

Research on Comprehensive Evaluation of Green Transportation Development in the New Era

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Abstract: Green transportation is an important feature and inherent requirement of the Strategy of Strengthening China's Transportation Industry. As an effective means to quantify the development of green transportation, the comprehensive evaluation of the development effect of green transportation is the core embodiment of the connotation of green transportation development, which makes the abstract and complex system of green transportation system understandable, measurable, guiding and stimulating, and directly affects the quality and effect of green development. This paper comprehensively analyzed the current situation, problems and challenges of green transportation development effectiveness evaluation from the perspective of national policy, industry development and government governance. On this basis, it put forward relevant suggestions on establishing comprehensive evaluation of green transportation development effectiveness, so as to provide scientific support for promoting the implementation of green transportation construction, encouraging the government and industry to take responsibility, and supporting energy conservation and emission reduction in transportation field.

1. Introduction

Green transportation is an important feature and internal requirement of the Strategy of Strengthening China's Transportation Industry. In the key tasks of the Outline of the Strategy of Strengthening China's Transportation Industry, it is clearly proposed that green development should be economical and intensive, low-carbon and environmental protection. If we want to implement the policy better, we must take the effectiveness evaluation as the guidance. As an effective means to quantify the promotion degree of green transportation, the comprehensive evaluation of development effect is the core embodiment of the connotation of green transportation development. It can make the abstract and complex system of green transportation system understandable and measurable, and has the function of guidance and incentive, which directly affects the quality and effect of green development. Strengthening and improving the comprehensive evaluation of green transportation development is conducive to promoting the implementation of green transportation

construction, encouraging the government and industry to take the initiative, and supporting the scientific realization of green transportation goals. Based on the in-depth analysis of the current situation and problems, this paper puts forward some suggestions on strengthening the comprehensive evaluation of green transportation development in the new period.

2. Development Status

2.1. The Construction of Green Transportation is Highly Valued at the National Level

General secretary Xi Jinping stressed that the construction of ecological civilization must be placed in the prominent position of the overall work, so that the good ecological environment will become the growth point of people's life and become the support point for the sustained and healthy development of the economic society, and become the force point to display the good image of our country. This points out the direction for building a green transportation system.

The Ministry of Transport has thoroughly implemented the spirit of general secretary Xi Jinping's series of important speeches and the new ideas and new strategies of governing the country. The Ministry of Transport regards green transportation as an important strategic measure for the transportation industry to strengthen the construction of ecological civilization and realize green development. It has formulated and issued a series of policy documents such as "Opinions on Comprehensively and Deeply Promoting the Development of Green Transportation", "Implementation Opinions on Comprehensively Strengthening the Protection of Ecological Environment and Firmly Fighting the Battle of Pollution Prevention", which are clearly proposed to take the national strategy of power transportation as the guide, deepen the supply side structural reform as the main line, focus on the implementation of seven major projects, speed up the construction of three major systems, and comprehensively promote the construction of transportation ecological civilization.

2.2. First Section (Sub-Heading 2.2)The Development of Green Transportation in the Industry has been Promoted in an All-round Way

In the process of promoting the construction of ecological civilization in China, the transportation industry has actively carried out a series of exploration and practice of green development. It is transforming from the application of single green transportation technology to the comprehensive energy conservation and emission reduction in a certain field and a certain region, exploring the systems, technologies and implementation schemes applicable to different regions and projects, so as to promote the green transformation of various fields and links.

At present, China's green transportation infrastructure system has been basically completed, and the total mileage of the comprehensive transportation network has exceeded 5 million km. The transportation equipment has gradually realized green upgrading, and 1.2 million yellow label vehicles have been eliminated. The level of specialization, standardization and large-scale of transportation equipment has been continuously improved. The green and efficient transport organization network has been steadily promoted. The annual passenger volume of urban public transport has exceeded 90 billion, and the efficient transport organization modes such as multimodal transport are booming. The scientific and technological innovation of green transportation has been continuously strengthened. The research and application of transportation energy conservation and emission reduction and ecological restoration technologies have achieved remarkable results. Big data, cloud computing, mobile Internet and other technologies have greatly improved the operation efficiency and energy conservation and emission reduction efficiency. With the deepening of international cooperation in green transportation, China Europe trains shuttle back and forth across

the vast Eurasian continent, gradually establishing a good image of China's transportation unswervingly taking the road of green and sustainable development in the world.

