



# URBAN SYMBIOSIS

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Portfolio of Li Ziqun

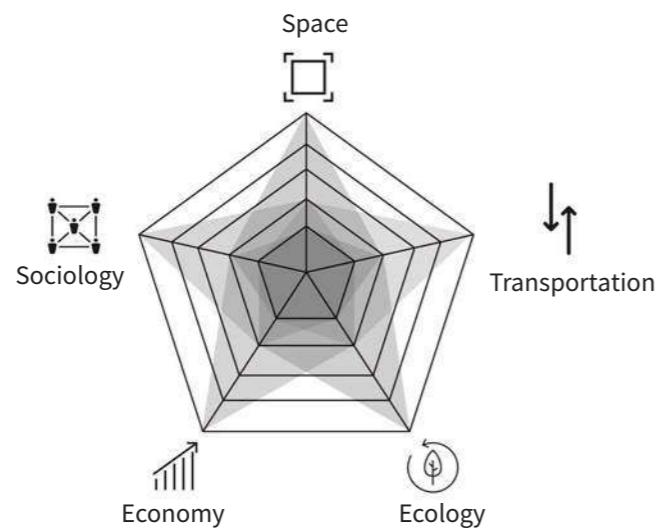
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Selected Works from 2014-2018

Master of City Planning Candidate 2019

Huazhong University of Science and Technology, Wuhan, P.R.China

# CONTENT



Witnessing China's rapid urbanization accompanying aggressive demolition and redevelopment works in the cities over the past two decades, I doubt the sustainability of this monotonic and standardized planning strategy to replicate urban landscape. A city's prosperity, in fact, largely relies on its inclusiveness of diverse population and cultures. As a future town planner, I consider it important to adopt more considerate urban design approaches catering people's physical and spiritual needs. In this reality, I have paid attention to a new urban model, that is, "symbiosis".

"Urban symbiosis" refers to a city's containment of different factors forming distinct physical spaces. On the other hand, it is about the balance and restraint of various key components in a city, including but not limited to society, ecology, economy, and transportation, which combine to ensure ideal sustainable development. Therefore, the five projects in this work focus on five different levels of city: society, ecology, economy, architecture and transportation, which carry out my thinking on urban issues as well as corresponding transformation and design of urban space.

01  SOCIOLOGY

[ 24 Hours of Old Hankow ]  
Public Space Design of Hankow Concession Area

02  ECOLOGY

[ Reviving The Front ]  
Urban Renewal design of Weidong Machinery Factory

03  SPACE

[ A Situational City ]  
The 3rd Art&Tech National Undergraduate Architectural Design Competition

04  ECONOMY

[ Live Long and Prosper ]  
Rural Planning and Design of Bapai Village, Yunnan

05  TRANSPORTATION

[ Urban Transport Investigation on Shared Vehicles ]  
National Urban Transportation Mobility Innovation Competition

# 01. 24 Hours of Old Hankow

Public Space Design of Hankow Concession Area

**Location**  
Wuhan,Hubei ,China

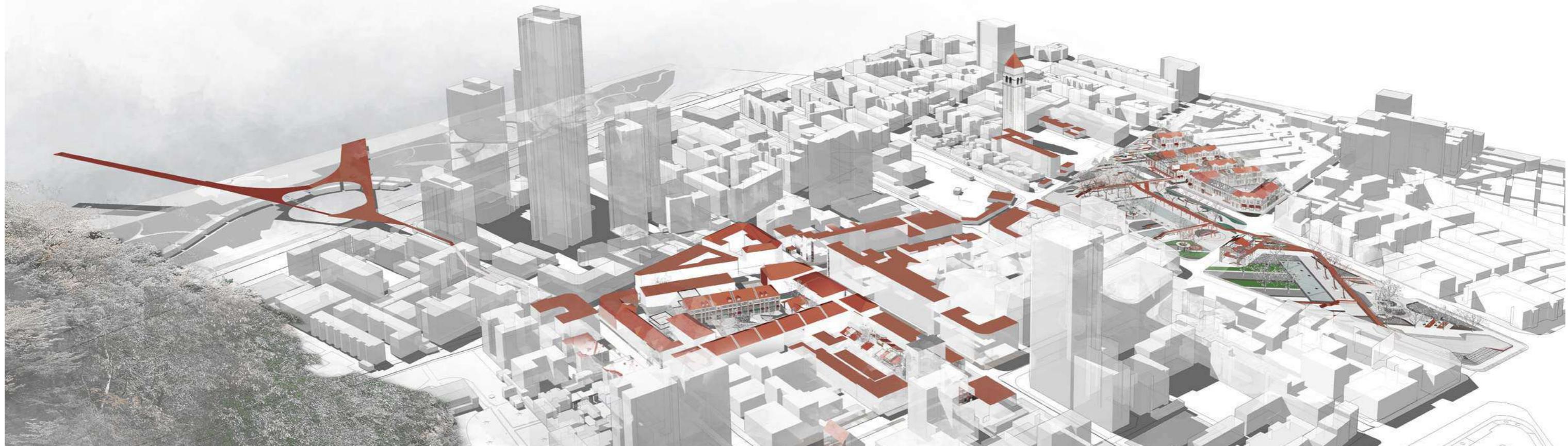
**Type**  
Academic  
Individual work

**Duration**  
Mar. 2017 - May. 2017  
Senior 3

**Instructor**  
Li Rong  
[lirong@hust.edu.cn](mailto:lirong@hust.edu.cn)

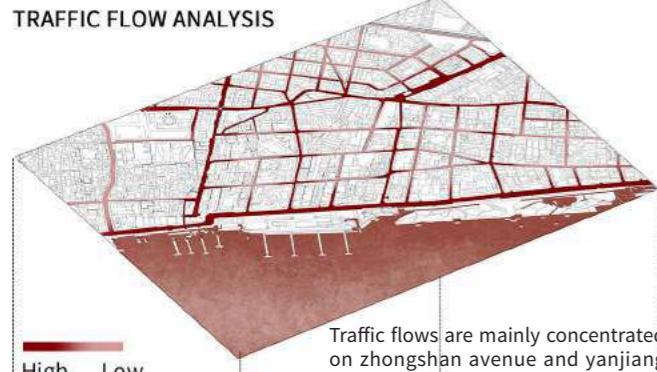
Looking back at the history of Hankow, from the earliest prosperity based on the port , to the gradual decline, then to the flourish of the concession, the Western planning concept has formed a fierce collision with the urban texture of Hankow. Nowadays, The old concession and the new city are constantly updated, which formed a variety of different public spaces in Hankow.

A good urban design should encourage more residents to participate directly in the design and be able to self-renew according to changing needs. Through the investigation of the concession area, I found that people generally want to preserve the historic buildings in the old city and show their willingness to participate in changing the environment of the concession. In the design process, I explored people's needs through **public participation**, and designed the venues in a targeted manner to tell about **the 24-hour life in Hankou through scene re-creation**. The well-arranged analysis of the collected data serves as important guidelines for proposing the design scheme, which was later endorsed by the end users in follow-up public consultation events.

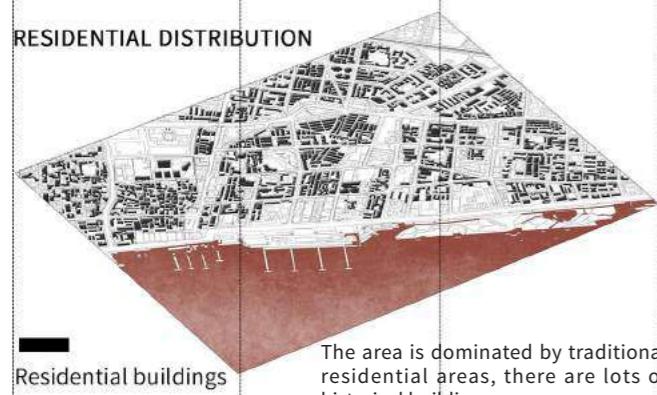


## SITE CONTEXT

### TRAFFIC FLOW ANALYSIS

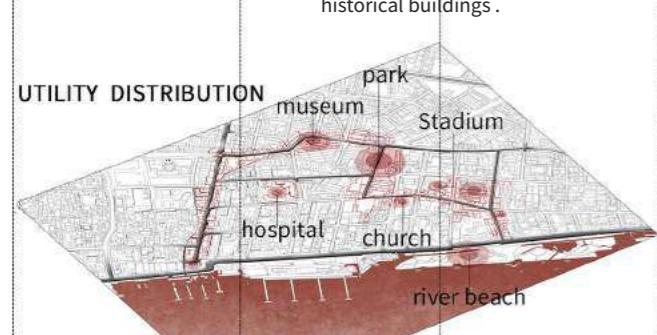


### RESIDENTIAL DISTRIBUTION



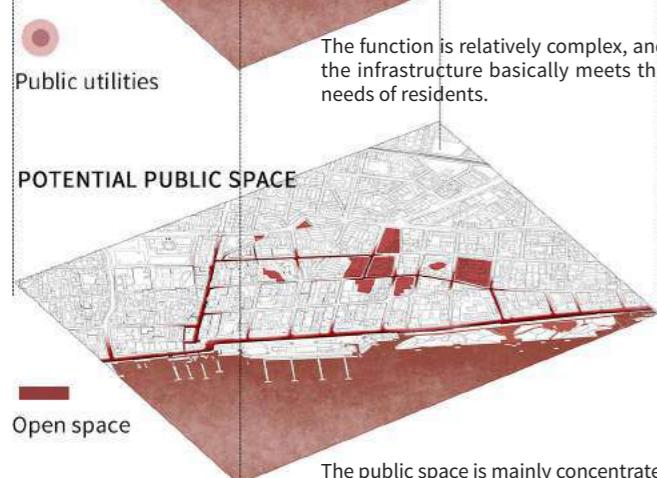
The area is dominated by traditional residential areas, there are lots of historical buildings.

### UTILITY DISTRIBUTION



The function is relatively complex, and the infrastructure basically meets the needs of residents.

### POTENTIAL PUBLIC SPACE



The public space is mainly concentrated in concession park and luoyuan area. The landscape system is fragmented.

## CONCEPT

Since the "Tianjin Treaty" in 1858, Hankow was established as a trading port, the concession became the "city" in the city, and the public spaces in Hankow are also becoming diverse and complex.

In the process of communicating with the local residents and visitors, I found that people generally want to preserve the historic buildings in the old city and show their willingness to participate in changing the environment of the concession. An inclusive urban public space is not designed by the designer but by the user. On this basis, I decided to connect people with the environment through the model of public participation, in order to enhance residents' sense of identity in design.

## PUBLIC PARTICIPATION PROCESS

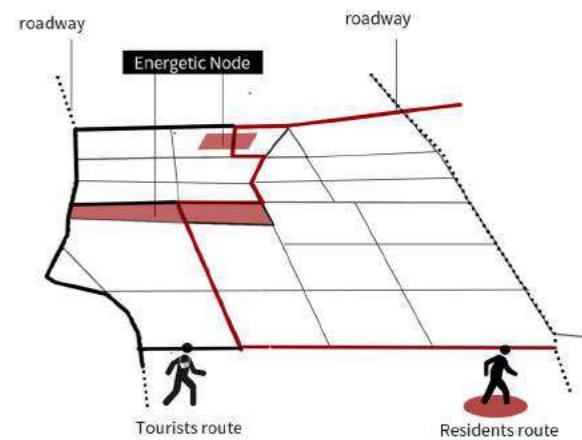
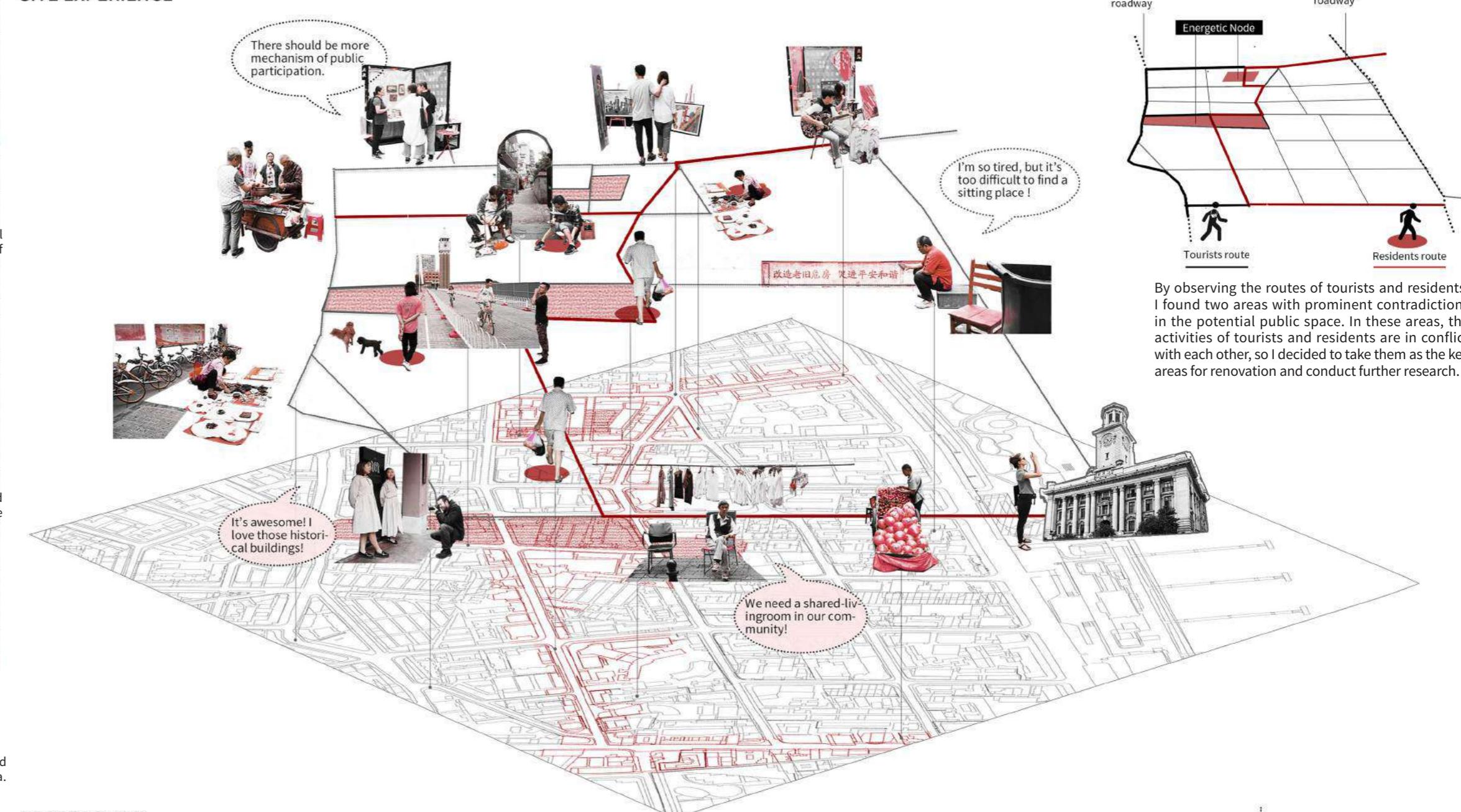
### SITE EXPERIENCE

### CONSULTATION

### COOPERATION

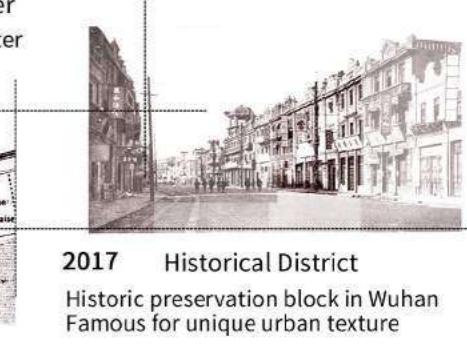
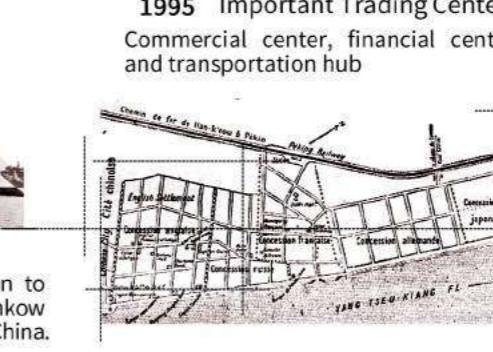
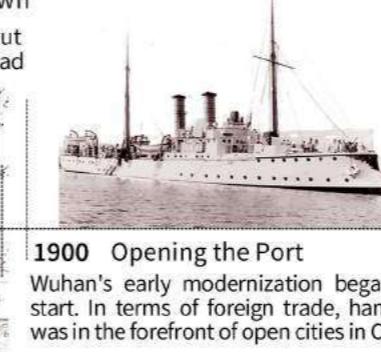
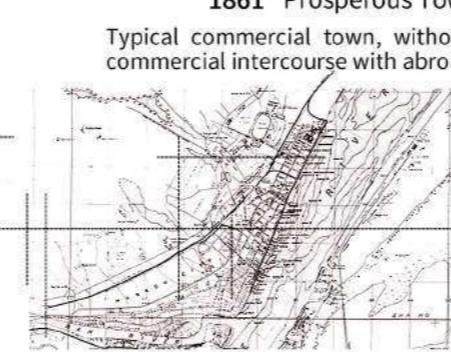
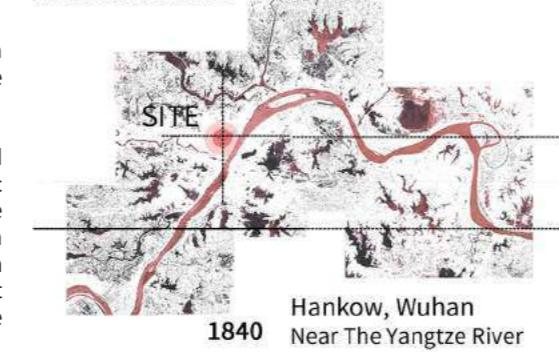
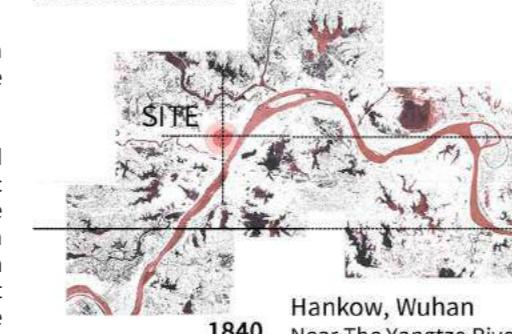
### FEEDBACK

## SITE EXPERIENCE



By observing the routes of tourists and residents, I found two areas with prominent contradictions in the potential public space. In these areas, the activities of tourists and residents are in conflict with each other, so I decided to take them as the key areas for renovation and conduct further research.

## BACKGROUND



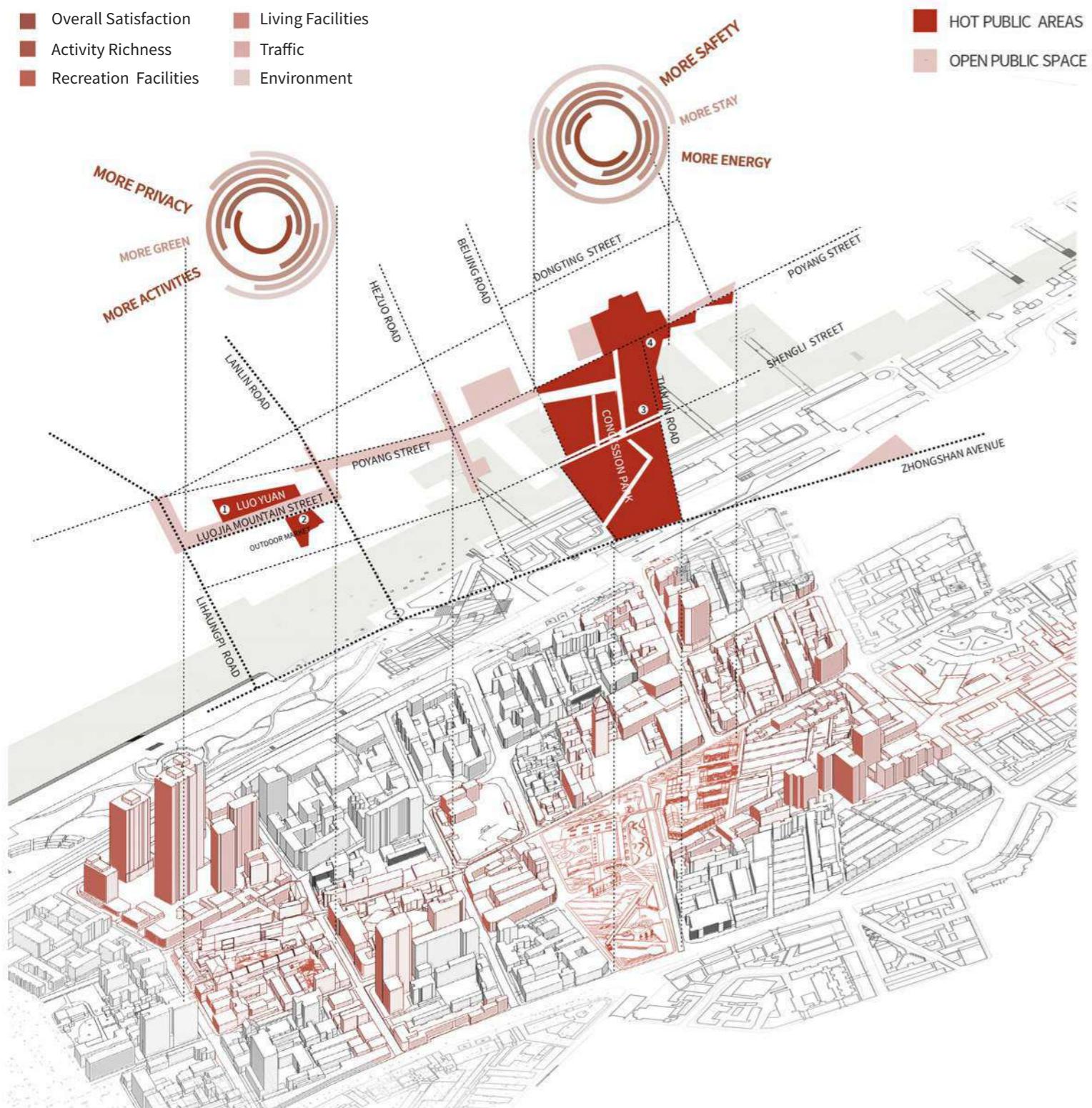
## CONSULTATION

I randomly surveyed 200 respondents in the concession area within a week (both weekdays and weekends), and obtained their opinions on their satisfaction with the current situation and suggestions about future development direction of the area through questionnaires, which were used as an important basis for public space design strategies.

According to the questionnaire survey conclusion and the summary of activity characteristics of the crowd in the site, we determined two key design public spaces, namely concession park and luoyuan.

## SATISFACTION SURVEY

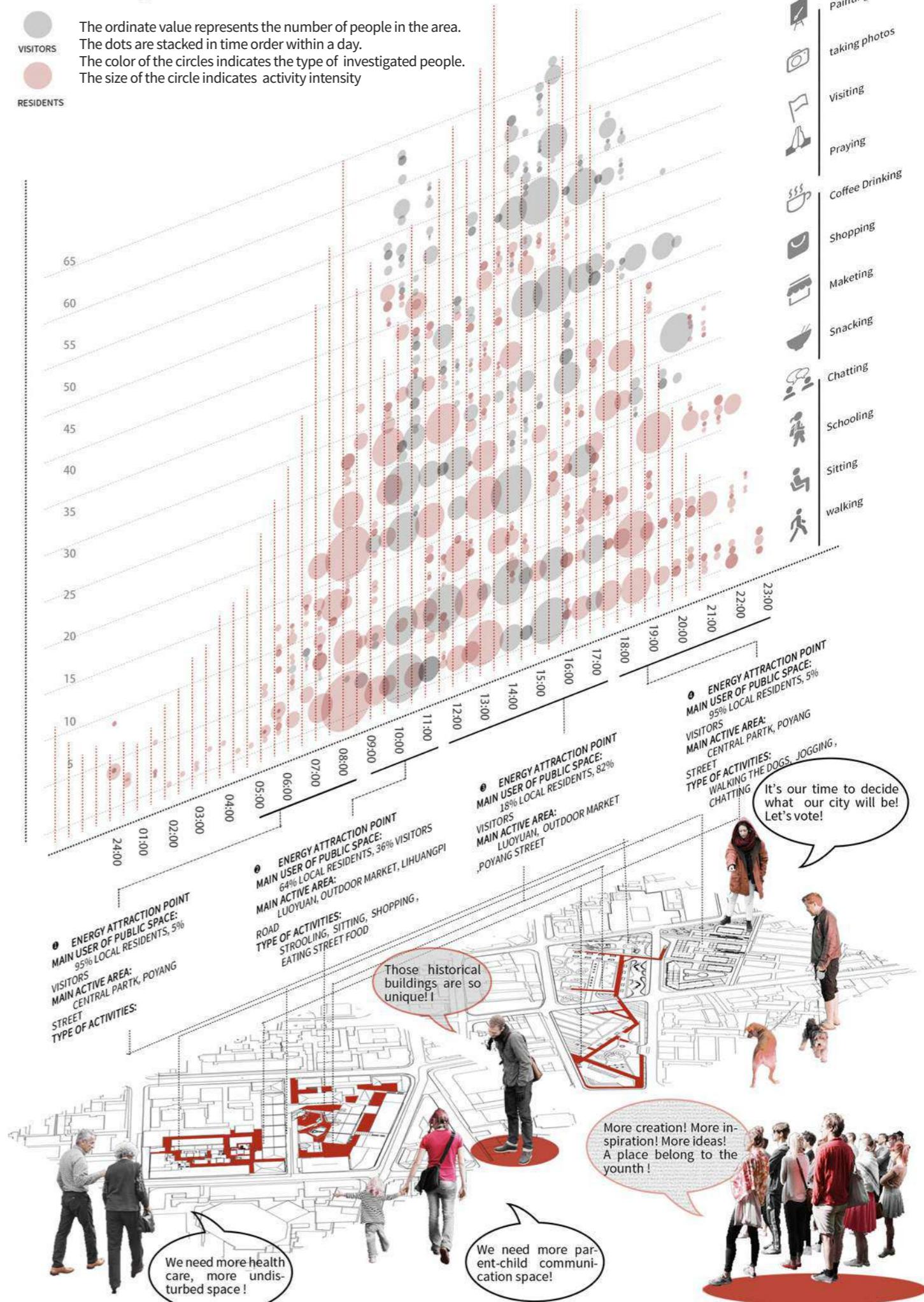
- Overall Satisfaction
- Living Facilities
- Activity Richness
- Traffic
- Recreation Facilities
- Environment



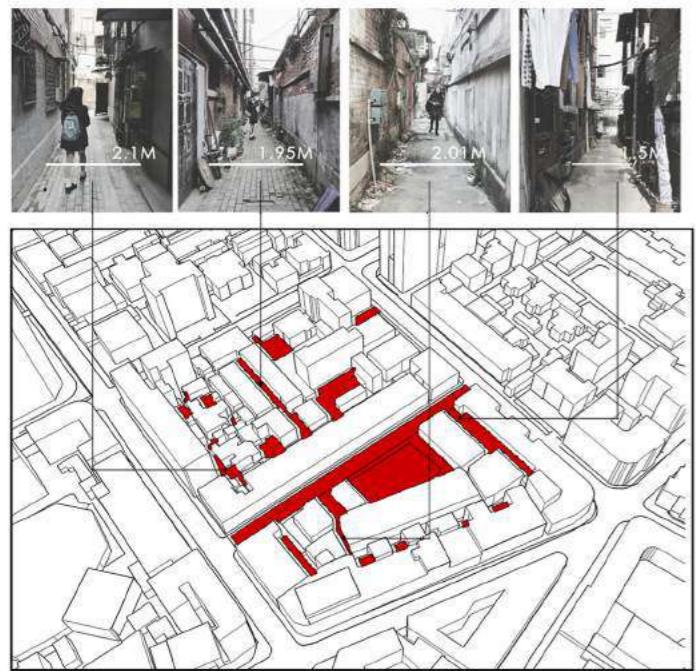
## ACTIVITY FREQUENCY WITHIN A DAY

- VISITORS
- RESIDENTS

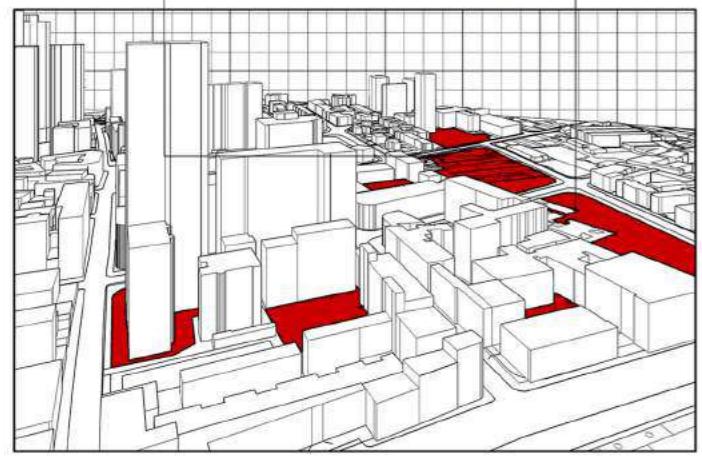
The ordinate value represents the number of people in the area. The dots are stacked in time order within a day. The color of the circles indicates the type of investigated people. The size of the circle indicates activity intensity.



