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New Requirements and Connotation of Comprehensive Transportation System Planning Under National Land Use Planning

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Abstract: Comprehensive transportation system planning under national land use planning represents an important support for the realization of spatial development strategies, optimization of the spatial structure, and coordination of the spatial layout in the new era with the limited land use. First, the paper discusses transportation demand transformation at the level of the whole metropolitan area, space, and elements, as well as the new development trends and important topics. The new target for the transportation system development under national land use planning and the new requirements for the transformation of transportation policies is put forward. The paper presents the new contents of transportation system planning under national land use planning in several aspects: the new content of spatial differential planning, the new structure of integrated transportation system planning, the transmission of management and control indicators, etc. **DOI:** 10.13813/j.cn11-5141/u.2021.0002-en

Keywords: national land use planning; transportation system planning; spatial level; transportation demand; planning renewal

1 New background in the development of the comprehensive transportation system

It was pointed out in Several Opinions of the Central Committee of the Communist Party of China and the State Council on Establishing the System of National Land Use Planning and Supervising Its Implementation (Zhongfa (2019) No. 18) that the system of national land use planning should be established and its implementation should be supervised. It was also pointed out that the plans for major function zones, land use, urban and rural development, and other spatial plans should be integrated into unified national land use planning so that the goal of "integrating multiple plans into one" can be realized. National land use planning is an important measure to scientifically arrange production space, living space, and ecological space. It is also a crucial measure to accelerate the formation of green production and lifestyles, advance the development of ecological civilization, and build a beautiful China. Although the development of national land use plans requires that "the planning emphasis shall be placed on the network layout of major transportation hubs and important linear projects," a clear paradigm has not been formed with regard to many issues. For example, it is still unclear how to formulate the development strategy for comprehensive transportation to support the development strategy for territorial space; how to guide the coordination and interaction of the comprehensive transportation system with the usage control, spatial organization, function layout and function connection of the territorial space; and how to build a sustainable comprehensive transportation system under national land use planning.

At the same time, China's cities and regions have entered a new period of development, and they have imposed higher requirements on the development of the comprehensive transportation system. The 19th National Congress of the Communist Party of China put forward the development vision of "building national strength in transportation." It also set a goal to preliminarily build a modern comprehensive transportation system by 2035 that would significantly improve its level of satisfaction and significantly enhance its capacity to support the country's modernization. In light of the overall goal of building a modern comprehensive transportation system that is "safe, convenient, efficient, green and economical," it is proposed to preliminarily form "national 123 travel circles" (one-hour commute in metropolitan areas, two-hour travel between cities in urban agglomerations, and 3-hour travel between major cities in China) and "global 123 circles of express cargo flow" (one-day shipping to cities in China, two-day shipping to cities in neighboring countries, and three-day shipping to major global cities). It is also proposed that passenger interline transportation should be convenient

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and smooth, and multimodal cargo transportation should be efficient and economical. The development of the transportation system should be transformed from pursuing speed and scale to focusing more on quality and efficiency, from developing various transportation modes relatively independently to highlighting integrated development, and from being driven by traditional factors to emphasizing innovation.

Therefore, comprehensive transportation system planning under national land use planning is facing new opportunities, whether from the perspective of establishing the system of national land use planning, or in view of building national strength in transportation. The new opportunities demand the high-quality development of the comprehensive transportation system in terms of concepts, goals and strategies, system construction and pathways. The comprehensive transportation system pays more attention to low-carbon, safe, efficient, intensive, and economical development. It emphasizes the guidance of development concepts, the coordination between space and the comprehensive transportation system, and the transformation from factor-driven to innovation-driven. It also highlights the greenness, safety, efficiency and convenience of the whole travel chains of people and goods and pays more attention to being economical and intensive during construction and service. Therefore, the traditional urban comprehensive transportation system planning needs to be reformed and innovated in the context of new concepts, goals and methods of development.

