International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 11 Issue 4 ǁ April 2023 ǁ PP. 128-134

Research on TOD theory and its practice

author

Abstract
With the rapid development of China's urban society and the continuous growth of population, China's first-tier and second-tier cities are undergoing more and more serious pressure test of urban density, and transportation has become a major problem restricting urban development. Through the analysis and research of urban development and transportation, it is found that sustainable transportation mode plays a crucial role in urban development, and one of the key means to achieve sustainable development of urban and transportation is to implement urban land development mode of public transportation.
The research content of this paper is the study of TOD theory and its practice. Through the detailed analysis of classic cases, the feasibility of TOD mode, design principles and its influence on the development of urban and rail transit are proposed in combination with cases. The results show that for different urban models, the adoption of TOD mode can enhance the development of urban traffic, but for different cities, the specific implementation and problem-solving measures are still different, but in general, the TOD mode still has its unique advantages for the future development of urban traffic.
Therefore, the TOD model provides urban planners and policymakers with a more sustainable green tool. For the domestic rapid development of the city, is to enhance the vitality of the city, for the citizens to provide a new, more comfortable, more efficient life and work mode of an important opportunity.
Keywords: The feasibility of TOD model developmentl; Principles of TOD design;Impact on urban and rail transit development; Promoting the development of urban construction

---

Date of Submission: 25-03-2023 Date of acceptance: 07-04-2023

I. Introduction

1.1 Research background

People have long recognized that transportation promotes and shapes the development of urban space. At the same time, the land use planning process may affect the mobility of the population. Historically, as part of the industrial revolution, the development of transportation based on Mara and mechanized railways has set off a huge change, from a compact small pedestrian city to an expanded star city that follows public transportation routes. Since 1920, in the United States and later elsewhere, the massive production and ownership of private cars have contributed to the continuous development of cities between radial transportation and urban expansion. In many countries, the adoption of planning limits the further expansion of cities, but the intensity of planning control varies greatly from the smallest to the largest. With the rapid increase in car ownership, the passage to the Central Business District (CBD) has become more congested, cities have become more dispersed, and cars have increasingly shifted economic activity to more car-accessible locations, especially near suburban highway intersections and rail loops. The suburbs of the city become new urban centers, especially in countries with weak planning controls. Therefore, transportation infrastructure investment plays a vital role in urban planning and can become a decisive tool for development.

1.2 Research status

1.2.1 Foreign situation

In foreign countries, traffic-oriented development (TOD) was introduced by Peter Calthorpe in the early 1990 s as a tool for the design and planning of public regional transportation systems and the development of medium or high-density mixed-use urban environments. Although deindustrialization, unemployment and population decline affected many cities and towns in heavy industrial areas between 1980 and 1990, not all cities and towns in economically developed countries experienced these effects. For example, the Sun Belt cities in the United States flourished during this period, which is home to most of the new light rail system in the United States. They provide another option for increased car traffic and congested roads, and encourage repositioning of development directions from disorderly, car-dependent suburbs to denser, mixed-use, multi-modal urban centers (TOD). Part of the reason for the transition to a post-industrial economy is to choose

whether to invest in building a new public transport system. This has led cities in some developed countries to adopt TOD as the main driver of urban renewal. The latest research puts forward the close relationship between transportation and urban regeneration and new urban development. TOD links new transportation systems with urban planning. TOD is now based not only on heavy rail transit (HRT) systems, but also on light rail transit (LRT), bus rapid transit (BRT) and shared bikes.

In contemporary developed cities, rail transit and BRT are facing major challenges, because the popularity of car availability means that most residents can choose cars as a mode of transportation in some or all of their trips. Therefore, the high frequency, high speed and high capacity of the public transport service network are very important in the competition with the flexibility of automobile use.

TOD strengthens the impact of investment in light rail or heavy rail and bus rapid transit. The decision-making of private enterprises and public sectors that plan policies shifts the focus to housing, employment, activity venues and public services around stations. This is more difficult to achieve in the neoliberal political environment, and market-driven forces may conflict with the goal of sustainable urban development.

Contemporary rail-based TOD also includes new high-density urban development, particularly in several major cities such as Seoul and Singapore. In Copenhagen, starting in 2002, the development of the new town of Olastad was promoted from a new small-scale light rail line, as a new mixed-use land reclamation development. The Danish broadcaster DR Byen has relocated from a number of CBD locations, and Flynn Pharmaceuticals and Ramber Engineering have also rationalized their corporate projects in different ways and relocated here. The railway and motorway routes of the Øresund Bridge, the location where Aulastad is located, bring an additional dimension to TOD in Sweden.