## BEFORE TRANSFORMATION



The public space of Luoyuan Area is dominated by narrow alleys and small squares, the main users of this area is local residents.



The public space of concession park is dominated by large squares and green spaces, the main users is local residents and visitors.

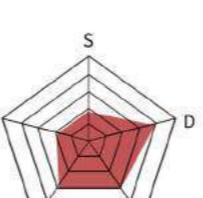
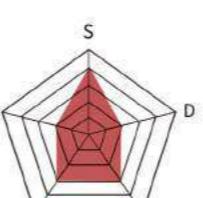
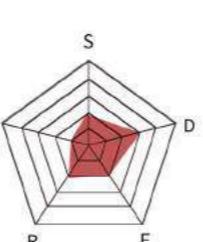
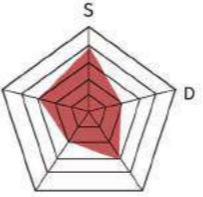
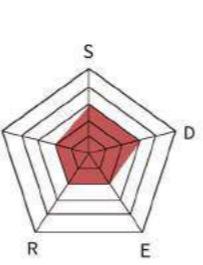
## PUBLIC PROCESS

### TYPE



children

### CURRENT



### DEMAND

#### FAMILY ACTIVITIES

- ③ ④ performance coffee bar picnic .....

#### LIFE SERVICE

- ⑥ nursery health service card room .....

#### CULTURAL EXHIBITION

- ② ⑤ street performance traditional lifestyle education .....

#### GREEN SPACE

- ② ③ ④ sports relax walk the dog .....

#### CREATIVE BAZAAR

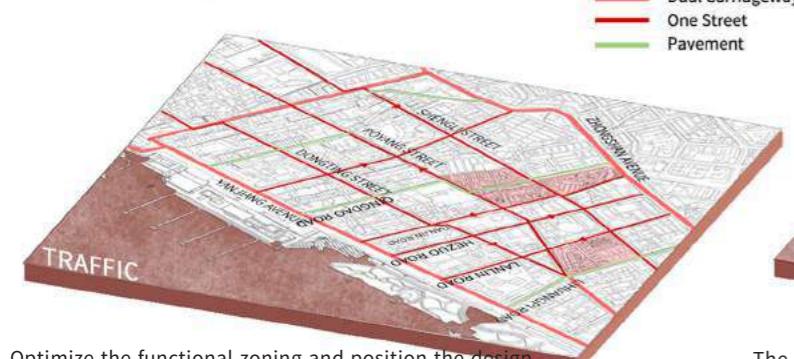
- ① coffee bar special snacks old stuff recycling .....

## AFTER TRANSFORMATION

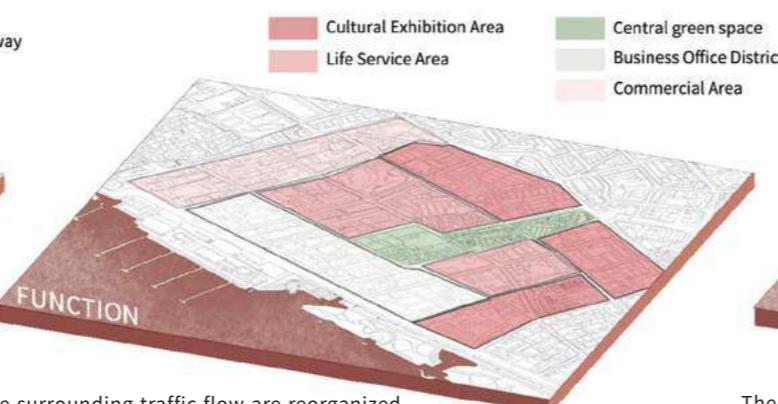
Through field observation and group interview, we found the main activity scope of different groups. Since they have various demands for the use of public space, specific transformations are made in several key public spaces.



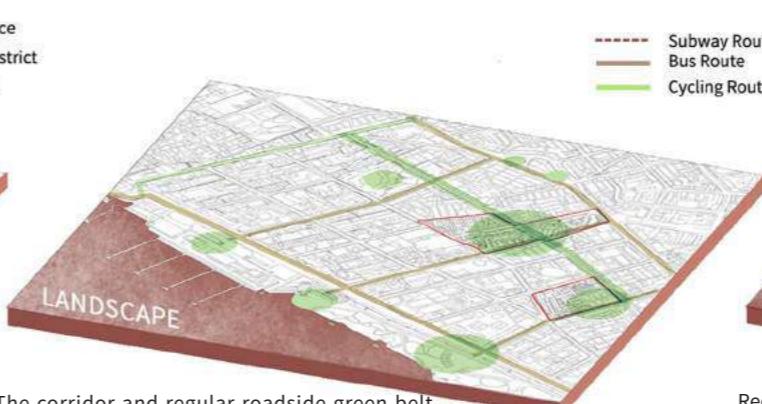
## SYSTEM DESIGN ANALYSIS



Optimize the functional zoning and position the design area as the central green area and the integrated life service area respectively according to the current function.



The surrounding traffic flow are reorganized, and the driving direction is specified to alleviate the congestion problem.

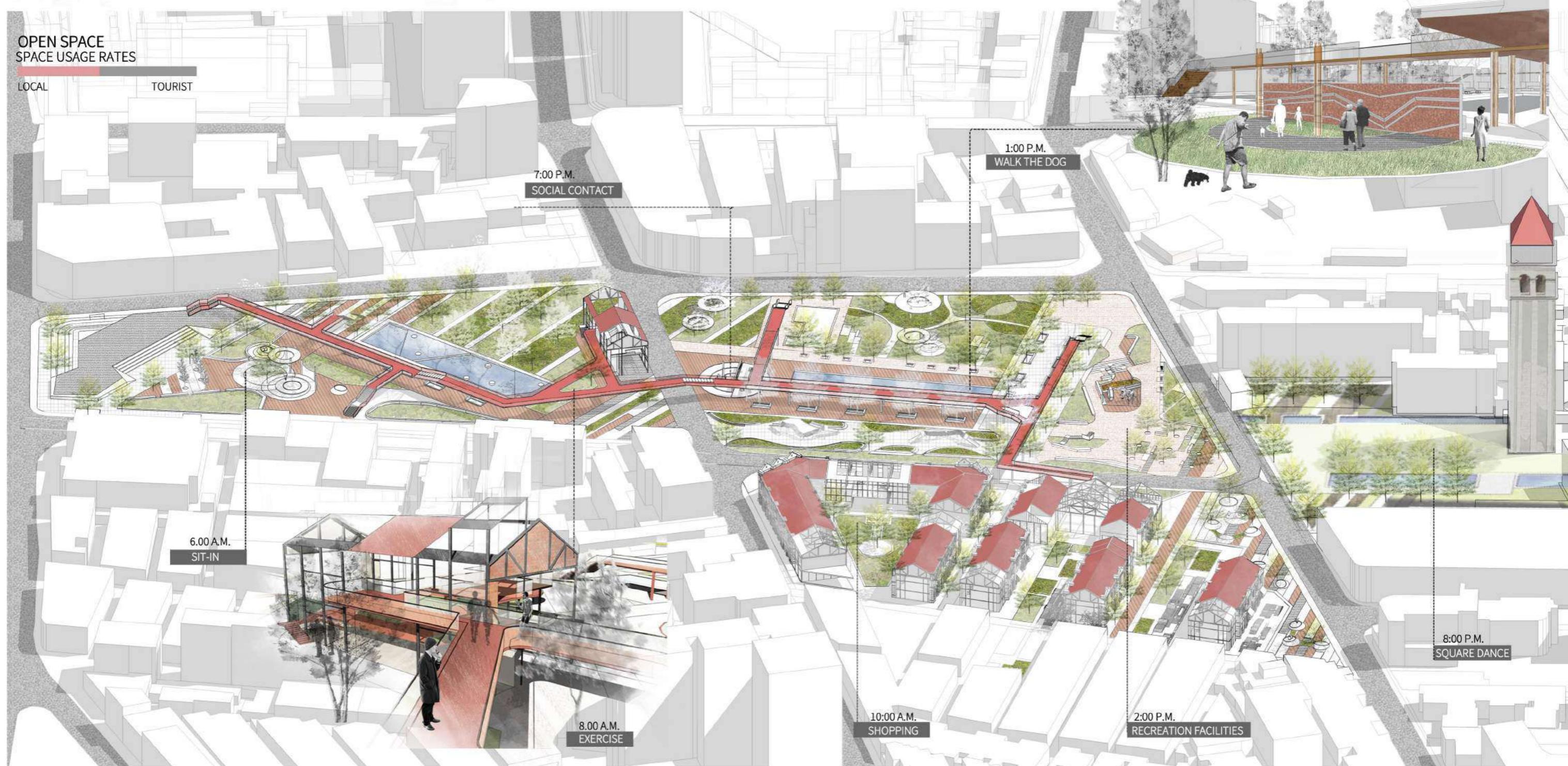


The corridor and regular roadside green belt connect the relatively isolated jiangtan park and the concession area.

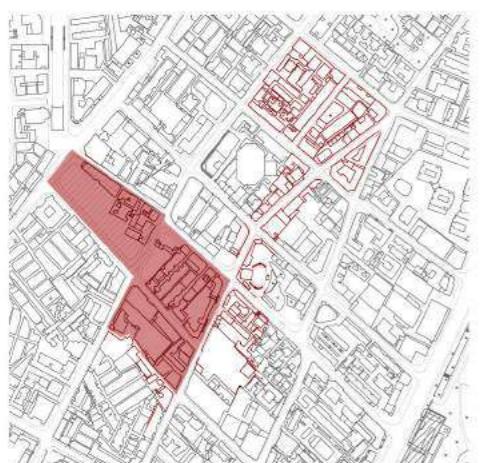


Reorganize the public transportation system and add independent cycling system to maximize the use of transportation facilities.

## CONCESSION PARK



## SITE LOCATION I



## DESIGN PROCESS



### Reservation

Keep the historical buildings of good quality and extract the urban texture



### Reappear

Reproduce the space according to the urban texture and give the space new functions



### Comparison

The implanted new urban square space is in contrast to the traditional street space



### Activation

The potential of inserting different functional nodes into space to activate the plot



### Knitting

Woving park lane and two - story corridor according to the urban fabric.

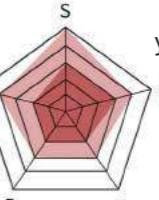


### Connection

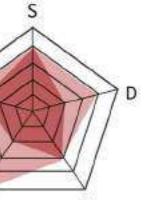
Two corridors are installed on the site to enhance the vitality of the space

## FEEDBACK

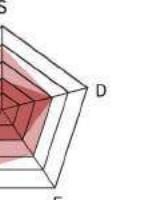
children



youngsters



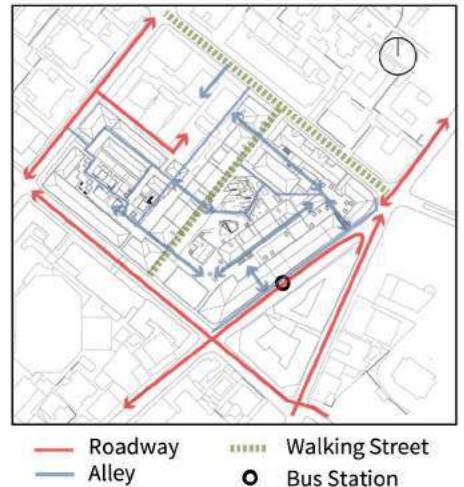
the elder



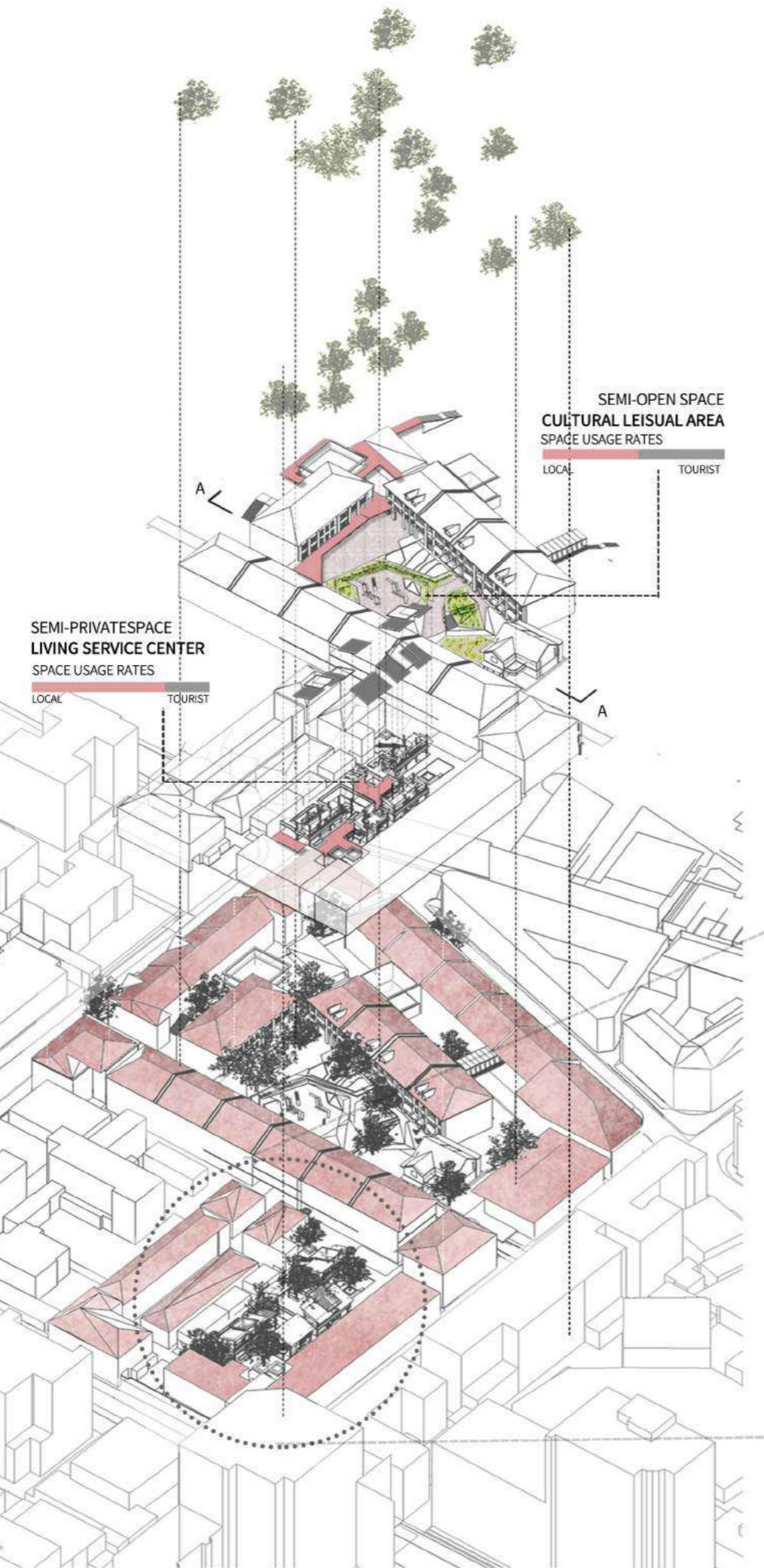
Legend:  
■ before  
 after  
■ S-safe  
■ E-education  
■ D-daily life  
■ R-recreation  
■ G-green

## RENOVATION PROCESS

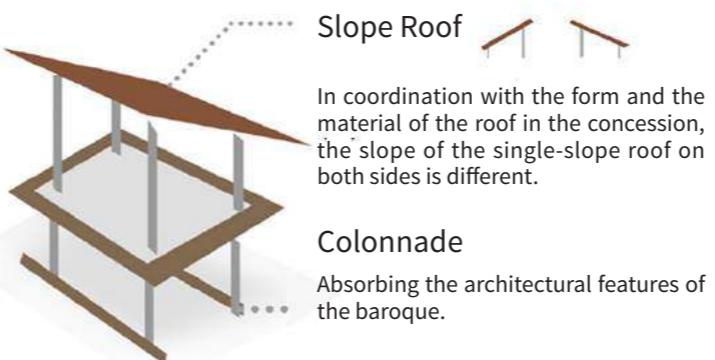
### STREAMLINE



## EXPLOSIVE VIEW OF LUOYUAN

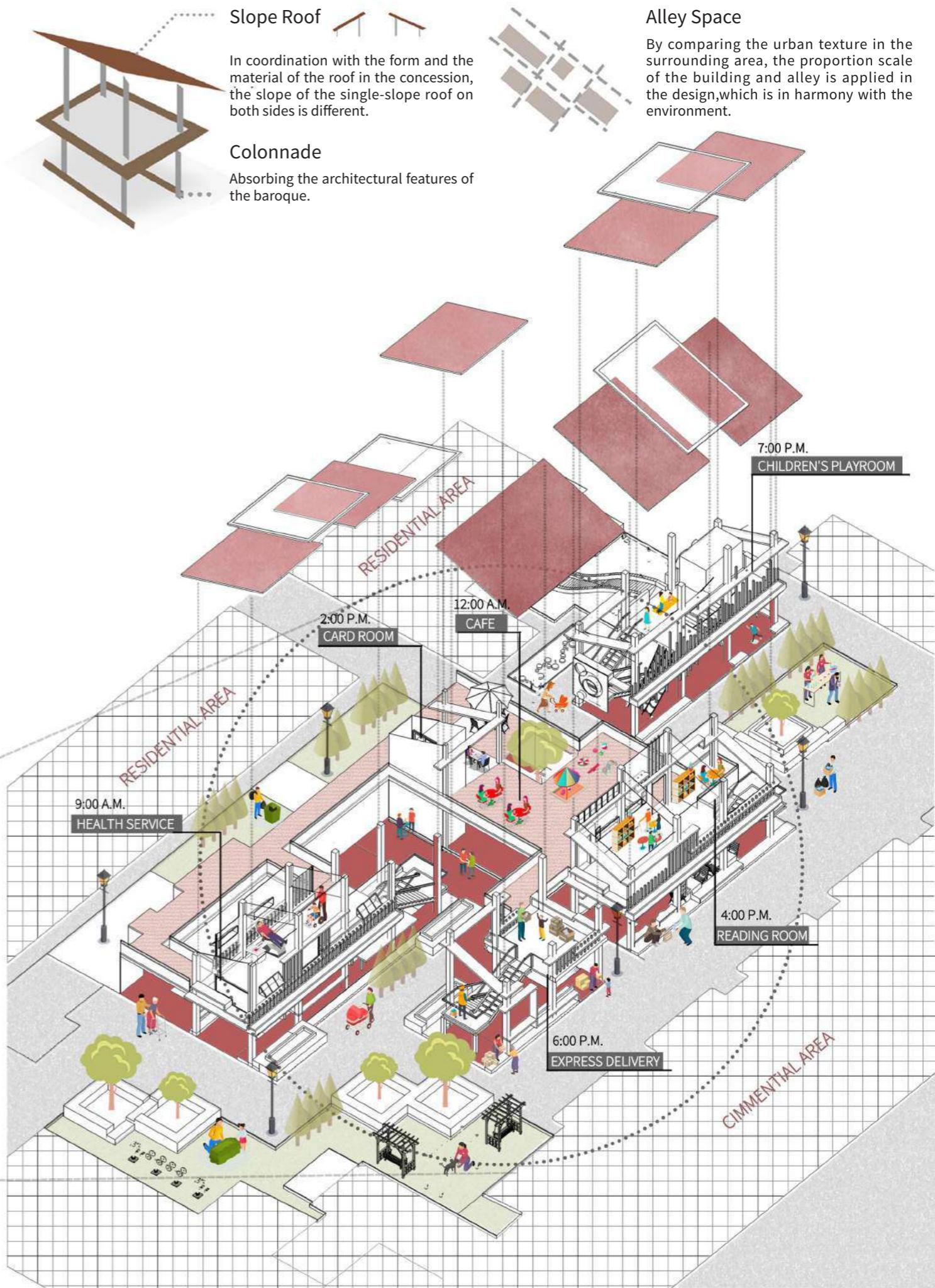


## LIVING SERVICE CENTER

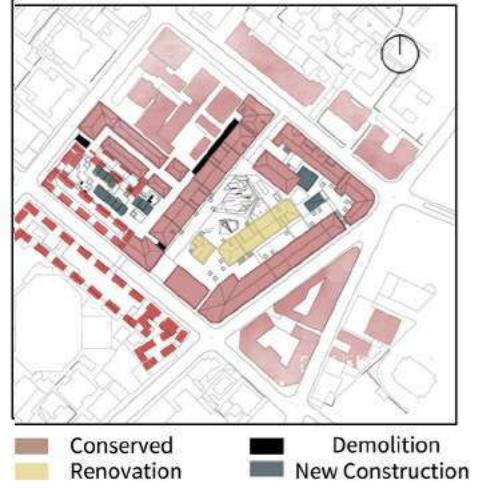


### Alley Space

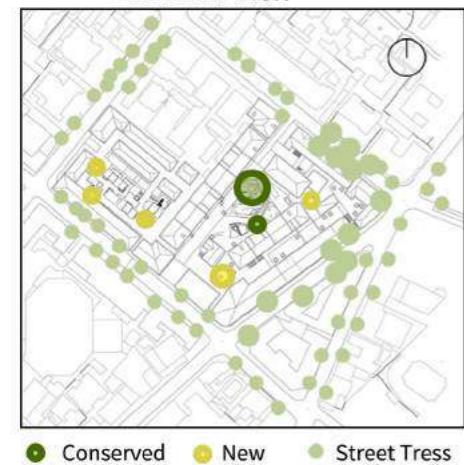
By comparing the urban texture in the surrounding area, the proportion scale of the building and alley is applied in the design, which is in harmony with the environment.



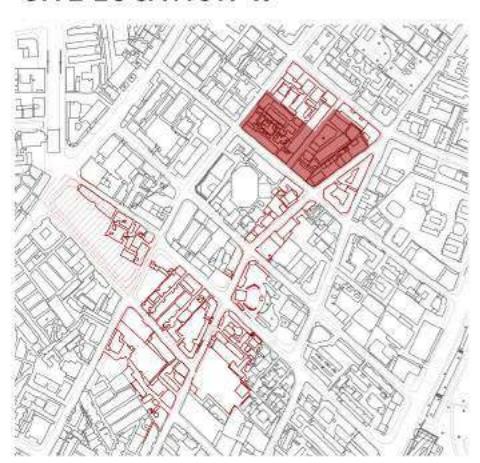
## ARCHITECTURE RENOVATION



## TREES TRANSFORMATION



## SITE LOCATION II



## A-A SECTION



## ADAPTIVE DESIGN OF STREET LIFE



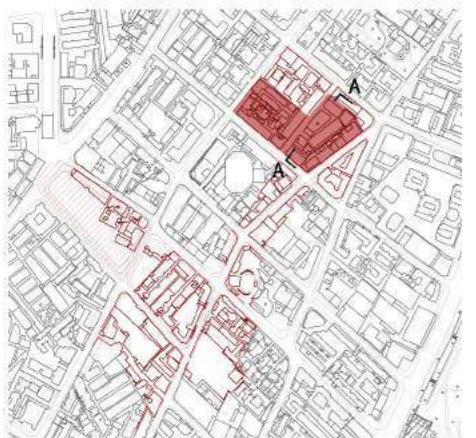
### ① OPEN MARKET

Reinvigorating and updating street trade through an outdoor marketplace.

### ② REST SPACE

Creating playful and active spaces that improve health and wellbeing.

