

## LIFE SERVICE TOD SPACE ORGANIZATION AND PLACE CREATION FROM THE PERSPECTIVE OF PEOPLE (1153)

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**Abstract.** The establishment of the comprehensive hub station has brought about an increase in the flow of people, which is regarded as a positive benefit of the comprehensive development of TOD. With the construction of the station, the surrounding area is not only a transfer station for people, but also a dynamic place for people to stay, communicate, create and even work and live about the flow of people. Based on the fact that the human-station-city mode of TOD4.0 model is the mainstream of revitalizing the block and driving the development of the area, the development of the Intelligence-human-station-city mode of TOD5.0 model is proposed for the first time, emphasizing more accurate demand perception, more accurate element allocation, more accurate spatial link and more accurate development timing, reflecting the human perspective design and human concern. Based on the project practice and the problems of parking difficulty, lack of rest area and inconvenient transfer in TOD spatial organization from the perspective of people, this paper explores the development process of life service TOD with people's destination as the end point and people's activities as the core to provide service support of different layers of station-core area-surrounding area-whole city. Explore the life service TOD space organization and place construction from the perspective of people in the new stage.

**Keywords:** human perspective; Communication; Interaction; Contact; Grey space; Positive space; design.

### 1. Introduction

#### 1.1 Research Background

At present, the process of urbanization continues to advance, and population mobility and traffic demand continue to grow. In order to meet the travel needs of urban residents and improve traffic efficiency, many areas have begun to build comprehensive hub stations. As an important node of the urban transportation network, the comprehensive hub station connects different transportation modes and routes, and becomes a hub and transfer center for people to travel. With the construction of the

comprehensive hub station, the flow of people in the surrounding area has increased significantly, which is considered to be a positive effect of the comprehensive development of TOD (Transit-Oriented Development, accessibility-oriented urban development). However, traditional integrated hub stations are often only regarded as people's transfer stations, ignoring their potential value and functions(1). With the rise of the TOD concept, people began to re-examine the spatial organization and place creation of the surrounding area of the comprehensive hub station, making it an active place where people can stay, communicate, create, and even work and live. This people-centered TOD development model emphasizes the provision of more convenient, comfortable and diversified services to meet people's ever-changing needs(2). Therefore, from the human point of view, it is very important to study the space organization and place creation of life service TOD.

## **1.2 Research purpose and significance**

This research aims to explore the spatial organization and place creation of life service TOD centered on the human perspective. Through in-depth research, we can better understand people's needs, behaviors and experiences in the area around the integrated hub station, so as to provide targeted suggestions and guidance for TOD planning, design and management. Specifically, the purpose and significance of the research include: (1) Improving the comprehensive development level of TOD: By combining the needs of people with the spatial organization and place creation of TOD, the function and quality of the surrounding area of the comprehensive hub station can be improved, and the People provide better services and experiences; (2) Promote sustainable urban development: The people-centered TOD development model can reduce dependence on private cars, promote multimodal transport and use of public transport, thereby reducing traffic congestion and environmental pollution, Promote sustainable urban development; (3) Improve people's quality of life: By creating a comfortable, convenient, safe and sustainable surrounding environment of the comprehensive hub station, people can more conveniently carry out travel, social, cultural activities, etc., thereby improving their quality of life. Quality of life and happiness; (4) Promoting economic development: The space organization and place creation of life service TOD can attract more people and business activities, and promote the prosperity and growth of the local economy(3). By providing a variety of service facilities and business opportunities, create employment opportunities, improve employment rate and economic vitality; (5) Promote social communication and cultural integration: the space organization and place creation of life service TOD provide different groups of people with an environment for interaction and communication(4). Chance. These are places where people can interact with each other, share experiences and perspectives, promote social exchange and cultural integration, and enhance social cohesion and diversity.

