



**REGENERATION OF UNUSED SPACES - DESIGN TO ALTER  
PERCEPTIONS**

**BY**

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**A THESIS SUBMITTED IN PARTIAL FULFILLMENT  
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### **Abstract**

In the context of economic development, due to the rapid development of urban construction, a large number of idle spaces have emerged. These spaces waste urban resources, affect the image of the city, and contain unstable factors. Therefore, the primary focus of this study centers around the revitalization and repurposing of underutilized spaces. Initially, the researcher conducted a comprehensive examination of unused spaces within the Jiangning District of Nanjing City. This involved a detailed analysis and study of both local and international instances of design and transformation pertaining to underutilized spaces. From the analysis, it became evident that the majority of these approaches could only offer solutions tailored to individual spaces, lacking the capacity for economic viability and reproducibility. Through research and design analysis, the researcher hopes to explore and design an outdoor furniture module system, which can activate the value of these unused spaces and drive urban development through the combination of different forms of expression, improve people's perception towards these unused spaces, and thereby open up new design ideas for solving the problem of urban unused spaces.

(Total 35 pages)

**Keywords:** Unused spaces, Regeneration

Student's Signature ..... Thesis Advisor's Signature .....

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# Chapter 1

## Introduction

### 1.1 Background and Significance of the Problem

With the rapid development of society and economy, the process of urbanization is speeding up, and people's transformation of cities has never stopped. The replacement of old and new cities is not only a "death", but also a "rebirth". Once upon a time, the urban development of "spreading the cake" has caused a variety of urban diseases to the current large-scale cities, seriously damaged the city's profound history and culture, erased people's "memories", and blocked the natural and cordial exchanges between people. However, in the context of the new normal economic development, urban construction has also begun to enter a new stage of stock optimization from incremental expansion. Space renewal has become a new theme. The transformation and utilization of unused urban space can improve people's living environment, improve urban quality and effectively stimulate the vitality of urban space to achieve urban "renewal" (Zhang, 2021).

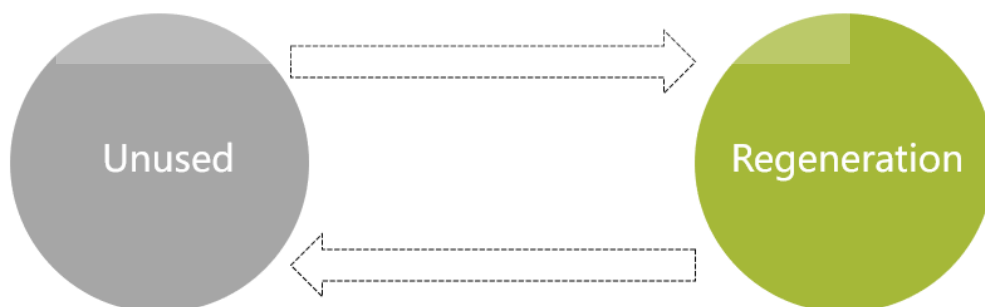


Figure 1.1 Diagram (a)

Source: Researcher



## 1.2 Research Objectives

Jiangning District, located in the southeast of Nanjing, Jiangsu Province, China, is one of the eight main districts of Nanjing, an important national science and education center and innovation base, an advanced manufacturing base, transportation and logistics hub and airport hub in the eastern region of the country. Jiangning encircles the main city of Nanjing from east to west and south, and the aviation, shipping, railway and highway transportation systems converge. It is an important hub for Nanjing's external communication. With a total area of 1561 square kilometers and a permanent population of 1926100, the area I investigated is the Baijiahu Business District in the center of Jiangning District, which provides leisure and entertainment accommodation for nearby residents, urban white-collar workers, students and tourists

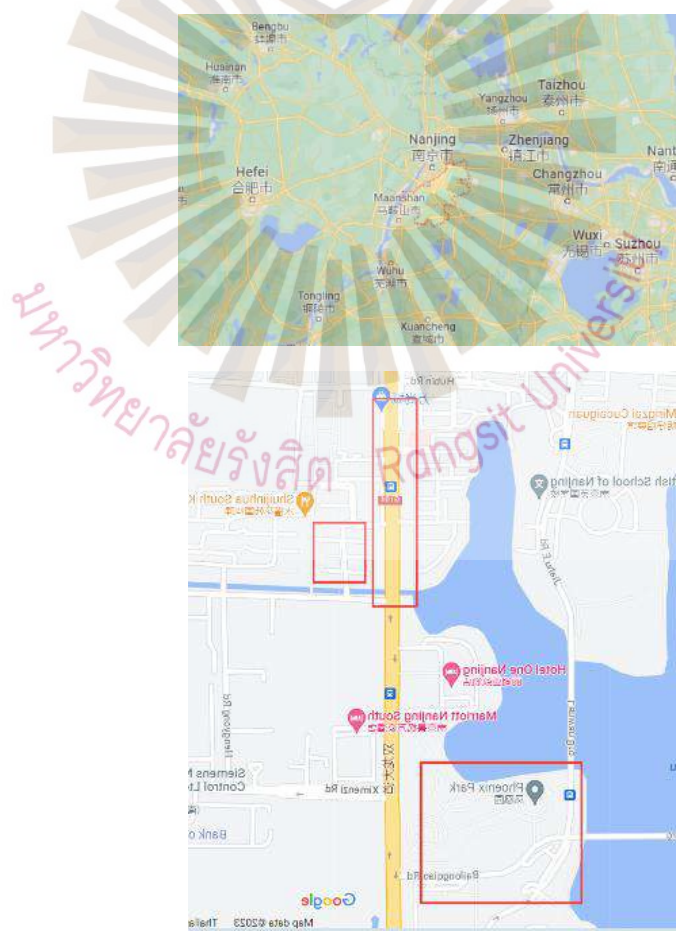


Figure 1.2 Position

Source: Researcher

Urban unused space refers to the areas at the edges and corners of urban planning relative to various urban entities. Some of these spaces are not properly planned, some are forgotten and not fully designed and utilized, and some are spaces with negative attributes that do not have specific functions and do not play their intended role. Usually, the boundaries are vague and people tend to overlook them, but they are ubiquitous.

