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Strategy for the regeneration of space under viaducts by means of design (on the example of the PRC)

Qualification work for obtaining the SVO «Master»

in the specialty B2 Design OPP «Design of the architectural and landscape environment»

The qualification work contains the results of own research

The use of ideas, results and texts of other authors must be referenced to the appropriate source. Jiang Chenchen 2025.11.18 13:24:55 +08'00' Jiang Chenchen (Jasmine)

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ANNOTATION

Jiang Chenchen(Jasmine).Strategy for the regeneration of space under viaducts by means of design (on the example of the PRC)

During the process of urbanization, the mileage of elevated Bridges has increased rapidly. While expressways provide efficient transportation operations, they have also brought about a series of utilization problems for the ancillary Spaces of elevated Bridges. The elevated bridge spanning the middle of the road divides the original spatial layout horizontally and divides the original linear road longitudinally. The two sides of the bridge gradually drift apart, and the existing space under the bridge is "marginalized". Given the above-mentioned current problems, the reuse of abandoned and abandoned Spaces becomes particularly important. However, as the current direction of development and utilization of space under Bridges in our country mainly focuses on building greening and public facilities, it is still in a relatively extensive stage. The rapid development of urbanization has led to a large amount of space under elevated Bridges being used for basic parking functions. Therefore, there are many problems in the construction of abandoned space under urban elevated Bridges. With the development of public Spaces worldwide, the concept of urban pocket parks has been proposed. As the name suggests, it refers to very small open Spaces in cities, often scattered or hidden in patches within the urban structure, serving local residents. Pocket parks are small plots of land that are planted with greenery and equipped with convenient service facilities such as seats. As the elevated bridge is one of the areas with the largest flow of people in the city, we should make rational use of resources. The planning ideas and landscape design strategies for both unbuilt and existing elevated Bridges, including site condition analysis, spatial positioning and establishment, spatial planning and construction, and integrated landscape design, as well as enhancing spatial quality through intensive utilization of spatial elements, optimization of transportation networks, ecological intervention, and landscape and cultural intervention.

Based on the previous research, the main characteristics, design principles, construction strategies and specific design elements of the space under the elevated bridge from the perspective of restorative environment are proposed, forming a complete design theoretical system. Ultimately, referring to the site location planning, the research results are applied to the design, and targeted strategies for landscape creation that fit the site characteristics are proposed, providing reference and inspiration for the design of the space under the elevated bridge from the perspective of urban micro-renewal.

The subject of this study is the design of the space under urban elevated Bridges.

The subject of the study is the principles of shaping the architectural and landscape environment of the space under urban viaducts.

The introduction part clarifies the significance of the research, elaborates on the purpose and goals of the research, summarizes the object and theme of the research, the methods adopted, the scientific novelty of the research work, the time and geographical boundaries of the research, as well as the theoretical and practical significance of the research work.

The first section analyzes the sources of materials for this research topic and, through a comparative analysis of domestic and international theories and practices, describes the problem from the perspective of conforming to the theory of restorability, clearly depicting the development trajectory of this field from "passive response" to "active creation". This has established a solid foundation for subsequent research and pointed out the unique positioning of this study - that is, to achieve the value reconstruction and functional revival of the space under the

elevated bridge through a systematic design method that emphasizes both theory and practice and is in line with China's national conditions.

The second part provides a concept for solving one's own design scheme, describing the regeneration design of the space under the elevated bridge of the Zhongwu Bridge section in Changzhou. This paper expounds various principles of the environment under elevated Bridges, including functional and technical principles, organizational and planning principles, information and psychological principles, and aesthetic principles. The purpose of applying the principle of functional technology is established in the text, and suggestions for the design of the spatial environment under the elevated bridge based on the general design principle are put forward. The article demonstrates the significance of professional spatial organization and planning. The design space and layout principles were determined in the text, and its design functions and contents were established. The article also determined the principle of the restorative theory and expounded its application scope in the design of space and landscape environment under urban elevated Bridges. The article also establishes the importance of creating beautiful Spaces by applying composition techniques, colors and artworks.

The third part, based on systematic research materials, forms the concept of the design scheme and describes the architectural and planning solutions for the functional areas, as well as the artistic and symbolic solutions for decorative materials, plants and lighting used in the design of the object.

The research results show that this project possesses all the necessary elements to further implement the achievements of qualification accreditation in design practice. It can be approached from three aspects: spatial optimization, ecological restoration, and cultural integration. The research and renovation of the space under urban viaducts are of great significance for improving the urban environmental quality, enhancing residents' sense of happiness and promoting sustainable urban development. The significance of the research reveals the following results of the task: 1. Expand the application field of the theory of restorative environment, deepen the theory of space activation under urban elevated Bridges, and promote the cross-integration of environmental psychology and environmental design. 2: Enhance the quality of urban public Spaces, promote community vitality and social integration, and drive sustainable urban development.

Keywords：the theory of healing；space under the viaduct；spatial activation；

Abstract

Relevance of the research. With the acceleration of urbanization, urban transportation is increasingly inclined towards three-dimensionalization. Due to its greater speed and convenience, three-dimensional transportation has gradually become the mainstream of urban transportation. As a result, elevated Bridges are becoming more and more common and have become a common form of urban public construction. It is a means that can effectively alleviate traffic pressure in a specific area within a certain period of time, significantly improve the efficiency of motor vehicle passage and traffic safety. As a special spatial resource in cities, the space under Bridges has huge development potential. Its rational utilization and

design not only help improve the efficiency of urban land use, but also enhance the urban landscape and ecological environment, and provide citizens with diverse public Spaces. From the perspective of an environmentally friendly and resource-conserving sustainable development city, it is of great significance to actively utilize the space under urban elevated Bridges and create a good green landscape. Especially in the area where the canal passes through the bridge, by setting up waterside platforms, not only can the interaction between citizens and the canal be enhanced, but also the ecological environment quality of the entire area can be improved.

Taking Changzhou as an example this time, Changzhou is a city in the south of the Yangtze River.The canal runs through the bridge, and the river channels crisscross. The integration of Bridges and water not only forms the unique urban landscape of Changzhou, but also brings boundless imagination space for the improvement of the city's spatial layout and environmental quality. However, how to conduct scientific design in the Spaces under Bridges and along rivers to enhance the quality of the entire environmental space remains an important issue faced by urban planning in Changzhou. With the rapid development of urbanization, elevated Bridges and overpasses have sprung up like mushrooms after rain. Although they have solved the problem of traffic congestion, the space under the Bridges is often overlooked and has become a "gray area" in cities. In Changzhou, the Spaces under these Bridges hold great potential, waiting to be rediscovered and utilized.

This study aims to establish the principles of space design under elevated Bridges and provide suggestions for the architectural and landscape environment design of such projects.

The subject of this study is the design of the space under an elevated bridge.

The subject of this research is the formation principles of the space and landscape environment under elevated Bridges.

Research objective:Based on the correlation between the perspective of restorative environments and spatial regeneration, through theoretical analysis and practical design, a feasible and innovative space activation scheme under elevated Bridges is proposed, aiming to enhance the quality of urban public Spaces, promote the mental health of citizens, and drive sustainable urban development.

2. Deeply explore the regeneration strategies for the space under elevated Bridges. By drawing on successful experiences both at home and abroad, explore the spatial planning and design methods under urban elevated Bridges, hoping to provide a scientific, systematic and operational design framework for the regeneration of elevated bridge space.

Taking the Zhongwu Bridge section in Changzhou as an example, improving the urban spatial environment not only promotes the mental health and well-being of citizens but also drives the city towards a more humanized, ecological and sustainable direction.

The time span of the research covers the period from the late 20th century to the first 25 years of the 21st century.

The geographical framework of the research covers the practical experience of space design under elevated Bridges in major countries in Europe, America and Asia.

