Research on Spatial Optimization Strategies for Passenger Transport Hubs Based on New Regionalism

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ABSTRACT

The rapid development of the times and the convergence of urban architecture have attracted widespread attention to the excavation and development of local architectural culture. Properly handling the relationship between traditional culture and the development of the times, continuing regional cultural genes, has become the key to urban public space design. As a symbol of a city's "gateway", passenger stations gather numerous passengers and play an important role in urban space. At present, the spatial design of passenger stations in China is transitioning from meeting basic functional needs to enhancing urban cultural value. However, a series of problems such as lack of regional characteristics, incomplete functional settings, and lack of novelty in materials and craftsmanship still exist. In response to the above issues, this paper innovates the research perspective and takes the new regionalism theory as the guiding ideology to shape the indoor space of passenger transport hubs with regional characteristics, in order to create a passenger transport hub space with complete functions, good environmental facilities, and a strong cultural atmosphere.

Key words: New regionalism; Passenger transport hub; Traditional architectural culture; Prototype

I.Origin of new regionalism

New regionalism is an evolution of regionalism with the times, originating in 18th century England. This theory first became popular in the field of architecture, mainly referring to the criticism of uniform modernism, originally referring to the incorporation of national, traditional, or folk cultural styles in architecture. In the 1950s, designer Gideon first proposed the concept of "New Regionalism", which he believed could provide contemporary designers with a way to solve regional problems. New regionalism not only promotes the revival of tradition and highlights regional characteristics, but also faces the world. It is a design style that inherits tradition and integrates with modern design.

Professor Wang Lijun from Tianjin University pointed out that the new regionalism is based on functionality, following modern design standards and practical requirements, and finding a balance between modernity and tradition. The new regionalism in Professor Wang's book "Architectural Typology" emphasizes finding prototypes from regions and history, and the original meaning of "prototype" is the initial form, method, or model, which can refer to a specific thing or an abstract idea. According to popular understanding, "prototype" is the root of all new things. The concept of "prototype" in architectural typology refers more to a collective unconscious product and a priori form. New regionalism advocates using prototypes as a design basis to inspire design inspiration. Only such designs can withstand the test of practice.

As a part of architectural typology, New Regionalism mainly seeks prototypes from regional architecture, triggers collective memory, and generates resonance. People also have the same expectations for indoor spaces, which can be understood as collective memory - prototype - specific space - awakening inner unconsciousness - sense of place belonging (as shown in Figure 1.1). Therefore, by searching for common features - extracting prototypes - modern interpretation - and establishing a

methodological system, we can make reasonable use of and guide the prototypes hidden in people's subconscious, awaken the spirit of the place, and generate positive spatial effects. Based on the prototypes, interior design can explore the fundamental relationship between people, the spatial environment, and the geographical place.

II.Analysis of functional elements and passenger activities of passenger transport hubs

Passenger transport can be divided into air passenger transport, railway passenger transport, road passenger transport, etc. A passenger transport hub, also known as a passenger station, mainly includes functional spaces such as entrance and exit spaces, waiting halls, ticket halls, commercial and entertainment spaces, and transfer transportation channels. It is composed of elements such as indoor walls, channels, art installations, signs, and indoor decorations. Specific situations in the passenger station space contain different behavioral norms. Different scholars have different research focuses on the space of passenger stations. Sociologists tend to focus on the value relationship between people and space, while architects pay more attention to the functionality and layout of space, as well as the rationality of character flow. Therefore, we establish the objective value relationship between traditional architectural culture and places in various regions. Based on the functional attributes and flow layout of indoor public spaces, we use prototypes combined with space to create a sense of belonging and place spirit in the space (as shown in Figure 2.1).

The functional space of a passenger station is mainly designed to meet various needs of passengers, such as on-site ticket purchasing, waiting, leisure and entertainment, ticket checking and boarding, etc. According to different standards, internal public spaces can be divided into various types, and can be divided into several major areas based on their functions: transportation space area, commercial service space area, leisure and entertainment space area, and transportation ancillary space area. The detailed division can be divided into transfer hall, ticket hall, waiting hall, storage area, security check area, catering service area, etc. In short, according to different usage functions and passenger needs, passenger stations are divided into core space, connecting space, transitional space, or gray space. The core space mainly includes the ticket hall and waiting hall, while the connecting space mainly consists of transportation corridors, vertical transportation systems, and transfer passages. The transitional space mainly includes entrances and exits, security checkpoints, corridor passages, and boarding areas (as shown in Table 2.1).

