing it which is quite unaccessible for other residents in the urban area.

Regional Scale

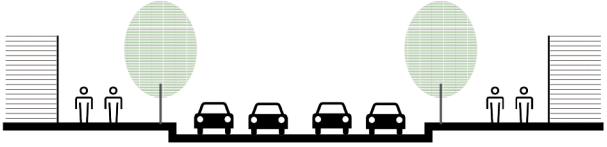


Local Scale

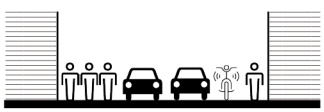
Historical Village



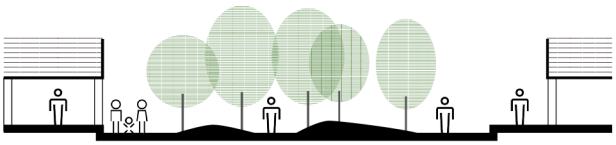
Traditional Community



Urban Village



Modern Community



3.3 SETTLEMENT LAYER

WHAT ARE THE FACTORS RESULTING IN SOCIO-SPATIAL SEGREGATION?

There are two main approaches about concerning urban segregation, namely **sociological and geographical** method. "The sociological approach considers segregation as **the absence of interaction between individuals of different social groups**. The geographical approach considers segregation as the **unequal distribution of social groups in the urban space"** (White, 1983)**.** Here I will use the most common method - the geographical approach to understand the socio-spatial segregation.

So I will classify the factors of segregation in three main aspects. **residential differentiation, needs of social groups and their use of space, and certain physical boundaries.**

"**Residential spatial differentiation** is the most concentrated manifestation of urban socio-spatial differentiation in China". Especially in the region of Pearl River Delta, the high degree of spatial segregation plays a part of reshaping the city spatial structure (Wu, Cheng & Young, 2017). And the residential differentiation is resulting in the social hierarchy.

Residential Differetiation

"With the continuous reconstruction and expansion of urban space as well as the repaid development of transportation technology and information, the needs of residents have been constantly increased, and **daily activities and lifestyles have become increasingly complicated, diversified and personalized**" (Shen and Chai, 2018). In order to have a better understanding on segregation in urban space, it is necessary to **explore the daily activities and behavior patterns of residents** from a more dynamic and comprehensive perspective.

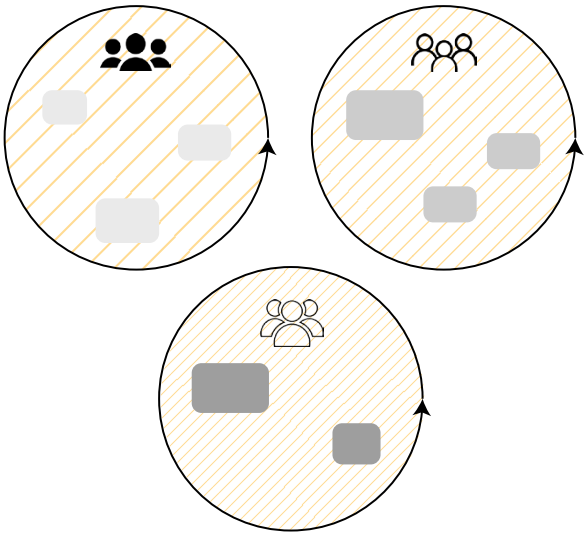
Spatial Distribution of Residents

Due to the fast-developing urbanization, the spatial distance between settlements and groups has shrunk, revealing that urban villages are mostly located in the urban center as the form of patches. This new urban pattern is that of "enclaves". "**The enclaves create a new form of segregation, where people are closer, but separated by physical barriers."** (Maffini and Maraschin, 2018)

Boundary

Personal Perception of Socio-spatial Segregation

Source: https://www.sohu.com/picture/311152435



RESIDENTIAL DIFFERENTIATION

3.3 SETTLEMENT LAYER

3.3.1 Residential Differentiation

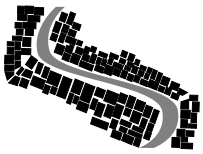
Based on the configuration of housing pattern, spatial structure in different typology can be summarized.

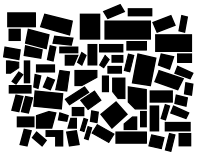
Historical village is more water-oriented where buildings are built along the river because of the conven
management in the past. The pattern in urban village is high-dense and regular while modern community
open spaces in different quality for residents.

Historical Village

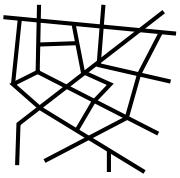
Traditional Community

Housing Pattern



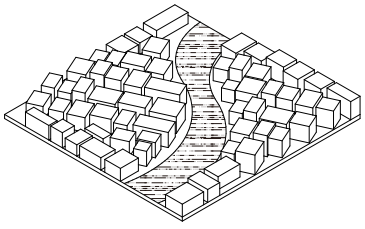


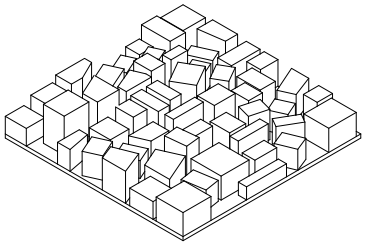
Road Pattern



Context

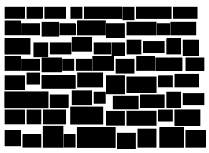
Spatial Feature

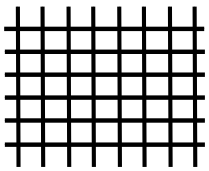


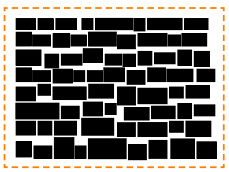


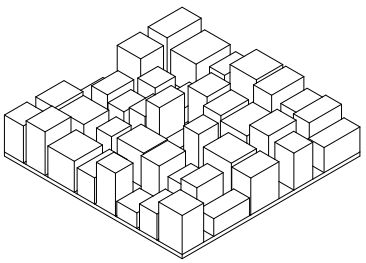
ient water system. Traditional community has irregular pattern because of the deficient construction
y has lower density. To sum up, different spatial structure in different settlements could create various

Urban Village

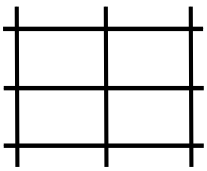


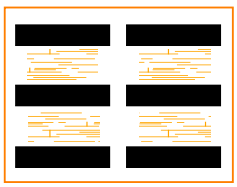


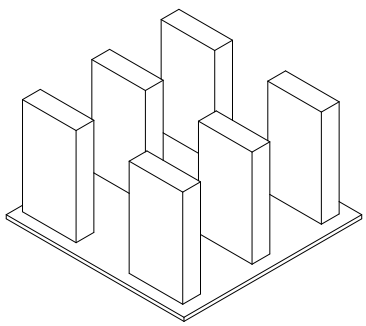




Modern Community







3.3 SETTLEMENT LAYER

3.3.1 Residential Differentiation

The various governance systems and multiple stakeholders **differentiate the quality of public facilities and services** between settlements. This leads to the different results modern community has high-level maintenance while the historical and urban village have low-level maintenance.

Historical Village

Village-based Committee

Tradtional Community

Governmental Department

Urban Village

Property Owner Committee

Modern Community

Private Management Company

Governanc

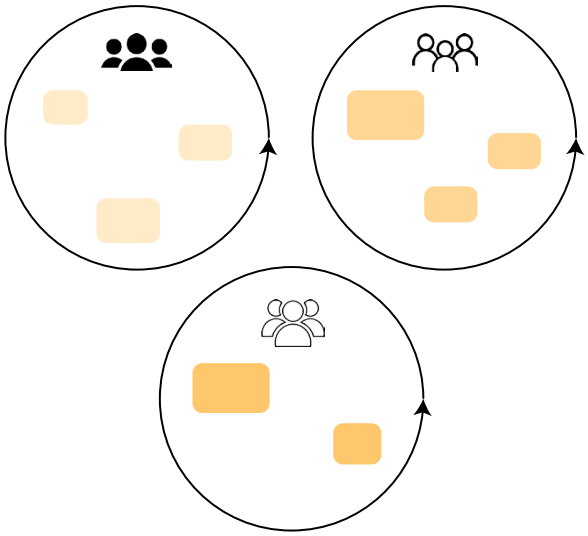
Financial A

Community

Community

Community

ce Organization				Result
id from Government	→	Limited Fundings	→	**Low-level Mainteinance**
Committee	→	Limited Fundings	→	**Medium-level Mainteinance**
Committee	→	Lack of Regulations, fundings	→	**Low-level Mainteinance** **Disordered, irreugulated Community**
Committee	→	Independent management Sufficient fundings from resdients Provide public facilities and sevices	→	**High-level Mainteinance** **Orderly, reugulated Community**



SPATIAL DISTRIBUTION OF RESIDENTS

3.3 SETTLEMENT LAYER

3.3.2 Spatial Distribution of Residents

Public space accommodates different social groups for social interaction. However, there is limited and fragmented public space in the urban area and separated public spaces in different quality served for different social groups. And the difference between the amount of public space in each typology could be significant, especially the difference between high-dense urban village and low-dense modern community. Because of the limitation, the spatial distribution and daily activities in each typology could be various.

Historical Village (historical buildings with commercial value)

Urban Village (public space in mix use)

Traditional Community (community park)

Modern Community (independent garden)

Special spatial uses in each typology (Source: author)

3.3 SETTLEMENT LAYER

3.3.2 Spatial Distribution of Residents

Historical Village

Aging/villagers-dominated

Activities along the river

Ou

Traditional Community

Aging, local residents

Pocket garden with seats

Informal

Urban Village

Low-income/immigrants-dominated

Informal open market

Commercial s

Modern Community

High-income/well-educated

High quality of facilities
e.g. gym facilities & sport courts

Sufficient resti

After data collection and field trip observation, the main residents in each typology can be concluded. Historical village has more aging villagers while tradiitional community owns a large number of aging local residents. Immigrants from other cities would prefer to live in the urban village that has the lowest rent price. High-income and well-educated people are living in expensive modern community.

Due to the different users and the condition of the settlements, the spatial distribution and uses vary one

utdoor gathering

Different kinds of cultural actvities
e.g. opera

Outdoor sitting

open market

Cultural actvities with stage

Waterfront leisure area

Historical buildings & attraction

treet with informal occupying
street space

Outdoor actvities
e.g. mahjong

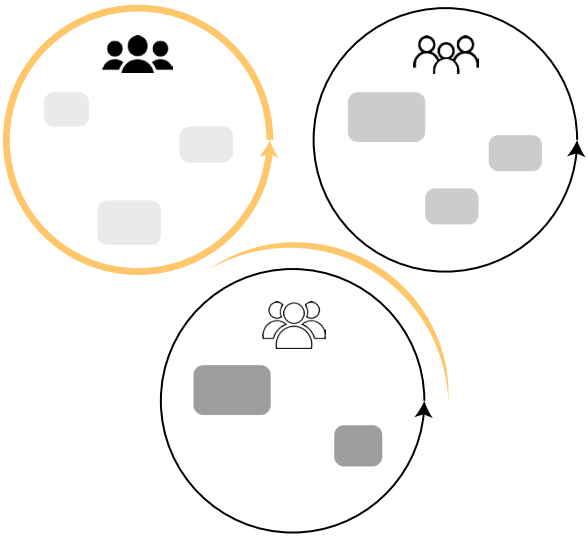
Informal street vendors

ng area and informal retailing

Independent kindergarten

Independent swimming pool and
children's playground

to another. Some special spatial uses and elements based on the needs of residents in each typology could be a potential quality to promote interaction. These features can be found not only in one typology, which means that there are similarity of needs in different settlements. And these special features have the potential to be applied to other settlements to build up connection between communities in the further design in order to improve the socio-spatial integration.

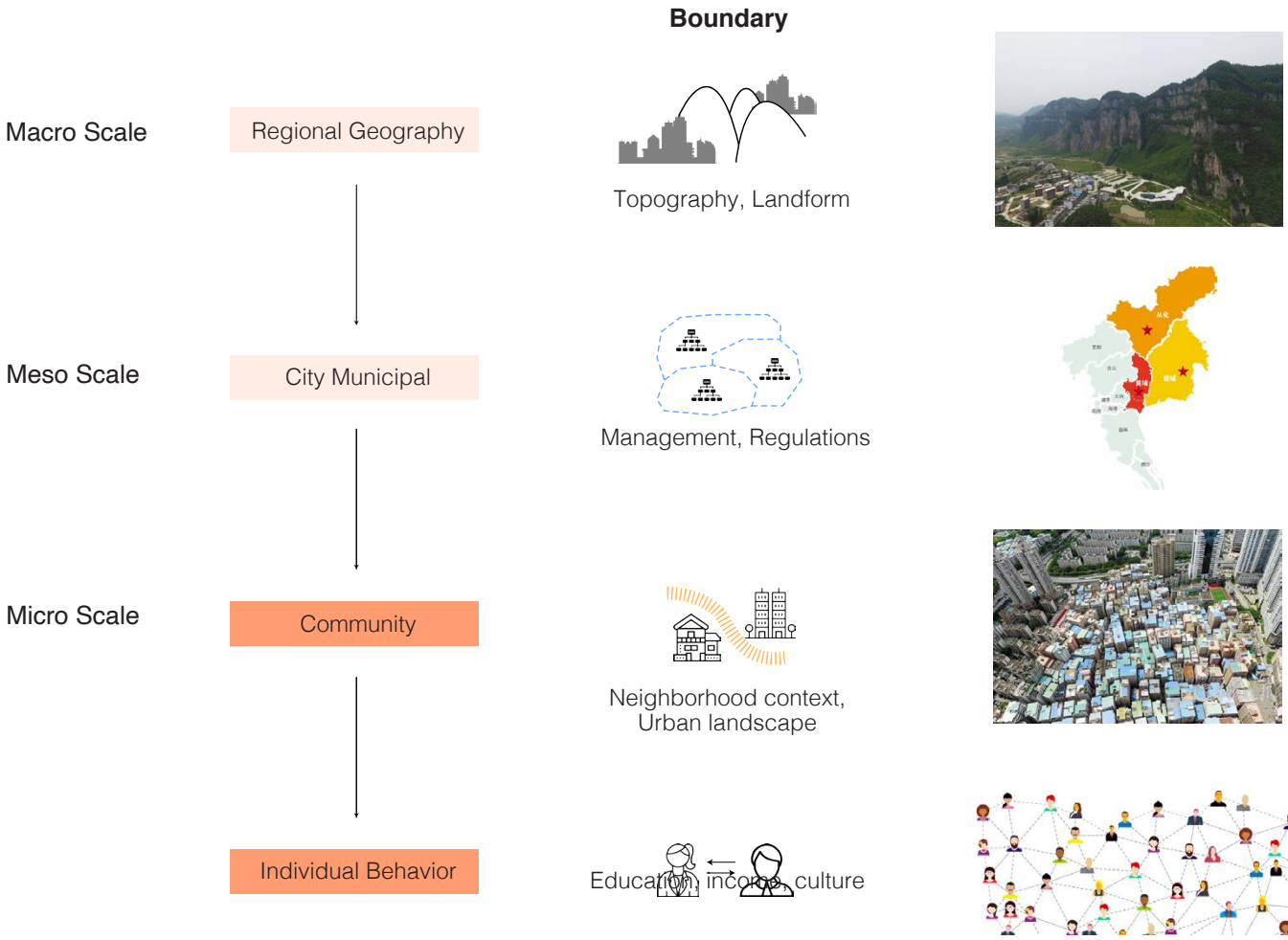


BOUNDARY

3.3 SETTLEMENT LAYER

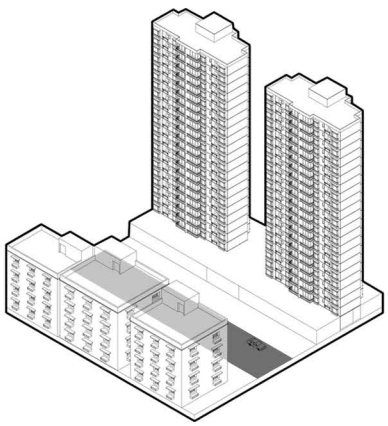
3.3.3 Boundary

"Boundaries (features of the built environment) disconnect urban spaces in ways that reinforce or exacerbate segregation (Roberto and Hwang, 2017) **and also restrict social integration and physical access."** (Jacobs, 1961; Grannis, 1998).



Boundary is a way to define segregation from a spatial perspective. At a macro scale, the boundary of typography and landform isolate different regions. Management and regulations in meso scale are boundaries to segregate city municipals. While in the mirco scale, different neighborhood contexts could build a barrier between communities and behavior of individuals that have different social status is another factor.

It is essential to define these boundaries both from physical and spatial perspective as well as on different scales. Here I try to summarize the boundaries into two parts, physcial boundary and spatial boundary. Physcial boundary which is one of the elements in the built environment exists to contribute to facilitate the persistence of segregation of different communities, such as road, water, wall etc. While spatial boundary implies a separation of residents from different settlements who can access to spaces in different spatial quality. (Roberto and Hwang, 2017)

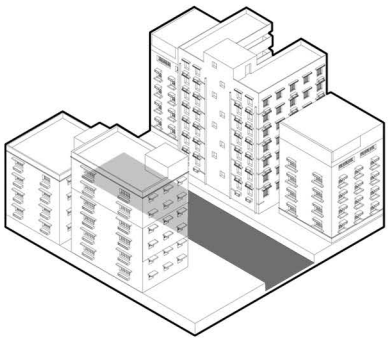


1. Road Boundary

Although road is mostly for connection, but sometime it may turn into a boundary between communities. It becomes physcial feature to limit the interaction between neighborhoods.

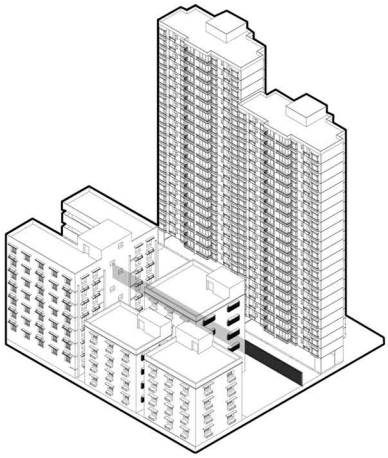
3.3 SETTLEMENT LAYER

3.3.3 Boundary



2. Water Boundary

Many creeks are running through the urban area which have certain negative impacts on integration from both sides of the water without connection.

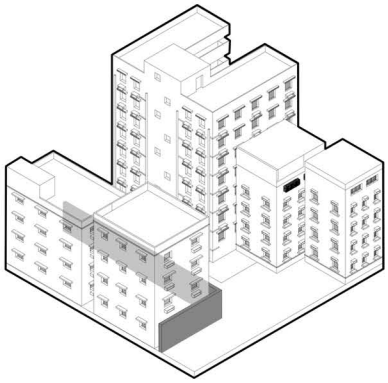


3. Fence Boundary

Fence is considered as a physcial barrier between communities preventing people from outside accessing to the neighborhood, which is commonly seen in the modern communities.

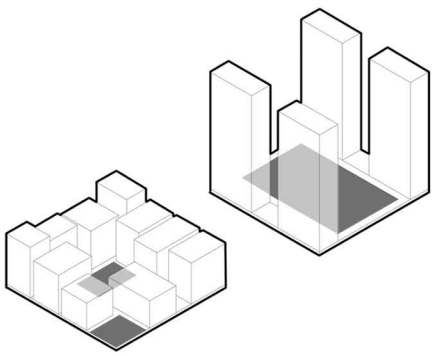
3.3 SETTLEMENT LAYER

3.3.3 Boundary



4. Wall Boundary

Wall used to be built around buildings, defining certain personal area within the neighborhood.



5. Spatial Quality Boundary

Spatial quality includes facilities, functionality, size of open space that can contribute to the various uses in the certain area. The provision of the quality ofopen space is different in differnt neighborhoods, especially in urban village and mdoern community.

3.3 SETTLEMENT LAYER

3.3.4 Conclusion

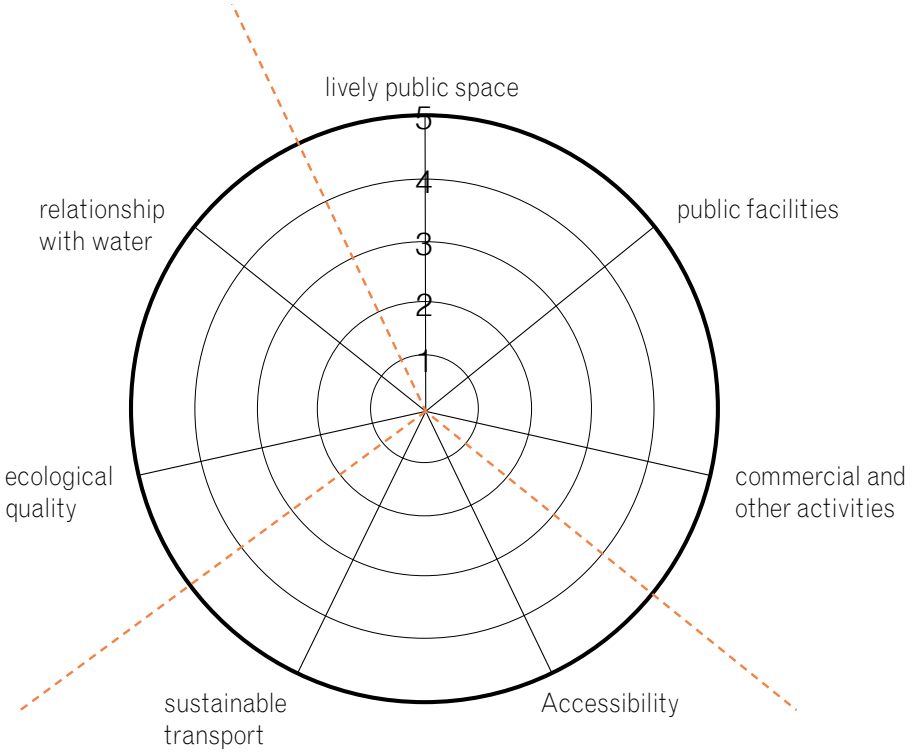
Based on the field trip observation and analysis above, I try to evaluate the four typologies from three perspectives, settlement, transport and landscape. Based on this evaluation, we can see the different qualities in each typology and further exploration and interventions can be applied to improve its shortcomings and maintain good qualities.

From settlement perspective, there will be three aspects - lively public space, public facilities, commercial and other activities. The figure at the right side tells us that there is hierarchy - 5 as the highest while 1 as the lowest - of each one of the aspects. As that of lively public space, the top-level represents that there is sufficient and vital public space in the community. In contrast, the bottom level indicates that there is limited space for interaction. For public facilities, the highest rank shows sufficient public facilities such as gym instruments are provided while the lowest one presents none or rare facility in the community. Moving to commercial and other activities, high ranking implies abundant commercial spaces and low ranking means none or rare commercial activity.

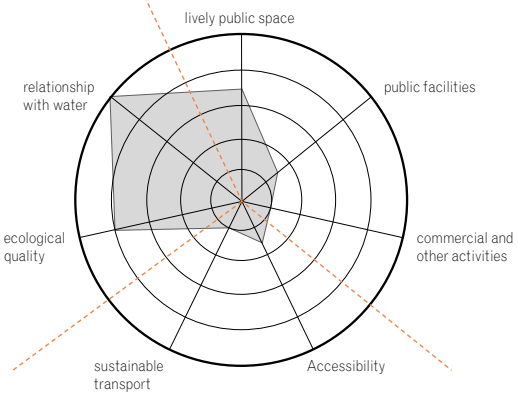
From transport perspective, there will be two aspects - accessibility, sustainable transport. For accessibility, high ranking represents good accessibility to public transport with more than one bus or metro stop within 500 meters while low ranking implies low accessibility. As for sustainable transport, the top level indicates there is slow mobility or sustainable mobility such as tram crossing the community. And the lowest one presents no sustainable transport.

From landscape perspective, there will be two aspects - ecological quality, relationship with water. Good ecological quality indicates that there has sufficient ecological green space as natural habitat while bad ecological quality means no green space at all for ecological value. The relationship between people and water is also dicussed in the landscape aspect. High ranking implies sufficient water activties on water and along water and livable waterfront spaces while the low ranking represents water is acting as a barrier with people and surrounding environment with no activities along the water.

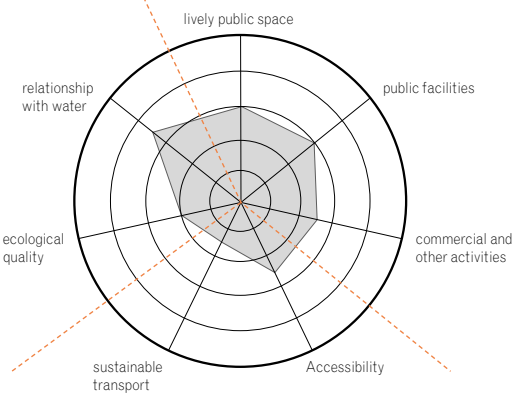
In conclusion, we could see that the historical village has more ecological value while modern community could provide more public spaces and facilities for social activities. The existing condition of urban village is the worst with the lowest ecological quality and lacking public space.



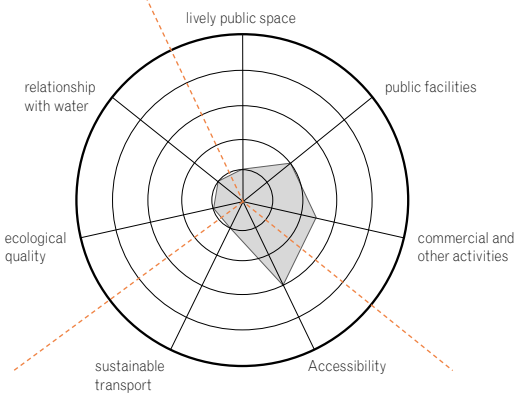
Historical Village



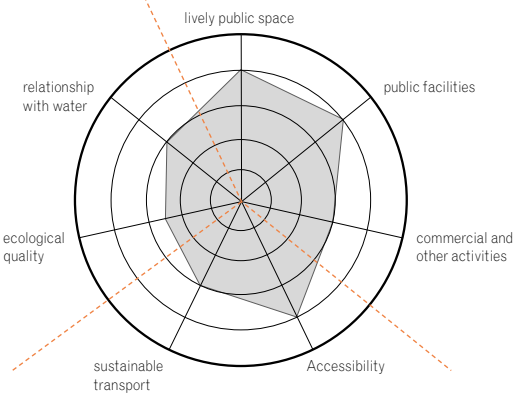
Traditional Community



Urban Village



Modern Community



3.3 SETTLEMENT LAYER

3.3.4 Conclusion

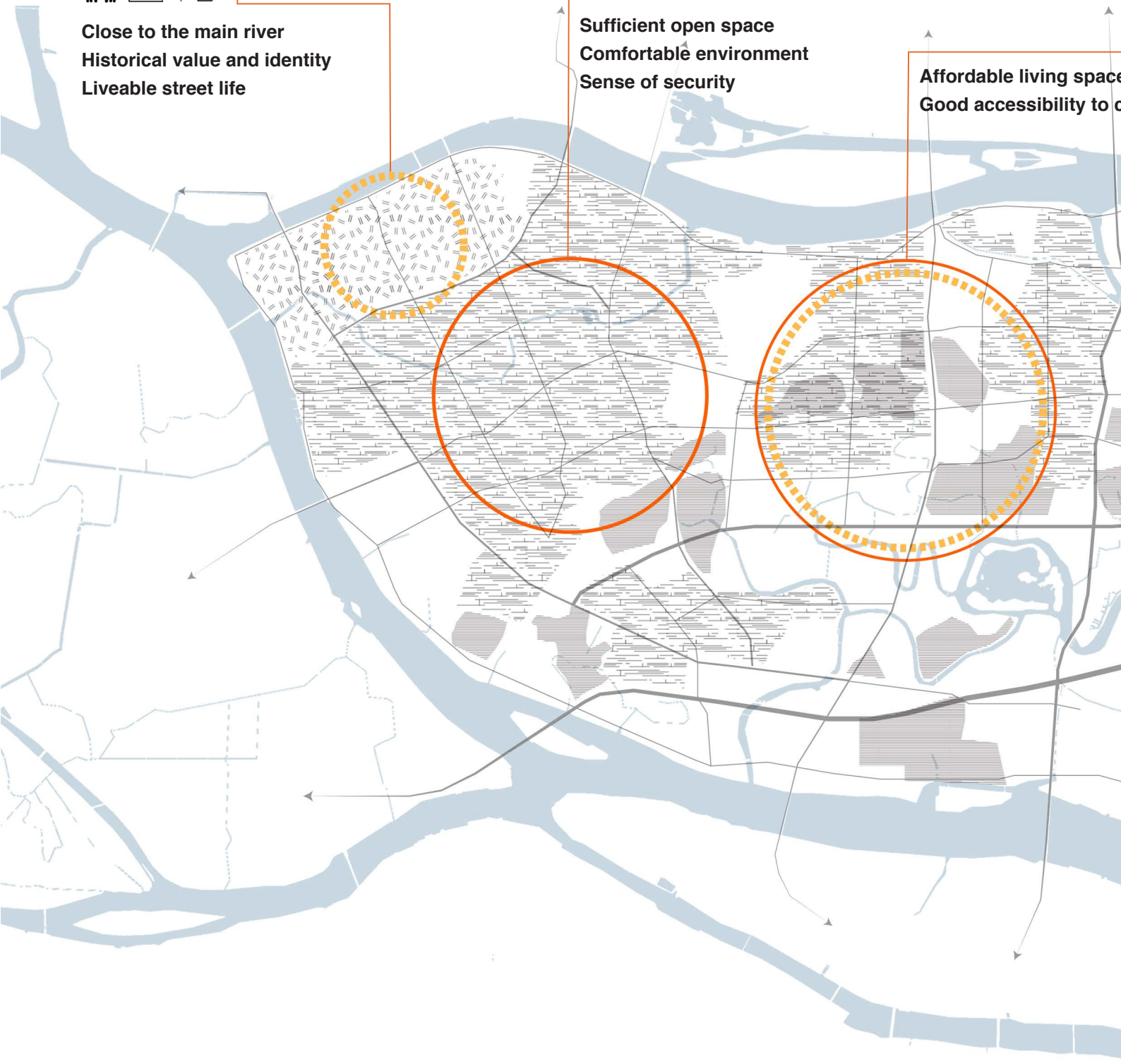
Traditonal Community:
Lack of recreational public space
Insufficient public facilities
Lack of social commercial activities

Close to the main river
Historical value and identity
Liveable street life

Modern Community:
Enclosed community
Lack of relation with water

Sufficient open space
Comfortable environment
Sense of security

Affordable living space
Good accessibility to c



Urban Village

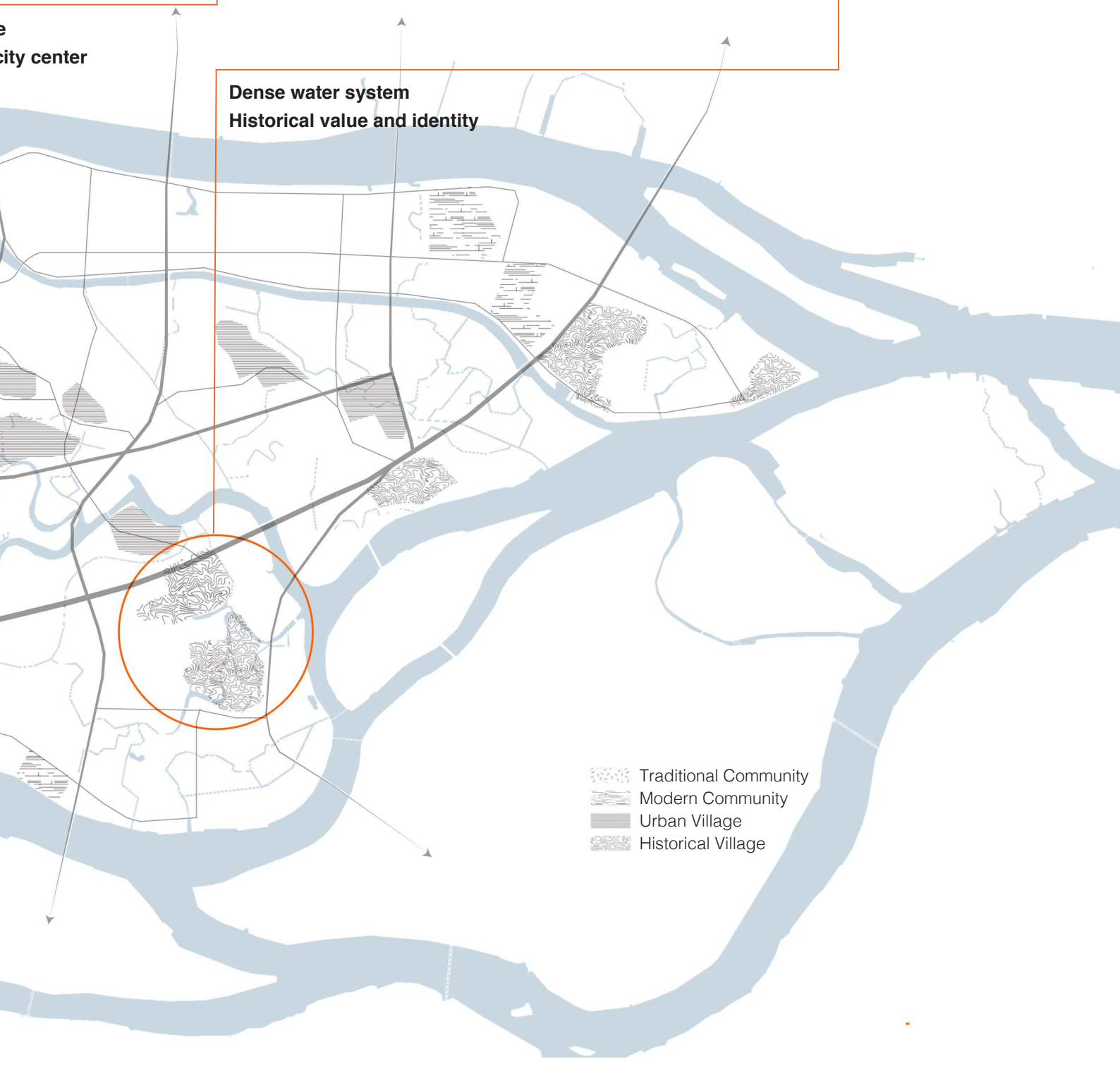
Lack of recreational public space
Mix-use of public space
Poor livinng environment
Lack of relation with water

Historical Village:

Lack of recreational public space
Unconvenient transportation
Insufficient public facilities
Lack of social commercial activities

e
city center

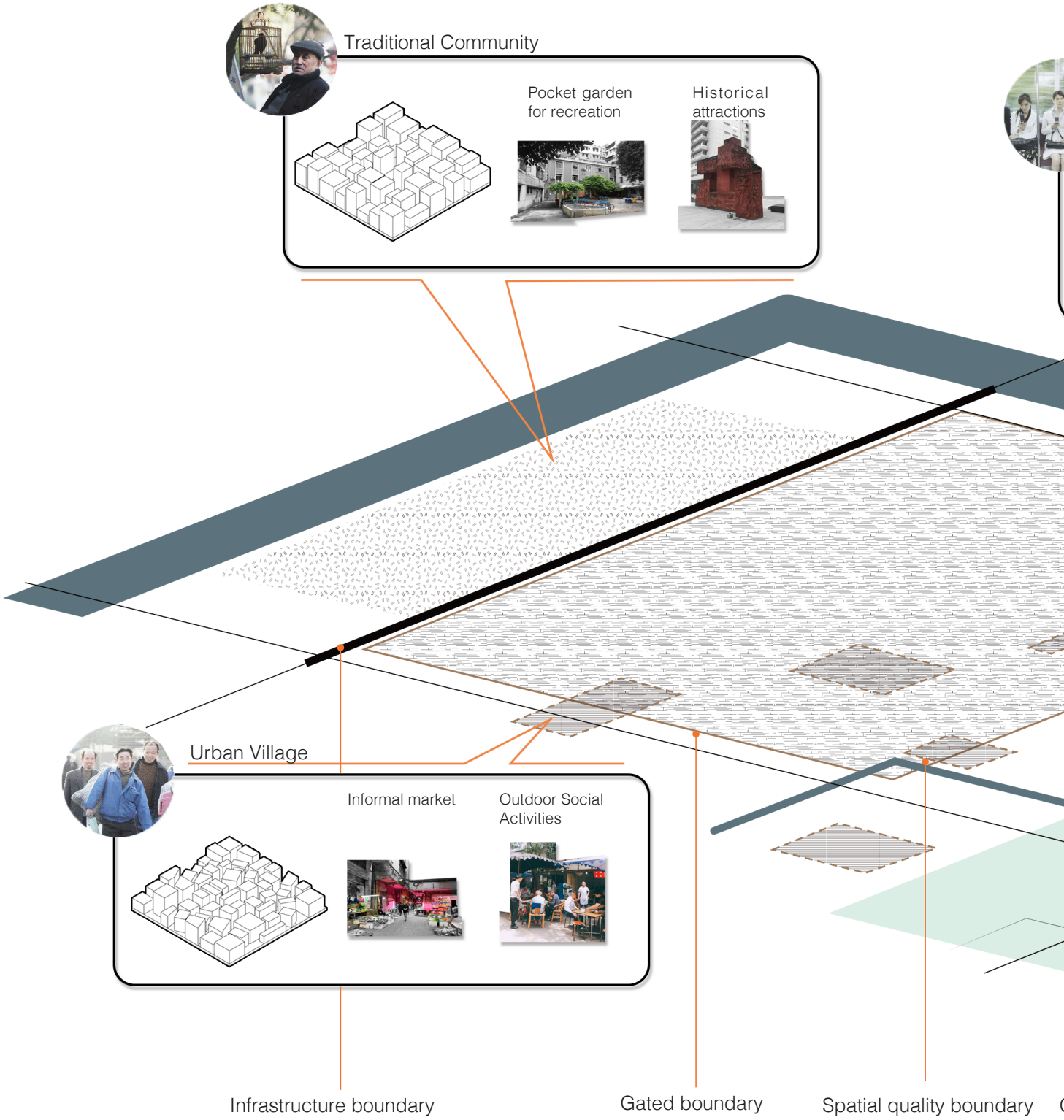
Dense water system
Historical value and identity



3.3 SETTLEMENT LAYER

3.3.4Conclusion

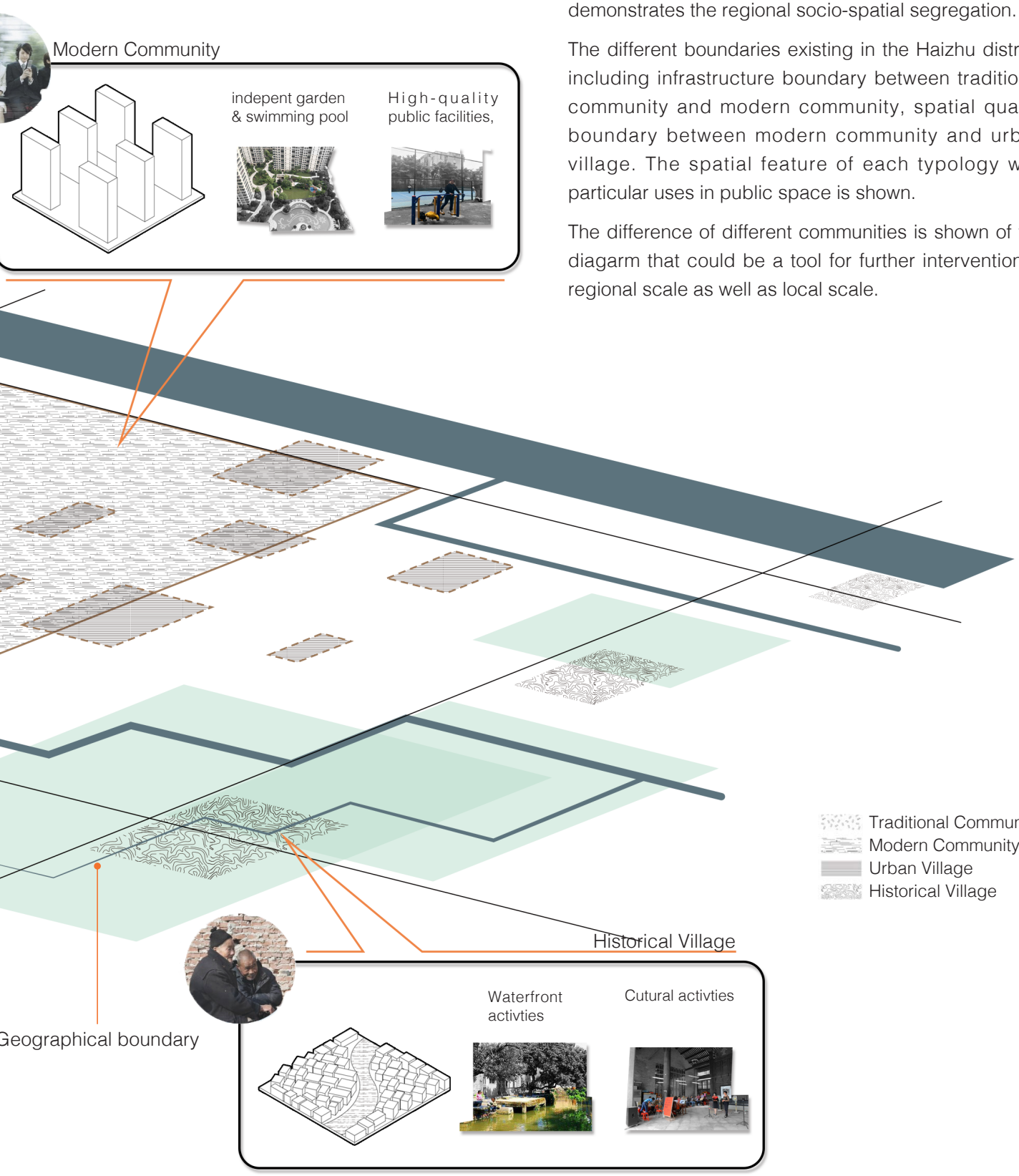
Regional Socio-Spatial Segregation



Combined with all the factors including residential differentiation, spatial distribution of residents and boundaries, the scheme diagram shown here demonstrates the regional socio-spatial segregation.

The different boundaries existing in the Haizhu district, including infrastructure boundary between traditional community and modern community, spatial quality boundary between modern community and urban village. The spatial feature of each typology with particular uses in public space is shown.

The difference of different communities is shown of the diagarm that could be a tool for further intervention in regional scale as well as local scale.



3.4 CONCLUSION

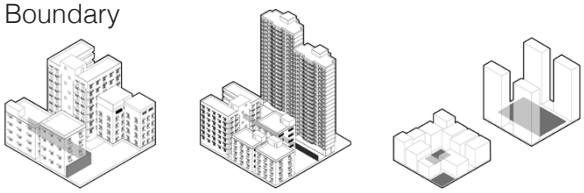
SETTLEMENT LAYER

Regional Scale

Local Scale

Neighborhood Scale

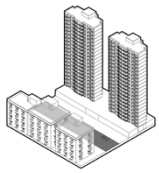
Boundary



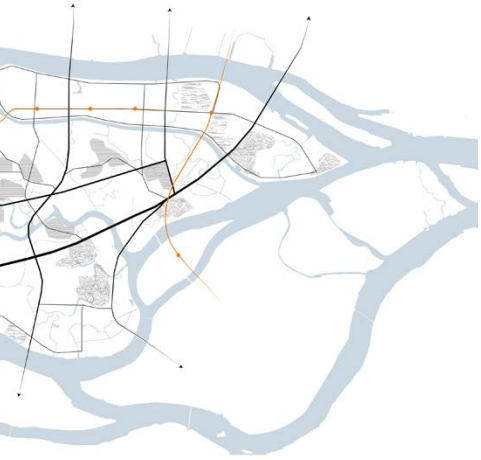
TRANSPO

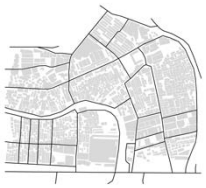
Regional Scale

Local Scale



ORT LAYER





LANDSCAPE LAYER

Regional Scale

Local Scale

3.4 CONCLUSION

3.4 Potential Elments

SETTLEMENT LAYER

Regional Scale

COMMERCIAL STREET

PUBLIC SPACE

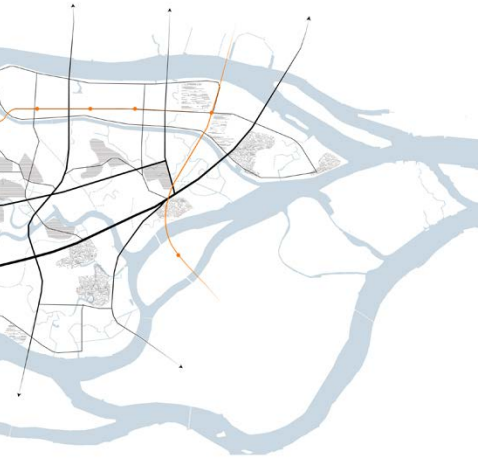
TRANSPO

Regional Scale

SUSTAINABLE TRANSPORT

SLOW MOBILITY

ORT LAYER



LANDSCAPE LAYER

Regional Scale

GREENWAY

WATER

ECOLOGICAL PARK

3.4 CONCLUSION

3.4 Challenges

SETTLEMENT LAYER

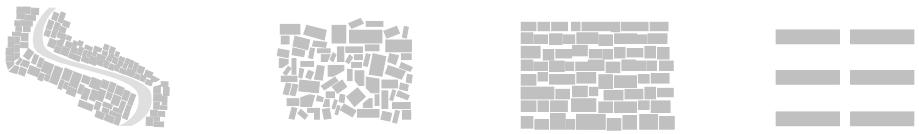
Regional Scale

Uneven distribution of public/ commericial hubs

Local Scale

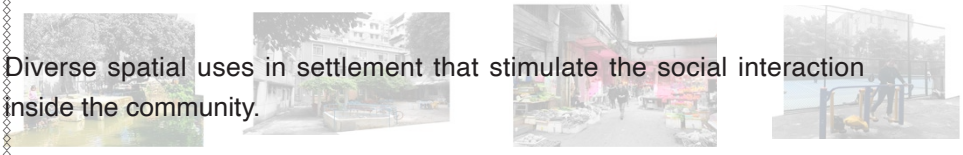
Isolation between differet spatial fabrics
Limited interactive space
Uneven distribution of pubic/ commercial spaces

Challenges in each typology



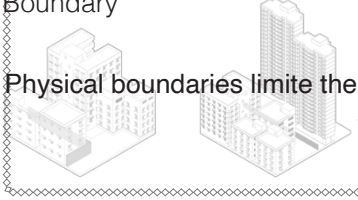
Neighborhood Scale

Diverse spatial uses in settlement that stimulate the social interaction inside the community.



Boundary

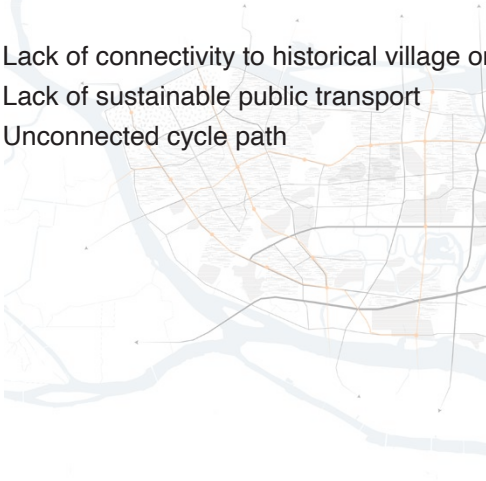
Physical boundaries limite the social contact inbetween two spatial fabric.