The scientific innovation of this research lies in:

The possibility of connecting with the space under the bridge under the theory of restorability

1.1 Novelty of theoretical connections

The Restorative Environments Theory mainly focuses on how to promote people's psychological recovery and relaxation through environmental design, and is usually applied in natural scenic spots, parks, green Spaces and other environments. This project applies the theory of restorative environment to the

space under elevated Bridges, a special urban residual space, which represents a brand-new theoretical connection. This article starts from people's psychological needs and explores how to promote people's mental health through environmental design, which has significant theoretical innovation value.

1.2 Uniqueness of Perspective

Compared with other similar studies, the perspective of this topic is more unique. Most of the existing research focuses on the renovation and functional diversification of the space under elevated Bridges, such as adding parking lots, bicycle lanes, parks, etc., but pays less attention to the impact of these Spaces on people's psychological aspects. This study focuses on restorative environment theory, emphasizing not only the redesign of space but also aiming to provide people with healing capabilities through design, infusing energy into the space.

1.3 Interdisciplinary Research

This study uses interdisciplinary theories and methods to analyze how the space under elevated bridges can be improved through design to transform neglected areas and create a healing environment. This perspective not only deepens the research but also provides more comprehensive theoretical support for design.

2. A proposal based on the characteristics of the urban area of Changzhou and the space under the bridge where the canal passes through

2.1 Full Utilization of Spatial Features

The space under the elevated bridge section of the Zhongwu Bridge has a unique geographical location and form: these spaces are influenced not only by the physical structure of the bridge but also by the canal beneath it. This study takes this characteristic fully into account and proposes a design plan in conjunction with the waterfront features of the canal. By utilizing the water landscape of the canal

and integrating it with the space under the elevated bridge, a public space with ecological functions and restorative benefits is created.

2.2 Integration of Ecology and Culture

The canal is not only a natural landscape but also an important part of Changzhou's urban history and culture. By integrating the canal's historical and cultural elements into the design of the space beneath the elevated bridge, and through landscape design and the installation of cultural facilities, the area under the bridge can be transformed into a window showcasing Changzhou's culture. At the same time, through landscape design, the ecological function of the space beneath the bridge can be enhanced, making it a public space that is rich in historical and cultural heritage while also full of natural ecological ambiance.

2.3 Design with diverse functions

Based on the activity demands of the residents in Changzhou urban area, this topic proposes a design scheme with diversified functions. Under the bridge, various functional areas such as a leisure square, pedestrian paths, bicycle lanes, children's play areas, and cultural exhibition areas are set up to meet the needs of people of different age groups and with different activity requirements. Meanwhile, through reasonable spatial layout and circulation design, the transparency and accessibility of the space under the bridge are ensured, allowing people to feel comfortable and happy when they are active in it.

Research Methods: This study employs the following methods for scientific research:

The literature research method involves consulting a large number of literature materials in related fields. On the basis of understanding and mastering the theories at home and abroad regarding urban spatial development, urban landscape, urban transportation, urban ecology, urban design, architectural design, bridge engineering design and landscape design, A large number of theoretical achievements on the utilization of space under elevated roads and Bridges and the

utilization of urban public space were deeply studied, which were taken as the basis of the research.

2. The inductive deduction method, based on relevant literature and collected domestic and foreign data on elevated Bridges, through the methods of induction, deduction and analysis, meticulously sorts out and deeply analyzes the spatial attributes, element composition, utilization status and existing problems of the space under urban elevated Bridges, the research object of this paper, providing guidance for the proposal of reuse strategies from the perspective of micro-updates in the following text.

3. Field investigation method: Select the elevated bridge on a specific section of the road as the research object. Through on-site investigation, photography, distribution of questionnaires and other methods, understand the current situation of space utilization under the elevated bridge, landscape features, traffic conditions, people's behavioral activities and demands and other relevant information on this section of the road, and solicit the public's views and feelings on the space utilization under the elevated bridge on this section of the road. From this, the focus of space utilization or renovation under elevated road Bridges can be analyzed, providing a certain basis for the design.

4. The case study method selects Changzhou City as the practical site and adopts the reuse ideas and strategies of the space under the elevated bridge proposed in the article. In practice, the specific problems of the space under the elevated bridge have been solved and the viewpoints mentioned earlier have been refuted.

5. The questionnaire survey method is used to obtain the residents' intended demands and principles for the utilization of space under Bridges, enhancing the scientificity, rationality and public participation of space utilization.

6. Behavioral Analysis Method Behavioral analysis method is a research approach that aims to understand the impact of the environment on human

behavior by observing and analyzing people's behavioral patterns in a specific environment. In this study, the behavioral analysis method will be used to deeply explore the current usage status of the space under the elevated bridge of the Zhongwu Bridge section in Changzhou, the behavioral characteristics of the crowd, and the interaction relationship between space and behavior, thereby providing empirical evidence for the design of space activation.

The theoretical significance of this research lies in: 1.Expanding the application field of the restorative environment theory: The restorative environment theory mainly focuses on how to promote people's mental health and recovery through environmental design. Traditionally, it has been mostly used in the design guidance of open Spaces such as urban parks and green Spaces. This study introduces this theory into the specific type of space under an elevated bridge, aiming to explore its applicability and innovative application in atypical urban Spaces, thereby enriching and developing the application scope and depth of the restorative environment theory.

2. Deepening the Theory of Activating Under-Bridge Urban Spaces: Spaces beneath elevated highways are often overlooked in cities due to their special location and form. This study proposes regeneration strategies from the perspective of restorative environments to promote the revitalization and reuse of such areas, emphasizing the principles of holistic and inclusive urban space design.

3. Promoting the interdisciplinary integration of environmental psychology and environmental design: This study combines environmental psychology to analyze the impact of spaces under elevated bridges on people's psychological experiences and proposes design strategies based on this analysis. This process promotes the concrete application of environmental psychology theory in environmental design, facilitates the integration of the two fields, and provides a new perspective for future environmental design research.

The practical significance of this study is: 1. Enhancing the quality of urban public spaces: The regenerative design of the space under the Zhongwu Bridge section of Changzhou, by introducing restorative elements such as natural greenery, art installations, and recreational facilities, improves the physical environment of the area, enhances the psychological atmosphere, and transforms it into a place where citizens are willing to linger and engage, thereby improving the overall quality of urban public spaces.

2. Promoting community vitality and social integration: The activation and utilization of the space under the elevated bridge provide surrounding residents with diverse recreational and social spaces, helping to foster interaction and integration among people of different ages and backgrounds, and contributing to the creation of a more harmonious social environment.

3. Promoting sustainable urban Development: The regeneration strategy proposed in this study focuses on the effective utilization of resources and ecological friendliness of the environment. For instance, green technologies such as rainwater collection systems and solar lighting are adopted, which not only reduce resource waste but also promote the sustainable development of the urban environment. In addition, by enhancing the utilization rate of urban space, the pressure on natural resources caused by urban expansion has been indirectly alleviated.

Work structure and scope.

This qualification assessment work consists of an introduction, three chapters, a conclusion, a list of references and an appendix. The theoretical section is 57 pages long. The total length of the qualification appraisal work is 97 pages. Appendix A is 24 pages long and contains 48 pictures. Appendix B is 8 pages long and contains 7 tables.

Introduction

The relevance of the research.

1.It is highly consistent with the national macro policies and the development orientation of the city

China's urbanization process has shifted from "incremental expansion" to "quality improvement of existing stock", and urban renewal has become the core task. In response to the national "urban renewal" strategy, the space under elevated Bridges, as a large number of underutilized "negative Spaces" and "gray corners" in cities, is a key target for their refined renewal. Urbanization in the new era emphasizes enhancing citizens' sense of happiness, gain and belonging, and should practice the new urbanization concept of "people-oriented". Through the regenerative design of the space under the bridge, with a focus on the daily needs of citizens, such as rest, exercise, socializing and commuting, a vibrant public space is created. Transforming and reusing the existing environment, compared with large-scale demolition and construction, is itself a sustainable development model that saves resources and reduces carbon emissions. The design transforms these "remaining Spaces" into "golden corners and silver edges", directly serving urban renewal. It explores how to introduce ecological landscapes, adopt environmentally friendly materials, and optimize microclimates in the Spaces under Bridges, providing support for the construction of the city's green infrastructure.