For an object A, when the space B surrounding him is a natural non-artificial space, B is A's negative space(N-space)

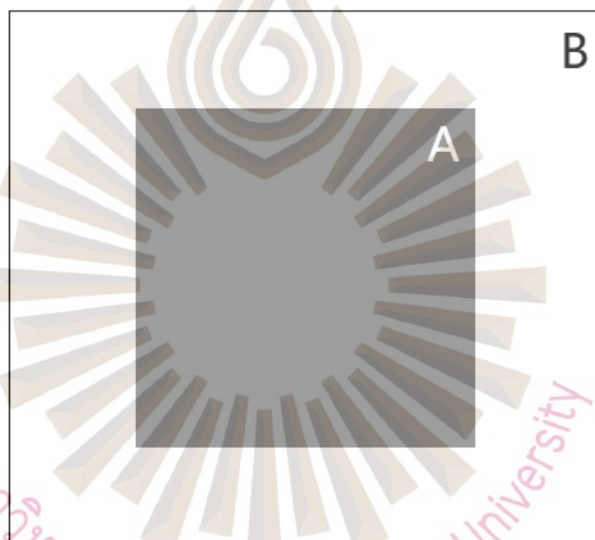


Figure 1.3 Sketch Map

Source: Researcher

1.2.1 Explore the systematic method of updating the urban unused space, and develop and reuse the unused space.

1.2.2 Design an outdoor furniture module system that activates unused urban spaces through different combinations.

### 1.3 Characteristics and types of unused space

The spatial characteristics of unused urban space can be divided into three categories: formative features, morphological features, and functional features.

Its formation characteristics are reflected in long-term and randomness:

1) The development of the entire city is not only functionally complex but also has a large time span, and the remaining space is naturally formed with the development of the city. Although fragmented and small, it is also composed of different elements that require a certain amount of time to accumulate.

2) The space left behind in urban construction and development is uncertain and random. And it is greatly influenced by the adjacent main space.

The remaining space can be divided into open space and semi open space according to its morphological characteristics:

1) Open spaces bring relatively weak sense of enclosure, but are conducive to the flow of people;

2) A semi open space that provides a place for people to briefly stay for activities.

Unused space usually refers to the negative urban space that has not been fully utilized or can not play a role in the city. With the rapid development of cities, there are many unused spaces. They can be roughly divided into three categories according to their original uses:

1) Public surplus space dominated by traffic surplus, green space and temporary idle land

2) Private surplus space mainly including corner areas and old private houses

3) Industrial leftover space dominated by old docks, old warehouses and workshops

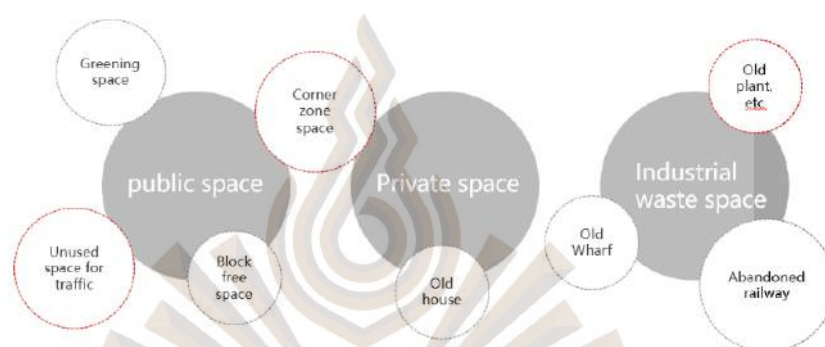


Figure 1.4 Unused space classification

Source: Researcher

The unused spaces in cities are mostly semi open spaces, distributed at the edge or in a corner next to the main space, with a certain sense of space and privacy, which is prone to crowd gathering behavior

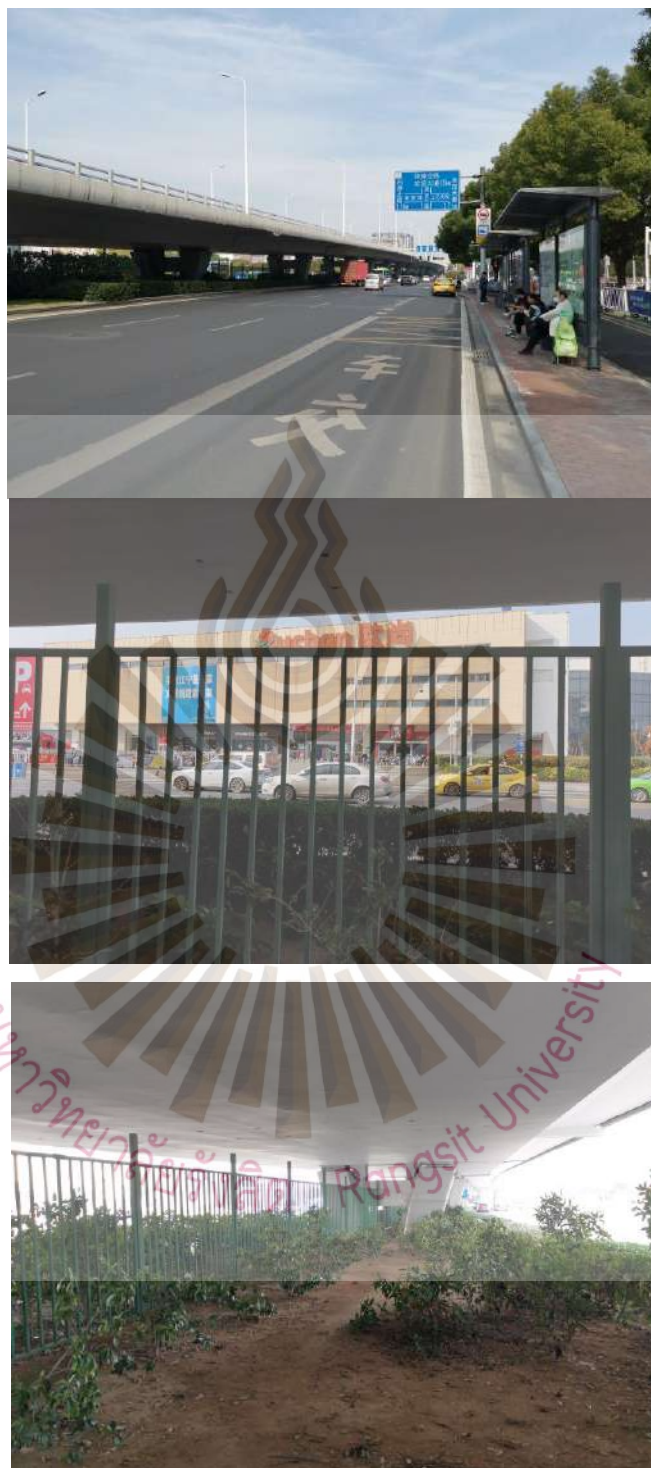


Figure 1.5 Under the viaduct

Source: Researcher





Figure 1.6 Roof

Source: Researcher



Figure 1.7 Community Factory

Source: Researcher

The surplus space of a city is a universal problem in the world, not a problem of a city. As long as the society is developing and the city is under construction, unused space will always exist. This paper mainly discusses how to solve these three problems of unused space through design.