2 New requirements for comprehensive transportation system planning under national land use planning

2.1 New orientation of comprehensive transportation system planning under national land use planning

The purpose and function of national land use planning is the long-term planning and overall arrangement of the comprehensive development and protection of territorial space, with the goal to strategically guide and strictly control its development. National land use planning promotes the balance between development and protection through the use of territorial space, the optimization of territorial spatial structure and the organization of territorial spatial relations. As a statutory program, the land use plan is supreme over all other spatial plans, which is characterized as a strategical, scientifical, coordinating, controlling and operable plan. National land use planning focuses on the coordination of space and the control of development boundaries. It represents a new type of planning that integrates planning of major function zones, land use planning, urban and rural planning and other spatial planning. National land use planning and national development planning mutually support each other but have their own focuses.

Various socioeconomic activities existing in the territorial space are the basic cells that constitute the space, and transportation is the circulatory system that maintains the territorial space's normal operation. Socioeconomic activities are concentrated in the areas with convenient transportation service. Therefore, the transportation system is the framework that shapes the spatial form and function layout, and it supports and guides the development and protection of the space. Comprehensive transportation system planning is an important measure to support and regulate the usage of territorial space, optimize the spatial structure, coordinate the spatial layout, and change the connection mode between territorial spaces. Apparently, comprehensive transportation system planning does not lead to a normal special plan, but the core element and key content of the system of national land use planning. The comprehensive transportation development strategy represents an important support for regional and urban development strategies and an important foundation for the construction and implementation of a sustainable comprehensive transportation system. In addition, comprehensive transportation system planning points out an important path to attractive territorial space and demonstrates an important measure to realize people's pursuit of beautiful and high-quality life. It is also a source to improve transportation management capabilities and a grand blueprint to guide the high-quality development of transportation in territorial space.

Therefore, the comprehensive transportation system and the territorial space layout are similar to veins and muscles, supporting and coordinating each other strategically and responding to and coupling with each other tactically. They support and guide the overall planning of territorial space at the same spatial level, which are the supreme design for comprehensive transportation development of territorial space. They should be prepared simultaneously, supporting, responding to and coordinating with each other.

2.2 New needs in the development of territorial space and new transportation issues

To meet the requirements of national land use planning in the new era, comprehensive transportation system planning under national land use planning is facing innovation and transformation. Its focus is shifting from urban space and passenger/cargo transportation to other topics, such as whole-area and all-element space, development and protection, ecological civilization and green development, meeting multimodal transportation demands in various spaces and embodying green ecology and humanity.

In the new era, national land use planning needs to focus on new topics, such as construction of attractive territorial space, improvement of competitiveness, development of green ecology, establishment of a safe and secure society, building of vital and efficient towns, and promotion of disaster preparedness and emergency response. These topics require corresponding countermeasures based on comprehensive transportation system planning.

Compared with the comprehensive urban transportation

system planning in the past, comprehensive transportation system planning under national land use planning greatly extends the research scope and topics. It has shifted the focus from urban space to all spaces and considered transportation demands in various spaces, such as urban areas, agricultural and rural areas, marine areas, as well as ecological protection areas, natural reserves, and permanent basic farmland [1]. In addition to highlighting urban space and the efficiency in moving people and goods, comprehensive transportation system planning under national land use planning needs to conduct further studies on various topics. The topics include coordination between transportation facilities and attractive space to perform the restriction and protection function; organization of tourism transportation to perform the support and guidance function; development of a transportation system of emergency response for natural disasters; and construction of a logistics system for resource recycling and a transportation system based on ecology safety (conservation and utilization of rivers and oceans, natural reserves, green spaces, etc.). The topics also include building a transportation system that can improve the efficiency and competitiveness of the regional connection between territorial spaces; ensuring transportation safety and creating a high-quality travel environment; improving the connection efficiency between differentiated spaces; and building a transportation system independent of cars and oriented to the quality of people's travel needs.

