Research Paper

Vitality Creation of Street Space in Mountainous City Based on Perceptual Phenomenology:

A Case Study on Shaanxi Road in Yuzhong District, Chongqing, China

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Abstract

As the main public place for people's activities in mountainous cities, street space has shown some problems in recent years, such as the loss of space vitality and poor space quality, which has become an essential focus of urban renewal. From the perspective of perceptual phenomenology, this paper establishes a spatial cognitive framework of mountainous cities' street space from place construction to perceptual experience. Based on a case study of Shaanxi Road in Chongqing, this paper analyzes the spatial characteristics and perceptual experience of Shaanxi Road through field investigation, questionnaire and interview. It then puts forward the suggestions for improvement from continuing the spatial structure of street space, enhancing the integrity of the spatial interfaces strengthening the diversity of the use of street space, and improving public participation. These renewal strategies are expected to provide a reference for the subsequent reconstruction of the vitality of street space in mountainous cities.

Keywords

Perceptual Phenomenology; Mountain cities; Street space; Shaanxi Road; Old city renewal

1. Introduction

With the concept of sustainable development and people-oriented urban design, the theme of urban design has gradually changed from incremental expansion to existent development, and the renewal of old cities has become a topic of general interest today. As the main public activity space of people, the traditional street space in mountainous city also show many problems with the development of the times, such as lack of infrastructure, low quality of space environment, disordered facade design, etc., which cause many inconveniences to people's production and life, resulting in the gradual loss of vitality of the streets and alleys(Figure. 1).

Figure. 1. Current Situation of Shaanxi Road. Source: Author.

In recent years, many domestic scholars have also studied the vitality shaping of street space. Scholars such as Ding Shuxin and Huang Ling (2013) corresponded life events to the space model of street space and call for the return of community life in the space of streets and alleys[1]. Ni Shuwen, He Yong and other scholars (2015) introduced spatial syntax into the analysis of traditional street space to find the center of vitality through quantitative means[2]. Zhang Xiaoyu (2019) introduced the adaptability theory to study street space in mountainous cities[3]. Nevertheless, on the whole, the research on the renewal of street space lacks the creation of spatial vitality from the perspective of perceptual phenomenology.

By introducing the theory of perceptual phenomenology, this paper investigates and analyzes the place composition and perceptual experience of Shaanxi Road, a typical mountain street space in Yuzhong District, Chongqing, and puts forward relevant strategies to shape the vitality of mountain street space and continue the spirit of place.

2. The Introduction of Phenomenological Theory of Perception and the Establishment of Cognitive Framework

2.1. Phenomenological Theory of Perception

Merleau Ponty founded perceptual phenomenology based on Husserl's phenomenological theory, and was then introduced into the field of architecture by Stephen hall, Palasma, etc. Its research purpose is to explore the internal relationship between architectural space and place by grasping people's situational rational cognition and psychological feelings in specific places[4].

Merleau Ponty believes that the certainty of the world supports our perception, and the existence of the body is the basis of perceptual experience[5]. People form subjective feelings and place experiences through physical movement. As a medium, perception connects the embodied experience of physical space and body and affects the formation of the final place image[6].

2.2. Establishment of Spatial Cognitive Framework of Street Space in Mountainous City Based on Perceptual Phenomenology

In the long-term development process of the street and lane space in the mountain city, its unique place characteristics are reflected in the formation of the place image of the residents through perception and then form the group memory, becoming a space with special meaning[7]. Based on this, a spatial cognitive framework of street space in mountain city from place composition to perceptual perception is

established (Figure. 2). Among them, the site composition includes the physical space composed of spatial structure, interface, node and detailed facilities, and the cultural activities composed of historical context and activity elements; Perceptual perception consists of vision, smell and hearing. Through the analysis of the relationship between the two, we find the key elements that affect the formation of the place image and shape the vitality of the space, and then put forward the design strategy of reshaping the street space of the mountain city[8].

