

# Gray Public Space under Urban Bridge -- A case study of public Arts Space Micro-transformation focusing on "Regional Culture" and "Art for all"

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**Abstract:** Since the 21st century, China's urbanization process has been rapid development, the concept and function of urban public space in the city has been gradually paid attention to. In order to guarantee life and water, most urban construction relies on rivers, and Bridges are the most important way to communicate between urban areas. The main functional part of the bridge is the span structure, that is, the bearing structure of the bridge, and the lower part of the "gray" space formed by the bridge structure. Considering the social level, with the economic growth and urbanization development, people have brought a better living environment and quality of life, and also improved the requirements for urban public environment. In the increasingly tense urban space, how to use and transform the space under the bridge is a problem that needs to be considered and solved. In view of this problem, in this study, we try to solve the micro-transformation of space under Bridges in cities through public art from the perspective of "regional culture" and "art for all". This paper analyzes the micro-transformation of space art under Bridges in two large cities of Shanghai and Foshan, namely, the space under Bridges under Songhong Road in Shanghai, the space under Bridges under Central Of Suzhou River and the space under Bridges under Pingsheng Bridge in Foshan. This paper discusses the cultural intervention of "regional culture" in the micro-transformation of the space under the bridge, and the influence and effect of "art for all" on the public art space under the bridge after the transformation to the community and the public.

**Keywords:** Urban grey space; Space under bridge; Public Art; Micro-transformation; Regional culture; Art for all

## 1. Introduction

### 1.1. Background and Purpose

All the large cities in history were built along the river. Like European countries, the Danube winds through many countries and nurtures many famous urban clusters. In China, the Huangpu River in Shanghai and the Yangtze River in Wuhan have helped the two cities rise rapidly as international metropolises in the new era. Cities are built on both sides of rivers, and the easiest and fastest way to communicate with each other is to build Bridges. Space under the bridge and the bridge space around

the waterfront space is the focus of the reform in recent years, urban construction and the urban space, bridge across a river to its large size, unique space form and existing time longer, influence and changing the urban public space environment, and the functions of urban public space, urban waterfront landscape shaping public activities, and people with great influence.

Jiantong Xia(2012) gave a detailed explanation of the lost space of the city, and explained that in this era of lost cities, all types of public space could not return to the glory of the past. Not being taken seriously is not the focus of urban construction. Behind the appearance of the loss of public space, what is more terrible is the loss of people's hearts. They lose their vitality to life, and they cannot live better and arouse the desire of people's heart[1]. Roger Trancik (2008) summarized several spatial structure principles by investigating the spatial characteristics of traditional cities. In the most modern cities, these principles have been lost, with a phenomenon called "anti-space" or "lost space"[2]. As the "gray" part of urban public space, the utilization and transformation ratio of urban public space under the bridge is relatively low. In China, space reconstruction implementation planning for city bridge is currently limited to economic development is relatively developed, the urban construction of high degree of large cities, while for small and medium-sized cities, is not yet perfect urban space construction process also can't let them have the ability to think about how should the bridge space of the problem of the reform of art. However, with the continuous increase of residential density in large cities, people lack enough public activity space, and rational use of space under Bridges in urban space has become one of the ways to solve this problem.

When thinking about how to transform public space under urban Bridges, we should first consider the inheritance and continuity of spatial transformation and local regional culture and historical culture. The addition of "regional culture" is an important factor to attract nearby residents and tourists to gather here for social activities by establishing a large city with a large number of migrants to give people a sense of belonging, increasing the cultural continuity of the city.

Secondly, it is not comprehensive to think about the transformation of urban space under Bridges from the perspective of practical functions. Urban space needs to be injected with vitality to revitalize urban development and environmental construction, which should be started from the perspective of creativity. The government and society need to pay attention to the needs of local residents for public space, and people need a space with artistic atmosphere where they can gather for activities. People are the main activity subjects of urban public space, and increasing art and creative space in urban public space is an important step to promote "art for all". Exploring artistic micro-transformation of gray space under urban bridge, so that people can have a public art space for art and daily activities, plays a crucial role in urban space construction and transformation.

The exploration of artistic micro-transformation of the space under the bridge is the organic integration of the gray space under the urban bridge and the waterfront area. On the premise of avoiding a large amount of social capital investment and long-term large-scale transformation, the interests of the public are guaranteed to the greatest extent and the public's demand for artistic and creative activity space is also met. The urban bridge not only realizes the main communication function, but also realizes the rational utilization of the space under the bridge to the greatest extent. It also brings important social value and significance to the city for optimizing the urban space resources and improving the quality of people's life.