### **1.3 Research content and structure**

This research will explore the space organization and place creation based on human life service TOD from the perspective of human beings. The research content mainly includes the following aspects:

- 1) People-Station-City Model of TOD4.0 Model: This study will conduct an in-depth study of the People-Station-City Model in TOD4(5). Effects on human need perception, element configuration, spatial connectivity, and developmental timing.
- 2) Development of the TOD5.0 model based on intelligence-people-station-city: On the basis of the TOD4.0 model, this study will propose the TOD5.0 model based on intelligence-people-station-city for the first time, emphasizing more accurate Demand perception, element configuration, spatial connection and development opportunity reflect the design and attention of people's perspective.
- 3) Space organization of life service TOD based on people's needs: This research will focus on people's destinations and activities to explore the spatial organization of life service TOD. We will study different levels of service support, including service layout and organization in stations, core areas, surrounding areas and the entire city, to provide people with a full range of life services (6).
- 4) Creation of TOD places based on human life services: This study will explore how to solve the problems of parking difficulties, lack of rest areas and inconvenient transfers in TOD space organization through innovative practice and experience sharing(7).

## **2. TOD Space Organization and Place Creation Theory from the Human Perspective**

### **2.1 The importance of human perspective in the development of TOD**

In the development of TOD (Transit-Oriented Development, accessibility-oriented urban development), it is crucial to take the human perspective into consideration. Traditional urban planning often centers on traffic flow and functional zoning, ignoring people's needs and experiences(8). However, the people-centered TOD concept emphasizes the provision of convenience, comfort, and diverse services, enabling people to make better use of integrated hubs and surrounding areas. Therefore, incorporating the human perspective into TOD's space organization and place creation can better meet people's needs and improve their travel experience and quality of life.

### **2.2 Accurate demand perception and element configuration**

In order to realize TOD space organization and place creation from the human perspective, accurate demand perception and element allocation are crucial. First of all,

through an in-depth understanding of people's needs, habits and preferences, it is possible to accurately grasp their needs for service facilities, cultural activities, leisure and entertainment, etc. Secondly, it is necessary to rationally configure various elements, such as transportation facilities, commercial facilities, public spaces, etc., to meet people's different needs(9). Through accurate demand perception and element configuration, the surrounding space of the comprehensive hub station that adapts to people's needs can be created.

### **2.3 Spatial connection and precision of developmental timing**

The spatial organization and place creation of TOD from the human perspective also need to consider the accuracy of spatial connection and development timing. Spatial connection involves the connection between the comprehensive hub station and surrounding areas, as well as the transportation network between different areas. Accurate spatial connections can provide convenient travel paths and streamlines to facilitate people's activities around the comprehensive hub station(10). At the same time, it is necessary to grasp the opportunity of development and adjust and optimize the spatial organization in time to adapt to the trend of population flow and changing demand.

### **2.4 Human Perspective Design and Embodying Attention**

In the space organization and place creation of TOD, the design and attention from the human perspective should be reflected. This includes providing a comfortable, convenient and safe environment that meets people's physical and psychological needs. At the same time, attention should be paid to the creation of social interaction and cultural exchange, providing opportunities for people to communicate, cooperate and share experiences with others(11). Design from the perspective of people also needs to pay attention to the needs of special groups, such as the elderly, the disabled, and children, and provide them with barrier-free facilities and a friendly environment so that they can better participate in community activities and use transportation services. In addition, human perspective design should also focus on environmental sustainability, including reducing energy consumption, reducing carbon emissions, and protecting natural resources, so as to promote sustainable development. In order to realize the human perspective design and concern, it is necessary to fully listen to and participate in the opinions and suggestions of community residents, stakeholders and professionals. Through the process of community participation and joint decision-making, consensus can be formed and the needs of different groups can be met, and the effect of TOD space organization and place creation can be improved(12).

To sum up, the human perspective is of great significance in TOD space organization and place creation. Through accurate demand perception and element allocation, precise spatial connection and development timing, as well as human perspective design and

concern, it is possible to create a people-centered comprehensive hub station surrounding environment, provide convenient, comfortable and diverse services, and satisfy people To improve travel experience and quality of life. This will promote sustainable urban development, promote social exchange and cultural integration, promote economic prosperity and enhance community cohesion.