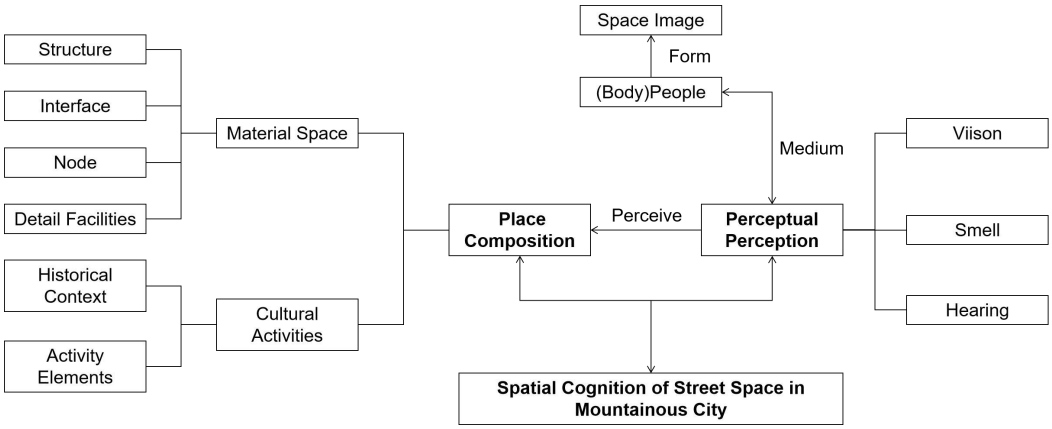

Figure. 2. Spatial Cognitive Framework. Source: Self Drawn by the Author.

3. Empirical Study on the Shaanxi Road Area in Yuzhong District of Chongqing

Shaanxi Road is located in the Yuzhong District of Chongqing, close to Chaotianmen harbor. It has been undertaking the function of commercial trade since ancient times. The investigated Shaanxi Road area includes Shaanxi Road, Chaodong Road, and the first to sixth lanes of Shaanxi Road.

3.1. Site Composition

3.1.1. Physical Space Elements

The physical space elements of Shaanxi Road street space are divided into the spatial structure, interface, node and detailed facilities.

(1) Spatial Structure

The overall structure of streets and lanes consists of two main streets parallel to the contour line and six lanes arranged perpendicular to the contour line. The mountainous terrain in this area has significant features, with typical spatial characteristics of the old urban area of Chongqing (Figure. 3).

Figure. 3. Space Structure of Shaanxi Road Area. Source: Self Drawn by the Author.

(2) Interface

Space is produced by restriction, and what defines the space of streets and lanes is the interface between the space of streets and lanes and the surrounding entities[9]. The interface can be divided into the top interface, side interface and bottom interface. The top interface refers to the skyline formed by the roof and the sky, and the mountainous street space creates a rich top interface through one another sloping roof. The side interface mainly refers to the solid wall surface of the buildings on both sides, which is the building interface. The bottom interface refers to the ground.

The materials and colours of the side interface in Shannxi Road are messy. And advertising signs and other prominent objects have no unified planning, and the relationship between facade elements and window openings is also monotonous and chaotic. In terms of the space design of the side interface, the walls of a class of buildings are recessed to form a gray space like a colonnade or arcade. And the experience of this kind of space is better than the former[10]. On the contrary, if the wall surface of another type of building is flush with the streets and alleys, the space feeling is relatively closed (Figure. 4).

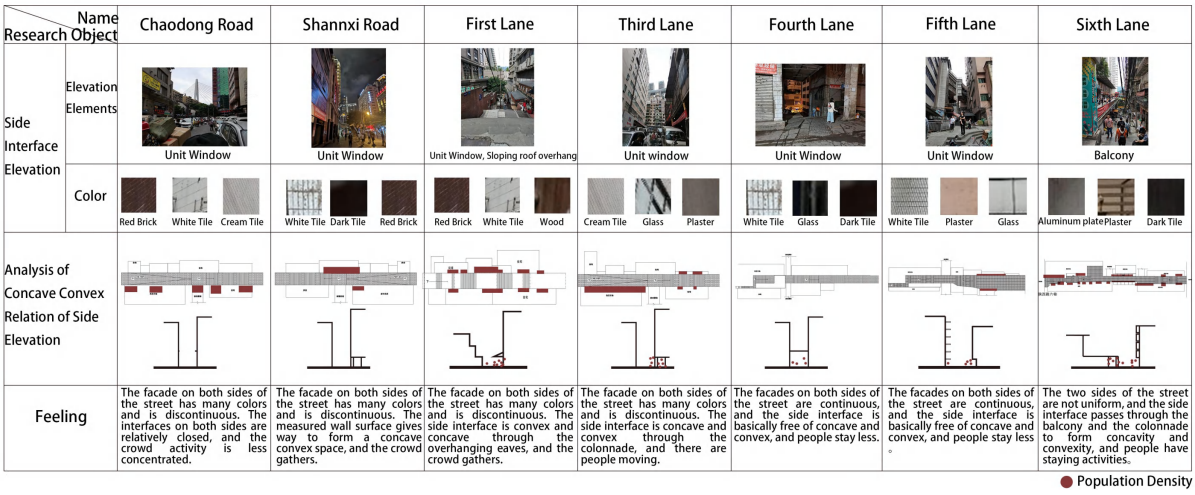

Figure. 4. Analysis of Street Lane Side Interface in Shaanxi Road area. Source: Self Drawn by the Author.