## 1.2. Scope and Method

For modern cities, Bridges are no longer simply to meet the main purpose of cross-straits communication, and rational use of the space under Bridges is an inevitable demand of urban space integration. It is an inevitable demand for contemporary urban space construction and reconstruction to transform the "gray" space under the bridge into a space that can realize traffic passage, has artistic aesthetic value and public activity space function, and meets people's artistic aesthetic demand for public environment. In China, cities with large rivers running through them, such as Wuhan where the Yangtze River runs through and Shanghai where the Huangpu River runs through, have planned and built a large number of Bridges, including cross-river Bridges and viaducts, to connect the traffic between different regions. A large number of bridge construction also produces corresponding under-bridge space. In small-scale cities with sufficient urban space, the demand for under-bridge space utilization and transformation is not very urgent, and local government departments are not eager to include the urban under-bridge space utilization and transformation into the planning scope. However, for large cities and large international cities, it is urgent and necessary to rationally utilize the space under urban Bridges due to the tight central urban space. Therefore, when these cities complete the construction of large Bridges or consider the space under Bridges that have been built for a long time, they will consider the transformation and utilization of space under Bridges based on the public's demand for public activity space and art space.

According to its own geographical location, space size and other factors, combined with the "regional culture" of different themes and the needs of local residents, the reconstructed art space forms different styles, and also forms multiple social benefits. From the perspective of the government, the reconstruction of space under the bridge is a measure "benefiting the people". In order to solve the problem of lack of space for public and art activities in big cities, especially in urban villages and dense business districts, it also avoids the waste of urban public space. On the other hand for the bridge under the gray space transform inputs are often less in the capital, are usually based on the existing space layout, through methods such as public art, public facilities, landscape, with small modification is given priority to, this makes the bridge space transformation can often use less money to achieve the goal of more significant effect. From the point of view of the public, the space under the bridge is a very suitable space for public art activities. Due to the factors of the bridge structure, public activities under the bridge are often not affected by strong light or rain, and the restrictions on outdoor activities are greatly reduced. In the case that the people's needs for survival have been largely met, the spiritual needs have been gradually paid attention to, and the concept of "art for all" is gradually recognized by the society.

Based on the transformation of space under Bridges in large cities in China, this paper takes the transformation of grey space under Bridges from the perspective of culture and art to provide ideas for the sustainable construction of creative space in large cities. Research will be based on the city "regional culture" and "national art" point of view, discusses the three large art completed bridge in the city public space transformation case, because according to the use of grey urban public space will be the new trend of China's future urban public art space transformation, and promote development of public art in China. Some progress has been made in this field in China, but it still needs to be improved. This paper focuses on the bridge space in Guangzhou, which has completed the renovation of public art activity space, as the research object, and analyzes the connection between the artistic renovation and urban regional culture, as well as the influence on the development of "art for all".

The research methods used in this study are mainly case analysis, theoretical research and field investigation. Firstly, the theoretical background is about four key words: "Transformation of space under bridge", "public art space", "regional culture" and "art for all". The background research of this paper is mainly discussed through literature, and the existing books, papers and other documents are used for analysis and research. Based on this research, this paper seeks to compare the differences and commonalities of different Bridges in Shanghai, Foshan and Suzhou in spatial geographical location, human factors and social factors through the analysis of practical cases. Field investigation method was used to enter the case space, and field analysis and public survey were conducted on the art space under the bridge after renovation, aiming to analyze and draw the experience and deficiency of large cities with large economies in the art transformation of the space under the bridge.

## **2. Theoretical Background**

### **2.1. Urban bridge space and art micro-transformation**

Since modern times, the disorderly expansion of urbanization and the increase of population base have led to the transformation of road traffic from planarization to three-dimensional. The complex viaduct formed from a single road, and the viaduct vertical to the ground formed the gray space of the city -- the space under the bridge[3]. Jane Jacobs, an American writer, pointed out in *The Death and Life of American Big Cities* that when the areas with single functions in a city form an interface area, they will gradually become the gray area neglected in the city, that is, the negative space of the city[4]. Over time, they will fall into the edge of the city. The space under the bridge, as a "gray" urban public space integrating the functions of passage, entertainment, view and leisure, is the intersection formed by crowd passage. Its space functions are vehicle and pedestrian passage, people conduct public activities, and local residents and tourists take a rest and watch.

