

Research on Spatial Optimization of Shopping Center under the Background of Epidemic Situation : A Case Study of Weilaishi Shopping Center in Handan

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Abstract: In the current social background of frequent epidemics, shopping centers, as commercial buildings with a large number of people, it is very important to reduce the risk of environmental infection. This paper takes the Weilaishi Shopping Center in Handan as an example, summarizes the epidemic prevention status of five types of spatial nodes through field investigation, and analyzes the shortcomings of the existing emergency design of the Weilaishi Shopping Center. Based on the analysis results, this paper puts forward the optimization strategy from the spatial level, which provides a certain reference value for the research on the improvement of shopping center space environment emergency capability.

Keywords: Epidemic Prevention and Control; Shopping Center; Spatial Optimization

1. Introduction

In the current era of normalization of COVID-19 epidemic prevention and control, the epidemic has had a far-reaching impact on people's consumption habits and lifestyle, and catalyzed consumers' strong demands for health protection. Consumers put forward higher requirements for the design of physical space in shopping centers. During the epidemic, shopping centers in domestic cities at all levels responded positively to consumer demand through measures such as the eliminate virus maintenance of hardware facilities and the reservation of corresponding epidemic prevention space. The safety and health of the shopping environment will become the primary consideration for the future development of shopping centers. The characteristics of shopping centers with traditional closed design may change, and consumers' fear of dense space will be enlarged unprecedentedly. Shopping centers urgently need to make changes in the spatial layout and the organization of the flow of people.

2. Investigation

2.1 Study Area

The Weilaishi Shopping Center is located in the south of the main urban area of Handan City. As an urban life enjoyment center, it embraces 31 communities within 3 kilometers of the surrounding area, creating a fashion mecca for local residents. Through the method of on-the-spot investigation, this study fully understands the spatial organization form and plane drawings of the Weilaishi Shopping Center, and focuses on observing and recording the epidemic prevention and emergency situation of the important space nodes.

2.2 Result Analysis

In this paper, the spatial emergency research of the Weilaishi Shopping Center is mainly analyzed from five types of spatial nodes: foyer space, atrium space, rest space, corridor space and vertical traffic space. The results are as follows:

(1) Foyer space: The Weilaishi Shopping Center has a total of four halls, of which the south foyer is the largest, but nearly half of the space in this area is occupied by shopping carts, resulting in a great reduction of consumers' activity space. This can easily cause congestion among consumers. Once there is an infected person, the probability of transmission of the disease will rise rapidly. The area of the west foyer is smaller than that of the south foyer, but the number of consumers

passing through here is relatively small. The two foyer spaces on the north side exist as passageways, and consumers often walk in a clear direction, which can basically maintain the epidemic prevention distance between pedestrians.

(2) Atrium space: There are three rectangular atriums in the Weilaishi Shopping Center. From the perspective of functional layout, the main atrium is used for publicity of daily activities, and the phenomenon of instantaneous crowd gathering often occurs in this area during the holidays. With the main atrium as the central axis, the two sub-atriums are symmetrically distributed on both sides of the main atrium. Sometimes the two sub-atrium spaces are used as commodity display areas, which greatly improves the utilization rate of atrium space to a certain extent. In addition, pedestrian congestion rarely occurs in the atrium space, and the environmental safety of the area is relatively high.

(3) Rest space: There are several rest areas in the Weilaishi Shopping Center, which have two main characteristics in distribution: one is to arrange rest seats according to the pedestrian line, so that consumers can easily reach the rest space, avoiding the feeling of crowding and clutter, thus realizing the possibility of keeping a safe distance for pedestrians under the epidemic. The second is to create a characteristic landscape in the rest space, creating a comfortable and pleasant atmosphere, but also using plant configuration to reduce the spread of the virus to a certain extent.

(4) Corridor space: The corridor space of the Weilaishi Shopping Center is very rich in form and layout, with multiple corridors set up between different spaces in addition to the main passageway, and the internal moving lines are flexible and transparent. In addition, a number of open nodes are interspersed in the corridor space, resulting in a natural transition between the corridor space and other auxiliary areas. However, the functions of these open nodes are relatively simple, and the functional settings combined with epidemic prevention are not taken into account.