In terms of the original terrain of the road bottom interface in Shaanxi Road, the six lanes in the area have the height difference change of climbing ridge, while the two main streets basically have no obvious height difference. In terms of ground material, the entire bottom interface of the two main streets is made of asphalt, with good continuity; Due to the planning, design and daily use, the materials of Lane 1 to Lane 6 are chaotic. Cement, slate and brick laying are mixed, and the continuity is poor (Figure. 5).

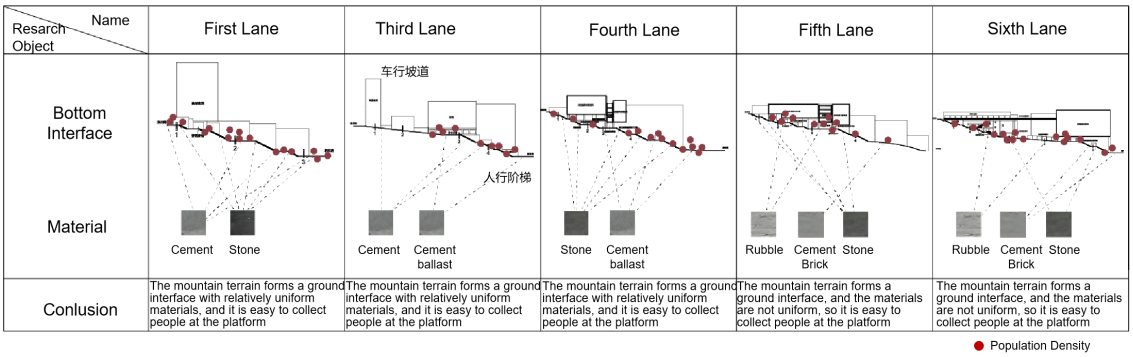

Figure. 5. Analysis of Street and Lane Bottom Interface of Shaanxi Road. Source: Self Drawn by the Author.

The top interface of Shaanxi Road and Chaodong Road is basically unchanged, and there is no cover. One side of the first lane in Shaanxi is a sloping roof building, and the other side is a fence. The eaves that change with the height difference make the roof interface change to a certain extent. There is basically no change in the third and fifth lanes in Shaanxi. The fourth and sixth lanes in Shaanxi have roof coverings, and the roof interface has changed to a certain extent. In general, the overall roof changes of Shaanxi Road are not very rich, and the roof interface changes are not great (Figure. 6).

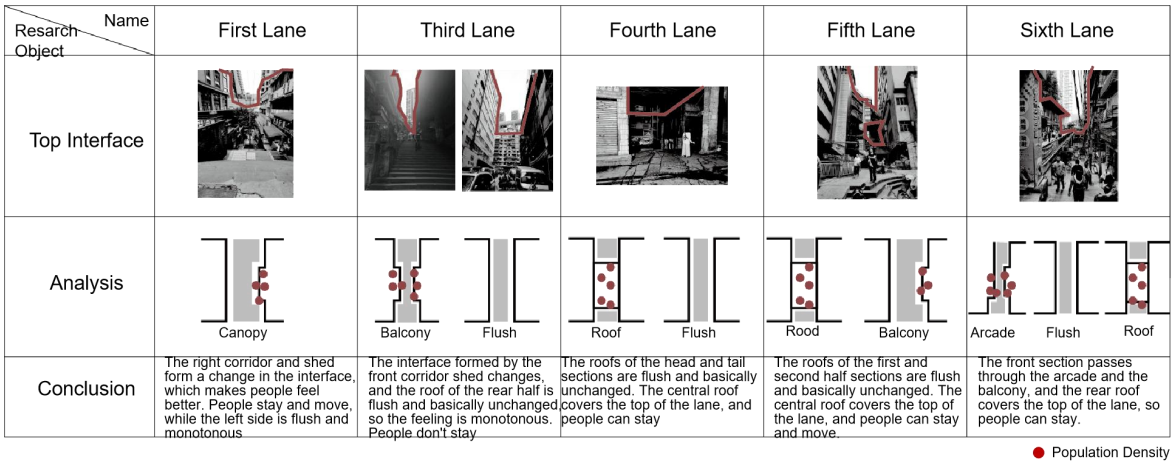

Figure. 6. Analysis of Shaanxi Road Top Interface. Source: Self Drawn by the Author.