In the early stage of large-scale planned bridge construction, designers and government cared more about the bridge itself to provide convenient and efficient communication and transportation functions, and lacked consideration of the space form, space reuse, art aesthetics and social benefits under the bridge, which resulted in some Bridges after completion. The space under the bridge is dark and depressed, and the space can not be fully utilized, which also causes the unbeautiful urban block environment. Because of the importance of urban bridge in the large-scale urban traffic network system, the management of urban bridge traffic and the utilization of space under the bridge are of great significance to the urban traffic and the overall spatial development of the city[5]. "Micro transformation" is to solve the problem of protecting historical blocks by demolishing partial buildings, replacing the use function of buildings, repairing, repairing, protecting and activating, and improving basic public facilities under the premise of maintaining the current spatial pattern basically unchanged[6]. To art space and space for bridge reconstruction of micro is talking about urban space under the bridge use a breakthrough point, to bridge space reconstruction should be to keep the river ecological environment protection, reduce line the Banks of the river ecological environment destruction, and the designer should be based on a comprehensive perspective of the public, functional, artistic considerations. The artistic transformation of the space under the bridge can be entered from various angles, and the space can be intervened by public art. Public art has various forms of intervention, including murals, sculptures and art installations, as well as public facilities, such as public seats, lighting installations and ecological landscapes. We can also reasonably set up some recreation and fitness facilities with interactive participation, experience, entertainment and sports in the space, and attract people to carry out public activities in the space by adding art and interesting elements. Regular public participation in art activities is also to increase the artistic creativity of the

space under the bridge and enhance the interaction between the public and the urban environment. At the same time, the creation of public landscape atmosphere and lighting transformation are also ways to create beautiful artistic space form from the perspective of public art.

Urban space under the bridge of art transformation should be from the overall level of city space, bridge main space level and Bridges connecting space level, pay attention to the "regional culture" in the city, to achieve transformation process of cultural and environmental factors of spatial relations grasping and improving the quality of the space environment, and integrated handle art elements of urban space under the bridge and link between people. Specifically, it includes construction planning of space under the bridge, functional zoning of space under the bridge, transformation of space art, lighting of night scene, and how to integrate "regional culture" into urban space construction and creation of artistic vitality. In general, the reconstruction of public art space under the bridge should be considered based on meeting the needs of local residents and tourists for leisure and entertainment in daily public activities.

## **2.2. Influence of "regional culture" on urban space reconstruction**

Within the regional culture is a regional culture material civilization and spiritual civilization, to point to in a certain cultural background and the integration of the regional environment, unique, unique culture system, it is usually a region long cultural accumulation, and ecological environment, production way of life, social customs and other factors. Therefore, regional culture has two levels of meaning: the first is the natural factors and geographical environment of a particular region; The second is the long-established material and cultural life patterns in specific areas[7]. In terms of time, it refers to all cultural heritages from ancient times. The formation of regional culture is a long-term process, regional culture is constantly developing and changing, but it has relative stability in a certain stage.

On the one hand, regional culture provides cultural impetus and spiritual support for the economic development of local cities; on the other hand, regional culture can produce huge economic and social benefits and promote the development of social productivity through the mutual integration of urban economy, culture and society. Therefore, the further research of regional culture and economic and social development, the development and utilization of good urban regional culture resources, analysis of regional culture and urban space, the interaction between reform and development so as to promote a specific city area economic society coordinated development, rapid for residents and tourists to provide a more open, free public space, is the social science academic theory study, Urgent need for further research.

Although the society and the government begin to pay more and more attention to the intervention of regional culture in the reconstruction and planning of urban public space, and some Spaces have integrated the elements and themes of regional culture into the design, there are still the following deficiencies in the combination of urban space reconstruction and regional culture in China:

First, the combination of regional culture and urban space construction and transformation is not enough. At present, some urban public space reconstruction schemes have not been coordinated with the city's regional culture and environment, resulting in poor overall transformation effect and lack of public space with regional cultural characteristics, which to some extent desalinizes the urban regional cultural atmosphere.

Second, the combination of cultural specificity and public participation is insufficient. Most has been completed after the transformation of the urban public space of regional culture elements reflect the culture of the majority to static display, vacuous, form a single, lack of modern technological means

to interact with people in the content, the lack of interest in space, tourists and local residents are hard to experience the culture and art in the space of fun, This undoubtedly greatly shortens the time people stay in the space, and weakens the function of interaction and communication between regional culture and people, as well as education and entertainment.

Thirdly, the combination of regional culture and public art forms is not sufficient. The influence of "regional culture" on urban space reconstruction can deeply express the cultural connotation of the city, increase the cohesion of the city, and help solve the problem that a large number of migrant workers in large cities lack of emotional affiliation to the local city. Urban space can best reflect the cultural characteristics of a city, which is a symbol to identify urban culture and specific regional people, as well as a symbol of a city's social form. Attaching importance to the role of regional culture in urban public space reconstruction is an important factor to enhance regional culture and economic competitiveness and promote the rapid development of society.