2. Facing the Core Issues in Current Urban Construction

The current state of spaces under elevated highways in many cities is concerning, commonly plagued by issues such as dirty environments and chaotic traffic. The design aims to address these problems through systematic design strategies, while also improving the overall urban environment quality and safety levels, and compensating for the shortcomings of public service facilities.

3. Significance for Academic Research

Currently, there is extensive research on other urban spaces, but the theoretical system for under-bridge spaces—"hidden" spaces—is still incomplete.

It is necessary to fill this gap and promote the development of urban design theory in this area. The regeneration of under-bridge spaces is an interdisciplinary subject, involving urban planning, landscape architecture, architectural design, traffic engineering, sociology, and other fields. By integrating knowledge from multiple disciplines and exploring strategies for ecological restoration and space creation under various constraints, it can help promote the integration and innovation of related disciplines.

Research significance: The study and renovation of spaces under urban viaducts are of great importance for improving the quality of the urban environment, enhancing residents' well-being, and promoting sustainable urban development.

Research objective:

1.Deeply explore the regeneration strategies for the space under elevated Bridges. By drawing on successful experiences both at home and abroad, explore the spatial planning and design methods under urban elevated Bridges, hoping to provide a scientific, systematic and operational design framework for the regeneration of elevated bridge space.

2.Taking the Zhongwu Bridge section in Changzhou as an example, improving the urban spatial environment not only promotes the mental health and well-being of citizens but also drives the city towards a more humanized, ecological and sustainable direction.

Research method:1.Literature research method By consulting a large number of literature materials in related fields, and on the basis of understanding and mastering the theories at home and abroad regarding urban space development, urban landscape, urban transportation, urban ecology, urban design, architectural design, bridge engineering design and landscape design, a large number of theoretical achievements regarding the utilization of space under elevated roads

and Bridges and the utilization of urban public space have been deeply studied. This serves as the basis for the research.

2. Inductive deduction method Based on relevant literature and collected domestic and foreign data on elevated Bridges, through induction, deduction and analysis, the spatial attributes, element composition, utilization status and existing problems of the space under urban elevated Bridges, the research object of this paper, are meticulously sorted out and deeply analyzed, providing guidance for the proposal of reuse strategies from the perspective of micro-updates in the following text.

3. Field investigation method Select the elevated bridge on a specific section of the road as the research object. Through on-site investigation, photography, distribution of questionnaires and other methods, understand the current situation of space utilization under the elevated bridge on this section, landscape features, traffic conditions, people's behavioral activities and demands and other relevant information, and solicit the public's views and feelings on the space utilization under the elevated bridge on this section of the road. From this, the focus of space utilization or renovation under elevated road Bridges can be analyzed, providing a certain basis for the design.

4. Case study method Changzhou City is selected as the practical site, and the reuse ideas and strategies of the space under the elevated bridge proposed in the article are adopted. In practice, the specific problems of the space under the elevated bridge have been solved and the viewpoints mentioned earlier have been refuted.

5. Questionnaire survey method To identify the residents' intended demands and principles for the utilization of space under Bridges, and to enhance the scientificity, rationality and public participation of space utilization.

6. Behavioral analysis method Behavioral analysis is a research method that aims to understand the impact of the environment on human behavior by observing and analyzing people's behavioral patterns in a specific environment. In this study, the behavioral analysis method will be used to deeply explore the current usage status of the space under the elevated bridge of the Zhongwu Bridge section in Changzhou, the behavioral characteristics of the crowd, and the interaction relationship between space and behavior, thereby providing empirical evidence for the design of space activation.

Expected practical outcomes: Based on the concept of integrating a restorative environmental perspective, the design is carried out on the basis of the ecological environment to build a stable, economically efficient, low-maintenance, low-impact and sustainable space under the elevated bridge. It provides multiple functions such as recreation, entertainment and sports for the city to meet the diverse needs of citizens. Enhance citizens' awareness of natural ecology and their ability to appreciate natural aesthetics, and promote harmonious coexistence between humans and nature. In rapidly developing cities, there is an increasing shortage of urban public and service Spaces for people to use. There is a great need for ancillary landscape Spaces under Bridges to shoulder the responsibility of urban public Spaces. Adding a sense of warmth brought by elevated Bridges to people can also integrate the city's humanistic characteristics, historical culture and other factors into the attached landscape space under the Bridges, creating a unique landscape space under the Bridges and adding vitality to the city's public Spaces. The attached landscape space under urban elevated Bridges has no absolute boundaries. People can freely enter and exit this space, effectively attracting people to participate in outdoor activities, increasing the enthusiasm of urban citizens, and

effectively enhancing the humanized construction of the entire city. In the design process, people should be put first. In addition, it should also be combined with the local regional culture to enhance the charm construction of humanized places in the attached landscape space under the bridge, have good interaction with the space users, and continuously inject the source of humanized construction into the attached landscape space under the bridge.

The structure of the work consists of an introduction, two chapters, conclusions, a list of sources used, and appendices.

CHAPTER I. STATUS OF RESEARCH ON THE TOPIC

- Analysis of theoretical research in China.

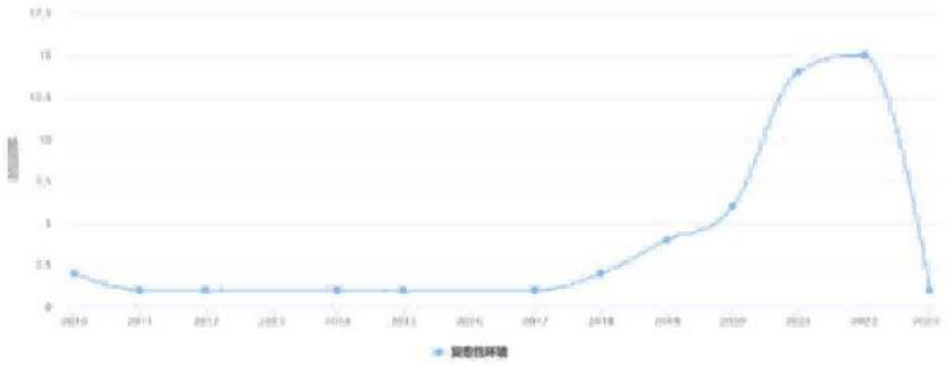
1. 1Current domestic research status

1.1.1 Current Research Status of the domestic theoretical section

（1）Restorative environment

Compared with foreign countries, research in the field of restorative environments in China is still in its infancy. With the progress of research, a certain number of monographs, journal articles, and master's and doctoral theses that have been published currently mainly focus on the following three aspects: On the one hand, starting from the theory of restorative environment, research is conducted on its definition, origin, development process and empirical methods. For instance, "The Theory and Evaluation of Restorative Environment" (Zhao Huan, Wu Jianping, 2010) explores the theoretical development and evaluation methods of "restorative environment", promoting the localization research and development of the theory. Another example is "Environment and Human Psychology" (Zhao Huan, Zi Fei) Wu Jian (2021) took the connection between the environment and individual psychological effects as the theme, and conducted research starting from the theoretical frontiers of ecological psychology, environmental perception and cognition. On the other hand, it conducts research and empirical evidence on the connection between the healing environment and the physical and mental functions of the human body, exploring the methodology for solving individual physical and mental health problems. The third aspect mainly provides theoretical guidance for creating a more comfortable living environment, with a focus on exploring the application of restorative environment theory in outdoor environment and landscape planning and design. In terms of academic journal achievements, this study took the literature included in the "China National

Knowledge Infrastructure (CNKI) Full-text Database" as the main source of Chinese literature, selected "restorative environment" and "spatial Design" as the thematic search terms, and conducted a Chinese literature search to obtain 37 documents. From 2017 to 2022, the number of published papers and the attention paid to "restorative environments" have grown rapidly.



