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ABSTRACT

Looking at the course of urban development, urban furniture, which has served as an adjunct to urban construction, was marginalized and rarely received enough attention and was presented separately as an important part of urban construction.

Along with China's rapid development, a new era of urban construction has also begun. Placed in this context, urban construction and development must better serve the people and constantly satisfy people's pursuit of a happy life. With the progress of city development and technology advancement, a brand new perspective is required when discussing the existed problems of urban furniture. Furthermore, study problems in the setup, construction, management and operation part of urban furniture in a systematically way, adapt them to the needs of urban life are equally indispensable. Therefore, it is necessary to examine the problems and its causes of Chinese urban furniture from multiple angles, analyze the achievements of Chinese urban furniture construction and sum up experience, to find new ways to build better urban furniture ecology and provide valuable experience for urban furniture construction in other countries.

KEYWORDS

system design, urban furniture, urban furniture system, street furniture

Urban furniture

In the 1860s, the United Kingdom, where the public art sprouted, produced the term named “Street Furniture”, which was translated as “街道的家具” in Chinese¹. Street furniture refers to equipment such

as lights and road signs positioned at the side of a road for use by the public². It is called "Elementos Urbanos" in Spain³, which refer to the articles and equipment installed on streets and roads for various purposes; and called "Mobilier Urbain" in French⁴. The street is to the city what living room is to the home, and street furniture is all kinds of furniture placed in the living room of the city - street lamps, seats, garbage bins, bus shelters, guiding signs, public artworks, etc.⁵

A beautiful and comfortable home cannot be separated from carefully selected and cleverly designed furniture. For such a large and complicated family as the city, the citizens long for the city they lived to be as comfortable, tidy, warm and beautiful as home. The streets and settlements of the city carry the daily activities of the citizens in the "big family" and are the places where these activities take place. These facilities attached to or placed on the streets are just like the "furniture" which provide service to the members of the "big family". The concept of urban furniture is generated and widely used as the road shifts from satisfying the single demand for transportation to satisfying the compound demand of people, full of humanistic care. It corresponds to the spatial environment elements of "street" and will play an increasingly important role with the improvement of urban design and environmental quality (Fig. 1).



Fig.1 - Urban Furniture in the Santa Maria Novella Square, Florence. (Source: Shude Song, 2018).

1. The Characteristics and Development Status of Chinese Urban Furniture

The derivation and development of urban furniture in China are different from that of western countries, manifested as the differences in development concepts and characteristics. The name "urban furniture" is in line with Chinese characteristics. Theoretically, the basic concepts and development characteristics of Chinese urban furniture can be summarized as follows:

(1). With the conditions for systematic construction. The construction and management methods are all Chinese-style and distinguish themselves from the urban furniture in any other country in the world. Urban furniture construction in China is often large-scaled and government-led. Different from the construction of blocks in Europe, China is often carrying out urban furniture-related construction in an

urban area or a city. Therefore, the scope is much larger and the construction can be implemented together. In this respect, China's urban furniture enjoy greater preconditions for systematic construction, which makes the system design, overall layout, as well as the integration of construction and management possible.

(2). With the characteristics of management. China's urban furniture itself has the attributes of urban management. The comprehensive management before and after construction also serves as an important part of urban furniture design, construction, implementation, maintenance and its sustainable development. If there is no unified and effective management, then unified design, unified construction, unified management, and unified implementation will be impossible to talk about.

(3). The Policy of Building a Beautiful China. This policy has provided great demands and forceful support for the construction and development of urban furniture cause in China. Urban builders and managers put the overall environmental construction of the city into consideration. Under the overall and comprehensive management, the rationality and scientificity of the urban public facilities service functions should be coordinated, and they recognize that the quality of urban furniture is an important component of urban environmental quality.

(4). Rapid development has provided a source of power for Chinese urban furniture develops by leaps and bounds. More and more cities have begun to pay attention to the construction of urban furniture, and work toward the goal of people-oriented, scientific setting, high-quality construction. The systematic planning, design and construction of urban furniture endow many cities with leap-forward development.

China is gradually driving away from the old path of extensive development. After more than 30 years of forrapid development of the Chinese economy, the era of large-scale urban construction is becoming the thing of the past. The renewal, upgrading and transformation of the urban environment will become one of the important themes of urban design in the future. More and more city managers and builders are putting quality in the first place; More and more citizens are paying more attention to the urban street environment and actively expressing their opinions. However, due to the imbalance that existed in regional development, a huge difference in the status quo of urban furniture has also be created. It can be divided into three types:

(1). In the developed areas represented by the eastern coastal areas in China, some urban furniture has been relatively complete and perfect. Urban furniture in cities such as Hangzhou, Suzhou, Yangzhou and other cities have integrated the cultural characteristics of the city into the construction of urban furniture, and has been partially unified in terms of shape, color and cultural symbols (Fig. 2).

(2). In some provincial capital cities or economically developed cities, urban furniture construction can only realize the functional use, then carry out road construction on this basis. Only the important urban nodes or landscape roads have been specially designed for urban furniture.

