Design and Implementation of Energy Distribution Planning for Beijing-Tianjin-Hebei Integrated Transportation Hub

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Abstract
Transportation infrastructure priority development is an important carrier to speed up the integration process of Beijing, Tianjin and Hebei. In this paper, the author analyses the design and implementation of energy distribution planning for Jing-jin-ji integrated transportation hub. Through the analysis of city traffic network group status and overall development characteristics, the author puts forward development suggestions, to promote the development of integrated transportation Jing-jin-ji city group, enhance the external radiation ability, which is conducive to the development of city group economic integration. A closed loop subway or urban light rail can be established between the urban hubs to form a city hub circulation. The combination of urban circulation loop and layer connecting channel will result in smoother traffic flow.

Key words: Integrated transportation, Logistics network, Traffic facilities, Development planning

1. INTRODUCTION
Transportation infrastructure priority development is an important carrier to speed up the integration process of Beijing, Tianjin and Hebei, and has important strategic significance in ensuring and serving the development of the capital and improving the level of regional development. In recent years, with the continuous development of Tianjin city agglomeration economy, continuously adjust and optimize the industrial structure, city rate and greatly increase the income level of transportation to achieve leapfrog development, city group, internal city group and other areas linked more closely, more frequent exchanges. The province of view, Beijing as the country's important traffic hub, the capital airport passenger throughput ranks first in the country, the world's second; Tianjin port is the third integrated port, fourth in the world, is also the capital of the North Sea portal and the important window of foreign trade; Tianjin port, Qinhuangdao port, Tangshan port and Huanghua port four port of China's important energy and raw material transportation ports. Further improving the comprehensive transportation system of Beijing Tianjin Hebei Urban Agglomeration is of great significance for realizing regional traffic interconnection, effectively easing traffic pressure in central Beijing City, and improving the comprehensive level of regional transport.

Tianjin city group is to optimize the development of regional planning the main functional areas, and is positioned as an important area, to enhance the national competitiveness of the national economy and the important population intensive areas and drive the national economic and social development of the leading. Beijing and Tianjin city group including Beijing, Tianjin, two municipalities and Hebei Province, Shijiazhuang, Tangshan, Qinhuangdao, Chengde, Zhangjiakou, Langfang, Baoding, Cangzhou 8 cities, integrity and coordination of regional research based on the content, this paper will study the range extended to Beijing City, Tianjin City, Hebei province and 11 cities under the jurisdiction of the municipality of Hengshui, which has increased in Xingtai, and Handan. In the past 10 years, Beijing and Tianjin city group has been an important area of research scholars, domestic scholars from the current development of the regional strategy and planning, regional industrial cooperation, regional spatial structure, tourism development orientation and other aspects of the comprehensive and in-depth research, but the research for traffic network is less, from the node and the node connection degree two aspects of a comprehensive study of the Beijing and Tianjin city group of traffic network is blank. Traffic facilities, as the basis and the basis of regional economic development, provide convenient conditions for regional cooperation and regional factor agglomeration, and are also important indicators reflecting the advantages and disadvantages of regional development conditions. Comprehensive evaluation of the traffic network in a region and its role in economic and social development has always been an important content of economic geography and regional economics research. Therefore, based on the analysis of traffic network coordinated development of Beijing and Tianjin city group, and the research results of the two integration, thus construct the basic structure of Beijing and Tianjin city group of traffic network, analysis the current characteristics and the overall development of the city group of traffic network, and then puts forward some suggestions to promote the integrated development of Beijing and Tianjin city group traffic, enhance the ability of radiation, which is beneficial to the development of Beijing and Tianjin city group economic integration.
2. BEIJING TIANJIN HEBEI REGIONAL TRANSPORTATION HUB INTERCONNECTION