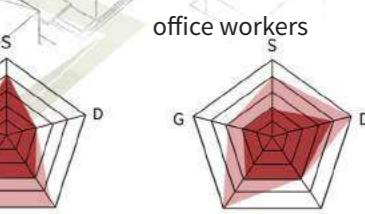
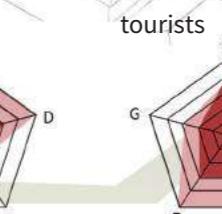
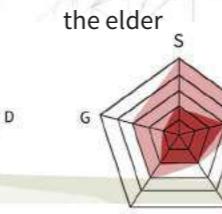
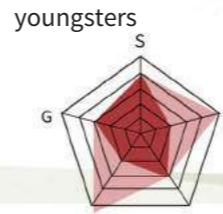
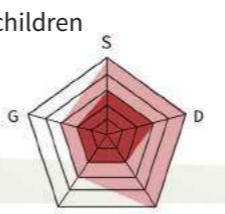
## SITE LOCATION II



**③ PICNIC PLACE**  
Nurturing intergenerational contact and strengthening community ties.

**before**  
**after**

- S-safe
- E-education
- D-daily life
- R-recreation
- G-green



**STOP**

## 02. REVIVING THE FRONT

Urban Renewal Design of Weidong Machinery Factory

**Location**  
Xiangyang ,Hubei ,China

**Type**  
Academic  
Individual work

**Duration**  
Mar. 2018 - Jun. 2018  
Senior 4

**Instructor**  
Shaobing Ren  
[Renshaobing@hust.edu.cn](mailto:Renshaobing@hust.edu.cn)

The third-front construction is one of the typical representatives of the characteristics of China's modern industrial civilization. For the cities that have arisen from the "third-front construction" , such as Xiangyang, these industrial heritages record the production and life of the Chinese working class and intellectuals in an era, and they are the basis of social identity and sense of belonging. How to better protect and utilize the existing three-line industrial heritage is a proposition that cannot be ignored at present.

In this project, I try to revitalize the decaying industrial area by taking ecological restoration and adding new functions to the site. In the design process, I introduce landscape corridors into the site to connect the natural environment and the buildings, which form the sequence space to help familiarize people with this valuable history. At the same time, I reduce the destruction of the original terrain as much as possible, and try to repair the landscapes terraces and restore the natural ecology, which still maintains the previous industrial landscape as part of the local memory.

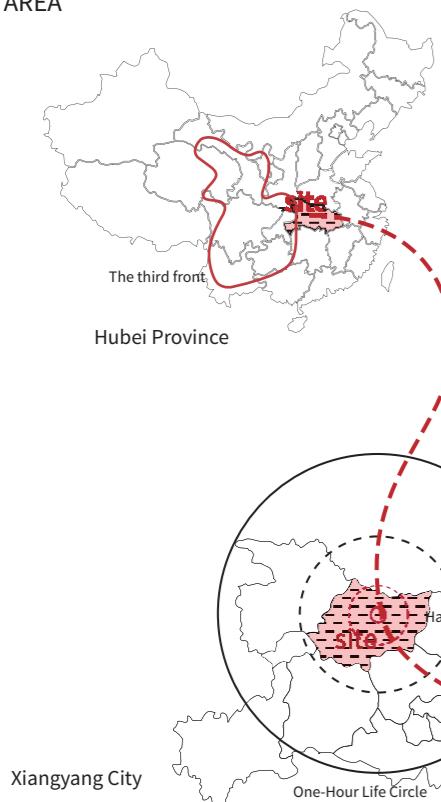


## LOCATION

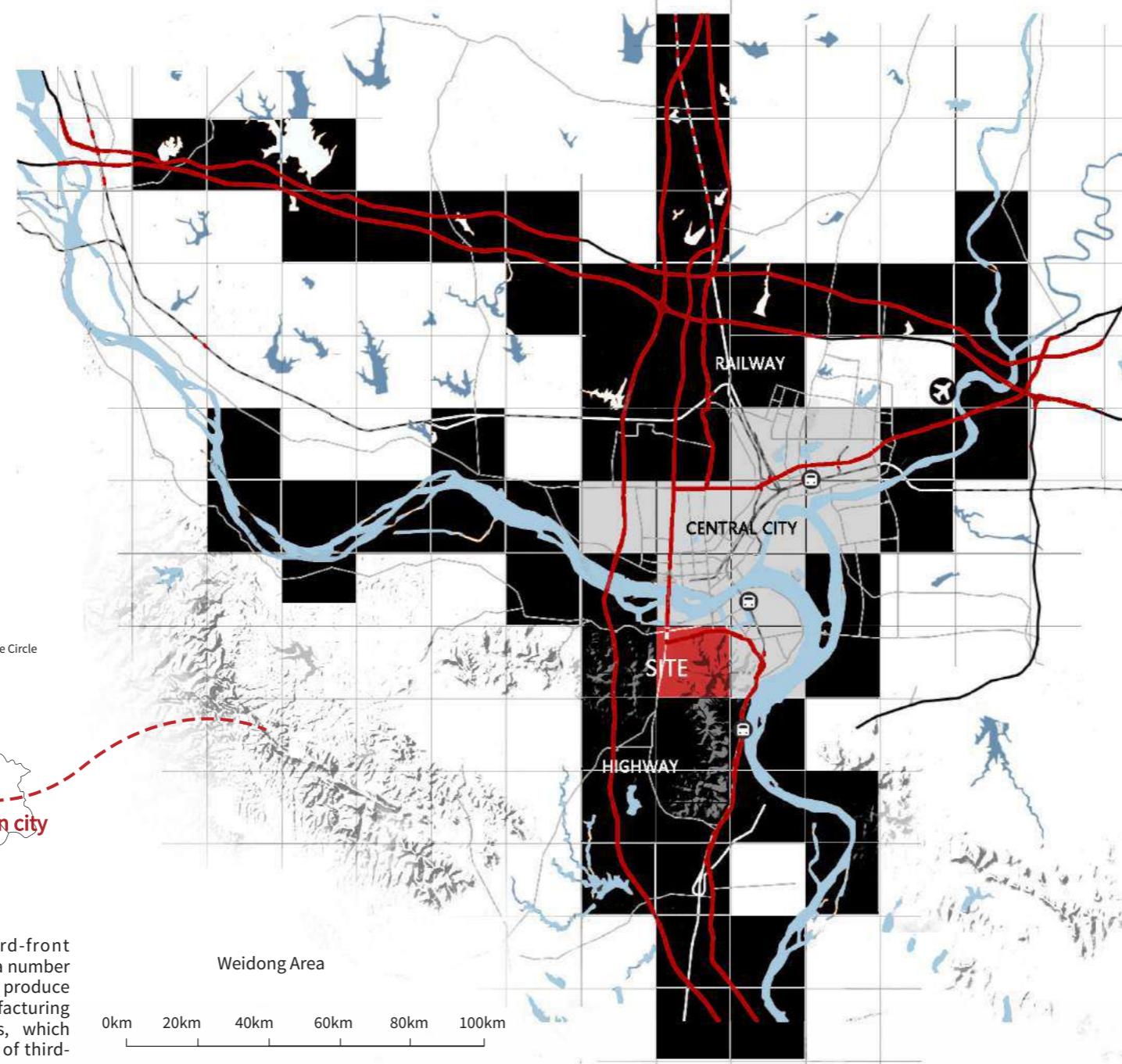
10,1 km  
DISTANCE TO CENTRE XIANGYANG CITY

280,5 km  
DISTANCE TO WUHAN CITY

28,4 ha  
SITE AREA



In the mid-1960s, the government carried out the third-front Construction for war preparations, and planned to establish a number of bases in the central and western parts of China that can produce conventional weapons and the necessary machinery manufacturing industry. Those factories are usually located in remote valleys, which is difficult to be discovered during wartime. Therefore, all of third-front factories are always accompanied by mountains.

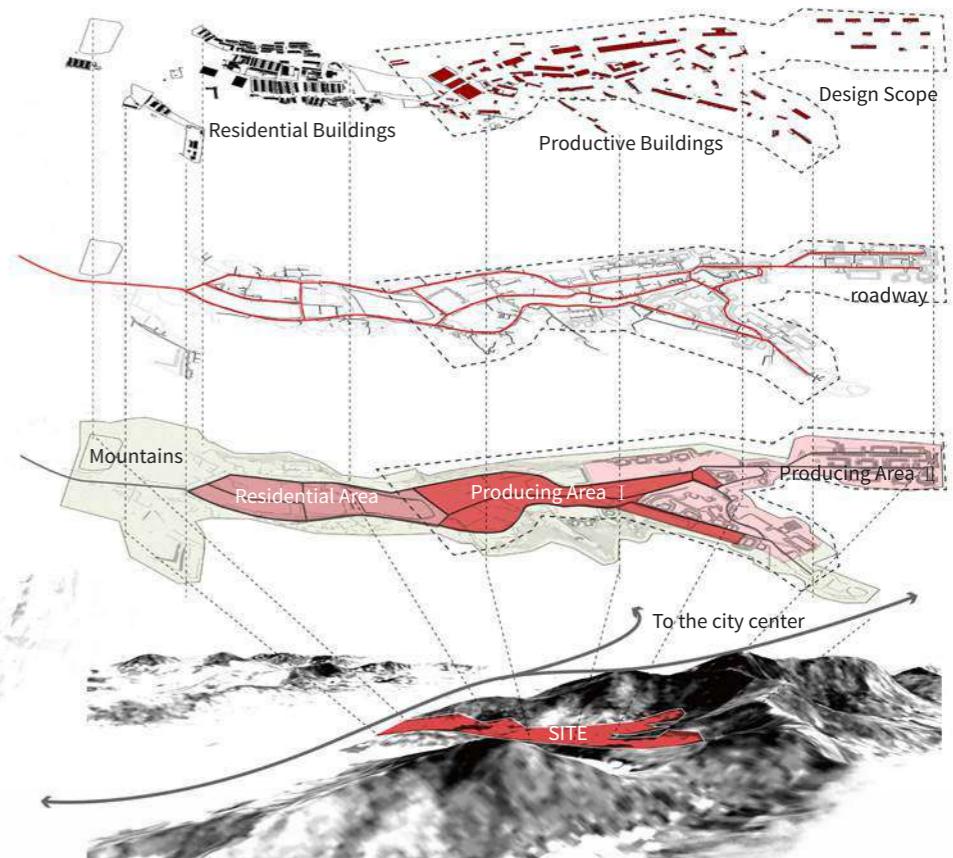


## BACKGROUND

At that time, many aspiring young people left for the machinery factory deep in the mountains from the city, most of the "three-front factories" and living areas were connected together, and the walls were built high and isolated. In addition to the factory and staff quarters, all facilities are available. Weidong Machinery Factory also has its own kindergarten, children's school, hospital, etc. The people here are the same as the outside. They could even go through their lifet without leaving the factory area.

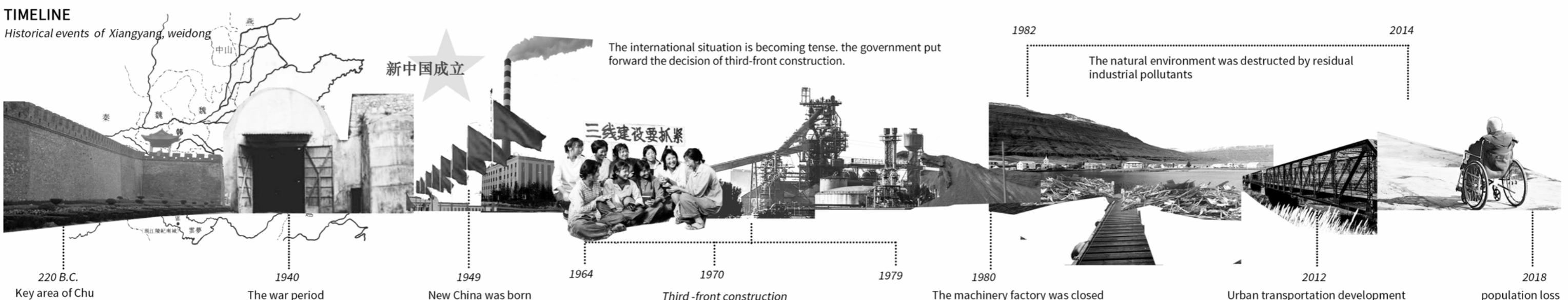
In the 1980s, under the wave of Chinese reform and opening up, there was no need for war preparations in old third-front factories. Weidong Machinery factories had been withdrawn and become ordinary state-owned enterprises. However, because of the Industrial pollution caused by factories, a lot of young people choose to leave this area. At the same time the solitary laid-off workers are facing serious mental health problem.

## SPATIAL STRUCTURE ANALYSIS

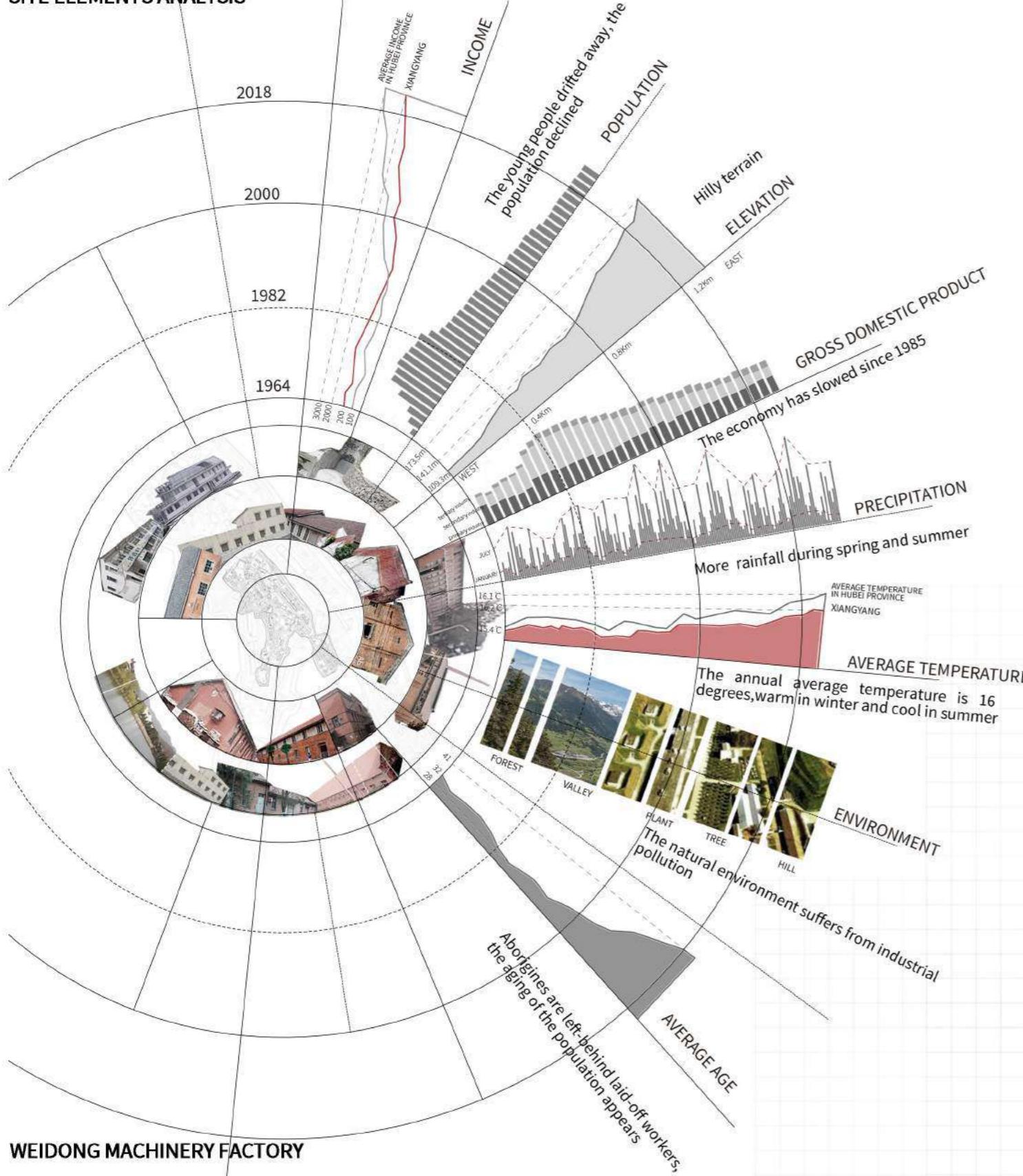


## TIMELINE

Historical events of Xiangyang, weidong



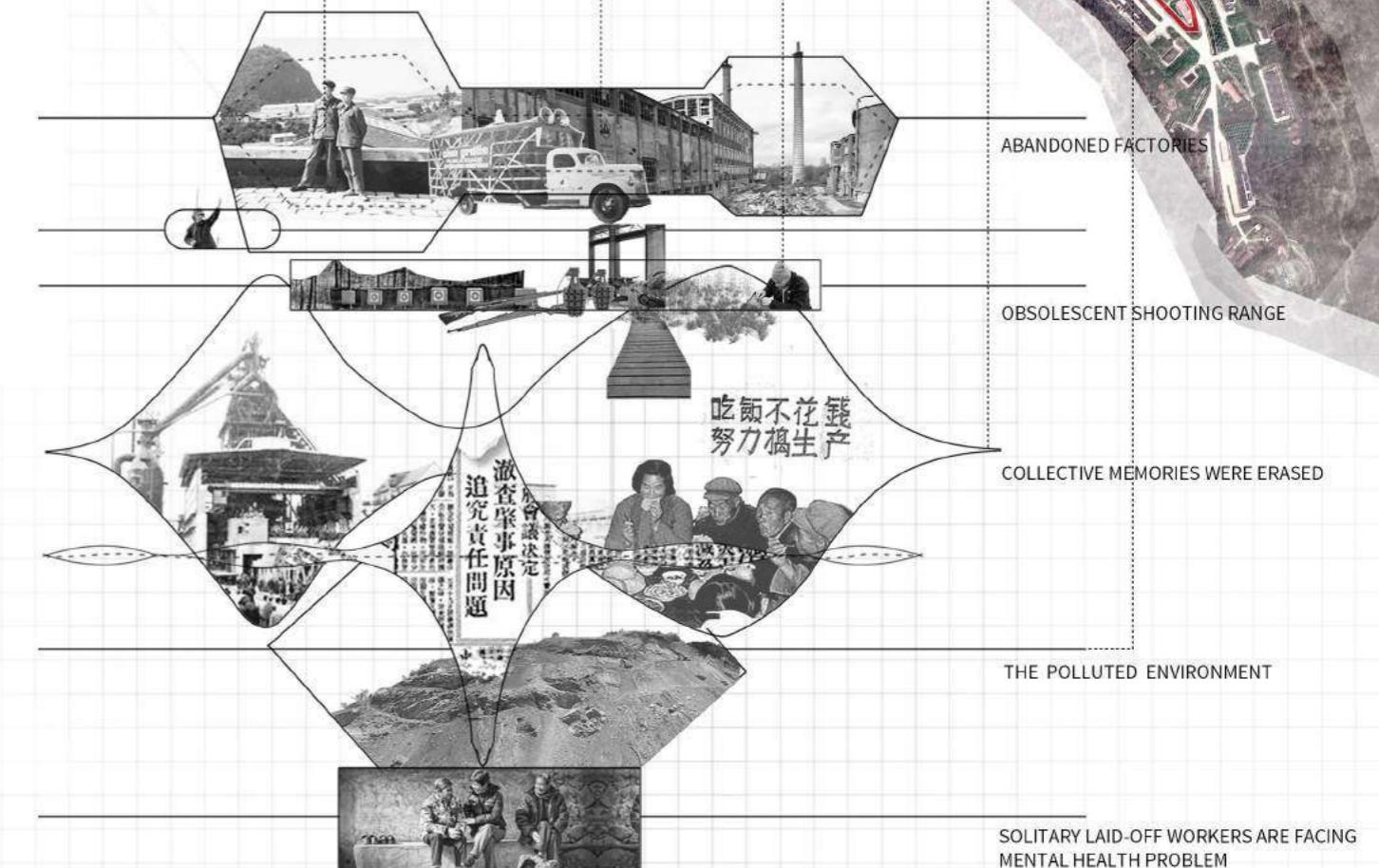
## SITE ELEMENTS ANALYSIS



WEIDONG MACHINERY FACTORY



## ISSUES



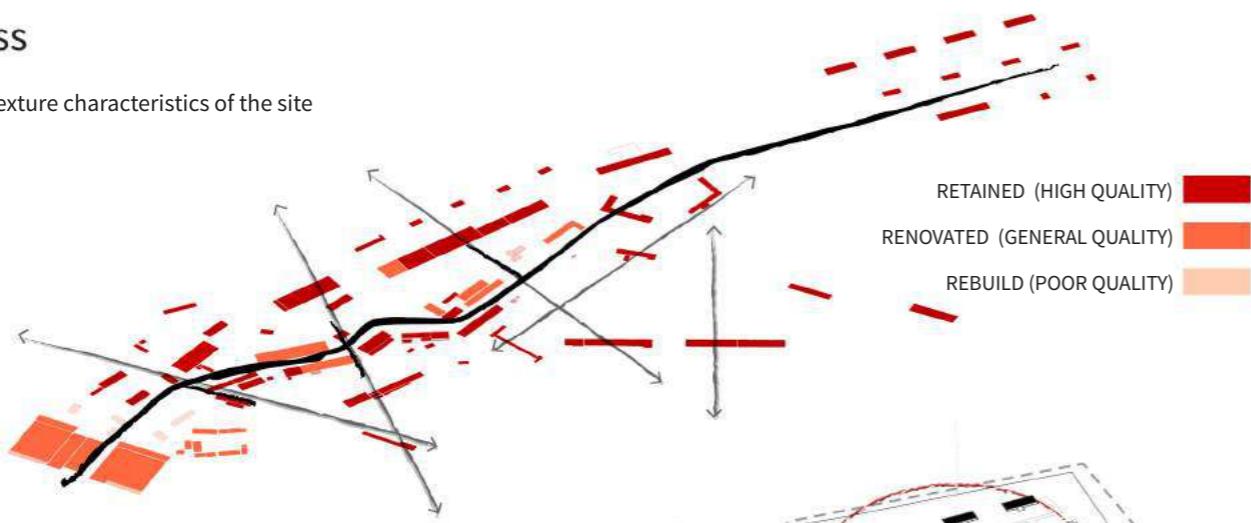
## CONCEPT

In the post-industrial age, how to deal with the relationship between industrial heritage and nature has become an urgent problem. The natural vegetation succession is a major means of ecological rehabilitation in the decaying industrial area. However, not only did the Weidong area suffer from severely polluted ecological environment, but the valuable collective memory born by the site is fading out.

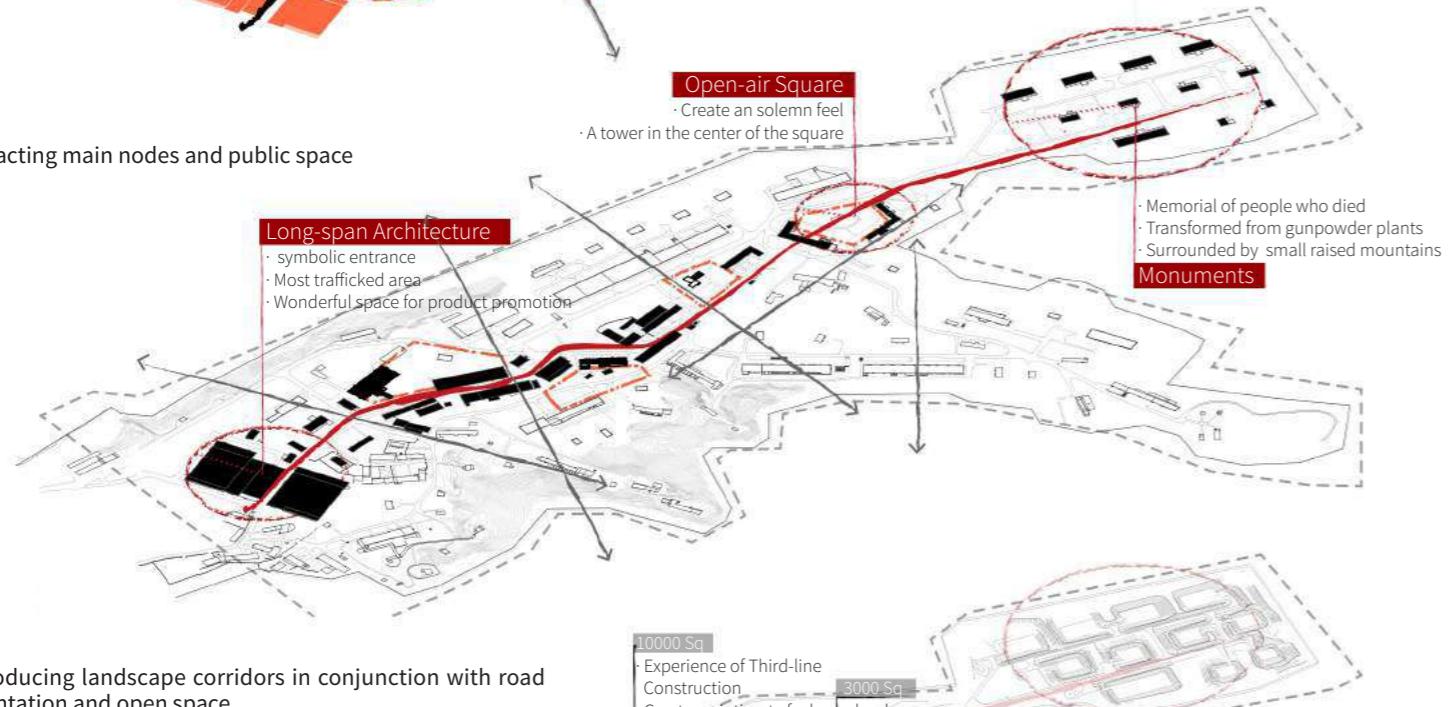
In this reality, I focus on the **human experience** in the interaction of industrialization and nature. I decided to repair the original urban texture and enforce ecological restoration, in order to **maintain the previous industrial landscape as part of the local memory**. In terms of spatial support for people's activities, I introduce landscape corridors into the site, which connect the factories, public space and natural landscape, providing people with more diverse experiences and revitalizing the decaying industrial area.