(3) Street and Lane Nodes

Kevin Lynch once pointed out in the city image that nodes are strategic points that observers can enter in the city, and they are the focus of people's exchanges[11]. In the dynamic linear street space, the entrance and turning point are locally expanded to form a node space to accommodate people's staying activities.

The node space of Shaanxi road is mainly composed of two parts: the entrance intersection of the main street and roadway space and the inner corner node space of the street corner(Figure. 7). The first type of node does not reflect the characteristics of its entry node, which is not highly symbolic, and people can not significantly feel that they have entered the area. The second kind of node, because the corner node

space is mostly the inner corner space, domestic garbage accumulation and random illegal construction can be seen everywhere, and now it has become the representative of dirty, messy, and poor.

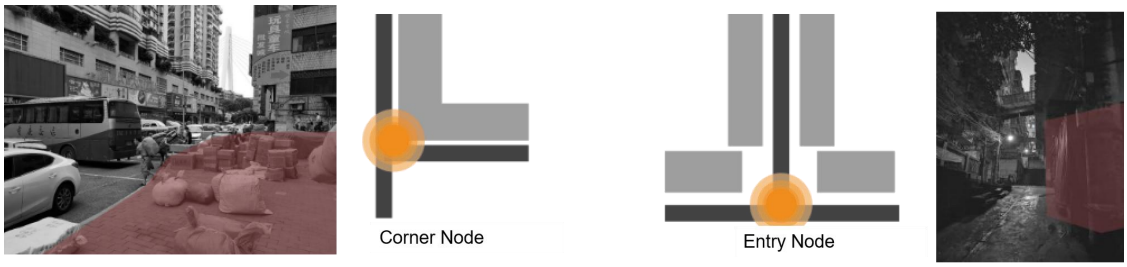

Figure. 7. Current Situation of Shaanxi Road Nodes. Source: Self Drawn by the Author.

(4) Detail Facilities of Street and Lane

Detailed facilities are closely related to people's lives and essential to the street landscape. Here, the detailed facilities are divided into greening, service, and decorative cultural facilities.

In terms of greening, in the Shaanxi Road area, except that Shaanxi Road has street trees on both sides of the carriageway, Shaanxi Lane 1, 3, 4, 5, and 6 only have a small number of potted plants planted by merchants and residents themselves, while Chaodong Road has no greening.

In terms of service facilities, Shaanxi Road has relatively complete service facilities, with street lights and garbage cans set at equal intervals, but it lacks certain rest facilities. Chaodong Road has perfect street lighting facilities and a certain number of garbage cans, but the utilization rate is low due to the stacking of goods. In the first, third, fourth, fifth, and sixth lanes of Shaanxi Road, the number of street lights is insufficient, the lane space is very dark at night, the number of garbage cans is insufficient, and the phenomenon of garbage stacking and littering can be seen everywhere.

In terms of cultural and decorative facilities, there are no decorative facilities and other sketches that can represent the historical context of Shaanxi Road in the Shaanxi Road area.

3.1.2. Elements of Humanistic Activities

(1) Historical Context

The group memory formed by the long-term precipitation of history is the key to the continuation of the spirit of place. As a city with a deep harbor culture, Shaanxi Road, which is close to Chaotianmen harbour, has undertaken the function of commercial trade since ancient times. The Shaanxi Road was named after many Qin merchants in the Qing Dynasty. At that time, because of the opening of many banks, Shaanxi Road had the nickname Financial Street. In 1891, Chongqing was opened as a commercial port, and Chaotianmen became a customs office. In 1927, Chaotianmen set up a harbor. During this period, the Shaanxi Road has always been an important place for business and trade. However, the fire in 1949 almost burned Shaanxi road. In 1990, with the relocation of the Xinhua Road roadside market, Shaanxi Road continued to assume the function of commercial trade. Today, Shaanxi Road is mainly a wholesale and retail market for textiles and related products[12].