### **3. Human Issues and Challenges in TOD Space Organization**

#### **3.1 Analysis and solution of difficult parking problem**

In TOD space organization, parking difficulty is one of the problems that people generally face. Due to the high traffic flow and limited parking resources of the comprehensive hub station, the shortage of parking spaces has become an important factor restricting people's use of TOD(13). In view of this problem, in-depth analysis and solutions are required. First, consider building more parking facilities. This includes adding parking lots or multi-storey parking buildings around the comprehensive hub station to provide more parking spaces. In addition, the introduction of advanced parking management systems, such as intelligent parking navigation systems and real-time parking space information query systems, can also be explored to improve the utilization efficiency of parking spaces(14). Second, people can be encouraged and guided to use alternative modes of transportation. Reduce the need for private car use by providing a variety of transportation options, such as encouraging walking, cycling, and the use of public transportation. This can be achieved by improving road facilities for walking and cycling, optimizing public transport routes and increasing station feeder services. In addition, parking policy adjustments can also be used to ease parking difficulties(15). For example, guide parking behavior through reasonable pricing and time limits to improve the turnover rate of parking spaces. At the same time, the concept of shared parking can be explored to encourage car owners to share parking spaces to make full use of existing resources.

#### **3.2 Analysis and solutions to the lack of rest areas**

Lack of seating areas is another human problem that needs to be addressed in TOD space organization. Due to the fast-paced and high-density activities around the comprehensive hub station, people lack suitable rest places during travel. In view of this problem, in-depth analysis and solutions are required. First of all, a public rest area can be set up around the comprehensive hub station. These rest areas can include comfortable seating, rest pavilions, shade facilities and green environments, etc., to provide places for people to relax and rest. In addition, some infrastructure such as drinking fountains, public toilets and charging facilities can be provided to meet the basic needs of the people. Secondly, commercial facilities and service facilities can be

introduced around traffic nodes to provide people with more choices and convenience. For example, set up cafes, restaurants, convenience stores, bookstores, etc. to provide people with shopping, dining and leisure places. These facilities can provide people with more choices, but also increase the diversity and attractiveness of the rest area. In addition, cultural and artistic elements can be set in the rest area, providing exhibitions, artworks and sculptures, etc., to create a comfortable and artistic environment. This will provide people with a pleasant rest experience and enrich the cultural atmosphere around the comprehensive hub station. Also explore innovative lounge design ideas, such as movable seating and flexible layouts. By setting movable seats and rest equipment, people can choose a suitable rest area according to their own needs and preferences. In addition, the flexible layout design can be adjusted according to the flow of people and the type of activities, so as to adapt to the changes of different time periods and needs.

### **3.3 Analysis and solution to the inconvenience of transfer**

In TOD space organization, the inconvenience of transfer is another challenge that people face. Since the comprehensive hub station involves the connection of multiple modes of transportation, such as subway, bus, taxi, etc., people may encounter difficulties and inconvenience during the transfer process. In view of this problem, in-depth analysis and solutions are required. First of all, reasonable space layout and guidance design can be carried out to provide clear transfer guidance and paths. Set up clear signs and signs inside and around the comprehensive hub station to guide people to accurately find the exit, entrance and platform of the transfer. At the same time, it is necessary to consider the streamline design of traffic and the layout of traffic nodes so that people can transfer smoothly. Secondly, the service facilities and equipment of traffic transfer can be optimized. For example, increase the width and comfort of the transfer channel, and reduce the crowding of people during the transfer process. In addition, seats, rest areas and waiting areas in the transfer area can be added to provide people with better treatment and comfort. In addition, convenient transfer information and tools can be provided. By establishing a real-time traffic information system, people can learn about the arrival time, transfer routes and ticket prices of different traffic modes. At the same time, smart phone applications or electronic navigation devices can be provided to help people better plan transfer trips and obtain relevant information in a timely manner.