### **2.3. Urban art public space under the concept of "Art for all"**

It is the focus of the construction of social spiritual civilization in the new era to promote the popularization of art, meet the diverse needs of the people, meet the diverse needs of culture and art, and realize the sharing of cultural achievements. With the rapid development of China's economy and the improvement of material living standards in recent years, people are no longer limited to the pursuit of material aspects, but increasingly pay attention to spiritual satisfaction. In order to better meet the people's demand for spiritual civilization, the concept of "art for all" has gradually come into the people's vision, and is more and more recognized by the society and the people. The popularization of art for all people can not only meet the people's gradually rising demand for spiritual civilization, but also better improve the aesthetic quality of the public. However, due to the influence of many factors, There are still many problems in the popularization of art in China, and it is urgent to solve these problems. Universal art popularization is a long-term work, which requires the extensive participation of all social groups. At the same time, it is necessary to actively change people's understanding of universal art popularization, and pay attention to the role and value of comprehensive art in improving the aesthetic quality of Chinese people. On the one hand, it can promote the smooth operation of the nationwide art popularization and guide the masses to take the initiative to participate in the nationwide art popularization activities.

China's traditional culture is rich and colorful, and people's aesthetic appreciation of art is also developing. From the stage of social development, it is urgent to popularize art to improve people's aesthetic quality. The improvement of people's aesthetic quality is also an important starting point for the popularization of comprehensive art. The function of aesthetic quality directly reflects people's spiritual level and life taste. By improving people's aesthetic quality, it not only enriches people's spiritual world, but also improves people's aesthetic ability.

At present, The level of social development in China has improved significantly. In order to promote the steady development of spiritual civilization construction, we should fully meet the spiritual and cultural needs of the people and take various measures to organize and carry out the nationwide art popularization. By carrying out various forms of public art activities in public space periodically, such as experiencing interactive art, participating in mass performances, appreciating artistic masterpieces, etc., or using public space to create activity places with artistic atmosphere, we can enrich national spiritual culture and improve people's cognition of beauty. Through diversified methods to implement comprehensive art popularization, stimulate people's understanding of art and beauty and improve people's aesthetic quality, through improving national aesthetic quality can promote the trend and trend

of art and culture of The Times. The current China's domestic demand for culture and art space is gradually increased, by implementing the art popularization, guide people to learn good culture and art, with the help of a public art Spaces promote the ability of the individual art appreciation, improve people's own artistic awareness and creativity, is the important way of enhancing the national aesthetic quality in an all-round way.

With the development of world economy, the contemporary social demand for "art" and "beauty" has become more and more urgent, improve public cognition is necessary and vital to beauty, and by promoting universal art popularization can be very good to achieve this purpose, the rich people spare life and spiritual life at the same time, rapid ascension people cognition to beauty. For example, use the public space of city space, community public space, such as bridge block mini park, etc., in the urban space is not fully get use of public space art, through to the art form of space transformation, and all kinds of cultural and artistic activities, held in the space near the people involved in the arts and culture. In the process of carrying out public activities or participating in art activities in public art space, the public can learn more cultural and artistic knowledge and appreciate more artistic works, gradually forming a perception and discrimination of beauty, which can improve the aesthetic quality of the public over time.

### **3. Case Studies**

The following is an analysis of typical cases of micro-transformation of different types of public art Spaces under Bridges in two big cities in China, taking "Under-bridge art Space under Songhong Road" in Shanghai, "Under-bridge space under Suzhou River Central" and "under-bridge space under Pingsheng Bridge" in Foshan as examples for discussion and research. Urban bridge space utilization planning should first choose the use function of space, through reasonable space organization planning, create characteristic space image, make it have specific place spirit, form humanized public activity space[8]. Combined with China's large cities of urban infrastructure and urban space management and reconstruction needs, often also marks the city's urban bridge construction stage of development[9], it makes the utilization of the grey space for urban bridge and retrofit, become the city space to update and improve waterfront space environment, improve the community an important point of public environment.

#### **3.1. Case 1: Art Space under Shanghai Songhong Road Bridge**

Shanghai Songhong Road Bridge Art Space is located under Songhong Road Bridge, Changning District, Shanghai, China. Songhong Road Bridge is located next to Xinjing Park in Shanghai. It is a bridge connecting Xinjing Port, a tributary of Huangpu River, as well as a part of Songhong Road. Songhong Road is located in Changning District, Shanghai. The road on the upper part of the river connects Hongqiao Road and Beizi Road from north to south. At the beginning, before the reform of Songhong Road Bridge, the space under the bridge could not be used by pedestrians, and pedestrians had to go around to choose other Bridges, which caused inconvenience for people to travel. At the same time, the space under the bridge that had not been fully utilized and transformed was also unfavorable to the improvement and beautification of the neighborhood environment.