3 New goals of comprehensive transportation system planning under national land use planning

1) To support and guide the formation of a low-carbon society

The expansion and decentralized layout of urban functions will cause new problems in the global environment. The official statistics of Japan show that the transportation system (especially personal cars) is the main source of CO_2, a major pollutant in the atmosphere[2]. CO_2 emissions continue to increase with the rise in the frequency and travel distance of personal cars [2]. In addition, as road congestion continues to intensify in urban areas, the low-speed operation (about 20 $km \cdot h^{-1}$) of motor vehicles further increases the emission of CO_2. The comprehensive transportation system under national land use planning should pay more attention to the development of green transportation to support the formation of a low-carbon society. It should build an integrated transportation system with walking, non-motorized vehicles and public transportation as the main components and strengthen the control of car usage. It should also ensure that green and intensive transportation modes have a priority of development over cars, and the limited space resources are allocated more to public transportation, walking and non-motorized vehicles.

2) To shape an intensive structure for territorial space

Urban transportation is facing tremendous pressure along with the expansion of the regional and urban spatial scale and the socioeconomic development. The attractiveness of public transportation can certainly be improved by implementing transit priority policies, regulating the development of cars, and building a competitive public transportation service system. However, from the perspective of the accessibility of public transportation facilities, the efficient use of limited urban spatial resources, and the efficient support of transportation service, it is necessary to gather urban functions around public transportation corridors and hubs so that major urban function spaces can be connected by public transportation and a spatially intensive urban structure can be built. Therefore, in the context of national land use planning, both the existing spatial resources in urban areas and the new spatial resources in urban expansion areas are facing the development challenge of how to optimize, restructure and efficiently utilize spatial resources. They should enhance the coordination and integration of the public transportation system, spatial layout and function organization so that the public transportation system can support and guide the intensive layout of territorial space.

3) To build a comprehensive system based on high-quality development of public transportation and the integration of multiple modes

Although many cities have implemented relevant policies and measures to prioritize the development of public transportation, it does not serve the travel chains as efficiently as cars which can provide door-to-door transportation service. As a result, the share of cars keeps rising, and public transportation grows slowly with its overall share declining. The sustainable development of public transportation is facing severe challenges. It is necessary to focus on the demand to improve the service quality of people's entire travel chains; improve the service quality of the public transportation system; build a multimodal, multi-level, and multi-choice public transportation system to meet the needs of travelers who prefer to travel by public transportation; and comprehensively improve the service level and competitiveness of public transportation.

4) To shape a charming, safe and secure travel environment

As more families start to own personal cars, the transportation policies that are friendly to walking and non-motorized vehicles should be implemented actively, for the purpose of support green transportation and a low-carbon society and reflecting the concept that transportation should serve the people. The redistribution of road space should focus on the improvement in the travel environment for pedestrians and non-motorized vehicles, and a safe and secure road travel environment should be created. The transfer environment for walking, non-motorized transportation and public transportation should be improved. The competitiveness of the entire travel chain with public transportation as the dominant mode should be enhanced, and the overall share of low-carbon

transportation should be enlarged. At the same time, in response to the fact that more families start to own cars and cars are widely used, spatial differentiation and moderate car use policies should be improved so that the urban economy can be promoted and a comprehensive transportation system in which people and cars coexist and cooperate can be built.

5) To develop transportation policies considering both supply and demand

The urban transportation policies developed during the rapid development period are generally supply-side development strategies. They try to ease the contradiction between transportation supply and demand through the supply of facilities, but fail to consider the role of managing travelers' demand. As a result, the actual benefits of policies and programs deviate greatly from the goals. In the context of national land use planning, travelers' demand should be considered in the formulation of development and management policies for the transportation system: The development policy for the comprehensive transportation system should be consistent with travelers' demand. Both the supply and demand sides of the comprehensive transportation system should be considered in the development of consistent transportation development policies that couple both sides.