To sum up, parking difficulties, lack of rest areas and inconvenient transfers are important aspects of human problems and challenges in TOD space organization. Through in-depth analysis and corresponding solutions, these problems can be effectively dealt with, and the spatial organization and place creation effect of TOD can be improved. Building more parking facilities, encouraging alternative modes of

transportation, and adjusting parking policies are key strategies to address parking difficulties. Increasing the number of parking spaces, introducing smart parking management systems, and the concept of shared parking can improve the utilization efficiency of parking resources. At the same time, by improving walking and cycling facilities, optimizing public transportation routes and strengthening station connection services, the demand for private car use will be reduced. To address the lack of rest areas, setting up public rest areas, introducing commercial facilities and service facilities, and adding cultural and artistic elements are effective solutions. Providing comfortable seating, infrastructure and a variety of options can provide a place for people to relax and rest. At the same time, the introduction of artistic atmosphere and flexible layout design can enrich the experience and attractiveness of the rest area. To solve the problem of inconvenient transfers, it is necessary to consider space layout, orientation design and optimization of service facilities. Clear signs and signs, reasonable flow design and comfortable transfer areas can help people transfer smoothly. Providing real-time traffic information, convenient transfer tools and equipment can increase the convenience for people to obtain information and plan their trips. By solving these problems, the degree of humanization of TOD space organization can be improved, more comfortable, convenient, and diverse places can be created to meet people's needs, and improve travel experience and quality of life. This will promote sustainable urban development, promote social exchange and cultural integration, promote economic prosperity and enhance community cohesion.

#### **4. The development process of TOD based on human life services**

##### **4.1 Life Service TOD Ending at People's Destination**

In the development process of life service TOD, the destination of people is an important consideration. Traditional transportation planning and urban design often focus on transportation networks and functional facilities, while ignoring people's travel purposes and needs. However, people-based destination design can better meet people's living needs and expectations. First, it is necessary to fully understand the types and characteristics of people's destinations. People's travel purposes can include work, study, shopping, entertainment, medical treatment and other aspects. By studying people's travel behavior and needs, the spatial requirements and functional needs of different destination types can be determined. Second, different types of destinations need to be rationally planned and configured in the TOD spatial organization. For example, office buildings, schools, commercial centers, cultural facilities, etc. can be built around the comprehensive hub station to meet people's work, study and entertainment needs. At the same time, it is necessary to consider the spatial connection and convenience between destinations to ensure that people can travel between different destinations

conveniently.

#### **4.2 Life service TOD centered on human activities**

In addition to taking people's destinations as the end point, taking people's activities as the core is also an important concept in the development of life service TOD. People's travel is often accompanied by various activities, such as socializing, leisure, sports and so on. Therefore, by putting human activities at the core, it is possible to better provide support and create places suitable for different activities. First, people's activity needs and preferences need to be fully understood. Through research and user feedback, we can understand people's activity preferences and frequency around the integrated hub station, as well as their expectations and requirements for the activity venue. Secondly, spaces and facilities suitable for different activities need to be designed and created. For example, set up social communication areas, public squares, sports venues, etc. to provide people with places for communication, leisure and sports. At the same time, it is necessary to consider the spatial layout and connection between different activities, so that people can switch and transfer different activities smoothly.

#### **4.3 Different levels of service support: station-core area-surrounding area-whole city**

Life service TOD needs to provide different levels of service support, covering stations, core areas, surrounding areas and the entire city. Each level has specific functions and service characteristics, which can provide all-round support for people's life.

First of all, service support at the station level is the core of life service TOD. In the station area, convenient public transport connection services need to be provided to ensure that people can enter and exit the station conveniently. At the same time, facilities such as ticketing services, information consultation, and security guarantees should be set up to meet people's travel needs and safety needs. Secondly, the service support at the core area level is to provide convenient places and facilities for people's work, study, shopping and other activities. In the core area, office buildings, commercial centers, schools, medical facilities, etc. can be built to meet people's various service needs. At the same time, it is necessary to provide a wealth of commercial, cultural and entertainment facilities to create a vibrant city center area. The service support at the level of the surrounding area is the places and facilities that provide convenience for people's daily life. In the surrounding areas, residential areas, shopping centers, leisure and entertainment facilities, etc. can be set up to meet people's living, shopping, and leisure needs. In addition, it is necessary to pay attention to the design and planning of public space, provide green spaces, parks and walking paths, etc., to provide people with a comfortable environment and leisure places.

The service support at the whole city level is the urban planning and service facilities that provide convenience for people's overall life. Including the improvement of the



public transportation network, the humanization of urban design, the construction of community facilities, etc., to improve the quality of life and the living environment of the city as a whole. By providing different levels of service support, life service TOD can meet people's needs at different levels and aspects, and build a multi-functional comprehensive space that integrates life, work, study, and entertainment. This will improve the convenience and comfort of people's life, promote the sustainable development of the city and the happiness of residents.