(5) Vertical traffic space: The vertical traffic inside the Weilaishi Shopping Center is mainly escalators and elevators, which are arranged near the three atriums. During the research, it is found that some staff regularly clean and disinfect the escalator handrails, which can effectively reduce the probability of virus transmission in these spaces to a certain extent.

3. Spatial optimization strategy

3.1 Foyer space

The foyer space is the intersection of the indoor and outdoor environment of the building, which not only has the transitional function of dispersing pedestrians, but also represents the first impression of consumers on the shopping center[1]. Under the requirements of epidemic prevention and control, health detection function has been added to the space, and consumers need to show personal health codes, itinerary codes and measure body temperature in cooperation with epidemic prevention work after entering. As a result, the original scale and streamline organization of the space can no longer meet the needs. In addition, considering that there are basically only two kinds of reverse pedestrian streamline in the foyer space, the frequency of contact between pedestrians is higher, and the risk of virus transmission is also higher.

3.2 Atrium Space

Atrium space as the gathering area of shopping center, reducing the sense of space congestion during the epidemic will be the focus of emergency design optimization. First of all, it is necessary to flexibly divide the atrium space from other functional spaces in order to reduce the retention of pedestrians in some areas. Secondly, an electronic partition that can monitor the body temperature of pedestrians can be set up in the connecting area between the atrium and the escalator, and the atrium space can be divided into inner and outer areas. Among them, the inner area can meet a variety of consumer activities, while the outer area is mainly used as a supplement to the traffic space to guide pedestrians up and down the stairs in an orderly manner. In addition, we can also consider setting eye-catching guide signs in the connection area to make consumers clear about the space attributes they are about to face and reduce the residence time in the connection area^[2].

3.3 Rest Space

Rest space as an important auxiliary space of the shopping center, its location and the form of seats will become an important consideration for epidemic prevention and control. According to the research, the distribution location of rest space can be divided into two types: one is the mixed type which is arranged in combination with other functional spaces. Due to the lack of spatial boundary sense, a large number of pedestrians crossing is easy to form a dangerous area of prevention and control. The optimization of this kind of rest space should mainly start with the establishment of regional boundary sense, and use partition or green plants to flexibly divide the rest area without changing the main structure of the building. The second is the independent type placed separately, this type of rest area can provide a more comfortable environment for consumers in the region. The optimization of this kind of rest space should mainly start with adjusting the form of seat placement, and realize the possibility of maintaining a safe epidemic prevention distance between people.

3.4 Corridor Space

The corridor space is a road that connects various commercial stores on the same floor of the shopping center, carrying a large flow of people all the time[3]. In this regard, we should start with balancing the flow of people in each region, adjust the scale of the corridor and the form of corner, and transform some over-stiff acute angle space into a moving line transition smooth obtuse angle space. As a result, the reaction time of pedestrian corner is increased, so that it is convenient for pedestrians to plan the route in advance, avoid the opposite pedestrians, reduce pedestrian conflicts and reduce the probability of contact.

3.5 Vertical Traffic Space

The vertical traffic space of shopping centers is mostly arranged in combination with the atrium space. After fully considering the needs of consumer behavior, it is found that most of the pedestrians who take the elevator are used to stay in the traffic area, which can easily lead to the phenomenon of crowd detention in the traffic area. In view of this situation, buffer space can be set up in traffic areas with more people, such as the transfer platform area of escalators, so as to increase the pedestrian movement space. At the same time, it can also be considered to configure a disinfection spray device combined with the buffer space to facilitate the work of eliminate virus in the event of an epidemic.

4. Conclusion

At the stage of regular prevention and control of the epidemic, the research on improving the emergency response capacity of shopping centers conforms to the development background of the times. Emphasize the multiple relationships among "business environment", "consumer" and "city", adapt to the changes of social environment, and provide reference for the renewal and optimization of shopping centers. At the same time, it also provides new ideas for the healthy development and long-term vitality of the city in the future.

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