2.3. Green Transportation Standard and its Evaluation Practice are being Carried out in Depth

In order to coordinate the development of green transportation standardization, the Ministry of Transport issued "Green Transportation Standard System (2016)", including 221 important energy conservation and environmental protection standards, initially established the green transportation standard system, and improved the green development supervision and service ability of transportation industry.

In addition, in order to enable the management department to regularly understand the green transportation development level of the whole industry, since 2012, the transportation energy conservation and emission reduction capacity construction project has carried out a complete set of evaluation index system research, including the evaluation of green transportation province, green transportation city and green low-carbon port, and initially established an evaluation index system suitable for the development of green transportation, which provided a basis for scientific evaluation of the development effect of green transportation.

3. Existing Problems

3.1. The Effectiveness Management of Green Transportation is Lagging Behind

In general, the current green transportation development effect evaluation is mainly studied and promoted by the third-party scientific research institutions, while the government practice is to carry out environmental performance evaluation which includes different levels of transportation related content. Therefore, the effectiveness management of green transportation is still in the initial stage of concept and research, the specific standards, methods, scope and boundaries of evaluation are not clear, and the effectiveness management system of green transportation development for regions, management departments and industry enterprises has not been formed. At present, the pilot work of the construction of the Strategy of Strengthening China's Transportation Industry has been carried out in many provinces and cities. The effectiveness of green transportation development in the pilot areas needs to be evaluated in time. In addition, with the promotion of the reform of the national fiscal and taxation system and the division of powers, the country will no longer implement the green transportation development mode based on capital guidance. Therefore, it is urgent to explore and establish a reasonable evaluation mode of green transportation development effectiveness.

3.2. The Existing Green Transportation Standard System is not Universal Enough

The existing green evaluation standards in the transportation industry, such as "Green Port Grade Evaluation Standard", "Green Transportation Facilities Evaluation Technical Requirements (green highway, green service, green channel, green passenger and freight station)", provide a certain support for standardizing the evaluation behavior and improving the level of energy conservation and environmental protection. However, these standards and the index system involved are mostly used for a single mode of transportation or facilities and equipment with strong pertinence. Therefore, any existing index system or method can not fully meet the needs of the industry wide green transportation development status assessment and effectiveness management, and the universality is not enough.

3.3. The Basic Data Supporting Function of Green Transportation is Insufficient

In order to serve the environmental quality management and research work of green transportation, in 2015, the Ministry of Transport issued the General Plan for the National Highway and Waterway Transportation Environment Monitoring Network, and carried out the construction of the first phase of the industry environmental data center project and 20 provincial industry environmental monitoring network pilot projects, initially forming the overall framework of the industry environmental monitoring network. However, due to the imperfect management system, inadequate monitoring technical support and standardization, limited capital investment, lack of talent team and other reasons, the current environmental monitoring network is still facing many challenges, which leads to the insufficient support of industry basic data for the development of green transportation, especially its effectiveness evaluation.

4. Countermeasures and Suggestions

4.1. Set up a Special Leading Group or Administrative Organization

According to the requirements of green development of the Strategy of Strengthening China's Transportation Industry, combined with the spirit of the construction of national ecological environment protection system proposed by the Fourth Plenary Session of the 19th CPC Central Committee, the transportation industry should set up a special working leading group or administrative organization, systematically design and uniformly deploy the comprehensive evaluation work of green transportation development effect, and formulate and publish the comprehensive evaluation system of green development effect of the industry in order to provide organizational guarantee for the construction of modern green transportation management system and fine management of green transportation.

4.2. Build a Comprehensive Evaluation System of Green Development Effect

In order to improve the modern green transportation management system as the goal, the basic research and theoretical system construction of green development effectiveness evaluation, such as green environmental protection, government governance, performance management, should be carried out, and then form a "Comprehensive Evaluation System of Green Development Effectiveness", which covers the specific evaluation subject, object, standard, method, scope, index system, accountability and other elements. According to the basic requirements of green development of the Strategy of Strengthening China's Transportation Industry, the index system should include the contents of resource conservation and intensive utilization, energy conservation and emission reduction, pollution prevention and control, ecological environment protection and restoration, take safety, high efficiency, low carbon, ecology and wisdom as the overall positioning, and take industry leading, function improvement, flexibility, intensive low carbon, circular saving, natural symbiosis, value creation and intelligent service as the basic attribute.

