

General Design Strategy for Tianjin Jinwan Square Station System

Baoru Yan, Lin Lu*

College of Urban Art, Tianjin Chengjian University, Tianjin, 300384, China

*Corresponding author

Abstract: In this paper, the current situation and progress of the Jinwan Square Station development of Tianjin Metro Line 3 are reviewed and analyzed, the development of the Jinwan Square Station system is discussed from the perspectives of the audience's cognitive and demand characteristics, the particularity of the Jinwan Square Station and the common problems existing in the system. After investigation and research, it is concluded that the guide system is deficient and the internal space environment is poor. The strategy for universal design of the Jinwan Square Station metro navigation system is derived. To promote the development of Jinwan Square Station system design and enhance the recognition of Jinwan Square Station systems, providing passengers with a more convenient and comfortable travel experience.

Keywords: Jinwan Square; Subway station; Guidance system; Universal design

1. Introduction

Ronald L. Myers, a professor at Tennessee State University, proposed to develop the orientation of universal design into "design for all". The core of "universal design" is "universal design", which refers to the design concept that can serve all people, that is, in the design process, the needs of all people should be considered to the greatest extent, to avoid the waste of resources caused by secondary design or special improvement design, and the use of the method should be based on the different physiological and psychological characteristics of all people. The core idea of universal design is to treat all people as people with different degrees of disability. People have different abilities and have different abilities in different environments.^[1] Based on the universal design strategy, this paper analyzes the Jinwan Square Station of Tianjin Metro Line 3, in order to integrate the space, channel the audience, break through the plane, and maximize the effectiveness of the guide system, it is convenient for passengers to travel.

2. Universal design principles

2.1 Principle of simplicity and intuitiveness

The principle of simplicity and intuitiveness in the design of the guide system is that the guide system should pay attention to the principle of clarity, easy understanding and memory. The information of the guide system should be concise, accurate and clear, avoid redundant and complex design elements, so that users can quickly and accurately find the required information. In order to realize the principle of simple and intuitive design, the guide system should be carefully designed according to the actual situation of the environment. Graphics, fonts, and colors should be as simple and easy to recognize as possible, fonts should be easy to read, and colors should be easy to distinguish so as to maximize the user experience. The universal design of the guide system of the subway station serves all the passengers. It is suitable for the cultural and educational background, living habits and perception ability of the audience of different ages, the aim is to provide clear, concise, easy-to-understand and memory guide information for passengers, so that tourists do not need to guess or think too much during the ride in the subway station.

2.2 Principles of clarity, continuity and communication of information

The principles of information definiteness, continuity and communication of subway station guide

system are to meet the needs of passengers better and make it easier and faster for passengers to get the required information. The principle of information clarity is to guide the visual system information should be accurate, clear, concise and clear, avoid ambiguity or misunderstanding. The information of the guide system should be carefully designed according to the needs of passengers, so that passengers can find the required information accurately and quickly. The principle of continuity is that the information of visual system should be continuous in space and time, so that passengers can feel the consistency and consistency of information when they walk freely in subway station. For example, the information in the navigation system should be consistent and coherent across different floors or areas, allowing passengers to easily access coherent information. The communicational principle is that the design elements of the guiding vision system should convey clear messages and follow the principle of "Simplicity and clarity", so that passengers can find the desired target location in the shortest time.

2.3 Standard system convenience principle

The principles of standardization, convenience and ease of the subway station guide system are interrelated, aiming to provide passengers with more efficient, comfortable and easy to understand guide services. The normative principle mainly refers to the design of the subway station guide system should follow the relevant regulations and standards, including the size, color, font and graphics of the sign. The standardized guidance system can improve the trust and sense of security of passengers, and also facilitate the rapid adaptation and memory of passengers. The principle of convenience mainly means that the design of the subway station guide system should conform to the ergonomic principle, so as to facilitate the use of passengers. For example, signs should be placed in a visible and easily accessible location so that passengers can quickly find the information they need during the walk. The presentation of the guide information should be simple and clear to avoid ambiguity or misleading situations. The principle of ease mainly means that the design of the subway station guide system should conform to the principles of psychology and create a relaxed and pleasant atmosphere. The guide information should be expressed in a friendly and friendly manner to avoid causing tension or depression to the passenger. In addition, the design of the guide system should also pay attention to the coordination and integration with the surrounding environment to create a more comfortable and pleasant subway station environment. This can make the passengers have a relaxed and pleasant experience during the ride, enhance the satisfaction of the subway station service and improve the visibility of Jinwan Square subway Station.