TRANSPO

Regional Scale

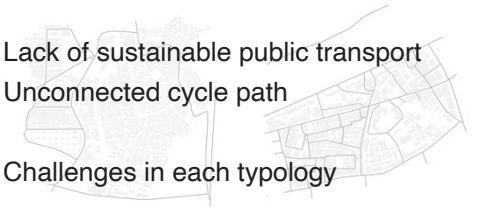
Lack of connectivity to historical village o
Lack of sustainable public transport
Unconnected cycle path



Local Scale

Lack of sustainable public transport
Unconnected cycle path

Challenges in each typology



ORT LAYER

n the south-eastern part

LANDSCAPE LAYER

Regional Scale

Fragmented green spaces
Truncated canals and bad water quality
Broken greenway
Lack of recreational value in ecological spaces

Local Scale

Lack of connection between ecological spaces and built environment
Lack of recreational value in ecological spaces
Broken greenway

Challenges in each typology

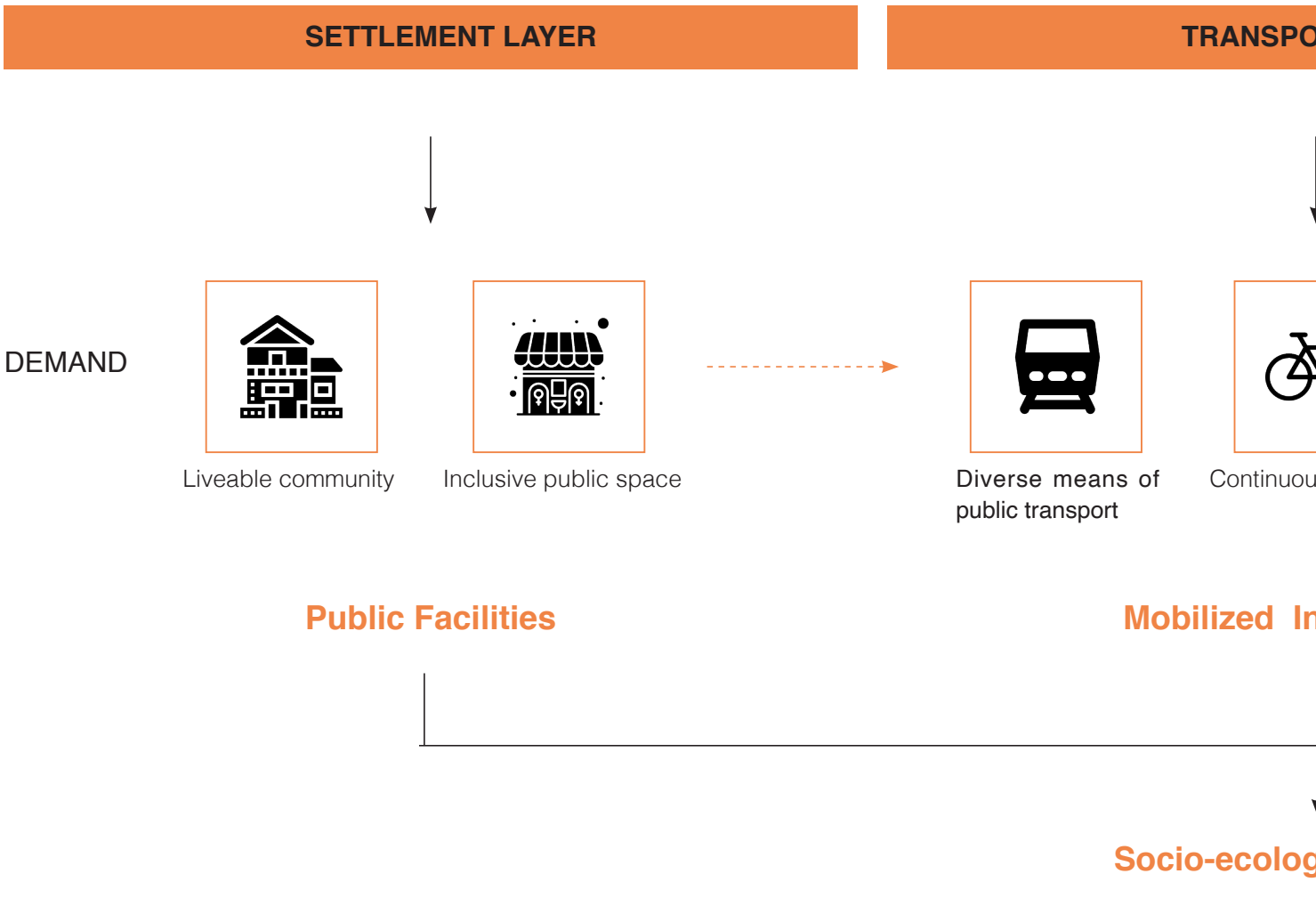
04

Applying

4.1 FRAMEWORK

The composition of proposed socio-ecological framework is based on the analysis of three layers in the understanding part, settlement, transport and landscape. The general future demands on each layer for the improvement of socio-spatial-ecological segregation are concluded in seven aspects. The demands for the settlement layer are to have a liveable community and more inclusive public space. For the transport layer, diverse means of public transport should be put forward and continuous cycle path is essential as well as the ecological corri ecological spaces. Landscap from social and ecological pe be more ecological spaces multifunctional and resilient wa

Therefore, **the three main socio-ecological network ar infrastructure, ecological sp**



dor for the enhancement of
e layer should be considered
rspective. The demand would
with recreational value and
aterfront area.

**characters composing the
e public facilities, mobilized
aces.**

Also, corridor and node are two components of the network. From this perspective, public facilities and ecological spaces are acting nodes while mobilized infrastructure acting corrdior has the capacity of connecting and integrating the social and ecological value.

ORT LAYER | **LANDSCAPE LAYER**

s cycle path | Ecological corridor | More ecological spaces with recreational value | Multifunctional and resilient waterfront area

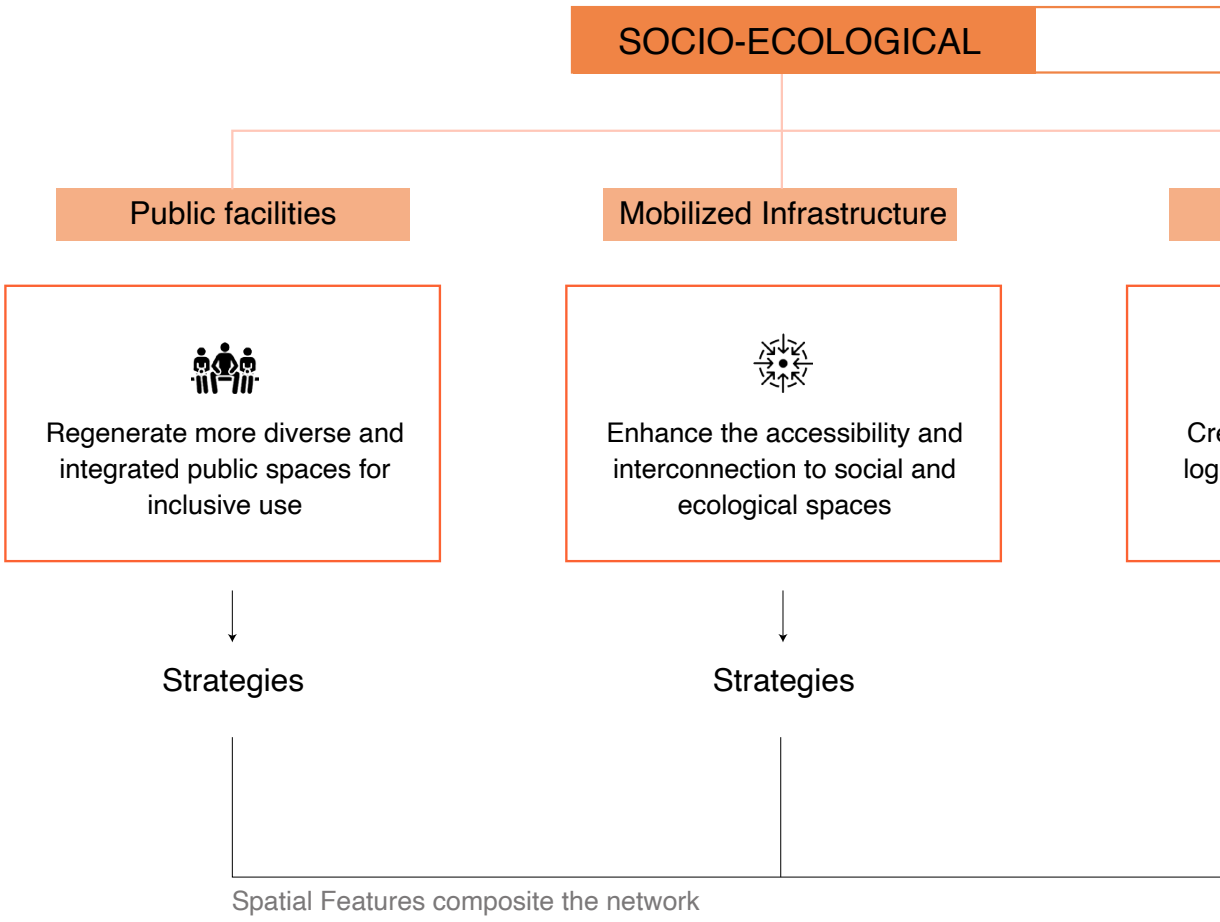
nfrastructure | **Ecological Spaces**

gical Network

4.1 FRAMEWORK

Therefore, three main fundamental principles related to three characters are put forward: regenerating more diverse and integrated public spaces for inclusive use, enhancing the accessibility and interconnection to social and ecological spaces and creating multifunctional ecological spaces and services. Further strategies responding to the principles could be applied on multiple scales.

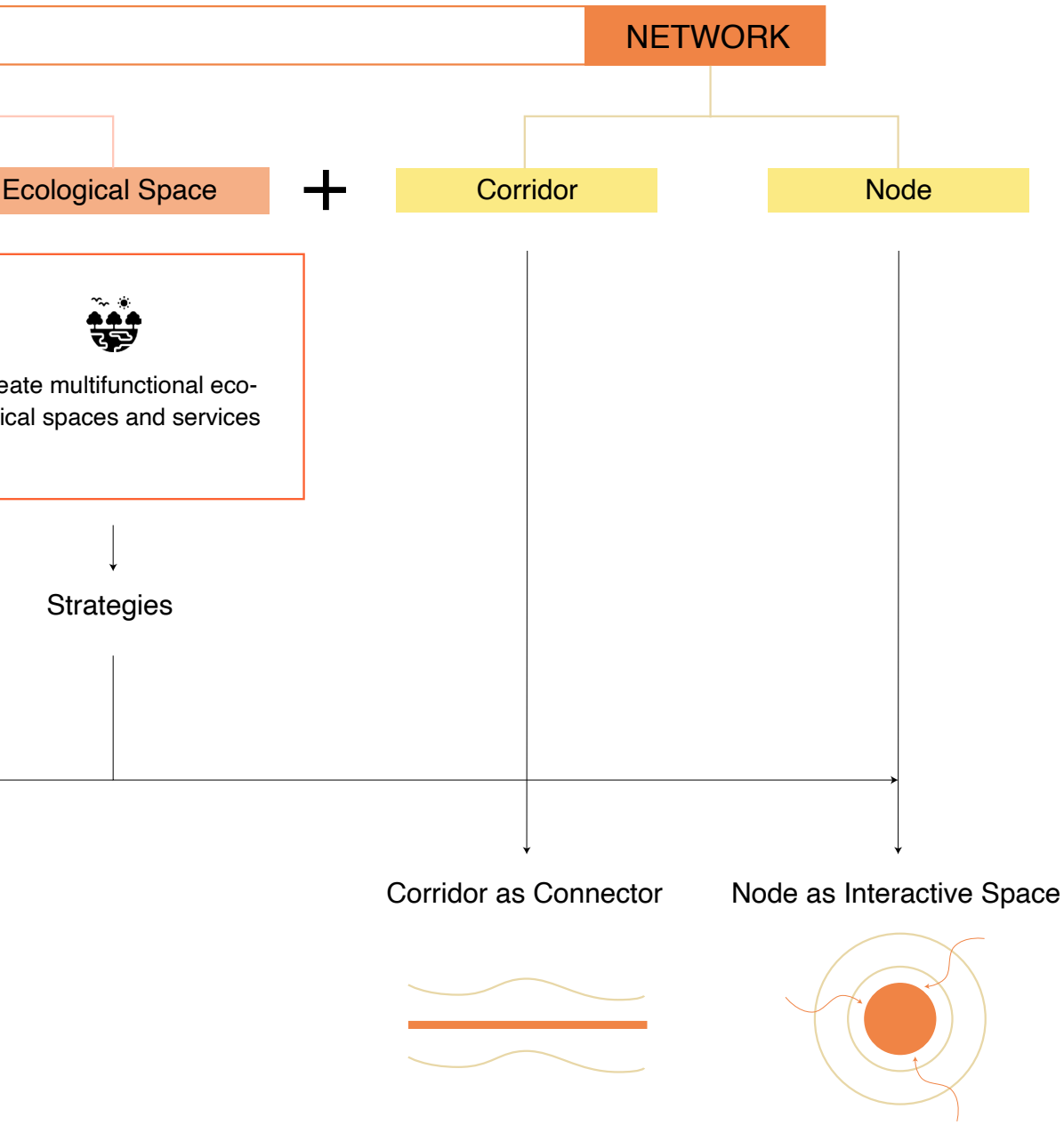
In order to improve the socio-
two components should be pc
by using the principles: **the**
node as interactive space.
boundary, corridor is chara
connection or movement be
buffer area to surrounding c
certain places where nature



-spatial-ecological integration, ositively applied to the network **corridor as connector and** Instead of a linear feature as cterized of creating a linear etween spaces with certain ontext. While node provides or people can integrate with

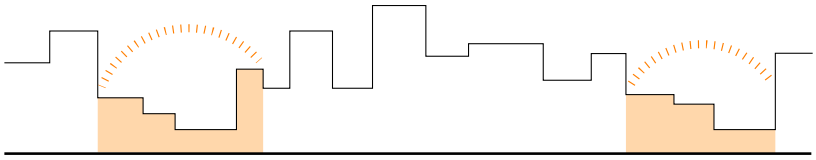
each other. The elements defined from the understanding chapter in different layers can be further developed in these two main principles.

And at the same time, three main characters of socio-ecological value acting as spatial features composite the whole network.

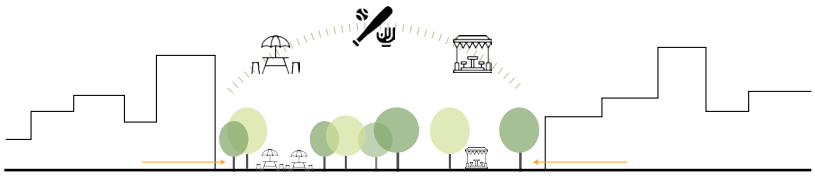


4.2 PRINCIPLES & STRATEGIES

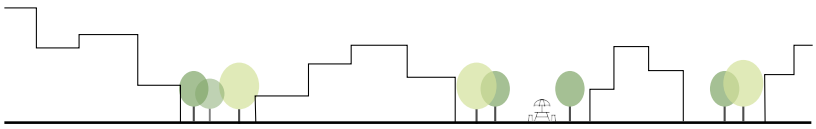
Regenerate more diverse and integrated public spaces for inclusive use



Several city hubs of urban functions as core zones for residents

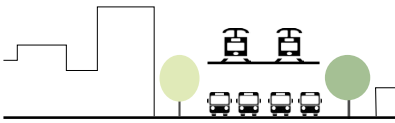


Diverse activities in public space for all levels of people

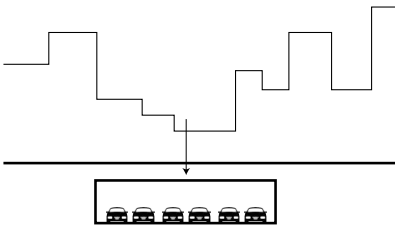


Sufficient public spaces in communities

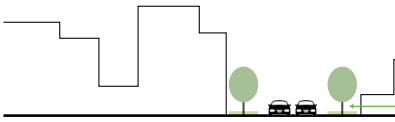
Enhance the a interconnect social and ec



Diverse means of pub the daily needs

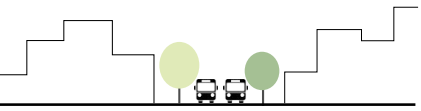


Sustainable mobility fast de

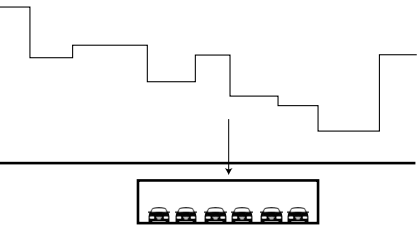


Continuous green

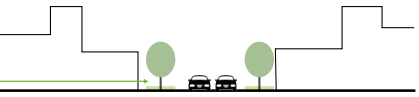
accessibility and
tion to different
cological spaces



blic mobility to respond to
s for transportation

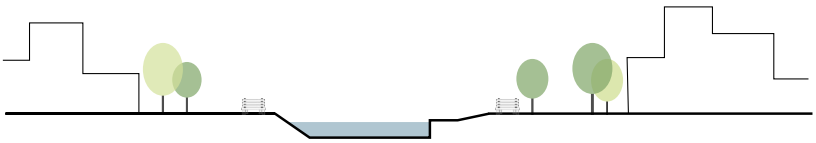


y system to adapt to the
velopment

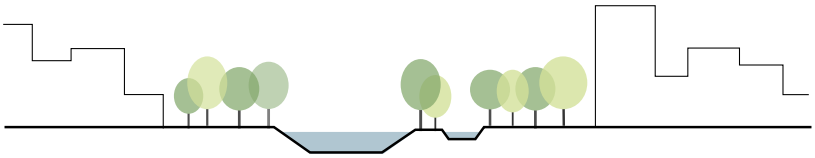


hway as slow mobility

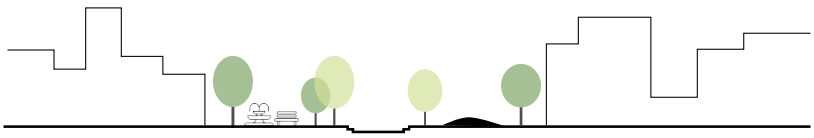
Create multifunctional ecological spaces and services



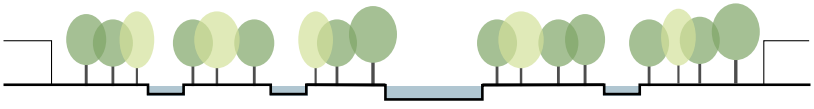
Resilient & multifunctional ecological corridors
e.g. riverfront



Diverse healthy ecological services for purification
and storage



Abundant recreational and resilient public parks in
the community



Improve the water management in the existing
agricultural area and orchard

4.2 PRINCIPLES & STRATEGIES

The strategies from the principles of using corridor as connector and node as interactive spaces are divided into ecological and social aspects.

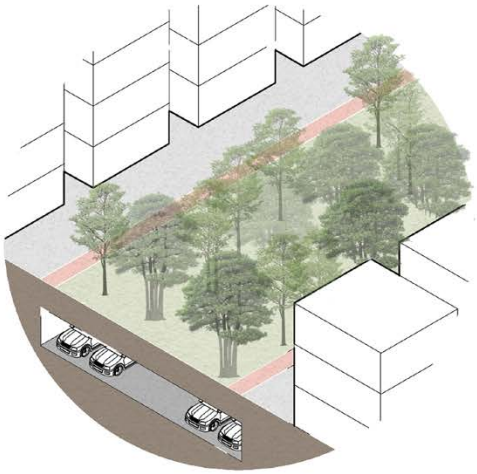
Corridors with ecological value can be defined as ecological corridor, continuous greenway, multifunctional waterway

and that with social value wou
mobility and commercial stre
urban spaces and residents.

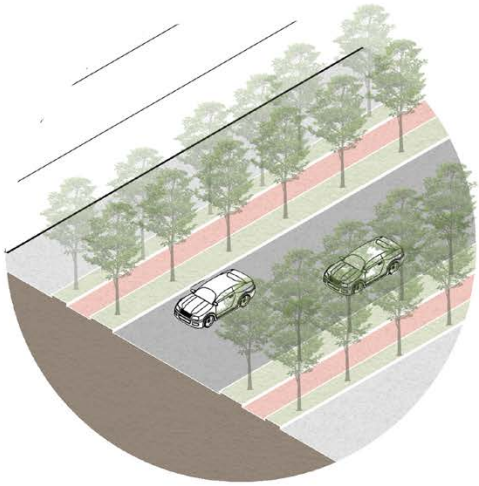
Recreational /ecological pa
gardens in neighborhoods ac

CORRDIOR AS CONNECTOR

ECOLOGICAL



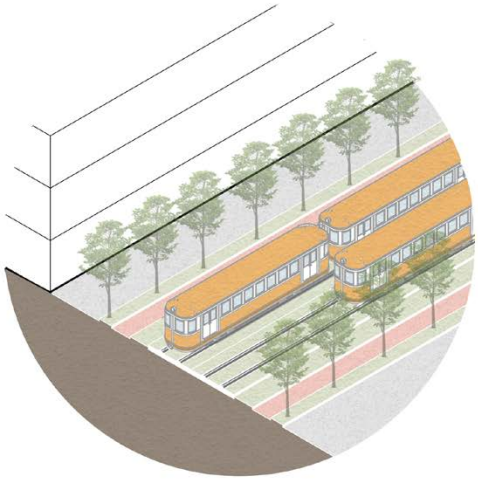
Ecological Corridor as Connector



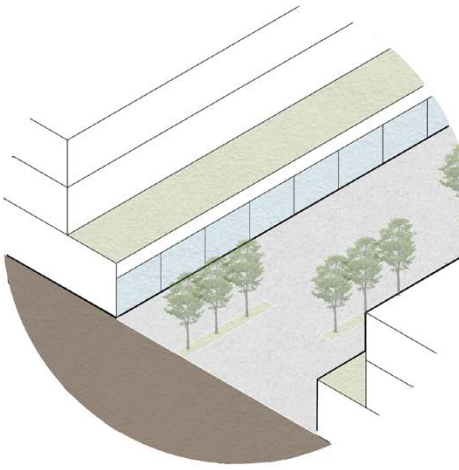
Continuous Greenway as Connector

Waterv
(Multifunctio

SOCIAL



Sustainable Public Mobilty as Connector



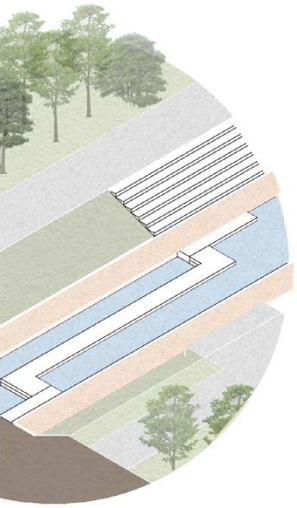
Commercial Street as Connector

uld use the sustainable public eet as connector to integrate

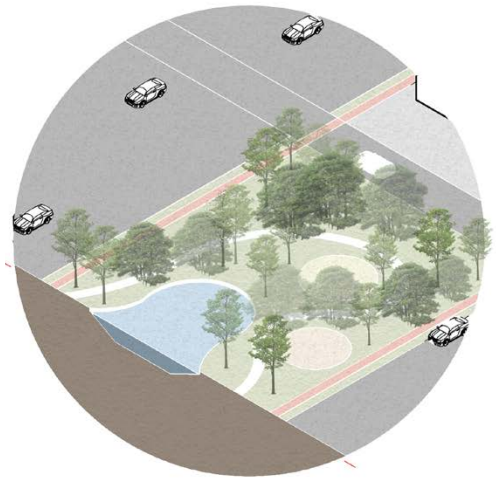
arks and community public ct as nodes that can improve

ecological value in the urban area. While commercial hub and activity hub with social value can provide physical condition for the integration of different social groups.

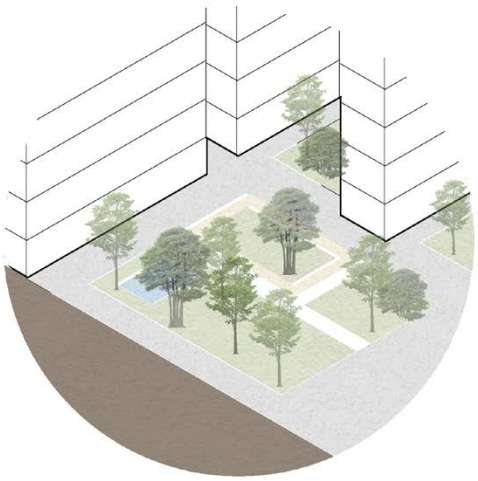
NODES AS INTERACTIVE SPACE



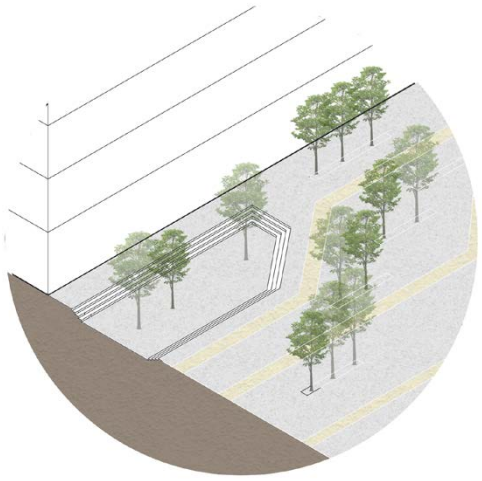
way as Connector
onal waterfront space)



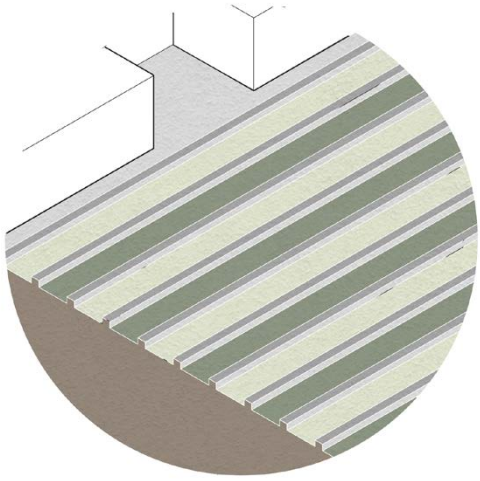
Recreational/ Ecological Parks as Interactive Space



Community Public Gardens as Interactive Space



Commercial Hub as Interactive Space



Activity Hub as Interactive Space
(Urban farming, flea market etc.)

4.3 VISION

4.3.1 Vision on regional sclae

Ecological Spaces

Green infrstructure

-strengthen the ecosystem structure through three ecological corridors

-formulate new continuous green routes combined with the existing greenways

-maintain big ecological spaces as biological habitats

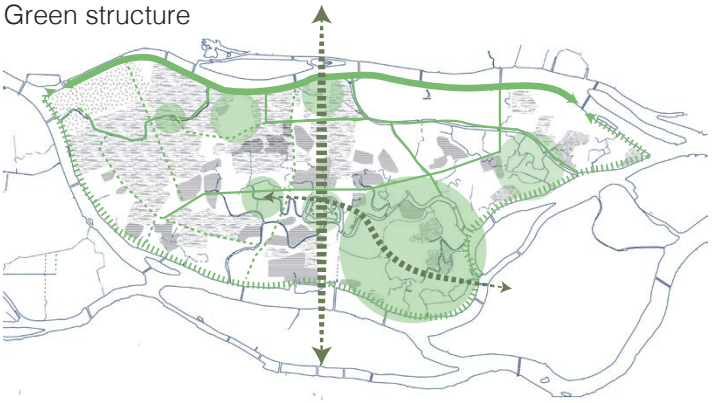
-create a hierarchy of urban parks with different service radius (3000m for city park, 1500m for district park, 1000m for community park)

Blue infrastructure

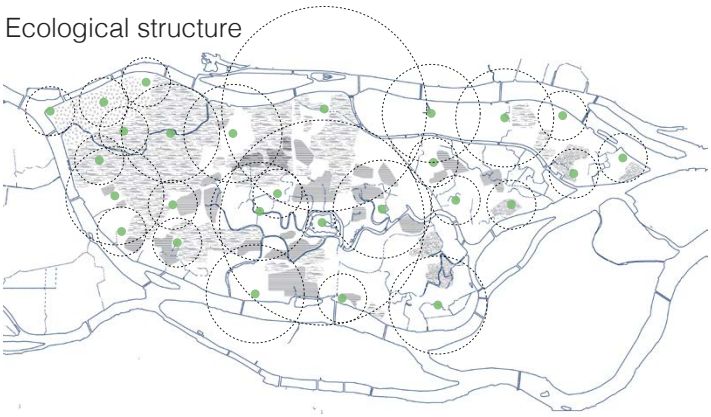
-connect broken canals

-create more room for water (flood plain, floodable urban spaces)

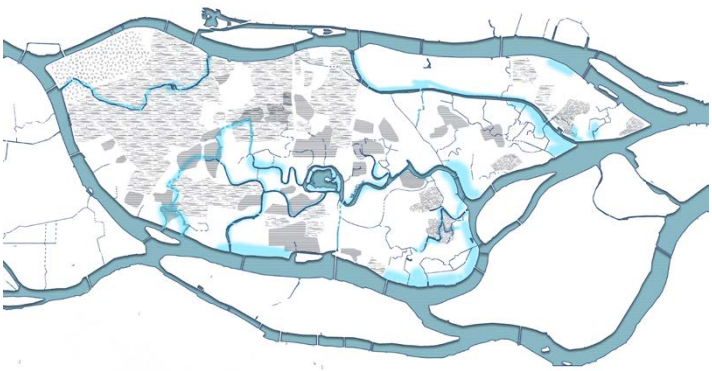
Green structure



Ecological structure



Blue structure



4.3 VISION

4.3.1 Vision on regional sclae

Mobilized Infrastructure

Road system

-strengthen the transport connection between functional areas

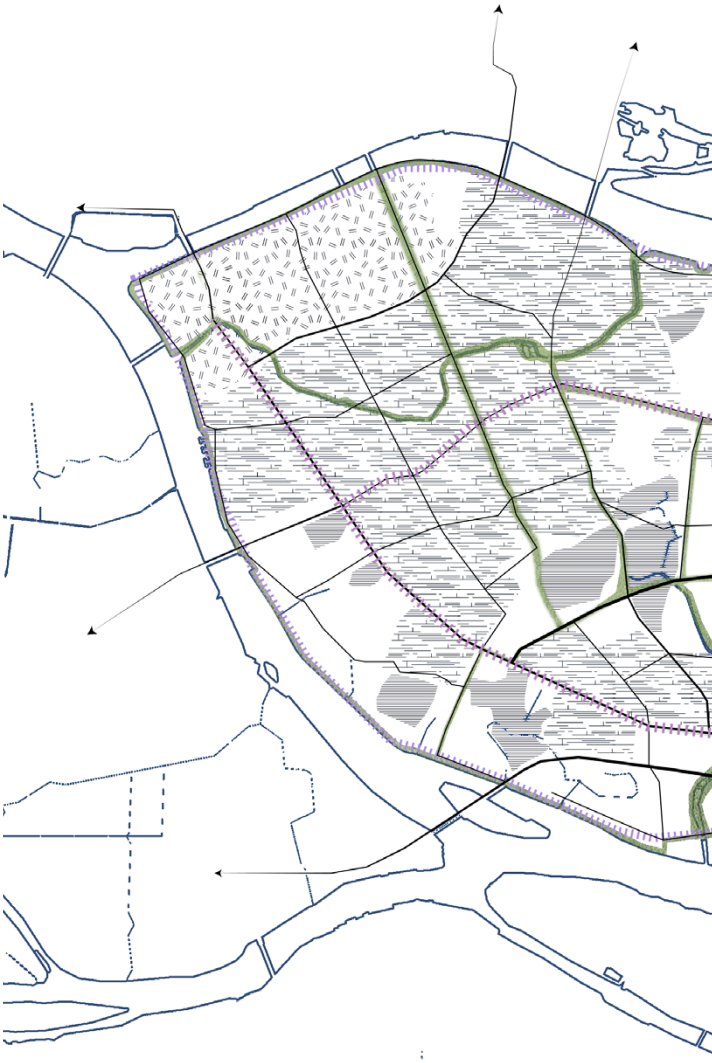
-reconnect broken road and develop comprehensive road system

-create connected slow-mobility system

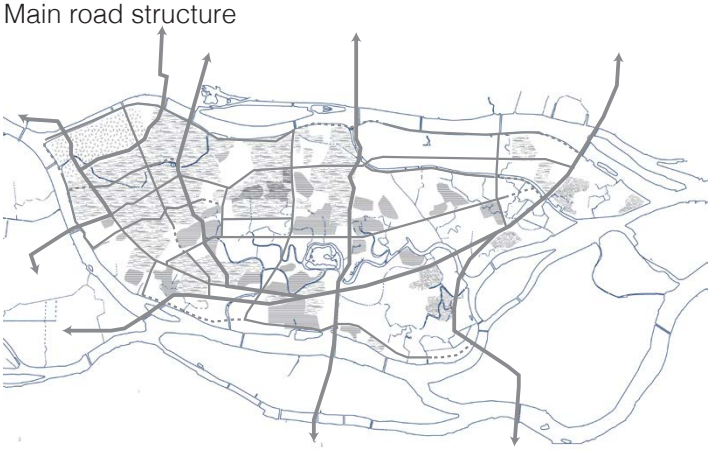
Public transport

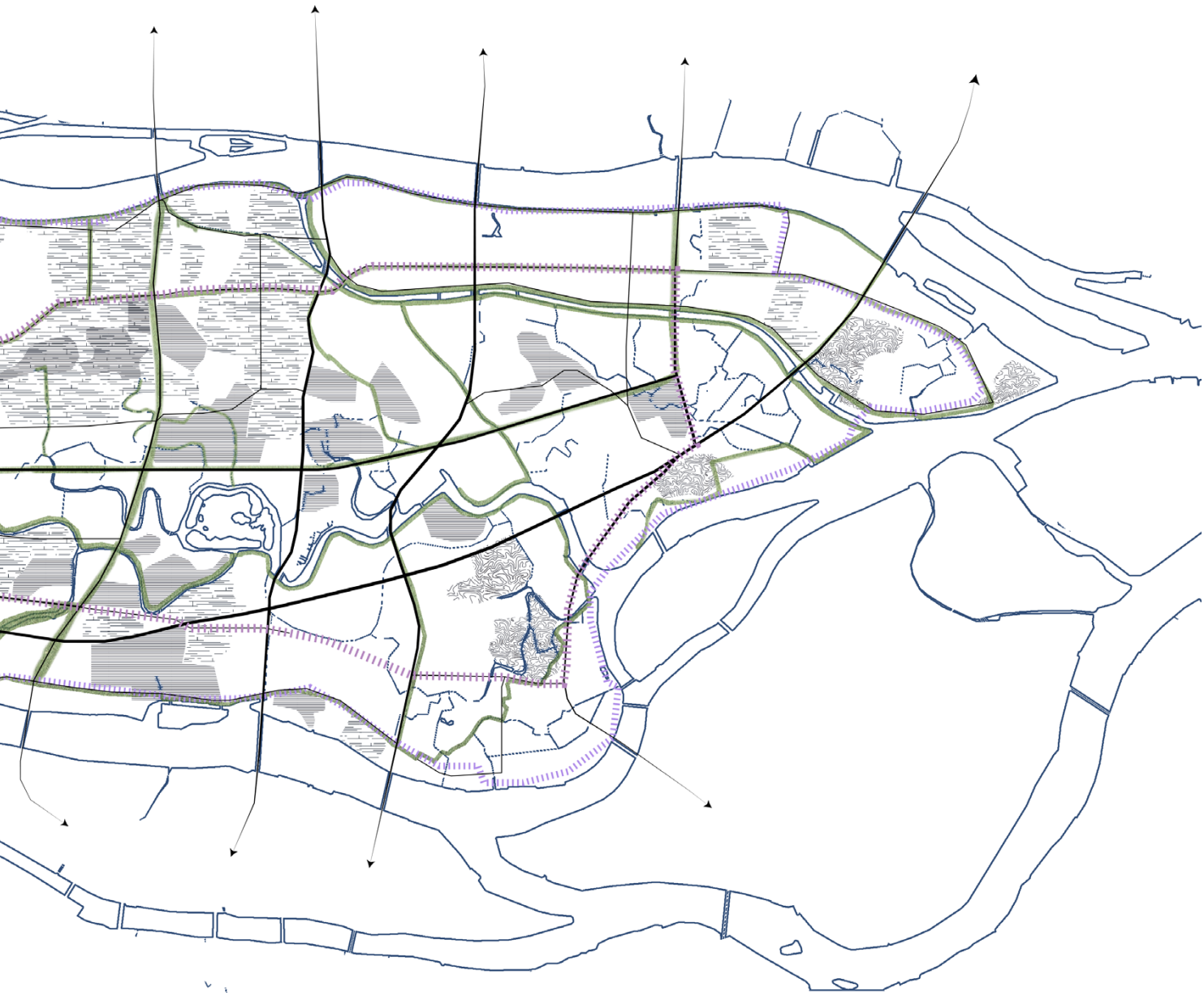
-complete circular tram system at the waterfront area

-build up a new tram system inside the urban area connecting different settlements from west to east side

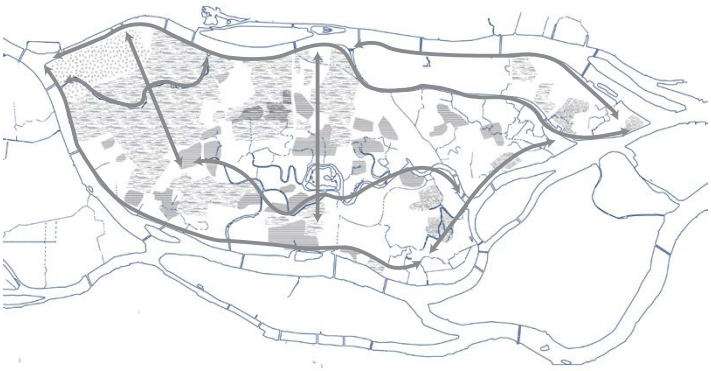


Main road structure

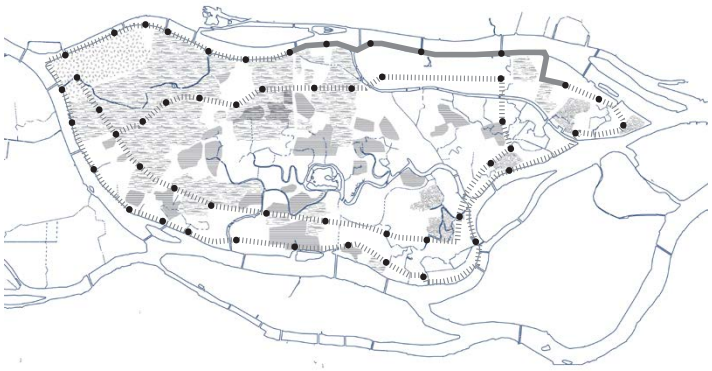




Slow mobility structure



Tram system



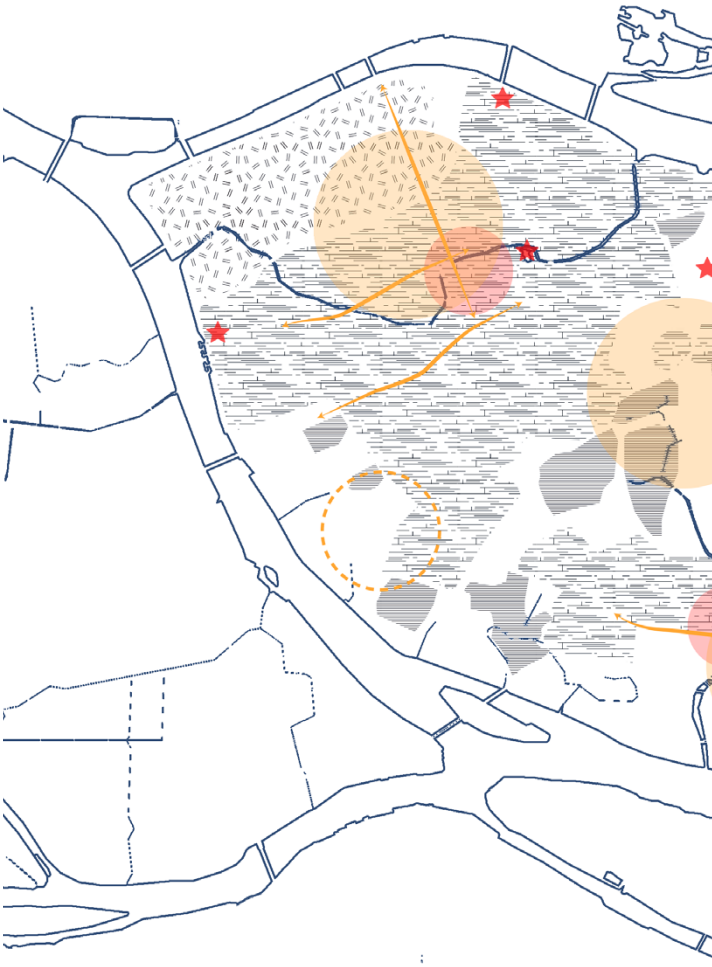
4.3 VISION

4.3.1 Vision on regional sclae

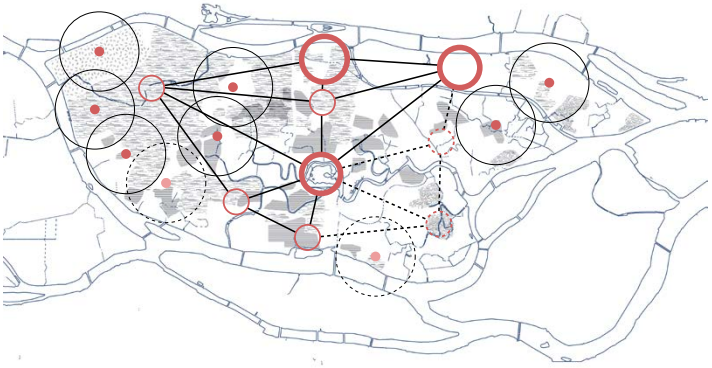
Public Facilities

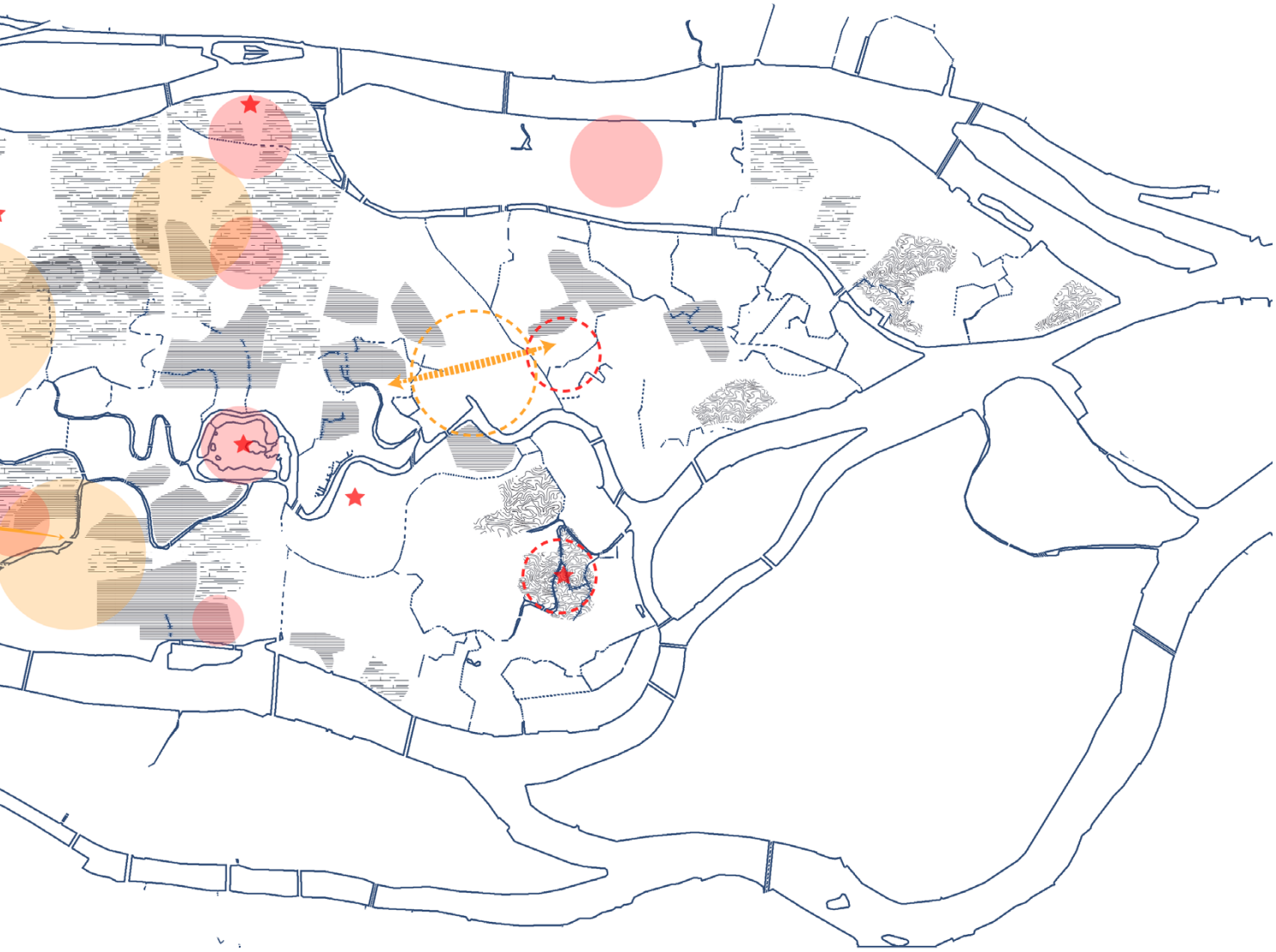
-create a hierarchy of public facility center

