Wuhan Subway Economic Development in the Perspective of "Innovation, Coordination, Green, Open, Sharing" Concept

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Abstract. Since the 18th congress of the communist party of China, the "innovation, coordination, green, open and shared" development concept has been a profound change in the overall situation of China's development. In this context, the Wuhan Metro has developed rapidly. This paper analyzes the current situation, characteristics and influence of the development of subway economy in Wuhan from the perspective of development concept, and puts forward some suggestions for the future development of subway economy.

Introduction

For a long time, China has faced problems such as uneven, inadequate, uncoordinated and unsustainable development, and it has already faced the "ceiling dilemma". In recent years, China is facing the downward pressure of the economy. In order to change the development mode and solve the development problems, the 18th National Congress put forward five development concepts of “innovation, coordination, green, openness and sharing”, which have important guidance for the future development of social economy. Xiong'an New District is an innovative, coordinated, green ecological, open and co-constructed shared future urban model. Wuhan, following the glory of history, is becoming a reactivated city, and it must follow this development philosophy. Rail transit is the city's arterial system, and has a profound significance for the prosperity of Wuhan.

The Concept and Content of the Subway Economy

The subway has not only changed the way people travel, but also played a role in fueling the development of the economy. However, as a quasi-public product, the subway is difficult to make profits based on its own operating income, so the subway economy has quietly emerged as a new economic form. The subway economy refers to a series of market activities related to its investment, planning, construction, operation, management, maintenance, etc., which are based on the construction of the subway and the surrounding resources, so as to generate greater social and economic benefits. It mainly includes three aspects [1]. (1) Internal economy, which refers to the economic benefits generated by the investment and output of the subway construction, such as fares, advertisements, and retail income. (2) The external economy refers to the economic benefits generated by the subway construction in the process of affecting external relevant departments and regions, such as the value added of surrounding real estate. (3) Derivative economy refers to the economic benefits generated in the subway sector in cooperation with relevant external departments or regions in a specific way, such as engineering consulting, subway greening, architectural decoration.
Innovation

Innovation is the main driving force for economic and social development. It plays a leading role in overall development. On the one hand, the “Metro Economic Belt” has strongly promoted the development of the urban economy, which is essentially the innovation of the development model. On the other hand, due to the special natural geographical location factors, the Yangtze River and Hanshui River traverse the urban area, which has greatly increased the difficulty for the construction of the subway. However, the Wuhan subway project overcomes difficulties and reflects technological innovation: Line 7 passes through the Wuhan Yangtze River Rail Tunnel, it is known as the “Super Project” and is the world's first shield tunnel. Line 1 has the nation's leading communication and power supply methods. Line 2 realizes the first domestic continuous transfer with the same station. Line 4 realizes close-crossing and crossing of multiple tunnels between two stations. Line 6 breaks through the station karst treatment construction technology and obtains patent application. The construction of Wuhan Metro has always carried out the spirit of innovation in all aspects and set the benchmark for the industry.

Coordination

Coordination is the inherent requirement of healthy and sustainable development. It is necessary to grasp the overall layout and shape a new pattern of regional coordinated development.

Table 1. Wuhan Rail Transit Situation Table in Operation.

<table>
<thead>
<tr>
<th>Subway</th>
<th>Mileage (km)</th>
<th>Starting and ending point</th>
<th>Number of stations</th>
<th>Earliest opening time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line 1</td>
<td>38.17</td>
<td>Jinghe - HanKou North</td>
<td>32</td>
<td>July 28, 2004</td>
</tr>
<tr>
<td>Line 2</td>
<td>47.53</td>
<td>Guanggu Square- Tianhe Airport</td>
<td>28</td>
<td>December 28, 2012</td>
</tr>
<tr>
<td>Line 3</td>
<td>28</td>
<td>Zhuanyang Avenue-Hongtu Avenue</td>
<td>24</td>
<td>December 28, 2015</td>
</tr>
<tr>
<td>Line 4</td>
<td>33.4</td>
<td>Golden Gate - Wuhan Railway Station</td>
<td>28</td>
<td>December 28, 2013</td>
</tr>
<tr>
<td>Line 6</td>
<td>35.95</td>
<td>Jinyinhu Park - Dongfeng Company Station</td>
<td>27</td>
<td>December 28, 2016</td>
</tr>
<tr>
<td>Line 7</td>
<td>30.85</td>
<td>Yuanboyuan North Station - Yezhi Lake Station</td>
<td>19</td>
<td>October 1, 2018</td>
</tr>
<tr>
<td>Line 8(Phase I)</td>
<td>16.7</td>
<td>Jintan Road Station - Liyuan Station</td>
<td>12</td>
<td>December 26, 2017</td>
</tr>
<tr>
<td>East section of Line 11</td>
<td>19.8</td>
<td>Guanggu Railway Station - Zuo Ling Station</td>
<td>13</td>
<td>October 1, 2018</td>
</tr>
<tr>
<td>Yangluo line</td>
<td>35</td>
<td>Houhu Avenue Station - Jintai Station</td>
<td>16</td>
<td>December 26, 2017</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>287</strong></td>
<td></td>
<td><strong>199</strong></td>
<td></td>
</tr>
</tbody>
</table>