(3). In most cities in China, against the background of rapid expansion, the construction of urban furniture has not kept pace with the construction of roads and still in a preliminary stage of satisfying basic functional demands.

China's current urban block construction is coming to an important turning point –from the increasement of “quantity” to the improvement of “quality”. The quality of urban blocks is mainly manifested in two aspects: first, the innovative construction of the urban environment; second, the construction of urban cultural quality. The systematic and standardized construction of urban furniture is an important way to quickly realize the urban environment construction and cultural quality improvement, enabling to show a city's innovation strength and cultural connotation.



Fig.2 - Street View of Wuzhen. (credits: Shidu Bao, 2017).

2. The Practice of Urban Furniture System Design

Lianyungang City, located in Jiangsu Province, China, as the east bridgehead of the Eurasian Continental Bridge, is a city with a long history and profound cultural heritage. Since the beginning of 2012, we have been commissioned by the Lianyungang Municipal Party Committee and Municipal Government to carry out the design program of an urban furniture system in Lianyungang City. Start with the 32km long BRT line 1 project.

In the early stage of the work, through careful on-site inspections and interview work with various urban furniture authorities as well as the public, the main problems of urban furniture are unfolded as follows:

(1). Managed by multiple government departments and lack of unity. As different functional departments managed various types of urban furniture, details including the number, type, form and color of urban furniture differ from one another, and conflicts occur in various types of urban furniture settings.

(2). No systematic urban furniture regulations and norms existed for reference. In addition to the lighting and transportation facilities, most urban furniture has no standards as a basis, resulting in a variety of problems such as lack of urban furniture functions, low quality, inadequate management and maintenance.

(3). Not enough in humane design and exquisite production. Many problems exist in the dimensions, materials and base installation of urban furniture, which can only meet the basic use functions, and even fail to achieve some use functions.

(4). No features in urban furniture. Without first considering the natural and human environment of the region, as well as failing to find the roots from the urban culture of the city, such as traditional style, local style and urban color. Therefore, urban furniture in many cities is the same, causing problems in shaping its own image and characteristics of the city.

These problems are still the unsolved task facing cities of Chinese and the whole world today. After sorting out and analyzing the above problems, we actively engaged in solving them. After several rounds

of program reporting and modifications, we summarized the practical experience in constructing urban furniture as follows:

(1). Taking into account the functional attributes and urban management attributes of urban furniture, systematically classifying urban furniture systems. It lays a solid foundation for sorting out the problem of coordination between urban furniture. We divide urban furniture into 6 systems with 33 types of facilities, including traffic management, public lighting, road pavement, information services, public transportation, and public services (Fig. 3).



Fig.3 - Systematic Classification of Urban Furniture in China. (credits: Donghua University Environmental Art Design Research Institute, 2017).

The relationship between integrated urban landscape and urban furniture is closely related. In view of this, according to the development concept of modern cities, combining the functional attributes of urban furniture with the urban management attributes to form a system of systems, it is beneficial to each type of system to list the relevant facilities, as well as contribute to the specific design, implementation and the docking work with related authorities. The specific types of furniture in the six systems can be increased or decreased depending on the type, location, attributes and needs of the street. The 33 categories in the figure are the more conventional types of urban furniture.



Fig.4 - Facade of Lianyungang BRT Street Furniture System. (credits: Donghua University Environmental Art Design Research Institute, 2008).

(2). Conduct systematic urban furniture design. According to the urban style and cultural image, the status quo and transformation direction along the road of Lianyungang as below: First, determine the unified design orientation of the six major types of furniture systems; further, determine the design elements, colors, and modeling foundation; Last but not least, carry out single professional design in line with the functional characteristics and technical requirements of each type of urban furniture (Fig. 4).

This systematic design not only keeps the integrity of the furniture system, but also meets the use of individual furniture, aesthetics appreciation, and even the display of culture and characteristics. The unification of urban furniture has had an immediate effect on the improvement and image-shaping of the urban street environment, as well as the display of urban characteristics. At the same time, the characteristic design work of urban furniture in different regions was carried out, bringing different changes and designs in terms of color, shape and cultural symbols in urban furniture facilities.

(3). Prepare urban furniture layout guidelines and systematically define the urban furniture settings within the design scope. The urban furniture setting belt is defined, and the distance, position and relationship between the furniture are regulated. Thereby, not only ensure the integrity of functions of the urban furniture and humane experience but also solve the problems of position conflict and functional inconsistency between the furniture.

(4). Draw a complete and clear picture of the construction and layout of urban furniture. The single construction drawings of urban furniture are drawn in detail for the size, shape, structure, foundation, material and process requirements of each city's furniture, aiming to enable each furniture manufacturer to construct according to the drawings. The urban furniture layout map is based on the road construction drawings, and each furniture unit is drawn on it as the basis for the installation of urban furniture. Two complete sets of drawings help to guarantee the standard unification during the entire process of planing-production-installation. Due to the lack of design specifications in most urban furniture in China, in the process of the drawings work, the cost should be fully considered and the economy of details such as materials, foundations and structures should be emphasized. At the same time, make reasonable arrangements according to the real needs along the road.