-allocate new public facility and commercial center on the east side

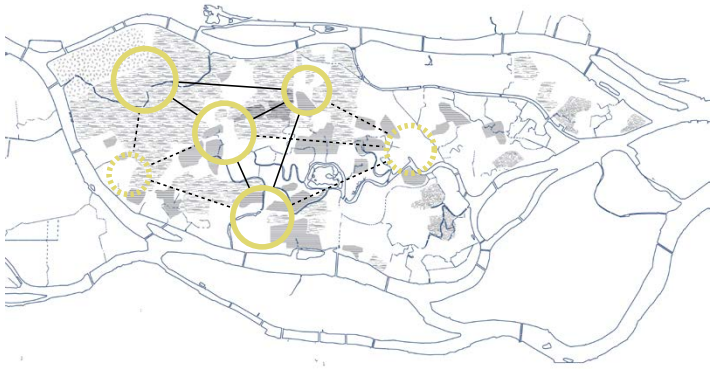


Public facility center structure



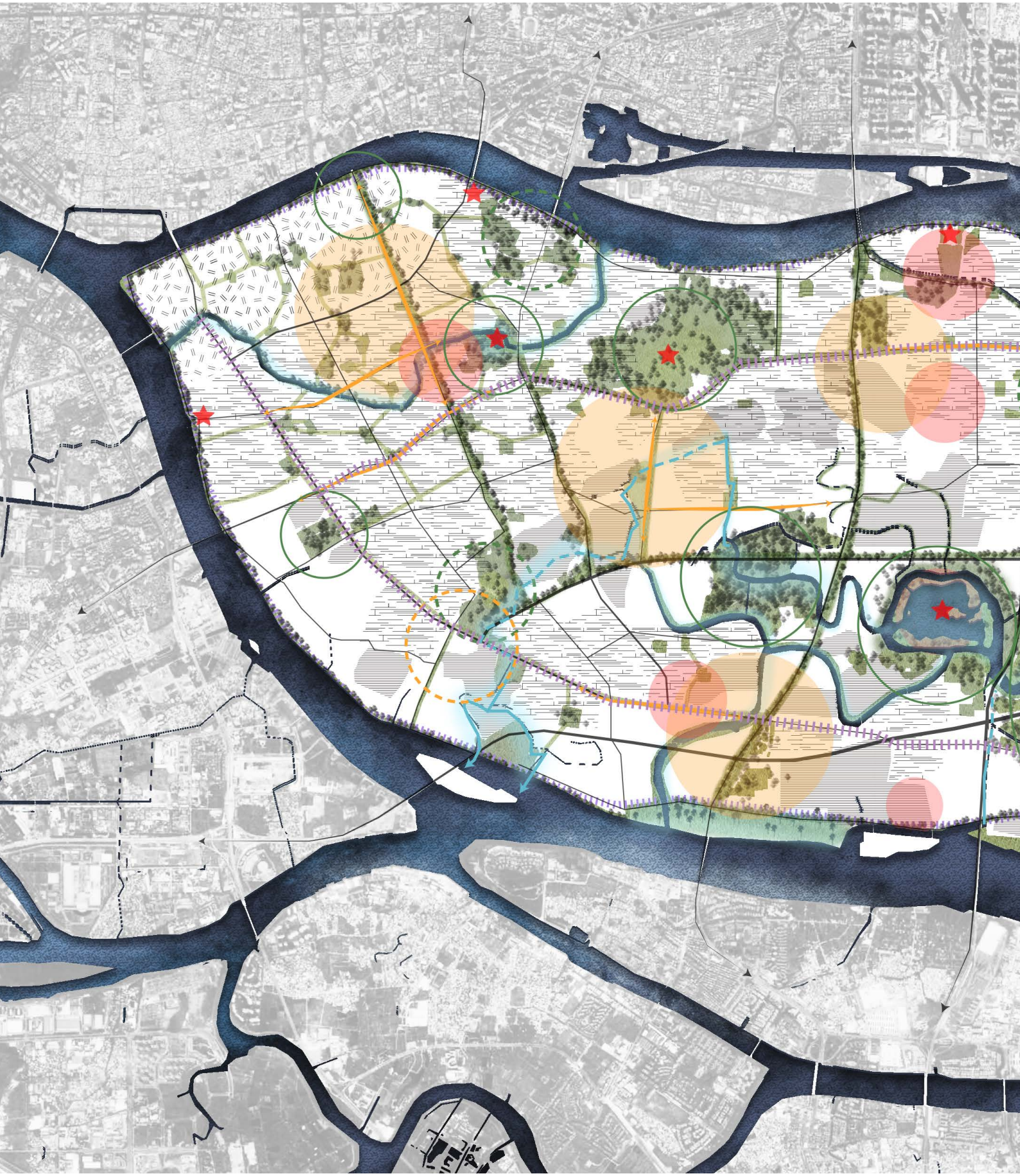


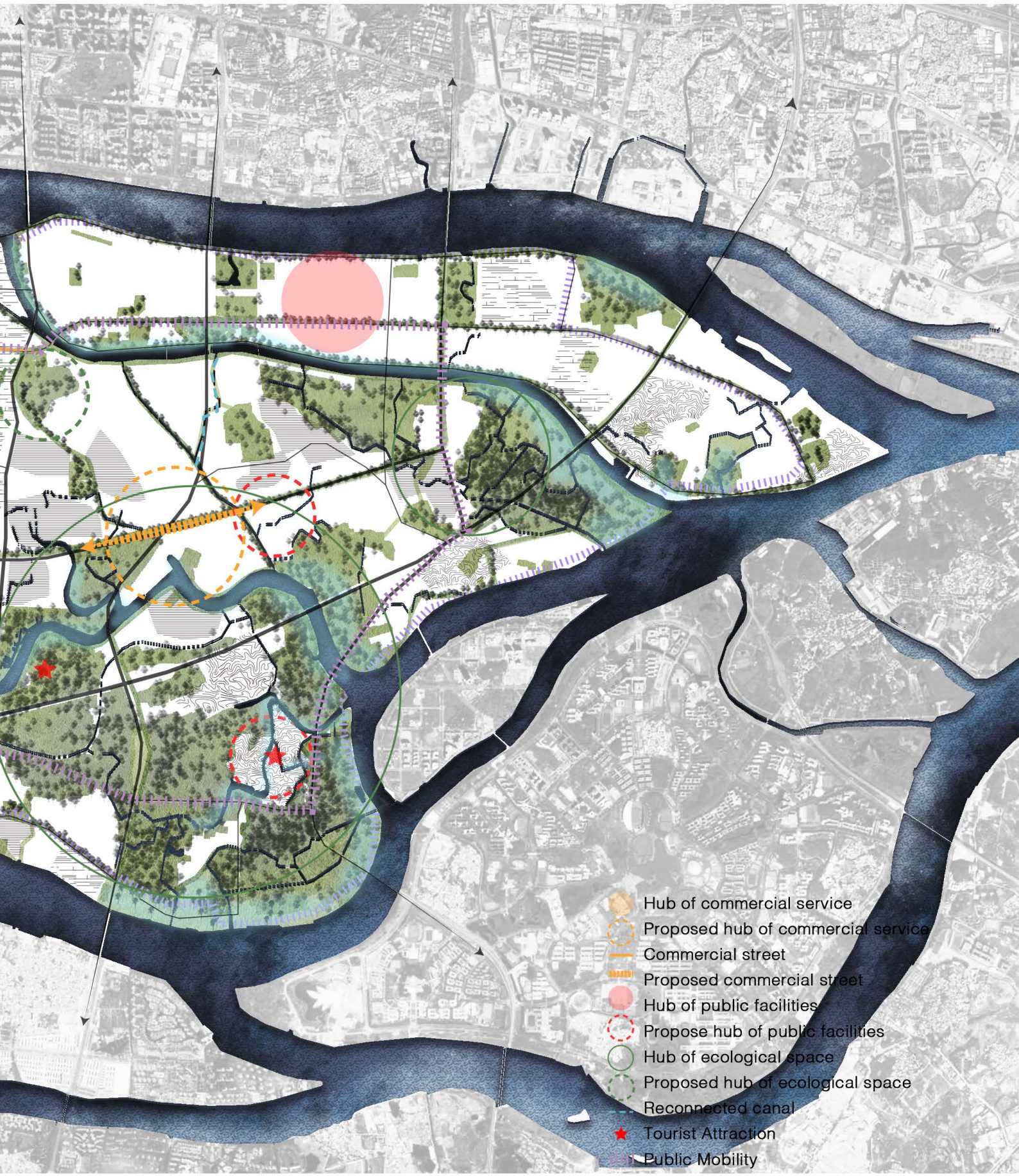
Commercial center structure



4.3 VISION

4.3.1 Vision on regional sclae

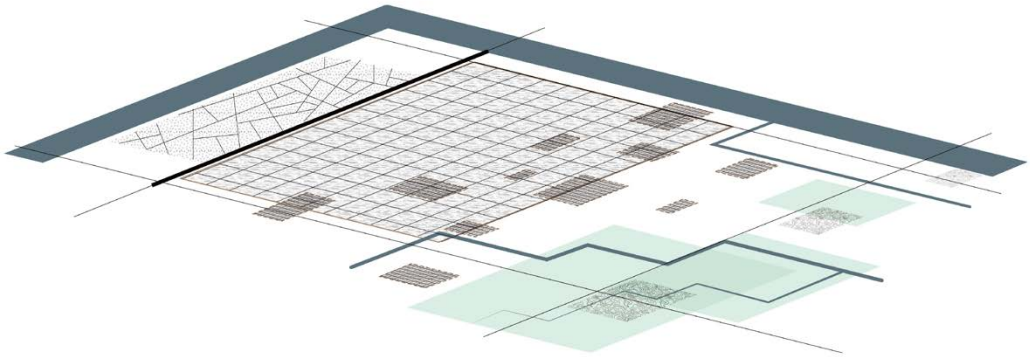


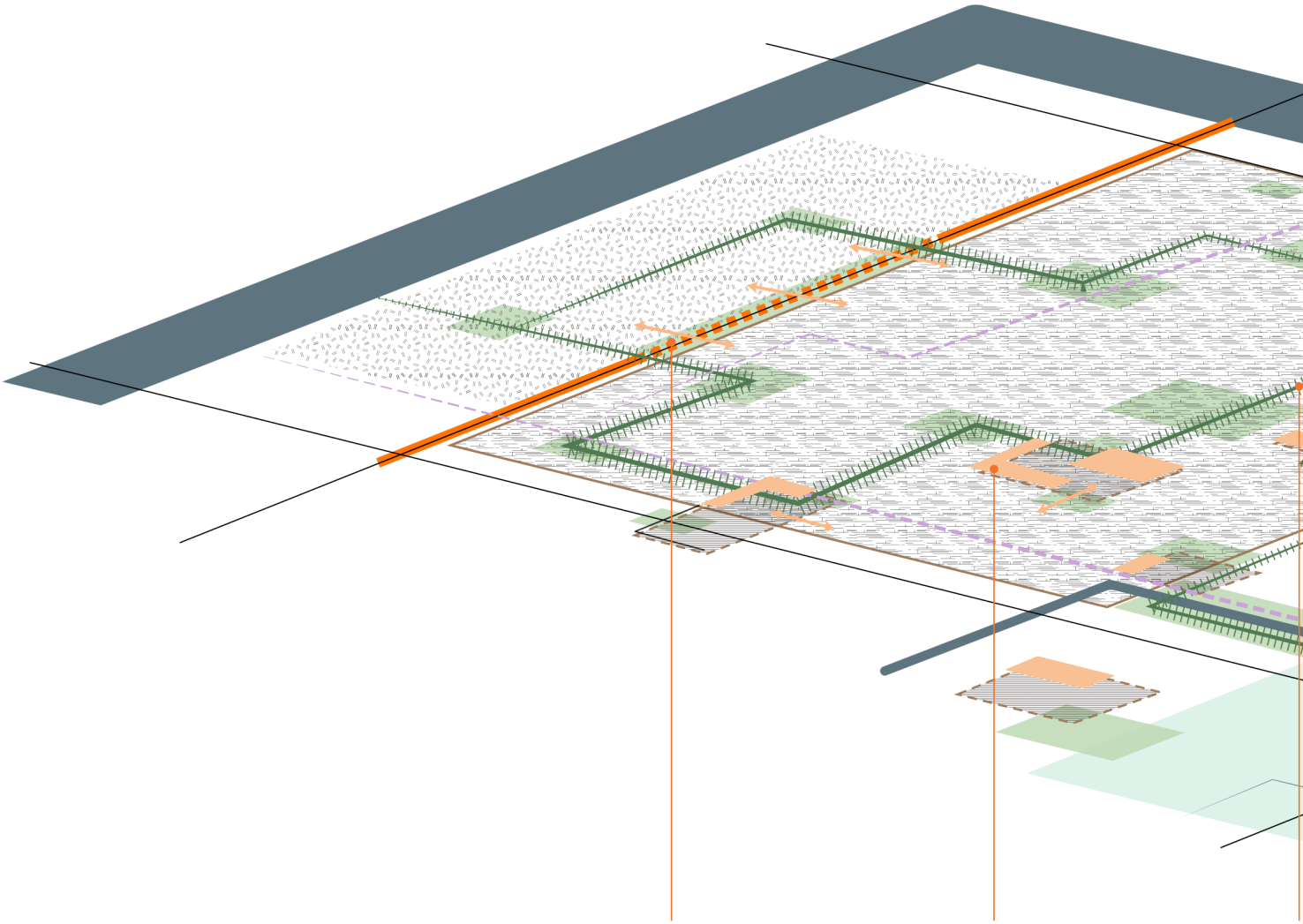

Hub of commercial service
Proposed hub of commercial service
Commercial street
Proposed commercial street
Hub of public facilities
Propose hub of public facilities
Hub of ecological space
Proposed hub of ecological space
Reconnected canal
Tourist Attraction
Public Mobility

4.3 VISION

4.3.1 Vision on regional sclae

Regional Socio-Spatial Segregation





Ecological Corridor as Connector

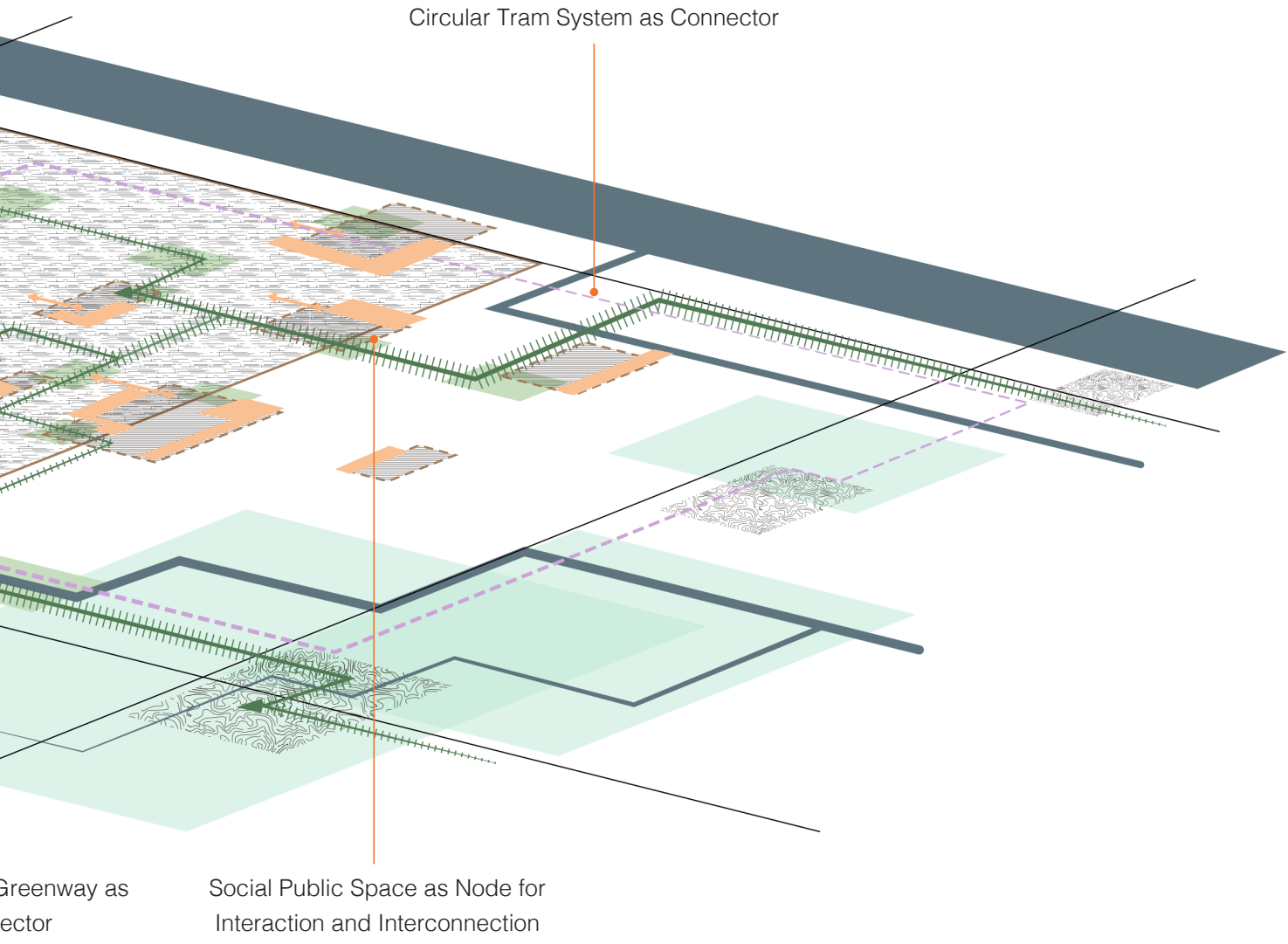
New Settlements as Buffer Zone

Continuous C
Conn

Generally, by applying the principles and strategies using different corridors and nodes, the context is transformed from segregation to integration from a regional perspective. The negative impacts from boundaries have decreased and sufficient public spaces with social and ecological value are providing places for social interaction of various groups.

From an ecological perspective, more urban ecological spaces are developed by spatial transformation with good connection with other spaces by various corridors. Also, the ecological value in Haizhu district is increasing.

From a social perspective, continuous greenway and circular tram system provide condition for connection between settlements. Ecological corridor on the west side is created instead of the existing road boundary, building up connection between traditional community and modern community. More social public space are created in and in-between urban village and modern community in order to improve the interaction between residents from these neighborhoods.

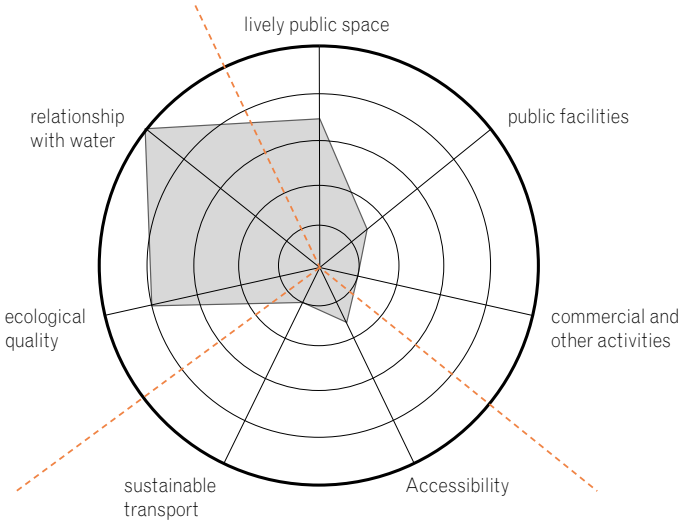


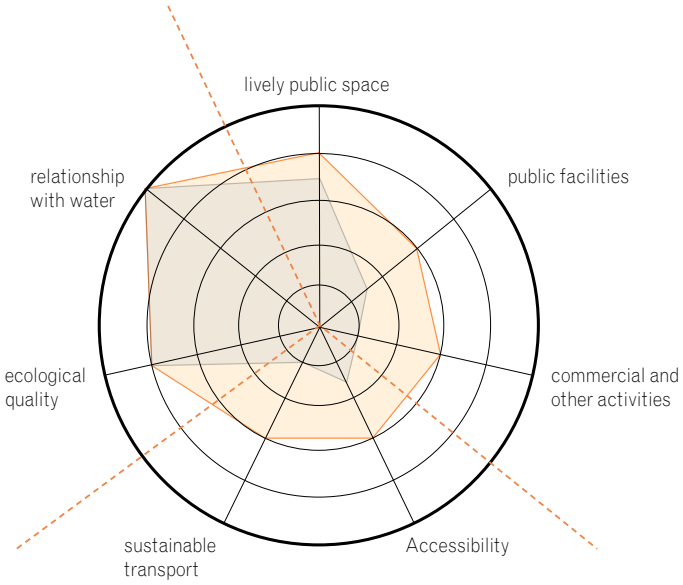
Greenway as
ector

4.3 VISION

4.3.2 Vision on local sclae

Historical Village





PUBLIC FACILITIES
-promote traditional cultural activities
-more waterfront actvities, e.g. cruise
-different rural recreational places of interest to attract tourists

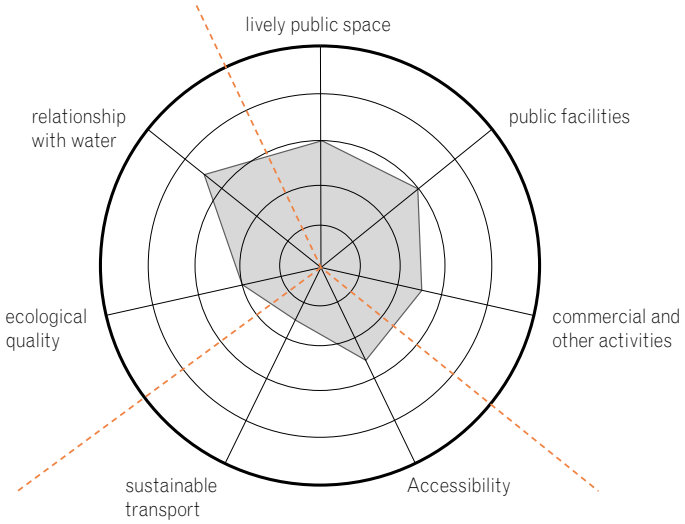
MOBILIZED INFRASTRUCTURE
-ecological corridor connected to urban area
-continuous cycling path

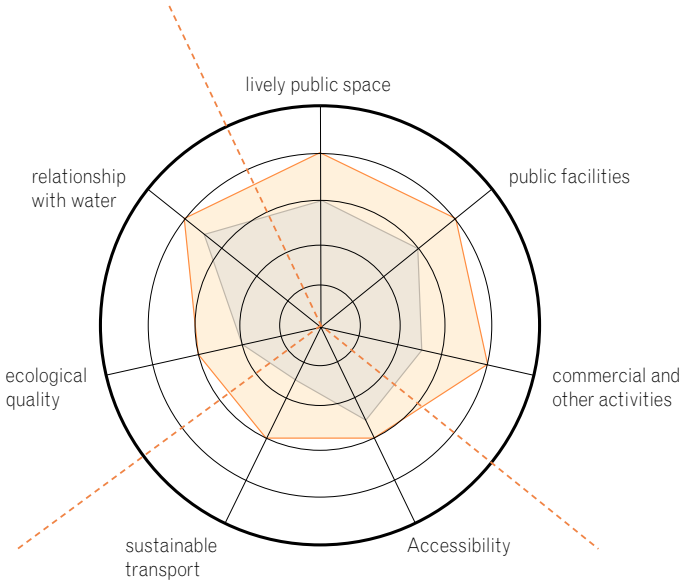
ECOLOGICAL SPACES
-floodable wetland and agricultural area
-interactive agriculture

4.3 VISION

4.3.2 Vision on local sclae

Tradional Community





PUBLIC FACILITIES
-more community pocket parks
-heritage as attractions to invite tourists
-commercial cultural street with different cultual activities

MOBILIZED INFRASTRUCTURE
-continuous cycling path crossing communities
-accessible to other settlements by sustainable tram

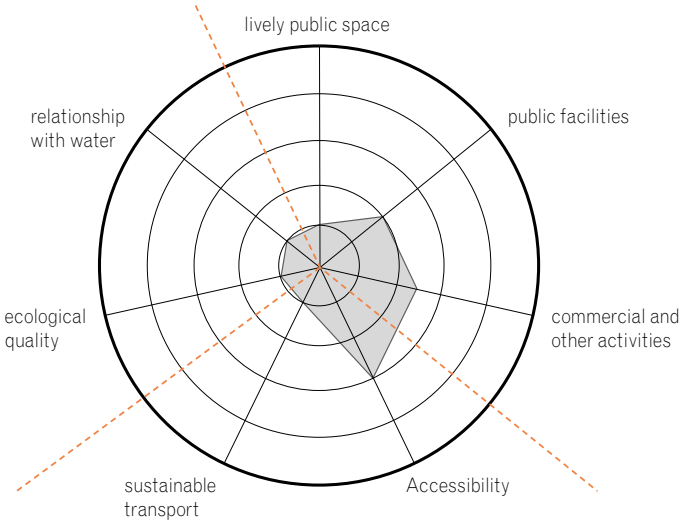
ECOLOGICAL SPACES
-multifuncational sustainable waterfront spaces to prevent sea level rise
-orchard/ ecological garden based on the vacant areas

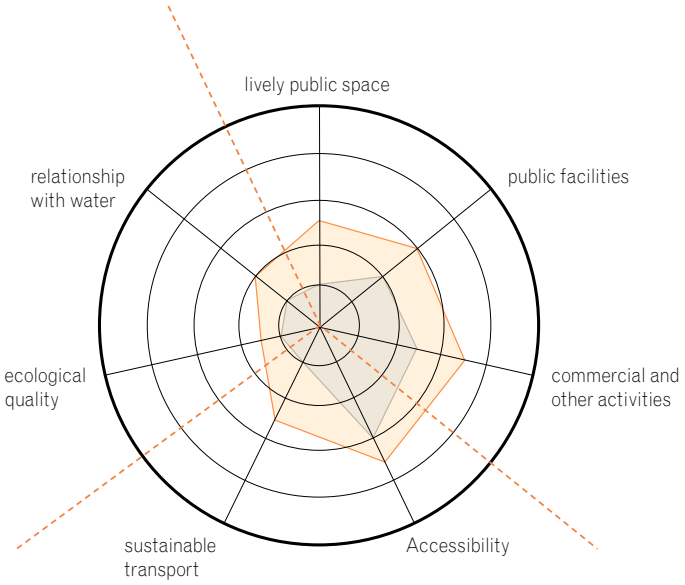

文化展览区

4.3 VISION

4.3.2 Vision on local sclae

Urban Village





PUBLIC FACILITIES
-more public pocket squares and parks with sufficient facilities for activties and resting
-commercial street and informal market as attraction for tourists
-activation of roof space as interactive public space for interconnection

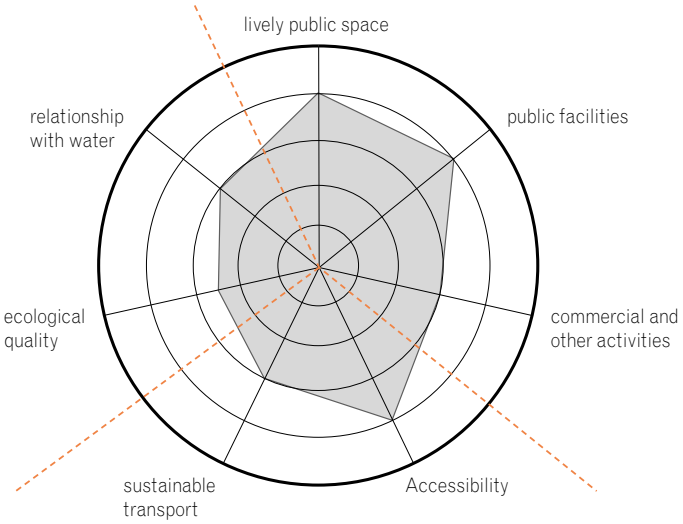
MOBILIZED INFRASTRUCTURE
-continuous cycling path
-commercial street along the waterway

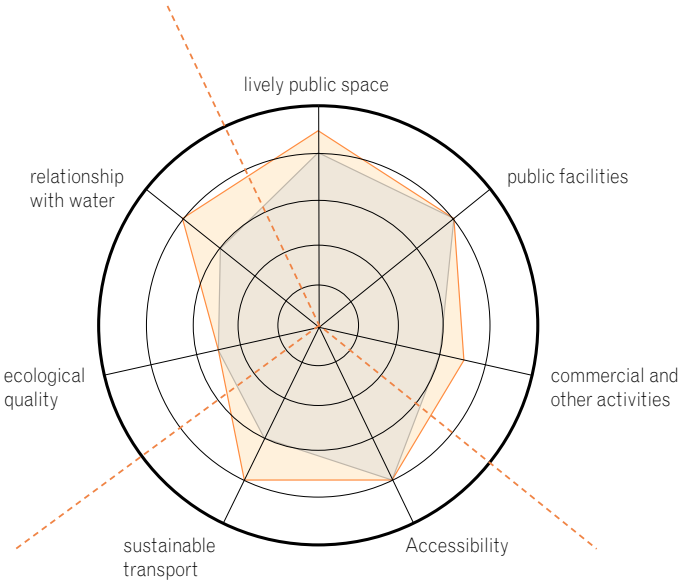
ECOLOGICAL SPACES
-certain big green spaces that can be floodable

4.3 VISION

4.3.2 Vision on local sclae

Modern Community





PUBLIC FACILITIES
-semi-public swimming pool and high-quality facilities
-ground floor as commercial space for public

MOBILIZED INFRASTRUCTURE
-sustainable and high density road connection
-continuous cycling path

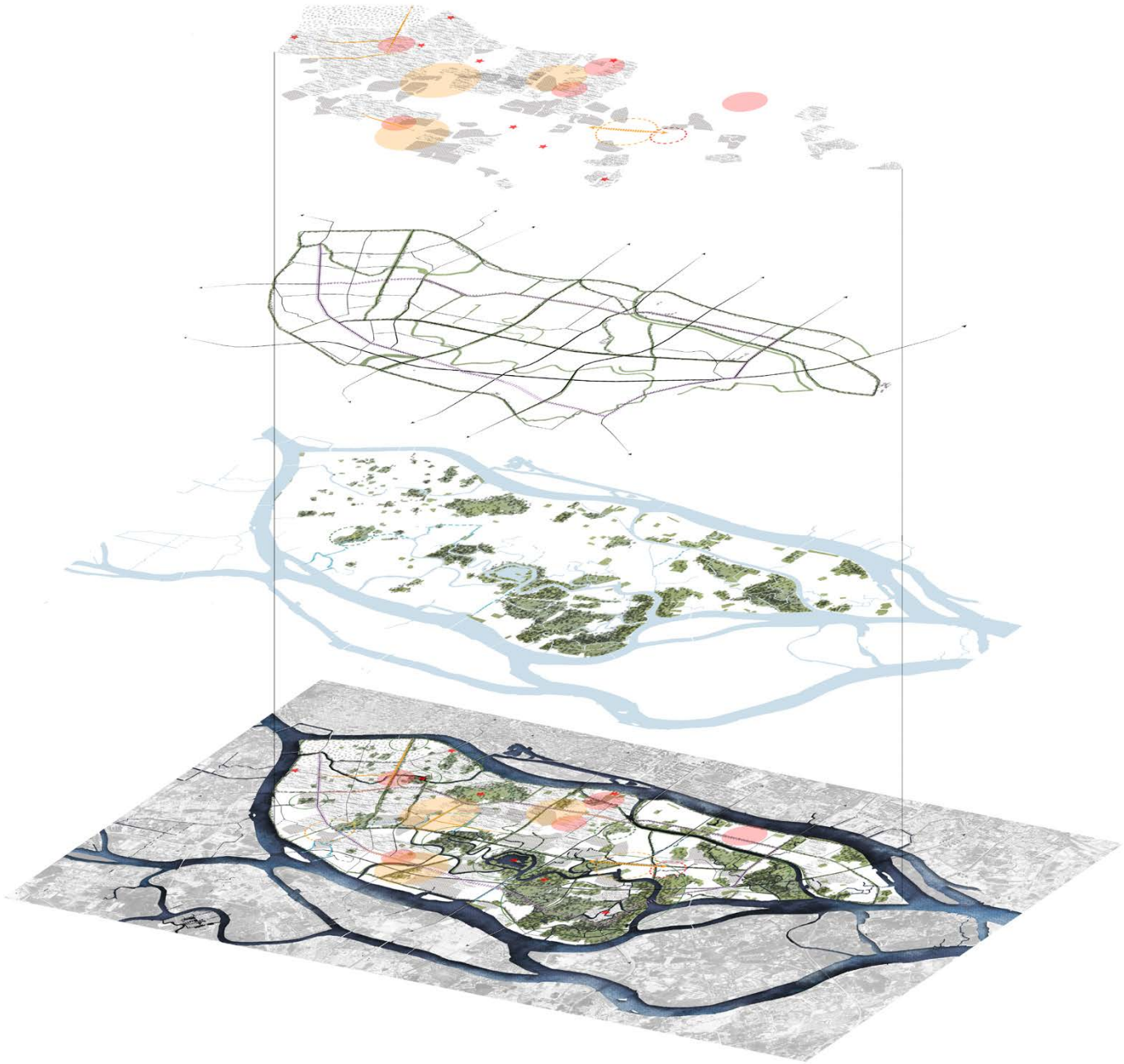
ECOLOGICAL SPACES
-sufficient green spaces increase biodiversity
-certain big green spaces that can be floodable

4.4 CONCLUSION

The three main characters of the network (public facilities, mobilized infrastructure, ecological spaces) are the basic spatial features composite the whole socio-ecological network. By developing the principles: corridor as connector, node as interactive space, the phenomenon of socio-spatial segregation and ecological fragmentation can be improved. These two main principles not only concern about the practical application based on the existing condition with identified elements but also affect future development with positve impacts from both social and ecological perspective.

The proposed framework in three layers provides a new opportunity of future sustainable planning. In regional scale, the new structure in each layer is based on the existing situation and elements and then integrate them into the overall network. Corridors and nodes, from this regard, offer practical methods to achieve the vision of integration. In local scale, it would be better to focus on the general small interventions inside the communities with features in three layers: dynamic uses of public space, improvement of accessibility and enhancement of ecological quality. More specific design interventions will be elaborated in the next chapter with certain complex context.

As a conclusion, corridor as connector and node as interactive space provide opportunities to decrease the negative effects from social and ecological perspective and help to create the sustainable planning. Despite applying principles on regional scale, further exploration in local scale with specific context is also important.



05

Exploring

5.1 BACKGROUND

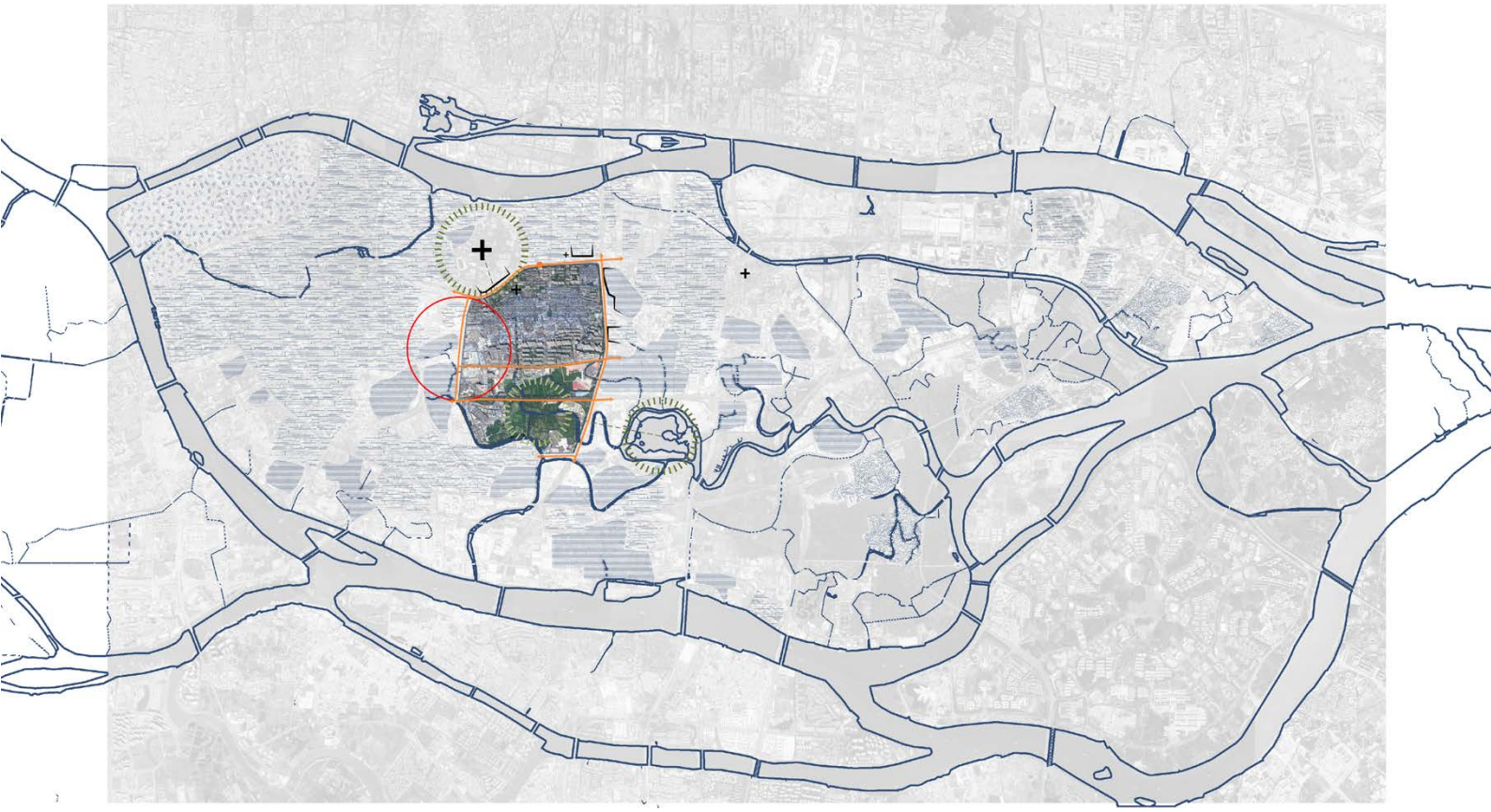
5.1.1 Site Location

The chosen site is located in the central part of Haizhu district. It is one of the most densely populated area near two ecological cores on the south and east side and sufficient commercial activities with an international textile center in the middle-west part.

The site is a diverse urban area with two types of communities in the north part, urban village and modern communities and is facing the problem of socio-spatial segregation between two settlements. Certain elements are identified as barrier to restrain the interaction between residents in two neighborhoods. It is essential to define these boundaries and apply the principles to it to improve integration.

There is an ecological orchard on the south side that is protected by the government but with less and less regulated management these days. Besides of this large green spaces, there are limited open green spaces on the north side that also reflect the issue of ecological fragmentation.

How to apply the principles of using corridor as connector and node as interactive space to this specific area? What design strategies can be put forwarded to address the existing social as well as ecological issues?

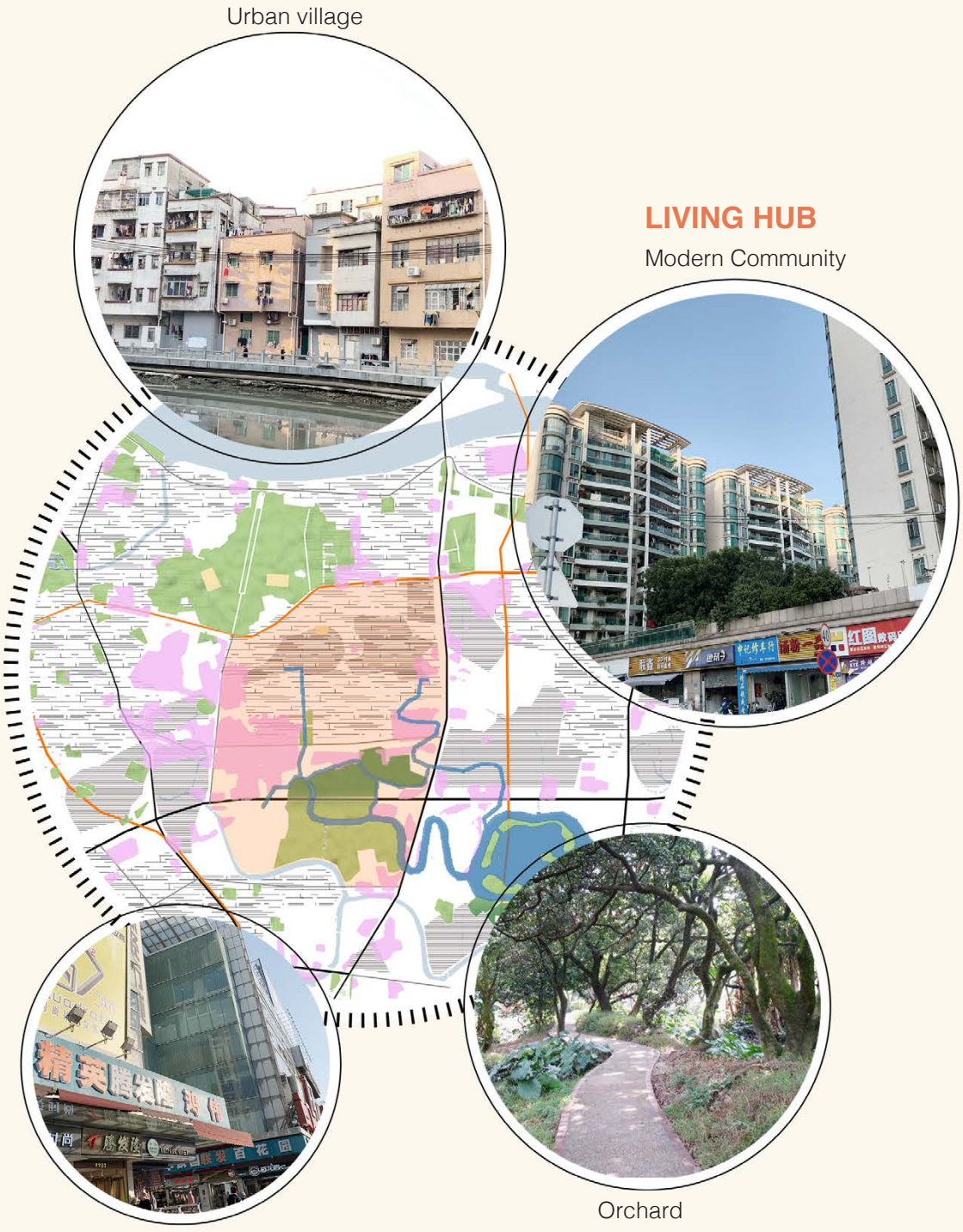


Diverse urban settlements (Source: http://www.sohu.com/a/287425832_825193)

Ecological Orchard (Source: http://bbs.zol.com.cn/dcbbs/d31_23353.html)

5.1 BACKGROUND

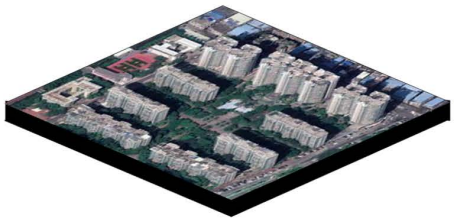
5.1.2 Site Elements



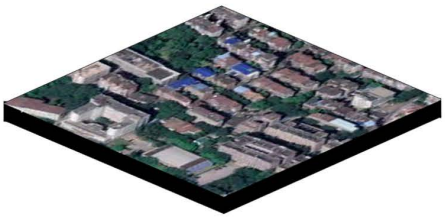
Based on the condition, the site can be divided into three hubs with different characteristics, living hub, commercial hub and ecological hub. The main elements found in each hub are identified with special features. And conflict appears between hubs and also in the living hub with the segregation issue between urban village and modern community.

