

Discussion on the Development Status of Urban Rail Transit in Zhoushan City

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Abstract: As the largest archipelago city in china, Zhoushan city has a large number of islands, and the development of urban rail transit is conducive to accelerating the construction of the Zhoushan free trade zone and the marine economy in Zhejiang, promoting the interconnection of islands, and laying a good infrastructure for a strong marine economy. Analyze in detail the feasibility of constructing urban rail transit in Zhoushan, and actively learn from the development experience of urban rail transit in china to provide a practical development strategy for promoting the urban rail transit in Zhoushan.

1. Introduction

Zhoushan city has obvious economic advantages and a good development foundation. It has rich deep-water shoreline resources, island resources, tourism resources, and marine biological resources, and has great development potential. However, for a long time, Zhoushan city has only the Zhoushan cross-sea bridge connecting Zhoushan's main island and the inland. Region, Zhoushan islands still need shipping to exchange personnel and materials, which seriously limits Zhoushan's implementation of various marine development policies and measures, and the goal of building a strong marine economy. This article analyzes in detail the feasibility of constructing urban rail transit in Zhoushan. In order to promote the construction of urban rail transit in Zhoushan city, it provides practical development strategies and promotes the construction of a strong marine economy in Zhoushan city.

2. Current Status of Traffic Development in Zhoushan

2.1 Highway Construction

According to statistics, the total mileage of the city's highways reached 1921.8 kilometers at the end of 2018. Compared with the end of the "twelfth five-year plan" period, ordinary national highways increased by 107.7 kilometers, and the rate of through-village and the rate of hardening of through-village highways remained at 100%. But only the east china sea bridge, Zhoushan cross-sea bridge and other bridges connect inland, and there are fewer highway bridges between the islands. Basically, each island has its own road construction.

2.2 Ludao Traffic Terminal Situation

The city has 160 land island transportation docks and 256 berths, including 118 passenger berths, 77 ferry berths, 46 passenger and freight berths, and 15 freight berths. The full coverage of the land island transportation pier for islands with more than one person, two islands with one island for two people, and islands with more than 3,000 people achieve the goal of full coverage for ro-ro terminals.

2.3 Road Transportation

The first is the situation of passenger transport companies and stations. There are 20 transport companies in the city and 10 major tourist passenger transport companies. The city has 53 highway passenger stations; 1,656 bay-style docking stations. Compared with the end of the "twelfth

five-year plan” period, there are 14 new passenger stations in the city, and the layout of rural passenger stations has basically taken shape. The second is the situation of road passenger transportation. There are a total of 2,893 commercial buses in the city; there are 161 passenger transport lines inside and outside the province. In recent years, the island's public transportation has developed rapidly. There are 934 buses and 159 operating lines. There are 23 taxi companies and 1,211 taxis in the city. There are 2,250 taxi drivers in the city. The third is the situation of road freight. The city has 8,598 operational trucks with a marked tonnage of 112,000. among them, there are 5,909 large-sized vehicles; 1,061 vans; and 2,361 container vehicles.

3. Urgency of Constructing Urban Rail Transit in Zhoushan

Ningbo Zhoushan Port is the port with the largest cargo throughput in the world. There are many water cargo merchant ships and fishing vessels, large freight volume, busy routes, and large water passenger traffic. There is no railway linking various ports, islands, and inland waterways. Limited by various conditions such as waterways and ships, it severely restricts the development of the marine economy.

3.1 Urban Development Layout

According to the overall development ideas of Zhoushan Urban Agglomeration Area, comprehensive consideration of the existing foundation, industrial development guidance and land space possibility, the overall layout structure of “one city and one island” is planned. among them:

4. “One City”: Zhoushan Marine Science City, China

Regional scope: It is located in the central part of Zhoushan Island, including the Xingang block of Zhoushan Economic Development Zone in the north, Lincheng New District, Changying Island, and Zirishan in the south.

5. “Zhudao”: Jintang Island, Liuheng Island, Laoshan Island, Northwest of Zhoushan Island, West of Laoshan Island, Sijiao Island, Zhujiajian Island, Yangshan Island, Changtu Island, Xiamen Island

Zhejiang Marine Economic Development Leading Zone. Give full play to the advantages of abundant marine resources and superior location conditions, actively respond to the construction of the Zhejiang Marine Economic Development Demonstration Zone, speed up the development process of Zhoushan port resources, build and improve the “Trinity” port and shipping logistics service system, and focus on improving the bulk goods transfer, storage, transportation, and processing And trade service business, actively participate in the co-construction of the Shanghai International Shipping Center; accelerate the development of modern marine industry agglomeration, build a modern marine industry system, and further enhance and give play to the status and role of Zhoushan Marine Industry Agglomeration Area in the core area.

