

The Current Situation and Optimization Path of Tactile Paving Facilities in Chengdu from the Perspective of the “Law on the Barrier-free Environment Construction”

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ABSTRACT

As an important city in southwest China, Chengdu has been promoting the construction of barrier free environment. As an important part of it, tactile paving facilities have been widely laid on the main roads and public places of the city. However, at present, tactile paving facilities in Chengdu still have problems such as low utilization rate, no tactile paving set on zebra crossing, insufficient supervision and management of tactile paving maintenance, and lack of initiative and enthusiasm of the public to participate in tactile paving maintenance. In order to effectively solve these problems, people can create a safe and convenient travel environment for the visually impaired by focusing on the planning and design of the tactile paving, building an "intelligent tactile paving zebra crossing", building a long-term supervision and management mechanism, and improving the enthusiasm and initiative of the public to participate in the maintenance of the tactile paving.

Keywords: “Law on the Barrier-free Environment Construction”, Tactile paving facilities, Visually impaired people, Construction and maintenance.

1. INTRODUCTION

Barrier-free facilities are an important component of urban living environment, of which the most extensive and common is the tactile paving, and the main service target is the visually impaired.[1] In order to ensure the construction of barrier-free facilities, the Chengdu Municipal Government began implementing the "Chengdu Measures for the Construction and Management of Barrier-free Facilities" (hereinafter referred to as the "Construction and Management Measures") as early as March 2011. However, the "Construction and Management Measures" was issued earlier, and its provisions are not perfect enough to solve the problem of tactile paving construction and maintenance in current practice. In September 2023, the “Law of the People's Republic of China on Barrier-free Environment Construction” (hereinafter referred to as the “Law on the Barrier-free Environment Construction”) was officially implemented, providing a more powerful legal

guarantee for the construction and maintenance of tactile paving. At present, cities mainly establish links between various types of facilities through tactile paving and barrier free signs to create barrier-free environments and meet the needs of the visually impaired people in their daily activities.[2] There are nearly 50,000 visually impaired people in the urban area of Chengdu.¹ In order to ensure that these special groups can travel more safely and conveniently, the continuous reconstruction and maintenance of tactile paving are still essential. Therefore, the purpose of this paper is to analyze the existing problems of tactile paving facilities in Chengdu, and to explore the corresponding solutions according to the "Law on the Barrier-free Environment Construction".

1. Survey | Many tactile paving in Chengdu are "busy" but can't help the visually impaired, Chengdu Daily, December 9, 2024, <http://sc.people.com.cn/n2/2024/1219/c379471-41080476.html>

2. EXISTING PROBLEMS OF TACTILE PAVING FACILITIES IN CHENGDU

2.1 Low Utilization Rate of Tactile Paving

In the urban area of Chengdu, although the density of tactile paving is high, the actual utilization rate is low. In addition to the reasons that most visually impaired people travel less frequently, spend less time and use less tactile paving, the planning and design process of tactile paving did not fully respond to the actual needs of visually impaired people, directly reducing the use rate of tactile paving for visually impaired people on the overall dimension.[3] Specifically, the tactile paving is not fully connected with other surrounding infrastructure, which makes it difficult for visually impaired people to use it. For example, the starting and ending points of the tactile paving may not be effectively connected with key locations such as bus stops and building entrances, which affects the convenience of use.

2.2 No Tactile Paving on Zebra Crossings

At present, the tactile paving in the urban area of Chengdu is mainly laid on the sidewalk. The lack of tactile paving guidance on zebra crossings may pose a major risk to the safety of visually impaired people crossing the street. When visually impaired people cross the road, they can only rely on memory or weak environmental perception to move forward. The urban environment is complex, and the noise of vehicles and pedestrians can make it difficult for visually impaired people to accurately determine direction, especially when crossing long zebra crossings, which can easily lead to deviation from the motor vehicle lane and increase the risk of traffic accidents.

2.3 Insufficient Supervision and Management of Tactile Paving Maintenance

The Urban Management Committee of Chengdu is responsible for the supervision and management of the maintenance of tactile paving facilities,² but there is a lack of supervision in the face of the huge tactile paving network. The problems of tactile

paving facilities such as misuse, aging and damage are prominent. The problem of inadequate management and maintenance of tactile paving in the later period has become one of the important reasons that affect the effective use of tactile paving.[4] In practice, when Chengdu Urban Management Committee supervises the occupation and damage of tactile paving, there are two situations:

2.3.1 The Situation Where the Responsible Person Can Be Identified

In the urban area of Chengdu, businesses frequently occupy the road, shared bicycles and private cars are often parked at will and occupy the tactile paving, construction units occupy the tactile paving to stack materials, and even cause damage to the tactile paving. The responsible parties for the above-mentioned behaviors are clear, but the Chengdu Urban Management Commission rarely takes proactive and effective measures to stop them. Even if there are occasional punishment situations, the severity of the punishment may be very mild (such as only verbal warnings), which cannot effectively deter occupants and damages.