Beijing Tianjin Hebei region has Asia and the world's first-class large-scale civil aviation, railway, port transportation hub, leading domestic transport capacity. However, due to the lack of overall planning and construction, the transportation hub in Beijing Tianjin Hebei region has limited interconnection efficiency, unbalanced transportation resources allocation, and the comprehensive traffic efficiency has not been fully developed. Beijing Tianjin Hebei local traffic fortress saturation capacity, traffic congestion, personnel retention and other situations often occur. When the emergency, force majeure and other conditions affect the normal traffic, there will be a large number of passengers stranded, not only increases the operating costs, but also increases the travel cost and time cost of passengers. In addition, due to the continuous accumulation of passengers in the traffic hub, coupled with poor information communication, sometimes extreme events occur. First, the efficiency of convergence between major transportation hubs needs to be improved. According to the functional positioning of the state of Beijing, Tianjin, Beijing Tianjin Hebei region of Hebei, taking into account the Beijing Tianjin Hebei region the transportation hub infrastructure and transport capacity, transportation hub of Beijing Tianjin Hebei region should be the Beijing Capital International Airport (or future second Beijing Airport) and Beijing's main train station, a major transportation hub in Tianjin, Shijiazhuang can be regarded as time hub. Large regional integrated transportation hub. Two is the main hub and sub hub in the region, and the connection efficiency between secondary and secondary hubs needs to be improved. First look at the connection between Beijing main hub and Tianjin and Shijiazhuang sub hubs. From the perspective of cohesion, except between the Beijing South Railway Station and TianJin Railway Station with Intercity Railway nonstop, Beijing West Railway Station and Shijiazhuang Railway Station railway through transport, the main hub of Beijing and Tianjin airport, Shijiazhuang airport and train station are required to link and ground traffic intersection, efficiency is not high. Look at the connection between sub hubs. Tianjin airport opened the subway between the airport and the railway station directly, and the hub access time efficiency is ideal. Shijiazhuang airport and train station, even without considering traffic jam factors, access time is more than 2 hours, low efficiency.

3. STRENGTHEN THE INTERCONNECTION OF BEIJING TIANJIN HEBEI REGIONAL TRANSPORTATION HUB

Transportation industry and information industry are the basic driving forces to promote regional economic development. The railway, highway and airport facilities of a regional urban agglomeration form the skeleton of the spatial structure of the urban agglomeration. The ideal city group is a reasonable hierarchy in the population, economy, society, culture and architecture, with complementary functions and good coordination mechanism in
terms of space boundary, resource allocation, industrial division, city community cultural exchanges etc. The urban agglomeration always has an industry and a dense distribution of urban corridors, through the development of transportation, communication network connected.

(1) the establishment of three-dimensional comprehensive transportation hub network, the hub level division, reasonable division of labor, strengthen cooperation. According to the function attribute of international and national features, and the combination of the Beijing Tianjin Hebei region with the combination of features, the Beijing Tianjin Hebei region and the hub location of Tianjin transportation hub will be divided into three levels, the establishment of three-dimensional integrated transport hub network. The Capital International Airport (or the future adjustment for the second capital airport, Beijing West Railway Station, Beijing Railway Station, Beijing South Railway Station) can be set to the main regional transportation hub, Tianjin airport, Tianjin railway station, Shijiazhuang airport, Shijiazhuang railway station to a hub, the other station and the airport is set to three level hub, and conduct in-depth research. Strengthen cooperation with different way of transportation hub, accelerate the construction of special major transportation hub between the same level of fast channel, reduce the transfer rate, strengthen regional passenger transport capacity, improve the conversion rate of passenger and freight transport hub; strengthen cooperation in different levels of cooperation, accelerate the rapid construction of interconnection channel between different levels of the main transport hub, improve transportation the efficiency of the different levels of passenger and freight hub inside and outside; accelerate the construction of city traffic hub with special closed-loop channel level between the same level, improve the passenger transfer hub capacity; strengthen the play between different traffic modes of complementarity and coordination role.

(2) to strengthen top-level Internet plus wisdom comprehensive transportation design, strengthen the wisdom of integrated transportation platform construction. Intelligent transportation platform needs to have the following functions. The access of regional highway network, railway network, bus network, traffic platform, airports and flights and other types of transportation platform, to provide real-time information; have a real-time display of city bus passenger transport (including rail), taxi, parking lot, public bicycles and other dynamic information and other functions; the travel staff to carry out real-time route planning, navigation route adjustment function; the access road, railway, civil aviation, city public transport ticket information and booking, ticket purchase, self-service exchange interworking function. In the future, intelligent transportation platform can be combined with the Internet, logistics network, financial integration with Alipay and other Internet, so when people travel network can "walk the world". In addition, the construction of intelligent transportation platform, not only convenient staff travel, automatic traffic grooming, the traffic data of the mass storage is on all levels of government and relevant enterprises to make reasonable policies and measures, an important basis for management, enterprise strategy. At the same time, through the intelligent transportation platform can also carry on the emergency management of the road, the floating crowd. Intelligent transportation platform can take the top-level design of government authorities, supervision and guidance platform construction and operation, financing by PPP mode construction, after the completion of the operation and management by enterprises.