## DESIGN PROCESS

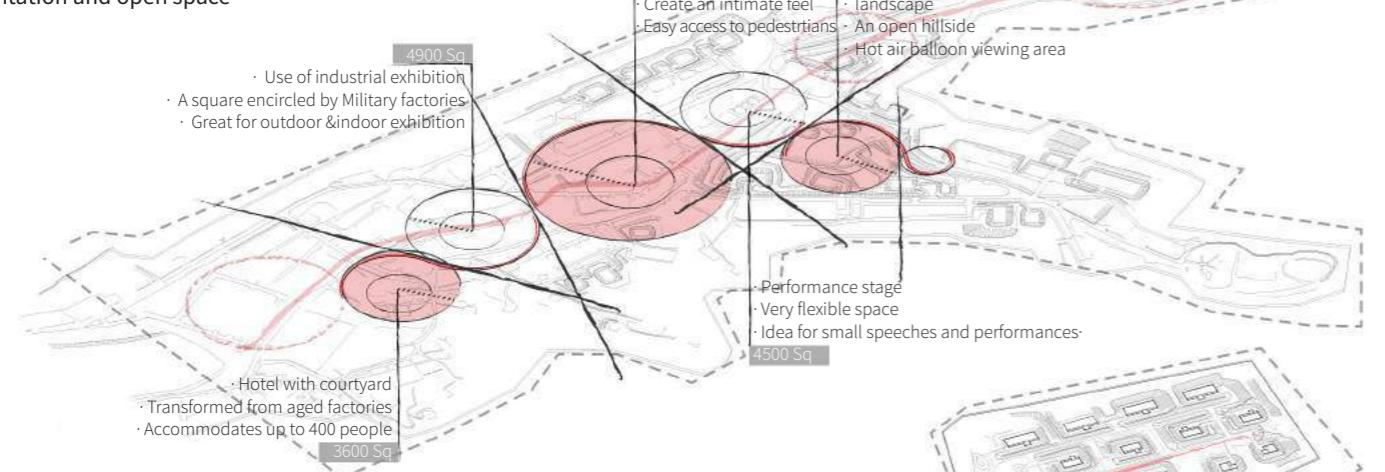
Study original urban texture characteristics of the site



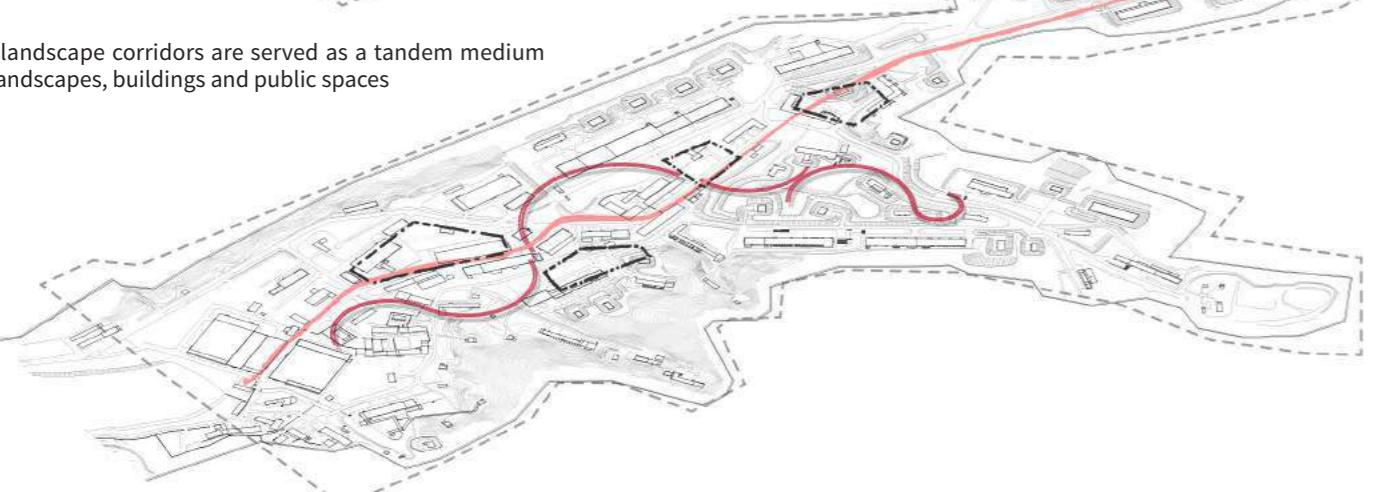
Extracting main nodes and public space



Introducing landscape corridors in conjunction with road orientation and open space



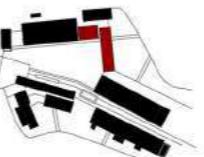
The landscape corridors are served as a tandem medium for landscapes, buildings and public spaces



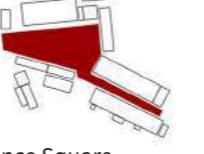
## TRANSFORMATION STRATEGY



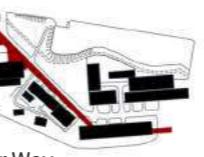
Original Entrance



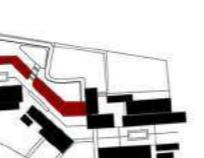
Add Exhibits Corridor



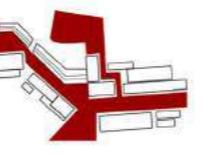
Entrance Square



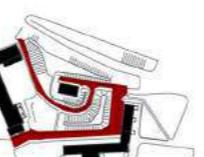
Motor Way



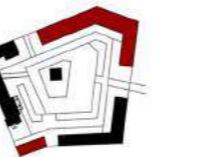
Landscape Terraces Reconstruction



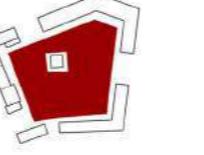
Pedestrian Zones



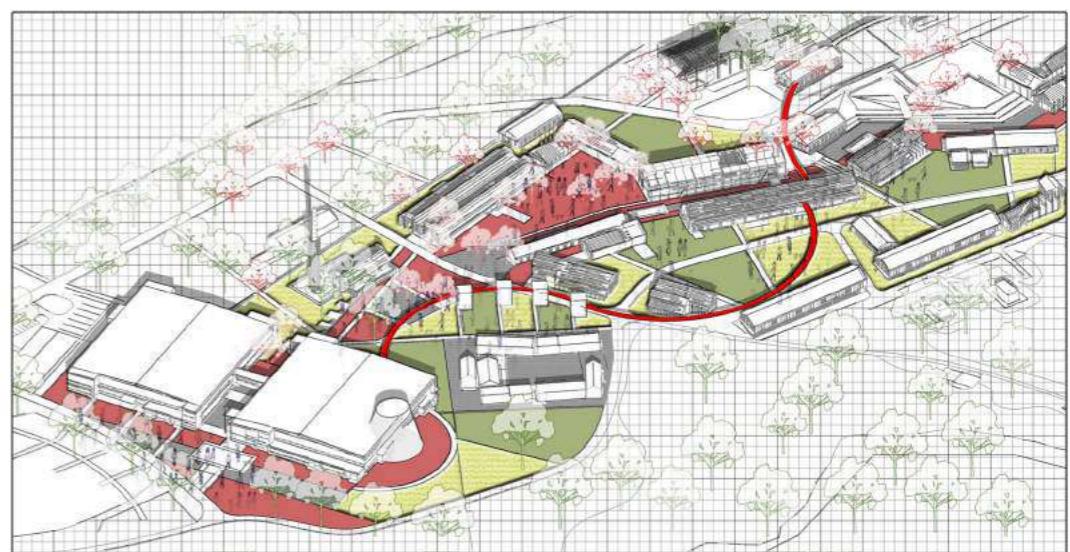
Narrow Street Space



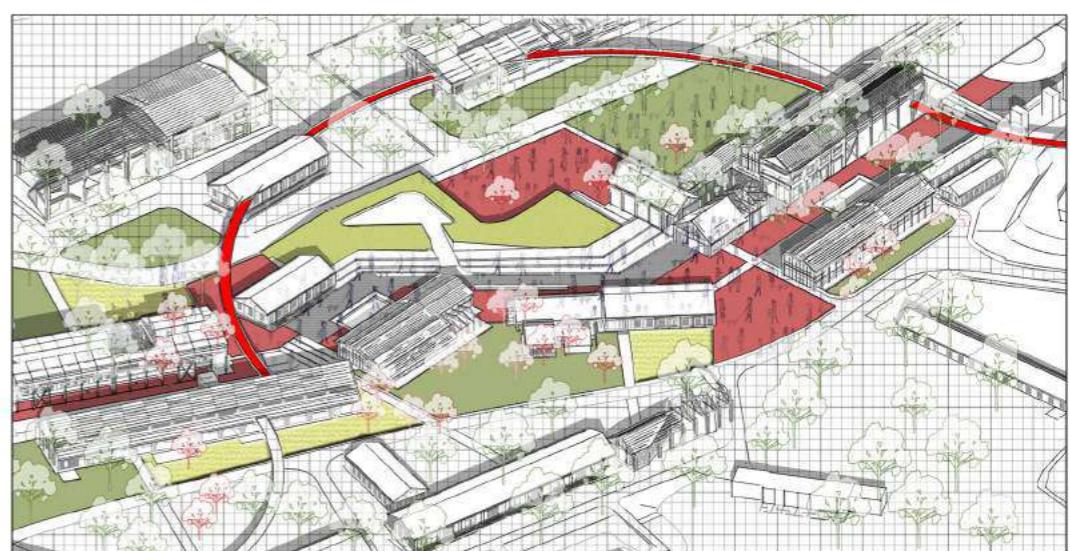
New Enclosed Buildings



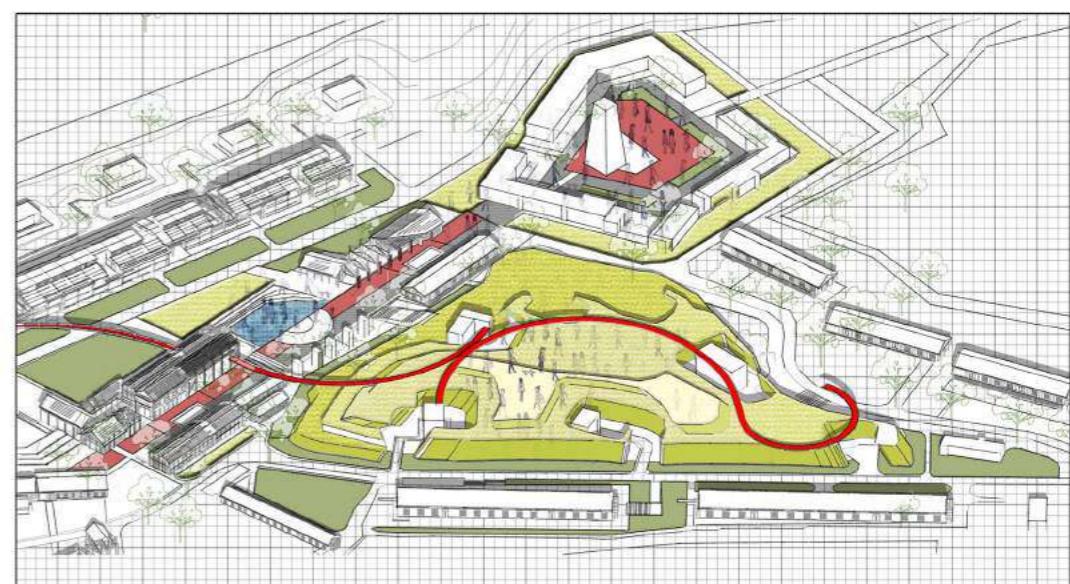
Memorial Plaza



THE WESTERN AREA



THE MIDDLE AREA



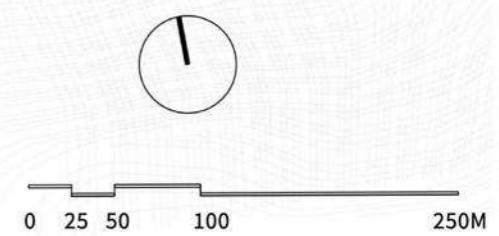
THE EASTERN AREA

## MASTER PLAN

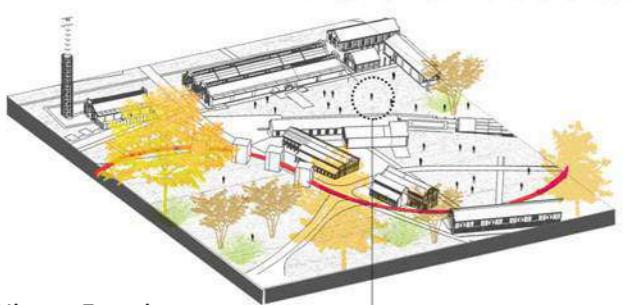


## LEGEND

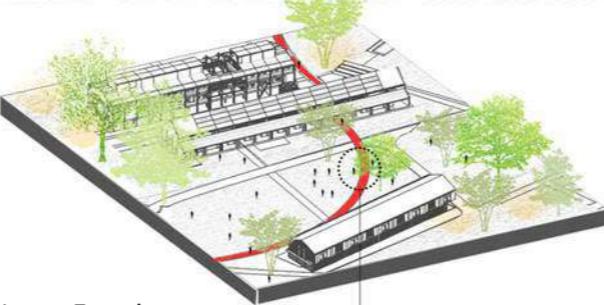
- |                       |                   |                                   |                  |
|-----------------------|-------------------|-----------------------------------|------------------|
| ① RESERVOIR LANDSCAPE | ⑤ HOTEL           | ⑨ WEAPONS TESTING GROUND          | ⑬ BALLOON AREA   |
| ② PARKING LOTS        | ⑥ EXHIBITION AREA | ⑩ THE THIRD-FRONT LIFE EXPERIENCE | ⑭ MEMORIAL PLAZA |
| ③ RECEPTION CENTRE    | ⑦ LAND ART        | ⑪ OPEN STAGE                      | ⑮ CEMETERY       |
| ④ INDUSTRIAL GARDEN   | ⑧ OPEN-AIR CINEMA | ⑫ LANDSCAPE CORRIDOR              |                  |



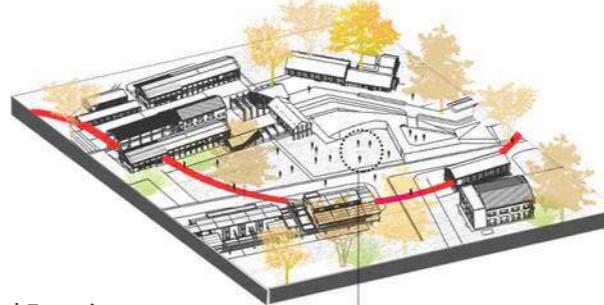
## PLACE



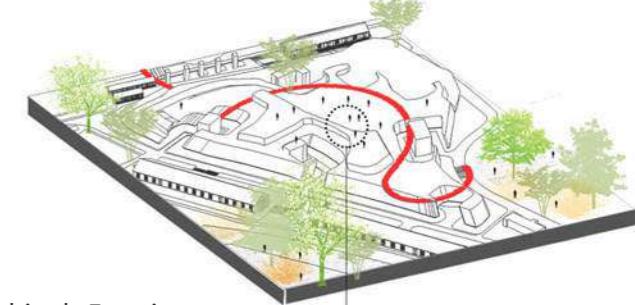
History Experience



Nature Experience

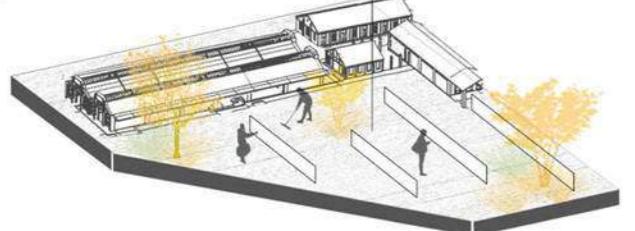


Cultural Experience

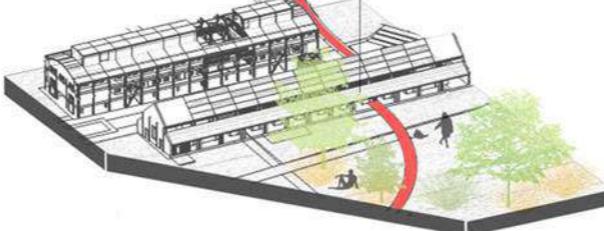


High-altitude Experience

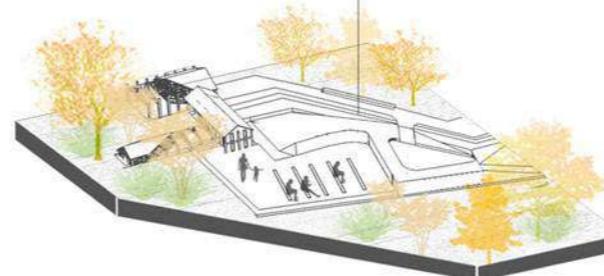
## ACTIVITY



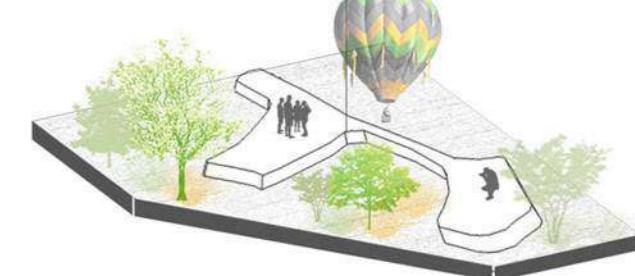
Street Museum



Various of Local Plants



Open-air Cinema



Balloon

## ECOLOGICAL RESTORATION

### PHASE1 COMPREHENSIVE SITE ASSESSMENT

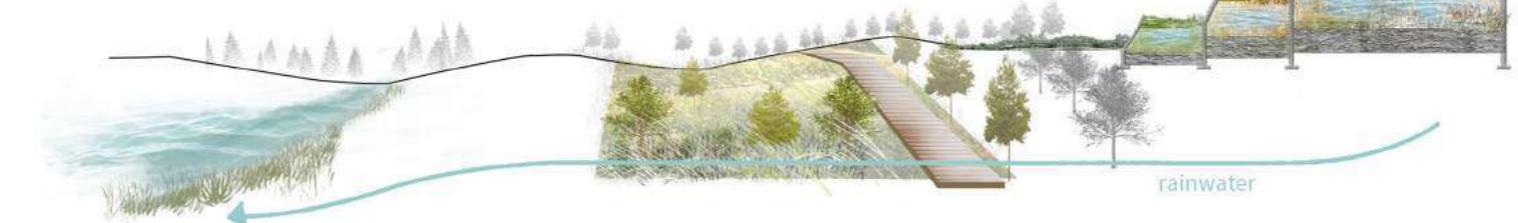


Reservoir garbage accumulation and serious water pollution.

Soil erosion, no vegetation covered land bare.

Destruction of the ecological environment.

### PHASE3 WATER MANAGEMENT

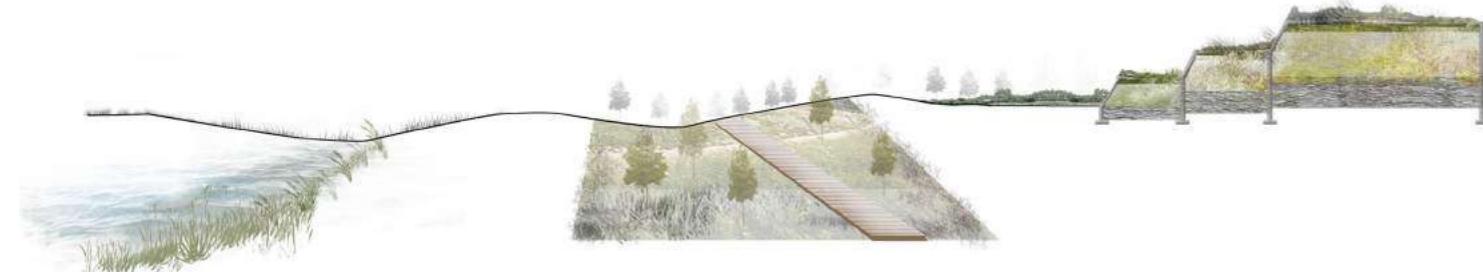


The water quality of the reservoir is improved .

Vegetation grow and purify the rainwater

Rainwater storage

### PHASE2 IMPLEMENTATION OF PHYTO TECHNOLOGY REMEDIATION

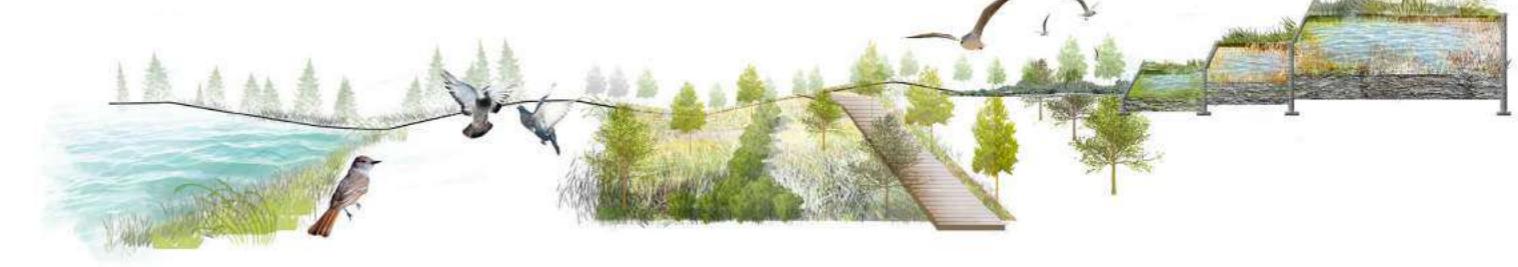


Riparian transformation, cleaning up reservoir waste, and planting aquatic plants.

Soil reclamation, planting trees and bottom vegetation to protect soil and water.

Construction of ecological retaining wall.

### PHASE4 OPERATION AND MAINTENANCE



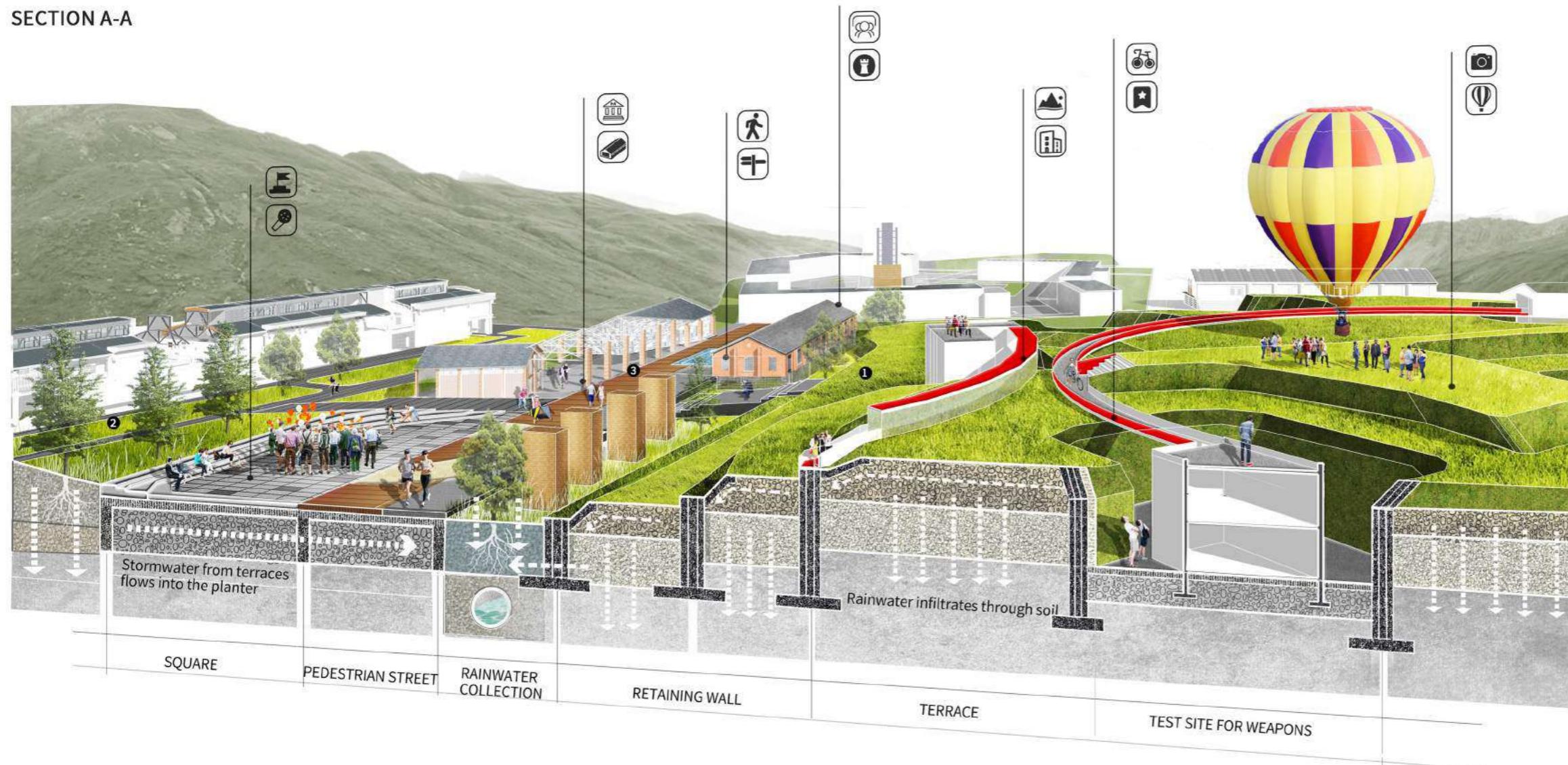
Aquatic plants are suitable for water environment and plant survival.