（2） Space under elevated Bridges

To sum up, the authoritative researchers in this field in China at present include Wu Jianping, Ye Liuhong, Zhang Fan and others. Their research focuses on the localization of the theory of restorative environments without any obvious emphasis. They mainly study the assessment methods of restorative environments and their connection with individual physical and mental health, providing a methodology for subsequent research. In the past five years, the research direction has gradually shifted from theoretical research to empirical application research in specific type Spaces.

In October 1974, China's first overpass was successfully built at Fuxingmen in Beijing. It was shaped like a alfalfa leaf, marking the beginning of the

diversification of China's transportation. The design of the landscape space under the bridge has also changed from blindly planting a single plant in the past to the current reasonable selection and combination of species. From its original single functional attribute, it has transformed into a diverse range of functional Spaces nowadays, adding many distinctive features to the urban landscape. Research on the ancillary landscape Spaces under urban overpasses in China started relatively late, and the achievements are also relatively few. Most research on urban overpasses focuses on the bridge structure and the form of the bridge body. As for the attached landscape space under urban overpasses, there are mostly relevant explanations in works on urban roads and urban road landscapes. Although some cities in China have conducted relevant research on the attached landscape Spaces under urban overpasses at the theoretical level, there are still not many excellent and successful cases. Meanwhile, the design of the ancillary landscape space under urban overpasses is still in the exploration and research and development stage, and no specific design plans or ideas have been proposed yet. In his book "Urban Road Planning and Design", Professor Liu Binyi mentioned the theory of urban road landscape planning, the methods of road landscape design and construction design. In terms of the design and improvement of the ancillary landscape space under urban overpasses, he put forward some theoretical basis of his own. Professor Zhang Yang, in his book "Highway Landscape Studies", put forward the specific meaning, characteristics and structure of urban highway landscapes, elaborated on people's views on highway landscapes and the ways to evaluate them, and guided people to think about the attached landscape space environment under

urban overpasses. Liu Chen from Chongqing University, in his research titled "Research on the Landscape Renovation of Ancillary Spaces under Overpasses", conducted a detailed investigation and analysis of the ancillary landscape Spaces under overpasses in Chongqing and Chengdu. Through analysis and comparison, he proposed principles and strategies for the improvement and renovation of the ancillary landscape Spaces under overpasses. Through specific cases for practice and discussion, he strengthened and provided feedback on theoretical research. Finally, corresponding suggestions were put forward for the creation of ancillary landscape Spaces under urban overpasses. In her master's thesis "Research on the Spatial Behavior of Urban Overpasses", Yang Rong from Central South University of Forestry and Technology, based on psychology, studied six separated overpasses and eleven interchanges in Changsha City. Psychological explorations were conducted on aspects such as the types of users, their psychology, and the attributes of the land under the bridge.

1.1.2 Domestic Practical Case studies

（1） Restorative environment

Shenzhen's "A Moment in an Instant" :

It is a new type of space category, specifically designed for modern people to offer massage naps and quick stress relief experiences. Through meticulous experience design, it has become an extension of people's bodies and minds, aiming to help people find their own moments of relaxation.

The design features of this space include:

Hall design: With the theme of desert imagery, through the use of stone walls, cacti and sand and stone tones, a distant, rough yet vibrant atmosphere is created, instantly allowing guests to escape the tense office and business environment and enter a spiritual oasis.

Spatial texture: Without decorative paintings, it emphasizes the granular texture of the diatom mud walls and the gentle interplay of the floor and wood, providing a delicate spatial touch.

Room design: It adopts an arc-shaped dome, imitating the sense of hiding in a childhood nest, bringing a sense of security as if returning to the mother's body.

Five-sense experience: Combining vision (spatial environment, light and shadow), touch (massage), smell (fragrance), hearing (music), and taste (healthy food), it provides a comprehensive experience of spiritual healing.

Healing atmosphere: The serene and natural ambience, the delicate and warm spatial touch, as well as the carefree and relaxing spiritual dialogue, together form a healing space that brings people boundless strength.

"In an instant" not only offers people a place to relax and heal, but also forms a virtuous cycle and a wonderful and free poetic field through the interaction between space and people. In the future, such healing Spaces are expected to become increasingly common in cities, serving as important places for modern people to relieve stress and seek inner peace.

A Case Study of Houtan Park in Shanghai：

Positive influencing factors:

Vegetation species richness: Enhance the natural perception of the population and their degree of recovery in nature.

The health level of visual subject vegetation: It also positively affects the natural perception and recovery degree of the population.

The cleanliness of the venue: Maintaining a clean venue has a positive effect on enhancing people's natural perception and healing feelings.

The presence of water bodies: The presence of water bodies in the scene is conducive to people's natural perception and healing feelings.

Road space type: Road types without hard paved roads or linear extension paths are more beneficial to people's natural perception and healing feelings.

The appearance of animals and the reduction of artificial pruning marks: These factors have a positive impact on the degree of natural perception in the human population, but have no significant effect on the sense of recovery.

Negative influencing factors:

Land exposure: The land exposure within a scene has a negative impact on people's perception of recovery in nature, but has no significant effect on the degree of perception of nature.

In conclusion, in order to enhance the perception and healing ability of people in nature, attention should be paid to increasing the richness of vegetation species, maintaining the health of vegetation, keeping the site clean, designing appropriate road space types, and reasonably introducing water bodies and other elements. At the same time, reducing the degree of land exposure and moderately minimizing the traces of artificial pruning can also help enhance the restoration effect of the landscape.

（2） Space under elevated Bridges

Qianjiang Century City Sports Park

In recent years, the construction of expressways and high-speed railways in Zhejiang Province has been in full swing, resulting in many idle areas under high-speed railway and expressway Bridges. According to Article 30 of the "Regulations on Highways of Zhejiang Province", the space under highway Bridges can be used for public welfare purposes such as leisure and entertainment for the masses, sports and fitness, and parking of small vehicles. In Hangzhou, the "City of the Asian Games", a batch of distinctive sports venues are being integrated into the daily life circle of citizens, fully meeting the fitness needs of the surrounding resides.





Jiande Xin 'anjiang Special Bridge and Yang 'an Sports and Fitness Center

If we closely examine the word "embed", it means "to fill or inlay something in the gap". For established urban Spaces, embedding them in the "gaps" is undoubtedly the most feasible implementation approach. As the "host" of the Hangzhou Asian Games that has attracted much attention from all walks of life, it is not surprising that Xiaoshan has many fitness venues ingeniously "embedded" in the lives of its citizens.

In Jiande, located far along the Xin 'an River, the transformation of the space under the expressway Bridges into fitness venues has gradually formed a "small cluster". Under the Jiejia Expressway Bridge in Xinpeng Village, Xin 'anjiang Sub-district, Jiande, under the Yang 'an Expressway Bridge, under the Shangshan Village Expressway Bridge in Yangcunqiao Town... The previous appearance of overgrown weeds and haphazardly piled sundries has now been replaced by a flat plastic ground. Colorful fitness equipment, basketball courts, badminton courts, ping-pong tables and other sports facilities are all available. Among them, the Yang 'an Sports and Fitness Center under the Xin 'anjiang Special Bridge covers an area of 16 mu. It has 3 five-a-side football fields, 2 standard basketball courts, 2 air

volleyball courts, 1 badminton court, 1 table tennis court, 1 gateball court, and 6 tennis courts built in the waterfront area. It is also equipped with a fitness square, public toilets, management rooms and 92 parking Spaces. At present, it is the largest and most fully equipped free outdoor sports venue in Jiande, capable of meeting the fitness and entertainment needs of 600 people every day.