(3) speeding up the interconnection construction of ticketing system between different traffic modes. Such temporary change requires a passenger journey in another mode of transportation, or other means of transport to travel throughout the need for complementary, but could not have a complete set of unified ticketing platform to provide one-stop booking or refund service. If the establishment of an integrated transport ticketing interoperability platform, to facilitate passenger traffic ticket information, whenever and wherever possible to understand the various types of self-help order, change, refund and other services for the city traffic hub pressure relief, ordered diverted due to flight delays or train stranded people.

(4) speed up the construction of regional aviation hub network, and strengthen the construction of 1 hours rapid interconnection facilities between different levels of aviation hubs within the region. Beijing Tianjin Hebei is the main hub area and domestic, regional and international communications traffic fortress, is a high-end business and travel choice. Civil aviation is a point to point transport, while railways and highways are along the line. Integrated Beijing airport layout and facilities capacity, aviation hub is located in Beijing, sub hub is located in Tianjin, Shijiazhuang, the other should be the three hub. Suggestions for the construction of a zero transfer, fast direct at different levels between the intercity rail contact channel, to strengthen the main interconnection, time efficient and convenient aviation hub, to promote the sharing of the Beijing Tianjin Hebei regional aviation resources; to establish a rapid and direct closed-loop to iron in the city or city light rail hub, the formation of city hub circulation. The combination of urban circulation loop and layer connecting channel will result in smoother traffic flow.
4. THOUGHTS AND SUGGESTIONS ON TRANSPORTATION INTEGRATION DEVELOPMENT IN BEIJING, TIANJIN AND HEBEI

Since the Beijing Tianjin Hebei collaborative development strategy has been proposed, the national level has issued the "Outline" and "integration" of the whole traffic planning. Tianjin traffic integration layout must take into consideration, put forward the overall layout of four vertical and four horizontal part of the traffic network, its core is the restructuring and optimization of the regional traffic network system change, taking Beijing as the core network layout and transportation organization mode. From Tianjin traffic integration to promote the work situation, three of Tianjin in the "integrated transport planning" under the guidance of accelerating regional major traffic infrastructure construction projects, has made some progress. However, while paying attention to the hardware construction of transportation infrastructure, more attention should be paid to the promotion of soft environment, such as transportation services, institutional mechanisms, investment and financing. To this end, from the passenger transport, freight transport and institutional mechanisms put forward three aspects of Beijing Tianjin Hebei traffic integration should focus on the focus of attention and corresponding recommendations.

4.1. passenger transport

Focus on rail transit interconnection and integration development. In accordance with the requirements of the construction of "Beijing, Tianjin and Hebei on the track", strengthen the integration of different levels of rail transportation network. One is to build urban rail transit complex corridor. It is suggested to increase the function of suburban railway in the planned intercity railway corridor of Beijing, Tianjin and Hebei, and reserve
stations and cross line conditions in the densely populated areas, so as to build a compound corridor of urban rail transit. Two is to build the hub of the city”. In the rail transportation hub station location, the intercity railway station set up in the city center area, and combined with the important functional area of the city, after the passengers arrived at the station, the bus green transportation can arrive at the destination to walk through, from the source to reduce road traffic pressure, but also improve the land intensive use. Give full play to the role of Beijing new airport in promoting regional opening up. Beijing new airport is located in the core of Beijing Tianjin Hebei region, which has the characteristics of large passenger flow and wide radiation range. Therefore, suggestions to make full use of the strategic advantage of the new airport, the main city in the region and the establishment of joint Beijing new airport convenient rapid rail transport links, construction of these city open international gateway, the new airport has become the Beijing Tianjin Hebei regional airport, accelerate the process of internationalization. Push passengers onward transport development, improve the service level of passenger transport integration. Onward transport is the key to enhance the comprehensive transportation efficiency, by creating integrated transport hub, construction of integrated traffic information platform, all aspects of the construction of regional planning travel information service platform, improve the integration between different modes of transportation connection efficiency, provide from the origin to the destination of the whole process, all links, door to door travel service for passengers.