6) To improve the spatial connection efficiency and competitiveness of metropolitan, national and international space

The urban transportation system serves not only the trips within a city, but also international exchanges, regional interchanges, and communication between metropolitans. Therefore, an urban transportation system should be accessible, efficient and convenient for the trips within the city. At the same time, differentiated service priorities and service time control should be formulated based on the characteristics of the spatial circles, spatial scales, and connection differences. Consequently, it is necessary to plan a regional service system based on the differentiation in connection time and an urban service network efficient in connection. The regional, national and international competitiveness and the influence of the territorial space should be improved actively, while the territorial space's sustainable development in industry, economy and society should be supported.

4 New connotation of comprehensive transportation system planning under national land use planning

4.1 Innovatively expanding the planning focuses of the transportation system at different spatial levels

The national land use planning demonstrates a system with "five levels and three types," and the comprehensive transportation system planning should be consistent with this system. However, the transportation system is characterized as open, systematic, and networked, and it needs to be planned and coordinated from the regional perspective. Therefore, transportation planning should not simply be divided into planning for each administrative unit, and cross-regional transportation system planning is an indispensable key component of the land use planning system.

The construction of the comprehensive transportation system under national land use planning should be based on multi-level, multi-dimensional, and differentiated spatial development needs, covering all spaces and all elements. The focus should be determined for each spatial level respectively, such as regions (watersheds), urban agglomerations, metropolitan areas, cities, counties, and central urban areas (Fig. 1).

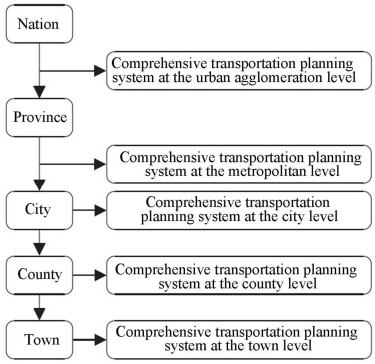

Fig. 1 Transportation planning system at different spatial levels

At the region (watershed) level, the focus is on the movement efficiency of people and goods, interconnection, coordination, and facility sharing. At the urban agglomeration level, it is on the movement efficiency of people and goods, the efficiency of spatial connection, facility sharing, and network integration. At the metropolitan level, it is on the movement efficiency of people and goods, the efficiency of commuting, and service integration. At the city and county level, it is on the movement efficiency of people and goods, and the travel quality and travel experience in three circles: the central functional service circle, the hub activity circle and the community life circle. At the central urban area level, it is on the movement efficiency of people and goods, and the quality of the safe and secure transportation environment. Transportation planning for the city and county level and higher levels should highlight the study of transportation strategies, whereas transportation planning for levels lower than the city and county level should concentrate on the study of transportation systems, facility layout, organization and coordination.

The key points for comprehensive transportation system planning at the urban agglomeration level include 1) constructing a wide-area service hub and its supporting system to enhance the competitiveness of urban agglomerations; 2) planning a low-carbon ecological transportation system that matches spatial organization and functional connections; 3) establishing a transportation system that reflects different

demands in spatial connection and travel efficiency; and 4) forming a cross-regional coordination mechanism. Emphases should be placed on 1) strengthening the portal function of the regional transportation hub for the urban agglomeration and improving its influence and service level; 2) strengthening the coupling and coordination between the spatial organization of the urban agglomeration and public transportation corridors and enhancing multi-level rail transit to support and guide the spatial organization of the urban agglomeration; 3) improving the transportation efficiency of important urban spaces within the urban agglomeration; and 4) covering the needs for transportation connection of all spaces and development efficiency.

The key points for comprehensive transportation system planning at the metropolitan level comprise 1) building a regional transportation system to enhance the overall competitiveness of the metropolitan area and comprehensively increasing the domestic and international influence of ports, airports and national railway hubs; 2) constructing a metropolitan public transportation network and hubs to support and guide the compact and intensive territorial spatial structure; 3) designing a multi-level, multimodal, and networked public transportation system that can be accessed easily by the public and can compete with cars to support a low-carbon society in territorial space; 4) building a road network with clear functions, a reasonable structure, and a moderate scale to meet the spatial need of all elements in the entire metropolitan area; 5) establishing a comprehensive transportation system environment that can be used safely and securely by people of all ages to support them to live comfortable life; 6) developing a resilient and reliable transportation system for rescue and emergency.