(2) Activity Elements

Activity is an essential factor in making space a place. Jan Gehl divides outdoor activities into spontaneous, necessary, and social activities in communication and space. Through the investigation of the Shaanxi Road area in the early, middle, and late periods, the following types and characteristics of activities on Shaanxi Road are obtained.

In the morning, there are various activities in the main street of Shaanxi Road and the first to sixth alleys of Shaanxi, including commuting, purchase, and delivery, and other necessary activities; There are spontaneous activities such as walking and sitting; There are also social activities such as chatting, chess and cards. After 3 p.m., the wholesale market was closed. Only the main street of Shaanxi Road intersected Raffles and the subway station, and there were social and spontaneous activities. There were only necessary activities after work and school in lanes 1 to 6 of Shaanxi Road.

3.2. Perceptual Experience

3.2.1. Visual Perception Experience

Visual perception often plays a decisive role in all perceptual experiences in perceptual phenomenology. People often perceive the overall image of space through visual perception, so colour, material, continuity, and so on are often more significant than other spatial attributes[13]. In the process of visual perception experience in Shaanxi Road, the problem of insufficient interface continuity is very prominent. The inconsistency of colour, material, and architectural style makes the readability of the overall space not high, which is not conducive to the generation of spatial images.

3.2.2. Auditory Perception Experience

Auditory perception is a subtle, indirect response to space. People use space in daily activities to produce relevant sounds, which are generated, reflected, mixed, and entered the human ear so that people can understand the environment in an all-around way[14]. In the Shaanxi Road area, the difference in auditory perception is an essential representation of the change in spatial vitality. During the daytime, the environmental sound formed by a large number of commercial and trade activities helps people to recognize the overall space; At night, the closure of the wholesale market dramatically reduces the environmental sound, which is not conducive to people's space experience.

3.2.3. Olfactory Perception Experience

Olfactory perception affects people's perceptual experience by distinguishing environmental flavour[15]. The domestic garbage accumulated in the inner corner often makes people have a poor olfactory perception experience, and the food aroma of the hotel is conducive to the formation of a unique living atmosphere in the streets and alleys of the mountainous city.

4. Space Renewal Strategy of Street Space in Mountainous City

To sum up, the defects in the design of physical elements such as interfaces, nodes, infrastructure, and so on in mountainous streets and lane spaces are often related to the lack of perceptual activities of the subject in the region. Therefore, the improvement and updating of physical space elements will help to improve the subject's perception and continue the spirit of the place. Therefore, the following design strategies are proposed:

4.1. Continue the Spatial Structure of Street Space

In the process of updating the space of streets and alleys in mountainous cities, it is unrealistic to completely use the structure of streets and alleys, and it is also inconsistent with people's living requirements in the new era. Therefore, on the basis of ensuring that the main spatial structure remains unchanged, appropriate rectification can be carried out to achieve the purpose of continuing history. For example, it can ensure that the fishbone pattern of the overall two streets and six lanes remains

unchanged and appropriately increase the node space that can carry out different activities so as to meet people's daily needs and form a spatial sequence of one after another (Figure. 8).