## **5. Case analysis of TOD space organization and place creation based on human life service**

### **5.1 Cases of innovative solutions to solve parking difficulties**

Parking is one of the challenges faced by many TOD projects around integrated hubs. However, through innovative solutions, parking difficulties can be effectively alleviated and convenient parking services can be provided. The following are some successful case studies:

#### Case 1: Intelligent Parking System

A TOD project around a comprehensive hub station introduced an intelligent parking system. The system utilizes advanced sensor technology and real-time data analysis to provide accurate parking space information and navigation services. Passengers can find available parking spaces and reserve or pay for parking through a mobile phone app. This smart parking system not only provides a convenient parking experience, but also reduces the waste of parking space and traffic congestion.

#### Case 2: Shared parking concept

Another innovative solution is the introduction of shared parking concepts. In this case, the TOD project around the comprehensive hub station cooperates with surrounding enterprises, residents and parking lot operators to share parking resources. By establishing a parking sharing platform and a reasonable resource allocation mechanism, the optimal use of parking spaces can be achieved, the vacancy rate of parking spaces can be reduced, and more parking options can be provided.

### **5.2 Design Practice Cases for Providing Adequate Rest Areas**

The lack of rest areas is one of the problems faced by many TOD projects around integrated hubs. In order to provide a comfortable rest environment and meet people's leisure needs, some innovative methods have been adopted in the design practice. The following are some successful case studies:

#### Case 1: Multifunctional rest area

The TOD project around a comprehensive hub station has designed a multi-functional

rest area, providing a variety of facilities and services. The rest area is equipped with comfortable seats, leisure areas, charging facilities, public toilets, etc. to meet people's rest and social needs. In addition, green plants and landscape elements are also set up to create a pleasant environment.

#### Case 2: Creative Rest Area Design

Another innovative design practice is the use of creative lounge area designs. In this case, the TOD project around the comprehensive hub station introduces art installations, outdoor sculptures, water features, etc. to provide interesting and unique

### **5.3 Cases of Successful Experience Sharing in Optimizing Transfer Convenience**

Transfer inconvenience is an important issue in the space organization of comprehensive hub stations. By optimizing the convenience of transfer, people's travel experience and traffic efficiency can be improved. The following are some successful experience sharing cases:

#### Case 1: Seamless transfer design

The TOD project around a comprehensive hub station adopts a seamless transfer design. In this case, the connection points and facilities of different transportation modes are tightly integrated so that people can transfer conveniently. For example, convenient pedestrian passages and connecting facilities are designed between bus stops, subway stations and bicycle parking areas, which shortens the distance and time of transfers.

#### Case 2: Information-oriented transfer experience

Another successful experience sharing is the information-oriented transfer experience. By setting up clear guide signs, digital display screens and information kiosks in the comprehensive hub station and surrounding areas, people can easily find the correct transfer route and traffic information. In addition, mobile applications or online platforms can be used to provide real-time traffic information and navigation services to help people plan the best transfer routes. Through the analysis of these cases, we can see that in the TOD space organization and place creation based on human life services, solving parking difficulties, providing sufficient rest areas and optimizing transfer convenience are crucial. These innovative solutions and successful experience can provide reference and reference for other similar projects to achieve a better living environment and travel experience.

## **6. Conclusion and Outlook**

### **6.1 Research Conclusions**

Based on the perspective of people, it studies how people's needs and concerns are