The key points for comprehensive transportation system planning at the city level include 1) building a transportation network that covers the entire urban area and establishing a transportation system that differentiates districts based on development requirements for living space, ecological space and production space (Fig. 2); 2) formulating the overall goal for the development of the comprehensive transportation system to support the development strategy of territorial space, while setting transportation development goals that consider different development requirements of different districts; 3) building a public transportation network that supports and guides the intensive spatial development; 4) creating a road network that is integrated with public transportation based on the overall organizational need to move people and vehicles over the entire urban area; 5) designing a comprehensive transportation network to meet the spatial needs of all elements in the entire urban area; 6) establishing a resilient and reliable rescue and emergency network.

The central urban area is the space carrier for the main functions of a city or a metropolitan. At the central urban area level, the priority should be given to the efficient use of the limited space resources so that transportation support can be provided to the socioeconomic activities in central urban areas, cities and metropolitans. In light of the type of socioeconomic activities and the demand for spatial connections, the construction of a comprehensive transportation system mainly serves three spatial circles, namely the metropolitan circle, the city circle, and the central urban area circle. The transportation system that serves multiple spatial levels and integrates transportation service functions should be built around the core public service circle, the comprehensive transfer hub circle and the residential daily life circle in a metropolitan area.

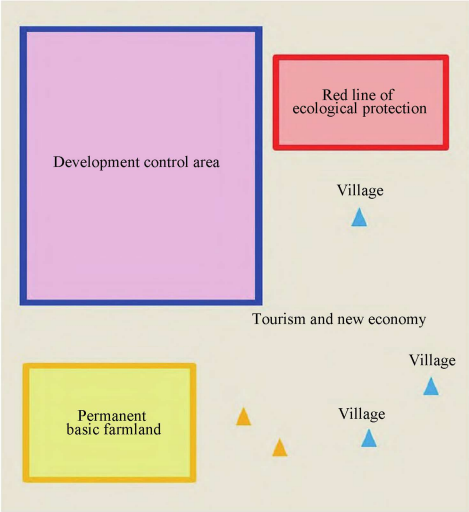

Fig. 2 Schematic diagram of "three areas and three lines"

4.2 Clarifying the planning levels and division of powers of the comprehensive transportation system at different spatial levels

The comprehensive transportation system planning at different spatial levels of territorial space generally includes strategic planning, comprehensive planning, special planning and detailed planning. As moving to lower spatial levels, the planning focus gradually shifts from macroscopic strategic planning, comprehensive planning, and special planning to microscopic detailed planning. The comprehensive transportation system planning at the level of urban agglomerations and metropolitan areas focuses on strategies, concepts and coordination. It introduces transportation development strategies and control indicators, comprehensive transportation corridors, and regional major transportation infrastructure programs to support and implement the development strategy of territorial space. The comprehensive transportation system planning at the municipal and lower levels proposes transportation development strategies and tactics to support and guide the territorial space strategy at the same level. It not only implements the major transportation infrastructure programs proposed at the upper level, but also proposes comprehensive transportation system programs for the same level, and puts forward development indicators to guide detailed planning by districts.

Among the transportation plans at the same spatial level,

the comprehensive transportation system plan is the prime transportation plan. It not only needs to inherit the transportation development strategies, but also needs to guide and restrict the special transportation plan and the detailed transportation plan. The special transportation plan and the special plans prepared by other departments should give feedback to each other.

The overall structure specifies what to manage, what to plan and what to review in comprehensive transportation system planning, special transportation planning and detailed transportation planning at different spatial levels. It needs to clarify who is responsible for plan preparation and approval and determine the division of powers (Tab. 1 and Tab. 2).

