

The Study of the Development of China's Comprehensive Transportation System

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abstract: Based on national conditions of China, the thesis first analyzes the status quo and problems in five modes of transportation, such as railway transportation, highway transportation, water transportation, air transportation and pipeline transportation; secondly, it analyzes the constitution of demands of the Chinese transportation, using the pattern of interrelationship between the development of social economy and that of communications and transportations. It advances a development pattern of the Chinese comprehensive transportation system as well as the development policy. Furthermore, it makes constructive suggestions in the strategy of developing both modern railway in the 21st-century China and Chinese highway traffic network.

Keywords: Comprehensive transportation. Development policy.

1. INTRODUCTION

Because of the rapidly developing of China's economics, the contradiction, between the demand and the capacity of transportation, is becoming more and more sharpen. The chinese present status quo of transportation is that the capacity is not enough seriously and that all modes of transportation are in need of developing. For this reason, it is an important research problem how to formulate the development policy of chinese comprehensive transportation based on national conditions and the economic development strategy.

According to the authors many research fruits about chinese transportation, the thesis mainly analyzes the status quo and problems in chinese transportation, the chinese national conditions and features of transportation demands, the developing pattern and policy of chinese comprehensive transportation system and the development strategy of chinese railway and highway.

2. The Status quo and Problems in Chinese Transportation

2.1. The Status quo of Chinese Transportation

The Chinese present system of Transportation mainly consists of five modes of transportation: railway, highway, water, air and pipeline. Great changes have taken place in all of them since 1949. Encouraging achievements have been made in the trade of communications and transportation which have contributed a lot to the development of national economy and social development.

In 1992, the operating mileage of Chinese railway is 53,565 kilometers. It has been increased by 146% comparing with that of 1949. It makes up 3.5% of the total national transportation mileage. Its multiple-track rate is 24%, electrification rate 16%, internal-combustion rate 38%. The total number of the railway workers is 3,400,000. There are 14,083 locomotives (in which electric locomotives make up 14%), 28,464 passenger trains and 373,233 freight trains. In 1992, volume of goods traffic is 1,523 million tons 1,154 billion ton-kilometer (which makes up 70% in the national total ton-kilometers of goods traffic), volume of passengers traffic is 988 million person-time, 314 billion and 830 million passenger-kilometer (which make up 60% in the national total passenger-kilometers of passengers traffic).

The total length of the national road network is 1,057,000 kilometers (in which highly highway makes up 0.6%), and it makes up 65% in the total length of the national transportation network. The road network has been increasing 20,000 kilometers per year since liberation. There are 5,500,000 road automobiles (in which freight car makes up 71%). The annual volume of goods traffic accomplished by the road transportation is 7,323 million tons, 322 billion ton-kilometer (which makes up 15% in the total volume of the national freight transportation), volume of passenger traffic is 6.5 billion person-time, 252.8 billion passenger-kilometer (which makes up 35% in the national total volume).

The total length of Chinese inland water course is 109,400 kilometers. It makes up 7% in the total length of national line transportation. There are 1,099 main coastal harbors wharves (among which there are 226 wharves for ten-thousand-ton ships). The number of motorized ships is 350,000. The annual freight volume is 808 million tons, 292.8 billion ton-kilometer (which makes up 10% in the national total volume of freight transportation), volume of passenger traffic is 350 million person-time, 17.86 billion passenger-kilometer (which makes up 3% in the national total volume).

The total length of Chinese domestic air line is 373,800 kilometers. The total length of international air line is 138,300 kilometers. There are 93 airports all over the country, among which there are 47 for giant passenger aircrafts. The annual freight volume is 328,000 tons, 650 million ton-kilometer (making up 0.05% in the national total volume). Volume of passenger traffic is 14 million person-time, 18.7 billion passenger-kilometer (making up 3% in the national total volume).

The total length of the national pipeline transportation is 14,300 kilometers, making

up 0.93% in the total length of national line transportation. The annual freight volume of goods traffic (oil, gas) is 156 million tons, 62.5 billion ton-kilometer (making up 5% in the national total volume).