2.4 Scientifically set the size interval and space principle

In a specific riding environment, when using the subway guide system, we should pay attention to the rationality of different people's posture, body type, their action space in the subway station, etc., and scientifically and objectively set the composition elements of the guide design and the carrier size. The scientific setting of size space and space principle of subway station guide system is mainly to consider the size, location and layout of the guide sign, so as to provide scientific, reasonable and easy to understand guide service. First of all, the size of the guide sign should be reasonably set according to the specific space environment and use needs. In general, the size of the guide sign should match the size and distance of the space, for example, in a narrow channel, the size of the sign should be small, so as not to bring a sense of oppression to passengers; In a spacious space, the size of the logo can be appropriately increased to enhance the visual impact. Secondly, the size of the guide sign should also consider the visual distance and Angle of view of the human eye to ensure that passengers can clearly read the sign information at different positions and angles. In addition, the location of the guide sign should also take into account the passenger's visual habits and walking routes, so that the sign information can be read naturally during the passenger's walking process.

3. Investigation and analysis of Tianjin Jinwan Square Station

3.1 Introduction of Jinwan Square subway Station

The Jinwan Square Station is located on the southern bank of the Hai River in the city of Heping District, surrounded by the Hai River to the east and north, and on the North Road of Jiefang to the west. It is located in the Old French Concession, and its architectural style is consistent with the historical buildings around it, the station is a Line 3, Tianjin Metro route. The history of the station can be traced back to April 2011, when the Tianjin Municipal Planning Bureau announced the name of the

station on the Tianjin Metro Line 3, the site is advertised as "Jiefang Bridge Station". On October 1, the Jinwan Square Station was put into operation with the opening of the Tianjin Metro Line 3. In the years that followed, the Jinwan Square Station underwent numerous renovations and expansions. The subway station of Jinwan Square has gradually become one of the important transportation hubs in Tianjin.

3.2 Research content and results

Tianjin Jinwan Square subway Station has unique cultural characteristics and architectural style. An in-depth study of the current construction of Tianjin Jinwan Square subway Station guide system, as well as the surrounding guide of the four exits of the subway station A, B, C and D as the research object, can reflect the research value of the universal design strategy.

3.2.1 Basic Information

In order to explore the cognition and needs of the audience of the guidance system, the author conducted a questionnaire survey on the basic information of 150 passengers, and the results are shown in Table 1.

Table 1: Basic Information Questionnaire

Number	Question	Option	Percentage/ %
Q1	Your Age?	≤19	8.0
		20-29	9.8
		30-49	30.2
		≥50	52.0
Q2	How do you usually travel?	Taxi	24.3
		Subway	36.8
		Bus	12.6
		Self-driving	26.3
Q3	Why did you get off at the Jinwan Square Station?	Work	22.2
		Travel	39.2
		recreation	38.6

The basic information survey in Table 1 shows that: first, middle-aged and elderly people account for a large proportion, which is characterized by stable economic income, interest in life, heavy nostalgia and inconvenient movement, and insufficient sensory mechanism; Second, a small part of the people who get off at Jinwan Square Station are working, and most people are traveling, watching movies, shopping, etc. It can be seen that Jinwan Square Station is one of the attractions that local and outsiders must hit the card.

3.2.2 Ride experience

The following is a questionnaire survey on 150 tourists' riding experience at Jinwan Square Station, and the results are shown in Table 2.

Table 2: The results of the questionnaire of ride experience

Number	Question	Option	Percentage/ %
Q4	Do you feel comfortable and happy during the ride?	Yes	65.0
		No	5.0
		general	30.0
Q5	Do you feel a unique ride?	Yes	46.0
		No	10.3
		general	43.7
Q6	Were you impressed with the environment of the station during the ride?	Yes	49.2
		No	8.2
		general	42.6

The survey results of the ride experience in Table 2 show that: First, the ride experience of the subway station is average, and the way of displaying the culture of the scenic spot is a little boring; Second, the design of all aspects of the subway station reveals the rich history and culture of Tianjin, but the passengers' involvement in the experience is very ordinary, and their satisfaction with the station's service is low, which needs to be further improved.

3.2.3 Subway station guide system

In order to explore the problems existing in the subway station guide system, the author conducted a questionnaire survey on 150 tourists in the scenic area guide system, as shown in Table 3.