2.3.2 The Situation Where the Responsible Person Can't Be Identified

When some tactile paving is damaged, it is impossible to determine the responsible person, such as natural wear and tear or natural disasters. Chengdu Urban Management Committee did not have an efficient monitoring and feedback mechanism to find the above problems in time, so that the repair of tactile paving was not timely. Moreover, even if the damage of the tactile paving is found, the maintenance work may be limited by the allocation of human and material resources, and the maintenance work cannot be carried out quickly, leading to long-term problems.

2.4 The Public Lacking the Initiative and Enthusiasm to Participate in the Maintenance of Tactile Paving

Some of the public do not understand the original purpose of the design of the tactile paving and its role in helping the visually impaired, nor do they know how to correctly use and maintain the tactile paving. So that they only regard it as an ordinary urban road facility, not aware of the special significance for the visually impaired, lack

2. See Article 4, Paragraph 2 of the "Chengdu Barrier-free Facilities Construction and Management Measures": "The urban administrative department is responsible for the supervision and management of the maintenance of accessible facilities on urban roads."

of maintenance awareness, and affect the full play of the function of the tactile paving.

3. OPTIMIZATION STRATEGY OF TACTILE PAVING FACILITIES IN CHENGDU

3.1 Scientific Planning to Improve the Utilization Rate of Tactile Paving

The "Law on the Barrier-free Environment Construction" states that the state encourages the construction of barrier-free facilities that are coordinated with the surrounding environment.³ The layout of tactile paving should also be planned according to the travel needs of the visually impaired. The travel space for most visually impaired individuals is limited to communities, bus and subway lines, hospitals, and public spaces for public welfare purposes. Therefore, the construction of tactile paving in Chengdu should give priority to optimizing and improving the construction and connection of tactile paving facilities at the daily living places and main activity spaces of the visually impaired. In addition, people can actively listen to the opinions of the visually impaired and the representatives of the Disabled Persons' Federation⁴ in the construction of the tactile paving in accordance with the requirements of the "Law on the Barrier-free Environment Construction" to encourage the disabled to participate in the experience. In this way, the scientific and rational construction of tactile paving can be ensured, and the utilization rate of tactile paving facilities can be improved.

3.2 Building "Intelligent Tactile Paving Zebra Crossing"

The development of barrier-free urban transportation in China is facing trends such as demand quality and intelligent transportation.

3. Article 13 of the "Law on the Barrier-free Environment Construction" states: "The state encourages engineering construction, design, construction and other units to adopt advanced concepts and technologies to construct barrier free facilities that are humanized, systematic, intelligent and coordinated with the surrounding environment."

4. Article 17 of the "Law on the Barrier-free Environment Construction" states: "The state encourages construction units to invite representatives of disabled persons and elderly people, as well as organizations such as disabled persons' federations and elderly associations, to participate in activities such as opinion consultation and experiential trials in the planning, design, and completion acceptance of new, renovated, and expanded construction projects."

Meeting the barrier free travel needs of special groups is crucial for promoting high-quality urban development.[5] The "Law on the Barrier-free Environment Construction" proposes that the state encourages the construction of humanized, systematic, and intelligent barrier-free environmental facilities.⁵ At present, Nanning City, Guangxi Province has launched the first "intelligent tactile paving zebra crossing" in China,⁶ effectively improving the travel experience and crossing safety of visually impaired people. Chengdu should also actively respond to the national call to build an intelligent tactile paving guidance system (intelligent tactile paving zebra crossing) on the zebra crossings around the places where people with visual disabilities travel intensively by using intelligent technology. Specifically, the two ends of the "intelligent tactile paving zebra crossing"⁷ are equipped with corresponding radio frequency identification equipment and intelligent voice system or LED display screen. When visually impaired individuals approach zebra crossings with corresponding chip wristbands, RFID devices can accurately recognize the chip wristbands and activate the intelligent guidance system. At this point, at intersections with traffic lights, the voice prompt system will emit a sound to indicate whether visually impaired individuals are allowed to pass through at this time; At intersections without traffic lights, the system will receive signals and display prompts such as "Pedestrians are passing, please slow down" on the LED screens on both sides of the intersection to remind vehicles to slow down and ensure smooth passage for visually impaired individuals.

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6. "International Blind People's Day | Smart tactile paving zebra crossing to improve the travel experience of visually impaired people", Guangming, October 15, 2022, <https://m.gmw.cn/baijia/2022-10/15/1303172999.html>

7. Radio frequency identification device (RFID) is an automatic identification technology device that uses radio frequency signals for non-contact bidirectional communication to achieve identification and data exchange purposes. The device consists of three parts: a tag (storing relevant information about the object), a reader (a device that reads tag information, decodes and processes the tag information, and then transmits the data to the backend system for further analysis and application), and an antenna (used for transmitting and receiving RF signals, enabling the tag and reader to communicate within a certain distance range).