The formation of trees, tree lined trail, natural ecological restoration

Various kinds of creatures are attracted

## PERSPECTIVE OF WATER MANAGEMENT

### SECTION A-A

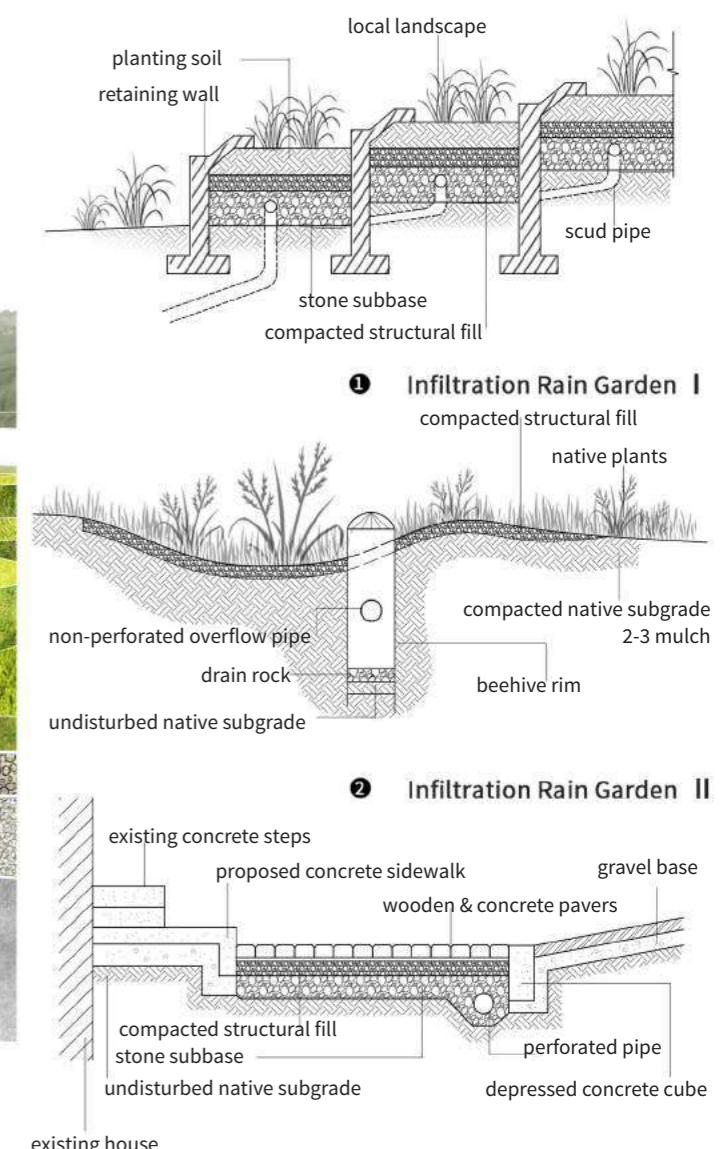


① Infiltration Rain Garden I

② Infiltration Rain Garden II

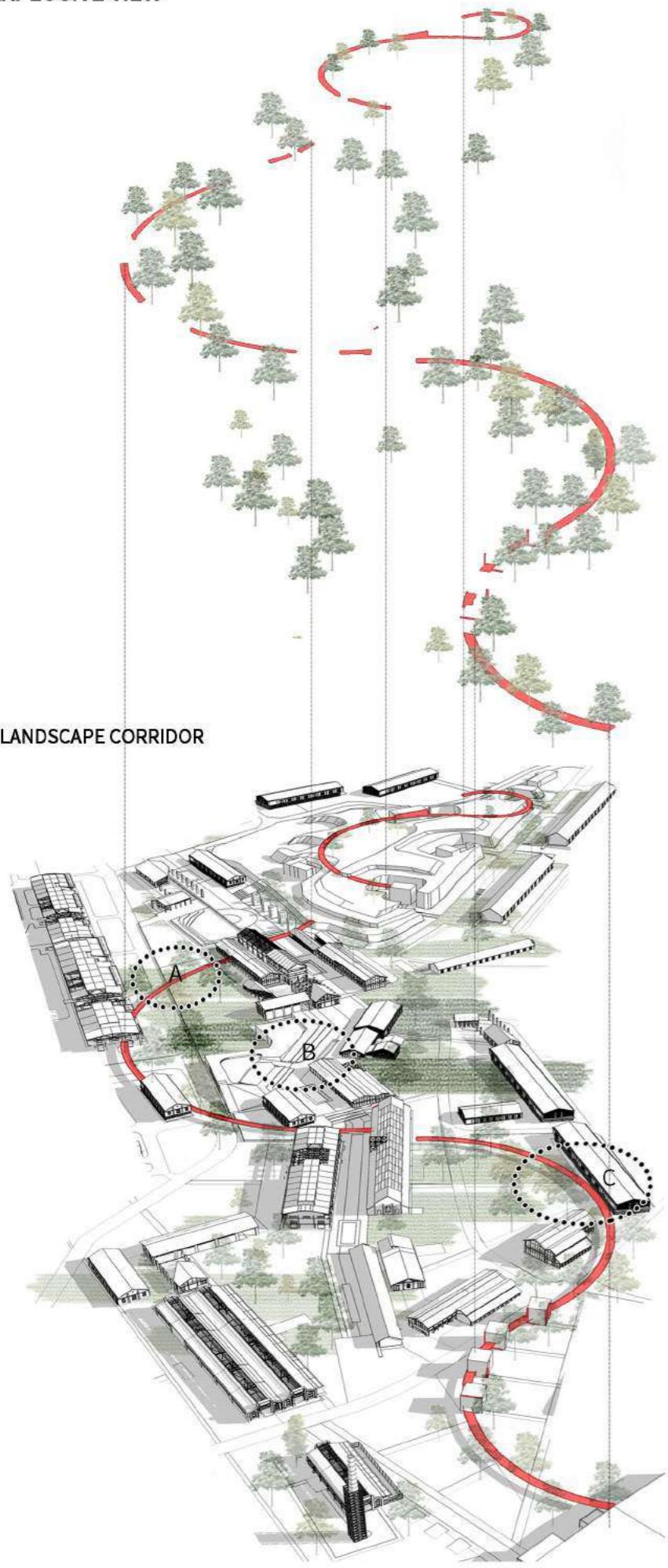
③ Detailed Pavement Construction

## GREEN INFRASTRUCTURE



③ Detailed Pavement Construction

## EXPLOSIVE VIEW



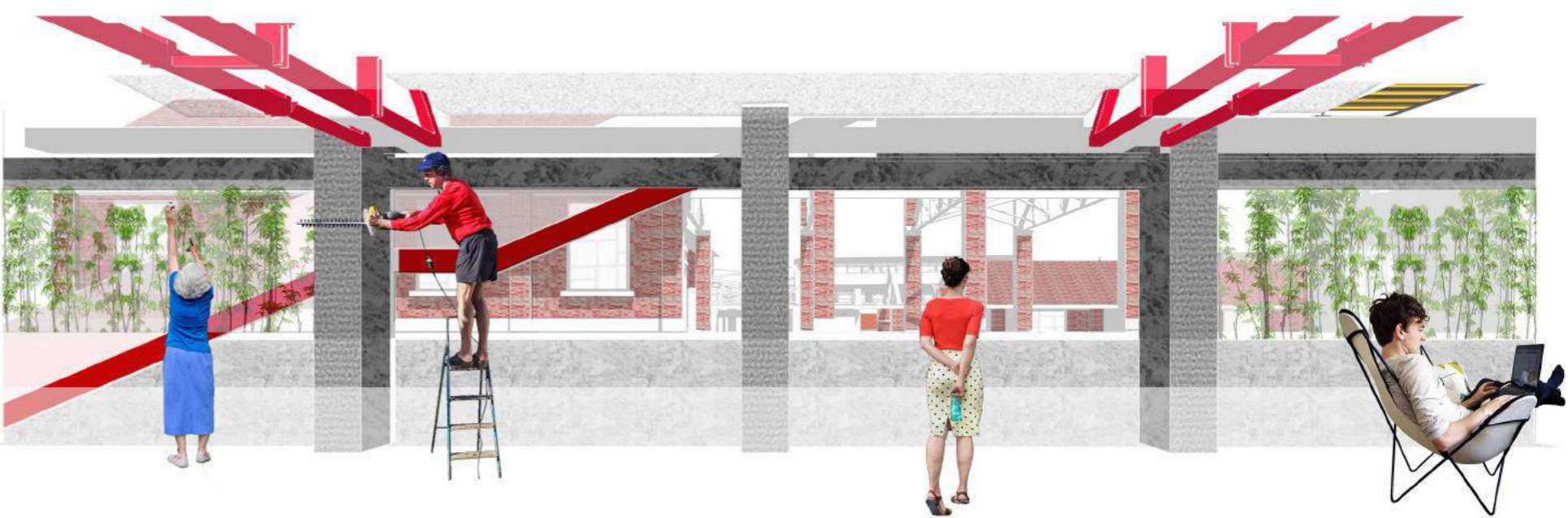
## OUTDOOR ACTIVITIES



## PEDESTRIAN STREET



## TRANSFORM THE FACTORY INTO GALLERY



# 03. A SITUATIONAL CITY

The 3rd Art&Tech National Architectural Concept Design Competition

## Duration

Feb. 2018 - Mar. 2018  
Senior 4

## Type

Academic/ Team work

## Team Member

Zhu Jingdan

## Role in Team

concept design  
digital modeling  
graphic drawing

## Instructor

Hexuan Dong  
HexuanDong@gmail.com

The term "situationist" refers to the construction of situations. Situationist theory sees the situation as a tool for the liberation of everyday life, a method of negating the pervasive alienation that accompanied the spectacle. The founding manifesto of the Situationist International, Internationale Situationniste #1 (June 1958) defined the constructed situation as "**a moment of life concretely and deliberately constructed by the collective organization of a unitary ambiance and a game of events**". The experimental direction of situationist activity consisted of setting up temporary environments favorable to the fulfillment of true and authentic human desires in response.

We take this idea and try to **create a full experience city through games and walks to confront the urban space**. we want to build a city about loss and choice: the visitor is lost in constant choice, the memory overlaps subtly, the traditional logic is pushed down, and When people get lost, landmark becomes the only bright light for people to lead the way. **The landmarks replaces the path, which finally become a memory of people in the city.**

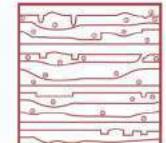
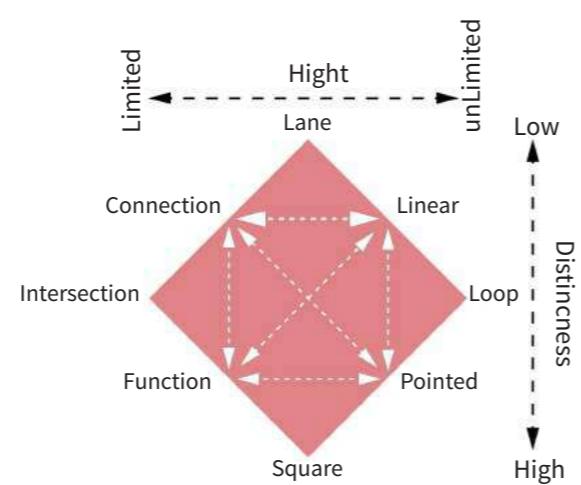
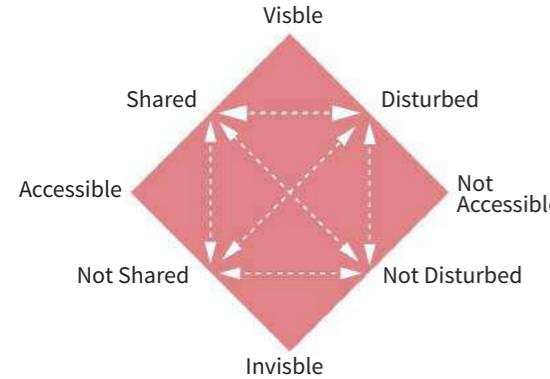


## A SITUATIONAL CITY

In the discussion of guy debord's The Society of Spectacle, he aims to realize the liberation of daily life by construction new situations in the city. Through the strategy of 'drifting', abandoning the 'usual urban habits' way to walk fast in the city. In our project, we take this idea and try to create a full experience city through games and walks to confront the urban space.

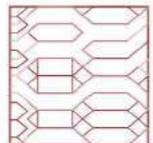
Based on the observation of the city, we believe that the city is composed of two parts: path and folly. In theory, people first remember path, and then they arrive and have corresponding behavioral activities. But in a city that aims to explore and play, we want to build a city about loss and choice: the visitor is lost in constant choice, the memory overlaps subtly, the traditional logic is pushed down, and landmarks replaces the path, which finally become a memory of people in the city.

## CONSTRUCTION RULES



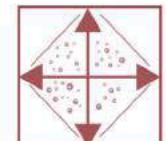
### LANDSCAPE

Ground, roofs and walls should respond to the landscape



### CONTINUITY

Streets are continuous in city



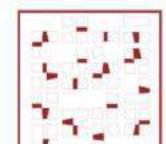
### FUNCTION

Limit space size according to functional requirements



### CLUE

Clue are connected in series to form a city route



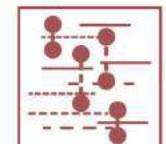
### SPACE

Dividing space by concave and convex relationship



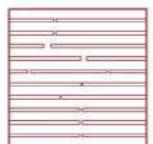
### DENSITY

The city is made up of high-density neighborhoods



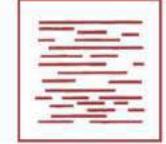
### CONNECTION

Vertical connection



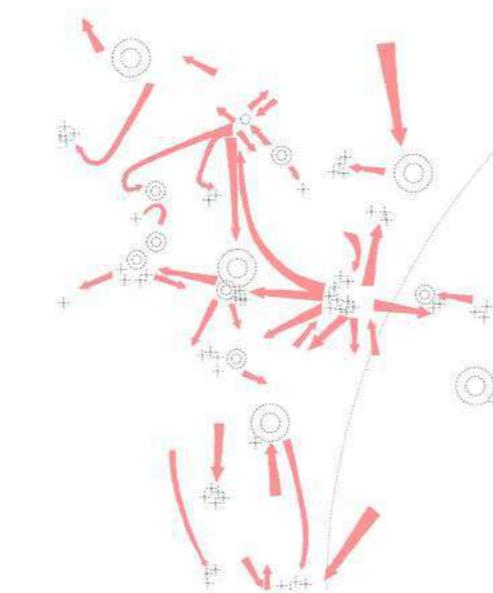
### LAYER

The vertical direction of the city is clearly layered

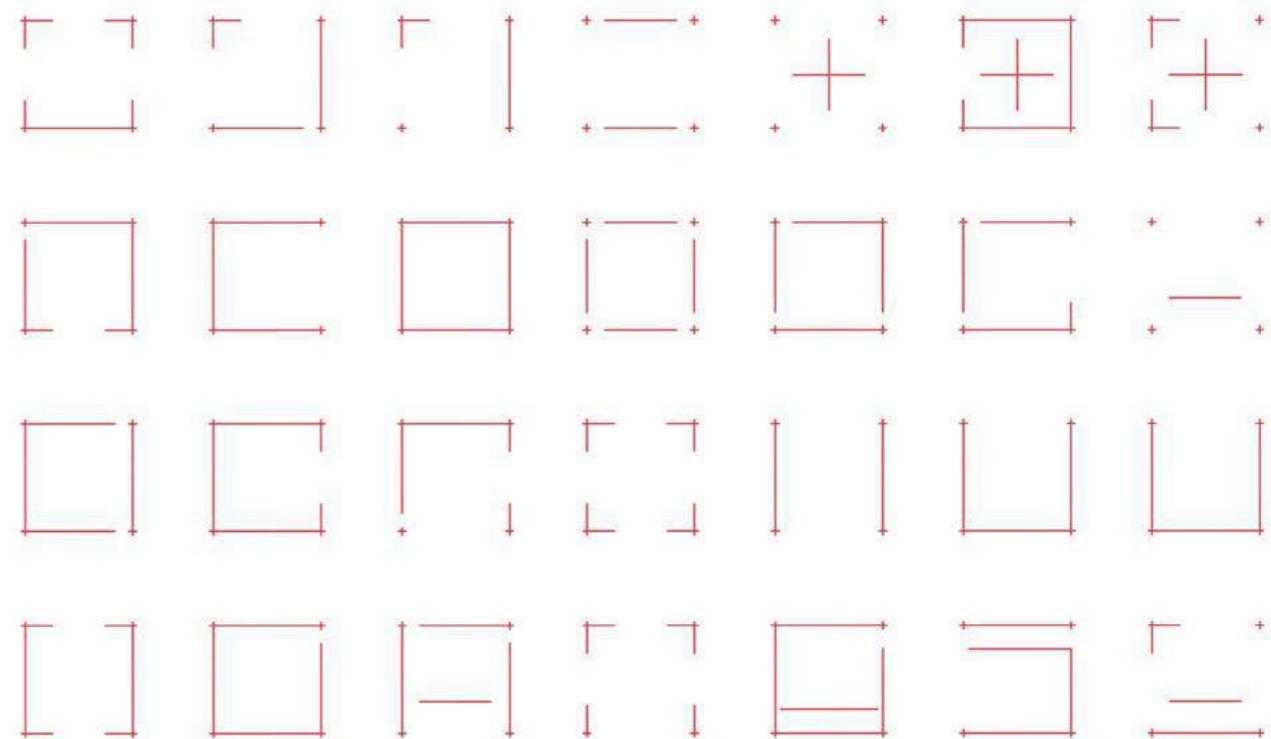


### TERRAIN

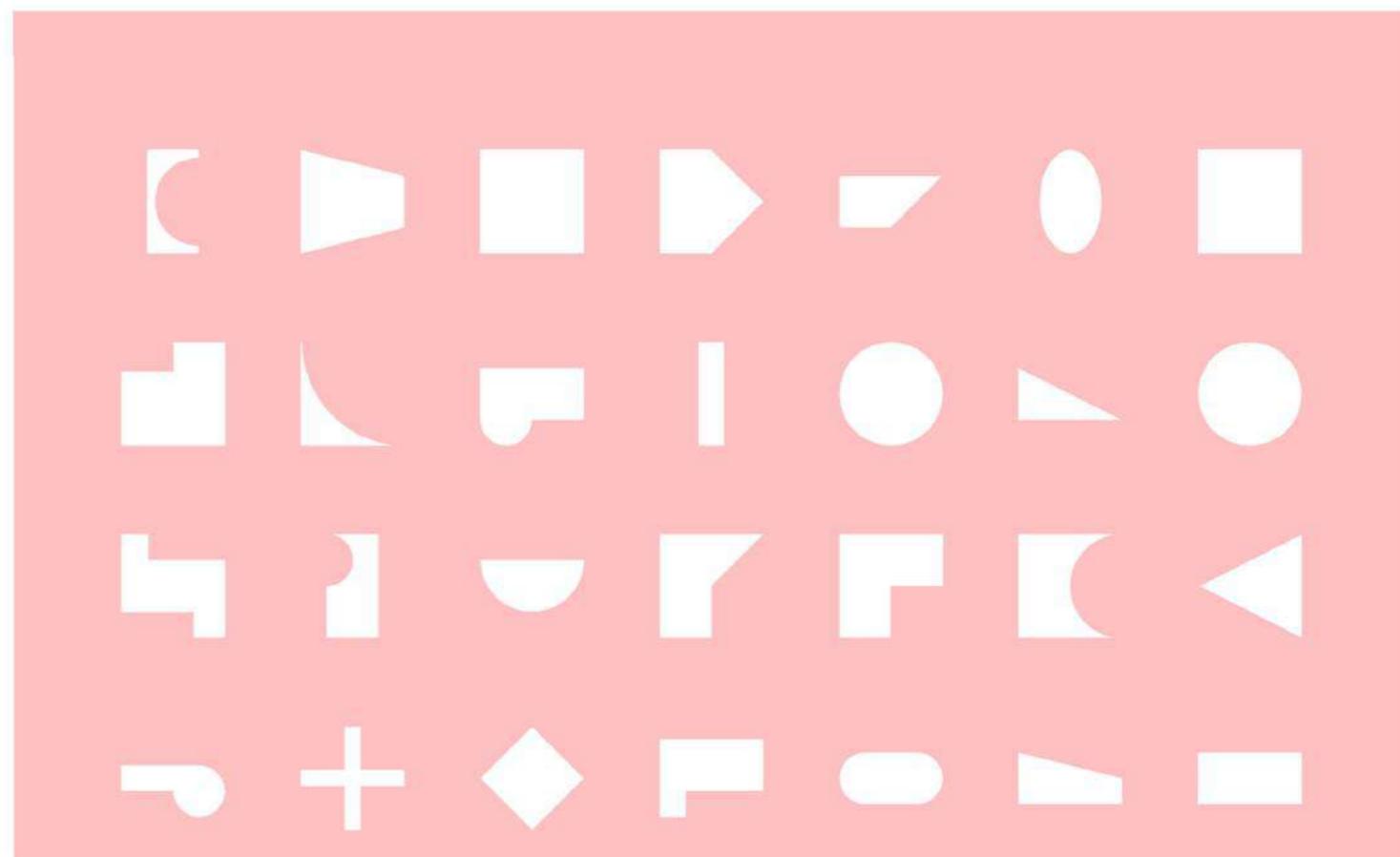
A terrain defines both up and down spaces



## TYPOLOGY

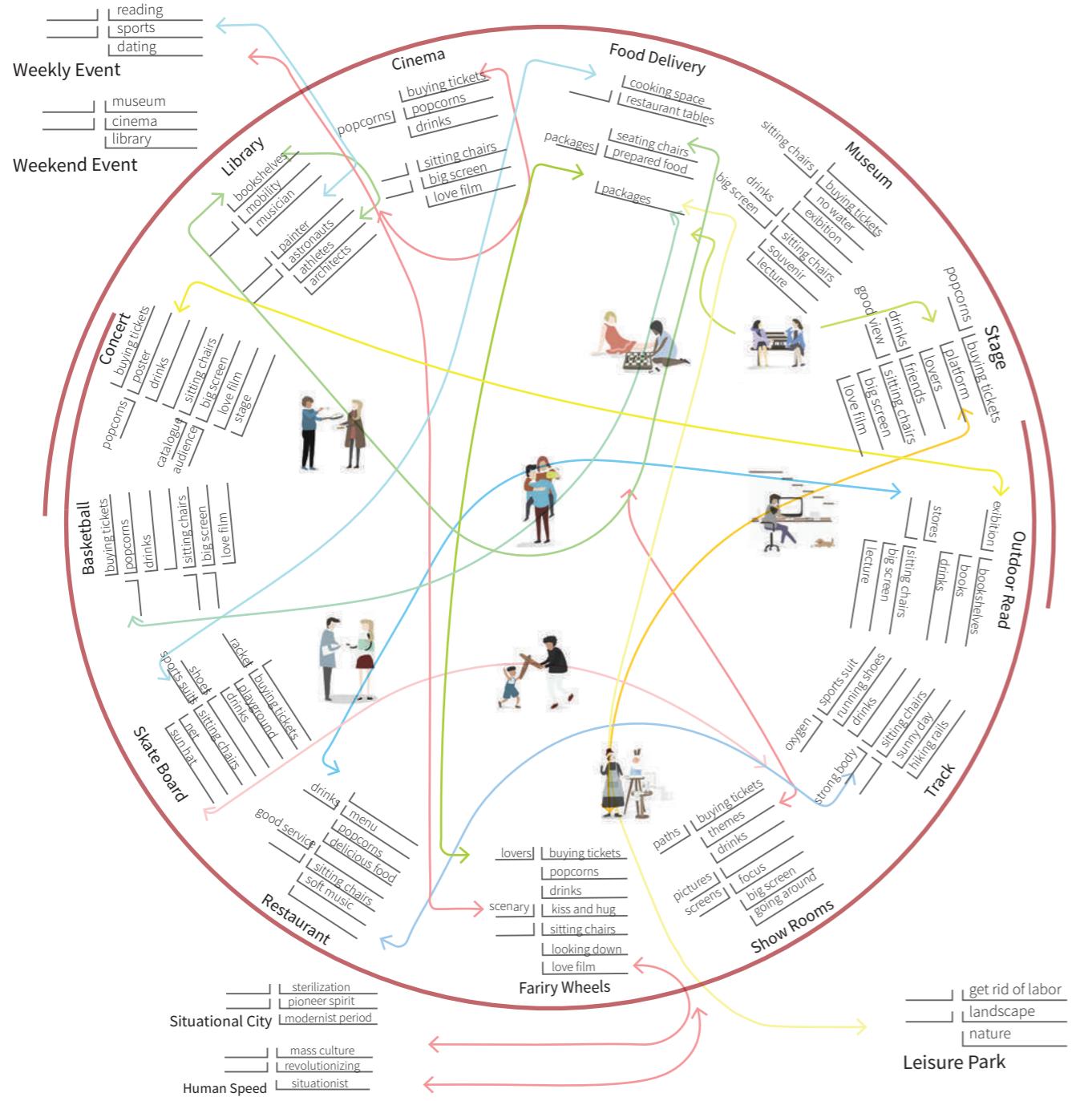


Cross columns and walls act as media to limit the space in which different scenes take place



Building blocks that can be put into the space

## MAP OF ACTIVITIES SEQUENCE CONNECTING WITH FOLLYS



### Outdoor Leisures

Type	Plan	Sequence	iTools	Output
Cinema	buying tickets popcorns drinks sitting chairs big screen love film	meet each other enjoy the movie feedback get closer	buying tickets popcorns drinks sitting chairs big screen love film	
Museum	buying tickets no water exhibition sitting chairs lecture souvenir	go to museum enjoy exhibition take pictures enjoy weekend	buying tickets popcorns drinks sitting chairs big screen love film	
Concert	buying tickets poster catalogue sitting chairs stage audience	shoulder aid enjoy the concert forest concert take pictures	buying tickets popcorns drinks sitting chairs big screen love film	
Tennis	playground racket shoes sports suits net sun hat	get shoes ready get rackets playing tennis rest a while strengthen health	buying tickets popcorns drinks sitting chairs big screen love film	

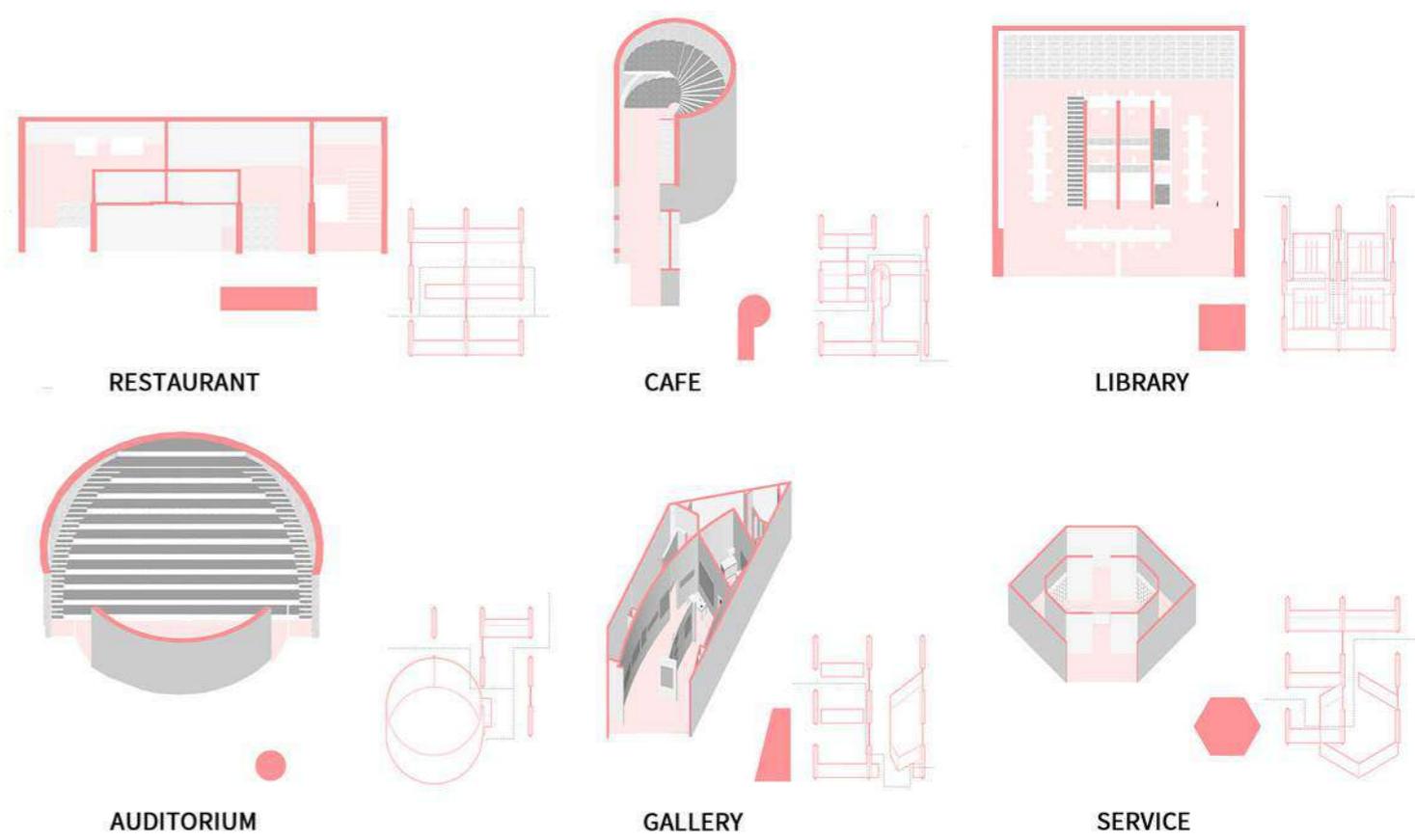
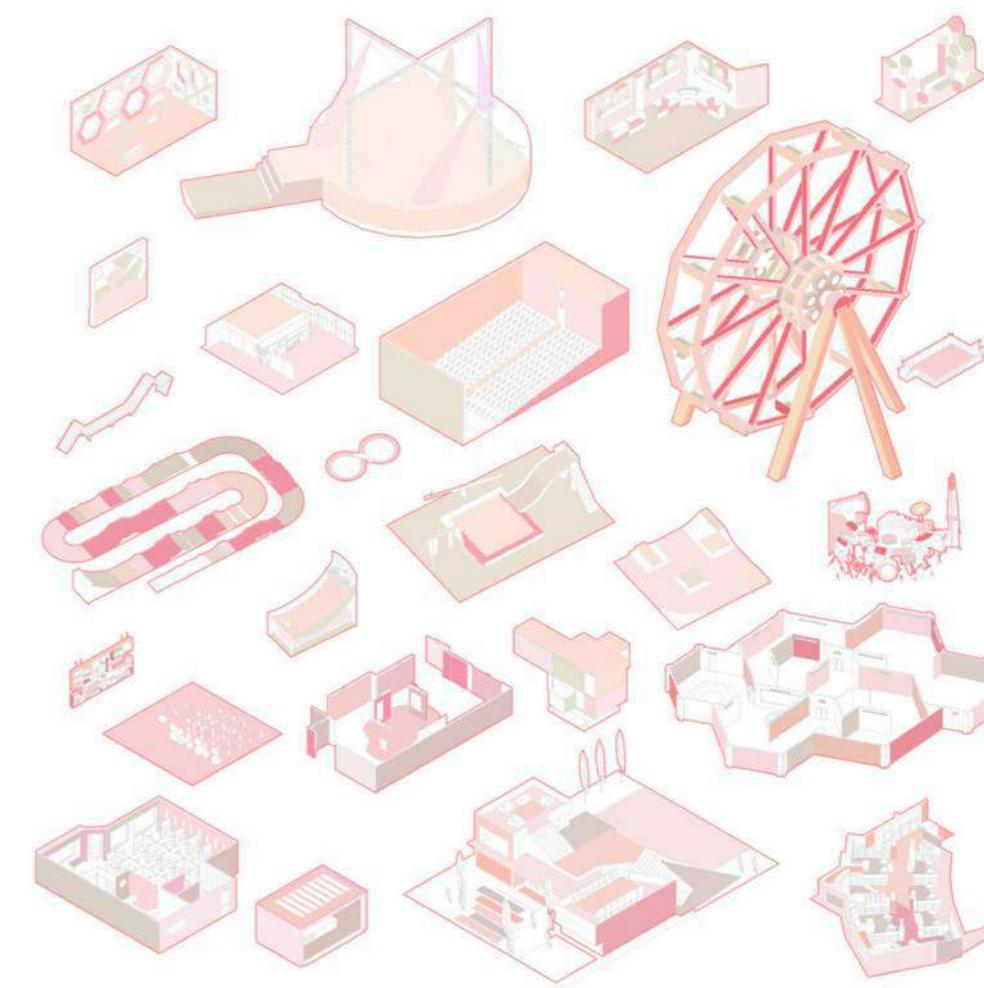
### Indoor Leisures