Figure 4. Transportation hub design

4.2. Freight aspect

Complete transport infrastructure short board. On the one hand, focus on the ease of Beijing's non capital function, construction of the capital railway freight link, ease the capital transit railway freight volume, ease capital area transit traffic pressure; on the other hand, according to the regional highway transportation and railway freight over reliance on the status quo of the development for relatively low, by strengthening the railway channel terminal connection, to improve the energy utilization rate of channel reverse and other measures to improve coal channel transport capacity and efficiency, and the railway in the transport of cargo to increase the proportion. Improve the transportation channel of Tianjin port and Hebei ports, strengthen port railway and water transportation seamless, good port railway planning. The coordinated development mechanism to improve the port, with government, association, enterprise is in "principle, the government is mainly to coordinate, through legislation to create a good market environment; the establishment of Beijing Tianjin Hebei regional shipping association, promote the integration of customs clearance procedures, market management, administrative enforcement of law and policy system; to further develop the market mechanism and the benefit mechanism, with enterprises as the main body, to the capital as a link to the project as a carrier, the establishment of inter industry and inter regional port management mode. Developing advanced transportation organization mode. In intermodal trains as the starting point, study on the construction of the Beijing Tianjin Hebei region docking international, radiation domestic city group, strengthening regional port and hinterland, cohesion multi-level intermodal trains, increase the proportion of the railway in the multimodal transport, reduce logistics cost, optimize the transport structure, promote the development of green freight. At the same time, to build a city group level, metropolitan level, city level three intermodal station system, to construct the hub for the multimodal transport system, combined with the anchor of heavenly stems and earthly
branches. In addition, we should continue to encourage the promotion and application of the advanced transportation organization mode such as throwing and hanging transportation and joint distribution from the aspects of increasing capital investment, cultivating leading enterprises and speeding up policy support.

4.3 System and mechanism

Improve the regional planning, decision-making and industry integration management mechanism. It is suggested that the regional planning organization of Beijing, Tianjin and Hebei should be established, and the system planning of the whole region should be carried out, and the platform for consultation and decision making of regional affairs should be provided. From the United States established area or special area of experience, set up the traffic area of Beijing Tianjin Hebei, such as port authority, Tianjin Tianjin Public Transport Union, Tianjin Integrated Transport Hub Development Company, to meet the needs of integrated management of regional key industries of Beijing Tianjin hebei. Innovative investment and financing system, explore the establishment of a diversified, sustainable transportation investment and financing mode. The “Rail + land” common development pattern as the focus, to promote the comprehensive development of rail transit and land use will be combined with the demand of rail transit and land comprehensive development in land use and consider the overall planning and city planning, land supply and land comprehensive development mode, support, index of land use intensity of land development in the comprehensive development of the supervision and coordination of the introduction of the implementation details, effectively promote the “Rail + land” mode to fully implement. In addition, to encourage and attract social capital to participate in infrastructure construction and operation, improve and perfect the PPP system framework and system of laws and regulations, the establishment of credit constraints and risk sharing mechanism, perfect the good market access and exit mechanisms, accelerating mechanism and talent team construction, developing diversified financing channels for traffic.

5. CONCLUSIONS

For the realization of regional comprehensive transportation development goal, take "two guide, two integration leading policy, regional comprehensive transportation development to guide and promote urban development, to guide the rational distribution of industry; integration of regional comprehensive transportation system, the integration of regional traffic coordinated development mechanism. To speed up the implementation and the implementation of the national transportation infrastructure, giving priority to the development of public transport priority policies, to ensure smooth traffic flow, logistics, protection of economic and social exchanges to ensure traffic convenience, the harmonious development of urban and rural. Relying on the intercontinental portals such as Beijing Capital International Airport and Tianjin port, we should build a perfect regional transportation system, strengthen the national transportation hub status of Beijing and Tianjin, and play its role in the national transportation network. To strengthen regional co construction of major transport facilities such as airports and seaports sharing, coordinate the Regional Airport and seaport reasonable division of labor; accelerate regional passenger railway, intercity railway and highway network construction, promote and drive the regional urban function integration, according to the traffic demand characteristics of hierarchical planning and organization of regional transportation; and build a comprehensive multi-level logistics network the reasonable distribution of regional transit traffic.

Acknowledgements

HebeiNatural Science Foundation Special project, Research on the planning, layout and design theory of comprehensive transportation hub in Beijing - Tianjin - Hebei region, (Project number : E2016513016)

REFERENCES