III.Analysis of the current situation of passenger transport hubs under the guidance of new regionalism

1. Analysis of spatial issues in passenger transport

Table 2.1 Analysis table of indoor space function composition of bus passenger station

Waiting Space	Attribute	Analysis of Spatial Characteristics	Activity Type
Waiting hall space	Publicity	Comfort of space activities	Waiting, holding
Transportation functional space	Openness	High frequency of spatial flow	Walking, queuing
Commercial service space	Diversity	Comprehensiveness of spatial function	Shopping, catering
Leisure and entertainment space	Shareability	Cultural nature of space display	Recreational activities
Service facility space	Serviceability	Convenience of space use	Show, consult

hubs under the guidance of new regionalism

(1) Lack of regional characteristics in space

There are significant shortcomings in the artistic presentation and regional expression of passenger stations. In recent years, most of the space designs of passenger stations in China have increasingly considered regional characteristics. The interior of passenger stations is equipped with uniform aluminum buckle plates and ground paving materials, and there is almost no difference in the design of internal spaces. With the development of the economy and the improvement of cultural concepts, the indoor requirements for travel space will become increasingly high, and the interior design of passenger stations with regional characteristics and artistic qualities will meet the spiritual needs of passengers. Clarifying the connection between cities and passenger stations is a key entry point for the interior design of passenger stations.

(2) Incomplete functional settings

As one of the important public transportation spaces, the functionality and practicality of passenger stations are extremely important. The unclear division of indoor space areas in passenger stations leads to a lack of specific functions in large areas and low space utilization. The facilities in the space are dilapidated and lack uniqueness, and the navigation system lacks integrity. In order to make up for this deficiency, based on new regionalism in the design of public space environments, we focus on the behavioral patterns of each passenger in the transportation space and refine functional facilities from a humanized perspective while meeting functional requirements. Create a fully functional and distinctive waiting environment.

(3) Lack of novelty in material and craftsmanship

At present, the interior decoration materials of passenger stations are too single, with large areas of reinforced concrete materials, making the space too calm and serious. The fixed combination has resulted in a uniform interior space of passenger stations. The selection of materials should fully consider their regional characteristics, which can enrich the style and features of the spatial environment while meeting the basic functions of the materials. Extracting suitable techniques from traditional architectural construction processes based on new regionalism in process selection. The flooring materials used in some passenger transport hubs are too rough and rudimentary, directly affecting the entire indoor space environment. This is manifested in the inconsistency of color, lighting, and content on billboards, leading to visual confusion.

2. Advantages of spatial cultural expression in passenger transport hubs under the guidance of new regionalism

(1) Audience diversity

Passenger transport hubs attract a large number of people, mainly divided into two categories: returning passengers and tourists. Due to the diversity of passenger flow, which includes audiences of different ages, education levels, cultural backgrounds, and appreciation levels, the complexity and comprehensiveness of passenger station space have been created, and it has also promoted the indoor space of passenger stations to become a comprehensive place to showcase regional culture. Through subtle and subtle means, people's artistic cultivation and aesthetic ability can be improved, and cultural spirit and sense of belonging to the place can be aroused. Therefore, the diverse audience groups make the cultural significance of this space more prominent.

(2) Forced visual appreciation

According to environmental psychology, in relatively unfamiliar environments, people often look around the space for various purposes, searching for targets or familiarizing themselves with the situation. People's vision is limited to a certain range by ceilings and walls, which is the compulsion of passenger transport space. It is precisely because of this forced appreciation that the cultural display and dissemination of passenger transport stations are more effective. Through the process of public viewing, regional culture can be understood, and higher requirements are put forward for the form of the space, which deeply integrates with regional culture and resonates emotionally with passengers.

(3) Integration of fragmented culture

The most concerning issue in urban space is to establish understandable connections between relatively isolated things, which is achieved by establishing

frameworks for various urban spaces and constructing the overall expression of urban space. The cultural resources such as historical heritage, cultural memory, and traditional architecture distributed in old urban areas generally lack connection with the emerging spaces of the city, resulting in fragmented distribution of various cultural resources, and even being buried and fragmented. The space of passenger stations can connect places and things that were originally separated by time or regional location, and organically integrate, reconstruct, and display them in a centralized manner, which is conducive to reconstructing urban spatial memory and creating new intersections of cultural resources. While promoting the linkage effect between the overall urban environmental space and regional culture, it also provides another method and approach for the renewal and development of urban cultural resources.

IV.Spatial optimization strategy for passenger transport hubs under the new regionalism

1. Dialogue environment: the entry point for prototype applications

In the overall design, the grasp of site conditions is the key to prototype localization. Therefore, interior design should conform to the characteristics of the site and extract prototypes that meet the requirements and attributes of the environment. If the prototype application does not consider the site, it will only be an ordinary symbol without specific meaning. Therefore, starting from the site environment, the prototype should be integrated throughout the design process. In the process of prototype application, a connection is established with the passenger station from three aspects: the composition of the plane, the volume of the space, and the visual perception. Under the constraints of the brevity of time and the regularity of the action route, the most suitable "instant aesthetic" is sought to understand the essence of the prototype and resonate with it.