1.2.2 Domestic situation

After decades of development, Japan, Hong Kong and Singapore are the representative cities of the world TOD model, with perfect cases and rich experience. [1] In China, due to different policies and national conditions, the application of TOD is not as popular as overseas. At present, TOD is still in the initial stage of development, and only a few high-speed growth cities have sufficient foundation to implement it. Especially with the rapid development of the city, the problem of urban planning has gradually expanded. The state and major cities attach great importance to the TOD plan and construction model and have issued many decrees. At the same time, many cities have carried out a lot of exploration and accumulated some experience. Taking Hong Kong as an example, Hong Kong, China has many mountains and more than 7 million people. It is one of the most densely populated cities in the world, so that there is less construction land and high-rise buildings everywhere. However, Hong Kong 's urban traffic has always been smooth, which is inseparable from its extremely high public transport utilization rate. [2] Over the past 20 years, China 's railway construction boom has accumulated, and the surrounding areas of the railway have become an important space for China to achieve TOD development.[3] However, due to the lack of division and understanding of the system, the construction of China 's railway surrounding areas is not sufficient. They must cross at least four roads regardless of the direction to the subway station ; no matter which bus to transfer, at least 350 meters. Therefore, the walking environment around subway stations in many cities is very inconvenient. In 2013, with the goal of low-carbon city development, Zhuhai North Station provided another opportunity to run the TOD development model for China 's new urban construction. This plan not only implements some public transport principles that guide urban development, but also uses landmark bays, lovers ' roads and bus boulevards, combines unique public places and parks, develops a series of unique public places, introduces a series of advanced ecosystems, and allows the new urban area to carry out more green and low-carbon TOD development, making the city more attractive.

At the China Urban Rail Transit High-level Forum, the new construction concepts of " track + property, " " track + community, " " track + town " and " track + new town " were put forward. [1] However, with the gradual implementation of these concepts, some problems have been found : policies and regulations cannot be applied, lack of land resources suitable for implementation, the market and the model cannot be linked normally, and the planning and construction are not synchronized. However, it is believed that after constantly running in with China 's development status, the TOD model can be more widely promoted and promote urban planning and development.

From the perspective of the process of national track development, the Railway Corporation and the provincial and municipal local governments have made efforts to innovate the mechanism, explore and promote, and have achieved results. In recent years, some TOD mode of railway land comprehensive development projects, such as Chongqing Shapingba hub complex, Guangzhou Kaidaer International Plaza and other projects have been completed, the development along the Fuzhou-Xiamen high-speed railway, the development along the Pearl River Delta, Hangzhou Genshan Gate EMU project and so on, a large number of projects are in an orderly manner, the subway has occupied 75 % of the urban rail. [4] From 2011 to July 2018, the number of

cities in China increased from 13 to 36. In addition, 15 cities have been approved for urban planning, and future implementation is planned in more than 51 cities nationwide. TOD plays an important role in the next development trend of the city, with sufficient theoretical basis, policy basis, industrial basis, local basis and market basis.

1.3 Research purpose and significance

After years of improvement and development, the TOD development model combines the emerging urban design concept with the characteristics of modern life, reshapes the spatial structure of the city, and brings convenience and comfort to people 's daily life and travel environment. Therefore, for the TOD model that has been widely used abroad, it will bring some improvement to domestic public transportation and people 's travel. The key to improvement is to solve the running-in of the TOD model with the domestic traffic situation and the combination of national conditions. In order to make the TOD model better and more widely used in China, in order to optimize the domestic traffic situation, improve the comfort of residents ' travel and improve the happiness of residents ' life.

1.4 Research process and methods

Based on the research topic of this paper, literature analysis and comparative analysis are carried out. In order to write this paper, the author consulted the literature and materials about TOD, communicated with the tutor in time, and gradually clarified the logical framework of the paper. At the same time, I also read relevant books in time to supplement my understanding of the concepts of relevant professional fields.