Type	Plan	Sequence	iTools	Output
Restaurant	menu delicious food drinks sitting chairs soft music good service	watching menu order food delicious food tips enjoy dinner	menu delicious food drinks sitting chairs soft music good service	
Track	sports suit running shoes sunny day hiking rails strong body oxygen	running shoes suit hiking rails good weather enjoy weekend	running shoes suit hiking rails good weather enjoy weekend	
Childhood	jumping sand swings slide parent care protection	with parents with friends enjoy nature swing & slides take pictures	jumping sand swings slide parent care protection	
Showroom	themes paths going around focus screens	get tickets ready favorite artist taking pictures	themes paths going around focus screens	

### Friend Leisures

Type	Plan	Sequence	iTools	Output
Ferris wheel		buying tickets lovers memory looking down kiss and hug	buying tickets lovers memory looking down kiss and hug	
Reading		select books go into chairs enjoy the book take notes get knowledge	books lectures sitting chairs big screen love film	
Deck		buying tickets with family enjoy weekend forest oxygen take pictures	platform lovers friends memory good view nature	
Introduction		get tickets ready favorite artist taking pictures rest a while strengthen knowledge	musician painter astronauts architects engineer	

## DIFFERENT SPACES REQUIRED FOR ACTIVITIES



## DESIGN PROCESS

### PATH

It is the connection between one destination and another destination. The open space can reach many paths, while the private space has limited roads. The width of the road also has different psychological effects on people. The space on the road is often considered to be an outdoor space.

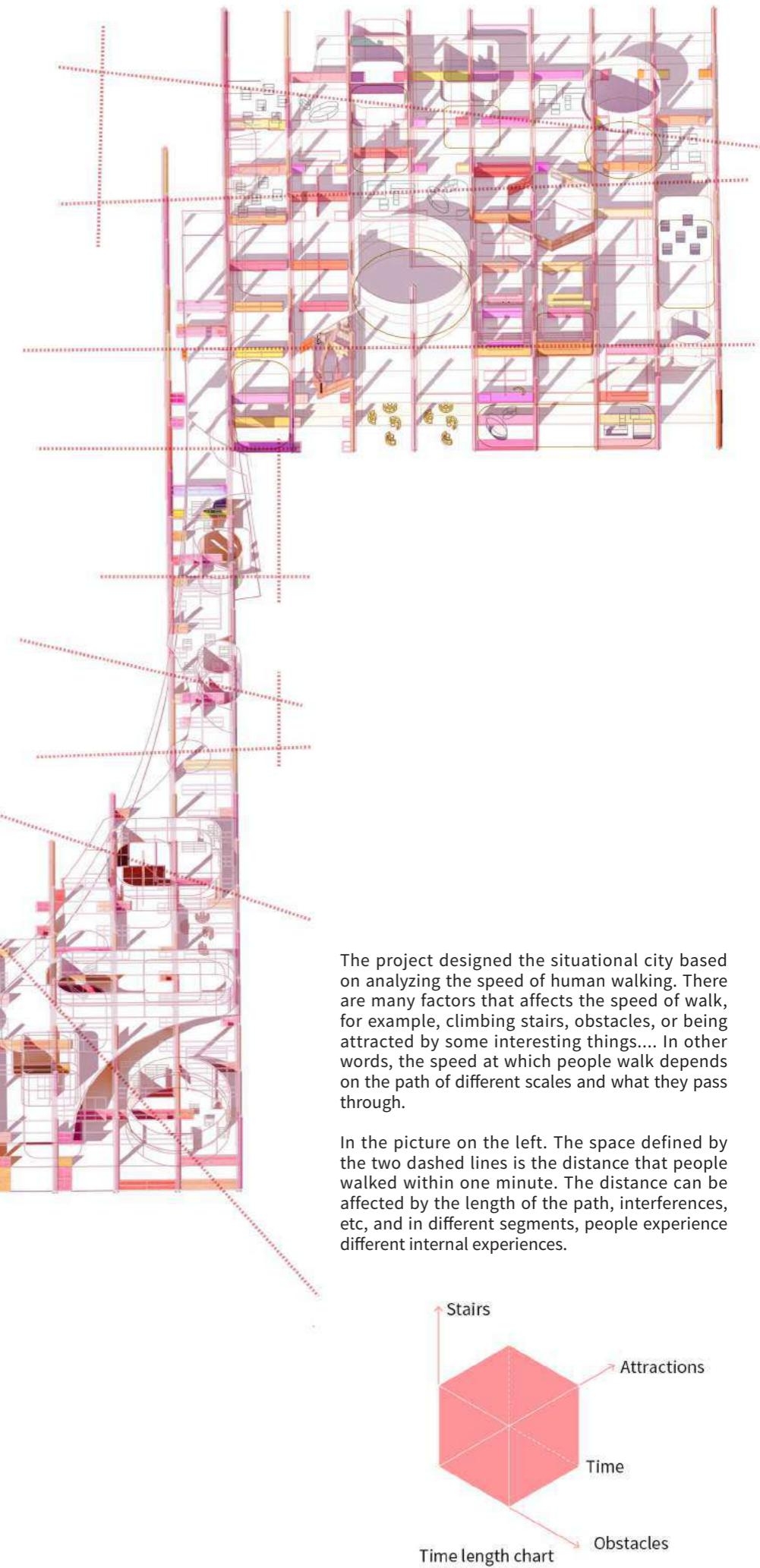
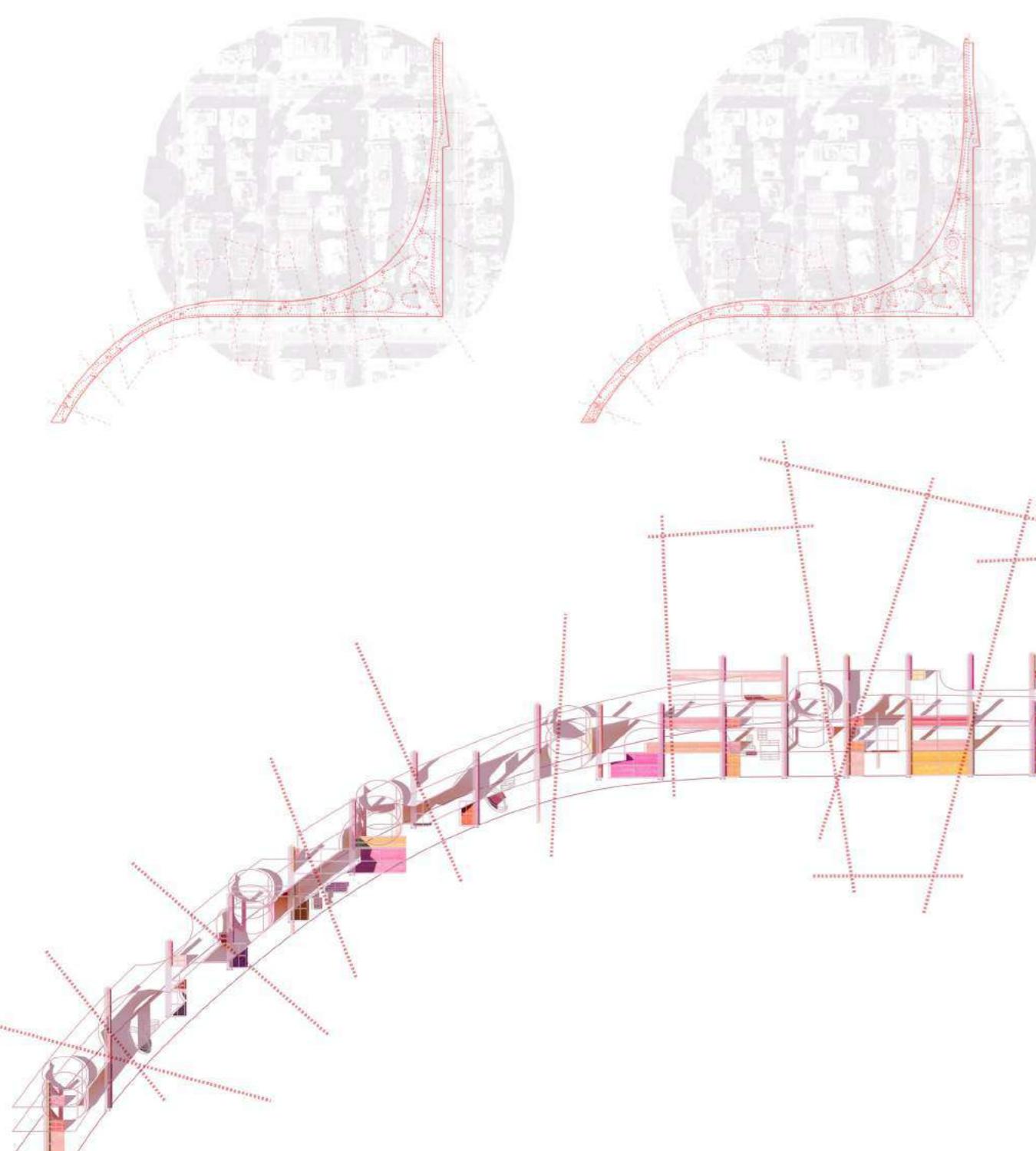
### FOLLY

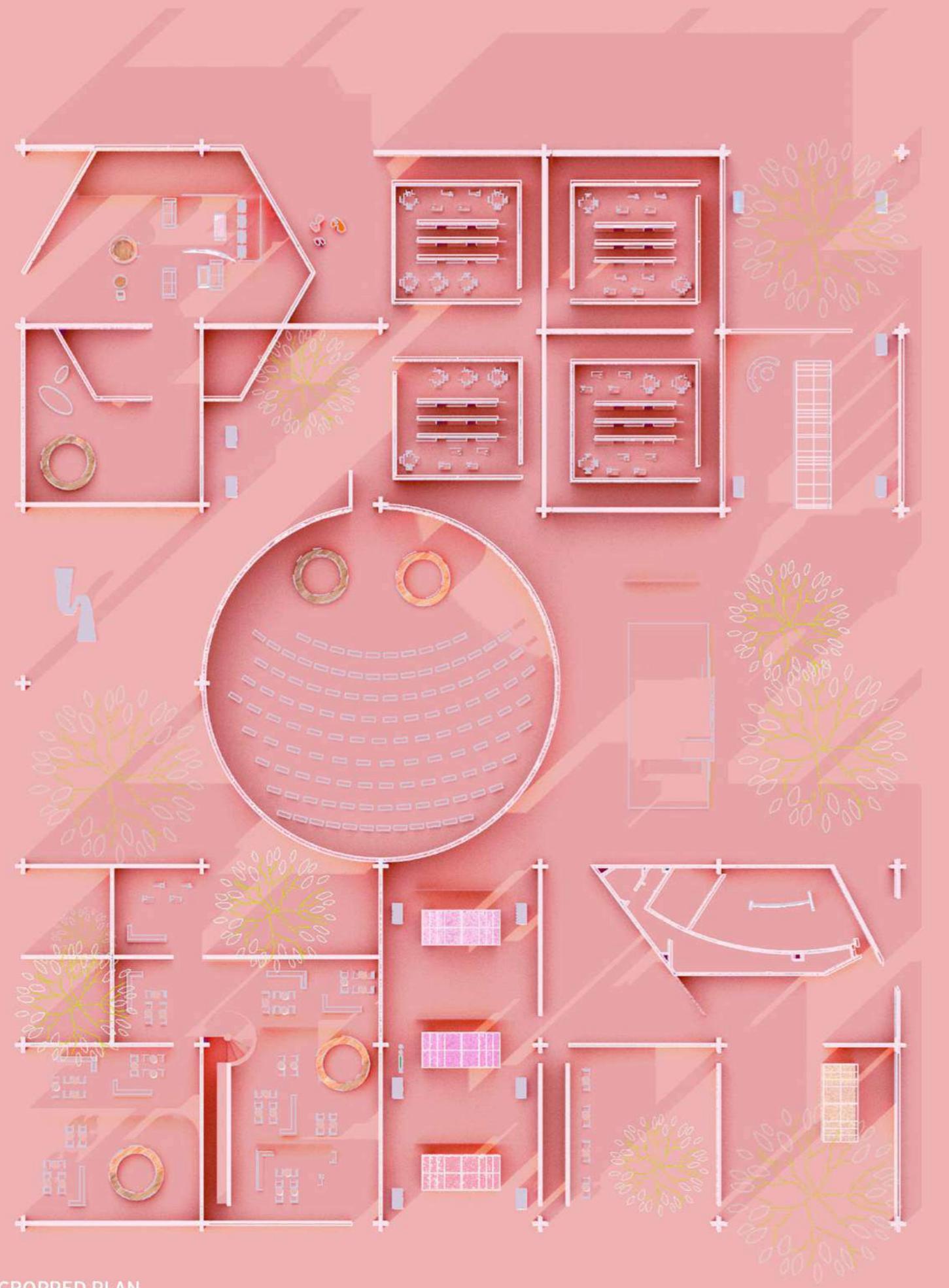
It is a space for special activities. The functionality of the space and the number of paths are related. Folly is often considered a relatively introverted space.

### IN-BETWEEN

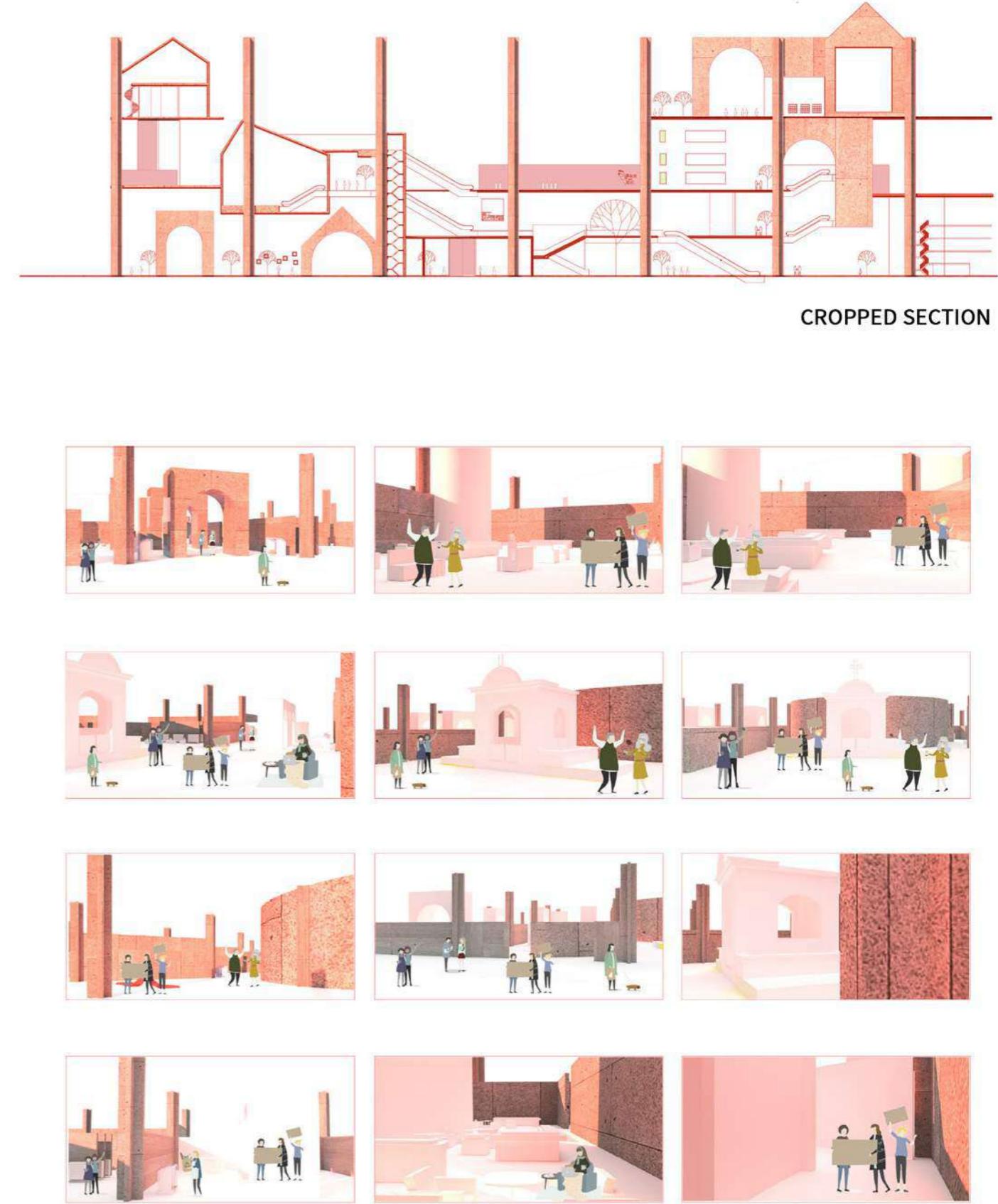
When path and folly overlap on a plane, people usually don't know the space. In this case, people will easily shuttle back and forth between different spatial experiences, and eventually lose their sense of direction to their location. This is what we can lost. And after people get lost, landmark becomes the only bright light for people to lead the way.

We separate the path and the folly for research and design. From the general layout, the west side of the site is connected to a private exclusive village, while the east is gradually open, and the space becomes more complex. In the planar arrangement, it is first determined that 60s is a time node. This is used as the boundary between space and space. For example, if the spatial function is relatively simple, the distance traveled during this time period will be longer, and if there are obstacles or attractions in the space, then the stay is longer and the distance traveled will be corresponding. In this way, streamlining planning is first performed, and clue are added according to the length of time. In sectional arrangement, the plan is unfolded and the corresponding functional requirements are added according to the length of time.