## 1.4 Research Questions/ Assumptions

1.4.1 The old factory was abandoned mainly because the buildings and facilities in the original space were old and had no use value.

1.4.2 Large area of poor lighting, easy to gather illegal activities

1.4.3 The space is monotonous

1.4.4 The space was abandoned and evaded by residents



Figure 1.8 Diagrams (b)

Source: Researcher



Figure 1.9 Diagrams (c)

Source: Researcher

มหาวิทยาลัยรังสิต Rangsit University



## **Chapter 2**

### **Literature Review**

#### **2.1 Theory**

In today's society, the rapidly developing social environment has led to many problems in urban planning and design. Large scale and modular construction will inevitably accompany the transformation of land use functions, as well as the abandonment and irrationality of space. If these spaces are not utilized, they will form idle spaces. In addition, with the improvement of economic conditions and the diversification of spiritual needs, people's life behavior, social interaction patterns, and values have also undergone changes. The diversity of people's requirements for living space has led to diversity in urban development. Therefore, a large number of different forms of unused space have emerged.

In order to effectively promote the reform of land resource utilization methods, the Jiangning Branch of the Municipal Planning and Resources Bureau has proposed to carry out actions to improve the quality and efficiency of existing land use. Since the beginning of this year, the sub bureau has been working on improving the quality and efficiency of existing land, establishing specialized teams, implementing special actions, introducing social capital, strengthening planning and guidance, strengthening service guarantees, and strict project management. Since the establishment of the special team for improving the quality and efficiency of existing land in Jiangning District, it has been clarified that 132 projects have been included in the first batch of projects for improving the quality and efficiency of existing land, of which 90% are social capital investment projects. At the same time, the focus is on promoting the planning, land, urban construction and other procedures of 43 intended construction plots, and revitalizing a large number of idle and idle land. Awakening

ten thousand acres of existing land, allowing every inch of land to grow into every inch of gold.

Therefore, this article evaluates and provides feedback on the design, construction, and use of the selected case by constructing a "design exploration" design loop. Grasp the environmental behavioral relationships and development trends in different scenarios and building environments, and ultimately return to the considerations and design principles when designing unused spaces, in order to achieve the goal of redesigning unused spaces.

## **2.2 Demonstration**

The specific presentation will be explained in the paper and demonstrated through case studies

1) By understanding the classification and development of unused spaces, applying professional knowledge and unique perspectives to better integrate the cultural connotations of modular systems into outdoor furniture design, making it a shining point in furniture system design.

2) Innovate modular furniture systems in the updated design of unused urban spaces

## **2.3 Research method**

By flipping through books, consulting materials, and online information, one can better, more, and more detailed grasp the research related to this topic

Research. Always pay attention to the latest trend of unused space design at home and abroad, take its essence, and open your eyes.

## 2.4 Technical route

Descriptive and exploratory research will be used to elaborate on the relevant content of modular furniture systems for the research of this topic. Using excellent design cases to illustrate the importance of modular furniture system design in unused spaces.



## **Chapter 3**

### **Research Methodology**

This paper mainly adopts the method of literature research: by searching for keywords such as "unused space" on the academic platform, summarize the existing research results of predecessors on unused space, and collect outstanding successful cases at home and abroad

Summary method: Deeply explore the existing literature on idle space, and try to find a theoretical basis for the research direction of this paper. Obtain relevant literature for classification and summary, which can help the author clear up his ideas and lay a foundation for forming his own design ideas later

Site survey method: after fully understanding a large number of cases, conduct a macro analysis of them, and select typical idle space transformation cases such as schools, viaducts, roof platforms, abandoned chemical plants for on-site investigation. In order to comprehensively understand the composition, age class, education level, living habits, main needs and other contents of the surrounding personnel, so as to better design and grasp the form of art installations, After on-site investigation and questionnaire investigation and data collection and analysis by Shenzhen People, the unused space will be activated and reused in combination with various aspects by judging the actual site and surrounding environment of the project

### **3.1 Case study**

3.1.1 Gooood (2021a) asks a question through this project : what if we expected highways to give something back to the places they cut through? A flyover can provide some shade in a hot city, and creates a small area of land that can't be developed with tall buildings. It's not such a crazy idea to make that into a public

space. The design transforms the overbearing elements of concrete infrastructure into the public space of the entire local community, adds much-needed facilities and greening, improves mobility, and creates a strong visual identity for the region. On a larger scale, the design provides a repeatable approach to sustainable urban development.