II. Concept

Since 1980, the United States has begun a new urbanism movement to solve the problems of congested traffic, sprawling cities and inner-city recession. The birth of the public transport-oriented development model has caused a theoretical boom in solving housing and transportation problems. The design concept of " people-oriented " is different from the mechanical " model design. " By facing the reality of urban expansion, it emphasizes the concept of mixed land layout and the development of public transportation, and provides new ideas and theoretical guidance for solving traffic problems and social economy. Transport-oriented development (TOD) is considered to be an effective planning strategy for sustainable urban development and has recently been widely used worldwide.

In a broad sense, TOD refers to the urban development model dominated by the construction of any transportation facilities, while in a narrow sense, TOD refers to the development oriented by public transportation. It coordinates the contradiction between traffic congestion and land shortage in the process of urban development through land use and transportation policies. [5]

Transit-Oriented Development (TOD) is a relatively new neighborhood development model that has been conceptualized as urban development and combines nodes (such as transit stations) and locations. [6] The characteristics of location standards are usually : support the medium to high density development of node public transport services ; a mix of land uses, such as residential, commercial, recreational and institutional, to promote and attract activity participation within the venue ; and well-connected street networks to integrate activities with active traffic. Therefore, this proximity and connected land use management reduces the need for people living in the TOD area to travel to another place to meet a specific need. However, if people need to travel elsewhere in the city to obtain goods and services, they can choose the fast, high-frequency and well-connected services provided by TOD nodes to meet the demand. Therefore, TOD is not only a transfer station to capture service needs, but also a place that integrates residence, shopping, travel and social interaction. It is also a carrier of personal and social communication and a manifestation of the urban development process characterized by concentration and dispersion. Therefore, TOD is identified as a key policy tool to prevent car travel, reduce greenhouse gas emissions and traffic congestion, thereby improving quality of life, social inclusion, health and well-being.

III. TOD mode application related problems and their solutions

3.1 Feasibility of adopting TOD development model

In the TOD mode, public transportation is the key. Compared with developed countries, China 's small car ownership is significantly lower, which also provides the necessary conditions for the TOD model of urban construction. China 's urban population density is significantly higher than that of Western countries. At this stage, the development period of urban development in China is developing rapidly. In the city, the rapid influx of population and the excessive pursuit of economic growth have led to the problem of urban traffic congestion

in the process of urban development. If these problems are not controlled, they will have a significant impact on urban construction and urban long-term development. In view of these problems, the application of TOD model in urban construction is not particularly perfect, but this model can deal with various urban traffic planning problems, which is a reasonable choice.

It is also the common policy orientation of many cities in China to adopt the TOD model, create a high-density living circle, and encourage the core of railway traffic stations to become a public service center in the community. On the one hand, when the field of life is combined with TOD, the role of TOD is fully reflected, and the normal operation of TOD can meet the needs of the population. In order to promote the intensive development of cities in China, many cities in China are adopting the TOD model to develop high-density land. By combining residential space with TOD, the residential function is concentrated around the railway traffic station, and the residents use public transportation facilities to enhance the balance and meet the requirements of green ecological city. Thinking from the direction of rail transit operation, the huge population of the living circle can provide a reliable guarantee for the normal operation of rail transit. [7]

On the other hand, through the combination of TOD and life circle, the population brought by traffic can support the land development of life circle, so that the construction of high-density life circle is no longer as remote as before. In order to solve the high-density problem of the city, it is necessary to build high-density and ultra-high-density residential areas to solve the residential problems of residents in the context of high-density, and whether the structural density of the living circle can be solved is a core issue. Under the operation mode of TOD, it guarantees the daily travel of many residents and provides the necessary conditions for the construction of high-density residential areas. In recent years, China 's big cities have laid a reliable foundation for the construction of high-density residential areas for the strong construction of rail transit systems. In general, in the construction process of various cities in China, the basic spatial basis for the application of TOD has been established, so TOD technology can be more applicable on the basis of this city.

