Comprehensive Evaluation Method of Urban Traffic System for Sustainable Development

Jia Shi

Qingdao University of Technology, Qingdao, 266500, China.

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Abstract: The basis of sustainable development is industrial civilization, and the concept of sustainable development in ecological protection, ecological technology and other aspects of the new content and characteristics. Today, with the further development and reform of information network technology and economy, with the further advancement of modern urban planning, construction and development in China, the layout of urban transportation has changed reasonably. The purpose of this paper is to make Suggestions for the planning of urban transportation system from the perspective of sustainable development by studying the comprehensive evaluation method of urban transportation system. Therefore, this article will be to go to protect the environment and economic development of the combination of low carbon environmental sustainable development of urban transportation system, strict analysis and discussion with the core idea of sustainable development, the related principles and guiding ideology, take appropriate evaluation index system, the urban transportation system for a corresponding analysis and comprehensive evaluation, the results show that under the evaluation method of testing, have 2 applies to the concept of sustainable development of transportation scheme score more than 8.5. Through this evaluation method, to a certain extent, it can promote the development of urban transportation system to a better quality direction.

1. Introduction

Urban traffic system is an open and complex dynamic system. The modeling and analysis of urban traffic and land use has been one of the most difficult and hot issues in the field of traffic science. On the macro level, the relationship between traffic and land use is reflected in the process of urban evolution, which is mainly reflected in the evolution of road network. The evolution of road network will affect the distribution of urban traffic flow, the average travel distance and travel cost of residents, and then affect the choice of residential location of residents, and thus further affect the nature of land use, etc. Various factors affect each other and work together to form the evolution process of cities. From the perspective of individual choice, the modeling and analysis of transportation and land use is actually a study on a series of individual choice behaviors such as residence choice and work place choice.

In the face of today's worldwide environmental pollution, people put the green with no pollution, pollution-free, environmental protection and sustainable development closely linked together. In the context of economic globalization, environmental governance and sustainable development in the global scope are becoming a common concern of all countries. The public demonstration project is designed to promote the upgrading of green manufacturing technologies in China to accelerate the "catch-up" of innovation and the transition to sustainable development. However, Zhou and Yuan's projects face implementation challenges because the associated barriers are different from traditional demonstrations in new technology fields when it comes to complex economic issues and the large number of small and medium-sized enterprises that are adopters. Therefore, Zhou and Yuan adopted a case-based approach to study a specific Chinese demonstration project to support large-scale green technology diffusion and its pilot implementation. Through case studies, Zhou and Yuan reveal a different set of diffusion barriers these demonstrations face in testing technology and promoting learning. In addition, the emphasis on market-oriented policies and non-legislative actors

and their combination with traditional coercive measures may require a new policy model to address these obstacles [1]. Manufacturing needs to consider the sustainability of green manufacturing throughout the product life cycle. Traditional product life cycle management does not consider the energy consumption of product manufacturing. Zhao, wen-bin proposed a new product life cycle management information model from the perspective of sustainability. On this basis, an energy simulation framework of sustainability on manufacturing industry is proposed. The analysis results show that energy simulation with the sustainable product life cycle management information model is conducive to energy conservation in the manufacturing industry [2]. Governments in emerging economies are under intense pressure to sustain rapid growth in manufacturing. Unfortunately, manufacturing consumes a lot of energy and other resources, emits a lot of greenhouse gases, and adds to environmental problems such as climate change and global warming. One possible solution to this problem is to implement green manufacturing (GM) in industry. However, gm's implementation faces many challenges. Governments and industry should promote incentives known as "drivers" to make this change possible. From the perspective of government, industry and experts, Mittal studied the driving factors and sorting problems of gm's implementation by using fuzzy sorting technology and the sorting method with similarity as the ideal solution. The study concludes that competitiveness, incentives, organizational resources and technology are the top drivers and should be helped to implement gm through government and industry. Manufacturing has been under enormous environmental regulatory pressure to reduce pollutants such as carbon dioxide. Limited natural resources encourage manufacturers to find ways to reduce energy consumption in daily production [3].

This article is based on the concept of sustainable development, respectively from two angles of macroscopic whole and microcosmic individual to modeling of transport and land use, and gives the optimization of the fast road network design and optimization of traffic management policy, urban planning and traffic planning integration optimization strategy, for scientific and reasonable city planning, transportation planning and management to provide decision-making basis. Considering the interaction between land use and traffic network design, a comprehensive evaluation model of urban traffic is put forward, which provides reasonable Suggestions for the design of urban traffic system.

