

# Regional Cultural Semantic Expression and Design of Urban Light Rail Station

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## Abstract:

It's the new requirement of urban metro station design to form regional cultural characteristics. The paper studies the structure and expression approaches of urban metro station's regional cultural semantics, analyzes its extension semantics and connotation semantics and summarizes the main design elements. Based on that, the paper suggests a new design procedure and methods of metro station design oriented on regional cultural semantic expression, and a design instance is conducted to test the method, which provides a valuable conference of urban metro station design.

## Keywords:

Metro Station Design, Regional Cultural, Semantic Expression, Design Practice

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## 1. Introduction

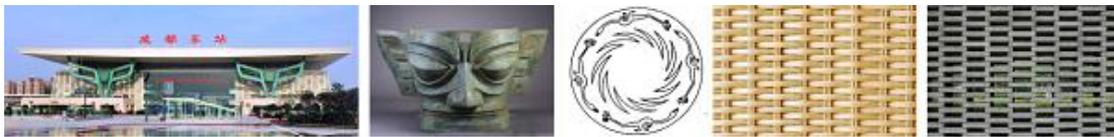
As an important hub of urban traffic, the design of urban rail station's architectural form will not only affect the image and quality of the whole city, but also be a part of the image of the city itself. Therefore, it is self-evident that it is important to design the architectural form of light rail station use regional culture. At present, in many design areas, especially in product design [1,2,3], interior and landscape design [4,5], regional culture has become an important part of research and reference and achieved some great results. However, in the design of architectural form of urban rail transit station guided by technology and function, the content of regional culture is relatively scarce. How to extract and carry forward the design symbols of local culture from the local regional cultural characteristics, and how to apply them in the design of architectural form of rail transit station becomes the common consideration of designers and engineering technicians.

## 2. Regional Culture And Urban Rail Transit Station Design

Lewis Mumford, American sociologist and urban planner, said, "City is the container of culture". It can be seen that city is the carrier of people's various cultural activities and regional culture is an important embodiment of urban cultural value. [6] On the basis of absorbing the essence of urban construction and development, the local government of Florence, an Italian famous city, has always inherited the local architectural features, human symbols and historical allusions, emphasized the mutual

shaping relationship between local culture and urban image, and even established a special gendarme force to protect cultural heritage, thus forming this world-famous and unique history. Cultural city. [7] Therefore, discussing the quality and image of a city from the perspective of regional culture, searching for the attributes of a city's architecture from the perspective of regional culture, and refining the symbols of local culture features in the process of designing uniform and homogeneous urban public buildings have become an important starting point in improving the city image, increasing the influence of a city and enhancing the added value of a city's brand.

Public buildings are the direct expression carrier of city quality and image. He Jingtang, academician of Chinese Academy of Engineering, once pointed out that “the content of landmark buildings should be the symbol of history and culture of a city or section, or the symbol of regional characteristics of a city or section”. As a type of building with special functional requirements—the light rail station, with its important geographical position, huge volume and huge traffic and a striking visual image, it has a tremendous impact on the city image and quality, should become the representative of landmark buildings. Therefore, it is very important to carry out special research and design on the construction form of light rail station. For example, the East and West entrances of Chengdu East Railway Station adopt Sanxingdui Bronze Mask Element, which is the most representative of ancient Shu Culture, to decorate the pillars. The extended roof design idea is derived from the flaming form of Jinsha Golden Sun birds. The aluminium alloy curtain wall system is designed with symbols such as “bamboo weaving” and “green bricks”, which represent Chengdu characteristic culture, so as to make Chengdu Train station has become the landmark center to inherit Chengdu's local culture.



**Figure 1.** Architectural design of Chengdu East Railway Station, Sanxingdui Bronze Mask Element, Jinsha Golden Sun birds, bamboo weaving and green bricks.