Tab. 1 Department for plan preparation and approval for comprehensive transportation system planning at different spatial levels

Planning category	Spatial level	Department for plan preparation	Approval department
Comprehensive transportation system planning	Cross-region	Natural resource department under the government that is one level higher than all the regions in the plan	People's government that is one level higher than all the regions in the plan
	City with subordinate districts	Municipal planning and natural resource bureau	Municipal people's government
	District (county)	District (county) planning and natural resource bureau	The district (county)-level people's government is responsible for approving the plan after the plan is reviewed by the municipal planning and natural resource bureau.
	Town	Town/street-level people's government	The district (county)-level people's government is responsible for approving the plan after the plan is reviewed by the municipal planning and natural resource bureau.

Tab. 2 Department for plan preparation and approval for transportation planning and construction at city levels

Planning category	Spatial level	Department for plan preparation	Approval department	
Special transportation planning	City	Municipal planning and natural resource bureau and relevant authorities	Municipal people's government	
	District (county)	District (county) planning and natural resource bureau and relevant authorities	The district (county)-level people's government is responsible for approving the plan after the plan is reviewed by the municipal planning and natural resource bureau.	
	Town	Town/street-level people's government	The district (county)-level people's government is responsible for approving the plan after the plan is reviewed by the municipal planning and natural resource bureau.	
Detailed transportation planning	Intensive construction areas within the town development boundaries	Municipal planning and natural resource bureau	Municipal people's government	
	Rural areas outside of the town development boundaries	Town/street-level people's government	The district (county)-level people's government is responsible for approving the plan after the plan is reviewed by the municipal planning and natural resource bureau.	
Transportation-related planning organized by industrial authorities	City	Relevant authorities	The municipal people's government is responsible for approving the plan after the plan is reviewed by the municipal planning and natural resource bureau.	To check with the "One Map" of national land use planning
	District (county)	Relevant authorities	The county-level people's government is responsible for approving the plan after the plan is reviewed by the municipal planning and natural resource bureau.	

4.3 Strengthening the hierarchical transmission of control indicators for comprehensive transportation system planning

The territorial space development strategies vary in different periods and at different spatial levels. The development strategies of the comprehensive transportation system under national land use planning should implement and support the overall territorial space development strategies, and any inconsistency should be avoided. Examples of the territorial space development strategies include shaping a low-carbon society, realizing the compact and intensive use of territorial space, building an ecological civilization, and ensuring the high-quality development of comprehensive transportation. These strategies should be transmitted hierarchically to each authority through qualitative and quantitative indicators.

The control indicators of the comprehensive transportation system under national land use planning mainly include the transportation connection efficiency of territorial space (urban agglomerations, metropolitan areas, and central urban areas), the development competitiveness of territorial space (airports, seaports, and their throughput; land connectivity and its service level), the share of green transportation, the accessibility of all-element spatial road network in territorial space, the coverage rate of public transportation in urban functional areas, and the density of urban (town) road network [3].

The transportation connection efficiency of territorial space mainly considers the connection efficiency between people and goods at different spatial levels. It also considers the demand for a change in the development mode of the comprehensive shipping system and the comprehensive transportation system, due to the construction of a low-carbon society. In accordance with the requirements for high-quality development, the goal is to achieve two-hour access between urban agglomerations, realize one-hour commuting in metropolitan areas and build 30-minute life circles in central urban areas. Transportation connection efficiency is a general indicator to guide the development goal, mode selection and planning of the comprehensive transportation system at different spatial levels.

The development competitiveness of territorial space refers to the capability to influence the external and the internal. It improves the competitiveness at the spatial level, such as core cities in urban agglomerations, central cities in metropolitan areas, and central urban areas in cities where major external transportation infrastructures are located. It is generally measured by the number of cities that can be accessed directly, total throughput, service coverage and service quality of airports, seaports and land ports of high-speed railway.