3.2 Design principles of TOD

3.2.1 High quality bus service

Public transport is the central element of TOD. Urban public transport is a major livelihood project, responsible for providing general travel services to the public. The success of TOD also depends on the charm of public transport services. The overall high quality of public transport services has attracted existing potential passengers. As an important part of the transportation industry, urban public transport plays an important role in the initial and final traffic. [8] Only by improving the quality of public transport services, can we hone the business card of the first city, expand the breadth and depth of public transport services, and increase the provision of high-quality services. At the same time, improving the service guarantee ability can improve the internal strength of urban public transport development, and the design, identification, related information and connection of various travel routes of bus stops or hub buildings all affect the service quality. [9]

3.2.2 Development of three-dimensional blocks

The development of three-dimensional blocks takes into account the concept of traffic congestion around China 's urban railway stations.In order to solve the problem of traffic corridors and pedestrian flow, the purpose is to form a continuous pedestrian system around the station by connecting pedestrian traffic corridors to air corridors and stations. [10] In China, the mode of subway construction is mainly TAD, which is a simple version of TOD.It lacks overall land planning and often overlaps with the business community, resulting in disorderly expansion. [11] In general, compared with other urban development models, the biggest difference of TOD is the scale of composite business and the development of public transport. Especially for China 's first-tier cities, increasingly tense land resources and expanding population will lead to unlimited expansion of the city, and cause traffic congestion, ecological damage and other problems.

When it comes to the successful examples of three-dimensional pedestrian blocks, the first thing that comes to mind is the urban pedestrian space model in Hong Kong. By constructing a three-dimensional pedestrian network centered on pedestrian overpasses and underground sidewalks, the conflict between pedestrian and vehicle traffic on the ground is solved. Pedestrians can easily access the station and surrounding buildings through the second floor corridor and the underground corridor, although the upper floors are limited by car traffic. Therefore, Hong Kong is known as a ' city without pedestrian flow '.It is difficult to see passers-by walking on the sidewalks on the ground, because the footbridges that almost cover most of the city have effectively connected the places that people need to travel daily. Therefore, combined with the construction of the three-dimensional pedestrian network model, first of all, improve the comfort of the walking environment, strengthen the walking convenience of the station, and improve the utilization rate of railway transportation ; secondly, optimizing the walking environment to shorten the psychological walking distance of pedestrians can improve the radiation impact range.Thirdly, the pedestrian network can realize the overall integration of

business, entertainment, offices and other public facilities in the park, promote the coordinated interaction of functions through traffic links, improve land use efficiency and optimize the spatial layout of blocks.

The TOD model will be combined with public transport to develop three-dimensional blocks suitable for walking distance. People can work, live, relax in it, reduce dependence on cars, reduce commuting time, and greatly improve urban happiness and vitality.

3.2.3 Combined with short-distance traffic

Cycling and walking are the main options for short trips. In addition, as the ' last mile mode ' between transit stations, they are also the main factors affecting residents ' use of public transport systems. The key to the success of TOD lies not only in the well-designed station walk-friendly corridor, but also in the higher number of public transport passengers. Therefore, in implementing and evaluating TOD projects, it should be crucial to provide access for pedestrians and to meet as many activities as possible. Bicycle use is significantly related to building environmental factors, and TOD also has the potential to flourish in places where cycling is booming. Cycling allows TOD users to walk 3 to 5 times longer than walking, and can reach 25 times larger accessible areas. Cycling and public transport need to develop a symbiotic relationship. Riding should not only be used as a supply model for TOD, but should be an integral part of the travel experience where possible. Therefore, bicycles are becoming more and more important in TOD, and the use of bicycles is growing with the development of dedicated bicycle lanes, bicycle parking and innovative bicycle sharing programs.

Bicycle sharing is a hybrid travel mode that has grown exponentially worldwide over the past decade and has become another possible pillar of TOD because of its ability to provide flexible, people-friendly prices and sustainable first-mile and last-mile mobility solutions. Bicycle sharing provides passengers with short-term use on an ' on-demand ' basis, extending public transport services to final destinations and potentially increasing residents ' use of bicycles. If it can prompt residents to stop using cars at a distance beyond a comfortable walking distance, it could add another environmentally friendly dimension to TOD. It can also be a secondary service at the starting point and destination of travel within a central area, especially a primary service based on rail and bus, complementing it. Bicycle sharing is now usually based on the global positioning system and can be easily accessed through mobile applications. Despite recent legitimate criticisms of many failed plans, bike sharing can still be effective and attractive when it coexists with extensive bike lane and bike lane networks, bike parking facilities and bike-friendly policies.