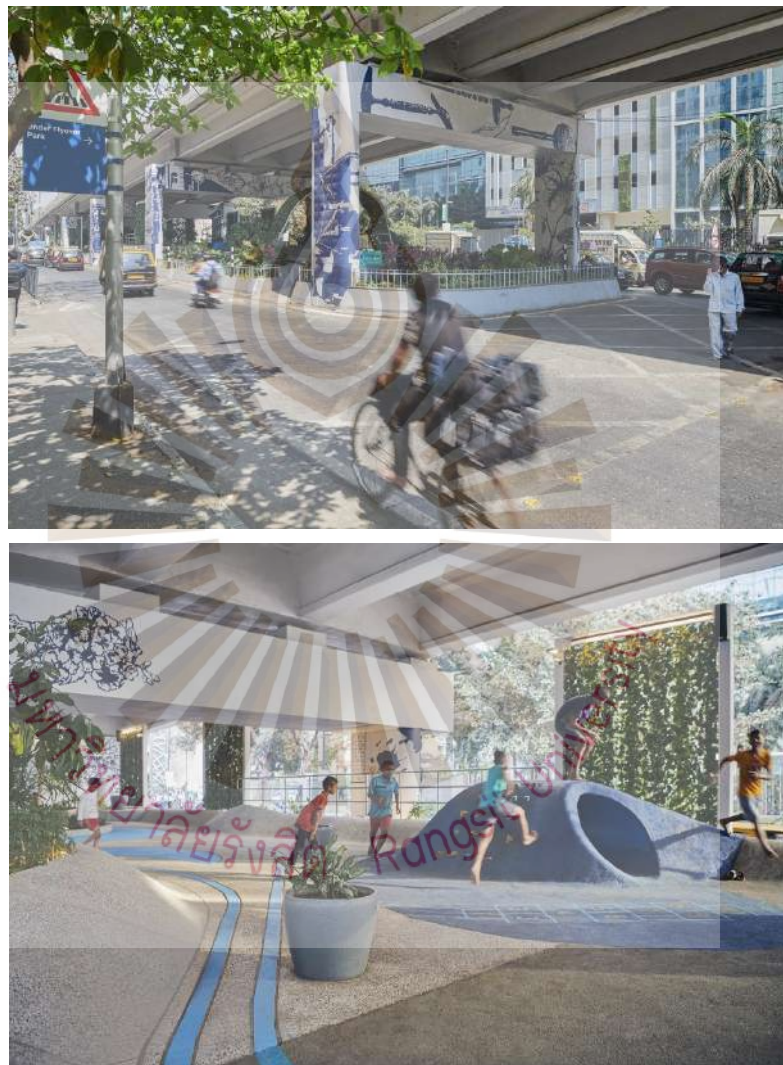


Figure 3.1 One Green Mile

Source: Gooood, 2021a

3.1.2 The roofs of Rotterdam have enormous potential, especially those of Het Nieuwe Instituut. With the panoramic view from its distinctive pergola, the building by Jo Coenen inspired the design team to create a platform 29 metres high. At



600 square metres, the platform is large enough to host a variety of events and meetings. It offers a view of the city, of the Museumpark, and of the neighbouring MVRDV-designed Depot Boijmans Van Beuningen Gooood (2021b).

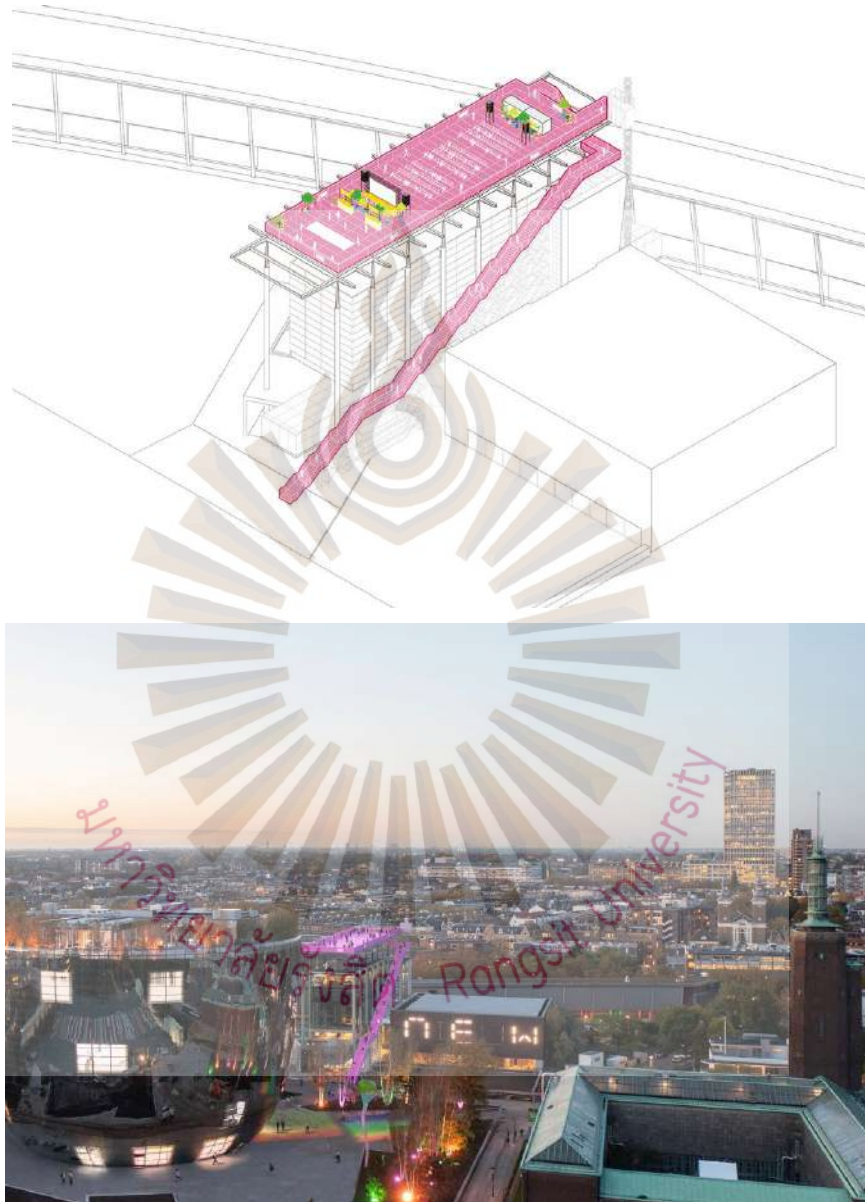


Figure 3.2 Pink roof platform

Source: Gooood, 2021b

3.1.3 As a building more like an art installation, the “Tower of Life” has several different states. When the screen is turned off during the day, it presents a translucent and lightweight landscape tower floating on the water; when it shows

works of art in the evening and at night, it is a digital art museum where the screen is deconstructed to create visual interaction with people; of course, it has a hidden mode, and the three front screens can be adjusted and rotated to meet more complex needs



Figure 3.3 Life Tower

Source: Gooood, 2023

Through the Case study, it is found that, as shown in Figure 3.1, the space under the Viaduct is deserted and evaded by residents by designing and creating a community space; Problems such as large areas of poor lighting and poor mobility. As shown in Figure 3.2, the new function of activating unused space on the roof is demonstrated through the use of temporary scaffolding structures and the recycling of floor materials. To achieve sustainable development of the city.