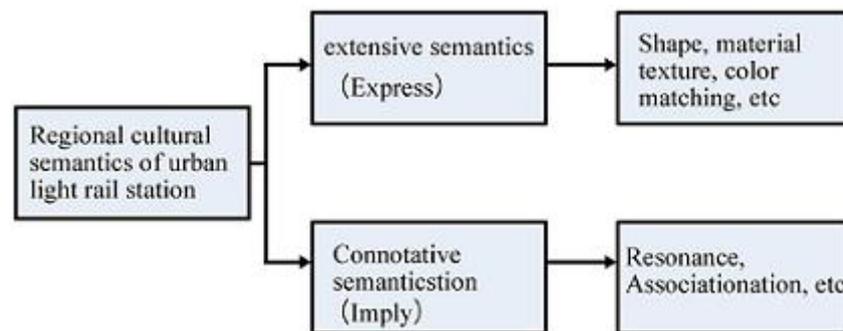
As a “Internet Star” city, Chongqing has made tremendous progress in rail transit development, but compared with its developed transportation network construction, excellent construction quality and efficient and convenient use attributes, the architectural form design of Chongqing light rail station is quite plain: taking the rail station of Line 2 as an example, although relying on its unique geographical advantages, it attracts people all over the country. However, the design of doors, windows, pillars, roofs, colors and materials which can reflect the architectural form is not much different from that of other urban rail transit stations, and has not formed its own design language and style. As the youngest municipality directly under the jurisdiction of China and the city with the greatest potential for development in the west of China, the architectural form design of light rail station representing its city image should be paid more attention and investment.

### **3. Semantic Structure and Expression Way of Regional Culture of Urban Light Rail Station**

“All meaningful material forms are symbols” [8]. The regional culture expression of urban rail station is a process of symbolic semantics communication through its external appearance, such as shape, material, painting, interior design, which conveys

to people comprehensive impressions about local social culture, customs, human feelings, etc. Therefore, the theory and method of design semantics are very suitable for the research of regional cultural semantics expression in light rail station.

Design semantics consists of product design, color, material, sound and action. Every design has language. Although it does not exist alone, it is the basis of language and produces visual language together with color and material. The proportion of voice and action in product language is gradually increasing due to technological advances, the emergence of intelligent products, and increased interaction between people and products. On this basis, in the theory of design semantics, product semantics is generally divided into two categories: extension semantics and connotative semantics. The connotation of a concept is the unique attributes of the object referred to in the concept, which indicate which characteristics the object refers to; the extension of a concept is each object in the objective world with the specific attributes reflected by the connotation, which indicates the scope of the object the concept refers to. The larger the connotation of a concept, the smaller the extension; and vice versa.



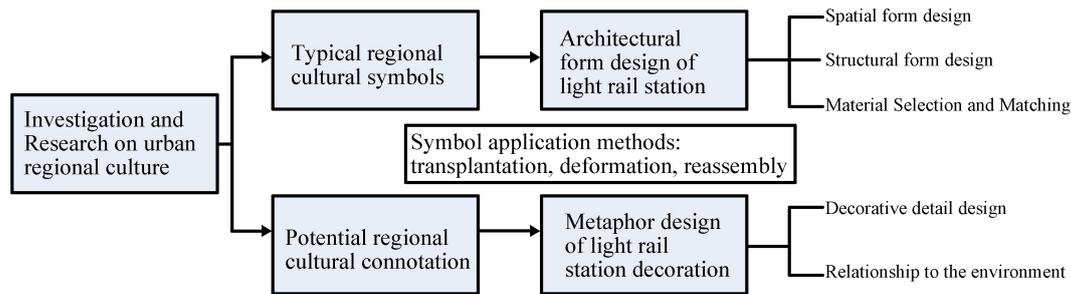
*Figure 2. Semantic structure and expression way of regional culture of urban light rail station.*

Denotative semantics is often the physical attributes of a product, such as color, shape, texture, function, volume, weight, etc.; while connotative semantics explains people's different understanding of an object, that is, the potential relationships that the object conveys to people that cannot be directly expressed with personal emotions, associations, ideologies, social and cultural backgrounds, etc. As shown in Figure 2, for the design of urban rail transit station, the extensional semantics mainly refers to the explicit symbolic semantics of the form, material texture and color collocation of the station buildings, while the connotative semantics mainly refers to the association of the viewers caused by the station. It is usually implied by the details of the station building design, which inadvertently causes the emotional reaction of the viewers and Let them have value identity.