Firstly, the prototype establishes a planar connection with the environment. As a part of the building, the interior space is a three-dimensional space enclosed by three interfaces: ceiling, floor, and three-dimensional wall. The different properties of each interface determine the different design techniques applied by the prototype. Planes are often the most easily overlooked and important environment in interior design, and the perception of the plane is delayed, which cannot be perceived as a whole, but also affects our behavior. The top interface is the interface with the greatest visual extension, which needs to take into account ground paving, regional functions, pedestrian behavior, etc. It is extremely important in space, and various equipment such as lighting, ventilation, and pipelines also need to be considered. In a limited space, while blocking and beautifying its pipes or other equipment, ensure sufficient floor height is left to enhance passenger comfort in the space. Traditional architecture carries the historical and cultural significance of the region and has a unique form. The interface of the passenger station roof combines traditional architectural charm prototypes with traditional ancient architectural elements such as sloping roofs, eaves and rafters, gray bricks, column decorations, flower windows, and coffered ceilings. Through extraction, abstraction, and recombination, it evokes passengers' memories of regional culture, organically combines traditional urban culture with modern urban functions, shapes artistic forms through prototypes, enriches spatial layers, creates distinctive visual effects, and adjusts the form of prototypes to adapt to new requirements.

Secondly, establishing a spatial connection between the prototype and the environment promotes the full integration of the prototype into the site, connecting the indoor space with the architectural space under the new regionalism, ensuring the connection and continuity between the passenger station and traditional architectural culture, which is conducive to the integration of architectural culture under the new regionalism into the interior, promoting the integration of the building interior, and making the passenger station have regional memory. Space is a comprehensive term that can be understood as the connection between the three interfaces of ceiling, floor, and wall. The prototype gives people an intuitive feeling of flatness, but processing the prototype in space can make it three-dimensional as an intermediary

connecting the three interfaces, creating a sense of hierarchy in the space, forming the core of interior design, and promoting more information exchange and interaction between the prototype and the interface after being localized.

Finally, the prototype establishes a visual connection with the environment, and the visual perception of the interior space facade is people's direct understanding of the site. The visual connection between the prototype and the environment is mainly to coordinate the balance between "describing haste" and "perceiving the atmosphere of the place". There is a contradiction between the limitation of time and the creation of the regional characteristic atmosphere of the passenger station. Therefore, from a macro perspective, we should start with speed and efficiency, and use the most suitable composition, colors, and themes to attract passengers' attention during the journey and showcase the city's personality. Due to the limitations of human vision, the prototype is mainly manifested on the facade when establishing a visual connection with the environment, so it is necessary to establish a connection between the prototype and the facade wall. As a side interface of space, it can best reflect whether the prototype is timely and suitable in space, and even increase guidance, fully utilizing the characteristics of this interface to combine it with the prototype.

2. Optimize functionality: Functional requirements affect prototype applications

Function is a key factor that cannot be ignored in interior design, and new regionalism is also a design concept based on function. Therefore, function is a key element that affects the spatialization of prototypes. Prototype can be understood as form, and in terms of the relationship between function and form, new regionalism tends to prioritize function. Another purpose of prototype application can be defined as meeting people's functional needs. Therefore, prototype application satisfies both passengers' psychological sense of belonging and their usage needs. In the design of the prototype application of the passenger station, attention should be paid to the travel environment of passengers and solving practical problems, adhering to the principle of pragmatism in the design process.

The prototypes in space are different from artworks such as paintings and sculptures, and require more attention to the environment to solve practical problems. As an important node of the urban transportation network system, passenger stations use prototypes extracted from the region combined with the site to express themselves while ensuring safe travel, fast boarding, and convenient transportation for passengers, achieving a win-win situation of traffic guidance and functional division of passenger stations.

3. Constructing space: Creating new spatial logic

The power of space lies in the fact that it is filled with memories and plot without mentioning specific things. The indispensable key in a specific space is to stimulate people's emotions and memories through spatial construction, extract traditional architectural cultural prototypes, and apply them to passenger stations. Resetting spatial order, various types of buildings have unique spatial forms and spatial order. Traditional architectural forms can create new spatial logic and use segmented methods to reconstruct the prototype in the passenger station space. Create spatial plot, which is the emotional expression that space brings to passengers. It can be arranged in sequence using parallel narration, interrupted narration, and interjections. Spatial parallel narration is the process of placing two spatial prototypes in one space, creating a completely new spatial plot through disjointed narration. This disjointed narration usually creates a sense of abrupt termination, while spatial interludes extend on the basis of spatial disjointed narration. While connecting the entire space through corridor spatial prototypes, the insertion of different areas gives people a feeling of "coincidence" or "mutation".