According to Table 1 and Wuhan Metro layout [2], as of October 2018, 9 subway lines in Wuhan have been put into operation, open mileage reaches 287 km. The construction of the subway is steadily advancing on the premise of meeting the financial resources, passenger flow demand and construction capacity. The rail transit network basically covers Wuhan three towns, the four lines cross the Yangtze River, the two lines wear Hanshui, run through the east and west, travel north and
south, communicate the three towns, supporting the intensive development of the main city and coordinating the overall development, an line runs through Hankou, activates the old city, and promotes the coordinated development of urban and rural economy. According to the Wuhan rail transit plan \(^3\), many routes will cover the previous “blind zone” of the subway. By then, the subway will cover all urban areas in Wuhan, construct a rail transit network of “main city network and new city line”, support the construction of key functional areas in the main city, promote the construction of new urbanization, and coordinate the development of urban and rural integration. Under the background of urbanization development, Wuhan rail transit planning bears the mission of urban development. On the one hand, it puts forward higher requirements for subway construction and service capacity, on the other hand, it reflects the scientific, coordinated and sustainable metro planning.

The construction of the subway has injected vigorous momentum into the development of the city. On the one hand, the construction of Wuhan subway has attracted huge investment. The metro economy will not only promote the upgrading of industrial structure, promote regional coordinated development, but also promote the transformation of economic growth to consumption, investment and exports. In addition, the metro economy can relieve employment pressure to a certain extent. On the other hand, the huge demand generated by the construction of the subway has greatly promoted the development of the real economy and helped deepen the structural reform of the supply side. The subway will drive the development of related industries. Commercial resources will gradually gather around the subway and hub stations, promote the formation of new economic regions, change the commercial layout of the city, and radiate and connect the ground commercial and underground commercial blocks to form a three-dimensional commercial system \(^4\). The surrounding commercial districts rely on the transportation and hub functions of the subway to organically promote the coordinated development of the region and reduce the difference in location development.

**Green**

Green is the only way for sustainable development of subway construction. The subway has obvious advantages in energy saving and emission reduction and reduction of air pollution and noise pollution. It vigorously promotes the environmental “dividends” brought about by subway transportation construction, and opens up a green development road for urbanization development, which is conducive to building “resource-saving and environment friendly” society. Compared with the traditional urban public transportation, the subway has the advantages of saving land, large carrying capacity and strong timeliness. With the development of economy and the acceleration of urbanization, the contradiction between traffic congestion and land use in Wuhan has become increasingly prominent. In recent years, the passenger traffic volume of public transportation carried by Wuhan Metro has increased year by year, and the sharing rate of urban traffic has been greatly improved, and it has gradually become the supporting skeleton of Wuhan public transportation.

**Open**

Openness is the only way to prosperity and development. Wuhan Metro has always adhered to this development concept and built a “circle + radiation” and four-in-one (high-speed rail network, main city subway network, intercity network, new city rail network) rail transit network. Wuhan Metro crosses two rivers and three towns, promoting mutual economic exchange and integration. Line 4 realizes seamless transfer between subway and high-speed rail and intercity. Line 2 is opened to Tianhe Airport, which realizes seamless transfer of subway, plane and high-speed rail. Line 6 connects the two satellite cities. Line 7 is routed to 6 main urban areas, which can be interchanged with 6 lines built in advance and connected to the external transportation hub Wuchang Railway Station. Wuhan Metro Transportation Network will facilitate the contact between the regions, contact the main city and the new city, link the satellite city, connect the university town, and cross the East Lake High-tech Development Zone, realize the interconnection with aviation, railways, waterways and highways, enhance the smoothness of the “Nine Provinces Wanted”, and build the foundation for
the open Wuhan economy. Wuhan plays an important role in the implementation of the two strategies of the “Yangtze River Economic Belt” and the “One Belt and One Road”. It is necessary to rely on rail transit construction to participate in the competition in a more open manner and to inject new impetus into the Wuhan economy.