Table 3: The Survey Questionnaire of tour guide system in scenic spots

Number	Question
Q7	What are the problems in the subway station navigation system?
Q8	What information services do you need to add to the ride?

In the survey results of the subway station and its surrounding guidance system, it is found that tourists' satisfaction with the ride experience is closely related to the information service provided by the station's guidance system. The existing problems of Jinwan Square's guidance system are listed and analyzed below.

(1) The guide configuration is improper

The information instructions of the guidance system near the subway station are not coherent enough, some blind areas appear, resulting in the interruption of information transmission, and objective problems such as improper setting of the guidance system and fuzzy fonts lead to unclear information transmission.

(2) The guide plate lacks a sense of design

Jinwan Square, "Safe entry" guide signs and "up and down stairs do not use mobile phones to pay attention to the foot beware of falling", lack of design sense. The subway guide system lacks the integration design that utilizes the uniqueness of Tianjin's history and culture and extracts its cultural elements. It lacks personalized design, and the design style of the guide system is incompatible with the surrounding scenic area environment.

(3) Low practicability of guidance information

In the complex environment of public subway stations, information should be updated every day, and the information presented in the guide content should also be updated in real time to avoid the lack of information.

(4) Lack of ride experience, carrier form is old

The subway station guidance system carrier is old and lacks intelligent interactive experience. The overall spatial layout and placed nodes should be designed systematically and scientifically to reduce passengers' irritability in the complex information.

(5) The lack of generalization of the guide system

Subway station A exit stairwell, as well as outdoor wire placement affect the beauty. The guidance system is seriously affected by urban modernization and commercial development, and lacks the standard of the overall universal concept. The focus of the guidance system ignores the needs of the non-healthy people and lacks humanistic care.

3.3 Research Summary

3.3.1 Audience cognition and demand characteristics

The characteristics of audience cognition and demand refer to the characteristics of audience cognition and demand for subway. Audience cognition refers to the audience's understanding and understanding of the product or service, including the characteristics, advantages, positioning and other aspects of the product or service. The demand characteristics of the audience refer to the demand and preference of the audience for the product or service, including the characteristics of the consumer's age, gender, occupation, income and education level, as well as their demand for the function, quality, price and brand of the product or service. [2] Understanding the perceived and desired characteristics of the audience is important for formulating services. Through in-depth understanding of the audience's cognition and demand characteristics, at the same time, according to the audience's feedback and demand, it can constantly improve and optimize the subway guide system service to improve passenger satisfaction.

3.3.2 The uniqueness of Tianjin Jinwan Square subway Station

Jinwan Square subway Station has a unique architectural style, luxurious decoration, crystal

chandeliers and copper murals, high-end facilities in the station, very complete, such as seats, escalators, access for the disabled, everything, and very clean, few people and clean. Jinwan Square Subway Station exit B is the famous century bell, from the subway station to Tianjin station only 5 minutes walk, across the Jiefang Bridge and the other side of the river directly to Tianjin Station, very convenient. There are also various cultural displays in the station, such as the landmark stone carved door plate displayed on the wall, telling the story of the golden age of Tianjin commerce and showing the hundred-year history of Tianjin commerce.

3.4 Necessity of universal design of subway station guidance system

According to the field investigation results of Tianjin Jinwan Square subway station, the degree of universality of the guide system in the subway station is low. The guide system can give passengers an objective feeling of Tianjin's history, culture and urban public infrastructure, and the subway station guide system should not be an emotionless "tool". The universal level of the guide system in the subway station is the intuitive impression provided by the subway station for tourists, and deepens the cognition of the humanistic care of the overall image of the subway station while providing information services. As a complete visual identity system, Tianjin Jinwan Square subway station guide system must combine the general design concept, adhere to the principle of "people-oriented", and create a humanized historical image of Tianjin.

4. Universal design strategy of Tianjin Jinwan Square subway Station guide system

Based on comprehensive research and analysis of basic information, ride experience and subway station guidance system, Combined with the uniqueness of the subway station with the characteristics of the audience's cognition and demand and the relevant concepts of universal design, three universal design strategies for Tianjin Jinwan Square subway station's guidance system are introduced, and reasonable and planned application of universal design strategies can truly enhance the visibility of the subway station and enable the subway station to achieve sustainable development.