LIVING HUB

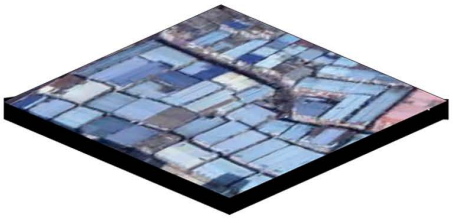
Urban Village



Modern Community

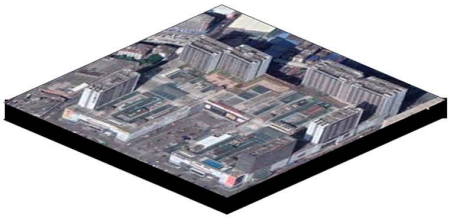


Educational College

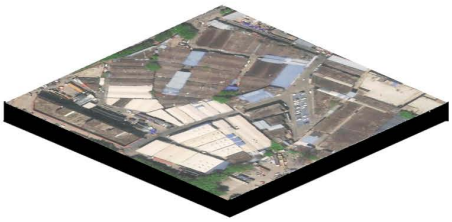


Factory

COMMERCIAL HUB

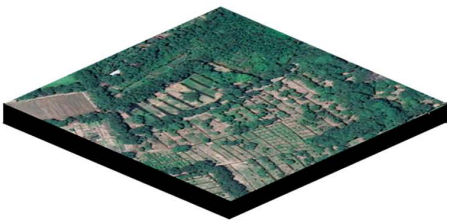


Commercial Center

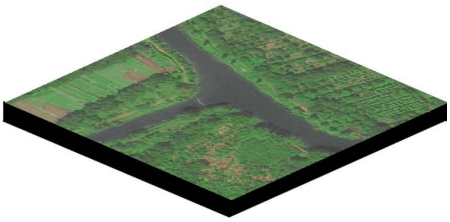


Accessory factory

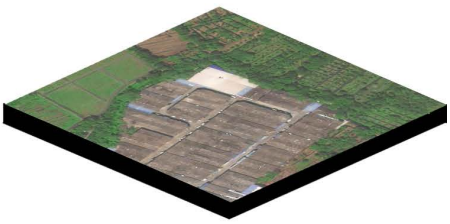
ECOLOGICAL HUB



Orchard



Water system

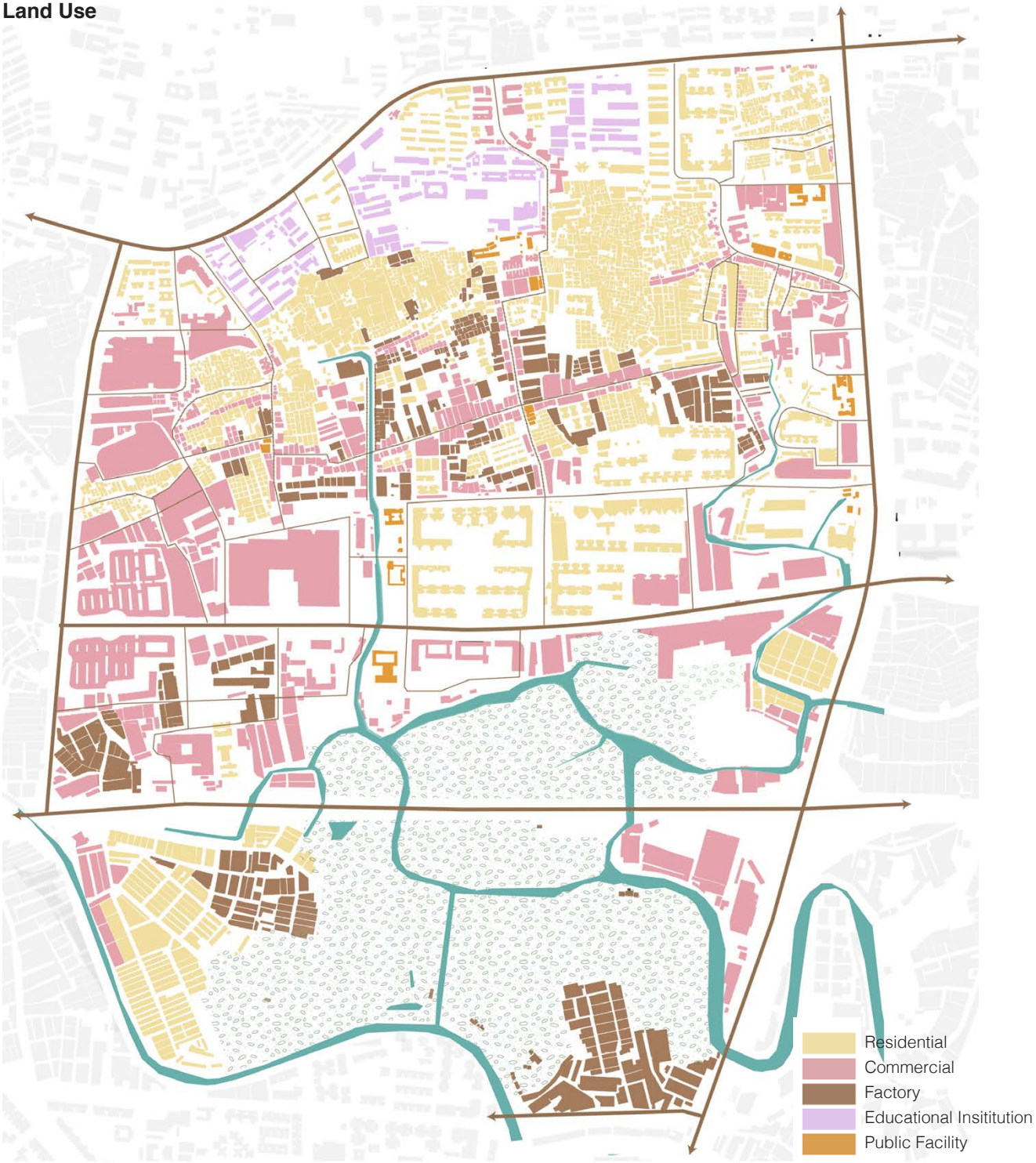


Farm House

5.1 BACKGROUND

5.1.2 Site Analysis

Land Use



Segregation between settlements

From the analysis on land use, we can see there are many factories in the living hub serving the textile market in the commercial hub. Modern communities are gated. There are two types of boundaries between the urban village and modern community, infrastructure boundary and spatial quality boundary. And the site has limited public space and lacks interconnection between urban village and modern community,

5.1 BACKGROUND

5.1.3 Challenges

Problem Identified

ECOLOGICAL

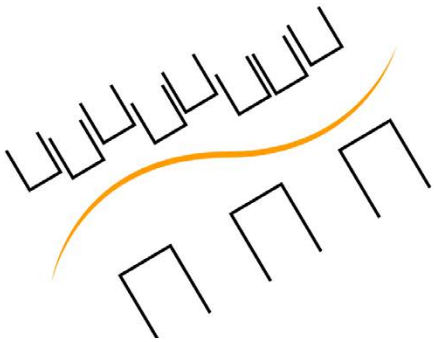
Disconnection between ecological spaces and built environment

Lack of green spaces for ecological value

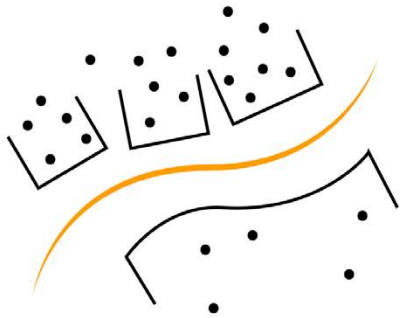
Poor water quality

Lack of sustainable techniques of space confronting climate change

SOCIAL



Lack of spatial and functional connection between urban village and modern community



limited interaction between immgrants and local residents in the living hub

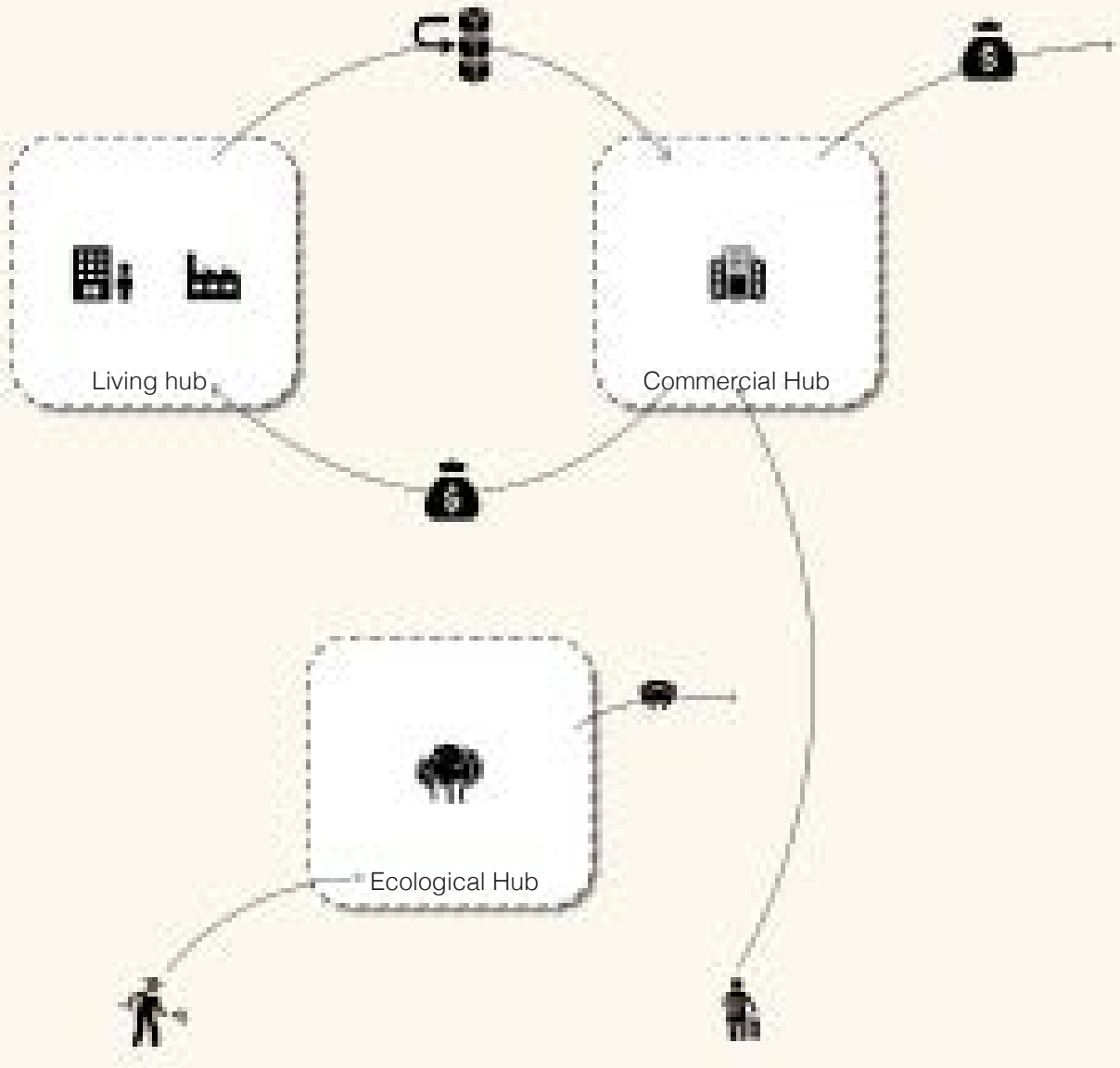
The connection between communities is blocked by certain boundaries

Lack of public space where residents can contact with each other

Lack of activities along the waterfront area

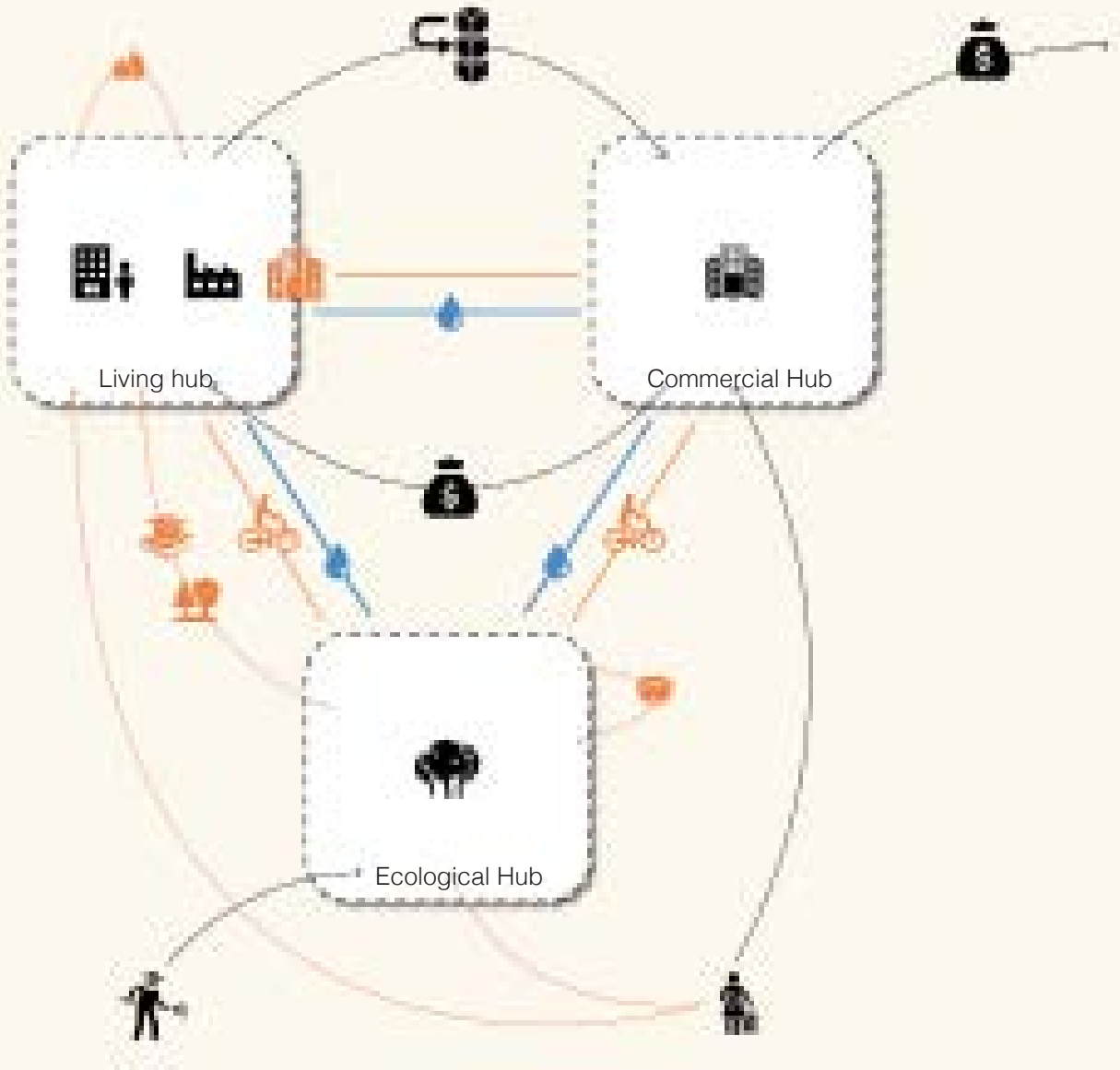
5.2 VISION

EXISTING



There is less connection among three hubs.

PROPOSING



A comprehensive socio-ecological network need to be created to regenerate and rebuild up a tight connection among the three hubs by introducing different corridors and nodes. Besides, creating and activating the spaces lacking vitality in community can contribute to integrate the connection between residents from urban village and modern community. Furthermore, the ecological connection is improved through the integration of water system and an overall green and blue network should also be created and enhanced at the scale to realize the ecological value.

5.2 VISION


Commercial Center
Slow Mobility
Linear Park
LIVING HUB
COMMERCIAL HUB

ECOLOGICAL HUB

5.3 SPATIAL DESIGN

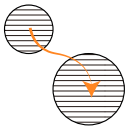
5.3.1 Design Strategies

The design goal is to integrate the three hubs as a whole and increase interaction by introducing corridor and node as social ecological network. Therefore, in this specific context, the main strategies about concerning corridor and node would be "**CONNECT**" and "**ACTIVATE**".

Connect would try to improve the interconnection between nature and the built environment and accessibility to social and ecological spaces. While activate would make use of the existing vacant areas to regenerate new public activities and vitalize the communities. From this perspective, by applying the theory of creative destruction of neighborhoods, certain spatial transformation with better sense of belongings should be considered.

These two different strategies should also concern about both ecological as well as social aspects with the contribution of different elements.

CORRIDOR AS CO



CONNEC

Elements

Infrastructure
-Waterway
-Roads
Greenway
Different experienc

Improve interconnection in socia
and accessibility to social and ec

NNECTOR

NODE AS INTERACTIVE SPACE

CT

ACTIVATE

s

Elements

ce routes

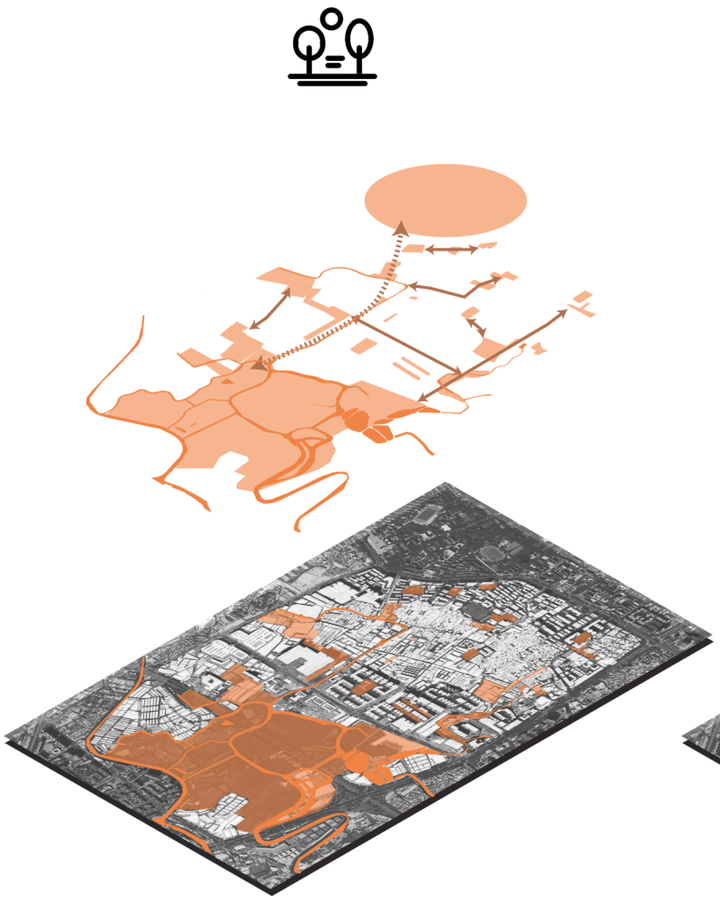
Large Open Space
-Commercial Space
-Ecological Space
-Recreational Space
Pocket Space in Community

l and ecological value
cological spaces

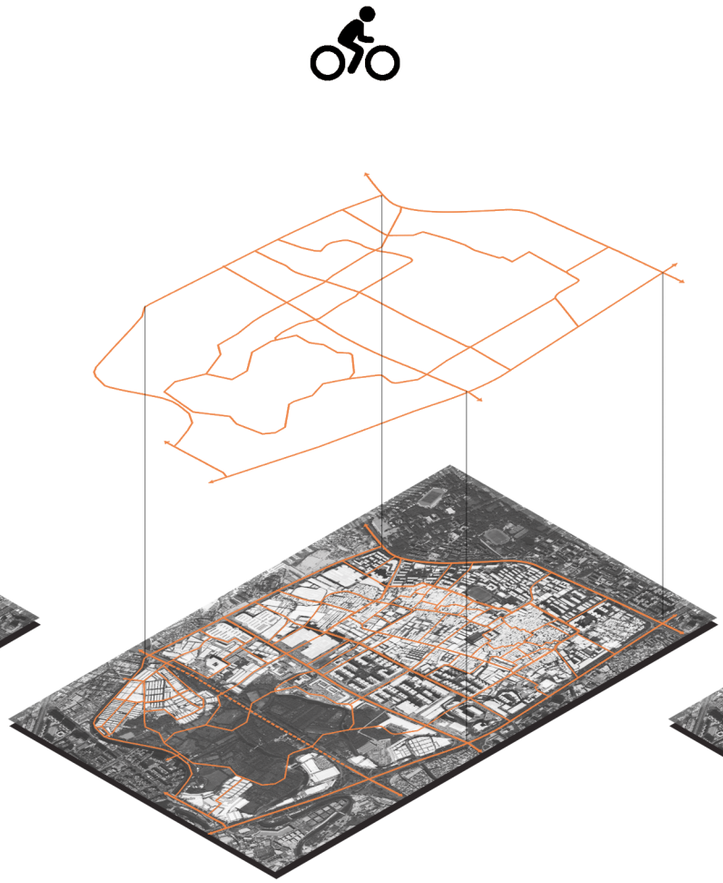
Make use of the existing vacant areas to regenerate new public activities and vitalize the communities

5.3 SPATIAL DESIGN

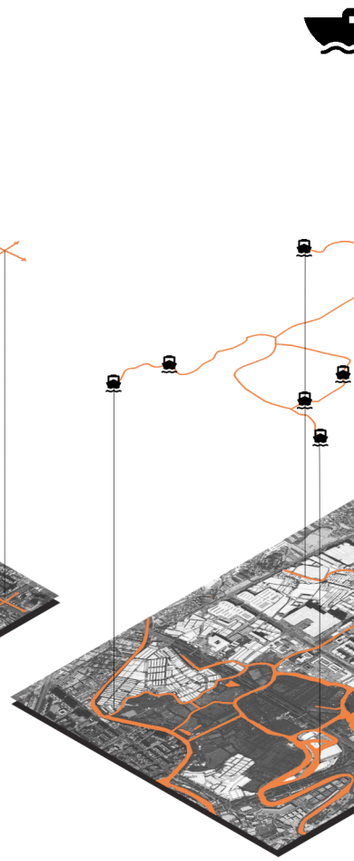
5.3.1 Design Strategies



ECOLOGICAL CONNECTION

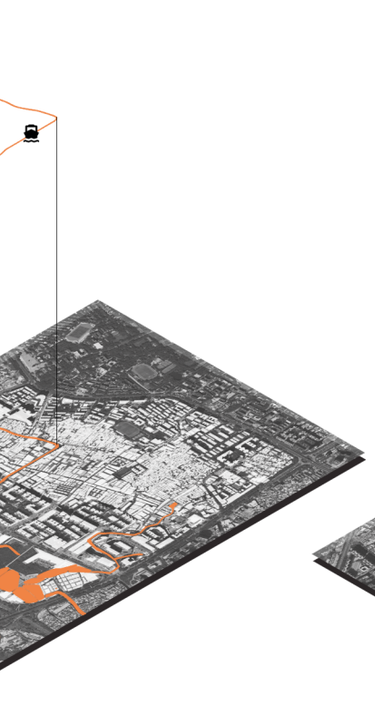


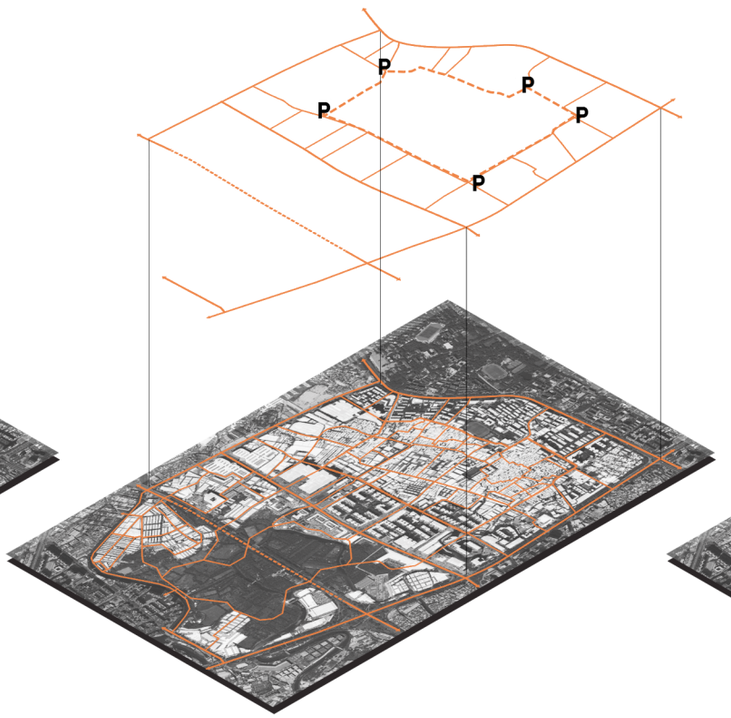
GREENWAY



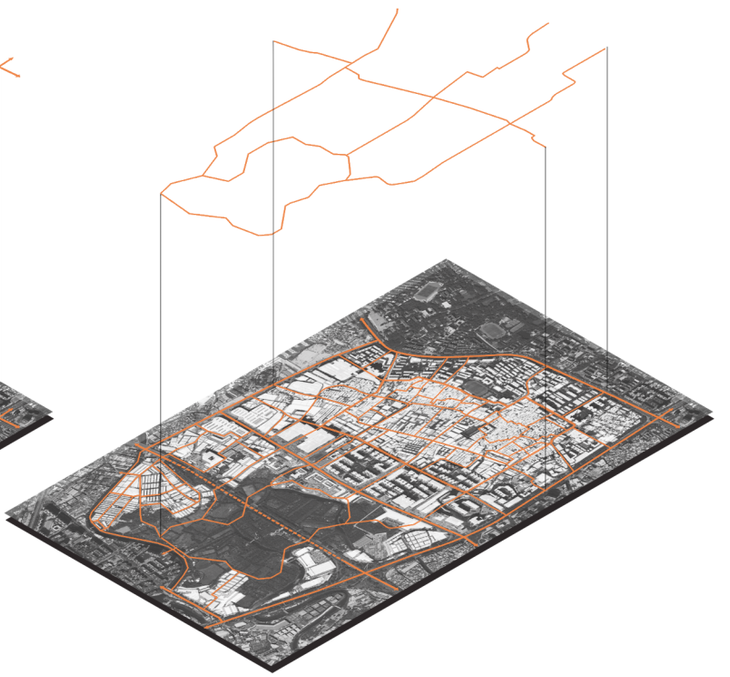
CRUISE

CONNECT





SLOW TRAM

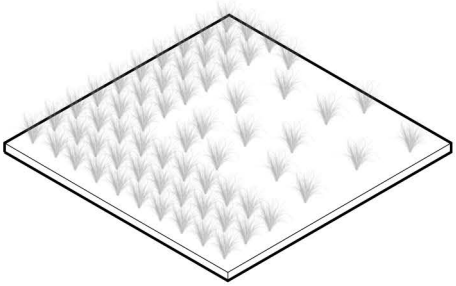


EXPERIENCE ROUTES

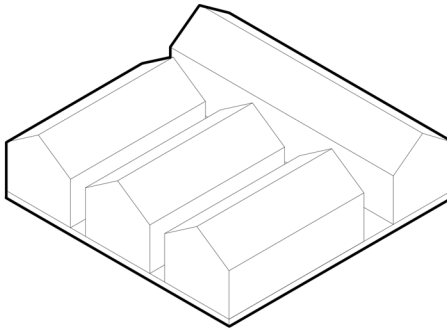
5.3 SPATIAL DESIGN

5.3.1 Design Strategies

Before

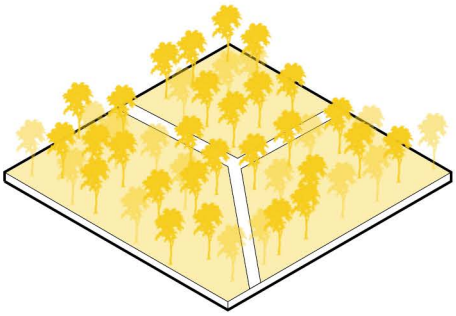


Vacant land/ Parking lot

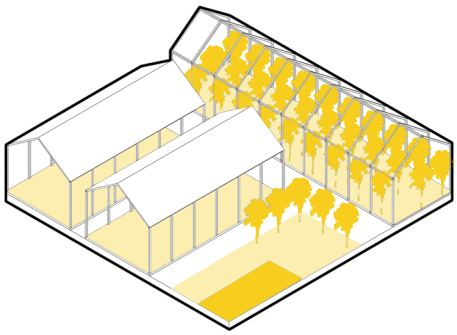


Abandoned Factories

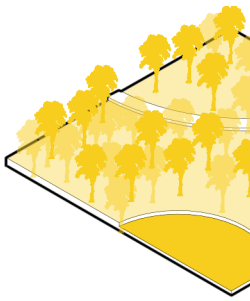
After



Transform into ecological / recreational space

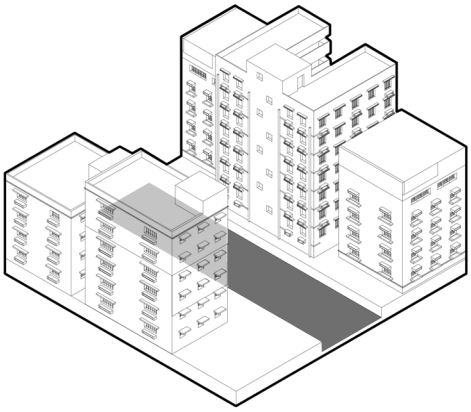


Keep the existing structure
Transform factories into new functions as urban farming, cafe, etc.

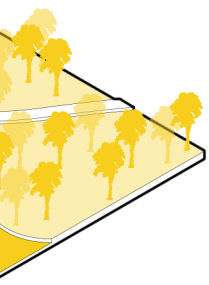


Transform into recreation

ACTIVATE



Water



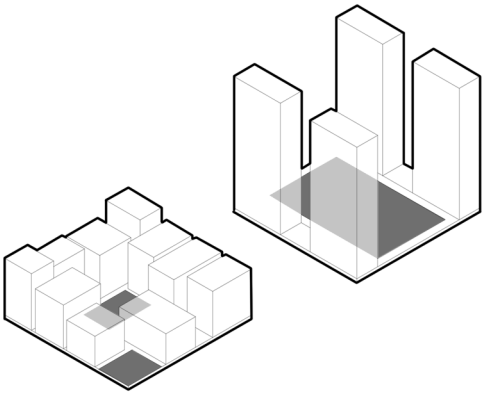
o ecological /
al space

Create multifuncational
waterfront area
Walking bridge for connection

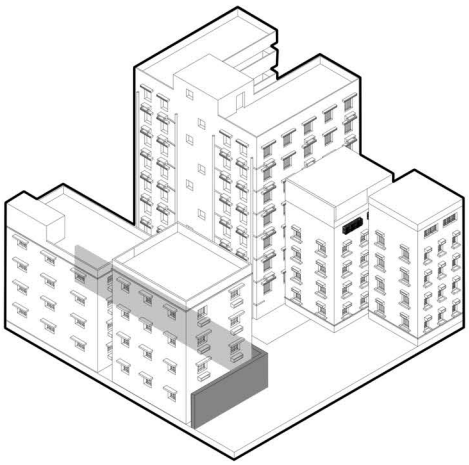
5.3 SPATIAL DESIGN

5.3.1 Design Strategies

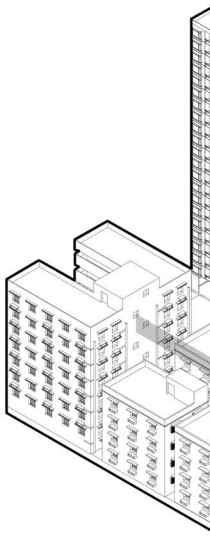
Before



Quality of Space

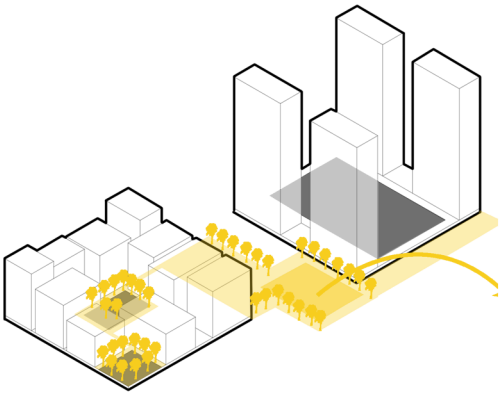


Wall

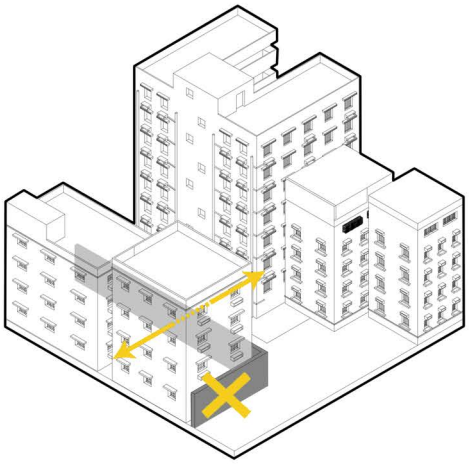


Fer

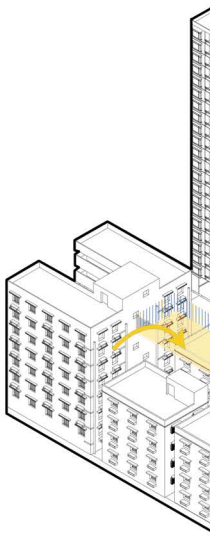
After



Renew public space with
multiple uses & functions

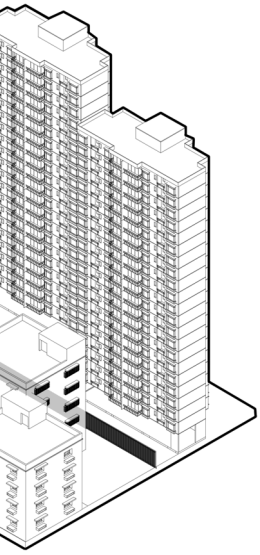


Remove the wall
Improve the connection



Relocat
Open certain

ACTIVATE



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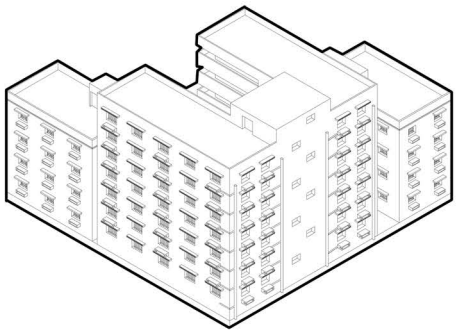
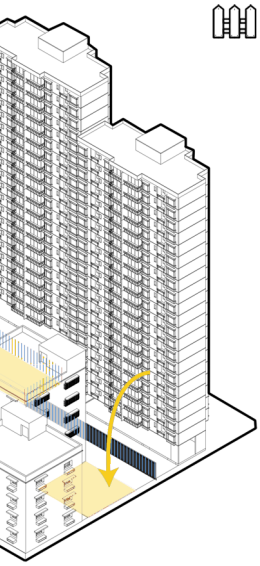
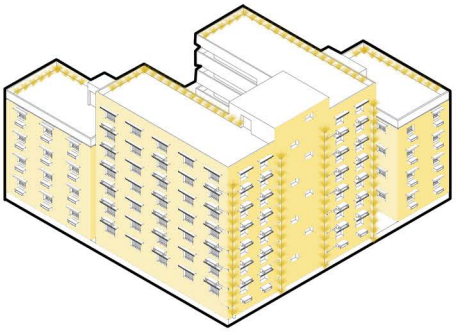


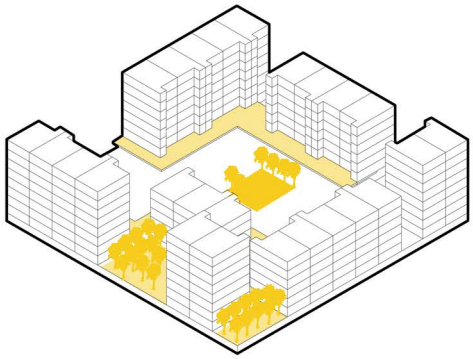
Building in bad quality



e the fence
n area for public



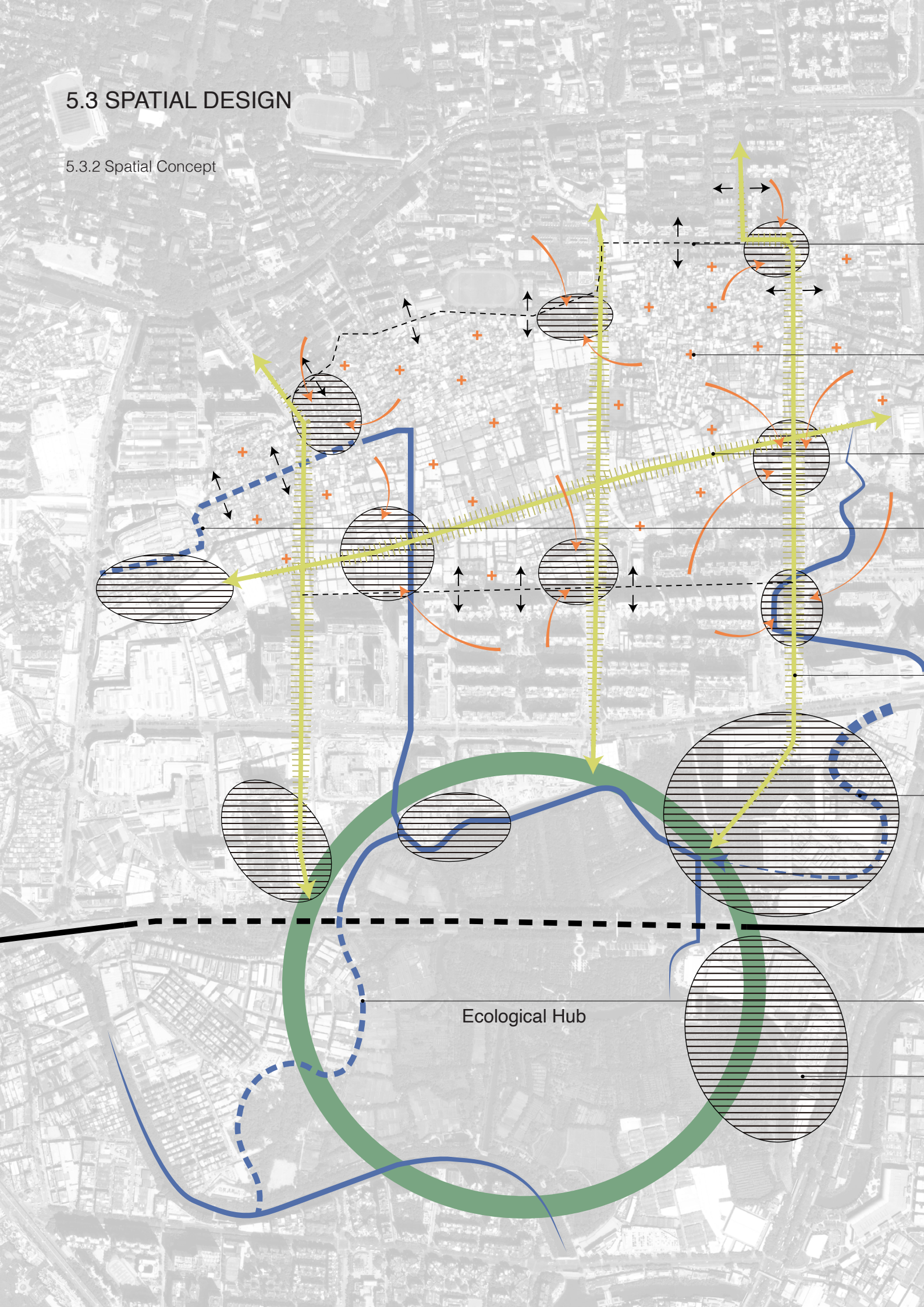
Renew the facade & rooftop



Create new building typology
as open community

5.3 SPATIAL DESIGN

5.3.2 Spatial Concept



Improve the integration and decrease the nagtive effect of boundary between the modern community and urban village

Create open public space inside the urban village for sharing, communitcating, sports, etc.

Connect commercial and living hub

Extend the existing canal and create livable waterfront space

Integrate ecological value from the ecological hub to the living hub and build up interconnection

Purify the water from the living hub and activate the site as a recreational park where residents can have social activities and the ecological value can be strengthened and realized

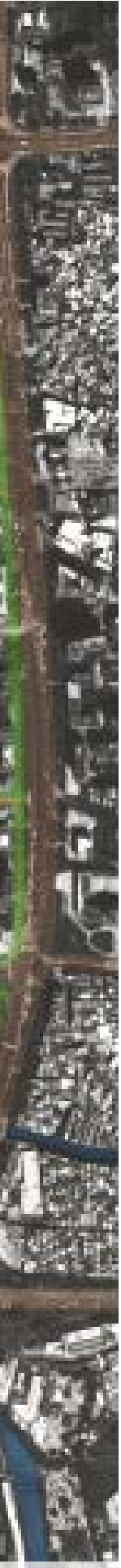
Remove the road and create connection between ecological spaces between both sides

Extend canal for better water management in the ecological hub

Create more room for the water, reactivate the space with floodable islands and floating housing for future sustainable development

5.3 SPATIAL DESIGN

5.3.3 Master Plan

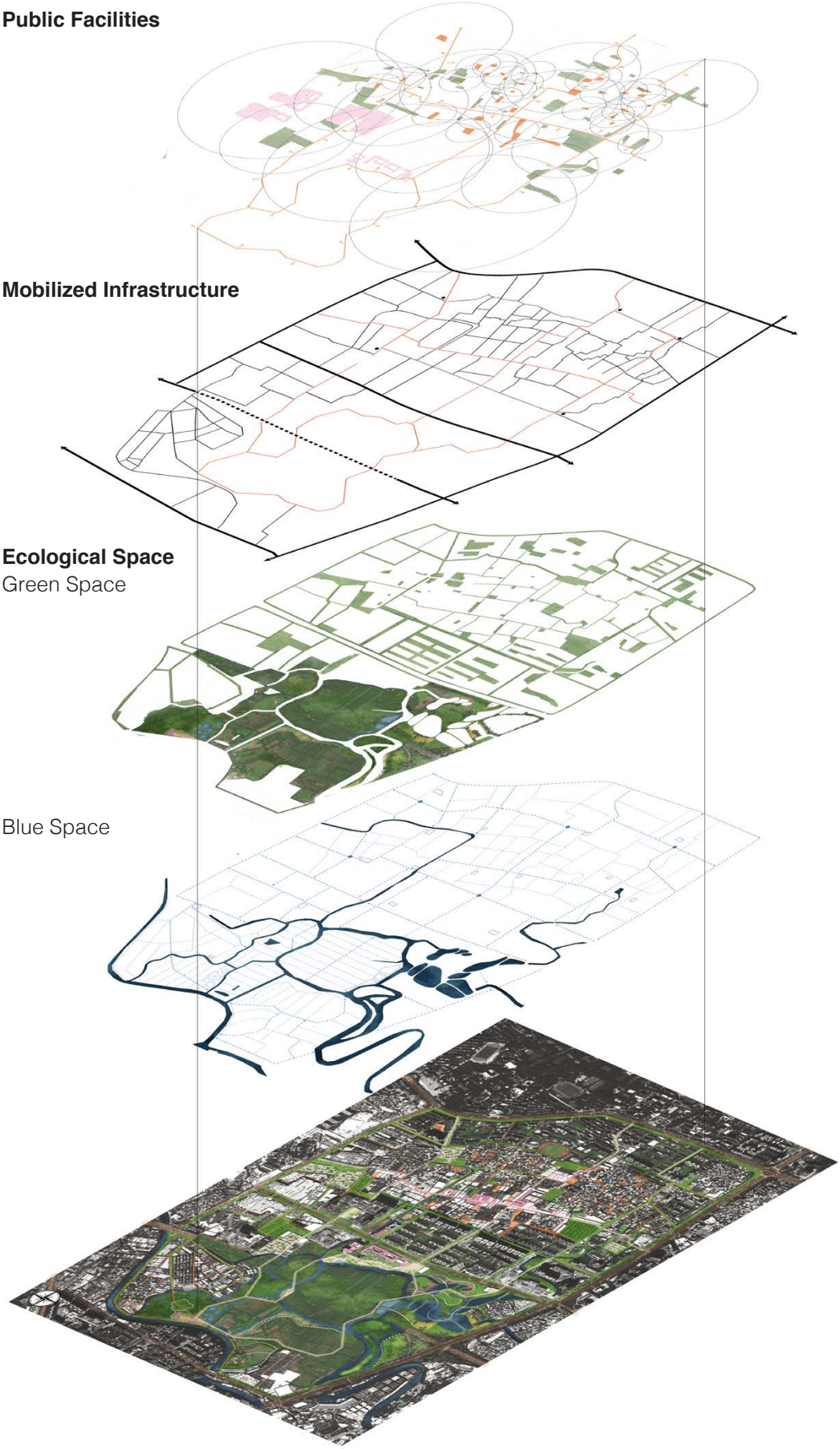


Public Facilities

Mobilized Infrastructure

Ecological Space
Green Space

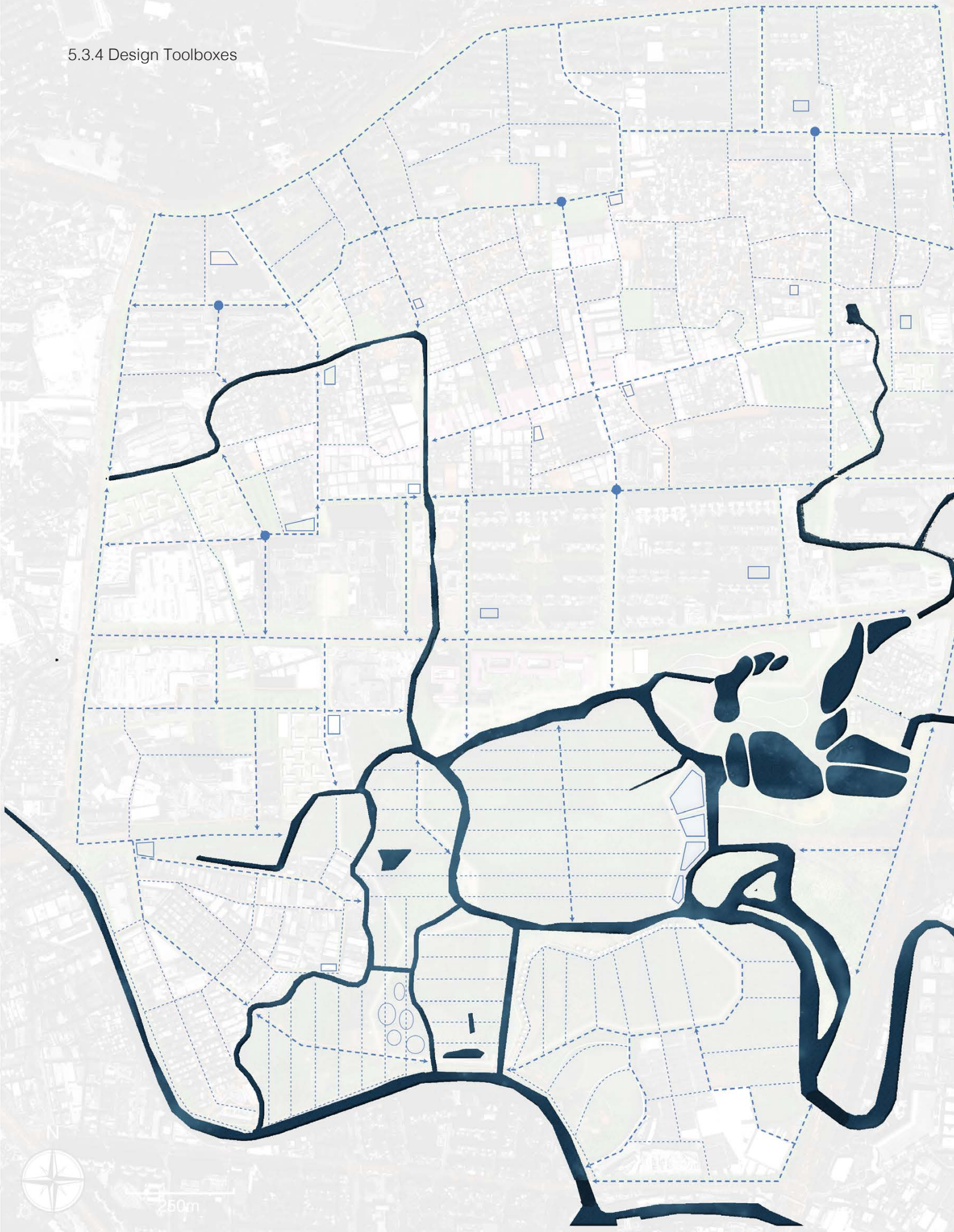
Blue Space



The layers of three main characters are elaborated. The moblized infrastructure here is focusing on the experience routes as corridor and by combining with the nodes on public facilities layer and ecological layer, it can composite the general socio-ecological network on the local scale with corridors and nodes.

