Research on the New Development Mode of Metro TOD Based on Tourism Economy——Taking Shijiu Lake Scenic Area in Nanjing as an Example

Haoxuan Hu ¹, Yuchen Zhang ² and Naijun He ³ *
Chongqing University, China
Email: ¹hhx17815155067@163.com; ²Laurie_zyc@163.com; ³nj. he@163.com
* Corresponding Author Email: nj. he@163.com

Abstract. Metro TOD plays an important role in the development of commercial economy and promotes the local industry and economy. Reasonable combination of Metro TOD and tourism economy will help to form a more diversified development model. This paper puts forward a new development mode of Nanjing Shijiu Lake Metro TOD.

1. Introduction
TOD (transit oriented development) is a "public transport oriented" development model. This concept was proposed by Peter kasopper, a representative of new urbanism. TOD has become a non automotive planning and design method to maximize the use of public transport when planning a residential or commercial area[1].

There are some typical TOD urban complex cases at home and abroad, such as Hong Kong International Financial Center - city terminal; New York World Trade Center - transportation hub; Frankfurt Airport complex - air rail intermodal; London Canary Wharf - Emerging CBD.

2. Analysis of Metro TOD Commercial Format in Nanjing
Metro TOD projects in Nanjing are widely distributed, such as Xinjiekou, Maqun, youfangqiao, Jinma Road, etc. The typical Metro TOD projects of Xinjiekou and Maqun are selected as the representative.

2.1.Xinjiekou Metro TOD Project
Xinjiekou is known as "China's first business district", with lots of shopping malls. Underground is the Xinjiekou metro station, which has 24 exits, many of which are connected with the shopping malls on the ground. For example, No.7 entrance leads to Deji square, the shopping center with the largest annual sales volume in China in 2019, therefore, Xinjiekou can be regarded as a model of Metro TOD project.

2.2.Maqun Metro TOD Project
Maqun Metro TOD project is located in Zidong Aera of Nanjing City, which is the "East Gate" of Nanjing central city (Figure 1).
Figure 1. Location of Maqun Metro TOD[1]

It has Metro Line 2 (in operation), line S6 / Nanjing-Jurong line (under construction), line 12 (planned) and Qilin tram (in operation), as well as Nanjing Ring Expressway and Nanjing-Hangzhou Expressway, with obvious traffic advantages(Figure.2).

Figure 2. Maqun Tod Traffic Map[1]

Maqun TOD complex is a comprehensive work(Figure.3), covering urban complex, mountain view residence, exquisite apartment, high-end office, connecting residential, business, shopping, leisure, social networking, transportation and other urban functions, with an overall volume of about 500000 square meters. It is the first attempt of TOD mode in Nanjing and is also the largest TOD urban complex in Asia[1].
3. Advantages of Developing Metro TOD in Shijiu Lake Scenic Area

3.1. Attractive Scenery
Shijiu Lake has a beautiful and pleasant scenery(Figure.4). There is a metro passing through the 12 km bridge in the lake, attracting a large number of tourists to punch in and take photos every year.

3.2. Convenient Transportation
Shijiu Lake is located in Gaochun District, Nanjing City, at the junction of Jiangsu Province and Anhui Province. Shijiu Lake bei is about 65 kilometers away from Xinjiekou in the north, the center of Nanjing, and about 6 kilometers away from Gaochun, a vice city of Nanjing in the south, and about 7 kilometers away from Bowang District, Ma'anshan City, Anhui Province in the West (Figure.5).
There are Tuanjiewei station and Mingjue station in the south and north of Shijiu Lake. The developed metro system in Nanjing provides convenience for visiting Shijiu Lake: about 80 minutes to Xinjiekou, 55 minutes to Nanjing South Railway Station, 45 minutes to Jiangning University Town, 30 minutes to Lukou Airport and 7 minutes to Gaochun.

3.3 Large Metro Passenger Flow
The metro line S9 passing through Shijiu Lake has a large passenger volume, with an average daily passenger flow of about 18,000[2]. A large number of passenger flow can promote the tourism development of Shijiu Lake and the construction of Metro TOD.

4. New Development Mode

4.1 Concentrate Various Advantageous Resources and Combine Nature with Humanity
There are unique natural landscape advantages in Shijiu Lake scenic area, and they have great potential for eco-tourism development, thus should be combined with human resources to create greater tourism value.

Therefore, we should seek and create more cultural resources[3] with the landmark characteristics of Shijiu Lake, such as holding cultural festivals regularly or building style towns with demonstration significance, so as to maximize the value of natural resources in Shijiu Lake scenic area and highlight the combination of nature and humanity to form a kind of brand effect.

4.2 Creating Multi-functional Zone in TOD
From December 1st to December 6th, 2020, some characteristics of TOD in Shijiu Lake Scenic Area were analyzed and summarized through field visits, interviews and questionnaires. In the questionnaire survey, a total of 500 questionnaires were issued and 489 were recovered, among which 480 were effective with an effective rate of 96.0%. 154 males and 126 females participated in this survey. Some basic information graphs of the survey are as follows.
Figure 6. The Proportion of Gender

Figure 7. The Proportion of Age

Figure 8. Ways to Obtain Tourist Information

Figure 9. Form of Travel Organization

Figure 10. Time Cost on Arriving

Figure 11. Time Cost on Touring

Figure 12. Transportation

Figure 13. Accepted Cost on Accommodation
Using Digital Media Technology to Promote Brand
Firstly, create a supporting digital system for intelligent services [4], such as online booking, passenger flow query and travel service by using high-tech technologies such as artificial intelligence and big data.
Secondly, AI, VR and other elements should be added to the Metro TOD complex, so that visitors can enjoy the audio-visual feast there.
Thirdly, register marketing accounts in Weibo and wechat, and regularly send the latest information to attract tourists.

Discussing an Innovative Mode in the Function of Architectural Space in TOD Based on the Tourists’ Emotional Appeal.
TOD is an important support for the development of tourism economy, and tourists’ emotional experience should be considered. Therefore, in terms of functional innovation of architectural space, tourists’ psychological experience should be taken as a starting point and a foothold.
There should be some innovations in terms of the selection of TOD facility materials, for example, high strength alloy steel, which is widely used at present. This material has the advantages of lightness, firmness and good plasticity, which has the possibility to be used as the framework of architectures, and its exterior, decorated with glass so as to build the aesthetic space.

Prospects
Shijiu Lake Scenic Area in Nanjing has the advantages of scenery, transportation and location, and has the potential to develop Metro TOD. Through the development of multi-functional and multi format Metro TOD, it can promote the tourism economic development of Shijiu lake, Nanjing city and even the Yangtze River Delta region. Based on the analysis of many aspects, it is believed that Shijiu Lake will develop into a prosperous Metro TOD, and a beautiful business card of Nanjing.

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