### 3.2 Materials

The materials selected for design are environmentally friendly and pollution-free, which can be divided into three categories Class refers to materials that can be recycled and reused, such as metal, stone, anti-corrosion wood, plastic, etc; The second type is biodegradable materials, such as paper, bark, sawdust, rattan weaving materials, recycled pine, etc; The third type is materials that can be used as building raw materials, such as sand, stones, gabions, red bricks, stones, logs, etc., which are selected based on the actual usage scenario.



Figure 3.4 Material schematic diagram

Source: Researcher



### 3.3 Principles of Urban Space Design

#### 3.3.1 Life principles

Urban space should be convenient for activities and meet the various living and working needs of the temple people. The humanization of space should care about people's needs, and the quality of living in the space should be improved. People can find their own life in the city, and personality is not constrained, which is the source of vitality in modern urban space.

#### 3.3.2 Principle of Order

The human centered material and spiritual space environment has rich levels and a complete system, such as the behavior and communication space of groups, spatial order and significance, regional characteristics and built environment, etc. Various open or closed spatial structures are clear and identifiable. The practice of replacing living order with artistic order will lead to the depletion of urban life.

#### 3.3.3 Comfort principle

The emphasis on spatial aesthetic evaluation and visual psychological comfort ensures that the corresponding space has comfort and a place that meets the requirements of human scale. In addition to meeting certain aesthetic, social, and economic requirements, the unified and appropriate population scale and facility service scope of the environment and spatial capacity should adapt to the dynamic development of urban socio-economic development.

#### 3.3.4 Selectivity

It makes the rigid spatial content more variable and adapts to the needs of economic structure and other aspects, while providing selectivity for urban lifestyles.

Ecological resources, natural regions, cultural and social interactions, and visual comfort

### 3.4 Strategy

3.4.1 Transforming "unused space" into "golden corner and silver edge" responds to the new expectations of the people for a happy and beautiful life

Nanjing will renovate and utilize unused urban space to create a "golden corner and silver edge" project, as a specific lever for learning and educating party history and "I do practical things for the people", and as a direct project carrier for benefiting and facilitating the people. According to the guidelines of the "Guidelines", we will promote the balanced allocation of sports facilities, cultural activity venues, point style living service facilities, etc. based on different spatial characteristics, relying on unused urban space. Pocket parks will be planted on scattered plots on street corners, connected to community greenways such as the "way to work" and "way to work", and serve as leisure service nodes, forming a community vitality hot spot that citizens can reach with every step, and promoting leisure communication among neighbors. Let citizens see more positive changes happening at their doorstep, gain more human scale and ingenious spatial experience, continuously meet the higher level health and spiritual needs of the general public, and embody the innovative development achievements of the city into visible and tangible beautiful experiences and life scenes for the people.

3.4.2 Transforming "unused space" into "golden corner and silver edge", creating a new window to showcase Nanjing's unique courage

Adhere to the principle of 'small spaces contain great wisdom, and small spaces do great work'. Nanjing focuses on hosting a sports and sports city, taking into account the hosting of the Universiade and other major international and domestic events and grand events. A series of urban unused space renewal and utilization projects have been implemented in key areas and important routes, and the project

presentation has been accelerated with high quality. In conjunction with the 14th Five Year Plan, we will promote the renovation and renovation of unused urban spaces from a point to surface perspective, creating a continuous and beautiful scene experience that integrates sports, leisure, entertainment, art, business, and social functions, enriching communication spaces, promoting the integration and coordinated development of cultural, commercial, tourism, and sports functions, further enhancing the popularity and urban vitality of the area, and reshaping the quality of public spaces and the "Sichuan style, international style" style and form through fine governance, By intervening in flowing cultural and artistic activities or implanting fixed cultural buildings (structures) and artistic installations, distinctive cultural charm is showcased, and a showcase window for the city's image is created by connecting dots and lines.

3.4.3 Transforming "unused space" into "golden corners and silver edges" has opened up a new path for the conservation and intensive utilization of national spatial resources

Implementing the requirements of "grasping the new development stage, implementing the new development concept, and integrating into the new development pattern", and promoting the renewal, transformation, and utilization of unused urban space in accordance with the "Guidelines" in the new stage of improving the quality of urban inventory, has become an important measure and connotation of the "gradual and embroidered" urban organic renewal and inefficient land redevelopment and utilization in Nanjing. Based on the fine construction of scattered plots and small public spaces, incorporating distinctive functional formats, shaping themed consumer experiences, moderately tapping and unleashing the potential of unused urban space, especially commercial value, effectively activating idle and inefficient land resources, and promoting the appreciation of urban space.

3.4.4 Transforming 'unused space' into 'golden corners and silver borders', constructing a new pattern of multi subject co construction, co governance and sharing

Nanjing adheres to the principle of "government guidance, departmental leadership, and social participation", adopting models such as government functional departments promoting, introducing market subject development, homeowners' independent transformation, and social organizations and community residents jointly building. Multiple entities such as government departments, streets, communities, residents, enterprises, and social organizations participate and efficiently collaborate to promote the renewal, transformation, and utilization of unused urban space. By conducting scheme comparison and selection, publishing opportunity lists, organizing mass themed activities, and special reports, we aim to improve the utilization rate of unused space in various cities, as well as the exposure and visibility of the "Golden Corner and Silver Edge". This process of updating and utilizing unused space in cities has become a process of enhancing neighborhood harmony and gathering social consensus, and has constructed a rooted community and diverse symbiotic urban governance pattern.