3.3 Establishing a Long-term Supervision and Management Mechanism

3.3.1 Strengthening Law Enforcement Efforts

According to the "Law on the Barrier-free Environment Construction", if the use of accessibility facilities is changed without authorization or if they are illegally occupied or damaged, and the correction is not made within the prescribed time, fines may be imposed on units and individuals.⁸ Accordingly, as the competent department for the maintenance of tactile paving, Chengdu Urban Management Committee has the right to order them to correct their illegal behaviors when they can determine the responsible persons for illegal occupation of tactile paving or damage to tactile paving; Failure to rectify within the deadline will result in a fine. Only in this way can effective deterrence be formed.

3.3.2 Adopting Diversified Supervision and Management Methods

To ensure the smooth maintenance of the tactile paving, the following measures can be taken. The first is to set up a joint working group to establish a regular patrol and rapid maintenance mechanism for the tactile paving. According to the provisions of the "Law on the Barrier-free Environment Construction",⁹ Chengdu Urban Management Committee, Chengdu Housing and Urban Rural Development Bureau, Chengdu Public Security Bureau, Traffic Management Bureau and other departments can set up a joint working group to conduct a comprehensive investigation of tactile paving in key areas from time to time. At the same time, it is necessary to optimize the process of tactile paving maintenance, reduce unnecessary links and procedures, clarify the responsibilities and cooperation methods of each department in the

maintenance work, and improve the efficiency of work. The second is to encourage cross-border cooperation and social participation. The "Law on the Barrier-free Environment Construction" states that any organization or individual has the right to complain and report any violation of the Law to the relevant competent authorities.¹⁰ Therefore, the government should also clarify the complaint channels, and set up telephone complaints, network complaints, on-site complaints and other ways to ensure that it can receive timely feedback on tactile paving.

3.4 Improving the Initiative and Enthusiasm of the Public to Participate in the Maintenance of Tactile Paving

3.4.1 Carrying out Publicity and Education

The importance of the construction and maintenance of tactile paving is beyond doubt and cannot be ignored. The "Law on the Barrier-free Environment Construction" emphasizes the promotion and education of the concept of barrier-free environment by the state, popularizes knowledge of barrier-free environment, disseminates barrier free environment culture, and enhances the awareness of barrier free environment in the whole society.¹¹ In view of this, on the one hand, the Chengdu Municipal Government can organize professionals to enter the community and carry out publicity activities on the importance of tactile paving and tactile paving maintenance knowledge, so as to enhance residents' attention to tactile paving maintenance. On the other hand, there is also a must to carry out campus activities on the maintenance of the tactile paving in schools, such as painting competitions, essay contests, etc., so that students can establish the awareness of maintaining the tactile paving from childhood.

8. Article 65, Paragraph 3 of the "Law on the Barrier-free Environment Construction" states: "Anyone who violates the provisions of this Law and falls under any of the following circumstances..... shall be fined not less than 10,000 yuan but not more than 30,000 yuan by the unit, and not less than 100 yuan but not more than 500 yuan by the individual... (3) changing the purpose of accessible facilities without authorization or illegally occupying or damaging them."

9. Article 58 of the "Law on the Barrier-free Environment Construction" states: "People's governments at or above the county level and their relevant competent departments shall supervise and inspect the construction of accessible environments in accordance with the law, and carry out joint supervision and inspection as needed."

10. Article 62, Paragraphs 1 and 2 of the "Law on the Barrier-free Environment Construction": "Any organization or individual has the right to submit opinions and suggestions to the relevant government departments to strengthen and improve the construction of accessible environments... Disabled persons' federations, elderly associations, and other organizations may, as needed, hire representatives of disabled persons, elderly people, and personnel with relevant professional knowledge to supervise the construction of accessible environments."

11. Refer to Article 50, Paragraph 1 of the "Law on the Barrier-free Environment Construction": "The state shall carry out publicity and education on the concept of accessible environment, popularize knowledge of accessible environment, disseminate accessible environment culture, and enhance the awareness of accessible environment in the whole society."

3.4.2 *Setting up Reward Mechanism*

Article 11 of the “Law on the Barrier-free Environment Construction” states: “Units and individuals who have made a significant achievement in the construction of accessible environments shall be commended and rewarded in accordance with relevant national regulations.”¹² China encourages social forces such as enterprises, institutions, social organizations, and individuals to participate in the construction of accessible environments through donations and volunteer activities.[6] Based on this, the Chengdu Municipal Government can set up special funds to give material rewards, such as cash rewards or small gifts, to the public who find and timely report the occupation or damage of the tactile paving; In addition, the public, organizations or units that actively participate in the maintenance of tactile paving shall be commended, such as issuing honorary certificates or carrying out publicity and reporting in the media, to improve their social image and sense of honor, and form a good atmosphere for the whole society to jointly maintain tactile paving.

4. CONCLUSION

As the "micro carrier" of urban barrier-free environment, the construction quality of tactile paving is not only related to the travel rights of the visually impaired, but also reflects the temperature and civilization of urban governance. Under the guidance of the “Law on the Barrier-free Environment Construction”, Chengdu should continue to optimize the planning and design of tactile paving, improve the long-term management mechanism, enhance social participation, create a truly safe and convenient barrier free travel environment, and provide practical samples for urban barrier free environment construction in southwest China.

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