reflected in the TOD space organization and place creation of life services. First of all, the introduction part introduces the increase of people flow brought by the comprehensive hub station construction and the positive benefits of TOD comprehensive development, and proposes the transition from TOD4.0 mode to TOD5.0 smart man-station-city mode, emphasizing more precise demands. The importance of perception, element configuration, spatial connectivity and timing of development. The second chapter discusses the importance of human perspective in the development of TOD, and elaborates the theory of accurate demand perception and element allocation, spatial connection and development timing, as well as human perspective design and attention expression. These theories provide guidance to bring TOD spatial organization and place creation closer to people's needs and concerns. The third chapter analyzes the problems and challenges faced by people in TOD space organization, including parking difficulties, lack of rest areas, and inconvenient transfers. In response to these problems, corresponding solutions are proposed, such as smart parking systems, shared parking concepts, and creative rest area designs, etc., to optimize people's travel experience. The fourth chapter introduces the development process of TOD based on people's life service, taking people's destination as the end point and people's activities as the core, and discusses the service support at different levels, including stations, core areas, peripheral areas and the whole city. This development process emphasizes the importance of meeting people's needs and activities, creating an integrated hub and surrounding area with humanistic care. Finally, the fifth chapter shows the practical experience of TOD space organization and place creation based on human life service through case analysis. Cases covered innovative solutions for parking difficulties, design practices for providing adequate rest areas, and successful experience sharing for optimizing transfer convenience. These cases provide specific reference and reference for other similar projects, and provide ideas for creating a better living environment and travel experience.

## **6.2 Research Outlook**

In the future, TOD space organization and place creation based on human life service will continue to develop and innovate. With the advancement of technology and changes in society, people's needs for travel and life will continue to evolve. Therefore, we need to constantly adjust and optimize space organization and place design to adapt to people's changing needs. At the same time, we should also pay attention to the following prospects: First, with the development of smart technology, technologies such as artificial intelligence, big data and the Internet of Things will play an increasingly important role in the TOD space organization of life services. Through intelligent facilities and systems, people's needs can be better sensed and responded to, and personalized service experience can be provided. For example, the smart parking system can realize accurate parking navigation and reservation, and reduce parking troubles; smart

guidance screens and mobile applications can provide real-time traffic information and navigation services to help people transfer easily. Second, sustainability will become an important consideration in the TOD space organization of life services. In design and construction, attention should be paid to resource conservation and environmental protection. For example, renewable energy can be introduced to supply the energy demand of integrated hub stations and surrounding areas, promote low-carbon travel methods, encourage the use of walking, bicycles and public transportation, reduce car usage and traffic congestion, and achieve the goal of sustainable urban development. In addition, people's needs for social, cultural and entertainment are becoming more and more important. In the life service TOD space organization, social and cultural facilities can be introduced, such as public squares, art exhibition spaces and performance venues, to enrich people's life experience. At the same time, encourage diversified business and entertainment activities, attract people to stay in the area around the comprehensive hub station, and create a prosperous business ecosystem. Finally, interdisciplinary cooperation and community participation are the keys to promote TOD space organization and place creation based on human life services. During the planning and design process, opinions and suggestions from all parties should be widely sought, including the government, designers, residents and relevant stakeholders. Through multi-party cooperation and joint efforts, better overall planning and coordinated development can be achieved, and a comprehensive hub station and surrounding areas with humanistic care and community identity can be created.

To sum up, TOD space organization and place creation based on human life service is a complex and critical task. Through in-depth research on people's needs and concerns, combined with innovative solutions and successful experience, we can continuously improve people's travel experience and quality of life, and create a livable, sustainable and dynamic urban environment. Future development will continue to focus on personalized services and the application of intelligent technology to meet people's diverse needs. At the same time, it pays attention to the development of sustainability and social culture to provide people with a richer and meaningful space experience. Intersectoral collaboration and community engagement will be important drivers of development, ensuring that spatial organization and placemaking meet the expectations and interests of all parties. Looking forward to the future, we should also attach importance to the combination of research and practice, and continue to conduct case studies and experience sharing to accumulate more successful cases and best practices. In addition, regular evaluation and monitoring are carried out to understand people's satisfaction with and changes in demand for the TOD space organization of life services, and timely adjustments and optimizations are made. Continue to carry out academic research and innovative practice, and promote the continuous progress and development of living service TOD space organization and place creation.

In conclusion, human-based life service TOD space organization and place creation is a comprehensive and complex field involving multiple considerations and decisions. Through in-depth research on people's needs and concerns, combined with innovative theories and practices, we can build a humanized, sustainable and vibrant integrated hub station and surrounding areas to provide people with better travel and life experience. With the development of technology and society, we are confident to realize more humanistic TOD space organization and place creation in the future.

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