3.3 The impact of TOD mode on urban and rail transit development

3.3.1 Impact on travel behavior

It is alleged that the quality and configuration of the surrounding built environment have an impact on travel choices : 1.4-5.1 % more communities on public transport ; the average leisure walking trip of residents in traditional communities is 10 % more than that of car-oriented suburban residents. In Brisbane, the probability of using traffic in non-TOD and potential TOD areas is 1.4 and 1.3 times lower than residential TOD, while the probability of walking and cycling is 4 and 2.5 times lower, respectively.In Toronto 's central business district, transportation competes with walking, as 41 % of commutes are on foot. [12] Other studies have also pointed out that neighborhood characteristics may also affect modal splitting. People believe that TOD, combining bus supply with a highly walkable built environment, may encourage more sustainable travel patterns. However, in different studies, with the increase of TOD, the decrease of car travel is different.

Using data from one-day travel diaries, foreign scholars have conducted a more detailed analysis of the impact of TOD on travel behavior among residents of 26 TOD housing projects in California. The level of public transport within walking distanceThe station is compared with stations in remote areas, taking into account heavy rail, light rail and commuter rail. People are willing to live in a place where they can continue to use their usual local mode of transport, transit in this case. The proportion of station public transport among residents living between 800 meters and 4.8 kilometers is only 7 %, while the proportion of people within 800 meters is 27 %, of which 85 % go to the station in a non-motorized manner. It can also be clearly concluded that the level of public transport assistance is more likely to be achieved by strengthening the supply of housing near the station and providing accommodation for small families with fewer cars, which can often be achieved near the point of travel.

3.3.2 Impact on real estate prices

Overall, in theory, proximity to the station and subsequent accessibility advantages should be reflected in the price premium. However, in fact, the relationship between these two factors may not be so direct. For example, it is possible that the value of a property varies according to the type of transportation infrastructure (heavy rail or light rail), the type of property (commercial or residential) and the level of neighborhood income. In addition, studies have shown that the value of residential property in the area near the subway station

(a radius of 400 meters) may decline due to the following reasons : congestion, noise and potential crime rates increase, but often exceed this limit, reaching a maximum distance of 1.6-4.8 km, and then decreasing again. [14] In addition, if the nearest station has a parking lot, but for houses near the station, the parking lot may be negligible. At the same time, the price increase and its distribution in the station area may depend not only on the distance, but also on the service scope and reachable destination. By controlling for spatial autocorrelation and other factors that are potentially important to real estate values, high-income communities found additional value surpluses. In general, proximity to TOD leads to higher house prices, and the real estate market is best developed by improving resident-friendly transport services.

3.3.3 Impact on residential location

The dependence of TOD residents on traffic habits has sparked discussion about the role of self-selection in the observed choice model, as one can suspect that the higher levels of traffic use often reported in the area where the station is located are actually the result of TOD, or that they simply reflect a preference for people to continue to live in places with the same mode of travel as before. Studies have shown that people with jobs may live within a mile of a traffic station. In any case, it is important to provide people with a lifestyle close to public transportation. As long as people have needs, they can make the surrounding residents rely on sustainable transportation models. Otherwise, communities without adequate transportation or infrastructure such as pedestrians and bicycles will not only ' self-select ' car-friendly residents, but will even deepen their attachment to cars.

3.3.4 Impact on urban form

In the previous analysis of the station how to affect the adjacent land use and the overall urban model. In fact, the ever-changing urban landscape should help define traffic development, and traffic development should help define urban form. Some foreign scholars have analyzed the economic and spatial changes around the railway station. It is reported that the population density along the subway has declined overall, while the value of real estate has increased significantly. These trends are particularly evident in the central area and around stations with high levels of network connectivity. At the same time, suburban populations typically grow along a new public transport route, suggesting that population distribution may be linear along the route. A detailed descriptive analysis of Denver 's intention to implement the TOD policy, change zoning regulations, and allow land-use changes in station areas for encryption and mixed use, combined with the types of stations described by the City Council, including residential and non-residential areas along the main line of light rail, can be found. A significant increase in TOD projects.Specifically, changes have taken place around the six stations in the city center, where 89 % of government office buildings and 61 % of cultural venues are located, accounting for 90 % of all ' office areas '. Thus, as the main attraction of the new development, the public transport system now plays a relevant role in changing the urban form and potentially reducing the use of cars by local residents.

3.3.5 Impact on community life

In the context of TOD, in addition to sustainable mobility patterns and dense built environments, the generation of a vibrant and active community is often mentioned mainly as a result of TOD implementation. The use of various types of land in TOD can address issues related to social exclusion and social capital by creating direct access to activities and social networks. It is believed that TOD is characterized by providing good conditions for vibrant street life, so communities should be naturally linked to communities. Since TOD is likely to trigger a rise in the price of adjacent real estate, there are concerns that low-income residents will be forced to leave an area and give it to wealthy population groups. This shift may have the opposite effect on TOD efficiency. Because high-income groups are often reported to have higher car ownership and more driving rights, it is debatable whether they will use public transportation.