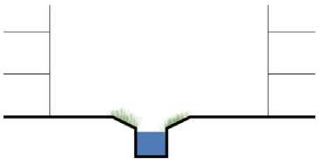
5.3 SPATIAL DESIGN

5.3.4 Design Toolboxes



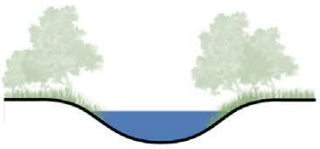
Toolbox

water square

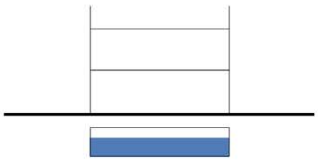


singel

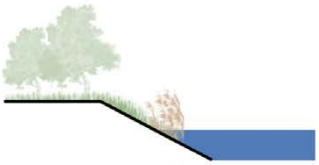
permeable pavement



retention basin



water storage

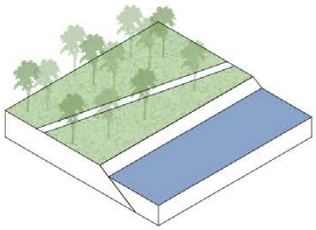


soft edge

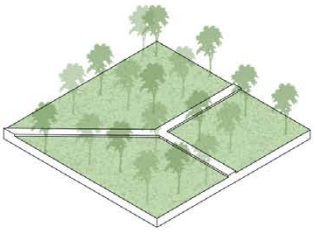
5.3 SPATIAL DESIGN

5.3.4 Design Toolboxes

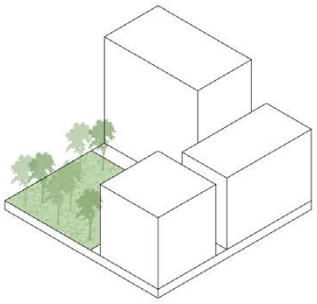
Toolbox



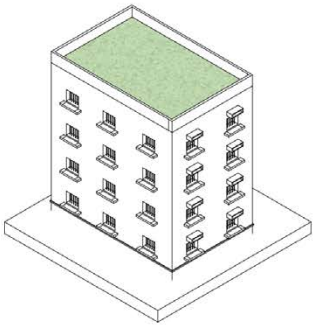
waterfront park



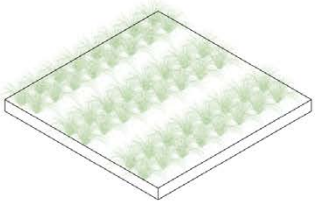
community park



pocket park



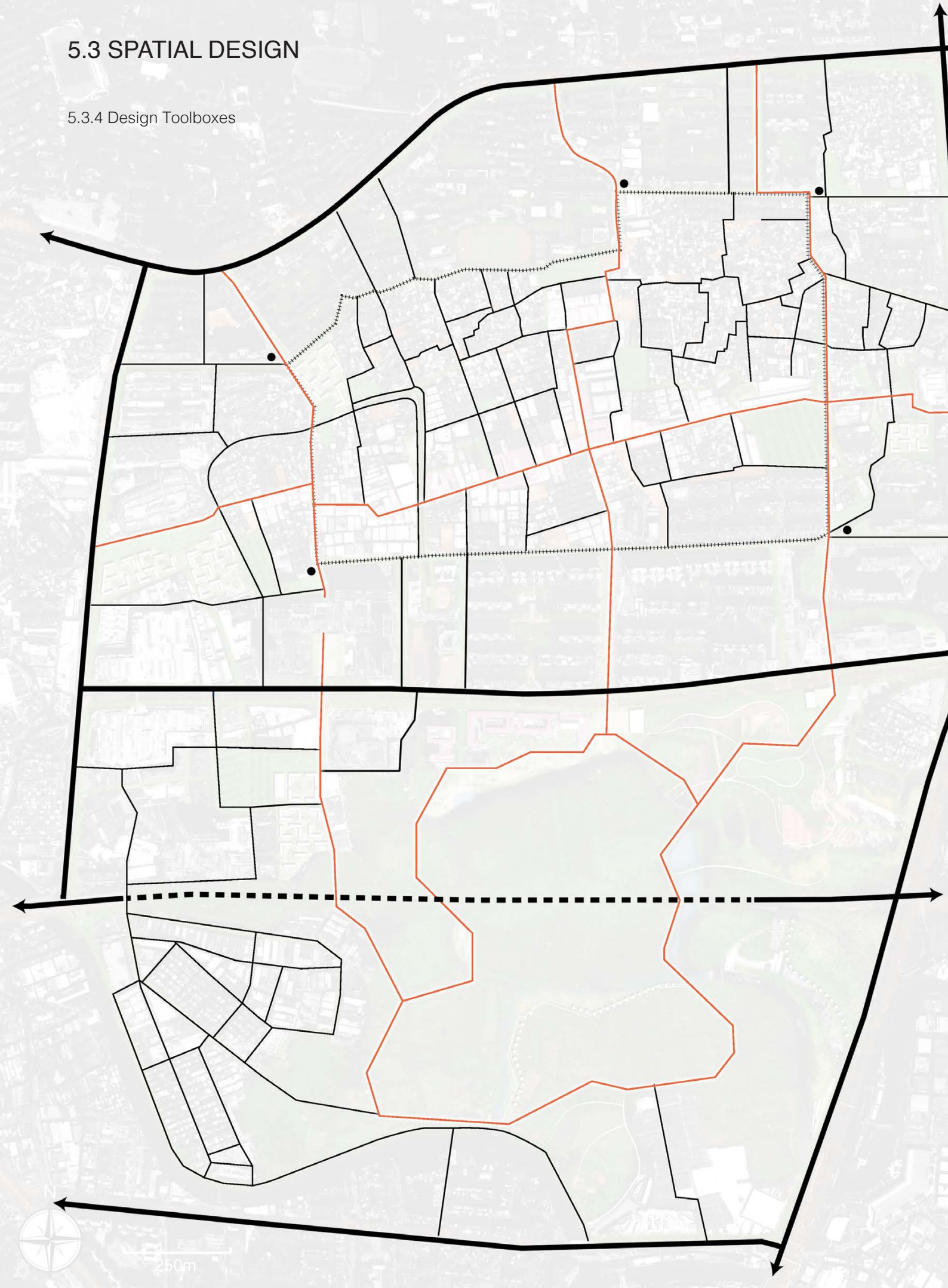
green roof



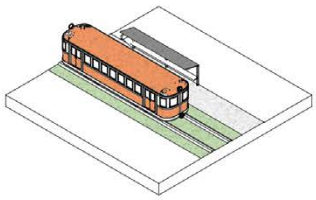
urban farming

5.3 SPATIAL DESIGN

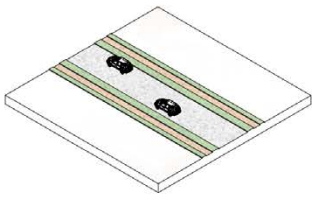
5.3.4 Design Toolboxes



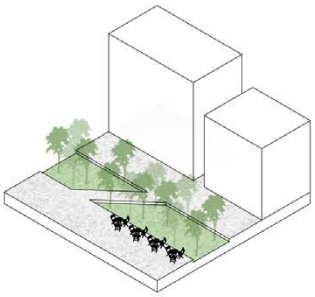
Toolbox



slow tram



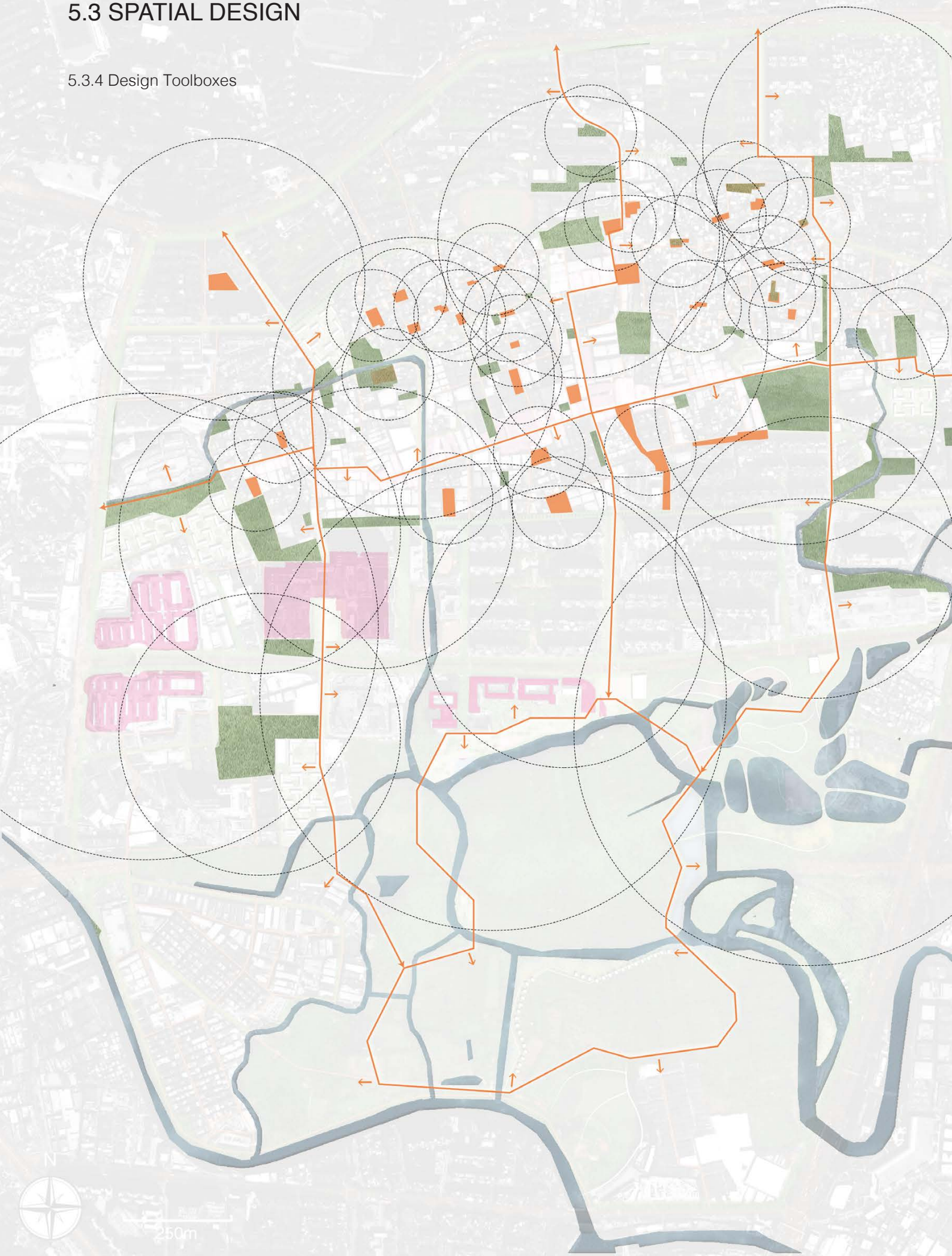
greenway



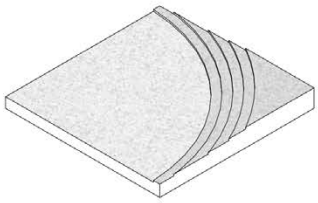
experience route

5.3 SPATIAL DESIGN

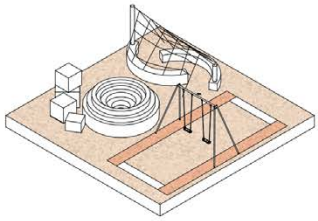
5.3.4 Design Toolboxes



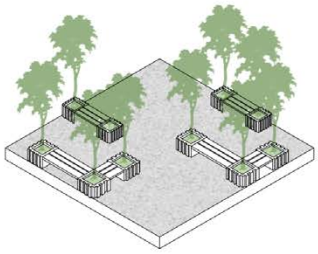
Toolbox



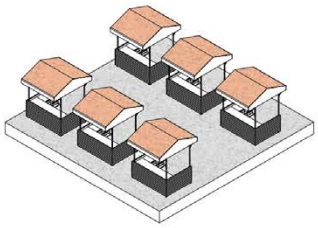
open square



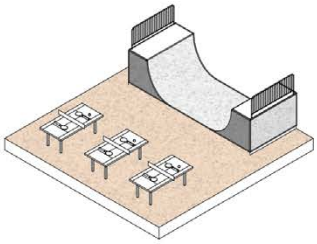
kid's playground



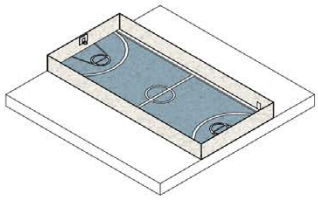
outdoor seating



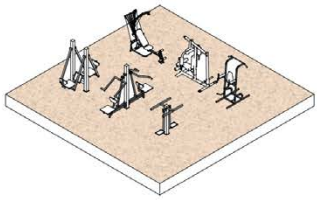
informal settlement



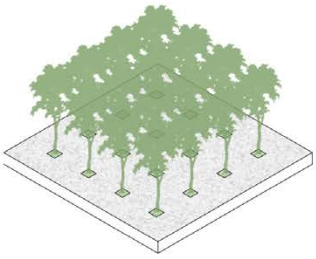
outdoor gaming



sport



outdoor exercises



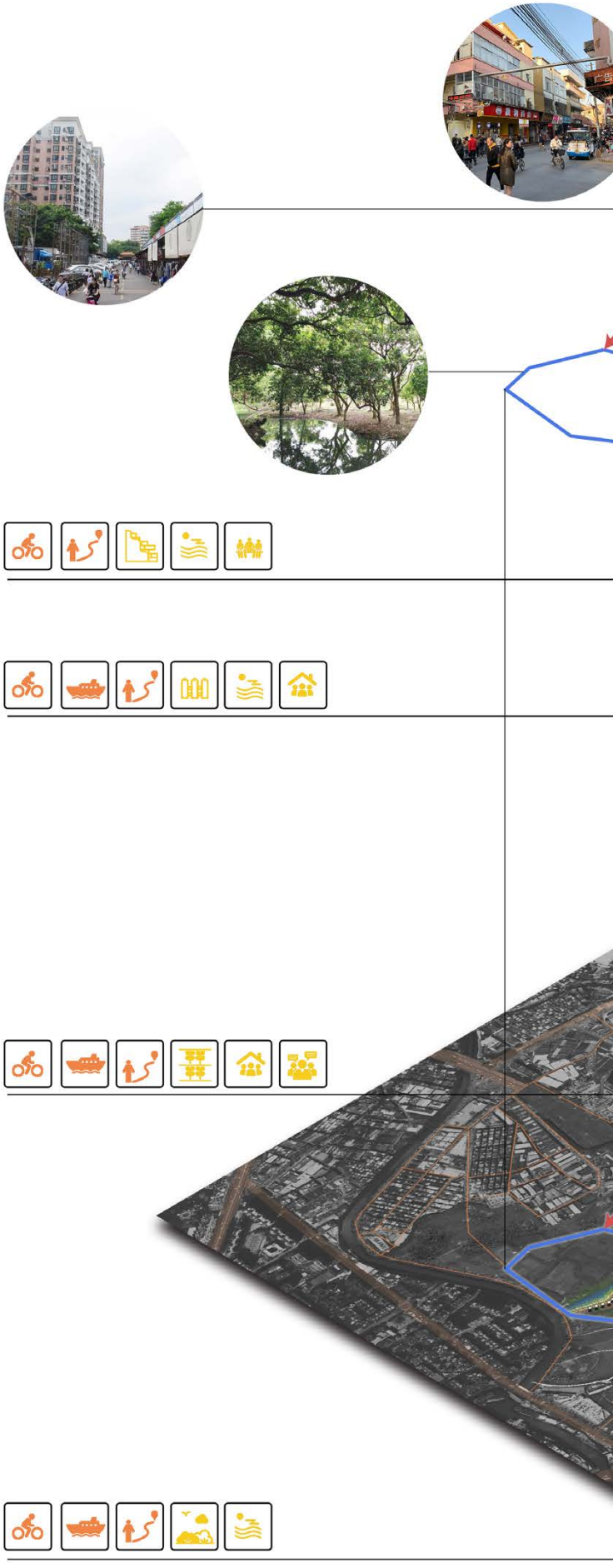
gardening

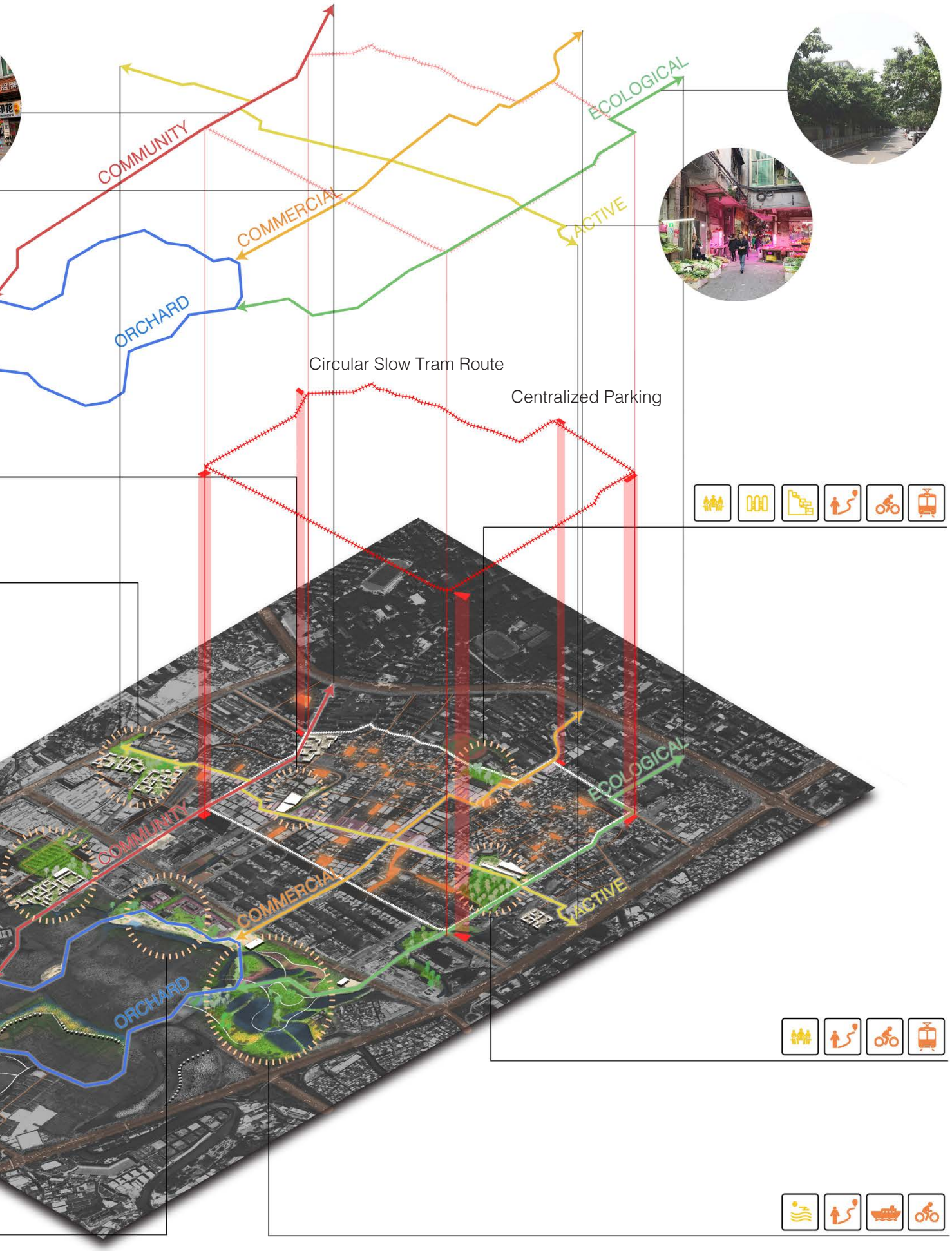
5.3 SPATIAL DESIGN

5.3.5 Design Intervention

In order to decrease the negative effects brought by the mix traffic inside the urban village, a new cicular slow tram route is proposed with several centralized parking areas around the tram line. This pedestrian-oriented network can be benficial for the living condition in the urban village and build up connection with the modern community.

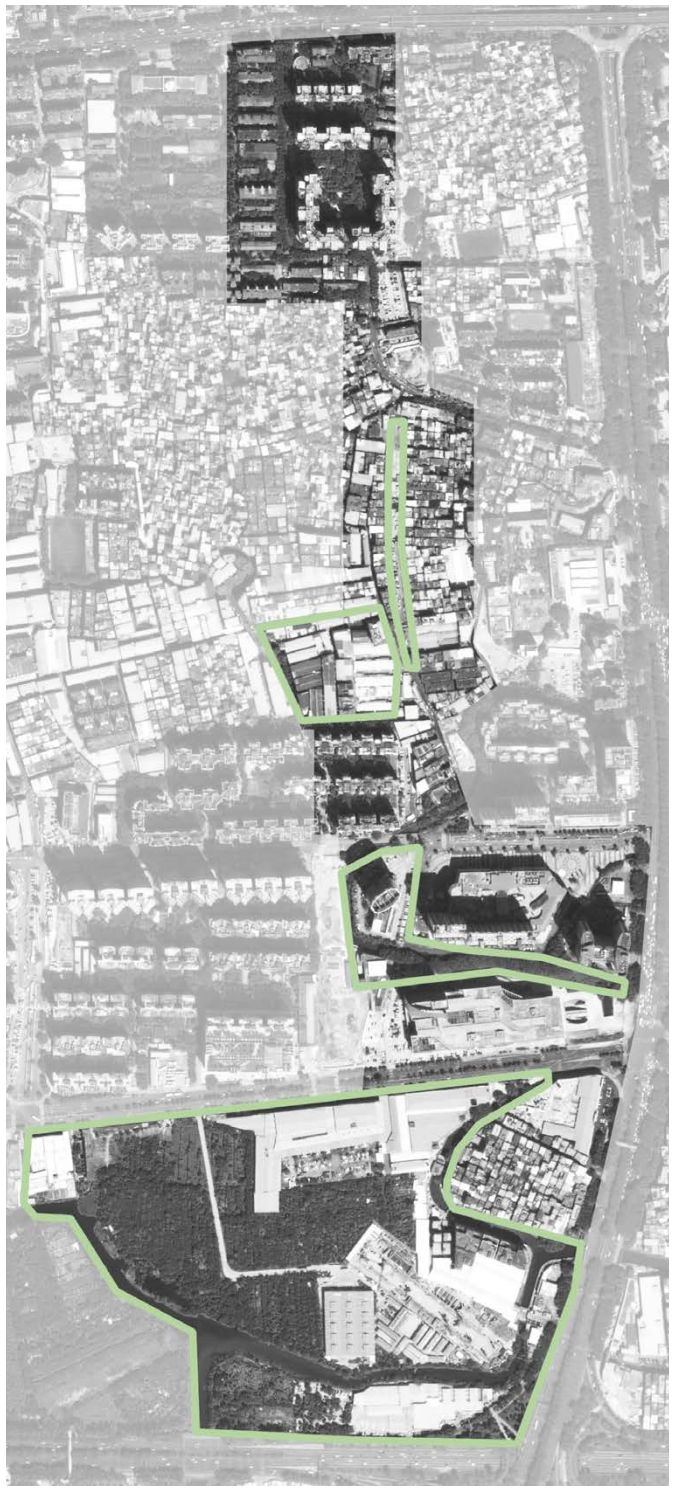
Besides, in this stage, five different experience routes are being focused as corridors for integration of three hubs and different social groups. Based on the existing elements and features in the site, the characteristics defined of these routes are proposed as ecological, commercial, community, active, and orchard. The experience provided in these routes vary from one to another with different functions and events along it. In the next part, the ecological route, active route and orchard route with nodes along them will be further elaborated.

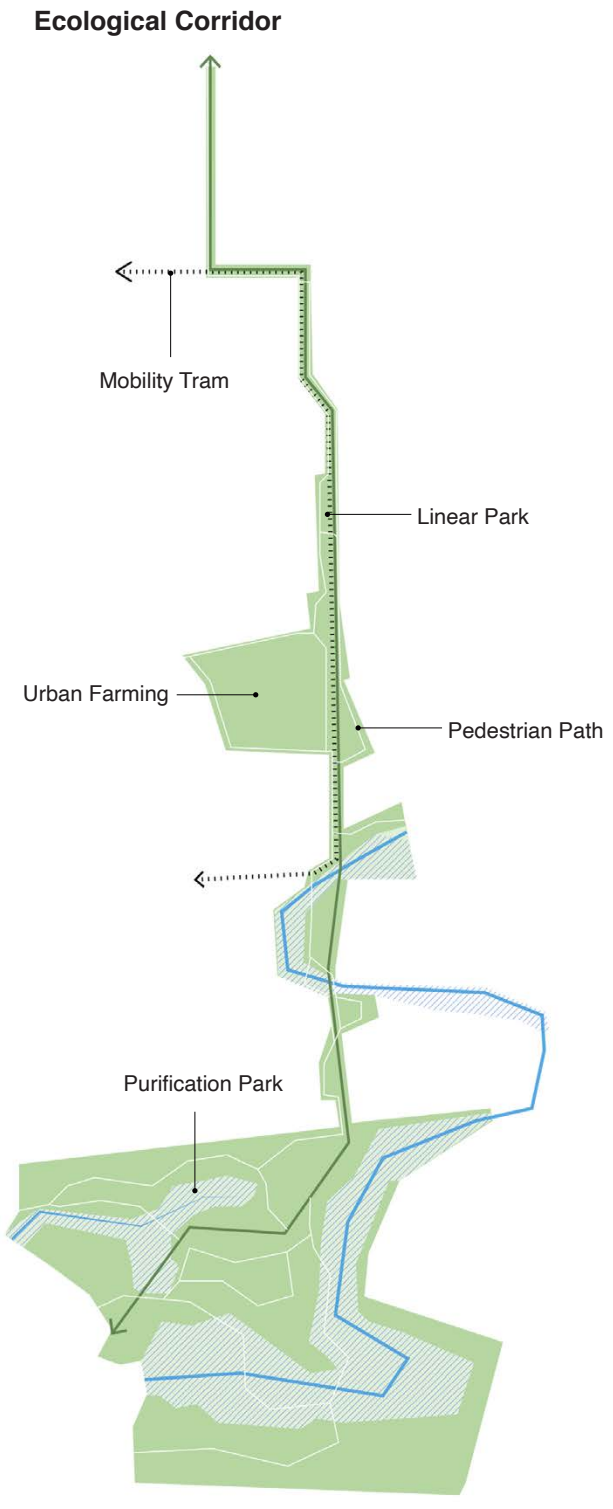


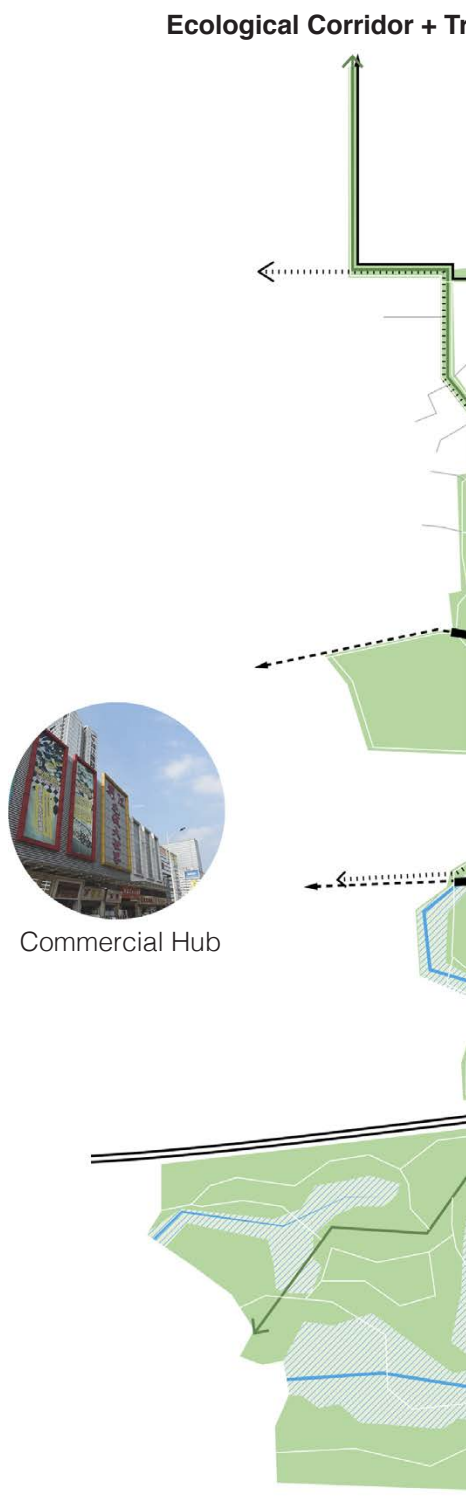

COMMUNITY
COMMERCIAL
ORCHARD
ECOLOGICAL
ACTIVE
Circular Slow Tram Route
Centralized Parking

5.3 SPATIAL DESIGN

5.3.5.1 Design Intervention - Ecological Route



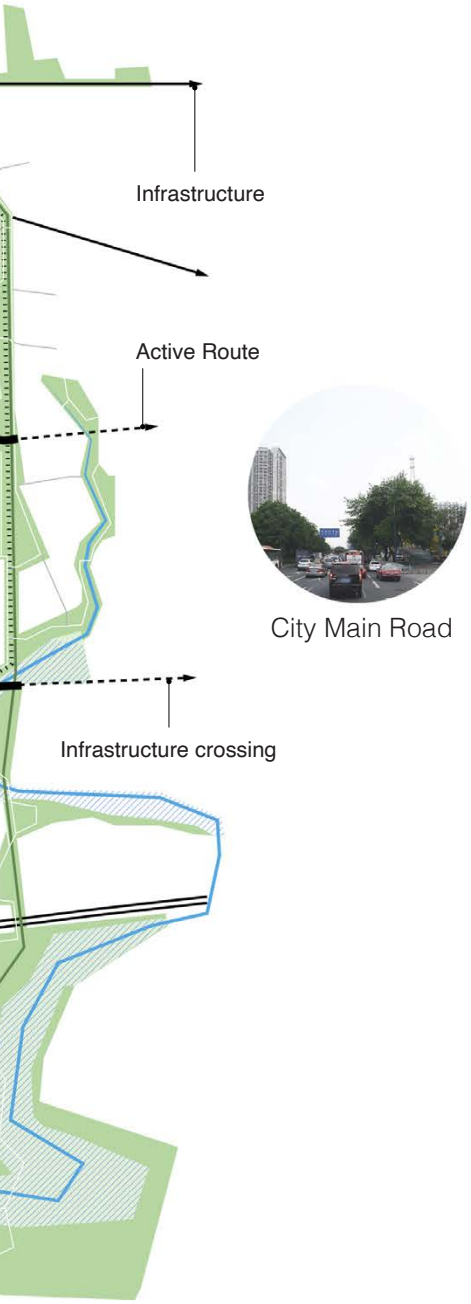




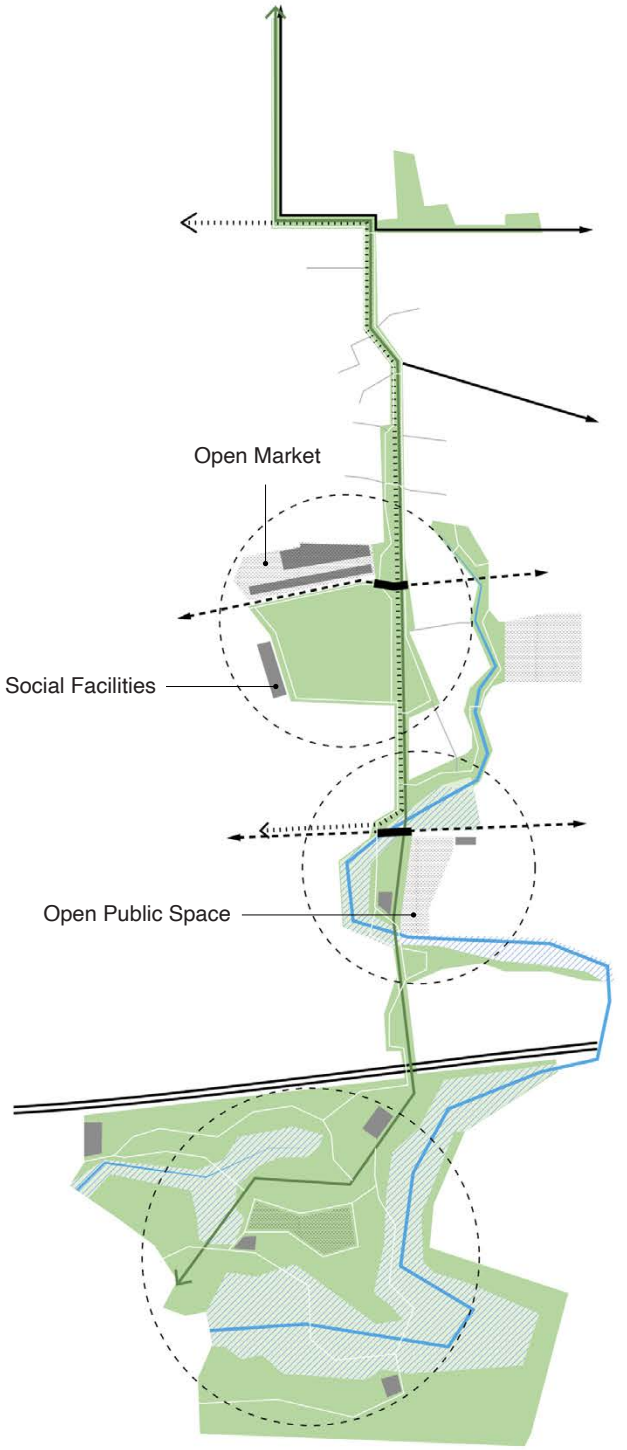
Firstly, it is the ecological route located east side of the site. By applying the theory of creative destruction of neighborhoods, certain buildings and factories are demolished to provide more room for the eoological space that can engage the ecological value from the ecological hub to the living hub. Besides, area on the south part is transformed into a purification park that could be more resilient for water storage and be sustainable for purifying the water from the urban area.

In this ecological corridor, there is a linear park and continuous greenway. The purification park is a ecological node connecting to the orchard route in the ecological hub. With the transerval corridor (active route, orchard route),

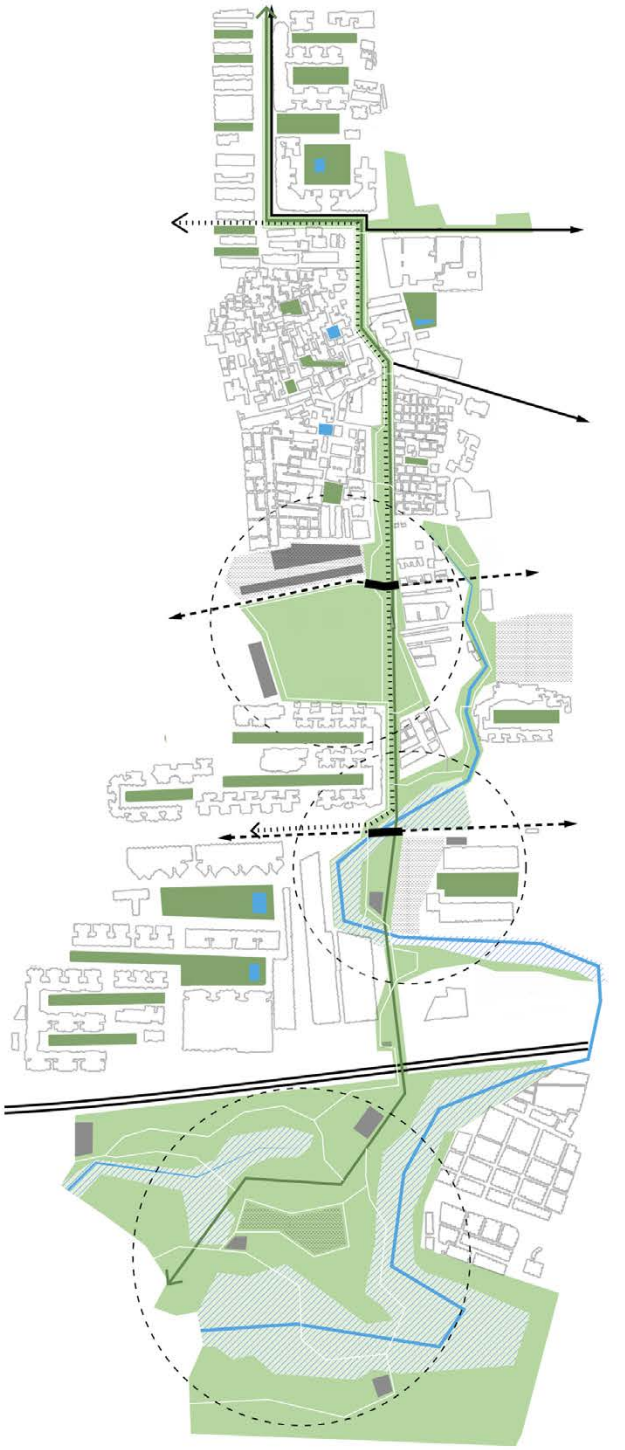
ransversal Corridor



Corridor System + Nodal System



Corridor System + Nodal System + Context



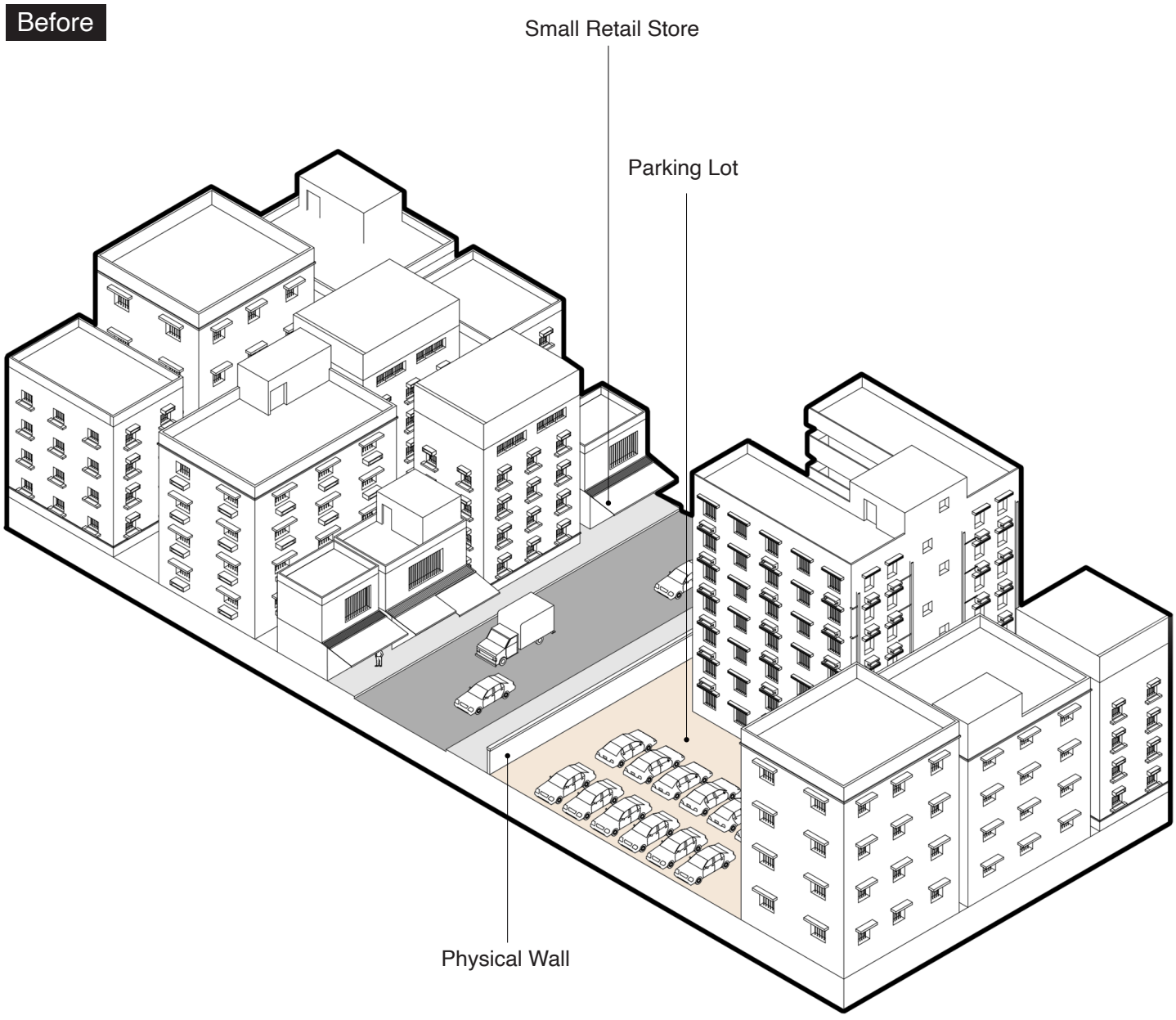
the pemeability to the surrounding context increases. Spaces with special features along the route build up nodal system. These nodes with some social facilities support communities to integrate residents from both urban village and modern community, such as urban farming and open market, livable waterfront public sapce. For ecological intergration, several water squares and water ponds are located in different neighborhoods to collect and restore water contemporarily and discharge to the river after.

5.3 SPATIAL DESIGN

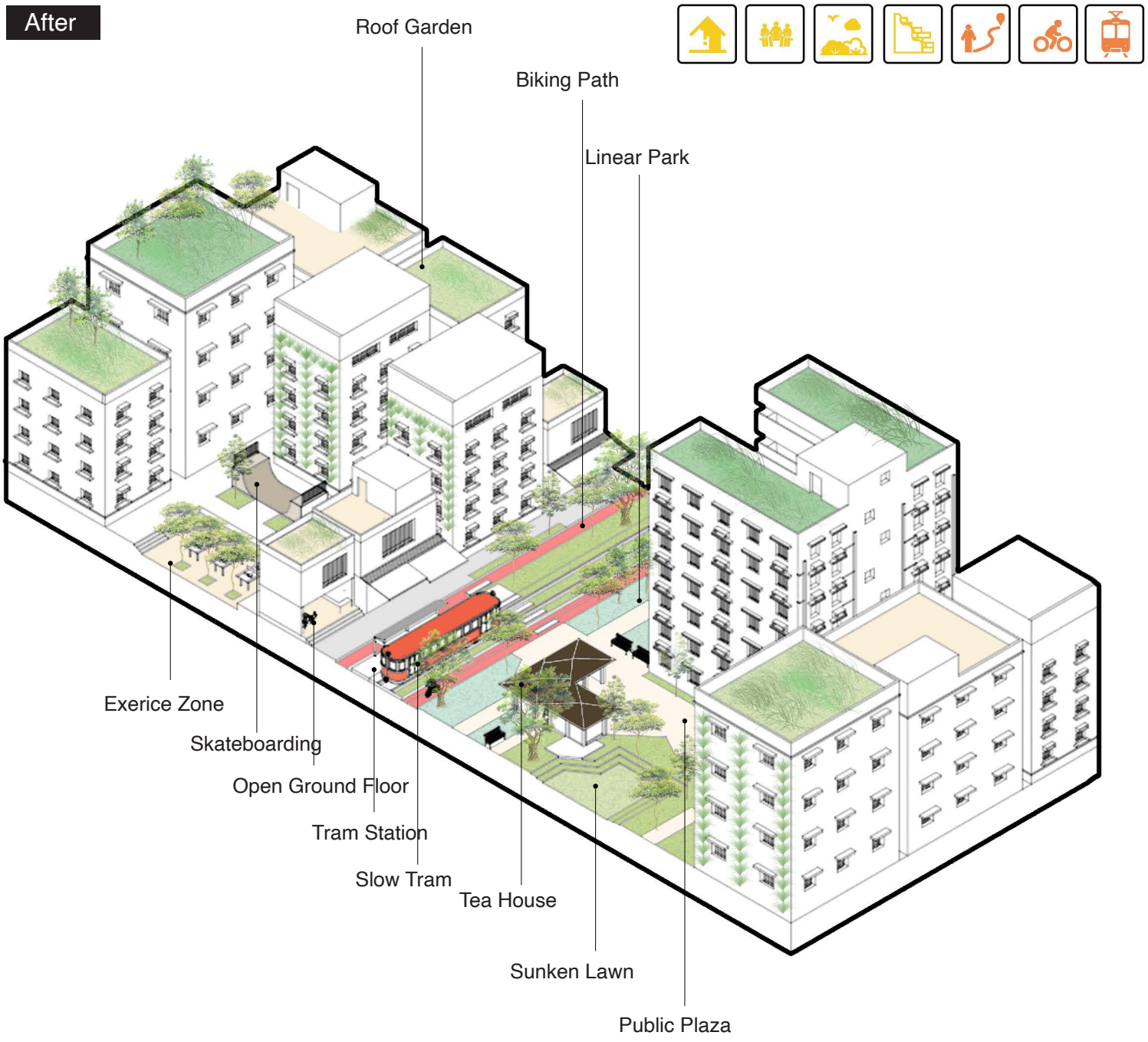
5.3.5.1 Design Intervention - Ecological Route

There is the slow tram and greenway system, linear park instead of the existing mix traffic network. The physical wall is removed to reconnect the communities on both sides and parking lot is transformed into public spaces with multiple uses, such as public plaza and open lawn that can store water in a rainy season.

The ground floor of the retail store is open along the street for public to build connection between the inner and outer space. By demolishing certain buildings in the dense urban village area, more public spaces can be created inside for social gathering.



After


Roof Garden
Biking Path
Linear Park
Exerice Zone
Skateboarding
Open Ground Floor
Tram Station
Slow Tram
Tea House
Sunken Lawn
Public Plaza

5.3 SPATIAL DESIGN

5.3.5.1 Design Intervention - Ecological Route

Community Garden

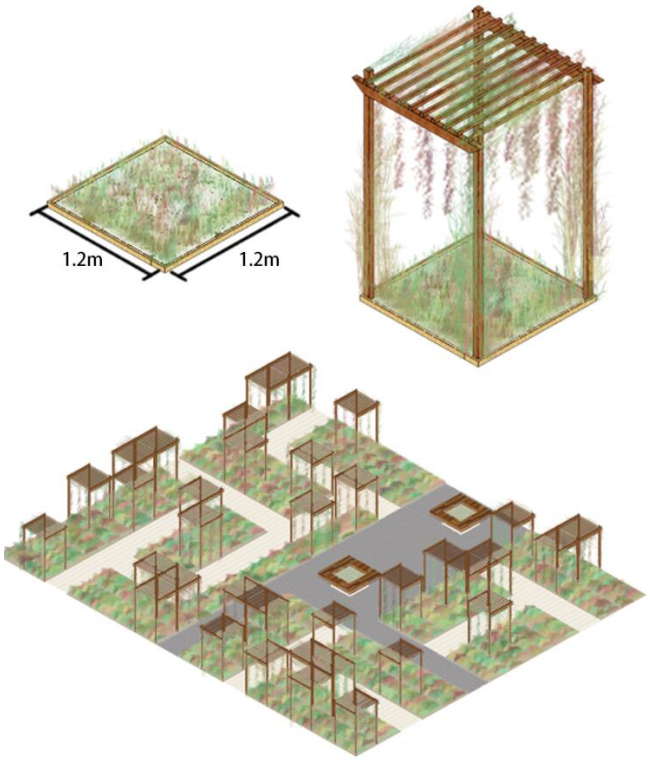

retail store
Linear park
public plaza

5.3 SPATIAL DESIGN

5.3.5.1 Design Intervention - Ecological Route

Urban Farming Area

The urban farm adopts modular planting method. Each person can come to the site by appointment with a planting grid of 1.2mx1.2m for free planting. They can choose to add arbor and plant climbing vegetables and fruits. In this case, it can provide places for social interaction to integrate different social groups.