The share of green transportation varies with spatial levels and spatial scales. At the urban agglomeration level, it mainly measures the proportion of low-carbon transportation modes in the movement of people and goods. At the metropolitan or city/county level, it measures the share of walking, non-motorized transportation and public transportation in commuting trips. Due to the large variation in the spatial scale of metropolitan areas and cities, the share of green transportation varies greatly. It should be determined after the comprehensive analysis of various factors, such as the socio-economic development stage, travel distance structure, and transportation behaviors.

The accessibility of all-element spatial road network in territorial space measures the transportation accessibility of all-element territorial space. The key difference between the comprehensive transportation system under national land use

planning and the urban comprehensive transportation system is the improvement and expansion of the spatial scope, spatial elements, and content. The traditional urban comprehensive transportation system focused more on the support of the development of cities and towns. It put less consideration on the transportation demand of ecological space and agriculture space, or the transportation elements such as tourism and emergency rescue.

The coverage of public transportation in urban functional areas is an indicator to measure how well public transportation organizes urban functions and urban spaces for a compact and intensive development. It usually considers the scale of urban functions, residential population and employment positions within a certain distance from public transportation stations and transfer hubs. In Japan, the typical distance for study is 300 m for bus stops or 500 m for rail transit stations [4].

The density of urban (town) road network is an important indicator to measure the quality of urban space, the support of transportation and the attractiveness of cities. In terms of building attractive cities, ensuring high-quality development and high-quality life, and shaping a safe and secure transportation environment, the development of urban functions requires the support of a road network with certain density. It also needs to consider the comprehensive functions and differentiated utilization of road space and optimize and redistribute limited road space resources to meet the goal of high-quality development of transportation.

4.4 Empowering transportation big data to realize the accurate planning of the comprehensive transportation system under national land use planning

The traditional plan of the urban comprehensive transportation system is developed based on comprehensive transportation surveys. However, the sample sizes of these surveys are usually small and the data relevance is usually low, due to the standardization and consistency of the survey data, as well as the limitations on the sample size of people and goods movement and on the framework of survey technology. As a result, the problems revealed through the analysis and interpretation of these survey data can only reflect topics on urban transportation development from a macroscopic perspective in most cases, and there is usually a lack of in-depth exploration of the causal relationship between transportation problems. In the new situation of national land use planning, data acquisition and data mining techniques become more mature gradually. The traditional comprehensive transportation survey data need to be integrated with the territorial space big data (the Third National Land Survey data) and the transportation big data so that the time-space characteristics of the travel trajectories and the transportation choice behaviors can be analyzed thoroughly and summarized accurately. Based on this integrated data, in-depth analysis should be conducted on the relevant factors behind transportation problems, such as urban development, industrial structure, and travel choice behaviors. A highly reliable transportation analysis model should then be developed based on the transportation big data and the territorial space big data. It can forecast future traffic demand and systematically evaluate the carrying capacity and adaptability of current transportation facilities to urban development. It can also guide the development strategy of the comprehensive transportation system under national land use planning, the selection of the system and mode, and the accurate preparation and scientific evaluation of the plan, so that a more scientific and effective technical system for the planning of the comprehensive transportation system of territorial space can be developed.

5 Conclusion

Comprehensive transportation system planning is an important measure and approach to support and regulate the use of territorial space, optimize the spatial structure, and coordinate the spatial layout. Comprehensive transportation development strategy is an important support for the strategic goal of regional and urban development. It is also the decision-making basis for the regional and municipal governments to choose strategies and implement plans on the sustainable development of the transportation system. The comprehensive transportation system under national land use planning is built upon multi-level, multi-dimensional and differentiated spatial development needs, covering all spaces and all elements. It adheres to the concepts of ecology, low carbon, efficiency, and safety, serving people's travel needs and revitalizing industrial development. The new situation for territorial space should be created, in which the organization of spatial functions, spatial structure and all-element transportation support are all based on public transportation. In the meantime, support should accompany regulation and guidance should accompany control so that the sustainable development of the comprehensive transportation system of territorial space can be achieved.

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