IV. Conclusion

Thanks to past research efforts, many different effects of TOD implementation can now be well understood. Since the concept of TOD is multidimensional, it involves changes in different aspects at the same time (but may not be at the same speed), and ultimately creates an interdependent complex network. In general, the TOD model increases the use of infrastructure provided near the station and increases real estate prices in neighboring areas. In turn, rising real estate prices may lead to continuous densification of the station area. It is worth exploring whether the number of passengers on public transport remains high once high-income groups settle in TOD. Usually, the above changes occur gradually over time, so some TOD effects may take time to fully demonstrate. Although previous studies have made progress, there are still many open opportunities and

challenges to be overcome in TOD research. Some of these challenges arise in TOD planning and development of user-friendly decision support methods that can be prepared for the popularization and application of TOD projects with the participation of all stakeholders.

There is evidence that policymakers need to better understand what is TOD and what is not TOD.To promote the development of TOD in the 21st century, it is necessary to continuously recognize the high-frequency transportation services that constitute TOD success. In addition to this, it is now important to recognize that ' transport ' includes the evolving variety of modes of transport that are concentrated in urban development. As discussed in this paper, these modes of transportation involve (though not limited to) various forms of rail transit, BRT, walking, cycling and autonomous driving modes.

The core of TOD is a series of evolving transportation models, which indicates that urban planning is moving in an increasingly sustainable direction. In this process, urban growth needs to be balanced with more environmentally friendly, socially equitable goals and smart growth strategies.

How urban planners and transportation developers can more effectively use past successful TOD experiences as a compass for future conceptual development. Is there any more policy that can limit the priority to cars rather than TOD mode ; can TOD continue to affect the change of travel behavior in a dynamic world ; how to promote the introduction and use frequency of TOD mode in a more efficient way is a problem that future research should solve, so as to provide a more sustainable way for future livable cities in cities seeking win-win synergy between transportation and land use planning, so that TOD can maximize its role.

Reference

[1]. Yan Shilin. The development status and landing points of TOD in mainland China [J]. China Industry and Economics, 2020, No.234 (02) : 64-65.
[2]. Ding Jian.Research on the profit model of Nanjing Metro Company [D].Nanjing University of Posts and Telecommunications.
[3]. Chinese practice of TOD model [J].China Weekly, 2019,000 (002) : 46-55.
[4]. Zhang Jianping, Li Qianru.Exploration and Practice of Railway Station and Its Surrounding Land Development under TOD Mode [J].Building Practice, 2019, No.11 (09) : 36-41.
[5]. Ma Buhai, Fan Chunxue.Research on TOD mode and implementation elements of railway trunk line [J].China Railway, 2016 (11).
[6]. Xiong Huanjie.Discussion on the operation mode of Shenzhen rail transit investment and financing platform [J].Utilities accounting, 2015 (3) : 31-35.
[7]. Mao Jian, Wang Zhen.Analyze the management mode of urban rail transit network operation materials [J].Low-carbon world, 2017,000 (036) : 295-296.
[8]. Zhang Lin. Beijing Urban Rail Transit Passenger Flow Identification and Safety Assessment Technology and System [D]. Beijing Jiaotong University, 2011.
[9]. Ma Qiyuan.Research on the overall renovation of the square area in front of the urban railway station [D].Chongqing University, 2013.12-13
[10]. He Donghua, Wang Moxiao.Planning and Design Principles for the Surrounding Areas of Urban Rail Transit Stations-From the Perspective of Public Transportation Oriented Development Model [J].Urban Issues, 2014,000 (005) : 39-43.
[11]. Puma Industrial Real Estate. TOD development model - an important development direction. https://www.toutiao.com/i6931152267445879299/,2021-2-20.
[12]. Kamruzzaman, Douglas Baker, Simon Washington. Advance transit oriented development typology : case study in Brisbane, Australia [J].Journal of Transport Geography, 2014,34 : 54 ~ 70
[13]. Li Xia.Spatial distribution relationship between urban commuter traffic and residential employment-model and method research [D].Beijing Jiaotong University.2010.59 ~ 60