As an international metropolis, The urban regional cultural atmosphere of Shanghai is diverse and inclusive. It is necessary to do a good job in the artistic micro-transformation of the space under the bridge in Shanghai to fit the regional culture and atmosphere of Shanghai. Songhong Road bridge under the art of the space is designed by the contemporary famous artist Mr. Peng Mingliang, the design mainly around "human yearning for nature, human change nature, human return to nature." The idea of. Located in the space at the top is made under the bridge in 2013 Mr Peng Mingliang ink line

works "dream is tomorrow", combined with 2020 oil painting "hope" to compose, to complex and simple, formed the sharp contrast of lines and colors, bright colour, visual contrast will forge a modern bridge space aesthetic feeling combined with environmental protection element of public art space, The work "Hope · Tomorrow" was born (see Figure 1). Sunshine, river, nature, city, art, and people are all integrated at this moment. Songhong Road bridge has a very spacious space. The bridge bottom is designed into abstract streamlined patterns, some of which are in the form of fish and rivers, and some of which seem to be heads of girls, which are very artistic. The central area at the top of the bridge is painted in bright pink, green and yellow blocks, while the overhead pattern is a simple black line with a modern feel. Bright color blocks and black and white lines form a strong contrast throughout the bridge, making the originally dimly lit space under the bridge bright and vibrant. New bridge hengjing port go along, the ground using high-tech patent products "green channel" sponge (see figure 2), use of plant waste (crops straw, trees, corn, etc.), through special patent technology processing, forming the unique pure plant particles to replace the commonly used pavement construction materials as aggregate, and combined with environmental protection adhesive high-tech innovation, Thus form a kind of ecological environmental protection health flexible permeable pavement. The foot feels soft and comfortable, with high toughness, zero pollution and high water permeability, which can play a strong shock absorption and buffering role for human knee joints and ankles.



Figure 1 Art Graffiti space under Songhong Road Bridge after transformation (Copyright © Shanghai)



Figure 2 Exterior space of Art Space under Songhong Road Bridge after Transformation (Copyright © Shanghai)

From the perspective of urban public space construction and people's living needs, it is necessary to reconstruct the space under songhong Road bridge in order to make it more convenient for people to reach the leisure space or landscape nodes near the riverside space. Through the transformation of the

space designed by artists, citizens can not only shuttle directly under the bridge, but also conveniently reach the nearby Xinjing Park, Fuyuan Temple, Xiyantang and other scenery along the river of Xinjing Port.

In 2020, Changning District Construction management Committee and the traffic center of the district will make every effort to promote the renovation project of Xinjing Port slow traffic system. The project reaches Beizhai Road in the north and Hongqiao Road in the south, with a total length of 3.7 kilometers. During the period, according to the circumstances around different sections, the design has its own characteristics, which not only facilitates residents' life but also improves people's aesthetic quality and artistic cultivation. The artistic micro-transformation of the space under Songhong Bridge in Shanghai makes full use of the waterfront space and further improves the slow traffic system of the city.

### 3.2. Case 2 Space under the Central Bridge of Suzhou River -- "Internet Celebrity Zoo"

Similarly, taking the art space under the bridge in Shanghai, China as an example, the Space under the Central Bridge of Suzhou River is located under the Central viaduct in Beixinjing Street, Changning District, Shanghai. Before the reconstruction, Zhonghuan Beihong Overpass had always been in a semi-closed state, mainly for municipal vehicles and temporary parking lots. It was difficult for local residents to find suitable public space nearby for public activities, so they had an urgent demand for public activity space (see Figure 3). Due to the shortage of land in central urban areas of big cities, only in the suburbs can there be ideal places for public activity areas. How to make this urban "gray space" available to more people through artistic micro-transformation is an urgent problem for designers to solve. Promoting the creation of space under the bridge, realizing the magnificent turn of idle land from "gray" to "color", endowing a new identity to this forgotten but also expected area, is the key point of the design of the transformation of this space.



Figure 3 Comparison of space reconstruction under Suzhou River Central Bridge before and after (Copyright © Shanghai)

The designer transformed the underutilized space under the bridge into a colorful Rock sports park using art forms. "Rock Park" is composed of four parts, including outdoor basketball court, covered basketball court, football field, sports service center, river promenade and landscape ecological park.