**Sharing**

Sharing is the essential requirement of social development. As a quasi-public product, the subway has a strong public welfare, and its essence is public transportation. The subway has a large carrying capacity and is fast and punctual. It plays an extremely important role in passenger transportation in Wuhan. “Subway economy” is a favorable economic phenomenon. The huge rail transit construction investment in Wuhan has promoted the arrival of the “red dividend” era, it plays an important role in promoting Wuhan's economic development, adjusting industrial structure, promoting social employment, promoting regional cooperation, and reducing regional development gaps. The development of the subway economy undoubtedly allows residents to share the fruits of economic development.

**Thoughts and Suggestions on the Economic Development of Wuhan Metro**

At present, it is at the critical stage of the “13th Five-Year Plan” of Wuhan Rail Transit. The development of the metro economy should also focus on the strategic deployment of the revitalization of Wuhan. It is hoped that the city of Wuhan can use land resources efficiently and through scientific subway construction and planning, truly practice the five development concepts of “innovation, coordination, green, openness, and sharing”, bringing new convenience and comfort to urban transportation and bringing more vitality to the urban economy.

**Drawing on the Hong Kong Subway Model, Adhere to the "MTR + Property" Integrated Development** [5]

The construction of the subway requires huge investment and a long period of time, and the government has great financial pressure. The development of the Hong Kong MTR is a sustainable development model, through the integrated development of “MTR + Property”, unified planning for rail transit and property development, and achieving win-win results for the government, the MTRC and the developers. Wuhan Metro construction can learn from the Hong Kong subway model, take into account the use of land resources, organically combine property development and subway construction, actively develop business activities such as commerce and advertising, stimulate internal and external economic benefits, and support the construction and operation of subways. In addition, the Public-Private Partnership model can be introduced into the construction of the subway to share the financial pressure of the government. However, it cannot be copied. It should be designed according to the specific environment. We must explore the sustainable path of transportation and economic development while meeting the functions of the subway, bringing new impetus and vitality to the city.

**Strengthening the Development of Subway Advertising Industry and Characteristic Subway Culture**

Subway advertising, an emerging advertising medium, has developed with the development of the subway, and huge passenger traffic can cause widespread concern. Wuhan Metro's advertising development is not sufficient, there are characteristics of not active delivery, "empty waiting for advertisements", lack of pertinence, single media, etc. We should innovate advertising media, enhance advertising creativity, improve interactivity, give full play to the added value of subway advertising, and open a new chapter in the subway profit model. The Wuhan Metro not only has to play its own transportation function, but also has the mission of spreading culture and showing the city's connotation, and inheriting Chu culture and Wuhan's natural and human landscape. At present,
many subway stations in Wuhan have their own characteristics. Their rich connotation promotes the development of tourism and other tertiary industries. It also effectively inherits the local culture. However, Wuhan's subway culture is still in its infancy, and it is necessary to intensify its development efforts to create a public art with distinctive characteristics of Wuhan [6].

**Rational Planning to Strengthen the Grasp of the "Land Use -Transportation - Environment" Integration System**

In the urban planning and management, if the lack of accurate understanding of the "land use - transportation - environment" integration, it will inevitably affect the scientific and effective decision-making. There is a two-way relationship between the spatial pattern of urban land use and the transportation system, and they will jointly affect the urban environment. This requires that urban planning and management policies must have a scientific, systematic and long-term understanding of the above-mentioned linkage relationship and mechanism. At present, Wuhan has problems such as traffic congestion or environmental pollution in traffic construction, which has a certain negative impact on traffic and economy along the route, and even bring inconvenience to residents' lives. Therefore, in the process of improving the quality of urbanization through subway construction, Wuhan City must have scientific and rational planning, adhere to the "resource-saving and environment-friendly" development concept, pay attention to the integration of above-ground and underground development, improve the efficiency and value of urban space utilization, and prevent short-term behavior to promote the rapid development of the regional economy [7].

**References**