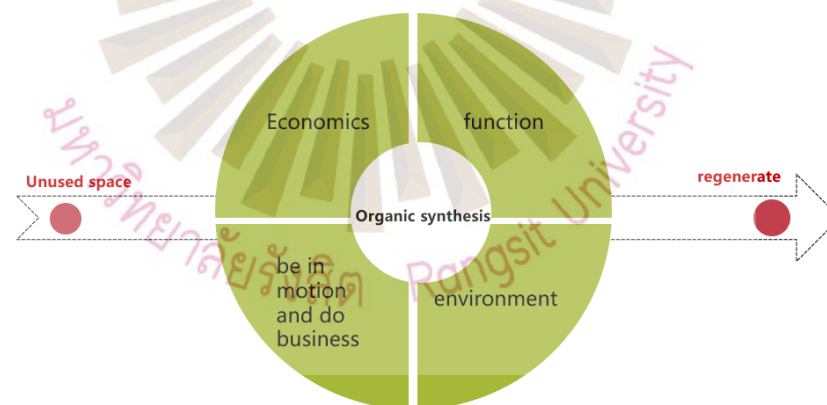


Figure 3.5 Sketch Map

Source: Researcher

## **Chapter 4**

### **Research Results**

#### **4.1 Explore principles and strategies for regenerating unused space**

This paper mainly analyzes how to regenerate unused space, and according to different types of idle space, improve their utilization rate, and puts forward the concept of temporary art installation design. She added a temporary art installation based on the original unused space attribute. The activity of the site is improved, so that the site is no longer idle. The temporary art installations in the site can be moved at any time according to the needs, which will not pollute the site and will not affect the reuse of the site. Analyze the research status at home and abroad, through case study, and then propose solutions to regenerate unused space according to the actual site survey status of unused space, causes of formation, and existing attributes of space.

#### **4.2 Design a "temporary art installation" to activate unused space**

According to the current characteristics of unused space, the regeneration of unused space should meet the principles of function, sustainability and people-oriented. The design can make the site a new site that can be used. Be harmonious with the surrounding environment and people. At the same time, it should be representative.



Figure 4.1 The Diversity of Modular Art



### 4.3 Discussion

The current renovation design of unused space has its uniqueness, as it is a separate design for a unique site without any duplication. However, the modular furniture system design proposed by the author is an important component of urban sustainable development construction. It not only improves urban land use efficiency, but also provides an interesting activity place for surrounding residents. At the same time, it stimulates people's desire to explore, attracts them to stop, and increases communication between people and space. Therefore, through reasonable design and utilization of urban idle space, not only can a more distinctive public environment be created, a positive public environment atmosphere be created, but also urban vitality can be enhanced and urban content can be enriched. It has certain promotion value.

### 4.4 Design exploration

A stall is an important place in everyday life. In a crowded street or square, amidst the bustling crowds, a family of three strolling, playful children, off duty staff, intimate couples, and a young man sweating profusely just out of the stadium The photography booth is named "Selling Happiness" and records beautiful moments among the crowds, capturing the beauty and current happiness.

The design of the stall setting device uses a motorcycle as the carrier for easy movement and easy operation. The overall color scheme has chosen a bright yellow and white combination, which is fresh and warm, warm and unrestrained. The graphics are presented in a combination of color blocks and lines, with a concise processing. This can enhance the vitality of unused space.

Existing problems: The size is too small to support the entire theme of the paper, the economic benefits are not high, and the user group can have more choices.

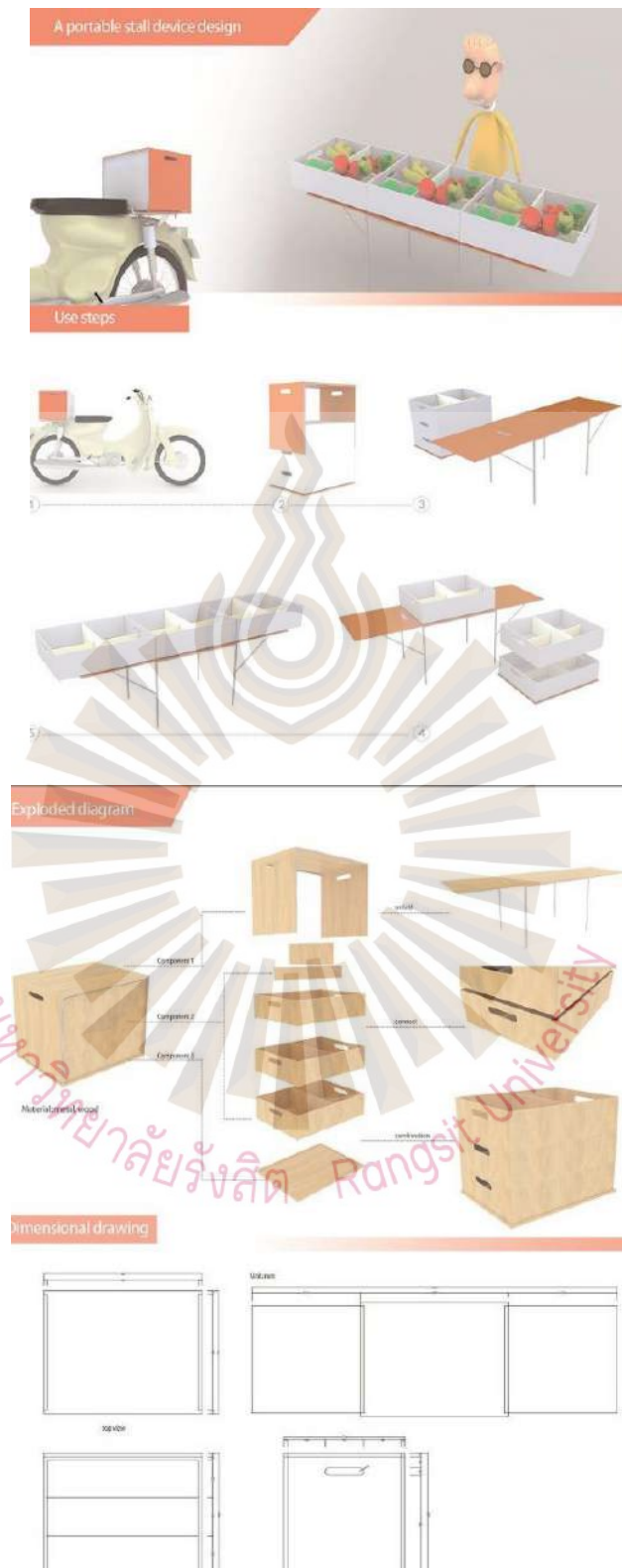


Figure 4.2 Option 1



## 4.5 Design exploration

The design is inspired by natural beehives and is presented in a modern way, achieving highly flexible use and layout, making it appear static but highly adaptable, giving it another vitality. This design can also be changed according to the environment and occasion of the community.