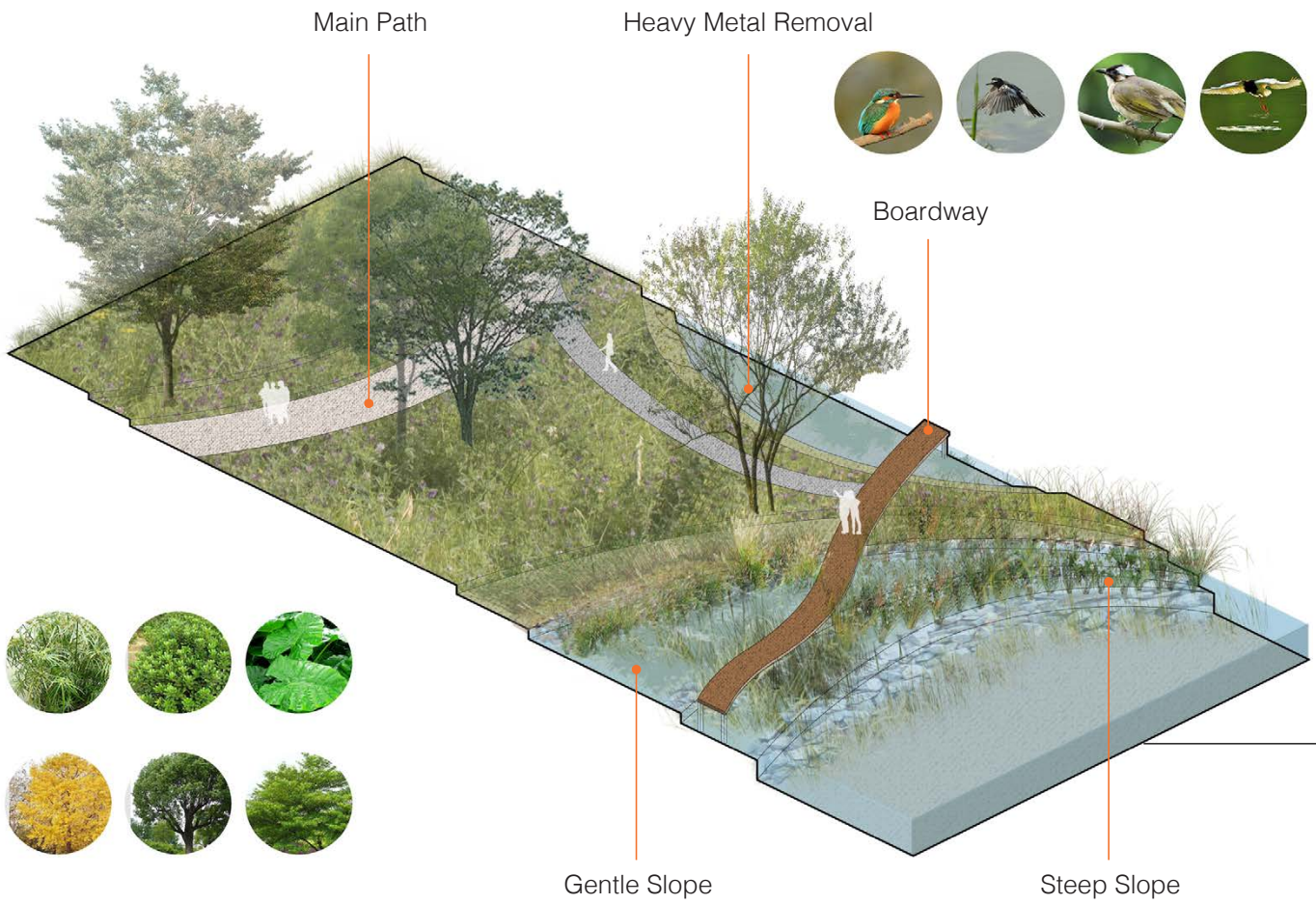
5.3 SPATIAL DESIGN

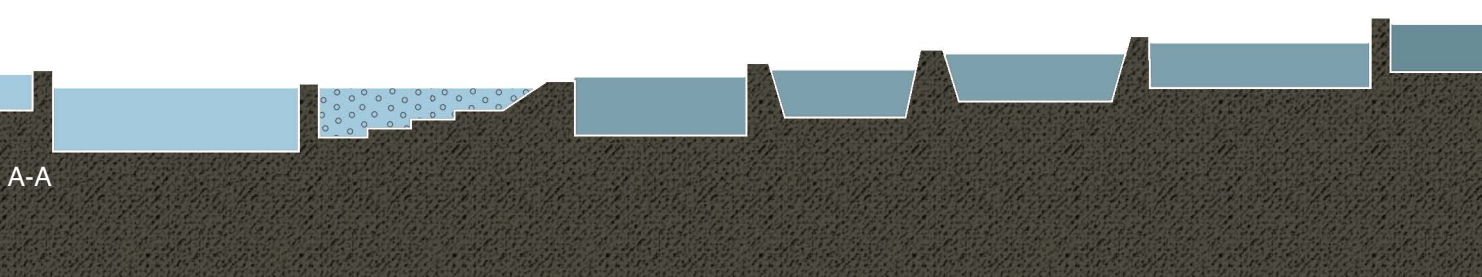
5.3.5.1 Design Intervention - Ecological Route

Purification Park

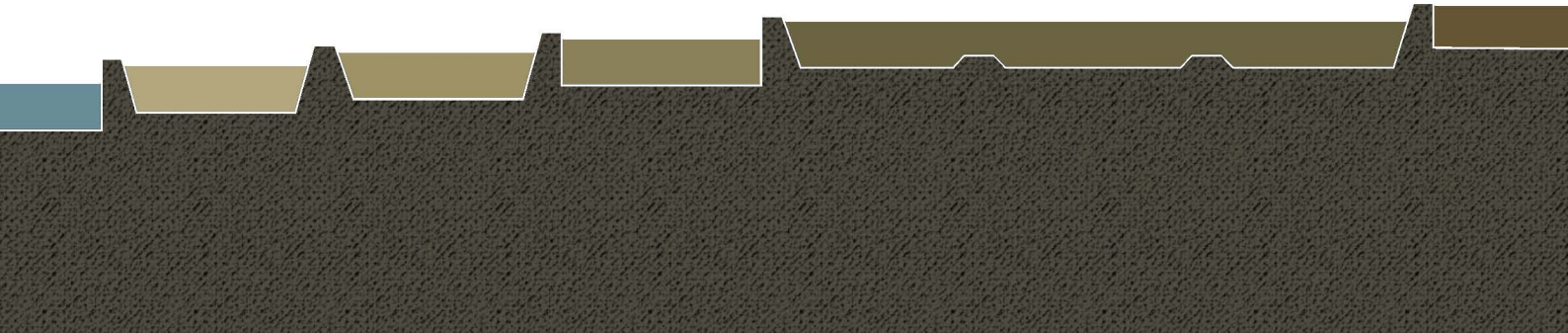
Several ponds constructed in the purification park are created in different level by using different vegetation to purify water from the urban area. These ponds woould have different impacts including absorbing pollutants, filtration, removing nutrient, stablization.

The whole purification park can be served for the residents from urban village and modern community. Some boardways are created crossing the ponds for people to enjoy the view.





Removal | Bio-Purification | Heavy Metal Removal | Subsurface Filtration | Bio-Purification

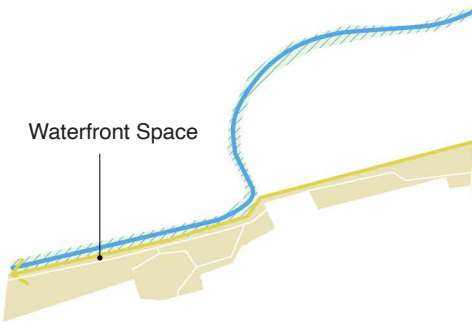


5.3 SPATIAL DESIGN

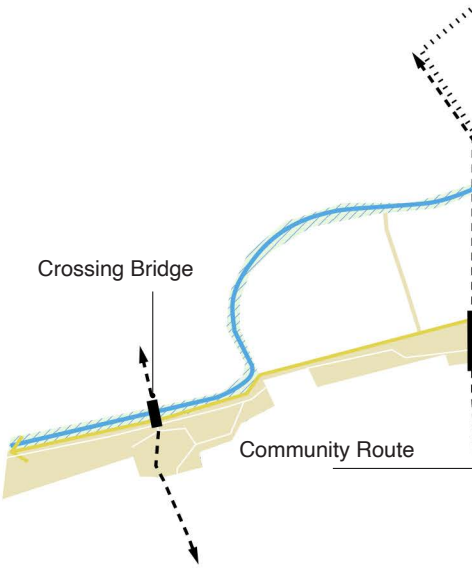
5.3.5.2 Design Intervention - Active Route

Secondly, it is the active route in the horizontal direction arossing the site to integrate the commercial hub and living hub. The existing canal is extended to reconnect to the canal on the west side. Concerning about the ecological value, resilient landscape at the waterfront space is created that can not only support biodiverisy but also offer a recreation area for residents. Some buildings in bad quality are demolished to create new open community along the canal. Also, by improving and transforming the factories, the industrial area could be a positive and vital place for people.

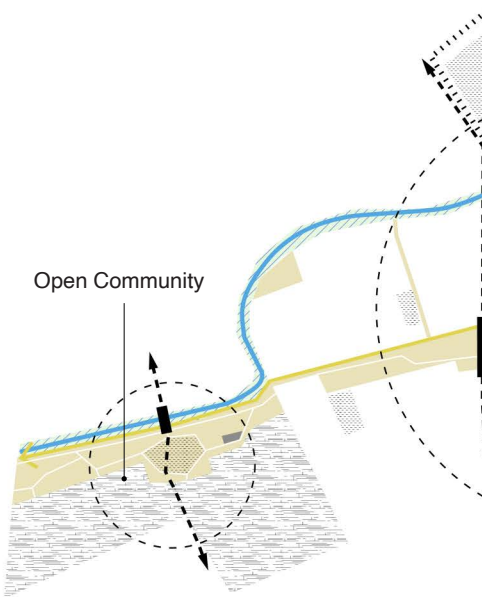
Active Corridor

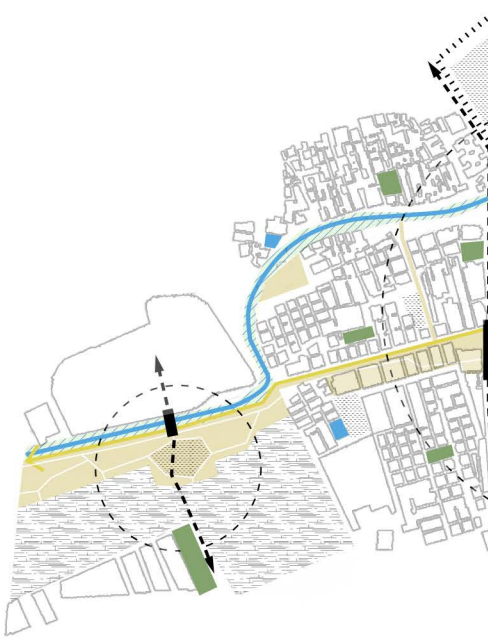


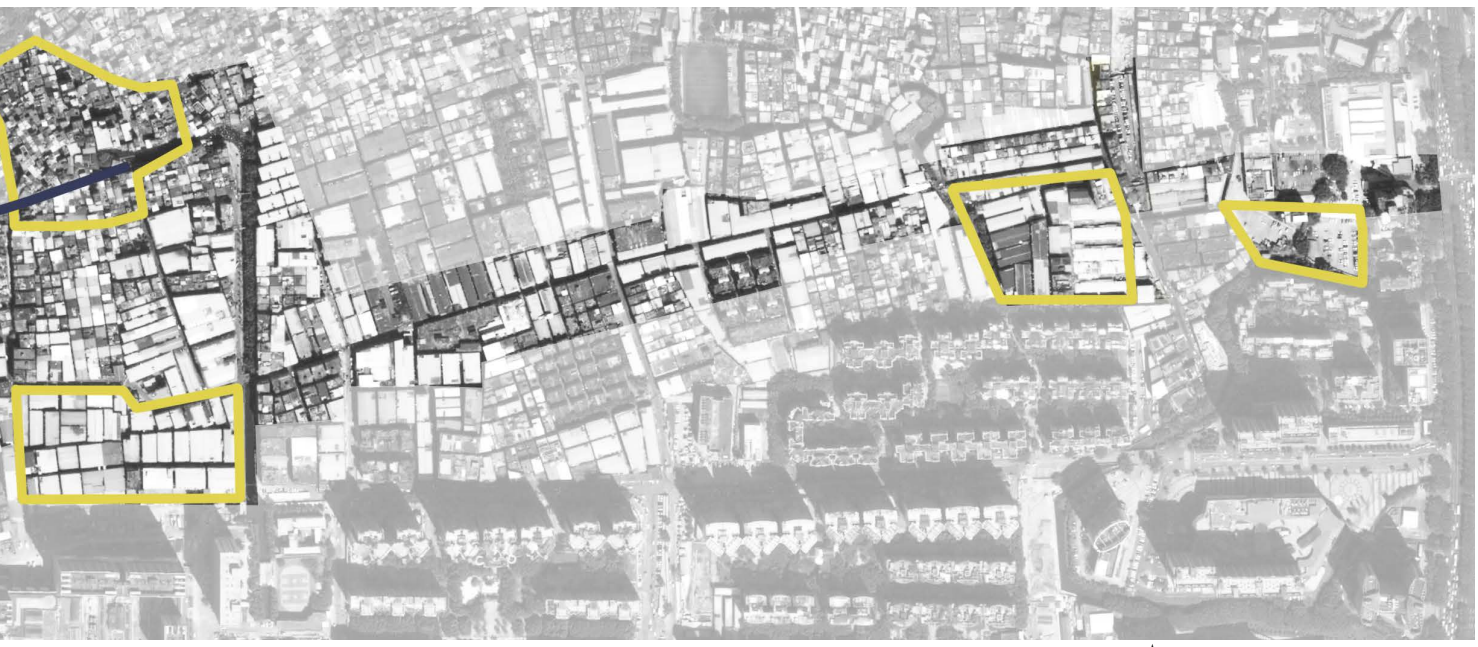
Active Corridor + Transversal Corrido

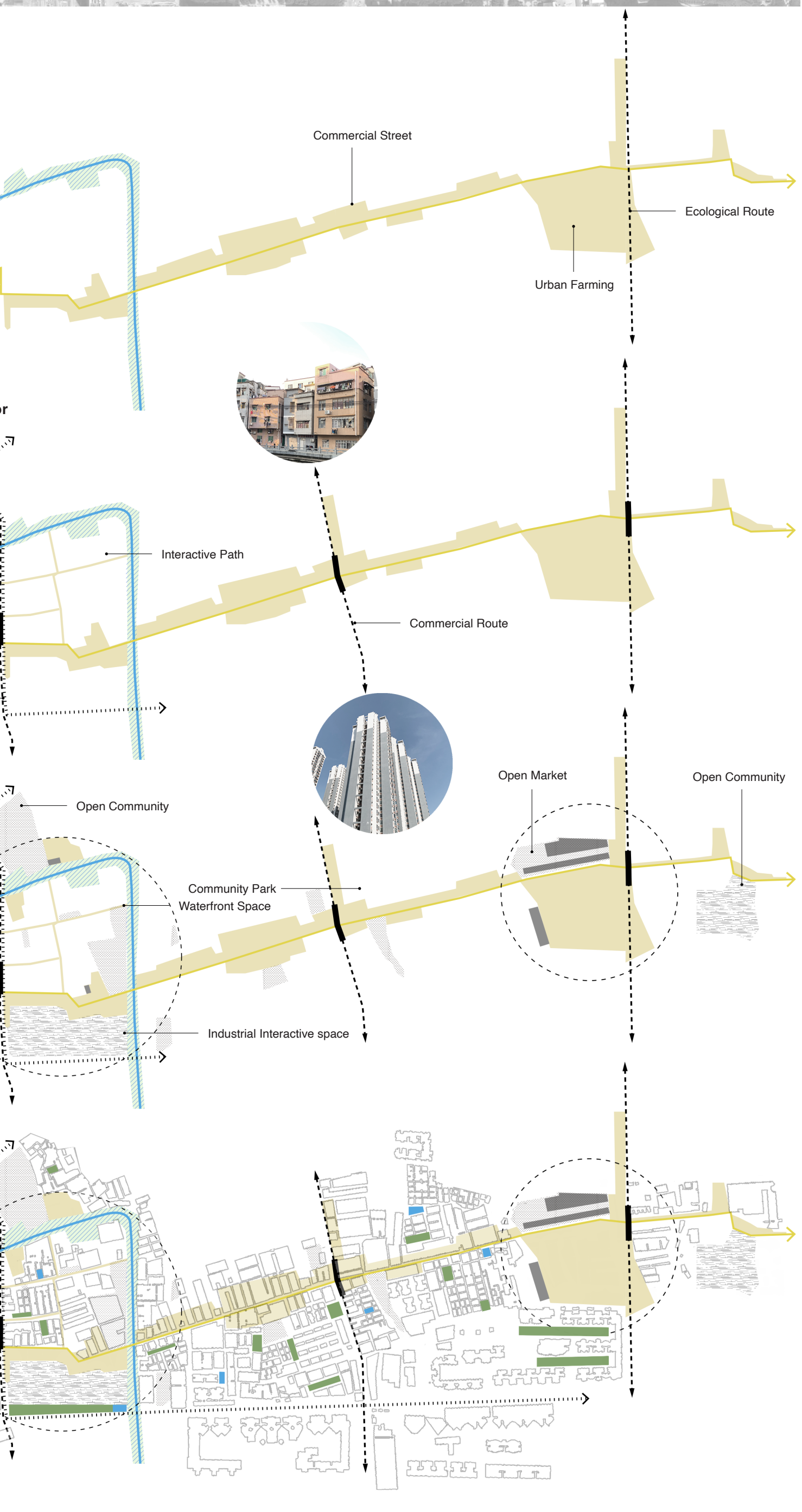


Corridor System + Nodal System





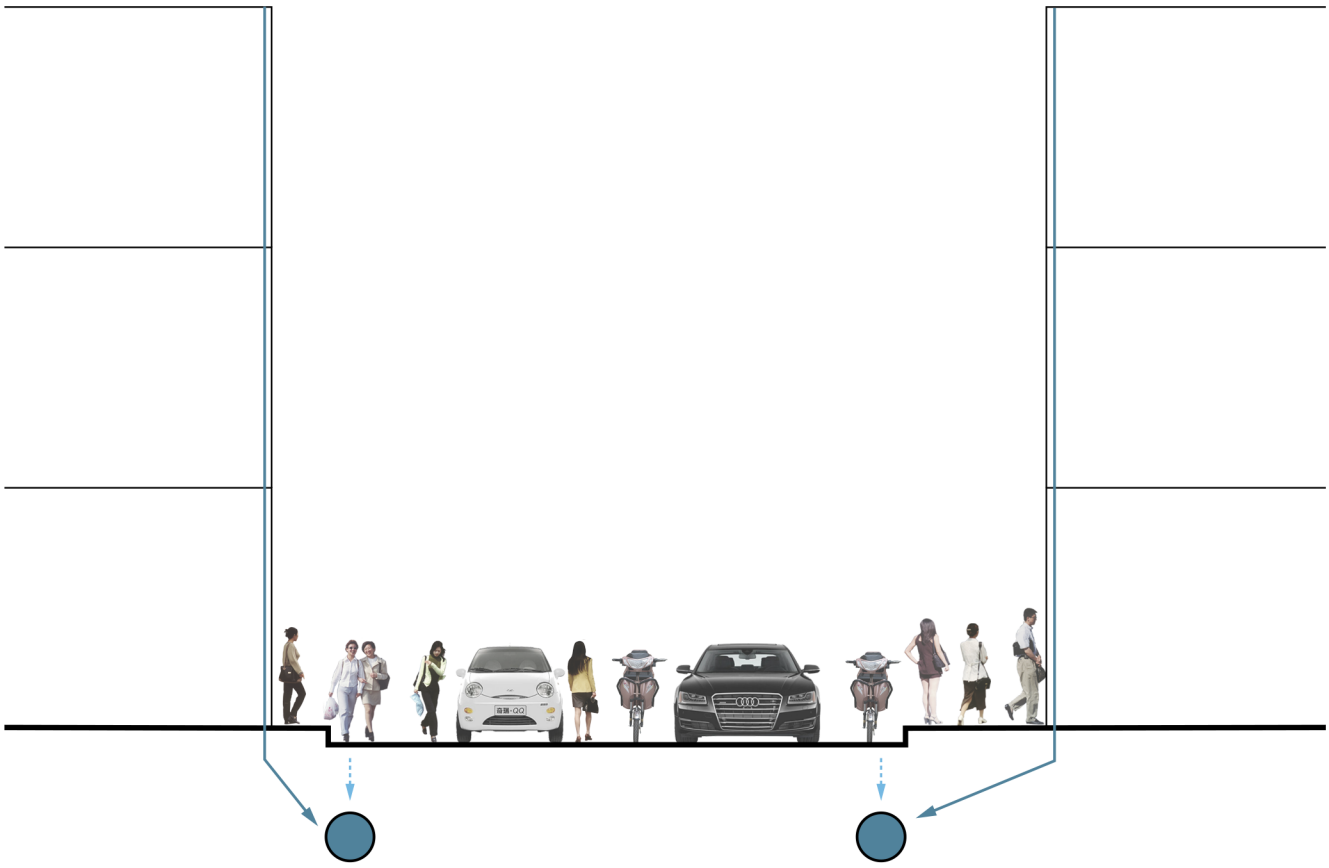


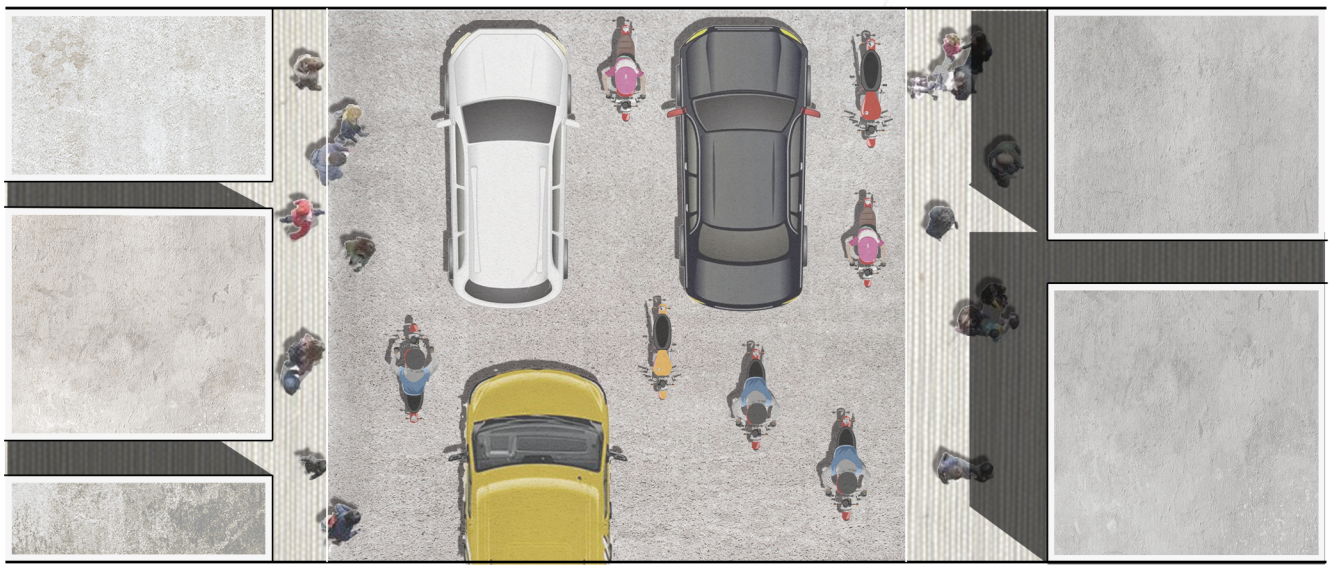

Commercial Street
Ecological Route
Urban Farming
Interactive Path
Commercial Route
Open Community
Open Market
Open Community
Community Park
Waterfront Space
Industrial Interactive space

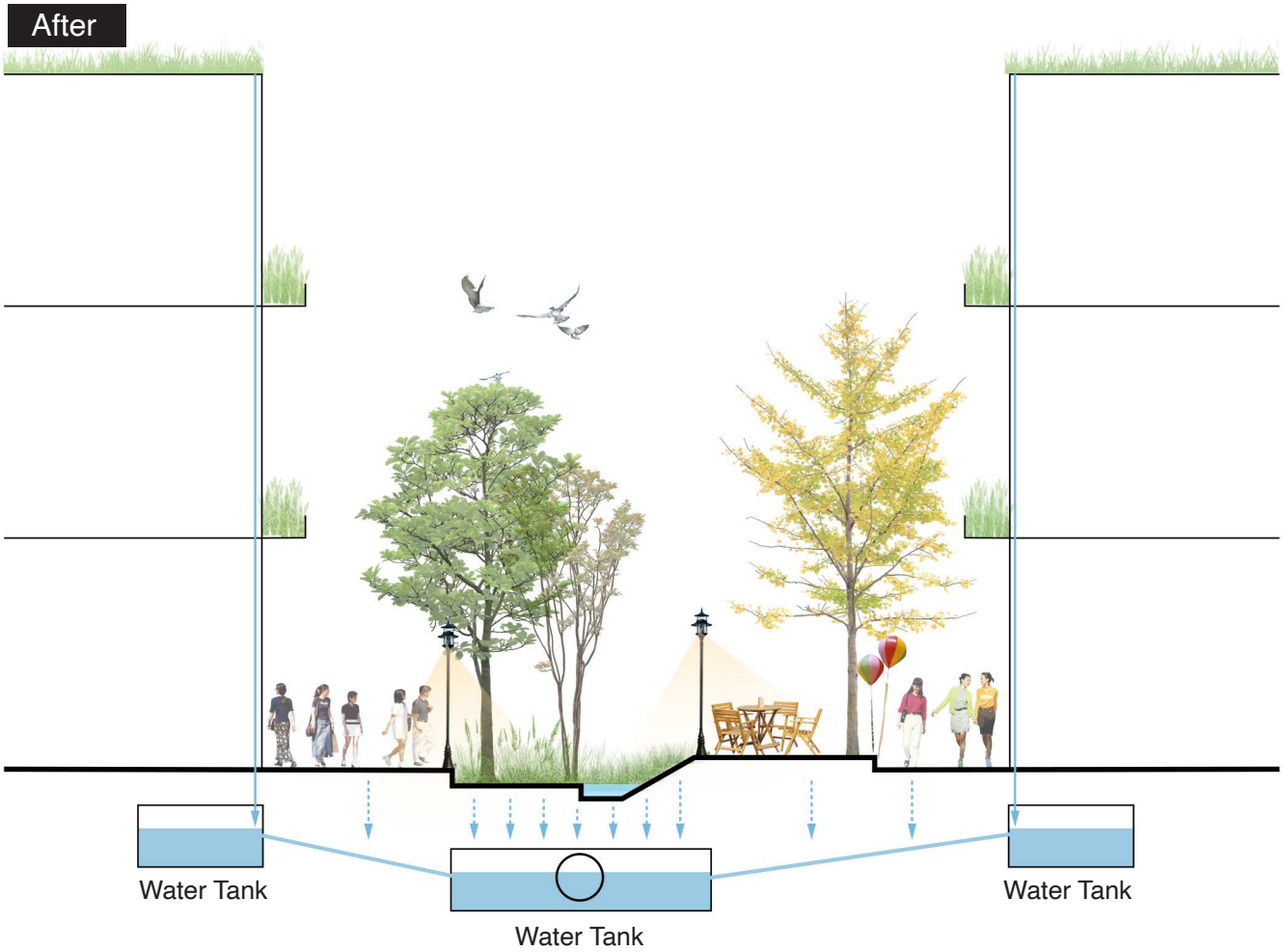
5.3 SPATIAL DESIGN

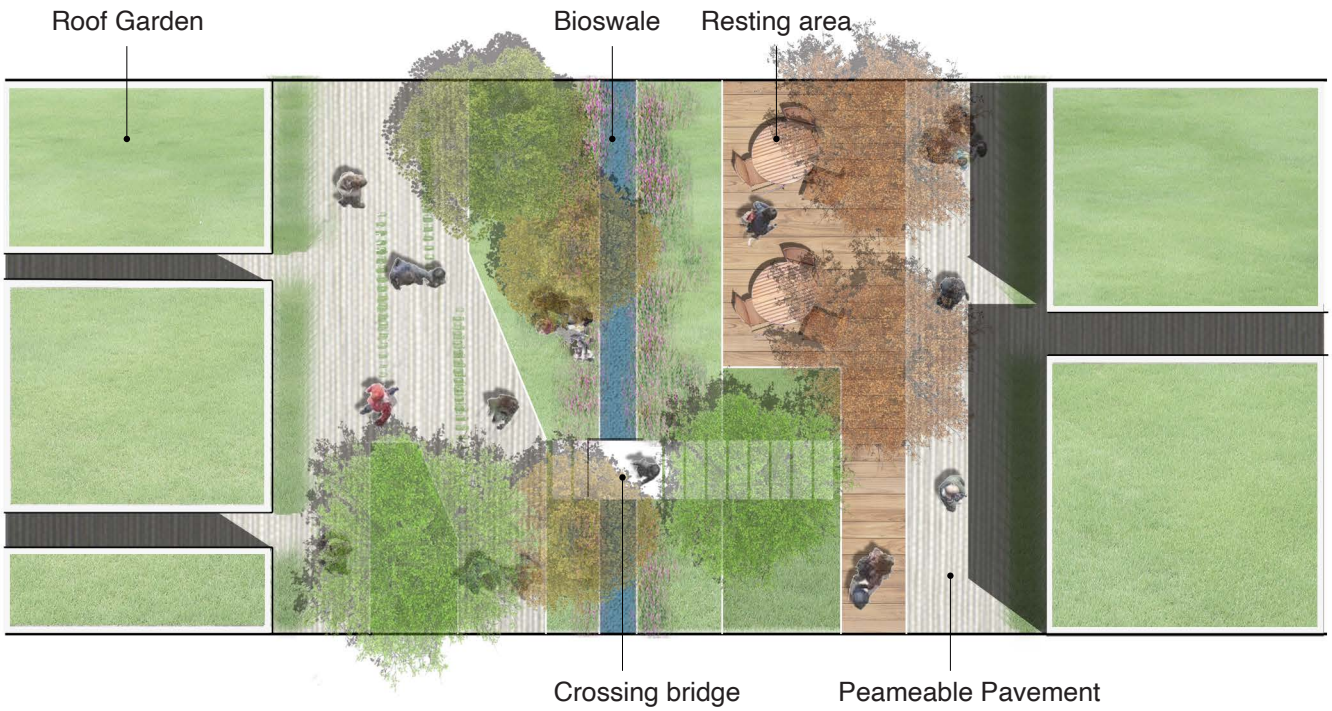
5.3.5.2 Design Intervention - Active Route

Before





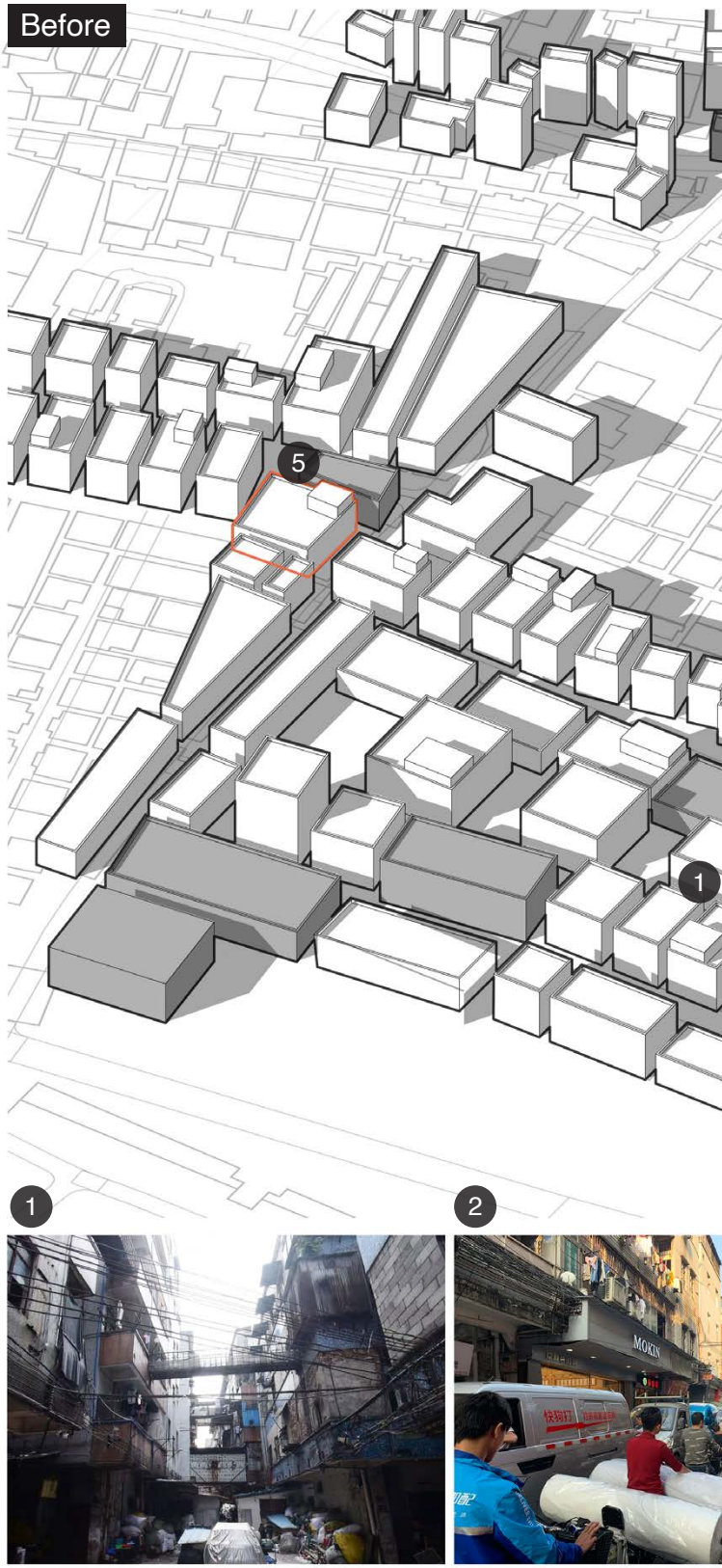

After
Water Tank
Water Tank
Water Tank

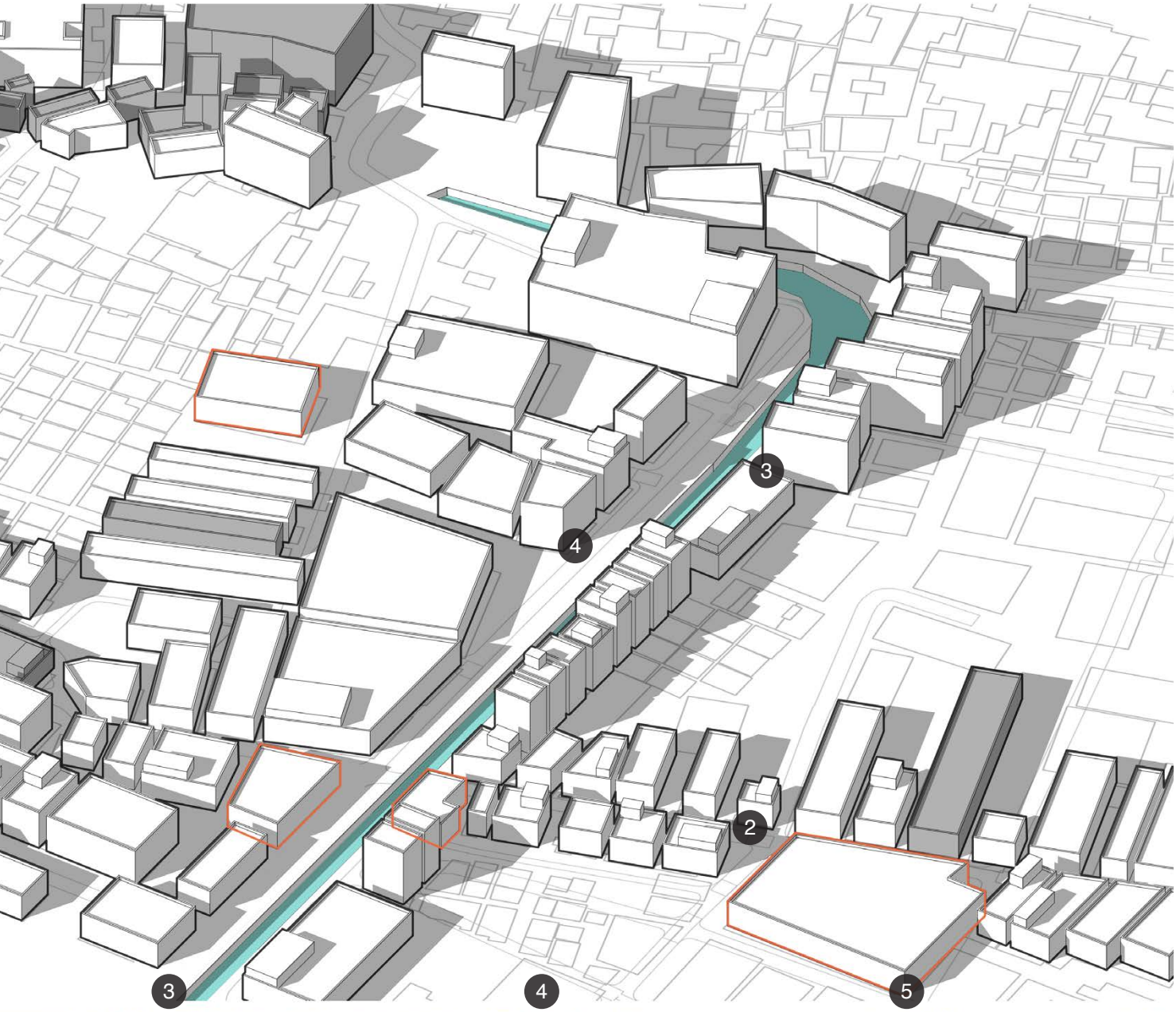

Roof Garden
Bioswale
Resting area
Crossing bridge
Peameable Pavement

5.3 SPATIAL DESIGN

5.3.5.2 Design Intervention - Active Route

One of the nodes along the active route in the middle of the site is being further elaborated. The site here is complex with different functions, residential settlements, commercial stores, industrial factories and some public facilities. The main road in the urban village is mix with pedestrian, cars and motor bikes. The existing canal is truncated, along which the spaces lack of vitality with low ecological qulaity. Besides, the current industrial factories have negative influences contributing to the whole urban village, such as waste, sound pollution.

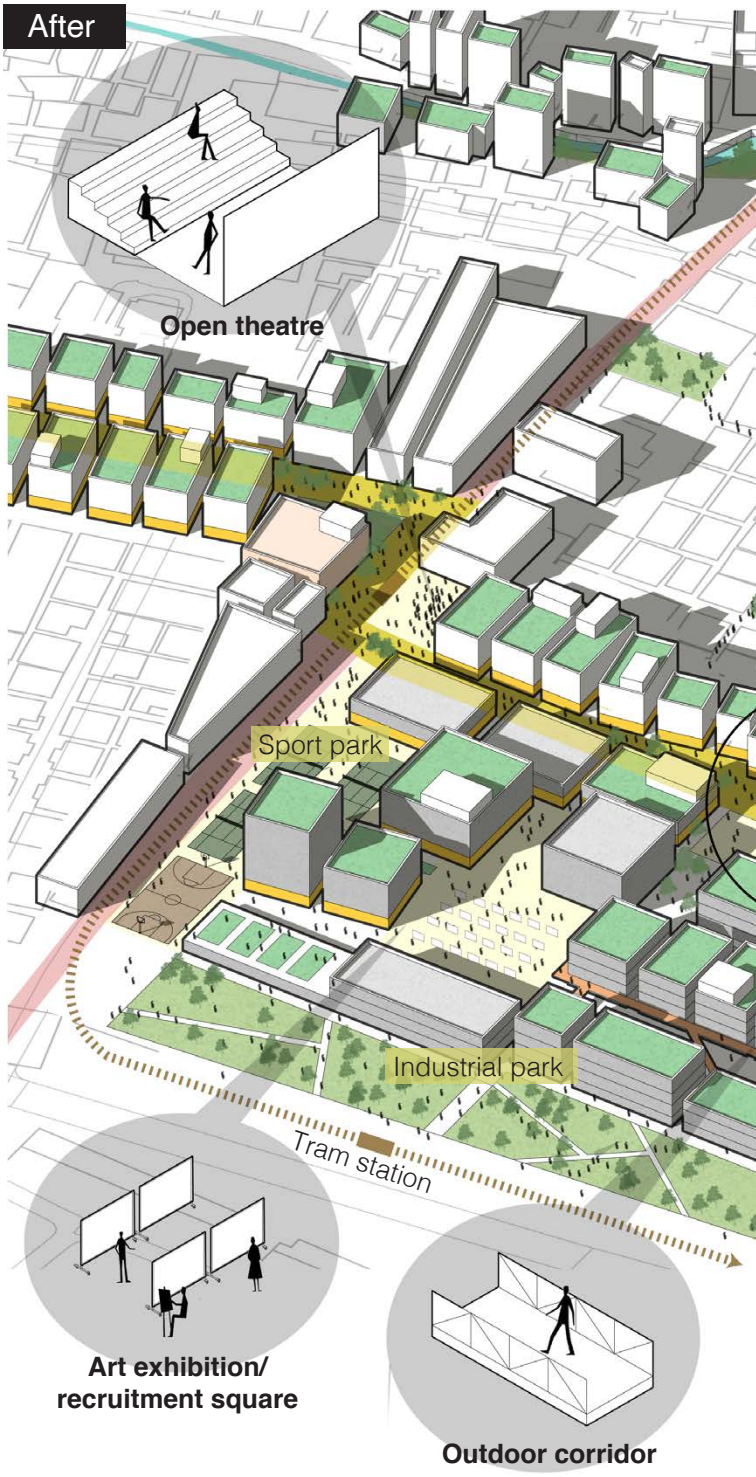


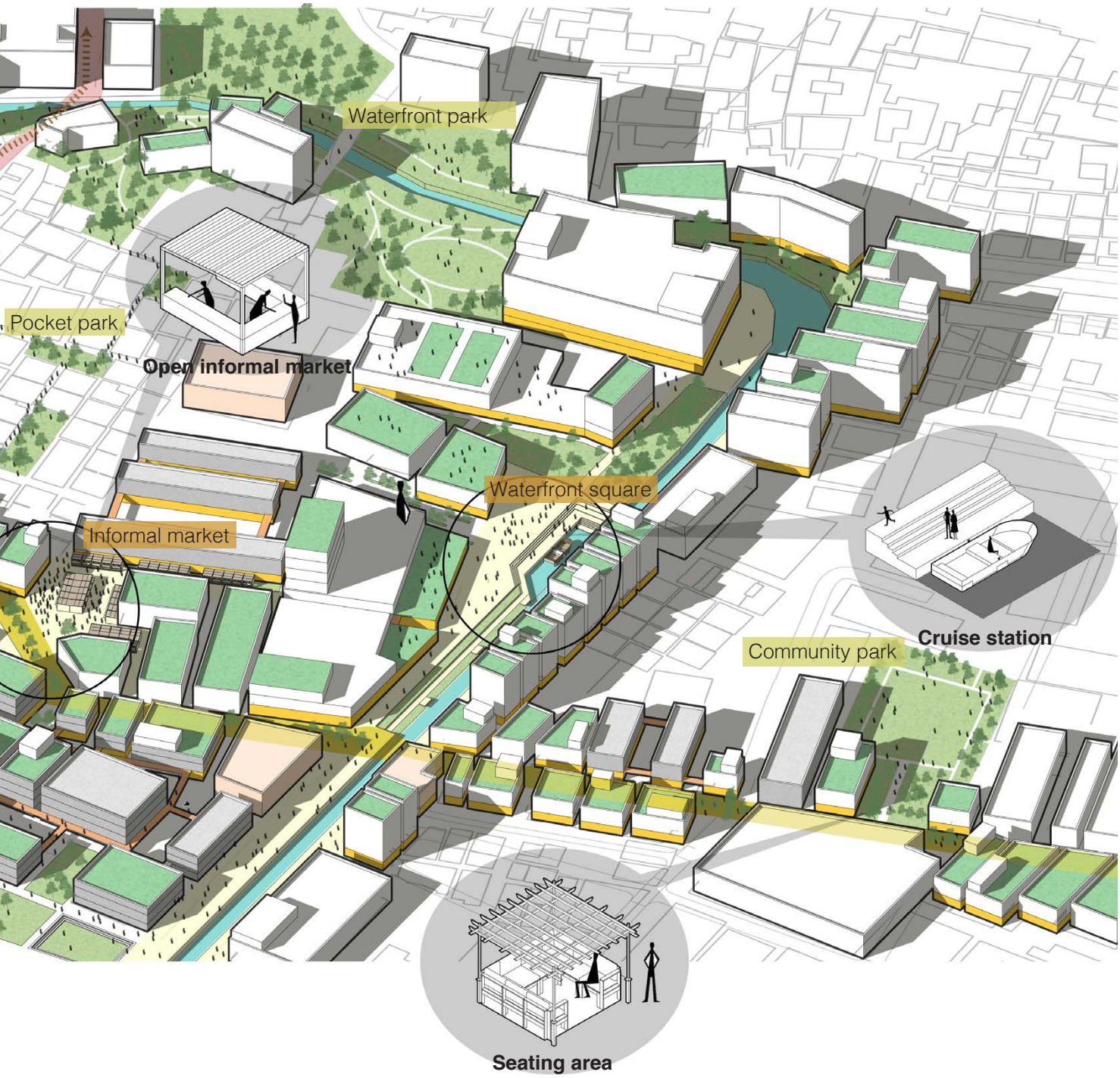

3
4
2
3
4
5

5.3 SPATIAL DESIGN

5.3.5.2 Design Intervention - Active Route

A series of interventions are implemented to activate this site by applying different design strategies. For example, the industrial area is transformed into a more inclusive and creative space with sufficient public spaces, such as the recruitment square, and sport park, and the buildings are connected by outdoor corridors. Besides, an industrial park is created in the south part with good accessibility to the tram station. Extending the existing canal offers more room for water and livable waterfront area along the canal can be created on the north part in terms of some waterfront parks with both social and ecological values. Besides, there are some pocket parks and community park inside the neighborhood restoring the missing ecology in the urban area and serving for the residents with social and ecological facilities, such as some seating area. Furthermore, public open spaces along the active route provide certain events like informal market, open theatre and sports that vitalized communities. Waterfront square area and informal market area will be explored in details in the next part.



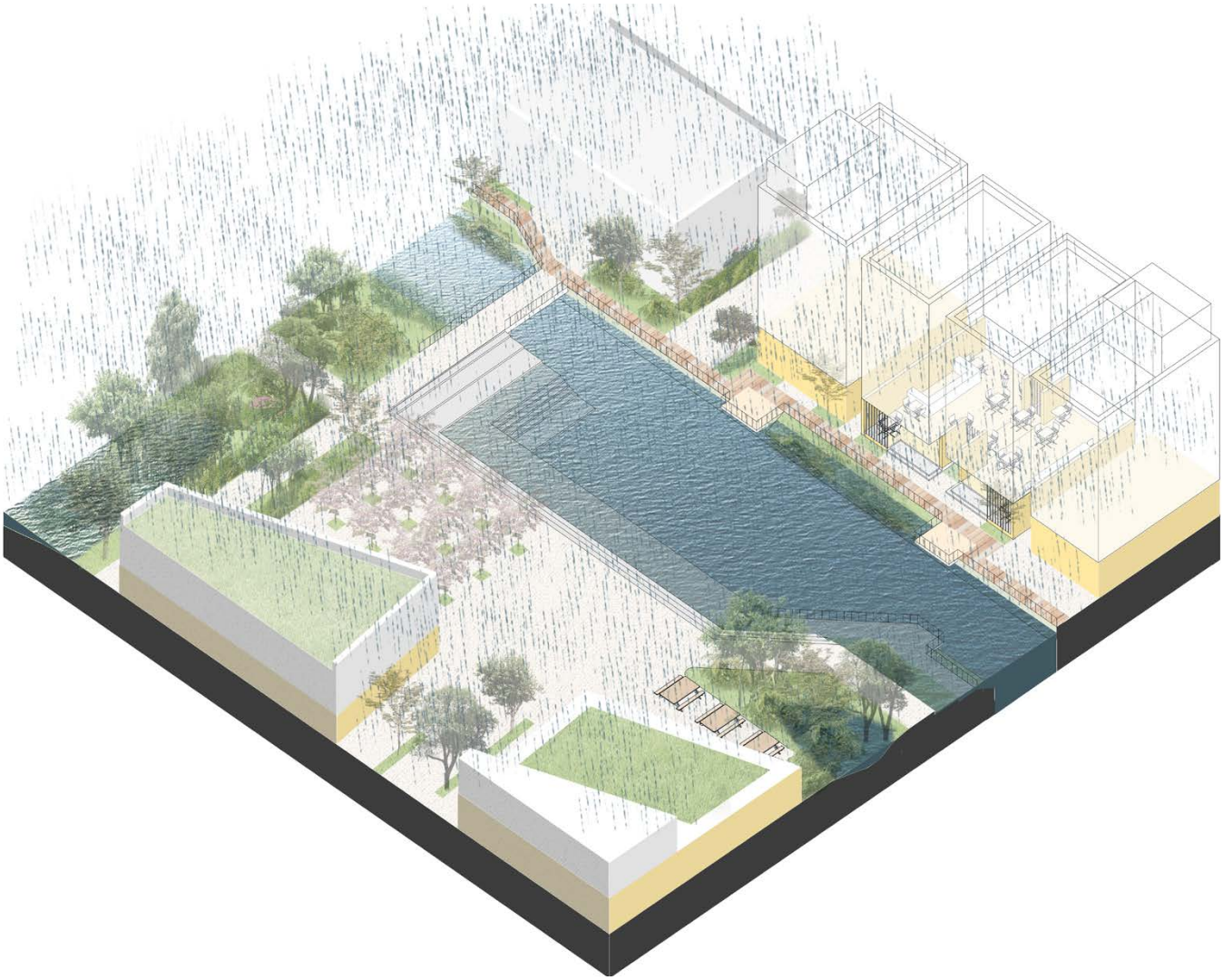

Waterfront park
Pocket park
Open informal market
Waterfront square
Informal market
Cruise station
Community park
Seating area

5.3 SPATIAL DESIGN

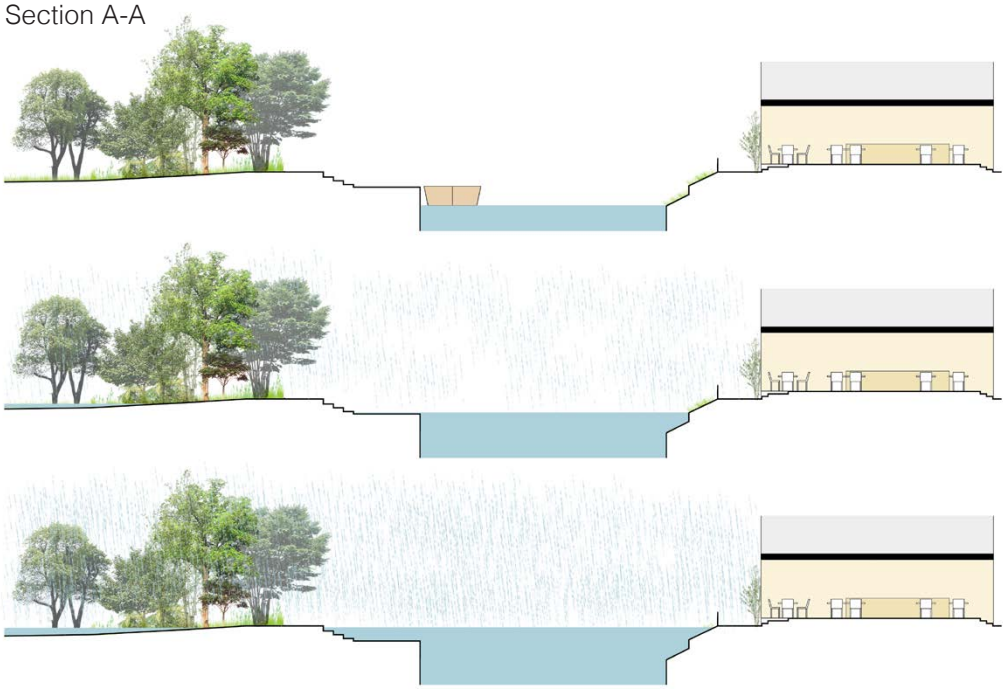
5.3.5.2 Design Intervention - Active Route

There will be a livable waterfront corridor along the canal, with a cruise station providing a way of public transport on water. For social aspect, viewing platforms on each side offer different view acorss the canal. The ground floor space on the east side is open for connecting inner space in the community while public open space with seating area on the west side provide people with leisure and entertainment. For ecological aspect, soft edge along the canal and rain gardens are considered to restore the ecology in the community. Also, roof garden is implemented to collect the runoff and reduce the urban heat.