Three animal images are used to show Foshan's urban vitality. The animal elements used represent the movement theme of the area under the bridge, namely pink "flamingo", dark yellow "cheetah" and black and white striped "zebra". Designers make use of the strong sense of fashion color, bold animal patterns, among which "the leopard has the idea of fighting brave, flamingo represents the young fashion, and zebra is elegant and delicate model. In the art painting inside the park, acrylic pigments used for painting are used to solve the problem that graffiti colors are easy to fade and the subsequent maintenance cost of the park is relatively high without affecting the sight of the driver when crossing the bridge. The art micro-transformation of the space under the bridge with the theme of "Internet Celebrity Zoo" gives new vitality to this gray space forgotten by the city. A design scheme that integrates multi-functional sports ground, art space, leisure and entertainment space and ecological landscape is presented in front of the public. The successful transformation case of Rock Park also won three awards: The Most Beautiful Public Cultural Space Award, the Hundred Best Public Cultural Space Award and the Excellent Operation case award.

People are also very enthusiastic about the renovated art activity space. They used to think that the space under the bridge was dark and lacked the functionality and interest of public space. After the renovation of Rock Park, many people said, "I didn't expect Shanghai to have such a lovely viaduct now." Public activities under the viaduct do not need to worry about time and noise. Sports in the water area have good ventilation, which is more in line with the concept of "low-carbon" urban development. Space intensive development changing district bridge section model for other cities to bridge the gray space, architectural legacy, and along the rail transit reconstruction of scattered land use provides can draw lessons from the case, also for centralized urbanization areas abundant space under the bridge, irregular scattered land for micro update provides a train of thought transformation.

Through the micro-renewal of the space under the bridge, the space under the Central Bridge of Suzhou River has increased about 18,100 square meters of public open space, including about 5,630 square meters of sports facilities and 1,885 square meters of supporting facilities. The land with low utilization efficiency is transformed into a multi-functional public space integrating sports, leisure and science popularization, which also meets the needs of surrounding residents for public open space. The space renewal project under Suzhou River Central Bridge not only improves the efficiency of land resource allocation, but also provides suitable public service facilities and interesting rest space for surrounding residents through the comprehensive use of land to set up sports venues, public green space, Suzhou River leisure station and municipal supporting facilities[10].

### **3.3. Case 3 "Art Extreme Sports Park" under Pingsheng Bridge in Foshan city**

Under pingsheng Bridge of S47 Guangzhou-Foshan Jiang-Zhuhai Expressway, Nanhai District, Foshan city, Guangdong Province, the largest all-weather street extreme Sports Park in Foshan City has been built (see Figure 4). In early March 2022, Foshan issued the Action Plan of Environmental Improvement and Landscape Improvement on Both sides of the Road and Under the Viaduct in Foshan, which promoted the landscape improvement of key roads, expressway overpasses and entrances and exits, and promoted the construction of civil parks, parking lots and greening under the Bridges (including overpasses). To achieve the urban landscape environment "along both sides of the road, under the viaduct" work target of "small change every month, change in half a year, change in a year". By the end of 2021, a total of 133 Spaces will be utilized under Bridges in the city, including 11 municipal parks, 28 parking lots, 77 landscaping improvements and 17 warehouses. Since the operation began in 2021, six viaducts have transformed the space beneath them from a squalid mess into an urban landscape. Foshan city uses the space under the bridge as the line to sew and repair the urban debris

space. Many of the original dirty and messy Spaces have now turned into vibrant art Spaces and "Internet celebrity punch-in points".



Figure 4 Comparison of space Under Central Bridge of Suzhou River before and after Reconstruction (Copyright © Foshan News)

The art micro-transformation of the space under the Guangzhou-Foshan Jiang-Zhuhai Expressway Pingsheng Bridge aims to build the largest all-weather, art, sports in one of the street extreme sports park in Foshan, with an overall area of 28,000 square meters. After the completion of the transformation, "Art Extreme Sports Park" creates a public space under the art bridge with bright and rich colors. At the gate of the park, a 10-meter-high public art installation named "Dream Pursuer" perfectly shows the charm of "adventurer" in skateboarding. In the park, the ecological green is interspersed with red, yellow, orange and blue; the skateboard pump path is supplemented with blue, yellow and orange; the ecological green is interspersed with red, yellow, orange and blue and organically combined with green space, which activates infinite vitality in the space. The bright colors and dynamic graffiti wall painting also add diverse artistic atmosphere to the space under the bridge. There are outdoor viewing platforms on both the north and south sides of the park, allowing you to enjoy different views of the city. Foshan is a city full of vitality and innovation. A large number of young people make the city full of youth and dynamic atmosphere. Leisure sports content, colorful space under the bridge art micro transformation, for the citizens to open a fashion fan, young fan, sports fan new life. The public also responded positively to the "Art Extreme Sports Park", believing that the government made full use of the urban public space to create a public art activity space favored by the public, which enriched the public venues for public activities and promoted the popularization of art for the whole people.