The 'hexagonal module' attempts to meet many different community scenarios simultaneously with a highly flexible system. Change its layout and form through its placement, and evolve into objects that meet the needs according to different occasions or activities. Provides space for activities such as rest, chat, and play, thereby updating unused space.

Existing problem: Hexagonal shapes are too common without certain uniqueness, and one of the modular bookshelf combination spaces has certain limitations in indoor use, which does not meet the scope of previous unused space research, and the materials are too single.



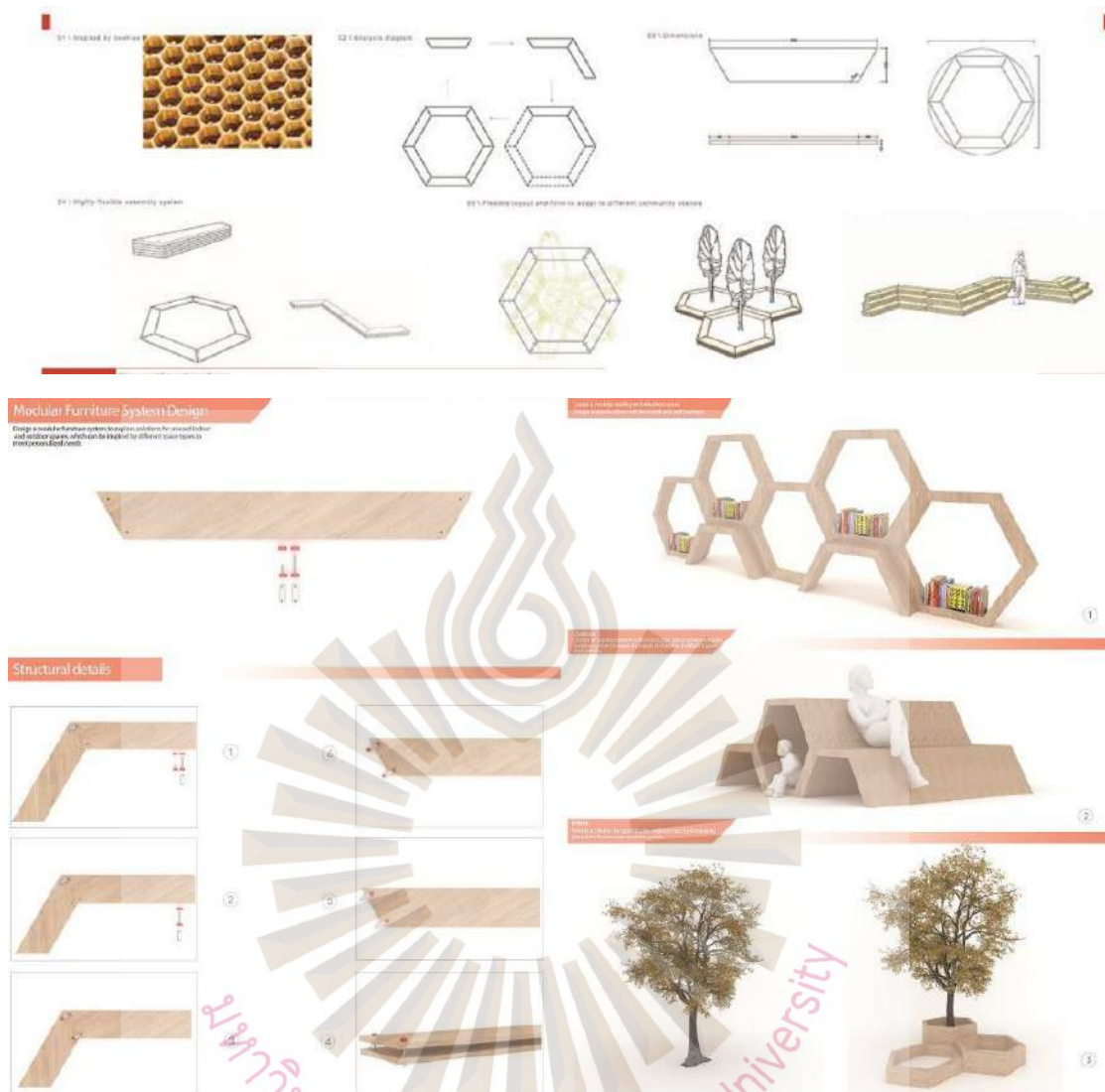


Figure 4.3 Option2

## Chapter 5

### Conclusion and Recommendations

#### 5.1 Conclusion

During this period, I explored various solutions, but there were some problems in the early stages. Finally, under the guidance of Ajarn, the final idea was to design a modular furniture system to explore unused space solutions, which can obtain inspiration based on different spatial scenarios to meet personalized needs.

The final shape of the module I want to design is similar to "Z", with a single module height of 1000mm

As shown in Figure 10, the design inspiration for the "Z" shaped module comes from the common wire mesh in daily life. Select one of the individual shapes to refine and simplify to form a specific design element, and on the basis of meeting structural safety, use artistic intervention and overlay new functions to reflect the renewal of unused urban space.

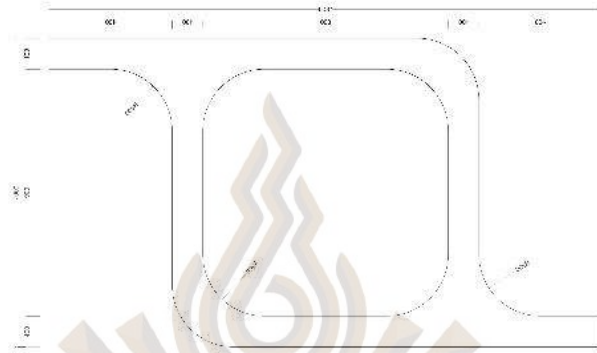
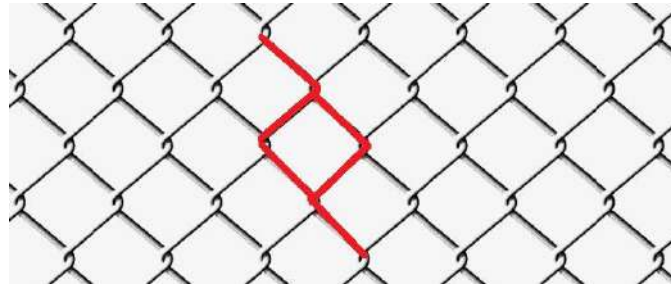


Figure 5.1 Module



Figure 5.2 Module Structure Link

The first scene space is a park space, where a modular outdoor furniture system is designed and trees are integrated into the system, while also providing rest functions.