2. Proposed Method

2.1 Sustainable Development

(1) The concept of sustainable development

The concept of sustainable development can be understood from four perspectives, that is, from the perspective of ecology, sustainable development is to "protect and strengthen the production and renewal capacity of environmental systems", that is, to seek an optimal ecosystem to make the human living environment sustainable; From a sociological point of view, sustainable development is to "improve the quality of human life without exceeding the capacity to maintain the ecosystem"; From the perspective of economics, sustainable development is "maximizing the net benefits of economic development while maintaining the quality of natural resources and services provided"; From the perspective of scientific and technological application, sustainable development is to move to cleaner and more efficient technologies, as close as possible to 'zero emissions' or' closed 'process methods, and reduce the consumption of energy and other natural resources as much as possible [4-5].

2.2 Urban Transportation System Planning

(1) Evaluation objectives and demand analysis

The construction of urban traffic system is highly integrated and real-time. In the demand design of the system, the content of high technology is relatively high. In particular, the system needs to be practical, scientific and the goal of the system to be realized in the technical scheme, not only to meet the design requirements of the system in terms of equipment selection and technical functions.

In the city intelligence traffic control and management system, the relationship between each subsystem and system integration, reflects the high degree of integration, however, to the system after the completion of the comprehensive benefit of: how to reduce the pollution of the environment and improve traffic capacity, reduce travel time and reduce accidents not established specific indicators, make the construction goal of traffic system highlights the specific technical parameters of equipment configuration and lack of system construction after the implementation of the overall goal of [6].

(2) Index system setting

At present, the evaluation index system adopted in China is composed of technical scheme, commercial quotation, enterprise qualification and project management. The evaluation index system is simple and lacks comprehensiveness and hierarchy. The evaluation index of the technical scheme is not perfect. The evaluation of the technical scheme focuses on the performance of the system and ignores the evaluation of the benefits of the system, such as improving the traffic capacity of the road, reducing the congestion time and reducing the accident alarm time, etc. [7-8].

(3) Evaluation method analysis

1) post-evaluation of the evaluation process of transportation system project

Post evaluation is an indispensable link in the whole management cycle from project approval and decision to completion and operation, and it is also an important information feedback link. After the completion of the bid evaluation and a period of time after the completion of the project, we conduct post evaluation on the whole result to check whether the whole evaluation process is scientific, fair and reasonable, whether the bid evaluation result is accurate and whether the project decision is correct. Through post evaluation, investors and relevant departments can timely summarize the experience and lessons of each stage of the bid evaluation process, so as to further improve and improve the bid evaluation work, and to achieve the purpose of guiding future project decisions and improving project investment efficiency.

2) The committee's post-evaluation on the quality of expert evaluation

An expert database was established. During each evaluation, several traffic experts, technical experts, financial experts and urban environment experts were randomly selected from the expert database for evaluation. Random selection from the expert database can avoid human interference [9].

3) Post-evaluation of construction implementation process and operation management

The evaluation of the implementation process includes the project implementation management mode, the construction preparation work, the construction method, the construction organization management, the supervision and the engineering quality control analysis and evaluation, as well as the evaluation of the management work in the early stage of the project. A comprehensive summary of the project implementation process can improve the level of design, construction and management, make rational use of funds, improve investment efficiency, improve and improve management, and provide scientific basis for formulating relevant policies [10].

3. Experiments

3.1 Experimental Background

The rapid development and deep level reform of China's economy have promoted the further advancement of China's modern urban planning, construction and development process. Meanwhile, it has also promoted the urgency of China's cities to build a perfect and reasonable transportation system. The urban transportation system always carries out scientific planning in accordance with the guiding ideology of sustainable development and devotes itself to the ability of urban transportation to serve urban economic development, which is consistent with the ability to protect the environment and continuously improve the quality of life of the broad masses of people. And in the process of economic development and urban planning and construction in our country, the urban traffic system is listed as an important object in urbanization process, urban traffic layout planning is to a certain extent, the significance of effective to promote the urban traffic, urban

economy and urban environment toward coordinated environment, population, economic, and energy resources in the direction of development, to ensure that urban traffic system in the condition of social, environmental and economic balanced development.

3.2 Experimental Design

The paper makes a comprehensive evaluation of the urban traffic system for sustainable development by combining the relevant evaluation index classification standard and the tower structure model. In addition, the relevant evaluation value calculation formula is used to evaluate the traffic development status. Under the guidance of relevant principles and guiding ideas of sustainable development, the development levels of transportation are classified into unsustainable development, weak sustainable development, general sustainable development, strong sustainable development and strong sustainable development.

Among them, the method to determine the weight of the evaluation index of urban traffic system is mainly the ahp method and the analysis and investigation method of relevant authoritative experts: the comprehensive evaluation value is > 90→ strong sustainable development; 80 < comprehensive evaluation value < 90→ strong sustainable development; 70< comprehensive evaluation value <80→ general sustainable development; 60 < comprehensive evaluation value < 70→ weak sustainable development.