1.2 A Review of the Current research status abroad

1.2.1Review of Research on the Theory of Restorative Environments

Theoretical research on restorative environments abroad started earlier and has achieved a relatively solid theoretical foundation. As early as the mid-19th century, the American landscape design master Olmsted proposed the concept of "healing". Relevant theoretical research began to gradually emerge in the 1970s and 1980s, giving rise to various types of theoretical viewpoints, including the cultural-oriented perspective, the awakening perspective, the resource overload perspective, and the psychological evolution perspective. On this basis, the most representative stress reduction theory (Ulrich, 1983) and the attention recovery theory (Kaplan, 1983) were proposed.

1. Cultural orientation perspective: Influenced by contemporary Western culture, people prefer to Revere nature and strengthen their connection with it.

2. Arousal perspective: Compared with urban environments, natural environments have a better stress-relieving effect because the recovery experience after excessive stimulation is more likely to occur in environments with low arousal levels.

3. Resource overload perspective: Complex stimulating environments require higher cognitive demands, which help individuals recover from stressful situations.

4. Psychological evolution perspective: Humans have evolved in the natural environment and formed a physiological and psychological balance point that is adapted to nature.

5. Stress Reduction Theory (dominated by the perspective of psychological evolution) : During the process of evolution, humans have developed a series of physiological, psychological and behavioral characteristics that are adapted to the natural environment. Being close to nature can effectively relieve stress and burden.

6. Attention Recovery Theory (ART) : An environment that is distant, rich, attractive, and compatible is conducive to individuals regaining their attention from high-pressure states. Such an environment is called a restorative environment. The natural environment provides conditions for reflection and promotes the deep healing influence in aesthetic preferences.

In conclusion, all these collectively emphasize the significance of the natural environment to human psychology and behavior, especially in terms of relieving stress, restoring attention and enhancing the happiness of life.

1.3 Case Studies on Overseas Practices

1.3.1 Golden Fulin Life Complex, Thailand

Case Overview: This project is located in Pathum Thani, a suburb of Bangkok. Currently, the total green space area of the project, including ground and structural landscape Spaces, amounts to 22,485 square meters, accounting for 40% of the total area, far exceeding the 30% standard requirement (see Figure 1-1). The

design principles of this project are the principles of physical health, sustainable nature and community awareness, aiming to meet people's diverse activities and enhance residents' all-round living experience by creating diverse Spaces.

Case Analysis: General Design of Rest Facilities The overall environment of this project demonstrates humanized landscape details and fully takes into account the universality of rest facilities. This venue adopts a "full slope passage" mode, with no extra transition steps. The passage path is equipped with handrails for going up and down, ensuring the safe passage of the elderly and people with disabilities (see Figure 1-2). There is a seat every 30 to 50 meters along the way, allowing users to stop and rest at any time. The forms of the seats are rich and diverse, some with backrests, some attached to tree pits, and some hidden in the bushes. They fully consider people's usage needs, taking into account both the need for communication and privacy. To effectively reduce the risk of users slipping, the path surface is made of rough materials and is equipped with complete lighting facilities to provide sufficient illumination for night use.

Healing natural Landscape: The healing garden is a major highlight in the health concept design of this project, aiming to use a rich variety of fragrant plants to engage the five senses of the users, thereby achieving an overall health effect. The plants on the site include ground cover plants, coastal trees and perennial plants, which vary in height, shape and flower color. These plants are mixed and arranged in the soft landscape area, forming ecological succession. Over time, new species grow with each other and naturally replace the older ones (see Figure 1-3). This type of highly adaptable ecosystem also provides food sources and habitats for urban wildlife such as birds, aquatic animals, insects and squirrels, playing a role

in protecting biodiversity and enhancing the overall naturalness of the environment.



1.3.2SKY-RAIL Community Activity Park, Melbourne

This project, as a case study, perfectly demonstrates how to transform the available space along the railway tracks. Through outstanding urban design, it provides a favorable environment for individuals and communities, removes the level crossings along the railway tracks, and opens up previously unusable public areas as new Spaces for community use, thus forming a shared path network under the railway line. The community activity stations along the railway tracks offer sports venues and entertainment facilities, forming a unique, vibrant and highly recognizable space.

March Studio has developed a vibrant experience venue for each activity park, which contrasts sharply with the local infrastructure and serves as an ideal canvas for creating and discovering a series of super images.





1.4 Research Methods

(1)Literature research method

Collect and sort out the literature related to this topic, as well as the current development status at home and abroad, conduct classified research on each case, and rely on the theories and construction experiences obtained from the research to analyze the construction of the space under the elevated bridge of the Zhongwu Bridge section in Changzhou, propose design ideas, and list the research framework.

(2) Field investigation method

Theoretical elaboration alone is far from enough. To apply the research framework to actual construction, it is necessary to conduct on-site investigations and studies, understand the local historical culture and humanistic background, which is conducive to identifying the appropriate development direction and ensuring the authenticity and scientific nature of the research.

(3) Comparative research method

The comparative research method mainly focuses on comparing two or more objects to identify commonalities and differences. This paper mainly studies how the theory of restorative environment can be applied to the transformation of the space under elevated Bridges. At the same time, by combining relevant theories and cases at home and abroad for analysis and comparison, the problems that will be encountered in the design are pointed out, and the advantages and disadvantages are clarified.

(4) Interview research method

The main approach is to conduct a survey through questionnaires among the residents of the Zhongwu Bridge section in Changzhou. This is a commonly used non-experimental method. This survey can provide more objective results. The space under the Zhongwu Bridge section in Changzhou can be renovated and designed based on the customs and habits of the towns along the line and People's Daily living habits, presenting a humanized design concept. This research method is highly favored by people.

(5) Induction and summary method

Based on extensive literature reading and research, the obtained materials are summarized and analyzed in detail to interpret the current construction status of heritage resources, landscape resources, ecological environment and infrastructure around the Changzhou Zhongwu Bridge section, thereby summarizing and deducing the optimization concept of the space under the bridge of the Changzhou Zhongwu Bridge section.

1.5Conclusion: Through the reading and research of literature materials, the research and practical progress of the space under urban elevated Bridges at home and abroad were reviewed, and the current problems were proposed. Secondly, theoretical research on related disciplines was conducted. The concept of space under elevated Bridges was understood and analyzed, and its characteristics, ideas, and related technical methods were summarized and generalized. At the same time, the design concept of restorative environment, the related concepts of pocket parks, and the types of pocket parks were also studied and analyzed. The specific design steps and contents were clarified, laying a foundation for the later practical application. Finally, by integrating professional knowledge from various disciplines and interpreting relevant cases, and absorbing and drawing on the micro-landscape design techniques therein, it serves as an important reference for the subsequent project design.

CHAPTER II: Spatial scheme design for the Zhongwu Bridge section

2.1Location Analysis

Geographical location: Zhongwu Bridge is located in Zhonglou District, Changzhou City, Jiangsu Province. Its specific address is 140 meters directly north of No. 497, Sanbao Street. This bridge spans the old Grand Canal, connecting the north-south main roads and echoing the Zhengcheng Bridge at the east gate. It is one of the two important Bridges before entering the old urban area of Changzhou. Zhongwu Bridge is not only an important node of urban transportation, but also a

key connection point between Zhonglou District and Tianning District, with a very significant geographical location.

Historical Changes: The location of Zhongwu Bridge was once the political, cultural and market trade center in the east of Changzhou City in history, closely linked to the historical development of the old urban area of Changzhou. Zhongwu Bridge (the predecessor of Zhongwu Bridge) was first built in the first year of Yongxing of Emperor Hui of Jin (304 AD) and has undergone many renovations and reconstructions. During the Yuan Dynasty, Zhao Youjun, a descendant of the Zhao family, invested heavily to rebuild the Zhongwu Bridge and renamed it "Huanglin Bridge". In the second year of the Wanli reign of the Ming Dynasty, the bridge was rebuilt again and renamed Henglin Bridge. However, this ancient bridge with profound historical heritage was demolished in the 1970s. In order to carry forward the historical and cultural heritage, in 2017, a new Zhongwu Bridge was opened at its newly relocated location, becoming an important passage connecting the old and new urban areas.