The transformation and utilization of the space under the bridge in Foshan city is dazzling. Foshan city is striving to create high-quality integrated development of urban and rural areas through comprehensive land renovation to comprehensively improve urban living quality and citizens' life happiness, and strengthen the construction of ecological space supporting living functions. At present, there are more than 140 available Spaces under Bridges in Nanhai District of Foshan city. The reuse of Spaces under Bridges can generate aesthetic value as well as place value. The transformation of "Space under the bridge" has become an important measure of Foshan to improve the quality of the city. A group of art public Spaces full of vitality and atmosphere have become "hot" in the circle, turning into a new space for leisure and entertainment favored by the young generation, further demonstrating the

charm of Foshan as a city of Internet celebrities. The activation of the "open" space under the bridge can improve the urban space style and urban cultural image, and realize the enhancement of both urban function and landscape style. With the transformation of the travel mode of using the space under the bridge and urbanization space, there will be more and more "space" under the bridge in Chinese cities, which will become a new bright spot for people's convenience. Add "ecological charm" to the city, make a more comprehensive inventory of the remaining space resources, and provide more future for the urban improvement and the release of urban vitality.

#### 4. Discussion

Based on the case analysis of the micro-transformation of space art under Bridges in Shanghai and Foshan, Table 1 summarizes the forms and characteristics of three types of urban grey space art transformation under Bridges, as well as the artistic influences and effects on cities and the public according to the different regional cultures.

To sum up, firstly, compare the regional culture and characteristics of Shanghai and Foshan. As an international metropolis, Shanghai has a large number of migrants from various provinces in China and all over the world, and the population composition structure of the city is complex and diversified. The large port has also brought amazing economic prosperity to Shanghai, which makes Shanghai an urban cultural atmosphere full of diversity and tolerance for art from the perspective of urban regional culture. However, Shanghai is located in the Yangtze River Delta region, and the urban land near it is very crowded. As a result, it is difficult for Shanghai's urban space to expand to the outside, so we can only obtain more public activity space by optimizing and transforming the urban interior space. Shanghai's two micro bridge space art transformation case songhong road & bridge is an artist in the art of art for their design inspiration for the design, the abstract image compared with bright color piece also reflected the city of Shanghai urban culture of coexistence of tolerance and warm and leap pattern and colour also lit up originally songhong road bridge space fading light, the active space atmosphere, At the same time, it dredges the traffic under the bridge, which was originally blocked, and facilitates the travel of nearby residents and tourists. To infect and influence the public in the form of art in public space. The volume, density and per capita volume of under-bridge and underground space reflect the quantity of urban under-bridge and underground space in the city. Monitoring and control of these indicators is of great significance to urban space management. The reconstruction of the space under the bridge of the Middle Ring Road is considered from another Angle. The area of the space under the bridge of the middle Ring Road is larger than that of Songhong Road. In the reconstruction of the gray space of such a scale, more attention is paid to the transformation of the space function and the coordination of the space art atmosphere. Considering the people near the lack of public space so the region reform aim is to increase the public can be large space of public activities, in order to avoid space drab and boring, combines the theme of the animals and the corresponding bright colour, from art, function, environment and public multi-angle retrofit scheme for solving the problem of space under the bridge.

However, the art micro-transformation scheme of Pingsheng Bridge in Foshan City has something in common with the space under the bridge in Suzhou Central, Shanghai. Before the transformation, the space under the bridge in both of them is large and has not been fully utilized, and the transformation scheme is art movement space. However, the difference between the two is that the case of Foshan not only combines art and sports to transform space, but also integrates landscape, leisure and other multi-functional space transformation, so as to meet the public's needs for public activity space to a greater extent. As a result, the space under Foshan Pingsheng Bridge has formed a

comprehensive public space with multi-functions such as art, sports, leisure, entertainment and viewing, which has met the needs of the public to a great extent and made full and reasonable use of the idle gray space in the city to improve the urban block environment.