4.3. Improve the Industry Green Traffic Data Management Support Platform

Referring to the data platform construction experience of other industries, the green data management support platform of transportation industry should be constructed. The platform can rely on the energy consumption statistics and long-term monitoring and data collection of environmental monitoring data, and make use of new technologies such as big data, cloud computing, 5G, Internet +, block chain, etc. to analyze and deal with the results of traffic pollution

source emissions, energy consumption and environmental impact in time, and scientifically evaluate the operation of environmental protection facilities and the effect of energy saving and emission reduction in the industry, and grasp the green development level of the whole industry. And then it can support the development of energy conservation and environmental protection strategy research, policy formulation, planning, standard formulation, supervision and management, enterprise service, effectiveness evaluation, etc.

4.4. Strengthen the Application of Evaluation Results of Green Transportation

Based on the results of green transportation performance evaluation, we should actively explore the establishment of evaluation model suitable for different development stages, resource and environmental attributes, and theme function requirements, effectively supervise and manage administrative departments and industrial enterprises, and strictly implement the accountability system of green transportation development. In addition, it is suggested to further establish a dialogue and communication mechanism with relevant departments such as ecological environment, natural resources, development and reform, as well as industry research institutions and think tanks, promote mutual technical exchange and mutual trust, strengthen data convergence and technical standardization, promote mutual recognition of green transportation performance evaluation results among different industries, and coordinate the relationship between high-quality transportation development and ecological environment constraints from the source and planning level.

5. Conclusions

As an effective means to quantify the promotion degree of green transportation, the comprehensive evaluation of development effect is the core embodiment of the connotation of green transportation development. It can make the abstract and complex system of green transportation system understandable and measurable, and has the function of guidance and incentive, which directly affects the quality and effect of green development. It is suggested to set up a special leading group or administrative organization, build a comprehensive evaluation system of green development effect, improve the industry green traffic data management support platform, strengthen the application of evaluation results of green transportation.

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References

- [1] Li H., Lin S., Zhong Z., et al. Analysis on evolution characteristics of river bed and rapids in Dongxikou reach of upper Yangtze River [J]. *Journal of Waterway and Harbor*, 2020, 41(06): 682-687.
- [2] Zheng B., Jing Y., Wen J. Energy saving and emission reduction method for green transportation in tourist cities based on grey correlation degree[J]. *International Journal of Global Energy Issues*, 2020, 42(5-6).
- [3] Li Q., He Y., Cheng F., et al. Influence of triaxial UU test of single sample multistage loading method on shear strength of Tianjin soft soil [J]. *Journal of Waterway and Harbor*, 2019, 40(06): 663-666+723.
- [4] Cheng X., Wang C., Jiang H., et al. Research on aging evaluation system of wharves [J]. *Journal of Waterway and Harbor*, 2020, 41(03): 329-335.
- [5] Lin Y., Liu C., Zhang H., et al. Comparison and reference between domestic and foreign green port evaluation systems [J]. *Journal of Waterway and Harbor*, 2020, 41(05): 613-618.

- [6] Geng B., Liu Er., Zhang C., et al. *Experimental study on energy variation of oblique wave propagating along vertical structure [J]. Journal of Waterway and Harbor*, 2020, 41(06): 635-642.
- [7] Xuan H., Liu S., Zhu L., et al. *Analysis on the key problems of pollutant discharge permit management of terminal [J]. Journal of Waterway and Harbor*, 2020, 41(05): 625-629.
- [8] Liang C., Prathik A.. *Analysis of performance-based issues in green transportation management systems in smart cities[J]. The Electronic Library*, 2020, 38(5/6).
- [9] Feng X., Feng H., Xu X., et al. *Temporal and spatial distribution of high-frequency tidal oscillations along the China East Coast[J]. Journal of Waterway and Harbor*, 2020, 41(05): 520-530.
- [10] Gao K. *Wind tunnel test study on wind load of port high-rise chimney and comparisons with China and US Codes [J]. Journal of Waterway and Harbor*, 2020, 41(06): 675-681.