#### **4. Ideas and Methods of Regional Cultural Semantic Design of Urban Light Rail Station**

According to the analysis of the semantic structure and expression way of regional culture of urban light rail station, it puts forward the architectural form design program and method of urban light rail station for regional culture expression, as shown in Figure 3. The program can be carried out in the following two directions: first, we can make a full investigation and Research on the regional culture of a city, and finds the most representative regional cultural symbol. The symbol may be a traditional residence form with regional characteristics, or a unique national dress or traditional custom. the symbol should be the representative of the regional

characteristic culture. Secondly, to study and analyze the acquired regional cultural symbols and analyze the most unique structural forms, spatial forms, line forms or patterns, and applies them to the architectural form design of light rail station, including the space form design, structural form design and material selection and collocation of light rail station. On the other hand, while looking for typical regional cultural symbols, it summarizes the regional cultural connotation behind these symbols, and expresses them in the details of the shape design of light rail station, which is reflected in the decoration details design of light rail station, the relationship between the architectural form of light rail station and surrounding environment.



**Figure 3.** Ideas and methods of regional cultural semantic design of urban light rail station.

Taking the architectural design of Chongqing light rail station as an example, the program and method shown in Figure 3 are applied to design. Through the investigation and study of Chongqing regional culture, it is found that the special natural and cultural environment in Chongqing has created the unique mountain building form, it named hung-feet building. As a typical mountain city residence, it reflects the life style and local customs of Chongqing people for thousands of years. It is also one of the most representative cultural symbols in Chongqing. This cultural symbol is used to design light rail station, on the one hand, it can research the modern reconstruction of its architectural culture, on the other hand, it can promote the dissemination of Chongqing local culture and enhance the quality image of the city.



**Figure 4.** Example of architectural form design of Chongqing Light Rail Station.

The biggest characteristic of Chongqing stilted building is that it is built on the mountains, it looks ups and downs, so it forms a special space form of undulating layers of roof. As a whole, because it is built on the mountains, the cliffs become a interface of the architectural space, half of the building is in the field and half in the air. There is no fixed architectural mode for the hung-feet building. It stands on the hill, and unfolds in accordance with the terrain contour. The space forms are diverse and flexible. The roof slope is small but far from the eaves. which are lightweight due

to the overhead bottom. Figure 3 abstracts these spatial forms (suspension design) and structural forms (superposition design) of the hung-feet building, and applies these main features to the overall design of the light rail station. At the same time, wood, blue-stone, glass and other elements are combined to design the building surface to achieve the visual effect of fusion of traditional materials and visual impact.



*Figure 5. Decoration detail design example of Chongqing Light Rail Station.*

As shown in Figure 5, in the detailed design of light rail station architecture form, we should take the cultural connotation of the traditional mountain city in Chongqing regional culture, and further extract some typical decorative elements of the hung-feet building to arouse the viewers' emotional recognition, such as arch, Liu-he Door, dui-zi Door, Wang-Zi Grille, Wan-Zi Grille, Shou-Zi Grille, and so on, They are applied to the decorative design details of light rail station by deformation, recombination and transplantation. In addition, the roof of light rail station building is made of glass, which is integrated with image elements of traditional hung-feet building to achieve the purpose of combining modern and traditional.

## 5. Conclusions

In the Central Urban Work Conference (2017), President Xi Jinping proposed that urban construction should protect and carry forward the excellent traditional Chinese culture, continue the historical context of the city, and protect the cultural heritage left by the predecessors; and combine his own historical heritage, regional culture and era requirements to build his own urban spirit. Chongqing is a famous city with a long history, rich national cultural traditions and unique geographical conditions, with distinct local cultural features, such as the culture of hung-feet building, Hong-yan culture, immigration culture, etc. There are many local cultural symbols and elements that can be used for reference in the architectural form design of light rail station. Based on this, the construction form of densely populated light rail station is set up. It plays a great role in improving the quality, image, brand added value and competitiveness of the whole city. At the same time, it is beneficial to discuss the new method of architectural form design of urban rail transit station, enrich the theoretical research of architectural form of traffic rail station, and provide reference for the practical work of architectural form design of light rail station in Chongqing.

## Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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