Figure 5.3 Use space (a)



The second scene space is the community, where a modular system can be used to design a versatile space for placing bicycles and other functions, which can improve the phenomenon of disorderly parking in the community

Zhang (2021) After designing the proposal, empirical analysis is conducted through model operation and display board promotion to determine the feasibility of resident participation and provide first-hand feedback

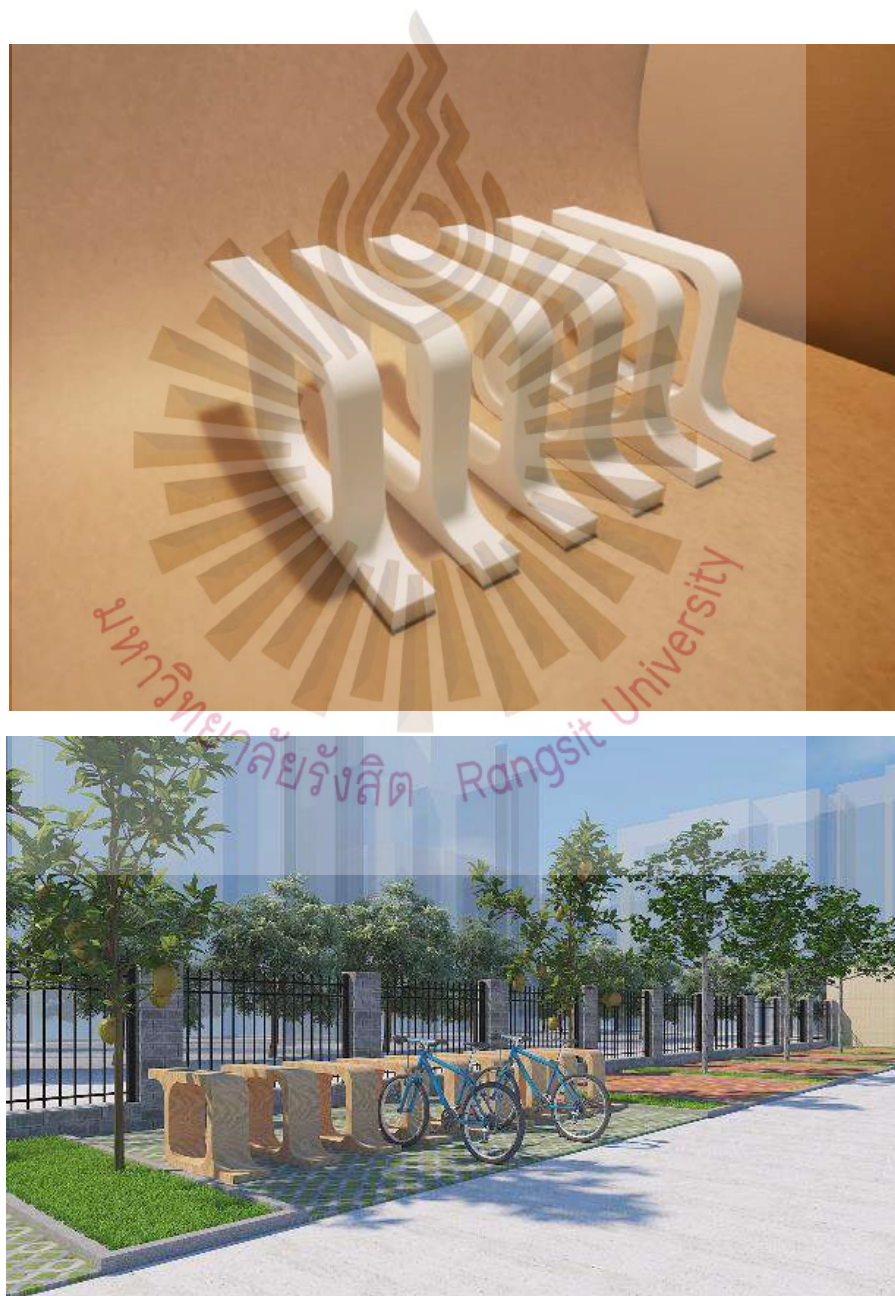


Figure 5.4 Use space (b)

The third scene space: building roofs, where a modular system can be used to design a water tank product with functions such as collecting rainwater.



Figure 5.5 Use space (c)

The fourth scene space: under the viaduct, design a modular system that can be placed under the viaduct space, providing a temporary place for homeless people to belong.

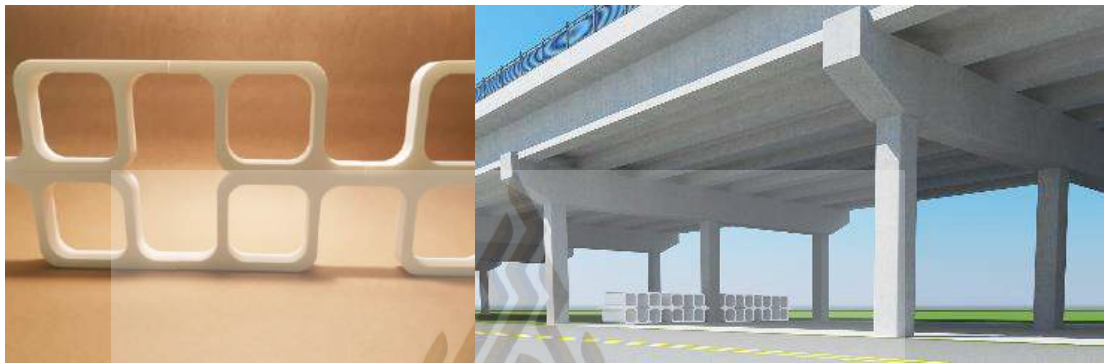


Figure 5.6 Use space (d)

## 5.2 Recommendations

Finally, through the modular system project, a series of exploration designs for different unused spaces are carried out, updating the unused spaces and encouraging people to stay and play here. I hope people can participate in changing the current situation and updating the design of unused spaces.



Figure 5.7 Use space (e)



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