5.1 The Population of Urban Development

According to the 2017 5 % population sample survey, the city ’s resident population was 1.168 million at the end of the year, an increase of about 10,000 from the end of the previous year, and the urbanization rate was 67.9%, an increase of 0.4 percentage point from the previous year. The total number of households in the city is 369,000, with a registered population of 971,000, accounting for 49.3% and 50.7% of the total population, respectively. In the whole year, there were 7,285 births, with a birth rate of 7.5 ‰; the death population was 8,790, with a mortality rate of 9.0 ‰; and the natural growth rate was -1.55 ‰. There were 16,500 new urban jobs throughout the year, and the registered urban unemployment rate at the end of the year was 2.62%, a decrease of 0.36 percentage points from the previous year. The inconvenience of transportation between land, sea and islands has led to a negative population growth in Zhoushan for many years. Constructing urban rail transit

and solving the flow of people and materials between land and sea and islands has become an urgent issue for Zhoushan's urban development.

6. Feasibility of Urban Rail Transit in Zhoushan

6.1 Geological Conditions Feasibility

The Zhoushan Islands are an extension of China's continental shelf to the East China Sea. Many rivers such as the Qiantang River, Yongjiang River, and the Yangtze River enter the sea here. The Pacific Ocean currents and inland river currents converge here. The ocean current environment is complex. A large number of ships and human activities drive the currents and undercurrents between the islands. It is more complicated. The river brings a lot of sediments to the sea bottom. The sea area of the Zhoushan Islands accumulates 3 sedimentary accumulation areas, including area A along the east port, area B on the southwest of Zhujiajian Island, and area C on the south shore of Xiaogan Island. It belongs to the near-shore island area. Various waterways in the area develop, and the gorge effect is large. The dark slopes on both sides of the waterway, especially the concave bank, have a small flow velocity. They are in an environmental condition that accepts sediments. The overall seabed environment is stable. Feasibility of tunnels and bridges between islands.

6.2 Environmental Feasibility

Zhoushan belongs to the northern subtropical monsoon climate zone. In summer, it is susceptible to typhoons and heavy rains cause water accumulation along the construction line, which provides conditions for soil erosion. Soil and water loss during construction will not only affect the progress of the project, but also produce other adverse environmental impacts. A series of effective measures need to be taken to control soil and water loss to a minimum extent. During construction, try to use the amount of excavation to fill it with digging to reduce Abandoned soil; route selection to avoid unstable areas fundamentally to prevent collapse, collapse, etc .; construction of the site in the rainy season should be done for drainage.

6.3 Project Implementation Feasibility

Shield tunnel construction can be used for subsea tunnels. Shield subsea tunnel construction and open cut station construction can absorb the construction of coastal cities at home and abroad in terms of construction difficulty, construction period, structural waterproof quality, and civil engineering cost. Experience, especially the construction experience of the Hong Kong-Zhuhai-Macao Bridge and Fujian Pingtan Bridge, further explores the construction of domestic subsea tunnels. At the same time, a combination of bridges and tunnels can be adopted in the construction of the project, which will not affect the operation of the existing waterway and combine The subsea structure and the direction of the ocean current design the direction of the submarine line. The overall engineering difficulty is within the scope of China's current infrastructure construction. From the implementation of civil engineering, engineering machinery and equipment, electromechanical equipment, etc., the overall feasibility of the construction is met.

7. Conclusion

Zhoushan City's urban rail construction aims to strengthen the economic ties between the inner and outer areas of the agglomeration and realize the development of transportation network. In accordance with the principle of “optimizing structure, highlighting priorities, and network layout”, it plans to coordinate the construction of highways, railways, ports, and waterways in the region, and build a multi-modal The modern integrated transportation network of intermodal transportation and external interconnection strengthens the ability to guarantee the long-distance transportation needs of logistics and people after the completion of the Zhoushan Cross-sea Bridge, builds a strong marine economic city for Zhoushan, realizes the land-sea economic linkage, and strengthens the flow of personnel and materials, because the convenience is of great significance.

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