There are n evaluation indexes, and experts are used to score the recently optimized urban traffic system of a city according to the indexes. The expert evaluation result is obtained, namely the evaluation matrix. The value x in the table represents the average value of the expert's scoring on the program index, I = 1,2... N, j=l, 2..., p. The evaluation matrix is obtained by multiplying the evaluation results of each indicator experts by the weight of each indicator in combination with the expert rating and index weight. The results are shown in Table 1.

Table 1. Test results

Indicators	x1	x2	x3	x4	x5	x6
Traffic congestion	66	71	96	58	91	94
Prevention of traffic accidents	59	64	42	74	91	83
The assurance of the smoothness of the road	53	54	86	66	93	96
Investment and operating costs	61	67	91	61	98	82
Environmental benefits	66	74	89	64	85	76

4. Discussion

4.1 Analysis of Comprehensive Evaluation Method of Urban Traffic System Based on Sustainable Development

As shown in Figure 1, according to the evaluation index set up five assumptions, in order to each index as the focus, in accordance with the principle of grey correlation analysis, grey correlation, the greater the description scheme of the comprehensive evaluation results, the better, according to the calculation results, the five transportation system design sequence is as follows: plan 5 (0.752) > 4 (0.735) > plan 3 l (0.728) > (0.72) > solution 2 (0.71), which can be seen that 5 optimal scheme, the scheme 2 is the worst. The order of the top 3 programs in the 5 programs changed: in the average score method, program 4 scored the highest on average, while program 5 only ranked the third. In the grey relational method, the score of plan 5 ranked the first, while plan 4 ranked the

second. By observing the scores of each plan, it can be found that although many items in plan 5 have lower scores, the ones with larger weight all have higher scores. And plan 4 scored less than plan 5 in three of these four categories. The score of the item with the largest weight is quite different from that of plan 5.

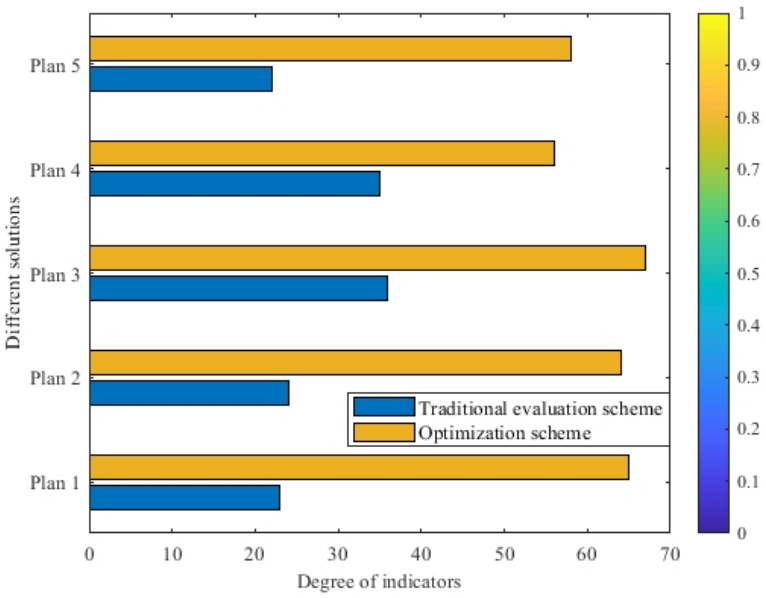

Figure 1. Comprehensive evaluation results of urban traffic system

4.2 Suggestions on the Comprehensive Evaluation Method of Urban Traffic System Based on Sustainable Development

According to the proposed model, the optimized urban expressway system planning scheme can well match the spatial layout of urban land use, and OD traffic flow and travel expenses are distributed evenly within the city. Therefore, the city not only has a high social total utility but also a good traffic status. In terms of urban layout, jobs tend to be located closer to the city center than where people live. With the increase of funds, the total social utility of the urban system increases, and the urban traffic conditions are also improved in this process. However, the increase of social total utility and the improvement of traffic condition brought by the increase of unit budget become smaller and smaller. Under the condition of lower capital budget, compared with the increase of radial expressway, the construction of circular expressway will increase the total social utility and improve the traffic condition more obviously.

5. Conclusions

In this paper, based on the principle of sustainable development and the guiding ideology, proposed USES the residents travel satisfaction, traffic resources affect fitness function, environment and development coordination degree is composed of 24 indicators in four aspects such as the evaluation index system, comprehensive analysis and evaluation of urban transportation system, and studied the method of quantitative evaluation index. This paper provides a theoretical basis for constructing the urban road design model based on the analysis of traffic and land use balance, and optimizes a simple method for evaluating large-scale infrastructure construction based on the data results of urban traffic system evaluation system. Taking the road traffic planning scheme of a city as an example, the guiding function of the evaluation process and the evaluation results to the sustainable development of urban traffic is illustrated.

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