The surrounding environment: The Zhongwu Bridge section is surrounded by a rich and diverse environment, featuring both historical cultural heritages and modern urban landscapes.

Commercial and residential areas: There are also multiple commercial and residential areas distributed around the Zhongwu Bridge section. These areas have formed a close spatial connection with the Zhongwu Bridge section, providing citizens with convenient living services and shopping environments. Meanwhile,

the existence of commercial and residential areas also provides potential customer sources and markets for the spatial revitalization of the Zhongwu Bridge section.

Transportation network: Zhongwu Bridge, as an important node of urban transportation, has formed a complete transportation network with the surrounding roads and traffic facilities. This provides convenient transportation conditions for the spatial activation of the Zhongwu Bridge section and also offers convenience for citizens' travel.

To sum up, the Zhongwu Bridge section enjoys a unique geographical location, rich historical changes and diverse surrounding environment. These characteristics provide rich materials and background for the research on the activation of space under elevated Bridges from the perspective of restorative environments. During the research process, the historical and cultural value, ecological environment demands and citizens' living needs of the Zhongwu Bridge section should be fully considered, and a scientific and reasonable spatial activation plan should be proposed to achieve the sustainable development of the space under the elevated bridge and the construction of a restorative environment.

2.2 Morphological Space Strategy

2.2.1 Enhance accessibility

In the revitalization of the space under elevated Bridges, enhancing accessibility is the top priority. At present, the space under elevated Bridges is being abandoned or used as parking lots, etc., which leads to the occupation of the

originally relaxing space for nearby residents and makes it impossible for people to use it normally. To address these unfavorable factors, we must first optimize the walkways and motor vehicle lanes. By setting up continuous walkways and motor vehicle lanes under the elevated bridge, it is essential to ensure the smooth connection between these channels and the surrounding roads as well as public Spaces. Secondly, add entrances and exits to the space under the elevated bridge at appropriate locations and set up clear indication signs to guide the flow of people in. Finally, it is necessary to consider integrating the space under the elevated bridge with nearby public transportation stops, such as bus stops and subway entrances and exits, to enhance the accessibility and utilization efficiency of the space.

2.2.2 Enhance hydrophilicity

Given that the Grand Canal runs through the bridge, this area is rich in water resources. Then, how to incorporate water resources into the design is of great significance. Improving hydrophilicity can enhance the appeal of the space, including: setting up waterside platforms and walkways: Installing waterside platforms and walkways in the space under the bridge near the water area for citizens to enjoy the water view and get close to nature.

The canal is bustling day and night, with transport ships coming and going. People are curious about the ships and tend to observe them. Some experience projects can also be set up in combination with the ships.

Create waterfront landscapes: Enrich the layers of waterfront landscapes and enhance the water-friendly experience by planting aquatic plants and setting up landscape features.

Strengthen safety protection: Set up necessary safety protection measures in water-friendly areas, such as guardrails and warning signs, to ensure the safety of citizens.

2.2.3 Enhance functionality

To meet the needs of different groups of people, the space under an elevated bridge should have diverse functions. Specific strategies include:

Divide functional areas: According to the spatial characteristics and the needs of citizens, residents need sports fields, painting fields, entertainment fields, etc. The space under the elevated bridge is divided into different functional areas, such as leisure areas, sports areas, cultural exhibition areas, etc.

Introduce public facilities: Set up public facilities such as seats, sunshades and trash cans in the space to enhance the comfort and convenience of the space.

Organize events: Regularly hold various activities, such as cultural performances, sports events, community gatherings, etc., to attract people and enhance the vitality of the space.

2.3 Functional Space Strategy

2.3.1 Insert appropriate functional types

In the activation of the space under elevated Bridges, the functional positioning should be fully considered and appropriate functional types should be placed. Specific strategies include:

Combining the needs of citizens: Through research, understand the demands and expectations of citizens for the space under the elevated bridge, and determine the functional type based on the demands.

Introduce cultural elements: In line with the cultural characteristics of Changzhou, set up cultural exhibition areas, art installations, etc., to enhance the cultural connotation of the space.

Develop commercial services: Under the premise of not affecting traffic, introduce small-scale commercial service facilities such as coffee shops and convenience stores, and make them in the form of mobile vehicles to meet the consumption demands of citizens.

2.3.2 Harmonize the surrounding environmental landscape

The space under the elevated bridge should be in harmony with the surrounding environment to form an integrated urban landscape. Specific strategies include:

Maintain consistent style: In spatial design, maintain harmony with the surrounding environment in terms of style, color, etc., and avoid a sense of abruptness.

Make full use of surrounding resources: Fully utilize the natural landscapes, historical and cultural resources, etc. around the elevated bridge to enhance the overall quality of the space.

Strengthen spatial connection: By means of green belts, landscape ornaments and other methods, enhance the connection and interaction between the space under the elevated bridge and the surrounding space.

2.3.3 Improve basic service facilities

To enhance the usage experience of the space under the elevated bridge, the basic service facilities should be improved. Specific strategies include:

Install reasonable lighting facilities in the space to ensure safety and comfort during night use；Set up sufficient restrooms, trash cans and other sanitary facilities to keep the space clean and hygienic；Optimize traffic flow lines, set up reasonable parking lots, bus stops and other transportation facilities, and enhance the accessibility and convenience of space.

2.4 Ecological Space Strategy

2.4.1 Restore vegetation communities

In the activation of space under elevated Bridges, restoring vegetation communities is an important means to enhance ecological quality. Specific strategies include:

Select suitable plants: Based on the conditions such as light and humidity under the elevated bridge, choose appropriate plant species for planting.

Create multi-level greening: Through multi-level greening configurations such as trees, shrubs, and ground cover plants, a rich ecological landscape is formed.

Strengthen maintenance and management: Regularly carry out maintenance and management of plants such as pruning, fertilizing, and pest and disease control to ensure the healthy growth of vegetation.

2.4.2 Soften the hard interface

To improve the stiffness of the space under the elevated bridge, the hard interface should be softened. Specific strategies include:

Set up green belts: Set up green belts near hard interfaces such as elevated bridge piers and walls to soften the interfaces through the growth and spread of plants.

Use ecological materials: Apply permeable paving, ecological bricks and other ecological materials in the space to enhance its air permeability and water permeability.

Add landscape features: Set up sculptures, seats, flower beds and other landscape features to enrich the spatial layers and enhance the visual effect.

2.4.3 Optimize the hydrological cycle

In the activation of space under elevated Bridges, the hydrological cycle should be optimized to enhance the ecological value of the space. Specific strategies include:

Set up a rainwater collection system: Install a rainwater collection system in the space to collect and utilize rainwater for purposes such as irrigation and cleaning.

Build ecological water features: In line with the characteristics of the water area, build ecological water features such as wetlands and streams to enhance the ecological quality of the space.

Strengthen water quality protection: Regularly monitor and protect the water quality of water areas to ensure their cleanliness and health.

Chapter Two Conclusion: The theory of restorative environments emphasizes the positive impact of the environment on human mental and physical health, especially in urban space design. By creating an environment that promotes people's relaxation and energy restoration, it aims to cope with the fast pace and high pressure of modern life. This paper takes the theory of restorative environment as the core framework and focuses on the activation of the space under the elevated bridge of the Zhongwu Bridge section in Changzhou. By comprehensively applying various research methods such as literature review, field investigation, case analysis and quantitative evaluation, it aims to explore the optimization strategies for this special urban gray space under the elevated bridge.