The present structure of the Chinese transportation system mainly represents as: the railway transportation undertakes most of the rotation volume of passenger and freight transportation, and plays an important leading role in the communications and transportation system. The freight transportation plays a prominent role. This is quite similar to the continental country the United States. Comparing with the railway transportation, both the highway transportation and air transportation have developed at a great speed, while the water transportation of passenger has an obvious tendency of flogging.

2.2. The main problems in Chinese communications and transportation

Generally speaking, the main problems in the development of Chinese transportation system represent as: the network of transportation is less than enough, the basic transportation equipments lag behind, the modern technical level is low, the transportation capacity is insufficient, the transportation service level cannot meet the requirement of the transportation, the development of the modes of transport is not balanced, the comprehensive transportation system has not been established, the policy of the comprehensive transportation development is not perfect, the market of transportation cannot adjust to the market economic environment, the system of the transportation management and administration needs being improved.

3. Analysis of the Chinese national conditions and the features of transportation demands

According to the author's researchers, the influence the Chinese natural conditions on the transportation demands mainly represents as: because China is a continental inland country with a vast territory, long-distance land transportation plays an important role; the distribution of Chinese natural sources and industry is in an intricate situation, and they are far away from each other, so the structure of large long-distance transportation over many areas will exist long; the structure of Chinese energy and mineral sources is that coals are more than oil, therefore, a large demand for the long-distance coal transportation will be the main object of Chinese freight transportation; simultaneously it indicates that the structure of Chinese transportation should require to reduce the consumption of oil as much as possible, as China has a large population and the space between cities is vast, the demand for medium and long distance passenger transportation will be continuously increasing.

The influence the Chinese social and economic conditions on the transportation

demands mainly represents as: China is a developing country, and it is in the early period of industrialization and economy developing at a comparatively high rate. The industry of energy and raw material needs being strengthened. All of these will bring a large number of demands for disseminated raw materials transportation. The level of industrial structure is low, processing industry is still in the period of producing more products of rough machining than that of finish machining, and products of concentrated resources make up a large proportion. It has not got into the period of finish machining industry, Thus, the features of product structure will still represents as: rough machining products of concentrated resources type play a leading role; demands of large-quantified, low-priced, disseminated raw materials and primary products freight transportation will increase rapidly; the implementation of Chinese "reform and open" policy as well as policies on market economy system will certainly accelerates the birth and development of many joint-venture enterprises and middle as well as small nongovernmental enterprises, hence a large quantity of demands for raw material and product transportation and international trade transportation will emerge; as the reformation and development of Chinese social economy will certainly bring the continuous change in the labour structure, the city population will largely increase and then a large quantity of demands of passenger transportation will be produced; since Chinese living consuming level is on the whole at a low stage, the feature of passenger transportation quality is that the cheaper mode of transportation is the principal part.

Based on the analysis pattern of the influence the Chinese national conditions have on the transportation demands (transportation economy pattern), the author's calculation of Chinese national transportation demands indicates: in 2000, Chinese total freight volume of transportation demands will reach 4.5 billion tons, 2,550 billion ton-kilometer; the total volume of passenger transportation demands will each 11.2 billion person-time, 1,060 billion person-kilometer; when the time comes, the rotation volume of passenger and merchandise will be shared by all the modes of transport as follows: railway 48.7% and 70.5%, highway 42.8% and 3.14%, water 3.3% and 21.96%, pipeline freight transportation 4.31% and air transportation of passengers 5.2%.

4. The developing pattern and policy of Chinese comprehensive transportation system

Based on the status quo of Chinese national transportation and existing problems, proceeding from actual conditions of Chinese national situations and transportation demands, the research studies the interrelationship between all the national modes of transportation and their rational division. The result indicates that under the national actual conditions, the interrelationship between the modes of transportation is mainly contact transportation, manifesting prominently as depending on each other, helping each other, compensating each other and coordinating.