4.1 Create the overall systematic structure

The signage system of subway stations needs to be standardized, including the elements of the size, color, font and graphics of the signs need to be unified and standardized, so as to improve the trust and security of passengers. Signs in subway stations should be placed in a prominent and easily accessible location, so that passengers can quickly find the information they need while walking. At the same time, it is also necessary to consider the visual distance and Angle of view of the human eye to ensure that passengers can clearly read the sign information at different positions and angles. Signs in subway stations should be concise and clear to avoid ambiguity or misdirection. The text of the logo should be short and clear, and the graphic elements should be intuitive and easy to understand, so that users can quickly get information. The sign design of the subway station should be coordinated with the surrounding environment to create a more comfortable and pleasant subway station environment. ^[3] At the same time, it is also necessary to consider the correlation and logic between different types of signs, so that passengers can read and understand the sign information quickly and accurately.

4.2 Component Elements

The components of subway station guidance system mainly include the following aspects:

(1) signage: signage is the most basic constituent elements of the subway station navigation system, the design needs to consider the material, texture, size, color, fonts and graphics to provide clear, easy to understand the guide information.

(2) lighting: mainly used for signage lighting and atmosphere rendering to provide comfortable, safe and eye-catching lighting effects.

(3) text and graphics: text needs to be concise, easy to read and understand; graphics need to be intuitive and easy to understand, able to convey information quickly. At the same time, the layout of text and graphics also needs to consider its size, color, font and typography and other factors.

(4) color: can enhance the visibility of the sign and the degree of recognition. Different colors can convey different emotions and meanings, therefore, it is necessary to consider the collocation of color

and the use of^[4]

(5) spatial layout: signage and other elements of the layout need to consider the subway station's spatial structure and people flow lines, as well as people's behavior habits and other factors, in order to provide the most reasonable, the most convenient guide service.

In the design process, with the universal design concept, to reduce the mobility of the disabled people in the process of road-finding, to provide passengers with a unique ride experience service.

4.3 Carrier

The design of the guide system should conform to the reading habits and movement direction of the car movement, and combine with the development process of Tianjin culture, the carrier setting of the guide node is extremely important, which is the link between the intersections and the associated intersections, so that the information content is more coherent, so as to achieve the best transmission effect.^[5] In the carrier of subway station guidance system design, the perception ability of special people is weak, and the old guide carrier is no longer able to accurately and quickly convey information, so it is necessary to use language broadcasting and intelligent media auxiliary equipment to accurately and quickly convey information according to the cognitive needs of all audiences. In the evening around the subway station, the transmission performance of the guidance system is relatively weak, so auditory and tactile guidance equipment can be used to ensure the safety and convenience of special people from all aspects and create a barrier-free environment.

4.4 Implement scientific guidance function

The overall core of the general design of subway station guide system is to meet the needs of all tourists to the greatest extent, realize the function of guide scientifically, and make the function of guide more universal. Establish a complete guide system database, conduct standardized design, and have functions such as dynamic display, interactive experience, intelligent navigation and integrated information. At the same time, scientific evaluation is required to continuously optimize the design and operation management of the guide system. Recognition, direction and information guidance are the basic functions of subway station guidance system, so that passengers can accurately convey the guidance information of building artistic conception in the unfamiliar subway station environment. Disseminate public information, including public norms, ways of use, danger warnings, etc., to create a safe and barrier-free environment.

5. Conclusion

Tianjin Jinwan Square subway station, as an important station of Tianjin Metro Line 3, should adapt to the development of Tianjin city in the new era. Tianjin Jinwan Square Subway Station guide system is an indispensable part of passengers' play and communication. It integrates the uniqueness of Tianjin's history and culture, extracts visual elements, and applies them to the design of the subway station guide system, improves the universality of the subway station guide system, and effectively reduces the errors of passengers' discrimination and understanding of information during the process of taking a bus. To promote the sustainable development of Tianjin Bay Square subway Station.

References

- [1] Yuanyuan Xu; Haotian Cui; Chao Cui. *Analysis on the Concept and Principle of Universal Design* [J]. Youth, 2017
- [2] Chengyue Tu. *Research on development and marketing of Marvel's post-movie products in the all-media era* [D]. Chengdu: Southwest Jiaotong University, 2020
- [3] Qiyong Liu. *Architectural Design Analysis of Subway Station building complex* [J]. Chinese Architectural Decoration, 2023
- [4] Yuancheng Zhou. *Design principles of color in interior Design and analysis of its specific application in family interior* [J]. Art Technology, 2013
- [5] Lin Lu; Sixu Chen. *The Universal design Strategy of the guidance system of the former Concession Scenic Area in Tianjin* [J]. Journal of Tianjin Chengjian University, 2020.