CROPPED PLAN



CONTACT SHEET

## 04. LIVE LONG AND PROSPER

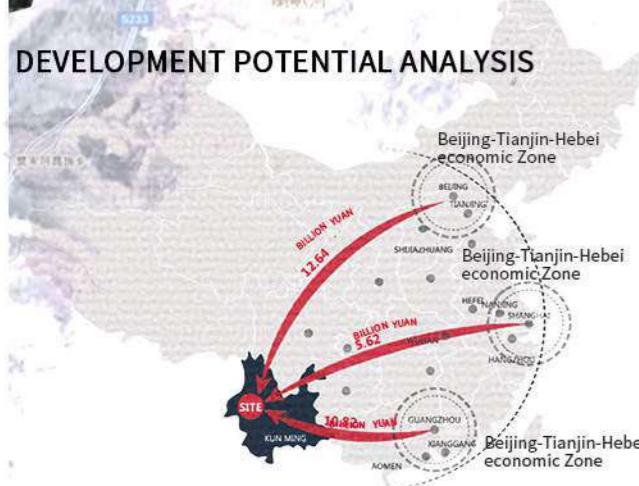
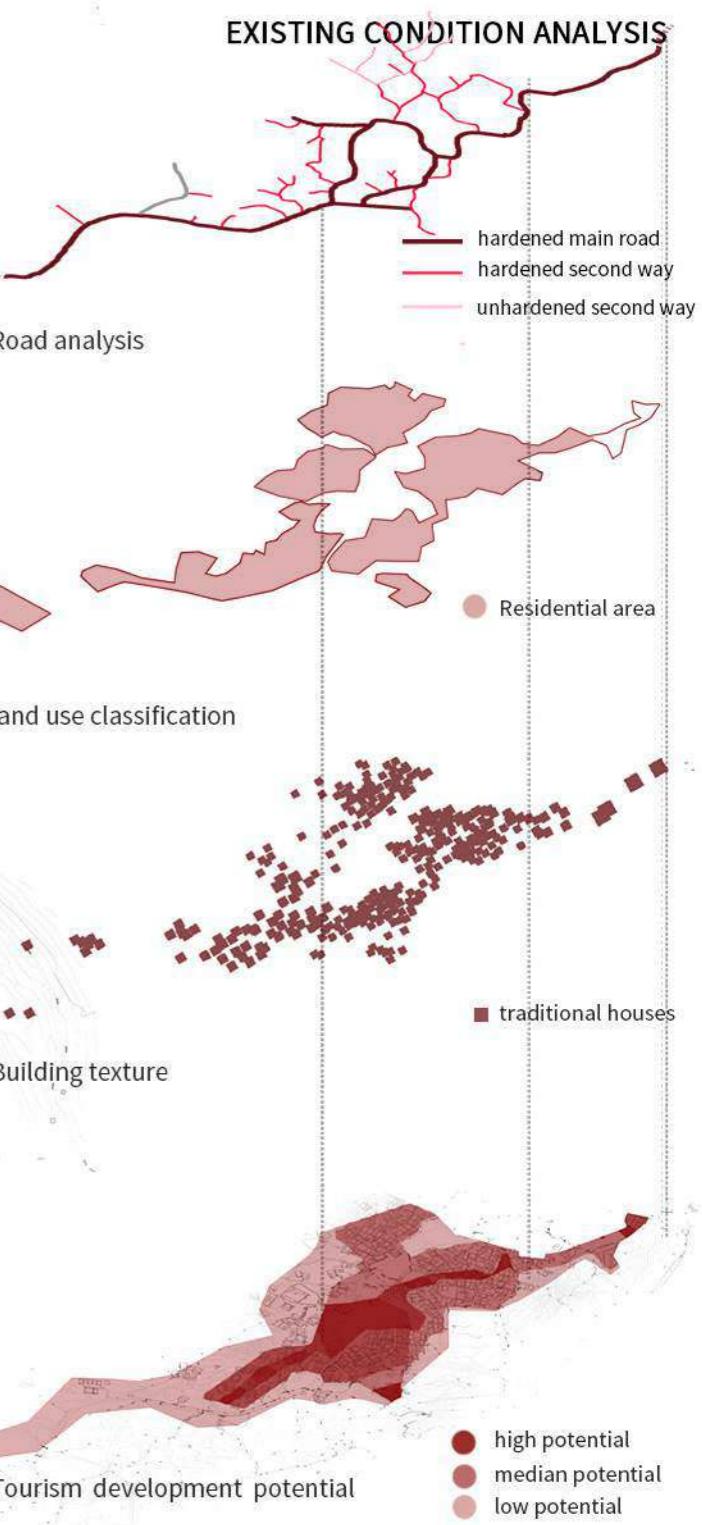
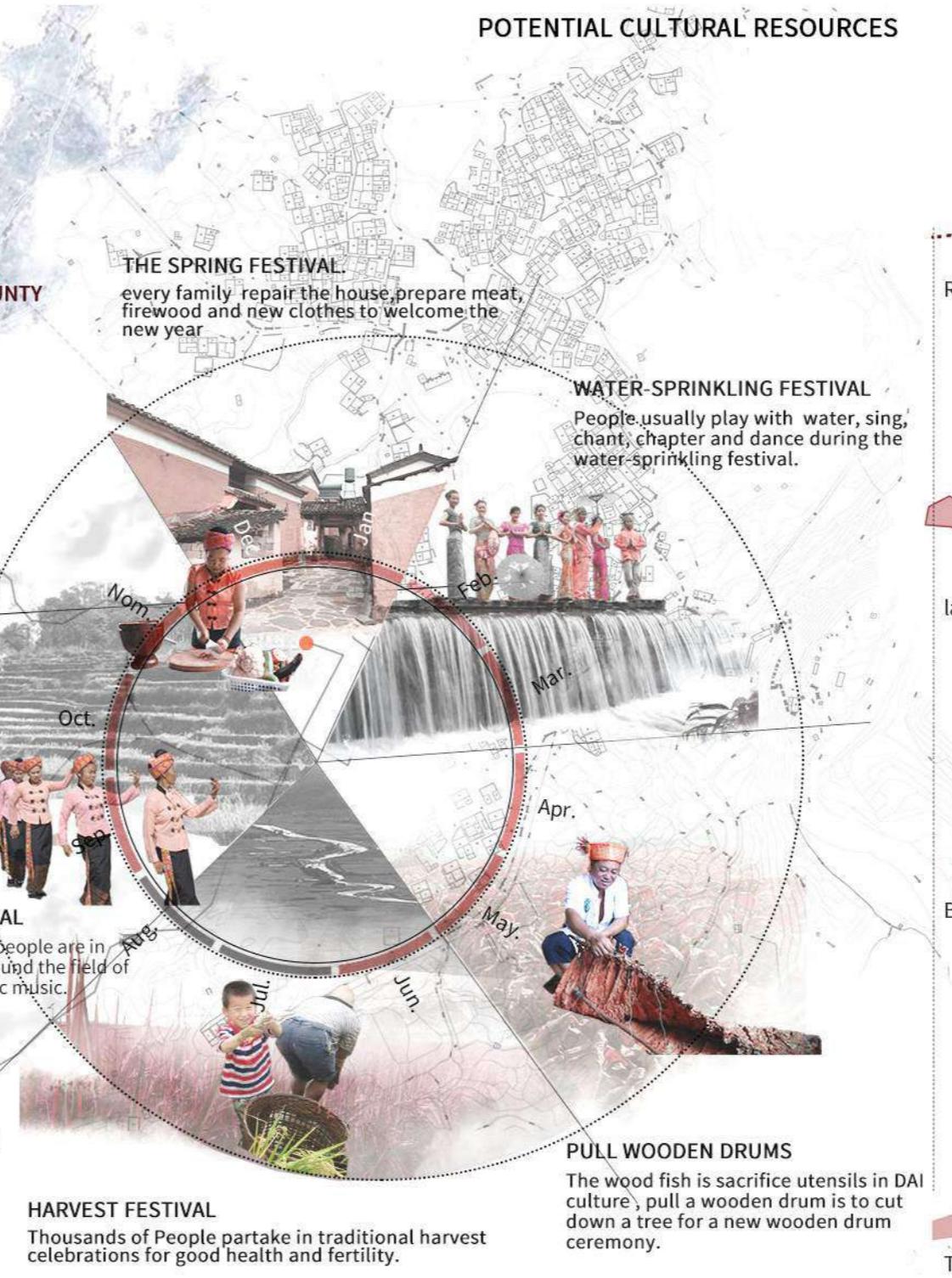
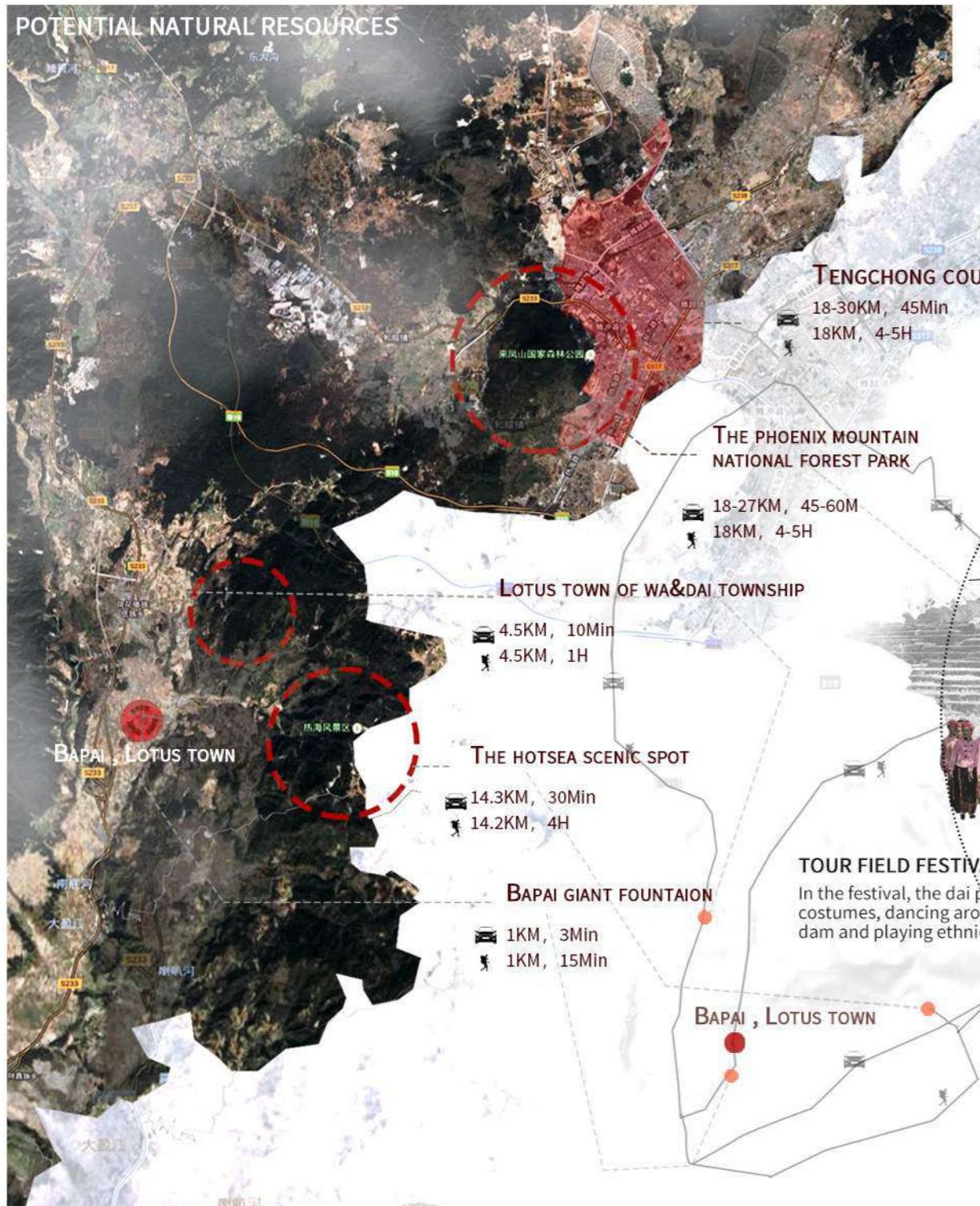
Rural Planning and Design of Bapai Village, Yunnan

<b>Location</b>	Bapai,Yunnan
<b>Type</b>	Academic Individual work
<b>Duration</b>	Nov.2017 - Dec. 2017 Senior 4
<b>Instructor</b>	He Yi Heyi@hust.edu.cn

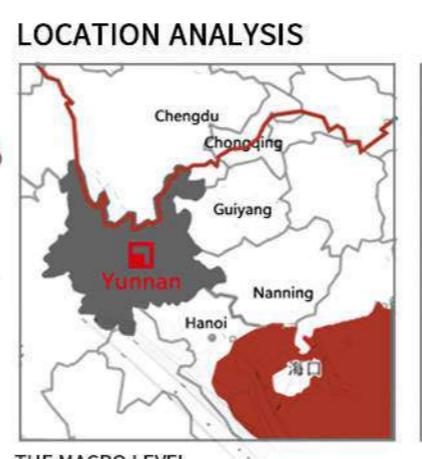
The American scholar Cobb Douglas once said: "The hope of the world is in China, because China still retains the countryside while industrializing." However, under the background of urbanization transformation, the urban is attracting rural population, land and resources into the city with magnet-like magnetic force. **A large number of rural areas are rapidly being swallowed up and dying.**

If we keep these villages, how can we maintain the development of them? In the planning of Bapai Village, I proposed the **YCS development model** by analyzing the future development potential of the Bapai village. **The village is planned for phased development, and the original funds are used to transform the rural space to developed the tourism and promote local economy.** In my view, the rules of the countryside and the city will change in the future. The essence of the countryside is a commodity, and **the future villages will continue to attract urban people to the countryside with their unique natural landscape resources and excellent services.** By sharing the urban and rural resources, we can achieve our goal for the village: Live long and prosper.





Baoshan has great potentiality in tourism exploitation. From the point of the domestic market, tourism customers are mainly form the southwest area, including Kunming, Chengdu, Chongqing, Guizhou and the surrounding area. Under the Tengchong city urban area development planning, it is expected to achieve 20 million in 200. In addition, family leisure vacation is major travel patterns, as well as business travel and healthy holiday.



**THE MACRO LEVEL**  
The site is located in southwestern China. Yunnan has a long history. There were numerous minorities in southwestern area, and the natural scenery is beautiful.

**THE MEDIUM LEVEL**  
The site is located in Baoshan city, which is next to Myanmar. Baoshan have localized 13 kinds of ethnic minority. The well-known Silk Road crosses here.

**THE MICRO LEVEL**  
The site is located in Tengchong county. Tengchong is Home Town Of Overseas Chinese, it is also a historical and cultural city.



## FUNDING SOURCES



We have money, but we have no idea what kind of project is suitable to invest. If possible, we hope to find a project that has high return.



We have a small amount of money. We want to find a suitable consumer activities, but this kind of activities need to be different from the city and can be experience deeply.



We can provide labor force and some funds. Firstly, we hope to solve the production problem as well as improve the industrial level. If there is a suitable project, we are willing to invest too.



We need more employment opportunities so that we can bring our own funds back to the villages. However, there should be reasonable project that can have return on capital.

## YCS DEVELOPMENT MODEL

### YEAR-ROUND

Basing on the rich nature and culture resources to plan year-round travel routes, in order to attracting more foreign capital and promote the development of the tertiary industry.

### COUNTRY

improving rural infrastructure and protecting rural landscape is the prerequisite; promoting the development of rural tourism and creative industries is the core.

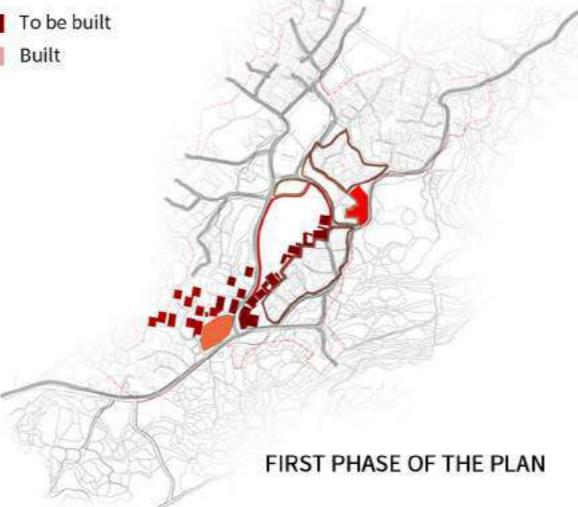
### SHARING

By sharing the urban and rural resources, we could promote the capital, talent and creativity of rural areas to share the social development achievements



## PHASED DEVELOPMENT PLAN

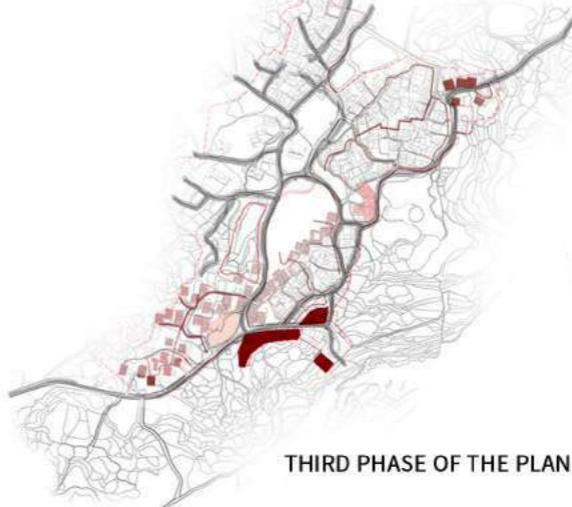
To be built  
Built



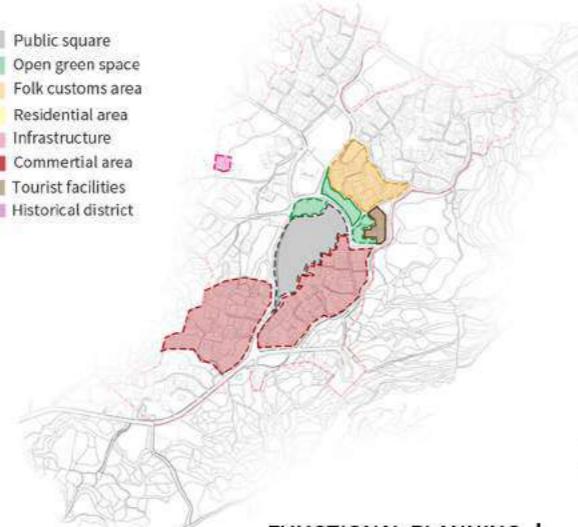
FIRST PHASE OF THE PLAN



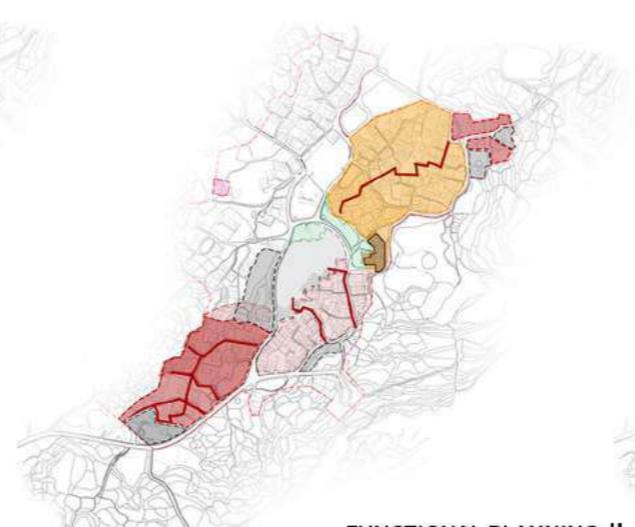
SECOND PHASE OF THE PLAN



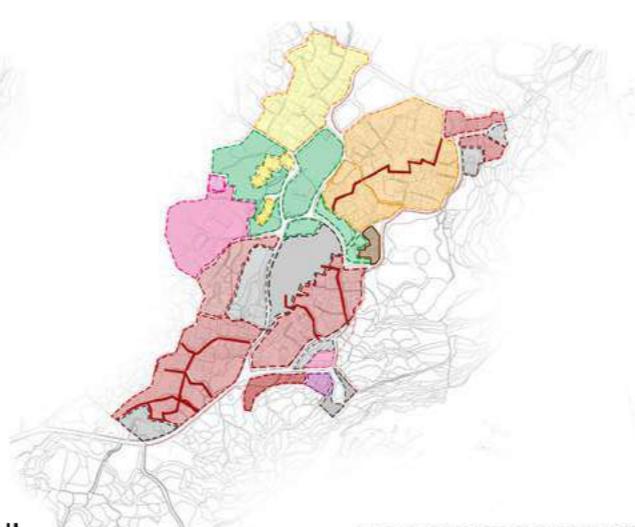
THIRD PHASE OF THE PLAN



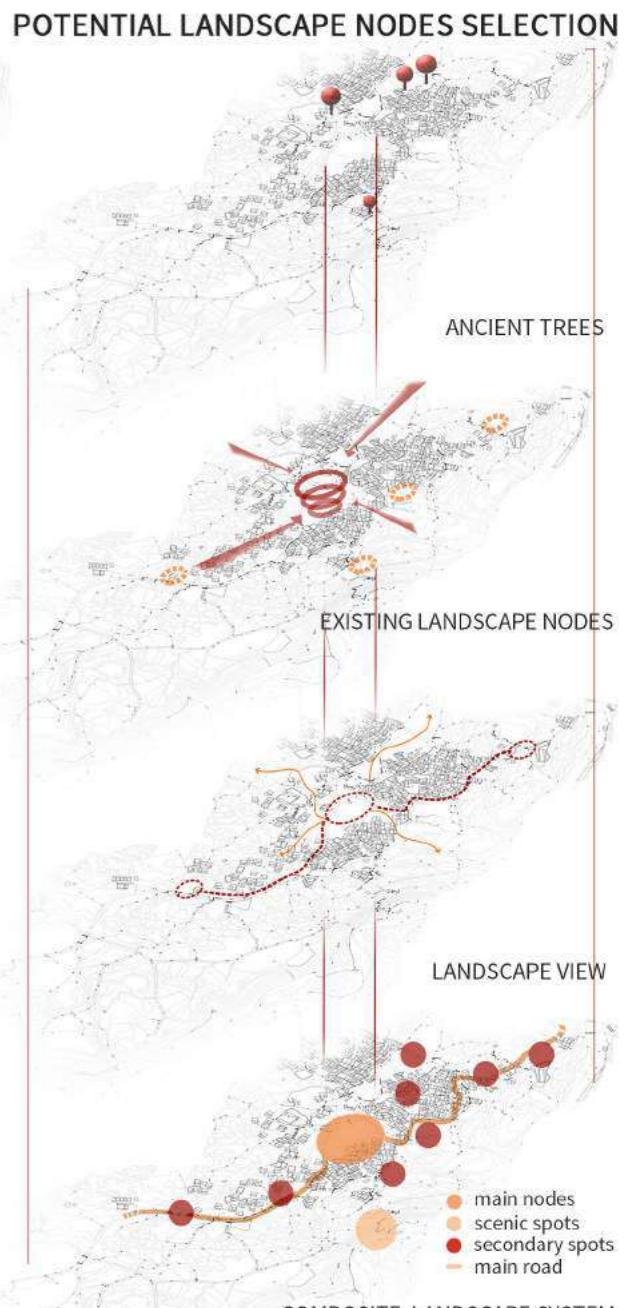
FUNCTIONAL PLANNING I



FUNCTIONAL PLANNING II



FUNCTIONAL PLANNING III

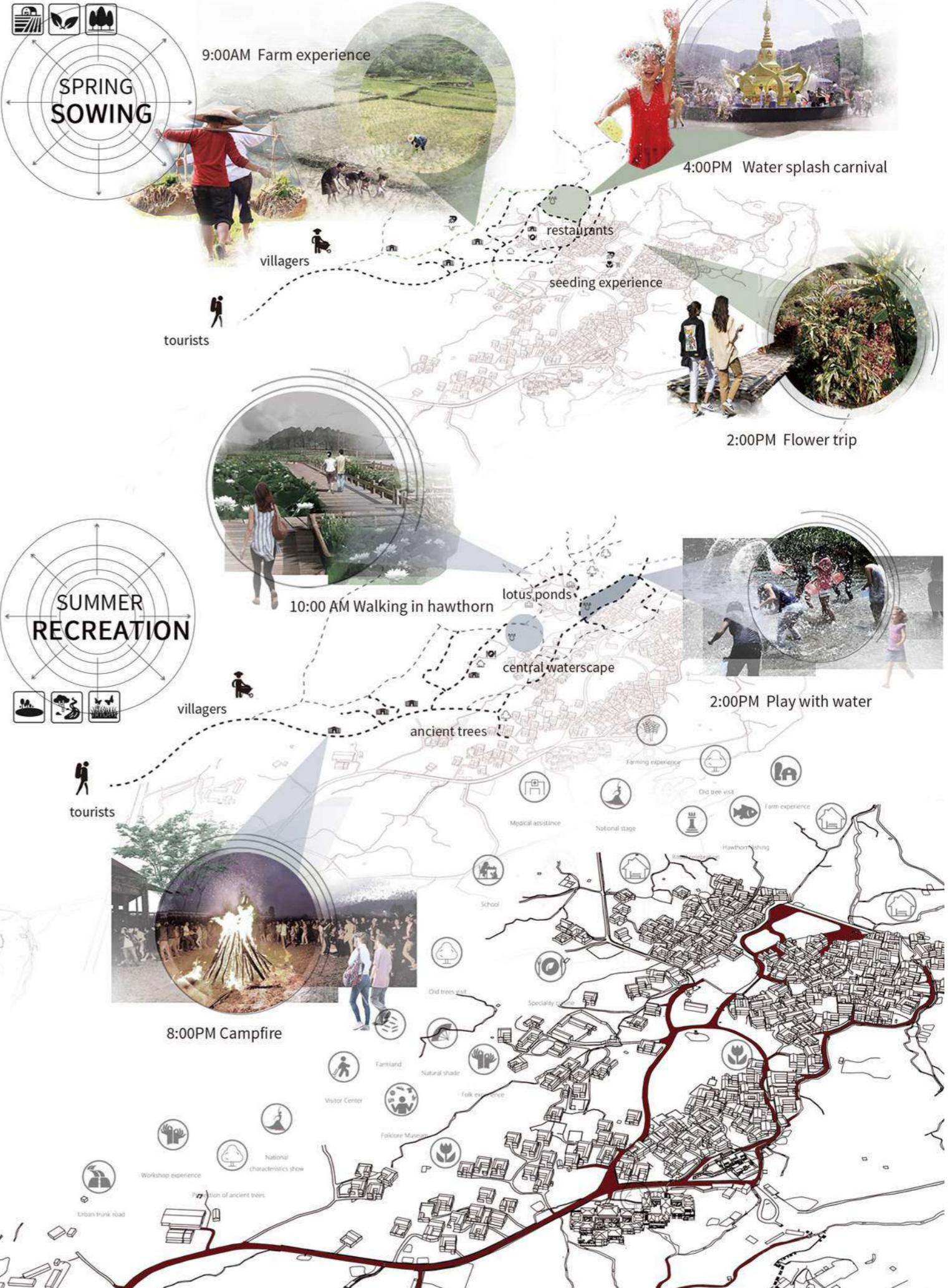
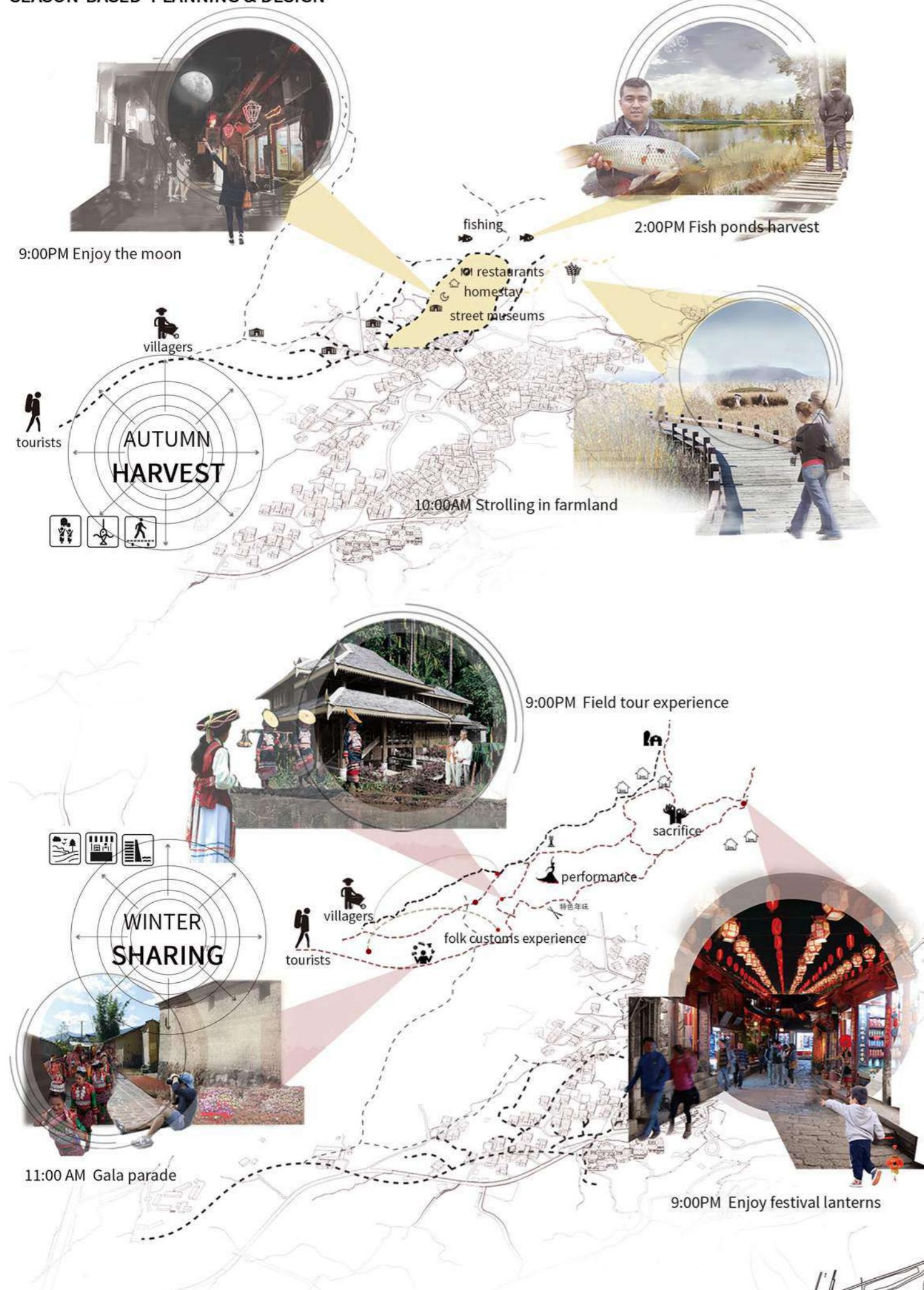


## TYPOLOGY OF NODES' TRANSFORMATION



With the rapid ongoing urbanization, people yearning for a return to the countryside have been more urgent. Our goal is paying the advantages of rural resources, transportation and location advantages, creating a characteristics town which has a set of creative agriculture, industry linkage, characteristics culture and urban to rural interaction.

## SEASON-BASED PLANNING & DESIGN



# 05. Urban Transport Investigation on Shared Vehicles

National Urban Transportation Mobility Innovation Competition

## Duration

June 2017 - July 2017  
Senior 3

## Type

Academic/ Team work

## Team Members

Kang yin, Xu yi,Cao shuying

## Role in Team

field investigation  
data statistics  
strategy analysis

## Instructor

Zhao Shouliang  
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Transportation, as a reflection of the dynamics of the city, is directly related to the operation of the city. With the sparkling aura of “shared economy” and “new energy automobile”, the time-sharing rent, which relies on the internet, of sharing cars has achieved explosive development. Result from the ability to record the travel path and geographical location, the activities of sharing automobiles continue to accumulate a rich amount of information and database, which can **help us better understand traffic problems in contemporary urban context.**

In order to solve urban traffic problem and improve people's commuting efficiency , we decided to do a research on Shared Vehicles in Wuhan. In the research process, we operated principle components analysis with SPSS to discover the relations between shared vehicles usage frequency and the types of supporting facilities situated in the immediate catchment. Consolidating the analysis, we summarized the key location factors that affect shared vehicles usage the most and promoted a strategic plan for allocating shared vehicles' parking locations based on users' usage pattern. This report was awarded the Third Prize in the National Urban Transportation Mobility Innovation Competition.