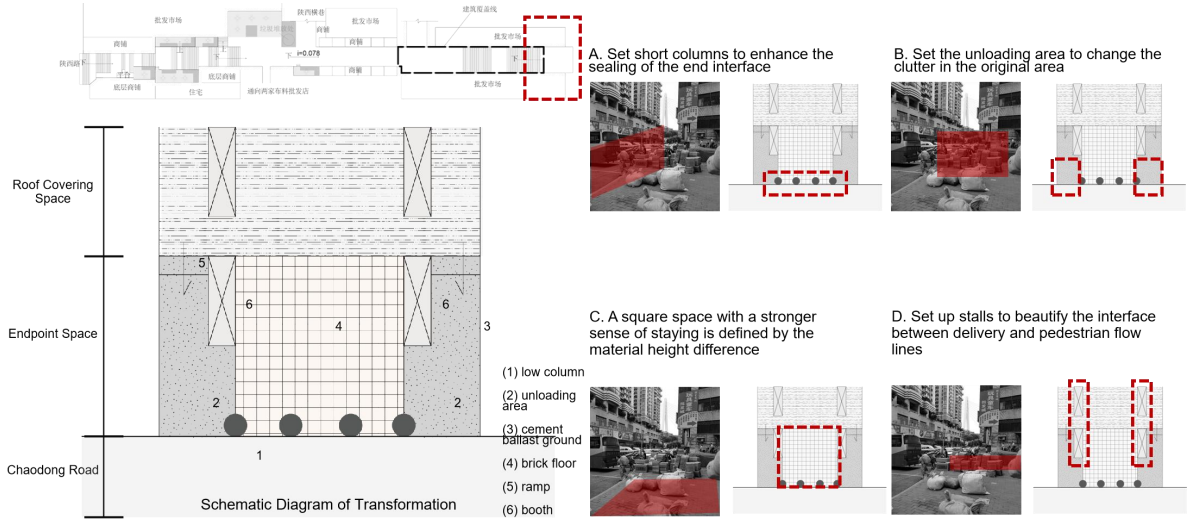

Figure. 8. Node Update Diagram. Source: Self Drawn by the Author.

4.2. Enhance the Integrity of Street Space Interface

The integrity and continuity of the street and lane interface is an important factor in ensuring the readability of the street space (Figure. 9). Enhance the continuity of the interface, enhance the characteristics and readability of the interface, make it a place to undertake people's activities, and continue spatial memory[16]. First, in the update of the side interface, the integrity and interest of the side interface are strengthened by unifying the decorative elements, materials, and colours of the facade and adding a concave-convex space design. Secondly, the continuity of the bottom interface is ensured by unifying the ground colour and material. Finally, the top interface should be enriched by appropriately adding canopies or sloping roofs and mountain walls to form an undulating skyline.

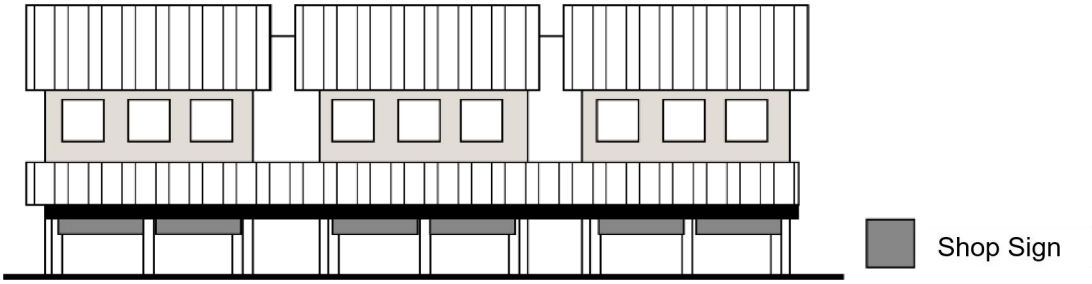

Figure. 9. Schematic Diagram of Side Interface Updating. Source: Self Drawn by the Author.

4.3. Strengthen the Diversity of Street Space Use

Diversity is the source of vitality in streets and alleys. Street space is not only an extension of private life but also a place for public activities[17]. Therefore, ensuring the diversity of space places and their activities is the key to continuing the spirit of places[18]. Therefore, in view of the current situation of the two-level differentiation of the vitality of Shaanxi lanes during the day and at night, we should improve the functional complexity of the space, enhance the ambiguity of the space, and introduce flexible business models such as night market economy and stall economy, so as to stimulate the vitality of streets and lanes at night.

4.4. Improve Public Participation in Street Space

Meeting the needs of users and improving the participation of space play an important role in enhancing the vitality of streets and lanes. First of all, it is necessary to meet the basic needs of users and carry out humanized and detailed design of space nodes, such as optimizing the layout of garbage cans, street lights, seats, and other service facilities. On the other hand, considering the aesthetic needs of users, add green plants at important nodes to provide rest places while beautifying the environment. Finally, at the cultural level, cultural propaganda facilities, such as fixed cultural propaganda walls, replaceable cultural propaganda walls (columns), cultural landscape sketches, etc., are implanted to realize the positive dissemination of culture and continue the spirit of the place[16].

5. Conclusion

With the rapid development of society and the times, the traditional street space in the mountainous city gradually can not bear people's new activities, showing problems that need to be updated. But at the same time, it is also very important to continue its own unique life, space, and cultural characteristics. Based on perceptual phenomenology, this paper establishes a cognitive framework from place composition to perceptual perception to make an empirical analysis of the Shaanxi Road. Finally, by continuing the space structure, enhancing the integrity of the space interface, strengthening the diversity of space use, and improving the participation of the masses, we can form a mountain street space with a specific place atmosphere and can meet the new needs of people in the new era, in order to provide a reference for the follow-up design and research.

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