When there is a rainy season, the multifunctional waterfront area with the soft edge and stairs as well as the retention basins are capble of storing water. Therefore, the intervention here tries to reestablish the relationship between water and people by using water as a corriodr from both social and ecological perspective.



Section A-A



5.3 SPATIAL DESIGN

5.3.5.2 Design Intervention - Active Route

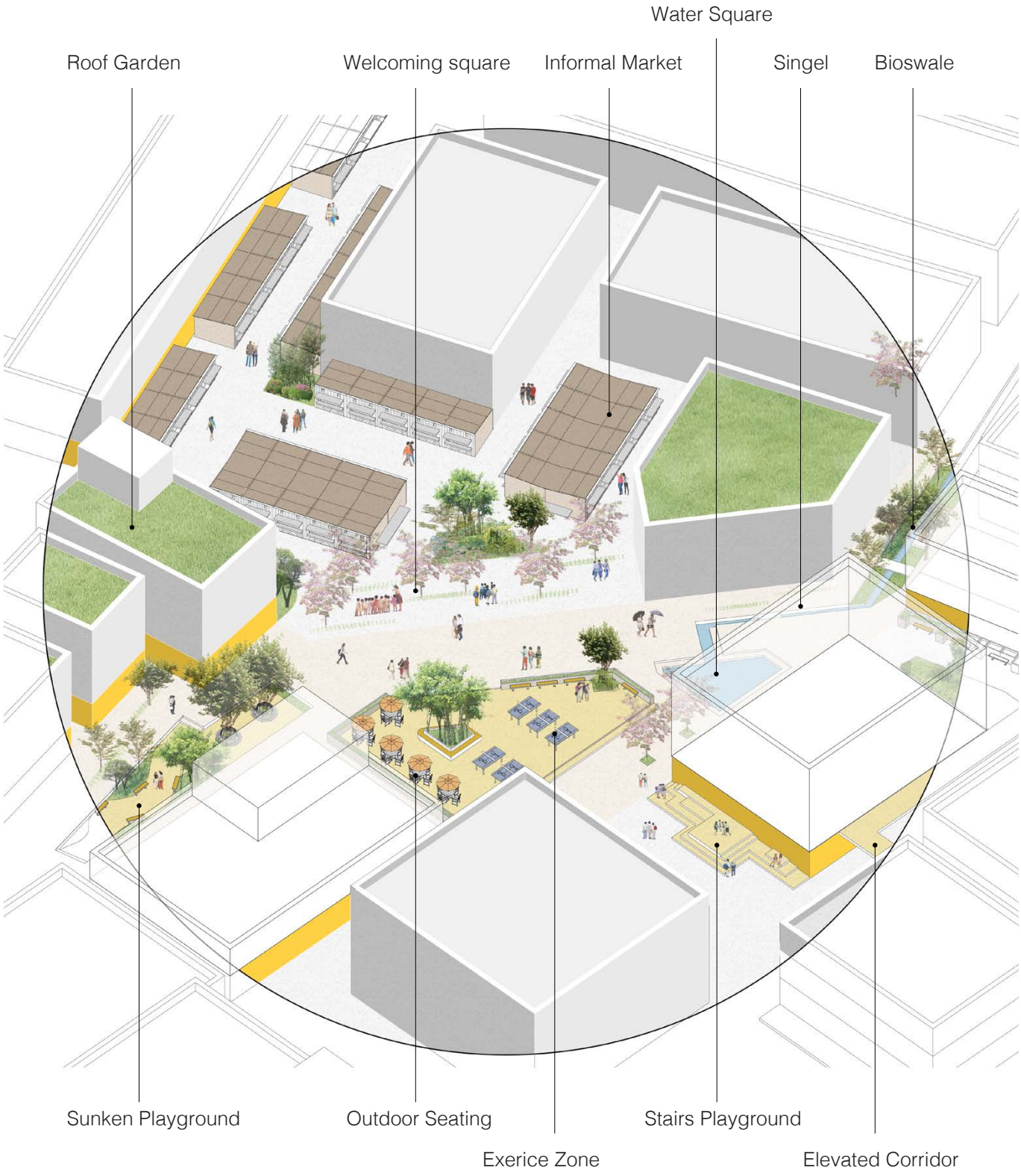
Waterfront area


open ground floor
soft edge
platform
cruise station
public plaza

5.3 SPATIAL DESIGN

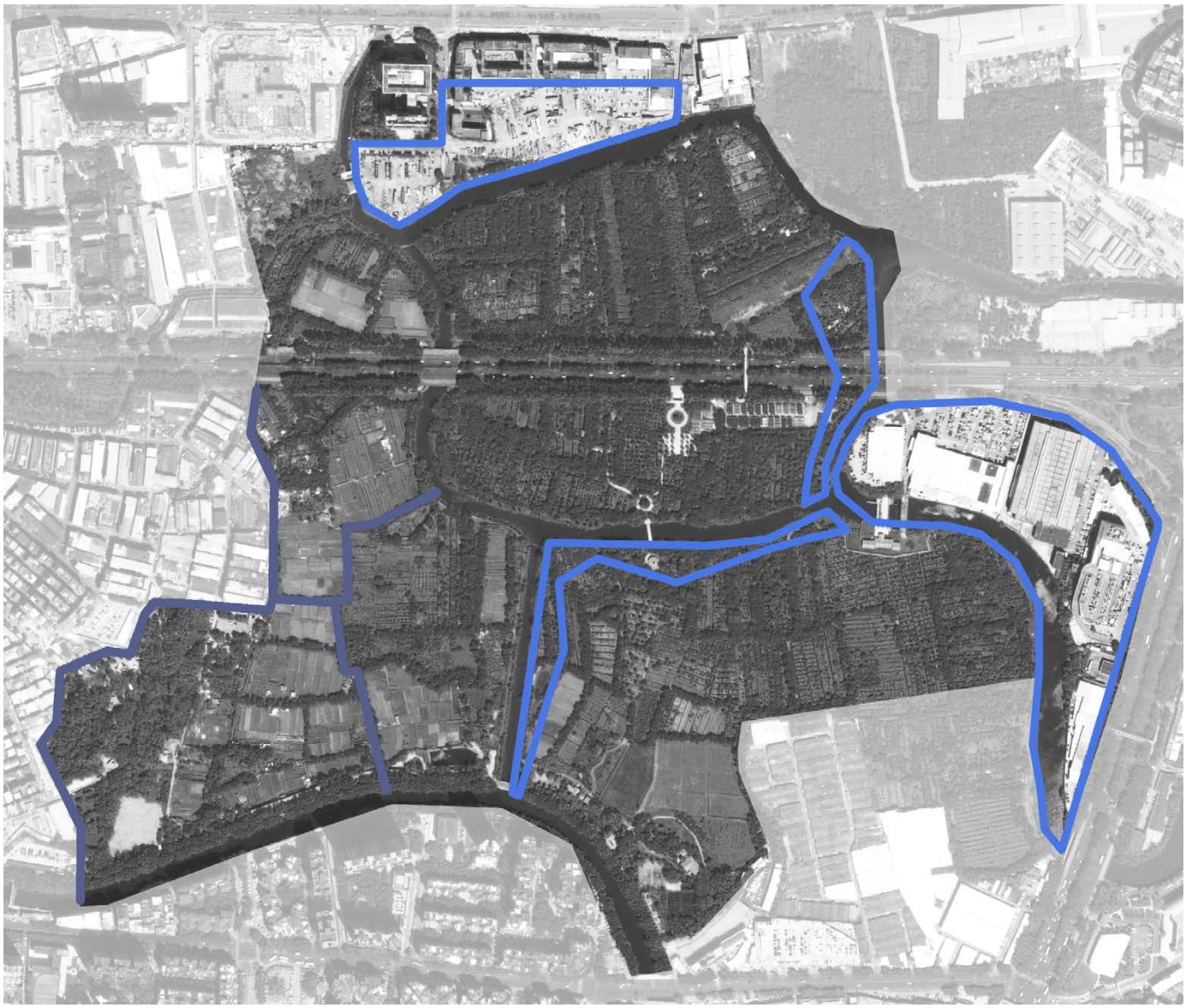
5.3.5.2 Design Intervention - Active Route

Informal market

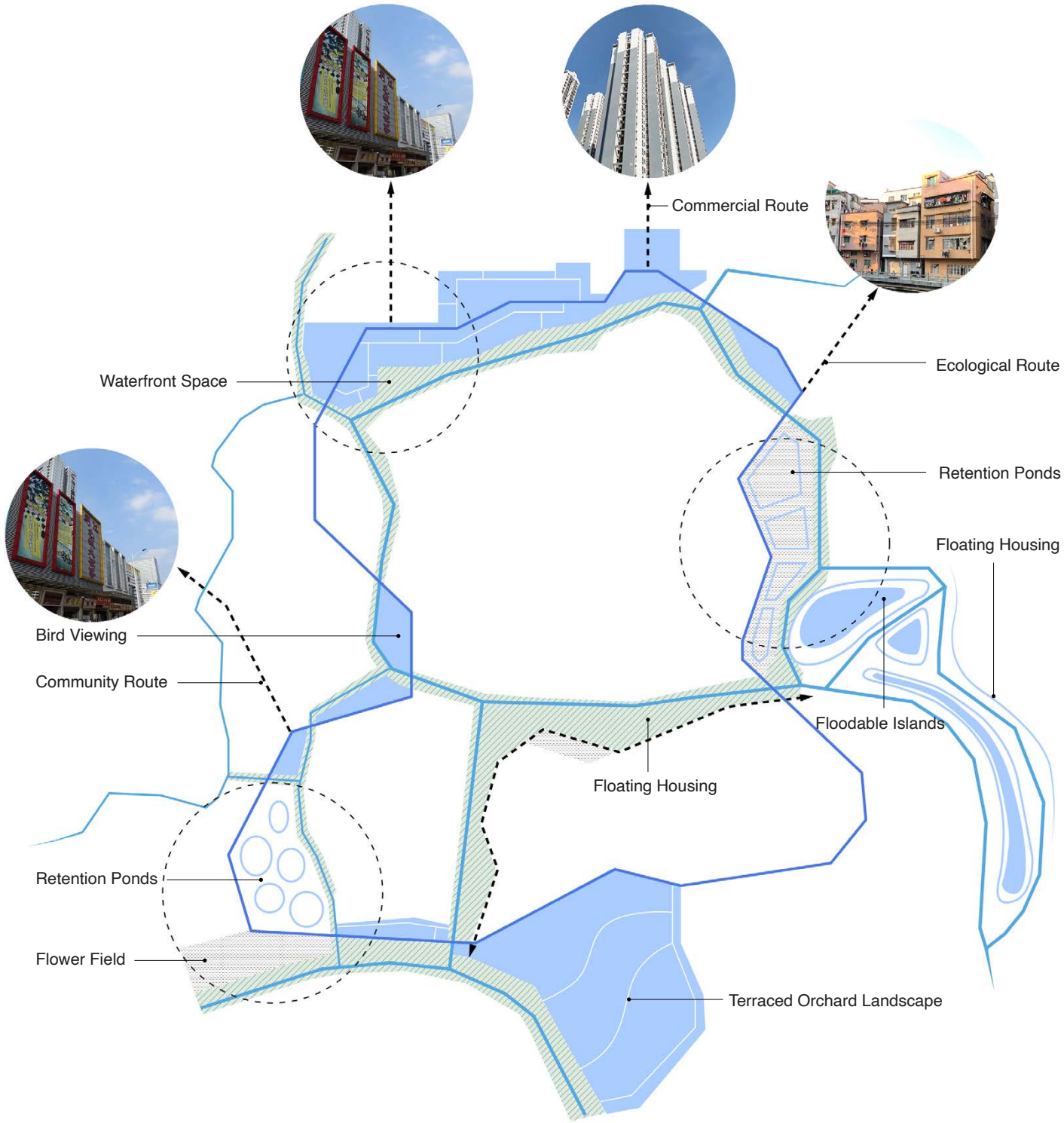


5.3 SPATIAL DESIGN

5.3.5.3 Design Intervention - Orchard Route



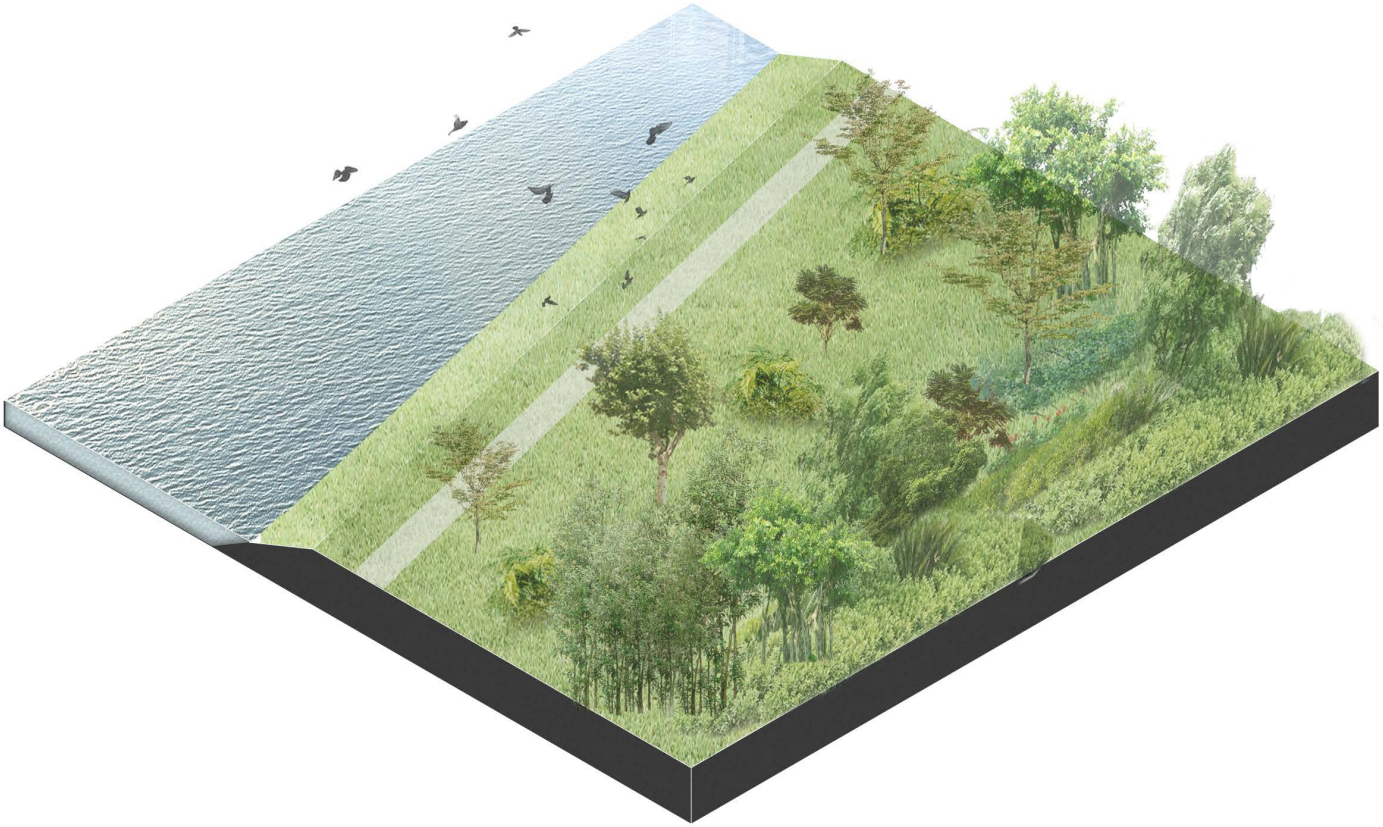
Corridor System + Nodal System



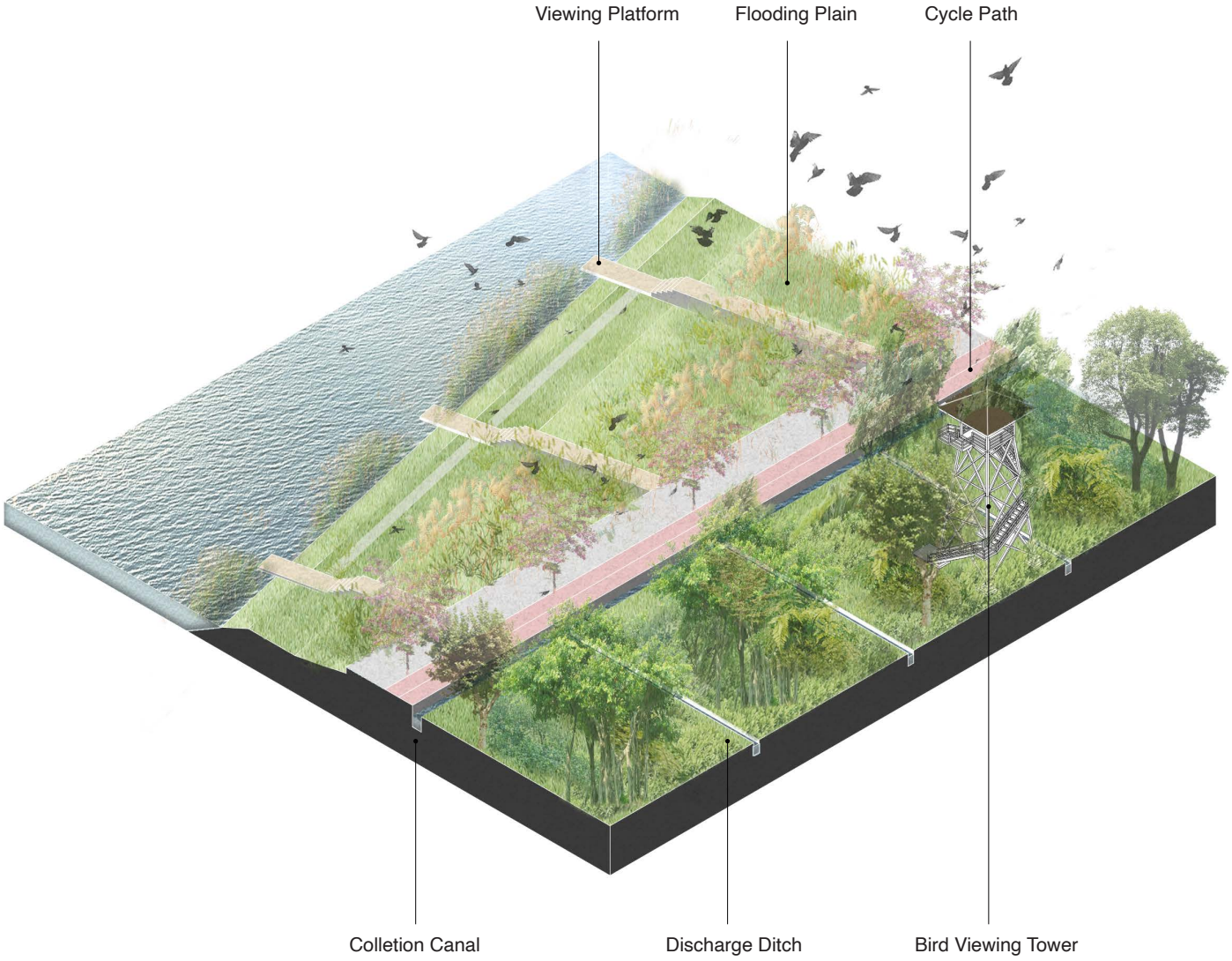
5.3 SPATIAL DESIGN

5.3.5.3 Design Intervention - Orchard Route

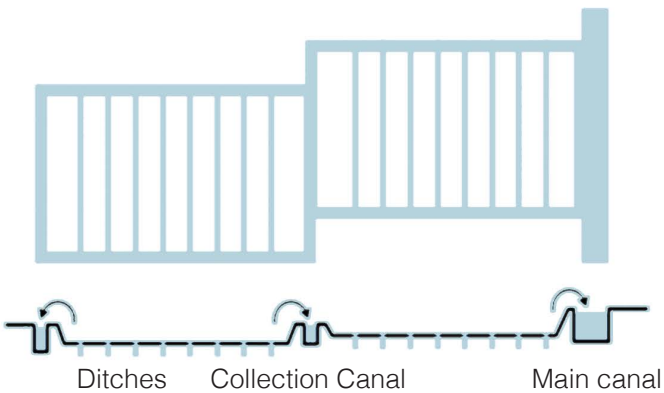
Before



After



Discharge System



The main orchard route is created in a more inner space to provide enough space for flooding. Three platforms stretched out to the canal from the route enable people to have a better contact with the nature. The Brid watching tower offers an opportunity to observe the orchard landscape from unique elevated point. Besides, a new discharge system is implemented for water management in the ecological hub. Ditches collect water from the orchard area and water is pumped to the colletion canal then to the main canal and finally water goes out to the Pearl River.

5.3 SPATIAL DESIGN

5.3.5.3 Design Intervention - Orchard Route

The main canal in the ecological hub can be used for water management and transportation. The retention ponds can create a natural habitat with both ecological and scoial value. When there is a rainy season, the ponds can be flooded to protect the inner orchard area. And different activities can be realized in different seasons.


Nandina domestica


Phragmites communis


Cyperus alternifolius


Pittosporum tobira


Alocasia macrorrhiza


Taxodium distichum

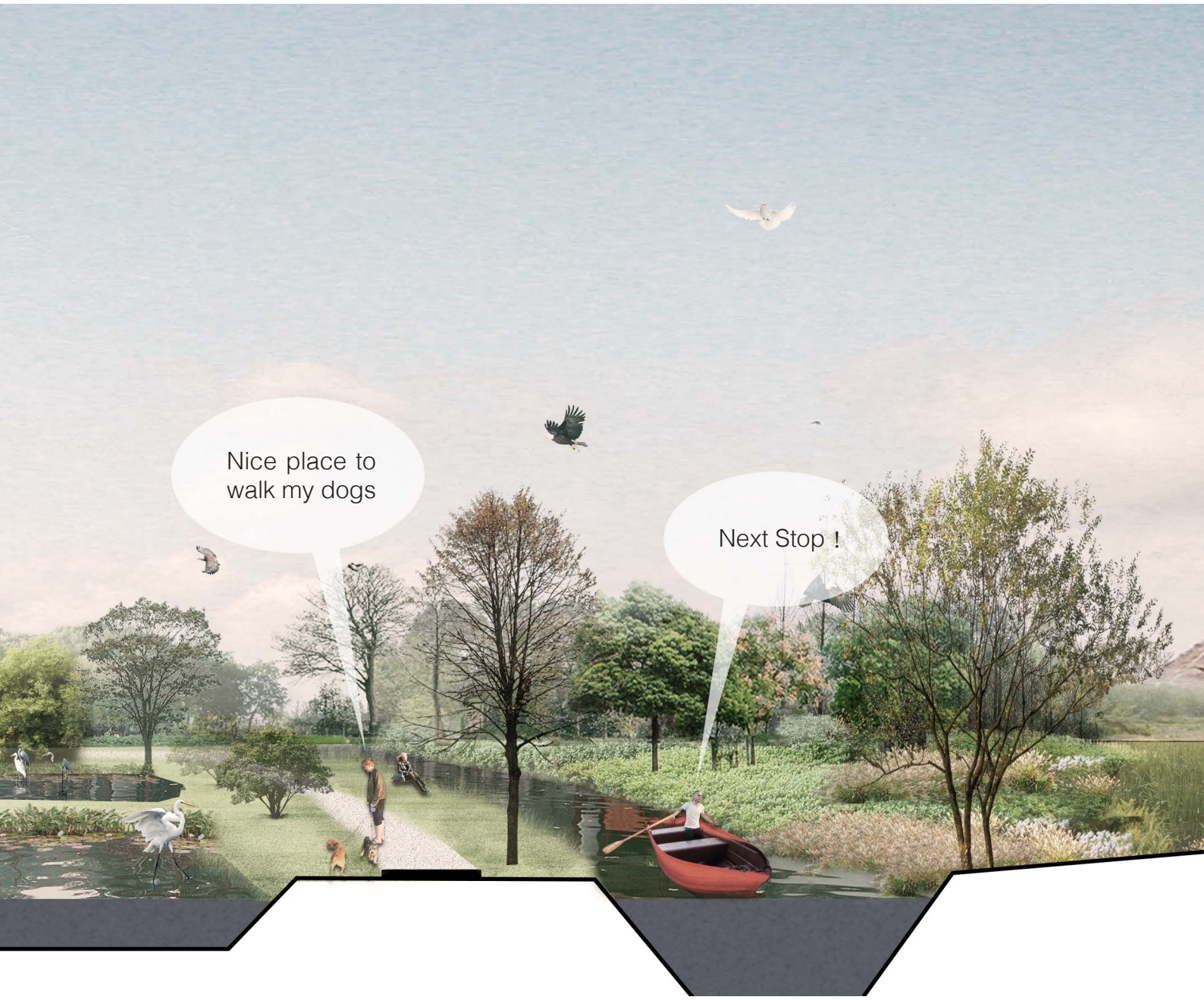

Salix babylonica


Sabina chinensis


Ginkgo biloba

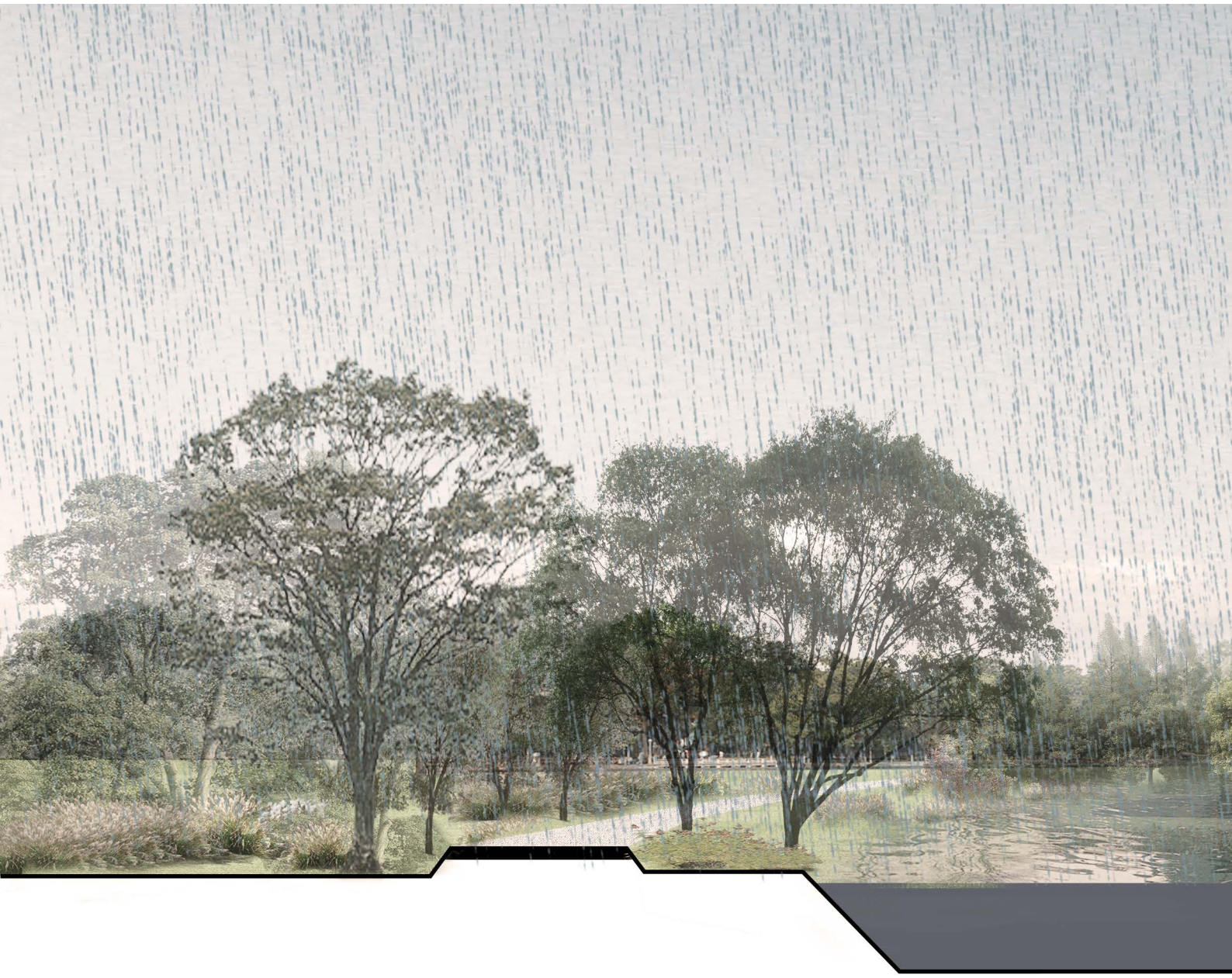

Cinnamomum camphora


Elaeocarpus hainanensis



5.3 SPATIAL DESIGN

5.3.5.3 Design Intervention - Orchard Route

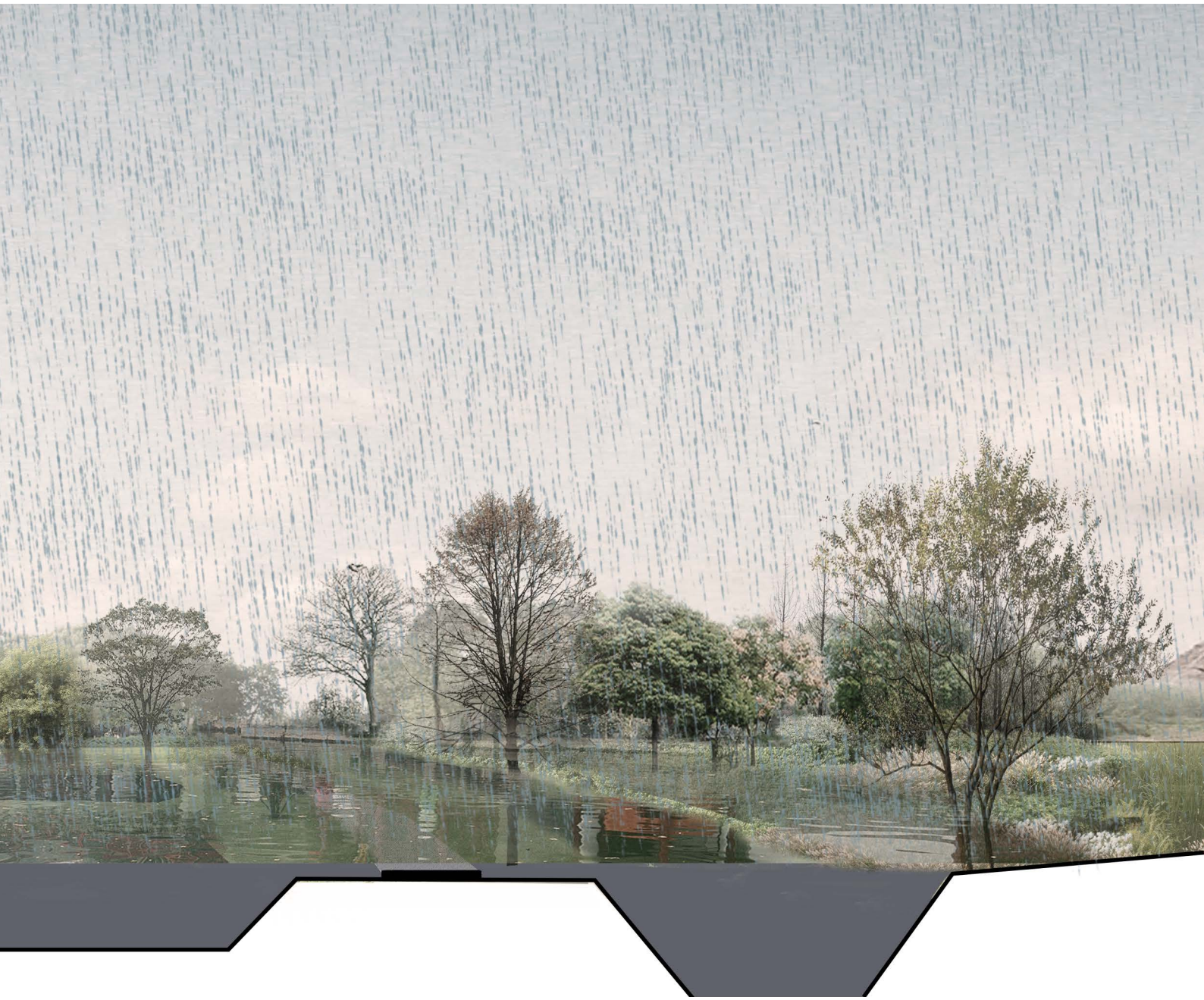


Dry Season

Jogging Dog walking Cycling Cruise Bird Watching Picnic Camping

Rain Season

Running Fishing Swimming Cruise Education



5.3 SPATIAL DESIGN

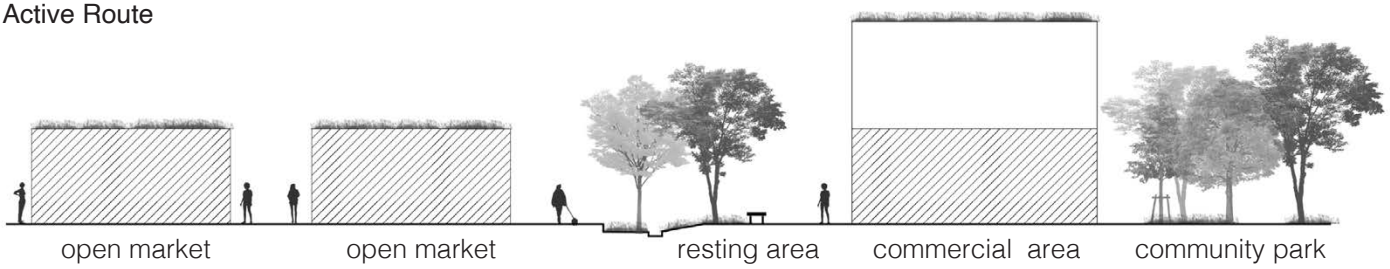
5.3.5.3 Design Intervention - Orchard Route

Retention Ponds Area

5.4 CONCLUSION

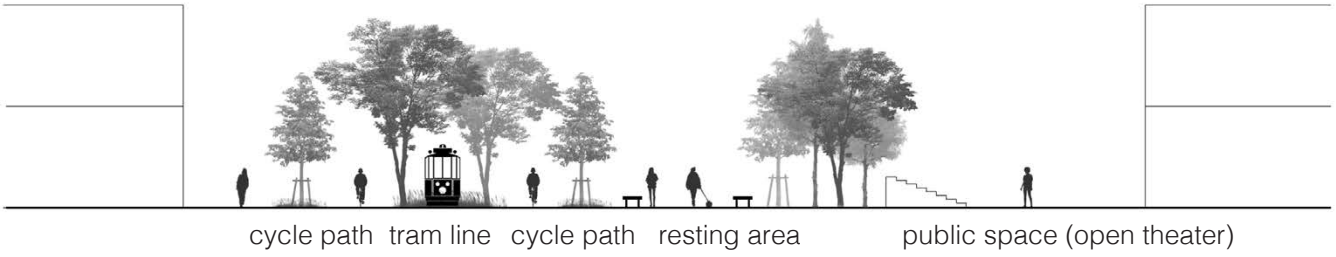
Corridor

Active Route

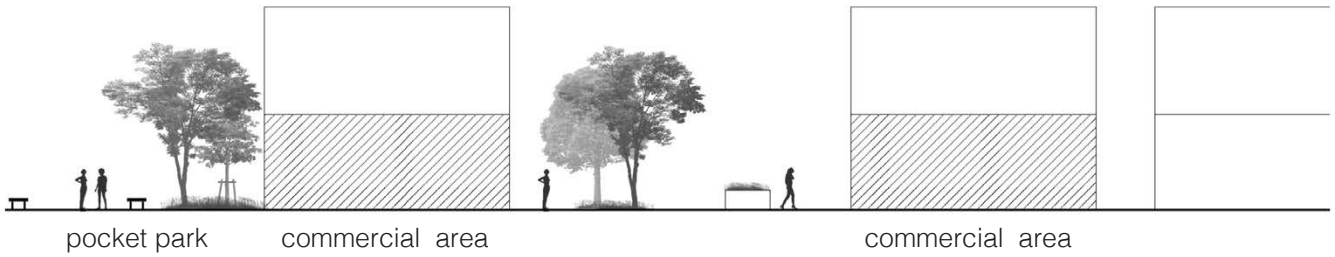


Ecological Route

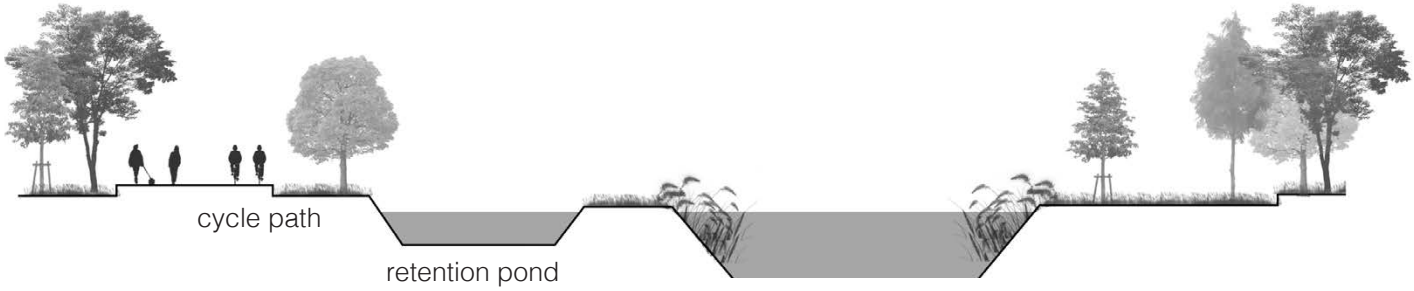
Community Route

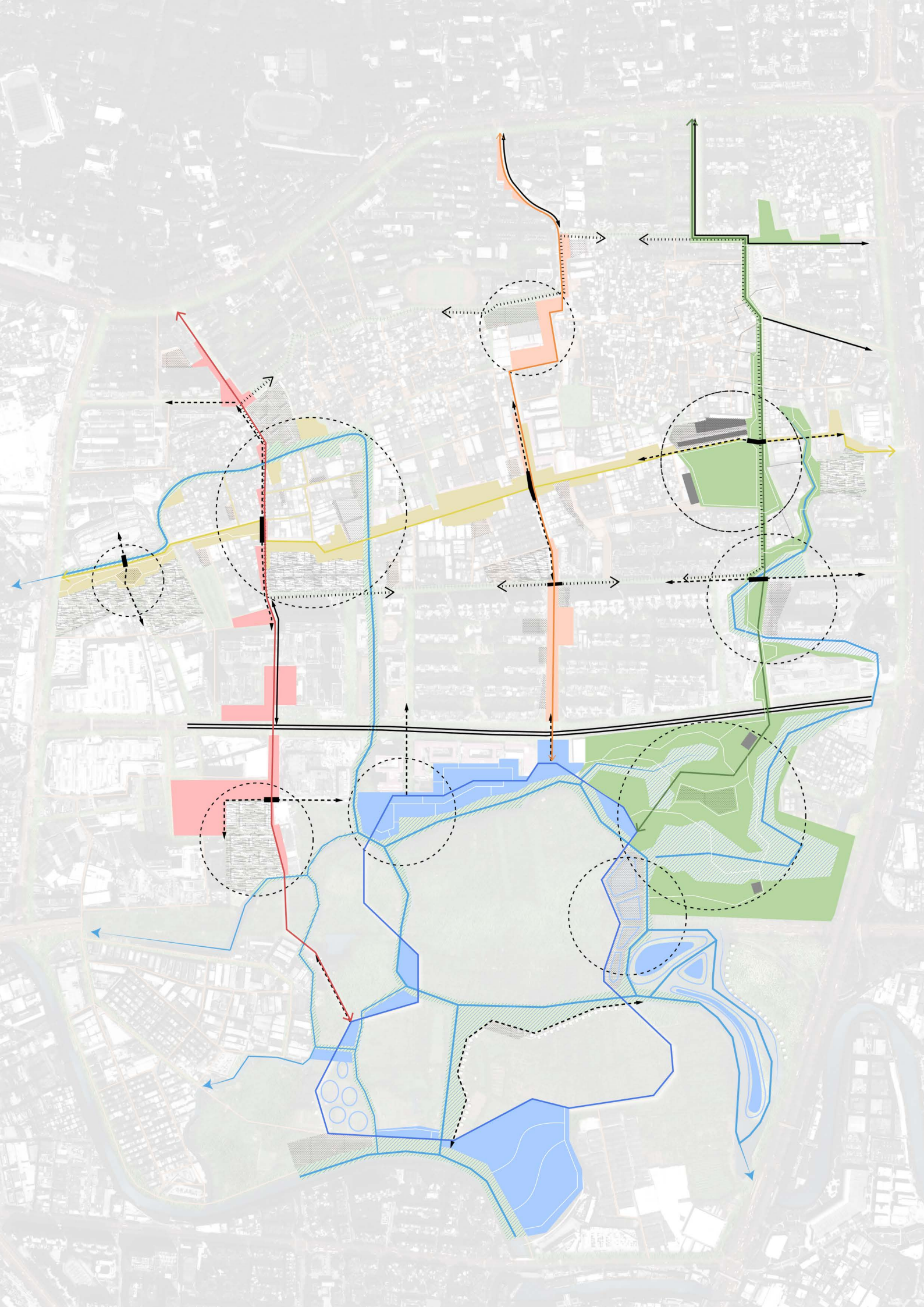


Commercial Route



Orchard Route

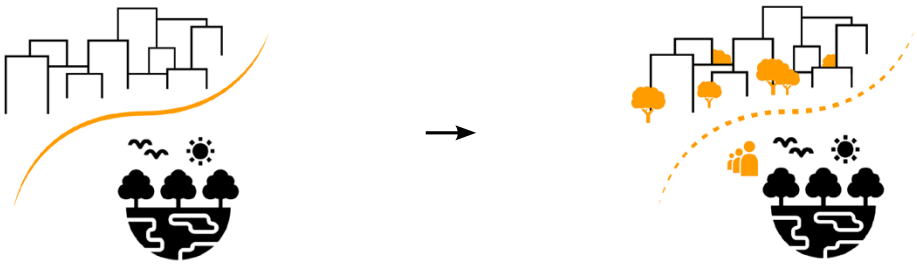




5.4 CONCLUSION

ECOLOGICAL INTEGRATION

The amount of green spaces is increased, and ecological spaces are regerenated in neighborhoods for creating an integrated social-ecological network at local scale, and providing spaces for people to have social contact.



SOCIO-SPATIAL INTEGRATION

Spatial and functional connection is improved between urban village and modern community and the interaction between different social groups is promoted by providing sufficient activities and public space based on the needs of user group.