Horizontally, this study has extensively reviewed the theories and practical cases of restorative environment design both at home and abroad, especially focusing on the field of urban public space renovation and regeneration. It has distilled key design elements that promote psychological healing, such as the

integration of natural elements, the openness of spatial layout, and the comfort of vision and hearing. Meanwhile, successful cases of space activation under elevated Bridges at home and abroad were compared and analyzed, providing rich references and inspirations for the design of the Zhongwu Bridge section in Changzhou.

Vertically, an in-depth analysis was conducted on the historical background, current problems and functional positioning in the urban spatial structure of the space under the elevated bridge of the Zhongwu Bridge section in Changzhou. Through the review of historical documents and on-site investigations, the unique geographical and cultural features of this area, the behavioral needs of the surrounding residents, and the current insufficiency of space utilization have been revealed. Based on this, combined with the theory of restorative environment, targeted design strategies are proposed from aspects such as spatial layout optimization, ecological greening implantation, cultural element integration, and functional activity diversity, aiming to transform the originally neglected urban negative space into a positive space with restorative functions.

In conclusion, this paper, from the perspective of a restorative environment, has conducted a comprehensive and in-depth study on the activation of the space under the elevated bridge of the Zhongwu Bridge section in Changzhou. The aim is to enhance the environmental quality of this area through scientific design strategies, making it a unique and attractive restorative space in the city, and

thereby promoting the improvement of the overall urban ecological environment and the quality of life of residents.

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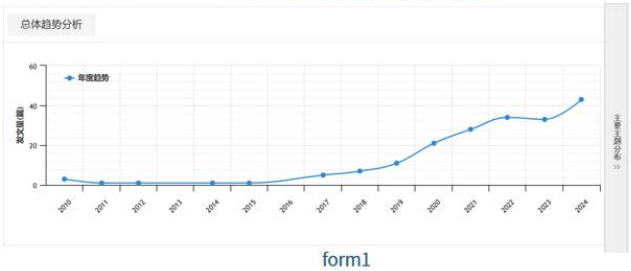
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APPENDIX A.(Tables and diagrams)

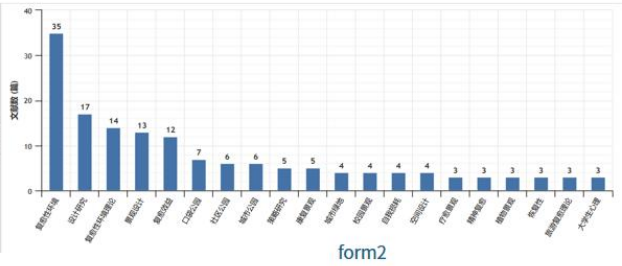
Table 1.Theoretical support

Recovery Theory

This topic contains a rich theoretical foundation (Tables 1–4) and includes an overall trend analysis of 'recoverability' based on CNKI Academic Journal Network (China National Knowledge Infrastructure). The number of publications on 'recoverability' shows an increasing trend year by year; similarly, the number of publications on 'space under elevated bridges' is also increasing year by year.



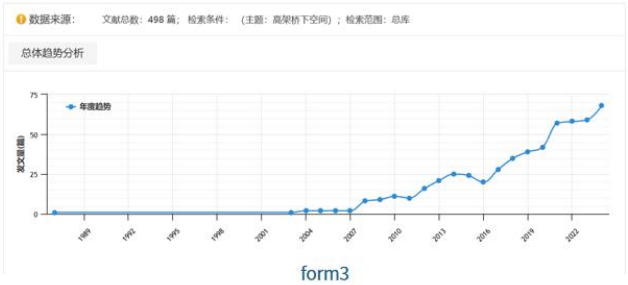
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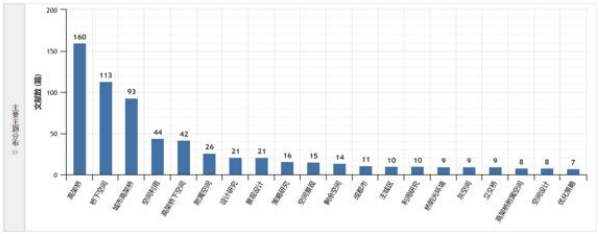
form2

In recent years, research on restorative theory has mainly focused on restorative environments and theoretical studies, and it also involves other related fields, such as therapeutic landscapes and rehabilitation landscapes.

Space under the overpass



form3



form4

The study of the space under elevated bridges includes both theoretical and practical aspects, with a greater focus on practical research. The theoretical aspect also involves design research, utilization research, and other areas, covering a very wide range of topics.