(5). At all stages, assist Party A to carry out sample inspection and product acceptance on urban furniture, timely solve various problems encountered in the process of production and installation. Ensure the effect of the implementation of the program; it is necessary to inspect the products produced by various furniture manufacturers in time to ensure that the construction is in line with the drawings and coordinate the inconsistency of product standards caused by different manufacturers with their own production process or technical processes.

(6). Compile the“Guidelines for the Implementation of Lianyungang Urban Furniture” and lay the foundation for the standardized work of the subsequent urban furniture system. The Guidelines provides detailed rules for the setting principles and specifications of various types of furniture in Lianyungang, thus becoming the standard and guide for coordinating and unifying the work between different urban furniture implementation entities.

Through the above six tasks, Lianyungang has completely realized the systematic construction of urban furniture. By the year 2017, more than 80% of the city's roads have completed the urbanization of urban furniture over the past five years, a total of about 700 kilometers. Lianyungang, known as the first city in China to carry out systematic construction of urban furniture, exerting significant impact and delivering promoting power in this field of urban construction across China. The street landscape in Lianyungang has greatly improved (Fig. 5). More importantly, through the systematic construction of urban furniture, the various functions of the street have been improved, the behavior of the citizens has been regulated and guided, the unique urban image of Lianyungang has been shaped, the comfort feeling of the citizens has been enhanced, and the sense of identity and pride in the heart of the citizens has been strengthened.



Fig.5 - Lianyungang BRT Line 1 Project Urban Furniture. (credits: Shude Song, 2010).

3. The application Prospects of Urban Furniture in China

The construction of urban furniture system carried out by Lianyungang has borrowed a lot of design and construction experience from Japan. Under the premise of meeting the current Chinese norms and standards in terms of function, form and rational arrangement, Lianyungang has made the first systematic system of urban furniture in China, bringing an enormous positive impact on the environment, management and image of the city after the construction. More and more cities in China have begun to build urban furniture systems. Jiangsu Province has promulgated the “Jiangsu Province Urban Street Space Refined Design and Construction – Urban Furniture Construction Guide”, and the standards for urban furniture related group are gradually being formulated.

The 1.0 version of China’s urban furniture system provides valuable experience for answering the question of how to systematically implement the urban furniture system based on the current development situations of Chinese cities and under the framework of urban management and design norms. The systematic and standardized construction of urban furniture is emerging in China. The culture, characteristics and living habits of the city will inevitably be reflected in the construction of urban furniture, becoming a part of the city symbol, and even becoming a symbol of “homesickness”.

With the advancement of technology, the development of the city, as well as the implementation of more and more urban furniture system construction in China, is upgrading into the 2.0 version and even higher versions, for example:

(1). Intensification and functional recombination. Intensification refers to the collection design and setting of various facilities laid on the road to form a shared utility, thereby saving urban road space and urban furniture costs, achieving the goal of space optimization, cost optimization and management optimization. For the adjacent urban furniture in the same location, the combination design and set up should be carried out. In the Multi-bar Integration project that is being carried out in Shanghai, the different types of urban furniture are combined to optimize the urban space through functional compounding.

(2). Intelligent. Smart city furniture serves as an important carrier for building a smart city. With the

rapid development of new generation information technologies such as "Internet +", cloud computing, big data, and the arrival of the era of "the Internet of Things", the application and development of smart city furniture have become an inevitable trend. The intelligent street lights, bus stations and smart road signs which equipped with various information technology modules can integrate more and more services and applications into them, greatly improving the level and efficiency of modern city management, hence creating a safer, more convenient society and delivering better services for citizens' daily traffic.

Conclusion

Construction to a city is what decoration to a family. It is not difficult to understand that besides its functional demands, the systematic, quality and characteristic needs of urban furniture construction is becoming a new bright spot in China's urban construction field. Street environment, as the constituent basis of the urban environment, the presence or absence of urban furniture, as well as its quality and the highlights of its characteristics, will become an important part of urban construction and management. Although China's urban furniture construction has many unique features, its practical experience, construction mode, development trend, as well as its quality and the highlights of its characteristics, and many other aspects can still provide experience for urban furniture construction or urban environment construction in other countries.

Notes

¹ Wang Yun, Wang Jingjing. Urban Environmental Facilities Design [M]. Shanghai: Shanghai People's Fine Arts Publishing House, 2006.6.

² Street furniture. Cambridge Dictionaries Online. Cambridge University Press. Retrieved 10 January 2012.

³ Libri di Josep Ma Serra. Elementos Urbanos: Mobiliario Y Microarquitectura [M].Barcelona: Editorial Gustavo Gili.1996.

⁴ Liu Na, Wu Zhangkang. A Brief Discussion on Urban Furniture Design [J]. Furniture and Interior Decoration, 2009 (01).

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