06

Concluding & Reflecting

6.1 CONCLUSION

SETTLEMENT LAYER

Analysis

Liveable community

Inclusive public space

TRANSPO

Anal

Diverse means of public transport

Continuou

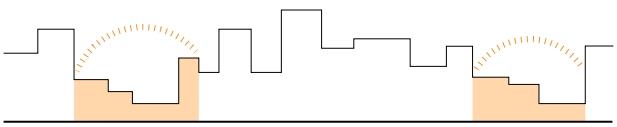
Public Facilities

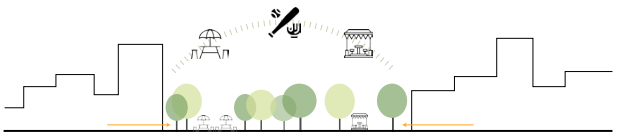
Mobilized In

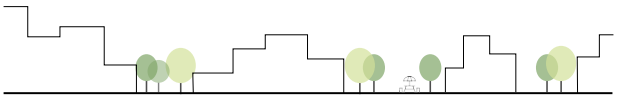
Socio-ecolog

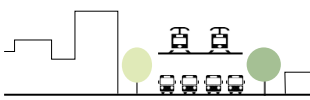
Regernrate more diverse and integrated public spaces for inclusive use

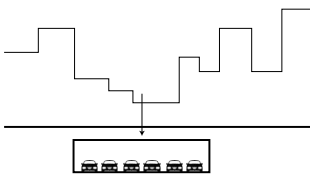
Enhance the accessibi to social and ec

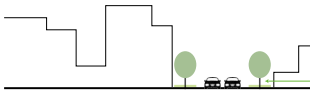












ORT LAYER

LANDSCAPE LAYER

ysis

Analysis

s cycle path

Ecological corridor

More ecological spaces with recreational value

Multifunctional and resilient waterfront area

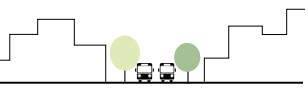
nfrastructure

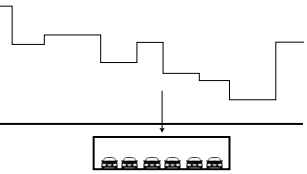
Ecological Spaces

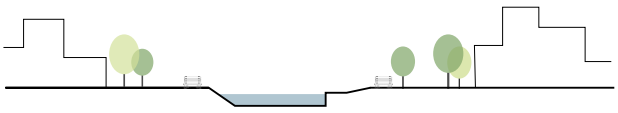
gical Network

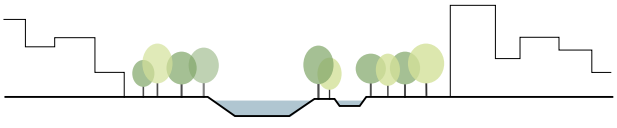
lity and interconnection cological spaces

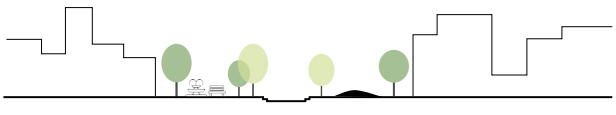
Create multifunctional ecological spaces and services

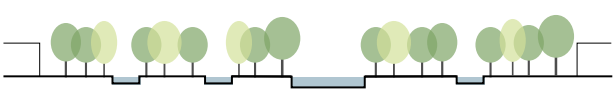










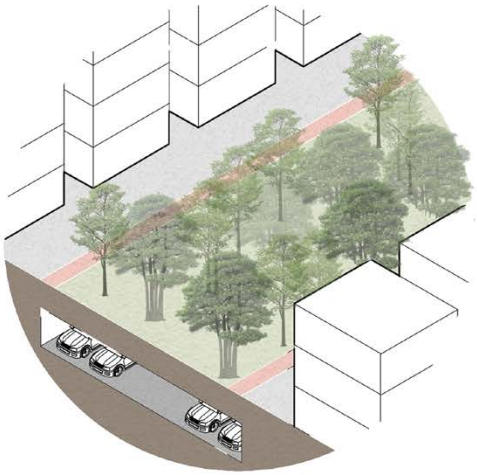


6.1 CONCLUSION

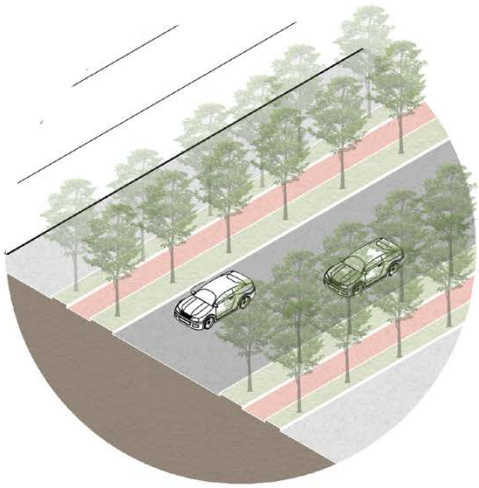
Regional Scale Strategies in terms of Corridors and Nodes

CORRDIOR AS CONNECTOR

ECOLOGICAL



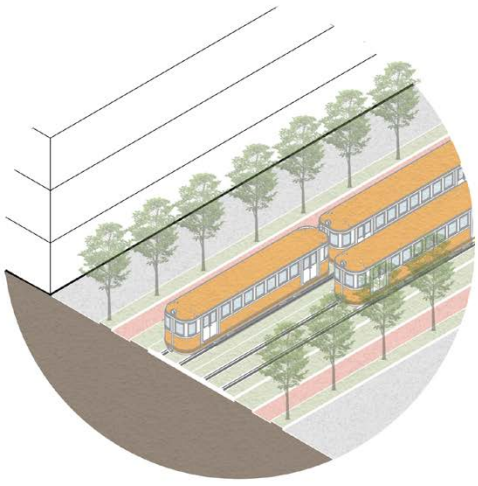
Ecological Corridor as Connector



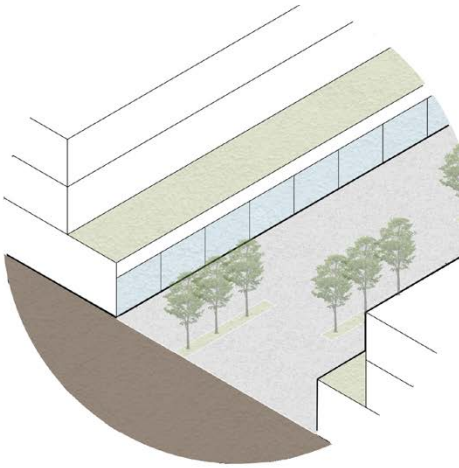
Continuous Greenway as Connector

Waterv
(Multifunctio

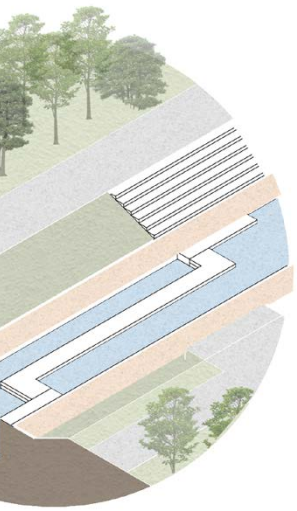
SOCIAL



Sustainable Public Mobilty as Connector

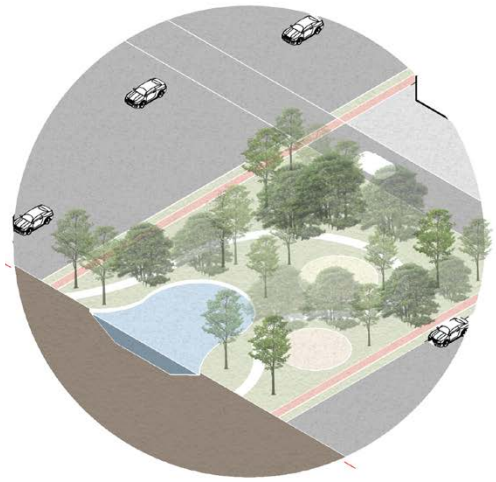


Commercial Street as Connector

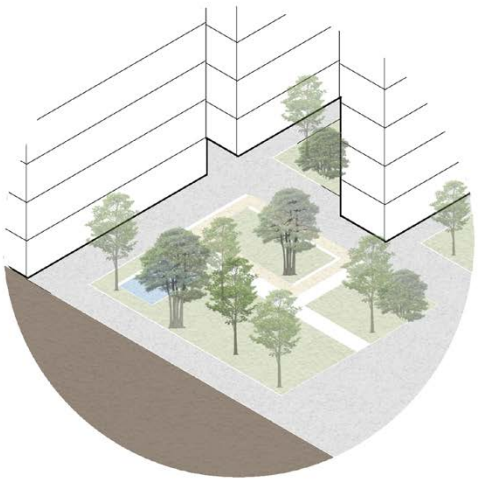


way as Connector
onal waterfront space)

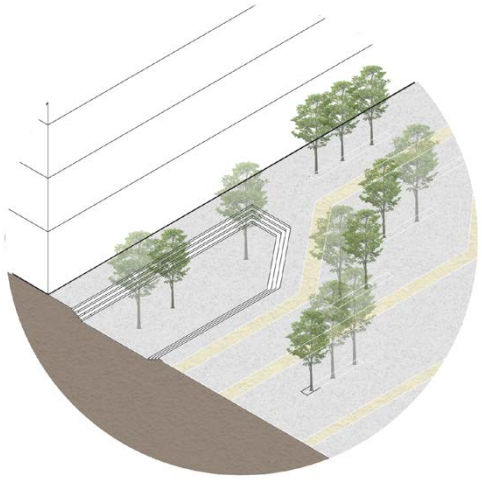
NODES AS INTERACTIVE SPACE



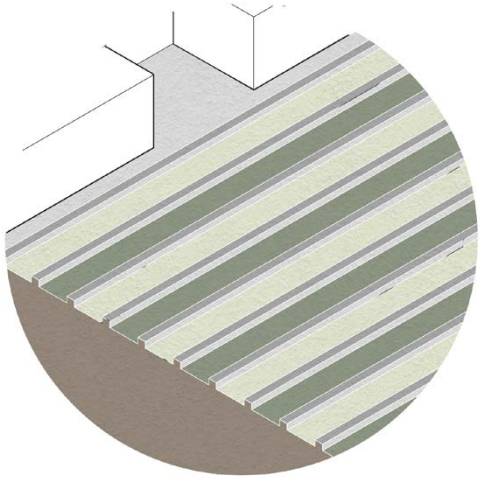
Recreational/ Ecological Parks as Interactive Space



Community Public Gardens as Interactive Space



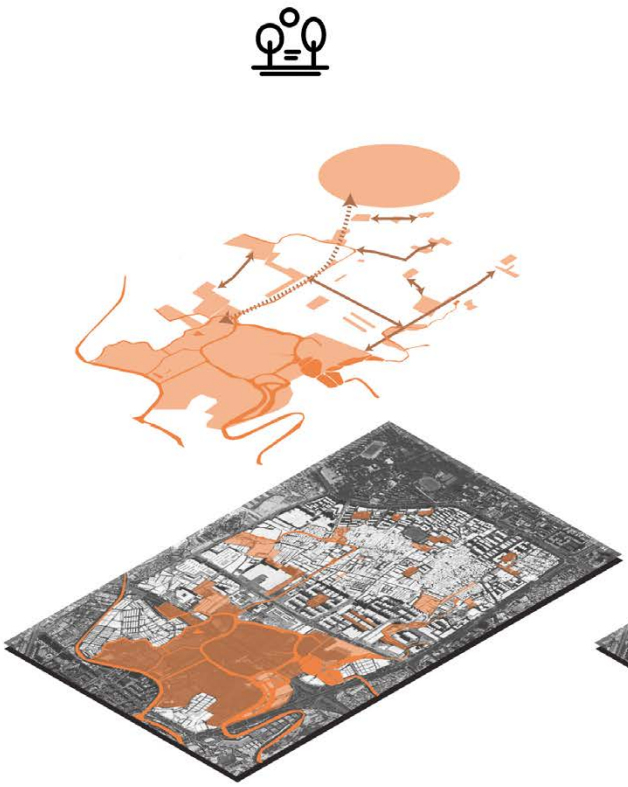
Commercial Hub as Interactive Space



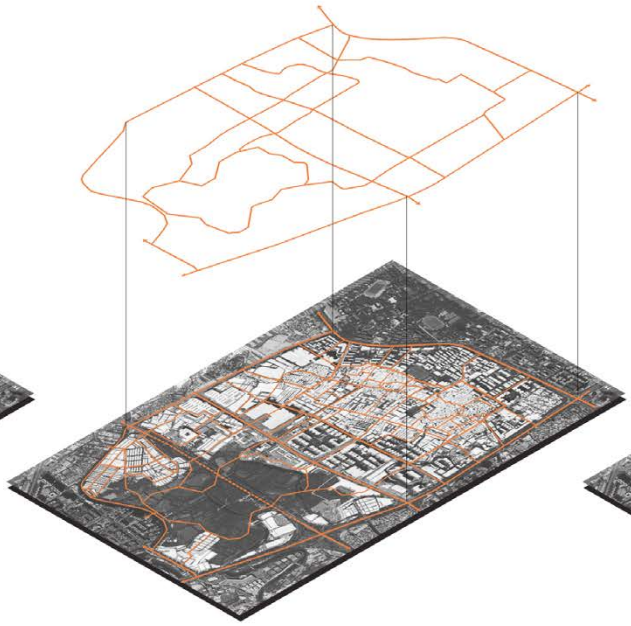
Activity Hub as Interactive Space (Urban farming, flea market etc.)

6.1 CONCLUSION

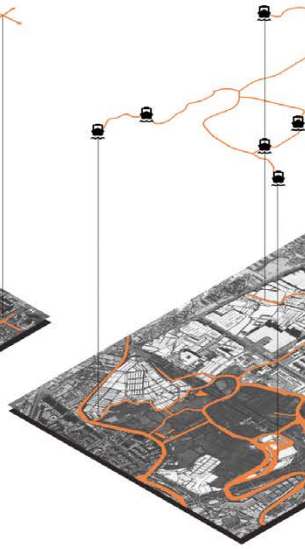
Local Scale Strategies in terms of Corridors and Nodes



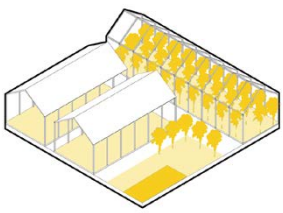
ECOLOGICAL CONNECTION

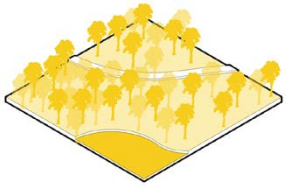


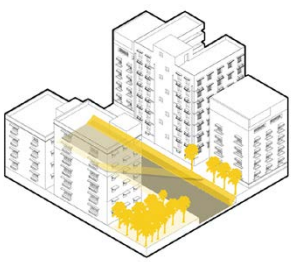
GREENWAY

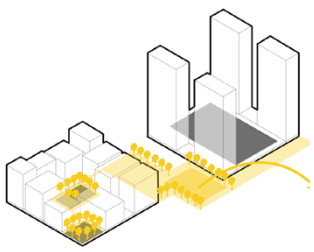


CRUISE

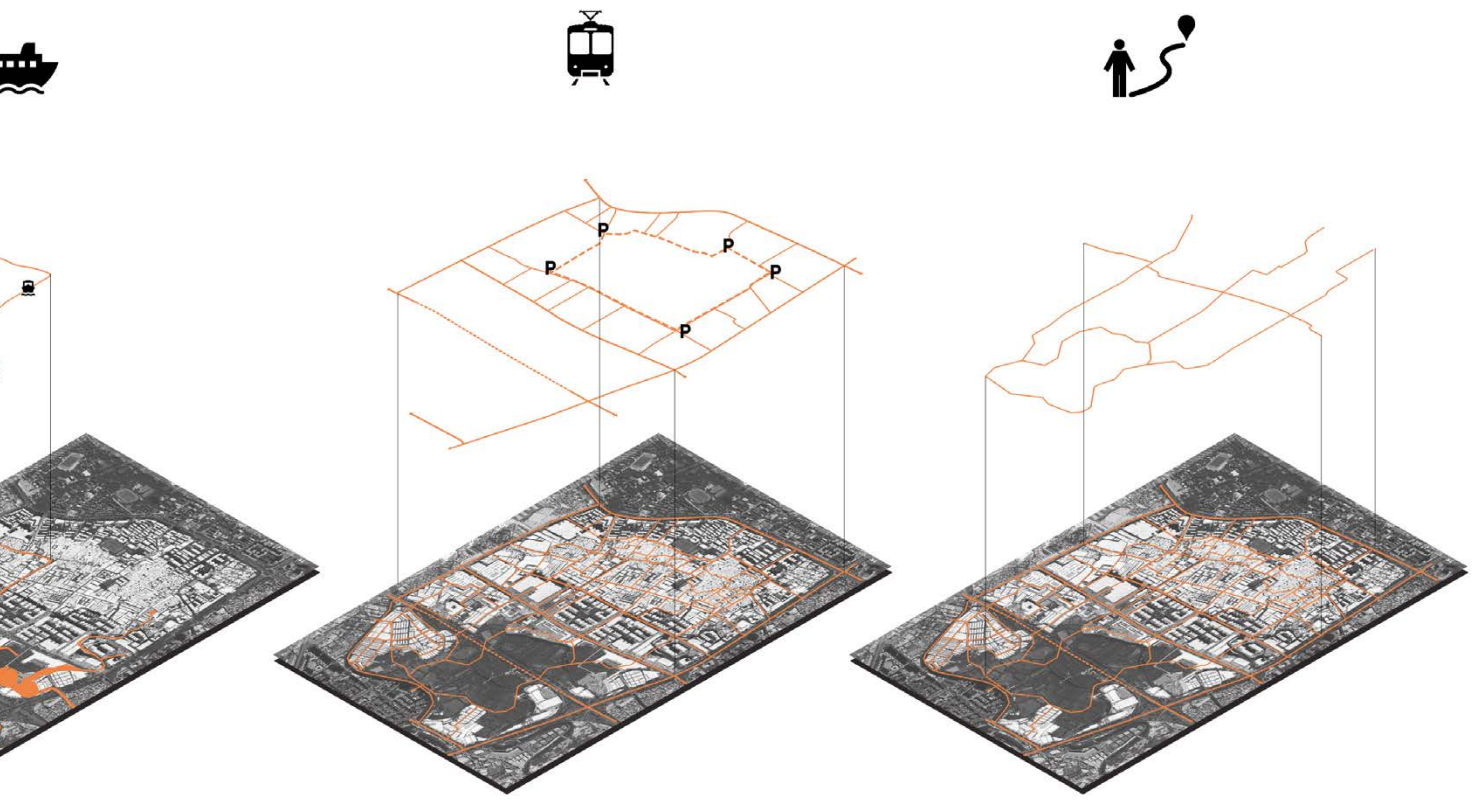








CONNECT

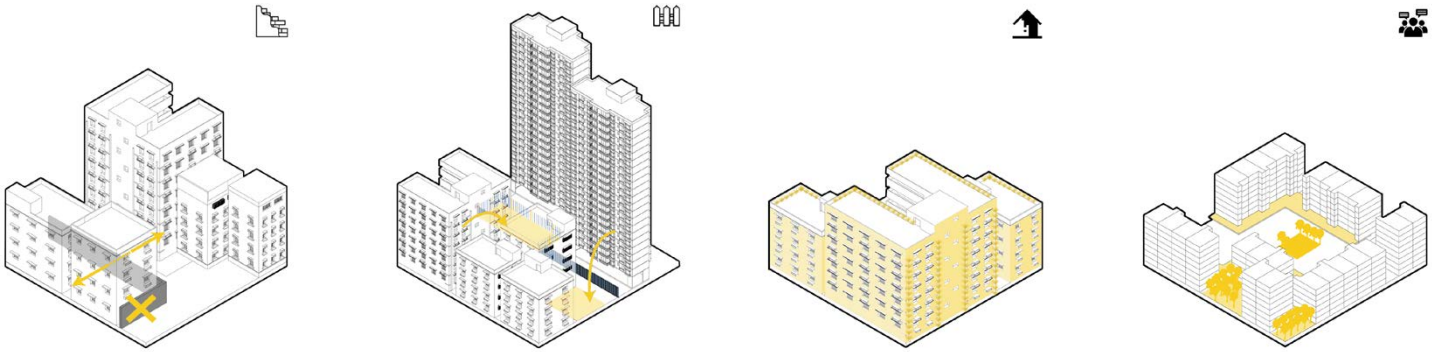


E

SLOW TRAM

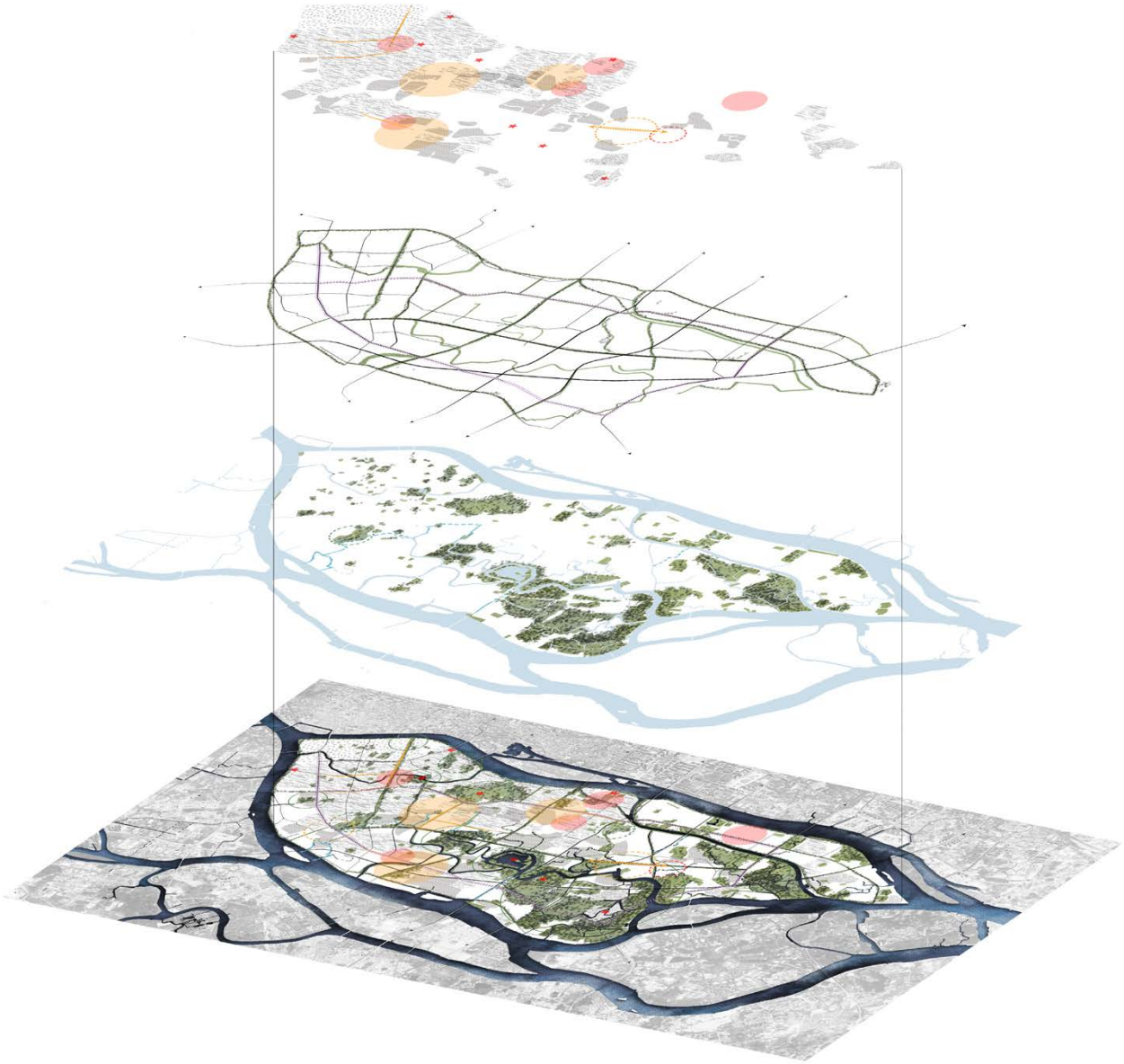
EXPERIENCE ROUTES

ACTIVATE

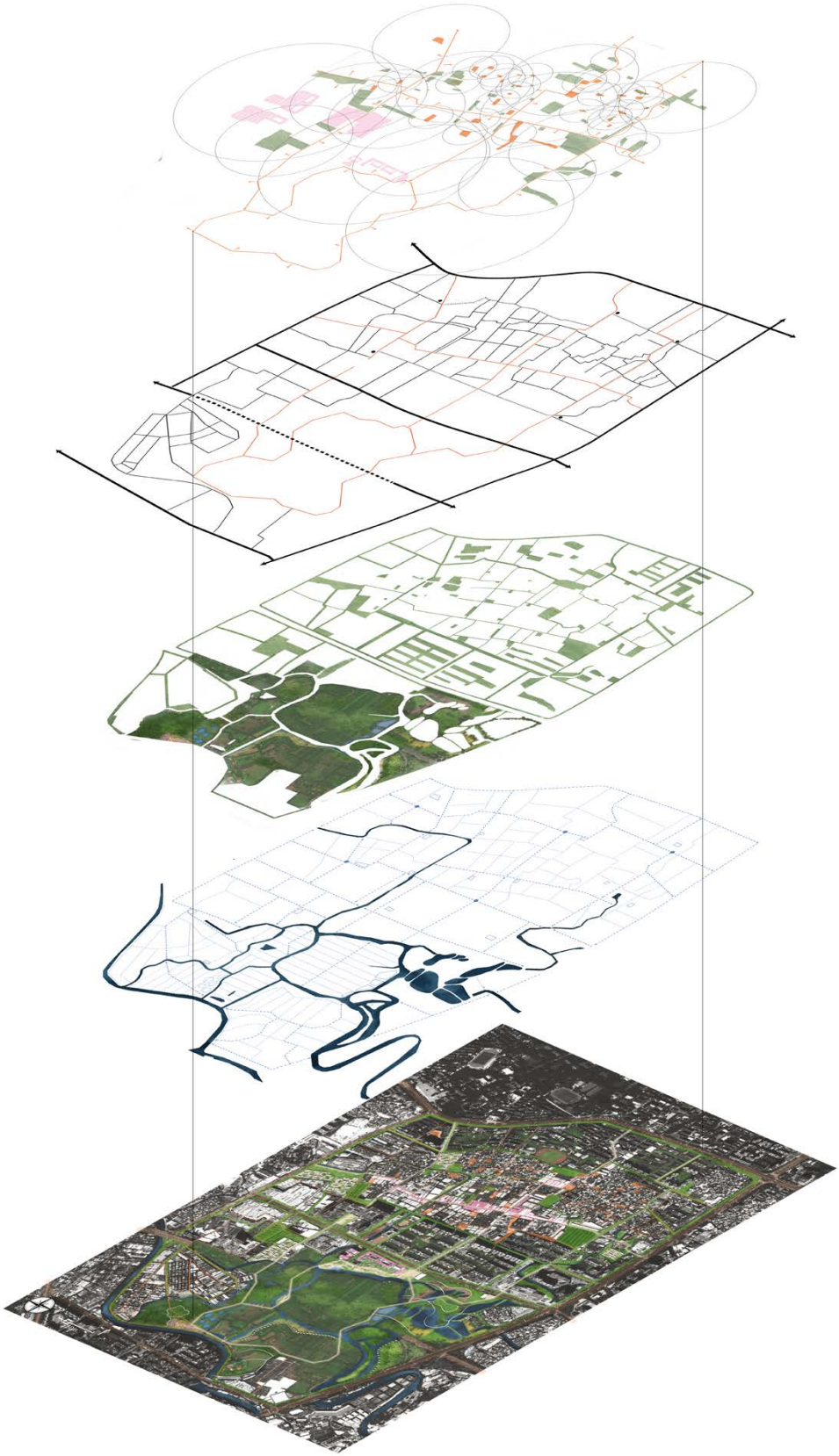


6.1 CONCLUSION

Regional Scale



Local Scale



6.1 CONCLUSION

Integration at Three Scales

Modern Community

High-income immigrants & Local people

Dance
Chat
Sit
Read
Shopping
Exhibition
Art
Eat
Sport
Entertained facilities
...

Urban Village

Low-income immigrants & Local villagers

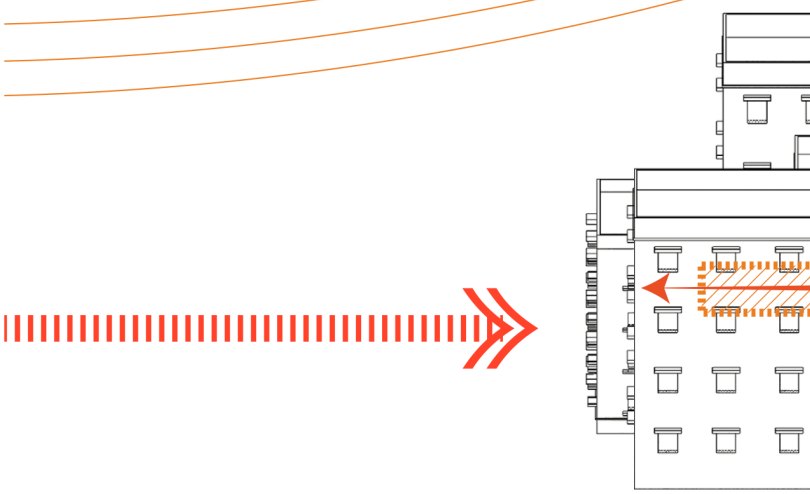
Work
Chat
Sit
Catering
Shopping
Eat
Chess, Majhong
Fitness facilities
...

Tourist

Shopping
Sightseeing
Eat
Rest
Exhibition
art
...

Events

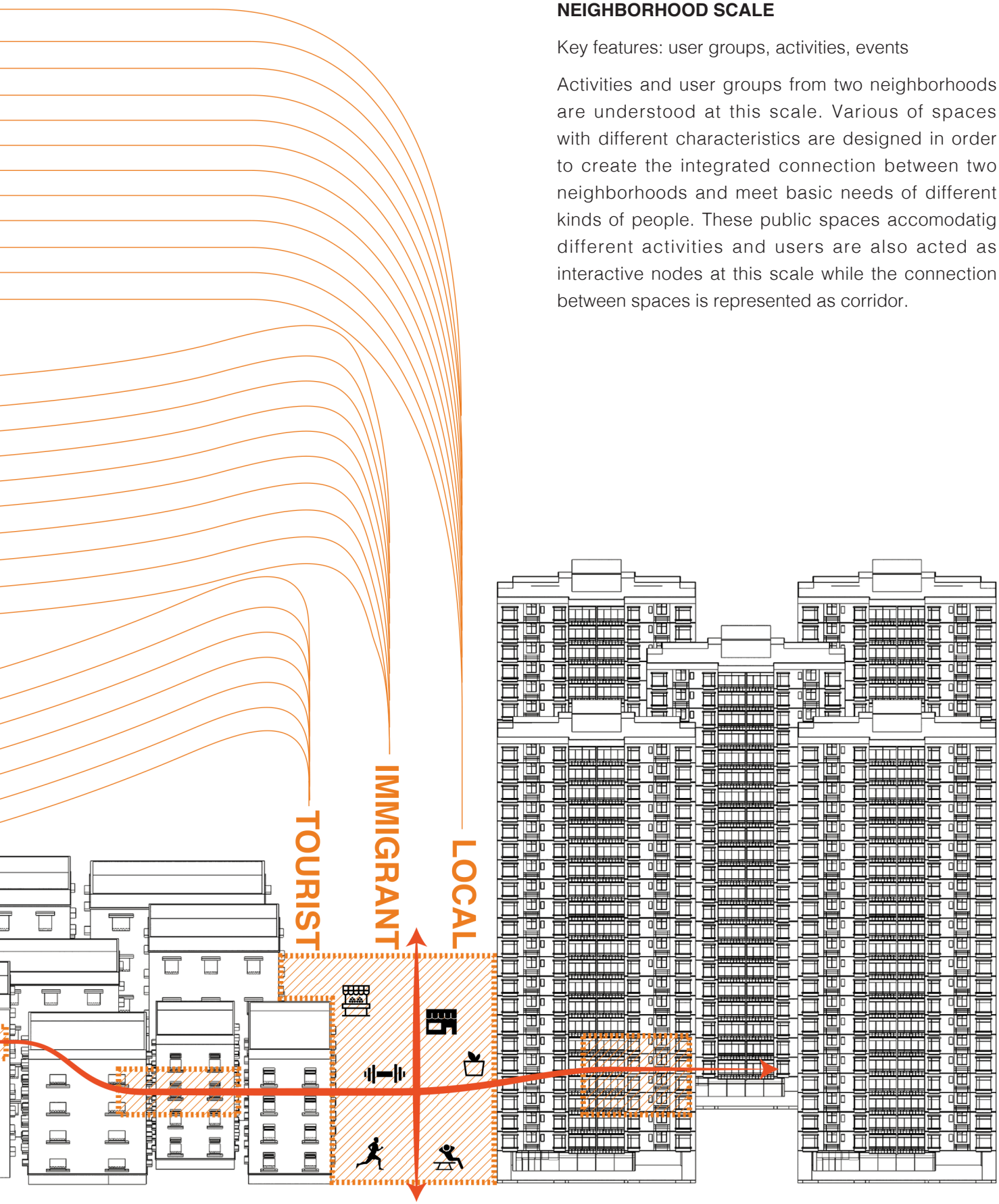
Open market
Workshop
Sport activities
Recruitment day
...



NEIGHBORHOOD SCALE

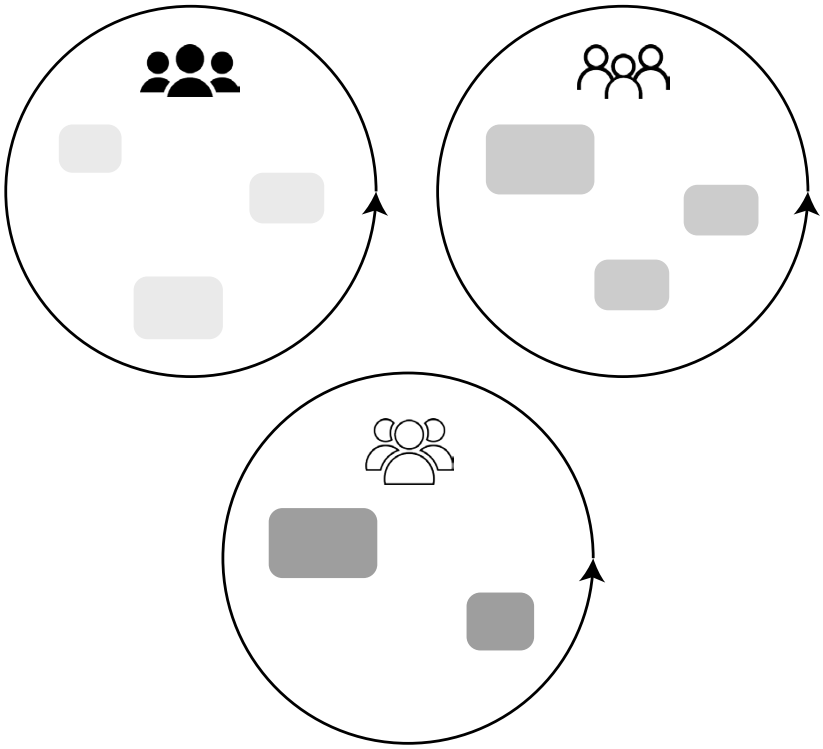
Key features: user groups, activities, events

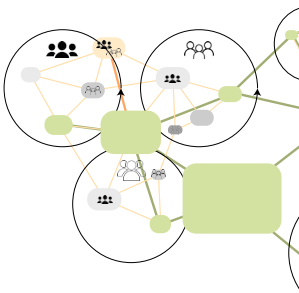
Activities and user groups from two neighborhoods are understood at this scale. Various of spaces with different characteristics are designed in order to create the integrated connection between two neighborhoods and meet basic needs of different kinds of people. These public spaces accomodatig different activities and users are also acted as interactive nodes at this scale while the connection between spaces is represented as corridor.

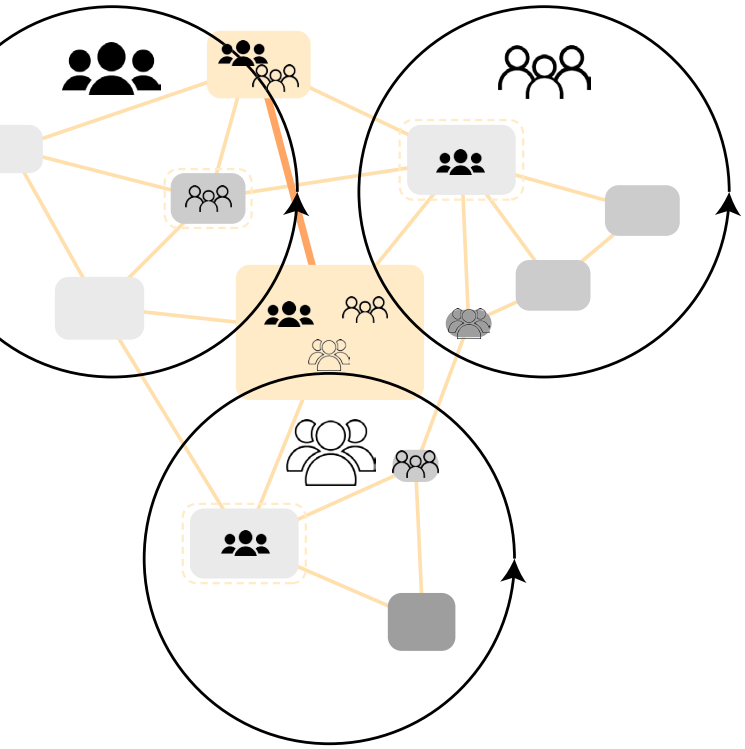


6.1 CONCLUSION

Integration at Three Scales



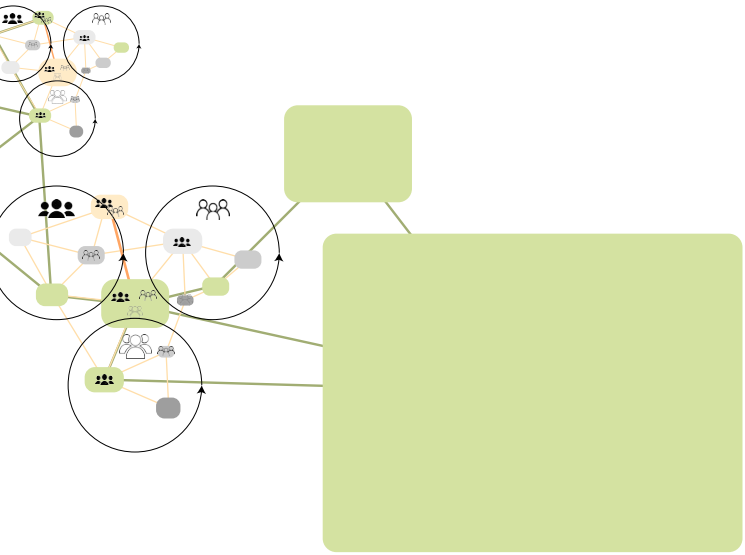




LOCAL SCALE

Key features: public space in and in-between community, spatial connection, spatial quality

By creating nodes inside and in-between communities, different social groups can integrate which can increase the relationship between neighborhoods and decrease the segregation condition. Spatial connection between spaces is also enhanced by using corridor.



REGIONAL SCALE

Key feature: ecological spaces, ecological connection, socio-ecological network

From a regional scale perspective, the nodes inside and in-between the communities can regenerate more ecological spaces as interactive nodes for the creation of socio-ecological network, which is also helpful to increase the amount of green space in the urban area.

6.1 CONCLUSION

Design Evaluaion

Ecological value	**Indicators**
Flood resilience	Different strategies to prevent flooding and collect water
Amount of Green space	More green spaces(parks, open spaces)
Diversity of habitat and species	Different types of habitats(wetland, orchard)
Social value	**Indicators**
Public space with diverse activities	Spaces and activities for different social groups
Multifunctionality	Commercial, residential, industrial, open spaces
Mobility	Slow mobility and accessibility improvement
Housing quality and diversity	Building quality(facade) improvement, new affordable building typology
Coordination of stakeholders	Consideration of benefits of different stakeholders
Public health	Air quality, water quality, etc.

In this graduation project, I tried to apply the landscape-urban design strategies to address the complex problem with social and ecological value. As a landscape architect, I need to strengthen the role of landscape and make use of the landscape features in the principles and strategies. Therefore, concerning about the ecological value when addressing this complex social issue is one of the key features in the project.

By creating this socio-ecological network in terms of using corridor as connector and node as interactive space at multiple scales, the integration between different neighborhoods and between people and nature is promoted. In this case, corridor is creating a linear connection or movement between spaces with certain buffer area to surrounding context instead of just a linear feature as boundary, while node provides certain places where nature or people can integrate with each other. The elements featured in the principles are defined by the analysis in different layers, which make the whole research and design process more coherent.

The design implementation, in the sense of the project, is focusing more on the different experienced routes as corridor rather than the other common corridors mentioned in the principle chapter. These corridors are defined based on the existing elements and condition, along which several activated nodes are located to provide vital and inclusive spaces for residents. The design interventions contribute to improve the socio-spatial integration between modern community and urban village and build up connection between nature and the built environment. In summary, the impact of the design, as an example, elaborating the principles and strategies is enhancing the social as well as ecological value

Since the urban village and modern community are two main settlements not just in Haizhu District but also Guangzhou, even in the whole PRD, the socio-spatial segregation between these communities affects the future development nowadays. From this perspective, strategies from the design exploration have the opportunity to be applied to other areas with the similar segregation and fragmentation problem such as Shanghai, Nanjing and other fast urbanized areas. However, research on the specific site is still needed to have a better understanding of the local characteristics.

In conclusion, with proper application of the principles with regard to corridor and node, urban landscape environment could be better constructed and developed in a more sustainable and inclusive way.

6.2 REFLECTION

(Source: blackstation)

The graduation thesis tries to give insights for the understanding of socio-spatial segregation and decreasing green and blue spaces due to the rapid urbanization process in Haizhu district. And a comprehensive social-ecological network as the solution is proposed in order to improve the socio-spatial integration and reconnect the fragmented ecological spaces. This thesis is divided into chapters to show what is the existing conditions of these mentioned problems and based on which, the principles and strategies related to the issues are put forwarded. The outcomings of the thesis are including the main principles – using corridor as connector and node as interactive space and related strategies on different scales. The reflection will be organized in 6 parts: reflection of the process, reflection of the objective, reflection of the thesis in different context, reflection of further potential results, relationship between landscape and studio and ethical issues and dilemmas.

Reflection of the process

The relationship between research and design

The project focuses on the socio-spatial segregation and ecological fragmentation in Haizhu district in China. Because of the complexity of the city systems, it is important to understand the existing context of what aspects or elements contribute to these problems. In the understanding chapter, the framework of the research is made up of three layers, settlement, transport and landscape, where the three characters of the network are created for building up a new comprehensive socio-ecological structure. Besides, elements featured in the principles are defined and explored by the research in the layers, which make the whole research and design process more coherent. What's more, the theory of socio-spatial integration and the concept of creative destruction of neighborhoods are contributing to the further design strategies and interventions. For example, the overall development with the balance public facilities is concerned on regional scale, while the interconnection between communities by corridors and nodes is created on local scale. The spatial transformation through small-scale intervention is implemented in the detailed neighborhood design based on the theory of creative destruction of neighborhoods. The role of design offers a solution to address the issues from a spatial perspective, giving possibilities on dealing with this socio-ecological problem.

Therefore, the relationship between research and design is quite interrelated in the whole process. And it is strongly being aware that research should become a tool and provide basic information to support and realize the design.

Research method and approach

By answering the sub-questions proposed, the research method and approaches can be reflected.

SBQ1&2: What are the existing conditions of socio-spatial segregation and what are the factors contributing to segregation? What are the existing conditions of ecological fragmentation at different scales?

In the settlement layer, comparative analysis and mapping help identify the characteristics of different residential typology. Field trip including interview and observation combining with mapping contribute to understand the spatial uses in different communities and provide information for the further spatial strategies and general intervention on local scale. Lessons can be learned that different spatial patterns lead to various spatial uses in communities which becomes a factor leading to segregation. In the landscape layer, historical analysis and mapping discover the decreasing ecological value in Haizhu, which forms the problem field of the project. Results have shown that urbanization and human activities have negative influences on ecological development resulting in the uneven distribution of ecological space.

SBQ3: How to create the socio-ecological network based on the current conditions and resources?

6.2 REFLECTION

The three characters compositing the socio-ecological network are based on the layer approach from the understanding part, which are interconnected with each other. In addition, three main strategies related to the characters offer possible solutions to create a comprehensive and sustainable socio-ecological network.

SBQ4&5: What principles and strategies can be put forwarded to improve the socio-spatial integration and reconnect the fragmented green and blue spaces on different scales? How can these principles be implemented in a specific complex area with social and ecological problems?

The question is answered by the application of two main principles – corridor as connector and node as interactive space. The results include improving the characteristic of elements identifying from the understanding part as corridors and nodes and defining new hubs as node such as activity hub. The implementation of the principles in a specific site is elaborated to explain how the interventions can be beneficial to improve the socio-ecological integration. Lessons can be learned that corridors and nodes have different representations on different scales.

The limitation of the project

Since the location of the project is a very dense urban area, it is very necessary to analyze for understanding and design in different scales which was a big struggle part of the whole process. It is very difficult to access the information and data on the local scale than regional scale because of the complicated construction situation of urban village. What's more, the accessibility to certain area in urban village is also quite limited.

From another aspect, as "boundary" is a key element contributing to socio-spatial segregation, besides of physical boundaries (e.g. wall, road), spatial isolation between communities also exists with different characteristics at both local and neighborhood scale. Besides, there is a hidden barrier inside everybody's mind based on their identity, income, education which is difficult to be discovered. Therefore, the design proposal creates and encourages interaction between social groups but still has certain limitations for breaking this invisible barrier.

Reflection of the objective

Objective: Create an integrated and comprehensive socio-ecological network in terms or corridor and node at multiple scales that can improve the socio-spatial integration and reconnect the fragmented green and blue spaces for Haizhu district.

First, in the understanding chapter, the existing condition of the context from both social and ecological perspective is learned with regard to the different types of settlements and uneven ecological distribution and fragmentation between the east and west part of Haizhu. Meanwhile, features from these three layers contribute to the formation of principles of corridor and node, such as greenway, ecological parks, commercial street and diverse spatial uses.

Secondly, in the applying chapter, the socio-ecological network is represented on regional scale in three layers related to the understanding chapter including new ecological structure, new transport system and new public facility structure with applying the principles of using corridor as connector and node as interactive space. Besides, the principles and strategies are concerning about the social and ecological value related to the problem field.

Last but not least, in the exploring chapter, the framework of the socio-ecological network is applied on local scale with specific elaboration based on the principles above. For example, greenway system, tram system, and water system as corridor have different representations on local scale. Also, by exploring different experience routes as corridors, three hubs defined in the site can be more integrated. Furthermore, demonstration on neighborhood and buildings scale helps to explain the interventions in corridors and nodes that facilitate the integration

and reconnection under the network. For example, improving and activating the main road and negative spaces in the urban village and introducing community and pocket parks support to build a more vital and livable neighborhood.

Reflection of the thesis in different context

Due to the rapid urbanization in China, the problem of socio-spatial segregation and ecological fragmentation are two of the main planning issues affecting future sustainable development in fast-developing cities. The knowledge from the understanding chapter of settlement classification and spatial distribution can be one of the applications for other regions, such as Shanghai, Xi'an where there is conflict between urban village and modern community. The framework of the research of using the layer approach could be an effective tool to have a better understanding of the complex context. Furthermore, principles from the project have the flexibility to be applied to other regions, because of the similarity of existing potential elements.

Reflection of further potential results

The proposed socio-ecological network and principles try to improve the socio-spatial integration and reconnection of ecological spaces at different scales. The planning on regional scale and design exploring in local scale, in this case, are beneficial to realize this objective. However, because of the time limitation, there are some potential results where the project can research in the future. First, in the exploring chapter, the site with the conflict between urban village and modern community was chosen, but other areas with segregation problem between traditional community and modern community can be further explored. From this perspective, the principles and strategies could be alternative and flexible in different contexts. The other one is the application of the principles on a larger scale such as Guangzhou. The exploration of the development of corridor and node would be an opportunity to form a new structure in Guangzhou city.

Relationship with Landscape and Studio

This graduation project is a part of the Adaptive Landscape Transformation Studio. It is addressing the social issue from the perspecive of adaptive spatial transformation concerning both social and ecological value by applying different landscape approaches, such as landscape as infrastructure, recreation of the green and blue network, combination of urban development with landscape. Based on the framework of three layers, principles and strategies related to the existing condition are applied to the content with various dynamics. Furthermore, in order to accomplish the goal of adaptivity, the project also considers the integration of green and blue network that can act as a backbone for the overall transformation of public space with facing the uncertain future with climate change or population growth. By exploring different possibilities to enhance the integration, the project gives solutions that can be adaptive and sustainable in the context of urbanization.

Ethical issues and dilemmas

The main ethical dilemma of the project is its feasibility of the recreation of the new structure for the territory. As for the design intervention, due to the condition that more 150,000 immigrants live in the urban village in the site, the certain demolishment of the urban village would affect these residents. Thus, the creation of open community should accommodate all these immigrants providing them with inclusive spaces from a practical perspective. The other issue of realizing the project is the fast-changing government's regulation and policy. Nowadays, the government still intends to demolish the urban village and build modern community instead of preserving and improving it. In the future, I hope that by participating in this process, new methods and strategies could come up for better a better development instead of demolishment.

07

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