Research on Bilateral Co-construction of Transportation Informationization Supply and Demand Based on Big Data Analysis

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Abstract. With the development of science and technology in our country, network information technology has been continuously integrated into transportation. Chinese traffic informatization has achieved great results, which provides better traffic services for people. However, compared with developed countries, Chinese transportation informatization still has many problems to be solved. Based on this, this article uses computer big data technology to first analyze the significance of traffic management informationization. Then, this paper analyses the unbalance of supply-demand relationship and its influencing factors. Finally, some suggestions are put forward.

Keywords: Supply, Demand, Co-construction, Transportation Informatization, Big Data Analysis

1. Introduction
In recent years, the use of motor vehicles in China has been extremely expanding. Therefore, there is a huge contradiction between the insufficiency of road traffic construction and the growing social needs. The increasing contradiction between supply and demand of transportation has seriously hindered the stable development of economy and society. How to solve the contradiction between supply and demand has become a hot topic. First, China should strengthen the necessary road traffic construction, which will enhance the capacity of road traffic network. Secondly, China should promote the informationization
construction of traffic management, which will ensure the maximization of the function of road traffic system. Practice has proved that traffic road management informatization is one of the effective ways to solve road traffic problems[1].

2. Concepts of supply-demand relationship in transportation informatization

2.1. Concept of traffic informatization
Traffic informatization is mainly as follows. Through all kinds of modern information technology, we can systematically process all kinds of traffic information collected. So we can improve the transportation facilities, which will improve the efficiency of the whole transportation and improve the level of traffic information service. The Ministry of Transportation clearly stipulates that transportation informationization is an important part of national informationization construction, which will play an important role in improving the development of transportation industry and the level of transportation service. With the development of recent years, traffic informatization has become an important factor to promote the modernization of transportation system. It plays an increasingly prominent role in the overall construction of transportation modernization. Therefore, traffic informatization has gradually become an important carrier of public services in China[2].

2.2. Supply-demand relationship of transportation
According to the different modes of transportation, the unbalanced supply and demand of transportation can be divided into road transportation, rail transit, waterway transportation and air transportation. The research objects of road transport include urban road transport and road transport in urban agglomeration. Urban agglomeration traffic is mainly divided into two types. The first is the internal connection of urban agglomerations. The second is the connection between urban agglomerations and the outside world. Among them, the internal links of urban agglomerations can be divided into the internal links of individual cities. As shown in Figure 1[3].

![Figure 1. Schematic diagram of city agglomeration traffic](image)

2.3. Supply-demand relationship of transportation informatization
In China, although urban agglomerations have developed rapidly, there are still many problems in the construction of transportation infrastructure of urban agglomerations[4-6]. The main performance is as
follows. Transportation supply and demand are constantly changing, which will lead to an unbalanced state of transportation supply and demand, as shown in Figure 2. We can see that the supply-demand relationship of urban agglomeration transportation is in a balanced and unbalanced cycle, which is mainly reflected in the following two aspects. First, traffic supply is less than demand. Transportation infrastructure can not meet the needs of the current social and economic development of urban agglomerations. There is a gap in the traffic supply of urban agglomerations. For example, during the long holidays, spring and summer transport peak, the traffic problems of important traffic nodes are more prominent, such as one ticket is difficult to obtain, traffic jam is serious, and so on. Secondly, traffic supply exceeds demand. The planning and allocation of transport infrastructure is unreasonable, which will lead to traffic supply exceeding demand. For example, the construction of intercity highways and railways in some cities is repeated.

![Figure 2. The interaction between supply and demand of city agglomeration traffic](image)

3. Bilateral structural imbalance between supply and demand

3.1. Imbalance between administration and marketization
Transportation industry is one of the basic industries of the country. Its construction, operation and management are directly co-ordinated by the functional departments of the state. Therefore, transportation has its own administrative color. Transportation informationization is an important way to realize the transparency, commercialization and intellectualization of the transportation industry, which is an important path of market-oriented reform. There are some conflicts between the administrative mechanism and the market mechanism. Therefore, the connection between administrative management system and marketization is particularly prominent. The imbalance between administration and marketization is mainly the contradiction between information monopoly supply and sharing demand.

3.2. Supply-side and demand-side imbalances
The imbalance between supply side and demand side is mainly multifaceted, comprehensive and holistic. This is rooted in the fact that the specific content of supply is very rich. Therefore, it is impossible to completely correspond between supply and demand factors. Information management must focus on the original traffic information resources, which need to pay attention to the traditional and order issues of information construction. In the process of traffic information production and dissemination, we must strengthen the executive power of information management, which will promote the deep integration of information technology and industry business. Again, information technology needs to change the over-supply of funds. At the same time, the transportation informationization also has a large demand for
talents, which is reflected in the corresponding problems between the demand side and the supply side of talents.

4. Measures of transportation informatization

4.1. Improve the mechanism of division of responsibilities

The supply-side and demand-side reforms of traffic information are holistic and systematic. It is not designed macroscopically by the traffic basic management department. Therefore, we need to strengthen top-level design and unified leadership. By clarifying and rationalizing the information-based decision-making mechanism and responsibility division mechanism, we can establish corresponding organizations, such as road network centers, integrated traffic data centers, emergency command centers and sub-centers at all levels. By innovating the traffic management service mode, we can realize the deep integration of business and informatization. By determining the market elements on the demand side, we can determine the supply side reform. According to the division of powers at all levels, we can clearly define the division of duties and responsibilities. By identifying the main body of implementation, we can clarify the business rules, construction management and technical requirements, which will help to clarify the assessment indicators. In the construction of informationization projects, we will form a combination of multiple reforms.

4.2. Value oriented by marketization and structuralization

The marketization of traffic information needs to promote relevant information resources to the market, which can be effectively adjusted and constructed by market demand side and government supply side. Specifically, traffic information should be market-oriented, such as sharing and exchange, data acquisition, data management and control, data exchange and so on. Traffic data exchange and sharing services should be market-oriented. Only in this way can we build a sound industry data management and use architecture. In terms of the basic data structure of the traffic industry, we need to determine the comprehensive data of all kinds of railway business and civil aviation operations, such as railway stations, shifts, routes, flights, routes, etc. At the same time, we need to update highway data, such as highways, provincial trunk lines, rural highways and so on. By optimizing the structure of traffic data, we will realize market-oriented traffic data supply.

5. Conclusion

The 21st century is an era of information and networking. In the field of road traffic management, informationization is an urgent task to meet the requirements of productivity development. Compared with simply increasing road traffic capacity, information technology has less investment and quick effect, which has more practical significance. Through information technology, a series of traffic organization can be carried out. Therefore, traffic facilities can control traffic flow in time and space distribution, which will avoid rush hour and some congestion areas. In a word, through advanced computer technology and network technology, we can strengthen the information construction of road traffic management, which will promote the sustainable and healthy development of transportation.
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