According to this, it raises a fundamental principle of rational division between all the modes of transportation: the railway is fit for the large-quantified, disseminated and low-priced freight transportation, as well as dense passenger transportation and middle & long distance transportation of passenger and merchandise; the highway is fit for small-quantified, short-distanced freight transportation, and short-distanced passenger transportation, as well as the freight and passenger transportation to help the railway, water and air transportation; the water transportation is mainly fit for large-quantified, disseminated and low-priced freight transportation which does not require strong effectiveness and timeliness; the air transportation is mainly fit for the long-distanced passenger transportation which requires strong timeliness, and for the transportation of small quantity of expensive merchandise; the pipeline transportation is limited to special merchandise such as liquid and gas.

Thus the developing pattern and policy of Chinese comprehensive transportation system is confirmed. The pattern should be: to indicate that the railway is the backbone of the national and inter-regional network in the comprehensive transportation system; to make the most of the railway's main line transportation function. Highway is the most widely dispersed and the densest modern surface mode of transportation. It is important to make the most of its surface transportation function, to make full use of the inland river resources as the main supplement of the freight transportation on land, and to make the best use of the long-distanced quick air transportation and pipeline transportation of special merchandise.

The Chinese comprehensive transportation network should be a organic three-dimensional communications and transportation network with railway; coastal harbor and the Yangtze River as the main framework, the highway transportation as veins connected with airline and pipeline. In the present stage and a quite long period afterward, the development policy of the Chinese comprehensive transportation system should be: firstly to adjust to the Chinese transportation demands on the whole; secondly to make the most of the railway which plays the leading role function. The main point is to increase the ability of railway transportation and simultaneously pay attention to the coordination development of all the modes of transportation to achieve the best comprehensive benefit.

5. The development strategy of Chinese railway and highway

5.1. The development strategy of Chinese railway

The main target of the Chinese railway development strategy to 2020 is to quicken the new construction, multiple track, electrification to increase the carrying capacity of freight transportation and speed of passenger transportation, and to quicken the automation of management.

The first stage (1990-1995) will finish the new track construction 6,600 kilometers,

multiple track 4,100 kilometers, and electrification project 5,600 kilometers. When that time comes, the total length of Chinese railway network will be 60 thousand kilometers, the rate of multiple track 30%, the rate of electrification 23%.

On the base of finishing the first-stage construction, the second stage (1995-2000) stresses on increasing the loading capacity of freight transportation, the speed of passenger transportation and on the establishing automation of transportation management. It tries to reach the target: on the main busy line 4,000 tons for general trains, more than 5,000 tons for loading trains, 6,000~10,000 tons for trains on coal line; finishing the construction of 200 kilometers per hour express railway between Guangzhou and Shenzhen; starting the construction of express railway between Beijing and Shanghai; developing major to the application of communication technology such as lightfibre, microwave and satellites; establishing computer management information system of freight and passenger transportation; finishing the construction of computer booking ticket system in some areas; advancing the reform in the railway management system.

The third stage (2000~2020) will finish the new line construction of 30,000 kilometer, so that the total length of Chinese railway will reach 90,000 kilometers, the rate of multiple track 34%, the rate of electrification 26%. The recent strategic target of heavy loading freight transportation and express railway construction of passenger transportation will be achieved, so that the communications and transportation can basically satisfy the demands of national economy's development.

5.2. The developing strategy of Chinese highway traffic

In 2000, the construction target of Chinese highway traffic is: to enlarge the highway network scope by constructing at a speed of 20,000 kilometers per year, so that when that time comes, the total length of the highway network will reach 1.2 million kilometers, the average density will reach 0.13 kilometers per square kilometer; to quicken the construction of expressway and high-quality road, so that when that time comes, the running mileage of expressway will reach 1,200 kilometers, first-level road 1,800 kilometers, and they will make up 17.6% in the total length of the highway network; when that time comes, the number of highway automobile will reach 12-13 million cars (among which there will be 9-9.5 million cars freight mobiles); to quicken the automation of management construction and the system reform, highway transportation can meet the demands of national economy's development.

6. Conclusion

Based on the theory that the development of the comprehensive transportation system and that of the social economy can influence each other greatly, starting from Chinese actual conditions, the thesis discussed the development pattern and policy of Chinese present comprehensive transportation system. However, with the continuous changes in

Chinese social economy, the question of contesting between the modes of transport, the problem of transportation price policy, the problem of communications environment, etc., all of which can become the main research task in the near future.

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