## references

[1] Wuhan Electric Vehicle Promotion and Application Action Plan

[2] Yin xin, "Sharing the car" to explore a new model of urban traffic construction "China Economic Weekly"

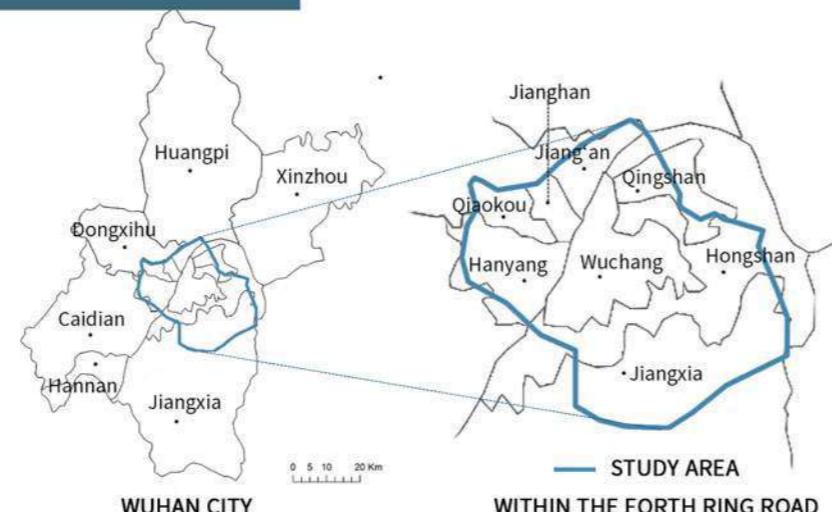
## 1 INTRODUCTION

### 1.1 STUDY BACKGROUND

In recent years, it has become a common phenomenon that the problems of traffic congestion , expensive parking fees and exhaust pollution have become more and more serious in many cities, such as Beijing, Shanghai, and Guangzhou.

At the same time, the emergence of "shared-car" powered by new energy has improved the convenience of people's travel and provided a new way of thinking for solving urban traffic problems. In Wuhan, however, there are many problems such as frequent demolition and construction of parking spots, low usage rate of some parking spots, and insufficient battery life of charging piles. In order to solve these problems, we decided to conduct an in-depth investigation on shared-cars.

Since the shared-car parking lots are mainly concentrated in the Forth Ring Road in Wuhan, we decided to choose the area within the Third Ring Road as study area.

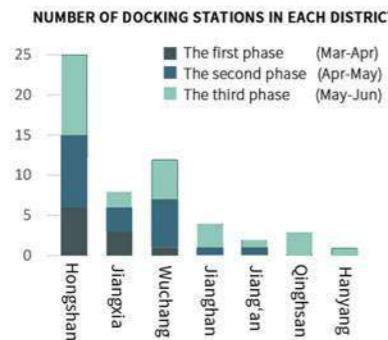


## 2 CURRENT SITUATION OF SHARED-CARS PARKING SPOTS

### 2.1 STATISTICS OF SHARED-CARS PARKING LOTS

Gofun shared-cars were first placed in three districts in Wuchang, and gradually developed to Hankou in the second phase. In the third phase, they were mainly invested in the Qinghai, Hanyang, Jiang'an District.

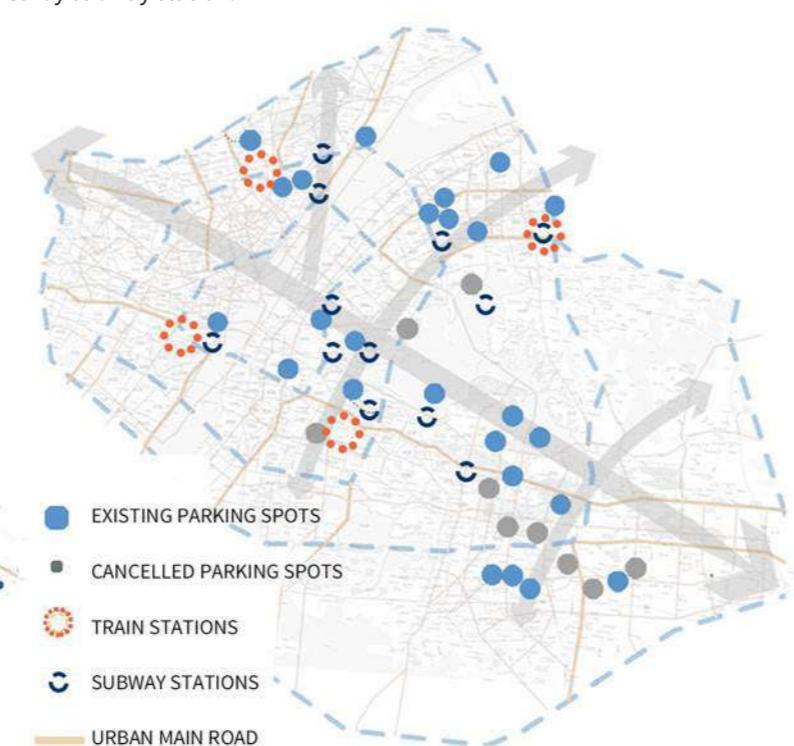
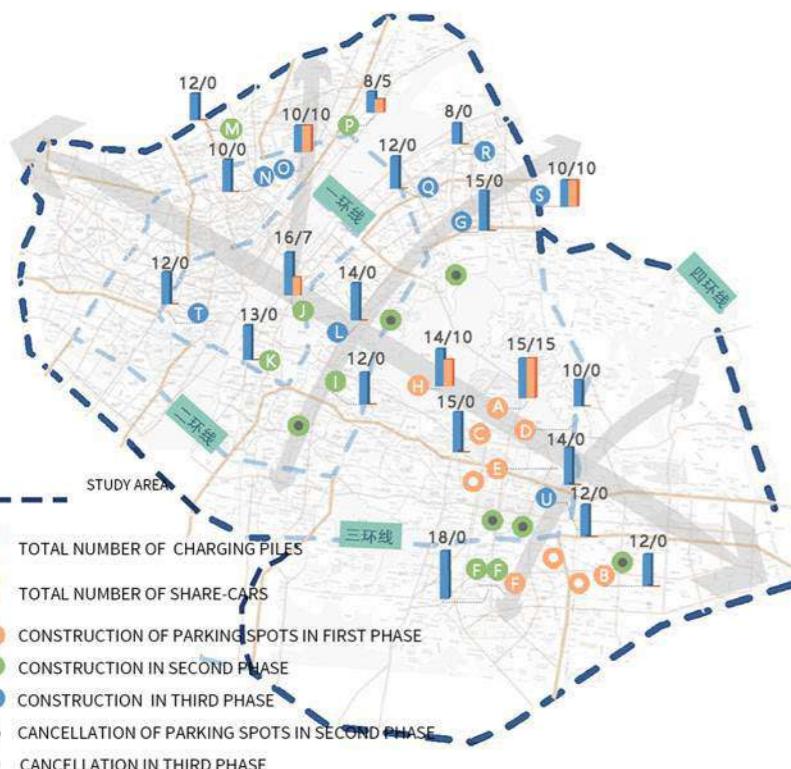
**Most of the parking spots have 10-15 share-cars.** Only P and R have fewer than 10 vehicles. Only 6 of the 21 parking spots have charging posts, accounting for only 28.6% of the total



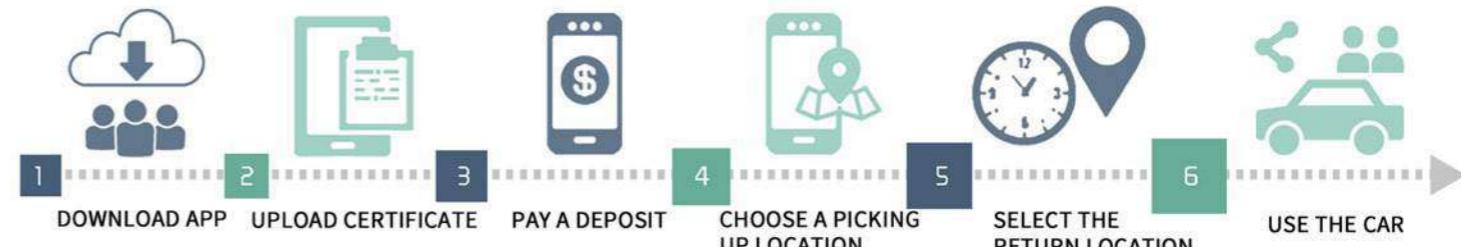
### 2.2 TRAFFIC SITUATION AROUND PARKING LOTS



Most of the shared-cars' parking spots are located around the main road of the city and are close to the intersection of the roads. In terms of transportation hub , many parking spots are built near the four main train stations in Wuhan(within 2KM ), and some of them can also serve nearby subway station.



### 1.2 INTRODUCTION OF GOFUN SHARE-CARS IN WUHAN



Shared car refers to the provision of new energy vehicle sharing services on campus, subway stations, residential areas, commercial areas, public service areas, etc. It is a time-sharing lease model. People only need to download the app, register their real name and pay a small deposit, then they can use the car at the shared car parking spot. In addition, after the vehicle is used, the driver needs to drive it back to the designated parking location. We selected the Gofun shared car in Wuhan as our survey subject .

### 1.3 METHODOLOGY

In the research process, we conducted a questionnaire survey and operated principle components analysis to discover the relations between shared vehicles usage frequency and the types of supporting facilities situated in the immediate catchment. Consolidating the analysis, we summarized the key location factors that affect shared vehicles usage the most, and promoted a strategic plan for allocating shared vehicles' parking locations based on users' usage pattern.

### 2.3 LAND USE AROUND SHARED-CARS PARKING LOTS



It can be seen that most of the parking lots are built in residential areas and educational areas. A small number of parking lots serve the office areas because of the needs for commuting . Some of shared-cars parking spots relies on hotels that are close to the scenic spots .



### 2.4 HEAT VALUE OF SHARED-CARS PARKING LOTS

#### HEAT VALUE MEASUREMENT

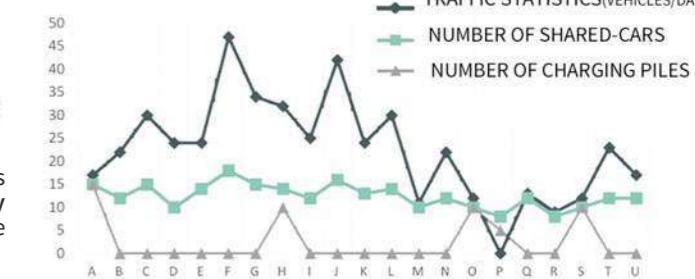
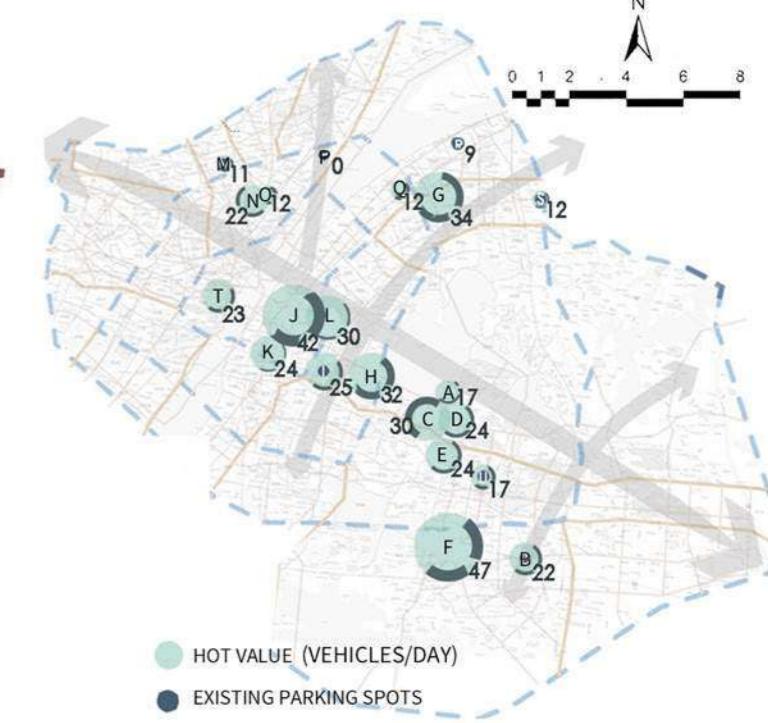
The net change number of shared-cars in the unit time (12 hours) at the parking lot is used as a measure of the heat value.

#### DATA STATISTICS AND PROCESSING

According to the above criteria, we randomly selected 7 days for testing in a month, and averaged the recorded data (vehicles/day).

#### HEAT MAP CREATION AND SORTING RESULTS

According to the average value obtained, the heat of each parking lot is proportionally expressed by the area of the circle. The heat value of each parking lot is from high to low: F>J>G>H>L>C>I>E>K>D>T>B>N>A>Q>O>S>M>R>P



## 3 DILEMMA OF SHARED-CAR PARKING LOTS NETWORK OPERATION

### 3.1 INADEQUATE INFRASTRUCTURE

#### LOW RECOGNITION

Most shared-cars parking lots are attached to the existing parking lot, and there are no obvious signs such as "shared car" parking when the parking lots are set up.



**LIMITATION OF CHARGING PILES**  
The configuration of the charging pile is relatively low, and the charging depends on the staff.



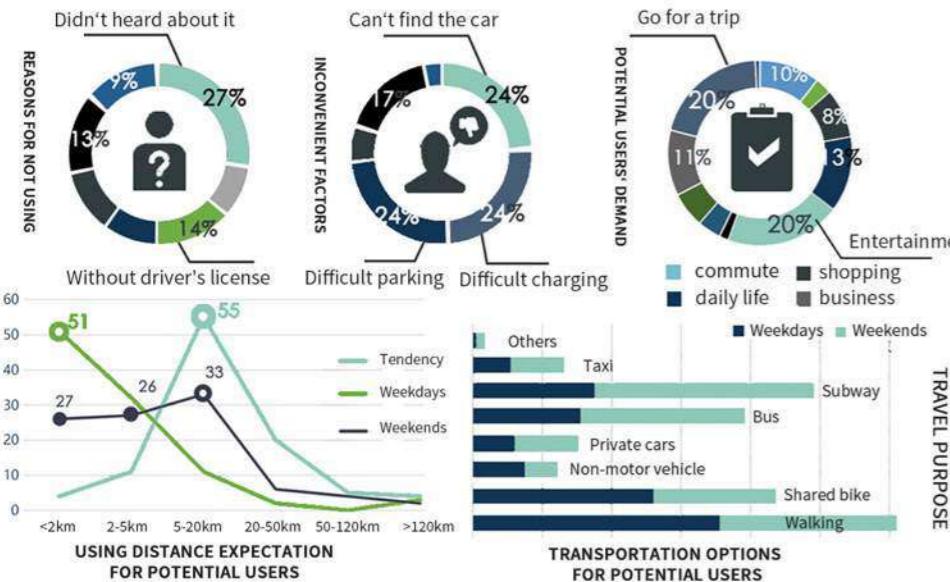
**3.2 UNSYSTEMATIC PARKING LOTS DISTRIBUTION**  
The setting of the shared-cars parking lots does not form an overall network system, and the performance is mostly a block-like centralized distribution setting.

### 3.3 UNCOORDINATED DEMAND AND SUPPLY

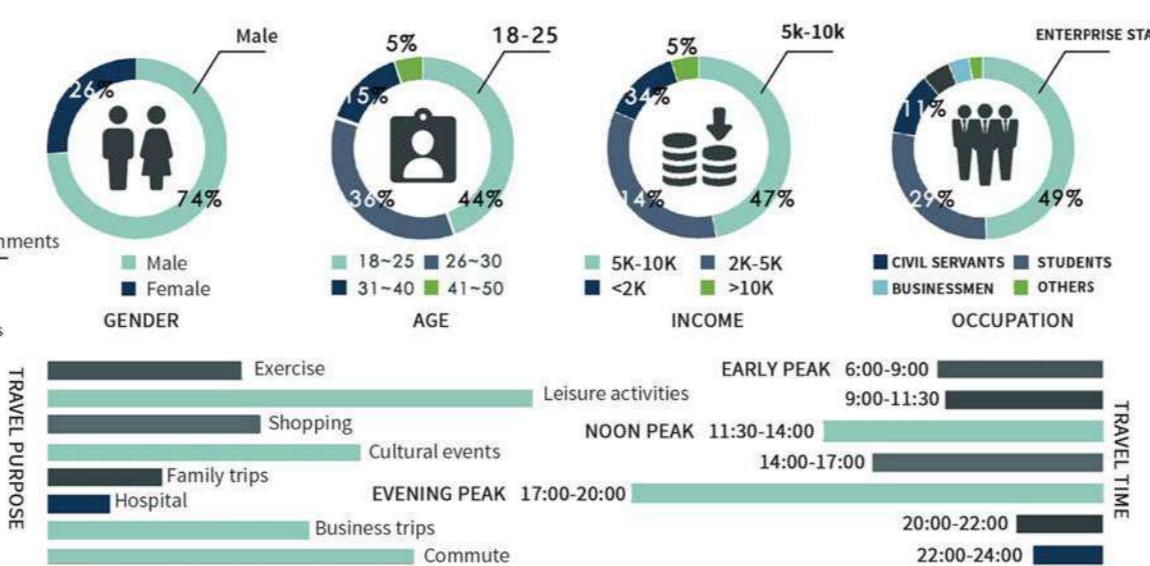
As shown on the right, the shared vehicle configuration is relatively average while the charging piles are not evenly configured. Sites with higher heat, vehicle and charging pile configurations may be insufficient.

## 4 ANALYSIS OF THE INFLUENCE MECHANISM OF SHARED-CAR PARKING LOTS HEAT VALUE

### 4.1 POTENTIAL USER DEMAND ANALYSIS



### 4.2 SHARED-CAR USER DEMAND ANALYSIS



A total of 540 valid questionnaires were used in this questionnaire, of which 243 were valid questionnaires for shared cars. Most people have not used a shared car because they have not heard of it, used to choosing other modes of travel or have no driver's license. The inconvenience is that the number of shared-car is small, and it is hard to find a place to park or charge. Compared with the working day, the number of people who chose walking or non-motorized vehicles decreased at weekend, and more people tend to use public transportation and cars for relatively long distance travel. The "weekend mode" and "entertainment" keywords are more suitable for potential shared-car users.

### 4.3 PARKING LOCATION OF SHARED-CAR FACTOR

In order to study the impact of commercial facilities, transportation sites, residential facilities, universities, scenic spots, and office facilities on the heat value of share-cars parking spots. We use the heat value as the dependent variable, and the number of facilities within 2km around the parking lots as independent variable. Firstly, using SPSS software to carry out principal component analysis of variables, it is concluded that the number of office facilities, attractions and traffic stations have a significant impact on the heat of the outlets. After the multiple regression analysis of the above three variables, the magnitude of the influence of each variable on the heat of the parking lots can be seen by the p value.

#### SPSS ANALYSIS RESULTS

MODEL	NON-STANDARDIZED COEFFICIENT		STANDARDIZED COEFFICIENT		T	P VALUE	SIGNIFICANCE
	B	STANDARD ERROR	BETA				
1 (CONSTANT)	-7.12	5.995			-1.188	.280	1.720
TRANSPORTATION SITES	.694	.238	.432		2.909	.270	1.730
SCENIC SPOTS	2.019	.865	.350		2.334	.058	1.942
OFFICE FACILITIES	.730	.147	.677		4.969	.003	1.997
COMMERCIAL FACILITIES	-	-	-		-	-	NULL
RESIDENTIAL FACILITIES	-	-	-		-	-	NULL
UNIVERSITIES	-	-	-		-	-	NULL

According to the analysis results, among the above six spatial location factors, office facilities have the greatest impact on the heat of parking spots, and the second and third are the number of scenic spots and traffic stations. The remaining factors have no significant impact on the operation of the outlets. Therefore, it is important to consider setting up parking spots in areas with more office facilities, classics, and convenient transportation.

## 5 REPRESENTATIVE OF HIGH HEAT VALUE SHARED-CARS PARKING SPOT

### INDUSTRIAL PARK-TYPE

There are intensive workplaces around the parking spots, and the shared-car users are accurately positioned mainly for company employees.

### COMMERCIAL CENTER-TYPE

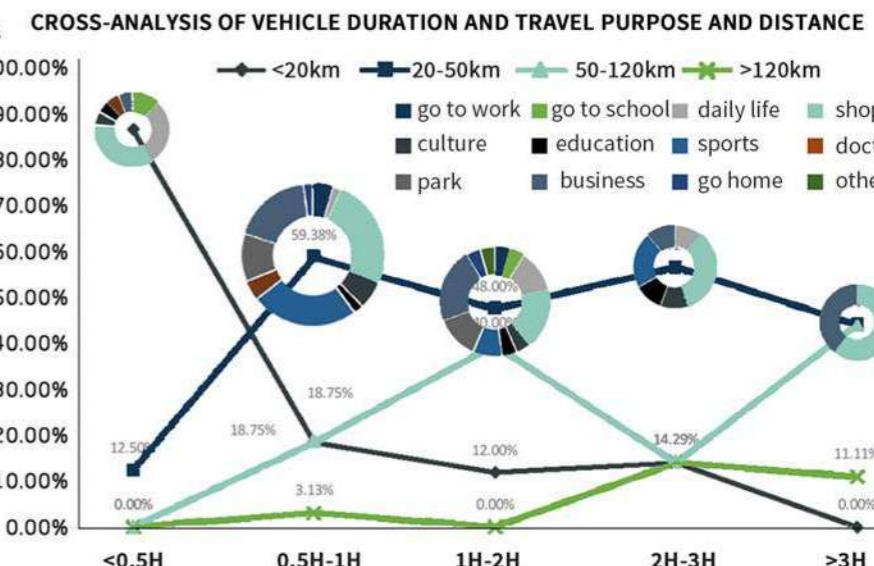
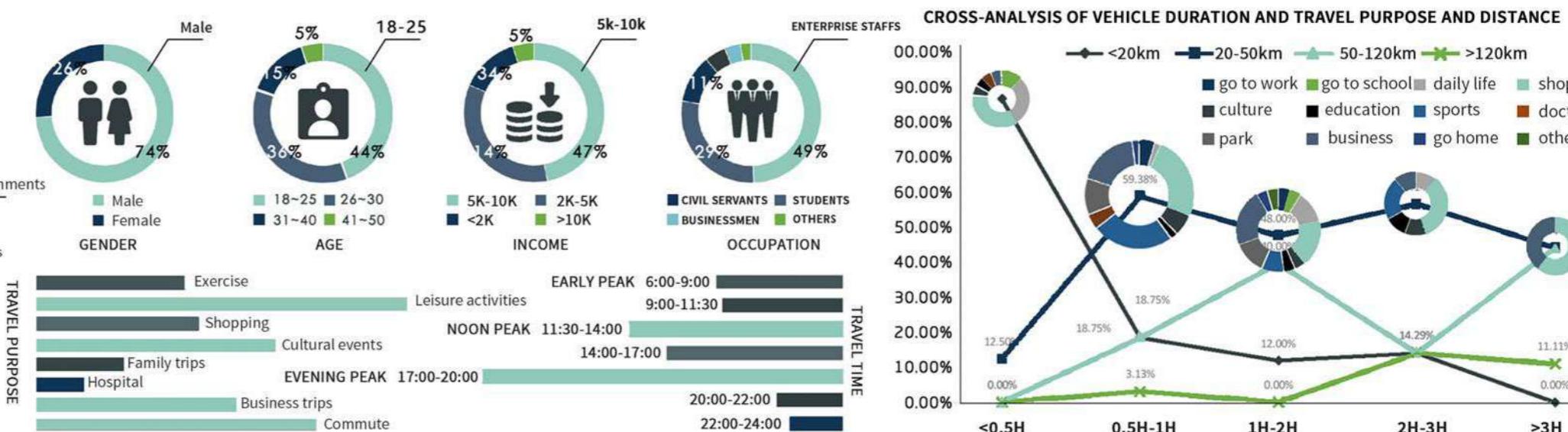
It is mainly based on the city's commercial center. The distance between the parking lot and commercial center is relatively close, and it is also closely related to other transportation sites.

### TOURISM SERVICE-TYPE

Tourism service parking lots are mainly located around the scenic spots. Serving tourists who want to travel freely in Wuhan.

### TRANSPORTATION HUB-TYPE

Transportation hub-type parking lots are usually set on important transportation nodes, in order to serve transportation transfer.



People generally choose to use shared-car when they are engaged in entertainment activities. Shared cars are more popular when it comes to group activities, followed by commuting. In terms of travel time, the usage rates of the three peak hours are high at 6:00-9:00, 11:30-14:00, and 17:00-20:00, especially at night peaks. The top two educational areas and the Jiyuqiao parking lot were used to analyze the characteristics of the users. It can be concluded that the basic characteristics of the users are 20 to 30-year-old undergraduate students with a monthly salary of around 5,000 yuan, and the average car is less than 1 hour.

It can be seen that most people who use the shared-car for less than half an hour drive 0-20 km, mainly for shopping and leisure activities; most users who use more than half an hour drive 20-50km, mainly for entertain shopping, sports activities and business. Only a small number of users use shared-car for commuting or medical treatment, which is a time-critical event. Overall, the shared car is mainly aimed at 20-50km travel (mainly for leisure activities).

## 6 SHARED-CAR PARKING LOTS LAYOUT OPTIMIZATION STRATEGIES

### 6.1 SPATIAL LAYOUT OPTIMIZATION STRATEGY OF SHARED-CAR PARKING LOTS

#### MAIN IDEA

By dismantling, adding, and optimizing existing shared-car parking lots, we will build a network of parking lots to further expand the use of shared cars and provide better services for people.

#### STRATEGIES

The adjustments of the shared-car parking lots are mainly divided into two categories: adding layout points and dismantling outlets.

**URBAN CENTERS:** Since the land use function of urban center is complicated, the strategy is aiming to increase the density of parking spots.

**OUTER DEVELOPMENT AREA:** Add new parking spots in potential plots with comprehensive functions.

**INCREASE THE DENSITY OF CHARGING PILES:** Add charging piles from the city center parking lots, achieving the goal that every 3 parking lots are able to share a set of charging facility.

#### NEW-CONSTRUCTED PARKING SPOTS

Industrial Park (B) scenic area (A C D) downtown business district (C D) transportation hub (E)



### 6.2 SELF-OPTIMIZATION

#### PARKING FACILITY

Divide independent shared car parking spaces and add guidance signs. Differentiate shared cars and general private cars to improve the recognizability of shared-cars. Add charging piles to share a ctcharging pile for every 2 parking spaces.

#### ACCESSIBILITY

The shared-car parking lot is selected in the ground parking lot with better conditions and avoid to be located inside the community or hotel.

When setting up parking lots in the city center, try to choose a public parking lot located in the branch road, and optimize the situation where the entrance and exit of the parking lot and the road relationship are not convenient.

#### TRANSIT SYSTEM

Enhance the connection between parking lots and public transportation stations. considering the connection with bus stations and subway stations.

Enhance the connection between parking lots and shared bike parking spots. Link the shared car to the use of shared bikes, and take into account the accessibility of shared bike parking spots.