Table 2. Technology Roadmap

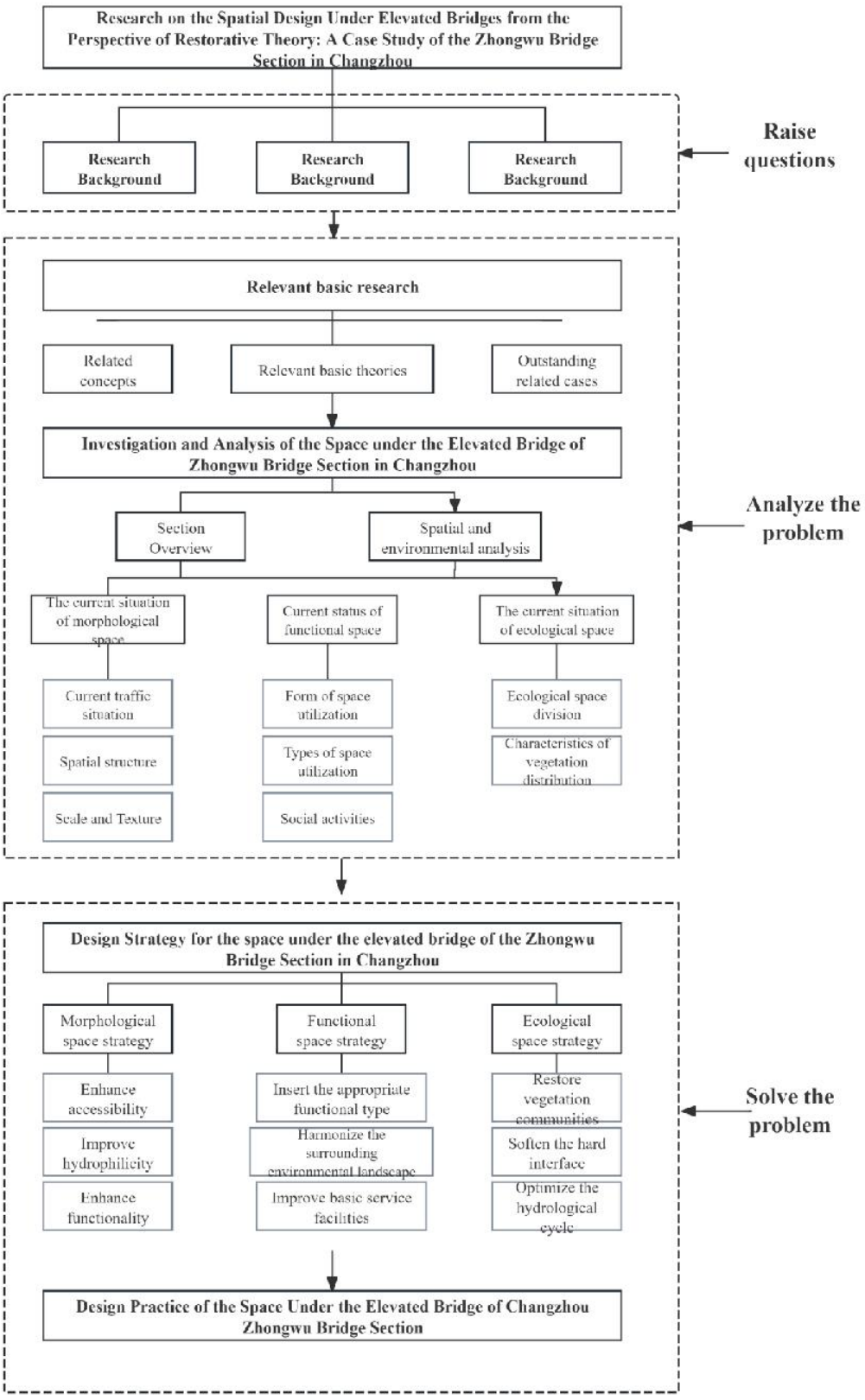


Table 3.SWOT analysis table

SWOT Analysis Table for the Space Design Under the Elevated Section of Zhongwu Bridge in Changzhou		
	Specific content	Corresponding strategy
Strengths	1. The Zhongwu Bridge (North) 'Heyue Sports Park' provides a mature renovation case that can serve as a reference.2. As an urban transportation hub, the surrounding area experiences a large flow of people, providing a foundation for high utilization.3. Some areas have already established smart courts, offering existing conditions for functional expansion.	1. Replicate the 'Heyue Sports Park' concept, optimize functional layout according to the characteristics of this section, and create distinctive spaces.2. Leverage the high foot traffic advantage, enhance the accessibility and attractiveness of the space, and increase usage frequency.3. Centered on the existing smart courts, supplement supporting facilities to form activity areas with functional linkage.
Weaknesses	1. Severe noise and air pollution under the viaduct affect the user experience.2. The spatial layout is complex (including areas under the bridge and between bridge piers), making design and construction challenging.3. Located near major traffic routes, there are safety risks from mixed traffic, and some areas have insufficient lighting.	1. Install soundproof panels and micro-particle adsorption devices, paired with noise-reducing and dust-absorbing plants, to improve environmental quality.2. Use 3D modeling technology for precise planning, and enhance space utilization through elevation differences and partitioned designs.3. Set up buffer zones, warning signs, and adequate lighting to clearly separate pedestrian and vehicle paths,
Opportunities	1. Jiangsu Province has issued guidelines for the utilization of space under bridges, providing policy support and potential resource allocation. 2. The demand for urban renewal has increased, making it possible to include it in special projects to integrate resources for development. 3. Residents have diverse needs for public spaces, requiring multifunctional uses such as	1. Design a multifunctional space for "fitness, leisure, and convenience" to meet the needs of different groups (children, the elderly, and young people).
Threats	1. Coordination is required among multiple departments such as transportation, municipal affairs, and planning, making the process complex and prone to delays.2. The design, construction, and post-maintenance require substantial funding, which is difficult to secure from a single source.	1. Collect public opinions through questionnaires and hearings in the early stage, and announce the plans during the design phase to increase acceptance.

Table 4.Analysis Table of Domestic and International Case Studies

Country	Name of the Elevated Bridge Underpass Space Design	Design-related plan	Picture
China	West Bay - Qianhai Bay Pedestrian Public Space	In addition to leisurely activities such as walking, jogging, cycling, fitness, and children's play, spontaneous activities like skateboarding, dog walking, and photography further enhance the charm of the space under the bridge.	
	Shanghai Lock Sports Park	The design uses stylish and vibrant color schemes and prominent animal themed patterns to create an easily recognizable identity for each area. The added functional facilities such as sports courts, seating, and lighting also echo the design theme, creating a harmonious yet cheerful atmosphere.	
	Shanghai 'Smart Bay' Under-Bridge Space	It has developed into a new popular space for sports, fashion, and leisure among young people. After enjoying a good workout, you can also go to the nearby 'One Wall Art Gallery' to experience an artistic immersion.	
India	Green Paradise	The project transforms concrete-built infrastructure into public spaces that serve the local community, adding much-needed amenities and green areas, improving traffic flow, and giving the community a stronger sense of identity.	
Melbourne	SKY-RAIL Community Activity Park	Removing the level crossings along the railway tracks opens up previously inaccessible public areas as new spaces for community use, thereby creating a shared network of paths under the railway line. Community activity stations along the tracks provide sports and recreational facilities, making it a unique, vibrant, and highly recognizable space.	

APPENDIX B. (Visualization of Space Design Under Elevated Bridges)

Street Corner Rest and Viewing Area

The street corner park cleverly utilizes the space under the overpass, integrating elements such as flowing water, sculptures, and seating to create a multifunctional urban recreational area for citizens that combines relaxation, sightseeing, and social interaction.

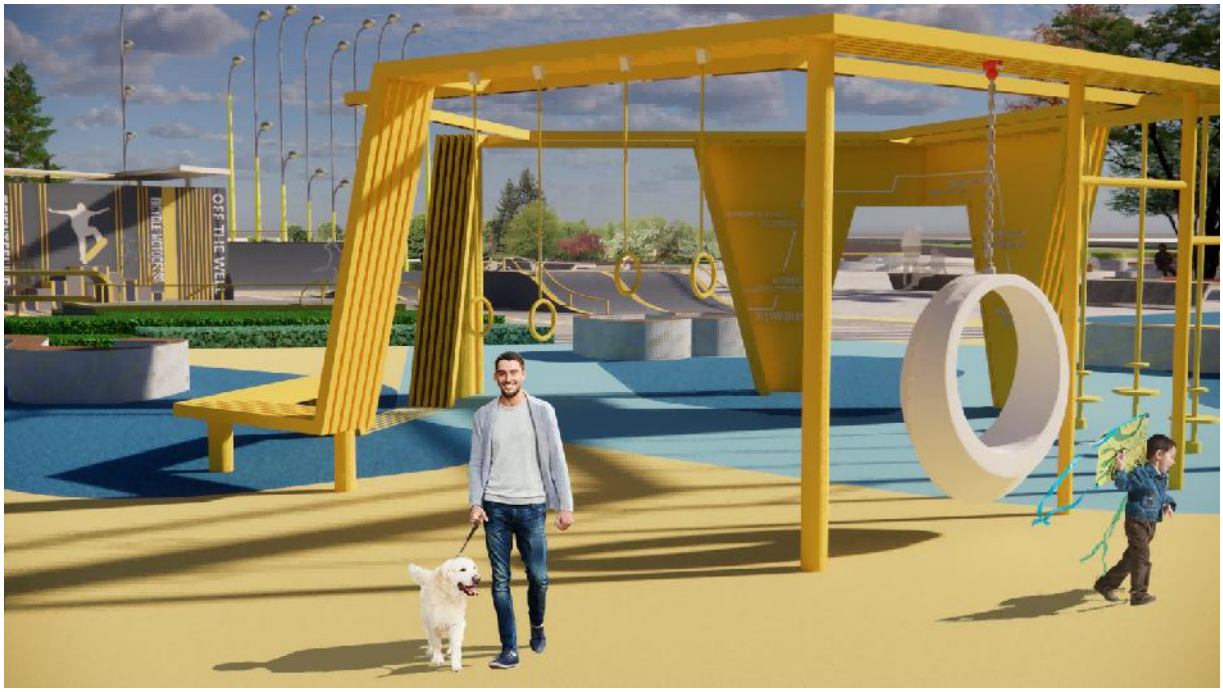




Amusement and recreation area

This is a skateboard park that also incorporates children's play facilities, serving residents of different age groups.







Space under the overpass 1

There are green plants separating the city roads here, which can purify the air and also be used for walking.





This is an open area under the overpass, and this piece of land has been turned into a plaza.



Space under the overpass

This area has been designed as a cultural exhibition corridor, featuring information about the location and traditional Chinese characters. Lights have been specially installed on the ceiling to compensate for the dimness under the overpass.





Space under the overpass 3

This area includes bicycle parking spaces, a sales office, basketball and tennis courts, as well as an exercise area.


MERRY
HAPPY







Space under the overpass 4

Because we wanted to create an urban healing space, many plant elements were added to this area, including a ceiling with plant features, and lighting was also incorporated as a guide.



（Night view）



Plaza area





Children's playground



General layout plan



Cross-sectional drawing





Bird's-eye view