Relieve spatial limitations, that is, break through the traditional understanding of space, combine traditional spatial prototypes with modern spatial needs. In the interior space design of passenger stations, it is necessary to combine the functional use and design concepts of passenger spaces in the new era background. This is mainly achieved through the mutual relationship between

space continuity and rupture, openness and closure, center and boundary, and through recombination and innovation, to reproduce the artistic conception of architecture in a new spatial language.

4. Decorative arts: A rational analysis of the application of decorative prototypes

In the process of localizing prototypes, in addition to satisfying their functions, attention should also be paid to their own form, which conforms to aesthetic stimulation of the public's senses. Compared to functional prototypes, decorative prototypes place more emphasis on surface form, but decorative representations are more expressive. Therefore, another important role of prototypes in space is decorative art. Through prototype transformation, the artistic features of the prototype are strengthened during its application, combining its beauty and charm with the space, making it more aesthetically pleasing. In the process of prototype application, consideration should be given to the combination with space in terms of decorative form, color expression, and material craftsmanship.

The structural forms are localized. The essence of prototype decoration is to express symbolism and highlight the cultural connotations of traditional architecture. Based on the synchronicity and diachronicity of traditional architecture, prototypes are extracted and combined with the passenger station space. What is particularly special is that the passenger hub space is a continuous linear process with a clear sequence compared to other types of building spaces. Therefore, the spatial structure should be considered first. When using prototypes to decorate spaces, the linear charm of the space can be displayed in chronological order, which is a form of spatial structure. By utilizing the origin, inheritance, and integration of spatial organization in traditional architectural culture, and through the sequence of time, strengthen the suggestion of spatial structure sequence to passengers' psychology.

The color expression is localized. The first impression of a color chart on site is usually its own color, for example, building color is an important feature of architecture, furniture color is the main feature of furniture, and indoor color is the main feature of indoor space. Color takes into account the characteristics of space and its different impacts on people in the process of localized application. Color preference can have varying degrees of impact on passengers' physiology and psychology. Analyzing the psychological characteristics of passengers in different spaces can help better design the interior space of passenger stations, such as anxiety when entering unfamiliar spaces, restlessness when queuing to buy tickets, curiosity while waiting, excitement when boarding and departing, etc. Combining the extracted color prototypes with the main functions of the color for design. In addition, by creating colors in the passenger station space, the distance between the passenger station and the urban space can be shortened. For example, the color selection of Suzhou Railway Passenger Station takes traditional Suzhou residential buildings as the starting point, selects white walls and gray tiles of Suzhou residential buildings, extracts color elements of white and gray, and extracts chestnut color of wooden frame buildings. The main colors are white, gray, and chestnut, and the space is shaped around the colors to make the color tone of Suzhou Railway Station consistent with that of Suzhou city, symbolizing the use of regional cultural characteristics in the passenger station space.

The materials and craftsmanship are localized. The development and evolution of prototypes, cannot be separated from the influence of time and space. Therefore, from the perspective of time, at any stage in history, corresponding materials will be produced, such as the gradual development of traditional Chinese building wood into modern reinforced concrete materials. From a spatial perspective, materials used in different regions also have different characteristics and choices, and the connection between materials and space gives them spatiality. The "tile wall" designed by Mr. Wang Shu makes building materials tiles a carrier of historical culture, telling the history of the city to the public in space. The localized use of materials to evoke passengers' memories carries a strong humanistic color, reflecting regional characteristics and traditions. With the baptism of time, it has become a cultural carrier of a certain era, so the material reflects the dissemination of cultural information and showcases

Chinese consciousness.

V.Conclusion

The continuation and expression of traditional architectural culture is a major issue facing China. In today's rapidly developing economy, people's demands for travel are increasing. How to creatively realize the development of passenger transport hub space is a difficult problem. This paper mainly extracts the prototype of traditional architectural culture from the perspective of new regionalism, studies its role in passenger stations, and increases the regionalism and recognizability of the site. In today's world where new materials and technologies continue to emerge, art originates from life and is higher than life. Under the guidance of new regionalism, prototypes are extracted and transformed from traditional architecture, and finally integrated into passenger stations, making the design of passenger interior spaces more vibrant and lively. This inspires designers' creative enthusiasm for passenger interior spaces, and at the same time, integrating traditional architectural culture into passenger stations not only enhances the cultural connotation of the place, but also benefits the resonance of the place spirit.

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