Table 1 .Comprehensive comparison of micro-transformation characteristics of space art under three Bridges

	Songhong Road, Shanghai	Zhonghuan Bridge, Suzhou River	Pingsheng Bridge, Foshan
City	Shanghai	Shanghai	Foshan
Government plan for space renovation under the bridge	In 2020	In 2020	In 2020
position	Songhong Road Bridge, Changning District, Shanghai	Under the Central overpass in Changning District, Shanghai	Under pingsheng Bridge, Nanhai District, Foshan
The role of Bridges	Connect the two sides of xinjing Port waters	Connect the two sides of Suzhou River waters	Connecting the two sides of Pingzhou waters
The situation before the transformation	Under the bridge, pedestrian traffic is closed, the space is idle, and the light is dim	The space environment under the bridge is chaotic and large area of space is idle	A large area of land under the bridge is restricted, resulting in a large amount of waste of public space and poor surrounding environment
Time to complete the transformation	In 2021	In 2022	In 2021
Transformation way	Art graffiti space under the bridge	Animal-themed art movement space under bridge	Art graffiti extreme sports space under the bridge
Embodies the urban regional culture	Diverse and inclusive	Vitality and variety	Pragmatic, free and casual
Design theme	Yearning and returning to nature	Colorful animals and athletic vitality	The vitality of art and movement
Art reflects	Abstract painting and graffiti style in the space	Cute animal theme combined with active colors to create a dynamic movement space	Art movement space created by the collision of color blocks, graffiti and art
The social significance generated after the transformation	The space under the bridge has the function of pedestrian passage, which facilitates traffic and improves the space environment under the bridge.	Integrating a large number of idle Spaces under the Central Bridge, beautifying the original chaotic environment under the bridge, so that citizens have a rich and spacious space for public activities.	It makes full use of the large grey idle space in the city and provides the public with multi-functional public space integrating art, sports, leisure and entertainment, viewing and so on.
The role of art for all	It reflects Shanghai's inclusiveness of public and comprehensive art, lighting up the dark space under the bridge in the form of art micro-transformation, endowing art with vitality, so that people can feel art and experience art in the public space.	The transformation of the space under the Central Bridge not only endows the public space with the function of allowing the public to participate in the movement, but also creates an art space for the public to feel the artistic atmosphere imperceptibly through artistic means.	The art micro-transformation of the space under the Bridge in Central Foshan has brought rich and vibrant colors to the original dull and gloomy space under the bridge, increasing the public's feeling and influence on art during public activities.

Through the above two cities of three bridge space art transformation cases can be concluded that the future city space transformation under the bridge will begin from the large-scale, economic developed city, then gradually get more government attaches great importance to the city, the government's decision-making in planning urban space transform, began to pay much attention to the gray space transform under the bridge. For the art micro-transformation of the space under the urban bridge, measures should be taken according to local conditions, the elements should be taken into account the urban regional culture and the objective situation of the bridge itself, in-depth research should be carried out, the design should be combined with the actual needs of the public, and the embodiment of urban regional culture and the importance of national art should be attached importance. At the same time, we should also pay attention to enrich the art form of transforming and utilizing space, and fully combine regional culture and urban spirit to design. In this paper, by comparing the three Bridges in Shanghai and foshan city space art transformation case the similarities and differences, help to realize how to "gray space" art renovation of city bridge and integrated utilization, make more forgotten cities better use of the gray space, and to seek for the promotion and popularization of art, and promote the sustainable development of city solution.

## 5. Conclusions

Due to social and historical reasons, many Bridges in China fail to fully consider how to use the grey space under the bridge at the initial stage of construction, which leads to the problems of idle space, chaotic environment and lack of functionality in many cities. There is no shortage of urban public activity space in small and medium-sized cities in China, but for large cities, it is difficult to expand urban land, which makes the public lack of free space for public activities in the increasingly densely populated urban space. A large number of idle urban gray Spaces, such as Spaces under Bridges, idle and scattered land between buildings, or scattered land in communities, are valuable renovation Spaces for large-scale urban public space planning. The space under the bridge belongs to the "grey space" in the city, which is easy to cause urban problems. If noise, dust and safety factors are solved through reconstruction, it has high plasticity and utilization value. The transformation of public space can not only improve the appearance of urban blocks and beautify the urban environment, but also provide more public activity space for the public and enrich public life. In the modern society with increasingly abundant materials, how to enrich people's spiritual world and improve their artistic accomplishment is a new problem faced by social development. Combining artistic means with spatial transformation is undoubtedly a dual role for the public and society. The transformation of the public art space under the bridge is not only a safe and beautiful extension of the community, but also a leisure zone, community facilities and urban stage of the city. At the same time, the park can also host a variety of artistic activities.

Since 2020, more and more cities in China have begun to attach importance to the utilization and transformation of urban Spaces under Bridges. Taking Shanghai as an example, since 2020, Shanghai has carried out renovation plans for multiple Spaces under Bridges in combination with the "One River, One River" plan. The government has made efforts to build multi-functional art Spaces by integrating and managing Spaces under Bridges. In the future, we expect to see more cities attach importance to and carry out the development and transformation of urban bridge space, so as to release the maximum potential of this part of the space that divides the urban environment.

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