Probe into standardization strategy of high quality regulation of collaborative products in the field of transportation

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Abstract. China's economy has turned to a high-quality development stage, and improving the quality and experience of collaborative products related to the vital interests of people's lives is the first problem to be solved in the transition from economic society to high-quality development. This paper briefly analyzes the typical problems in the process of collaborative product development in the field of traffic engineering. From the perspective of standardization, it proposes ways to improve the quality of collaborative products and the efficiency of regulation. It will enhance the effectiveness of regulation, inspire new research directions, and promote the overall quality of China's products and it has certain value in improving people's living environment.

1. Introduction

In recent years, standards have played an irreplaceable role in regulating market economy and social order and promoting China's economic and social development. They are playing an increasingly important role in optimizing the technological process, ensuring the product quality and standardizing the service process. The changes in social contradictions and the growing demand of the people for high-quality life pointed out in the report of the 19th National Congress of the Communist Party of China require more in-depth reform of standardization. At the same time, with the continuous development of new materials, new technologies and new processes, the quality of products is constantly improving. However, in real life, the use of products in most cases needs to cooperate with each other. The improvement of the quality of a single product is far from meeting the actual needs, and the overall quality of the products used in conjunction with the products needs to be improved. However, it is precisely in these areas that lack specifications and requirements for relevant standards. However, there is a lack of standards and requirements in these areas. Therefore, the standardization work needs to further check the deficiencies and make up the omissions. At the same time, the standards can not only stay on the minimum requirements. The formulation of collaborative standards, the improvement of technical indicators, the comprehensiveness of technical requirements or the direction that standardization researchers should rethink in the new situation. Of course, from the stage of high-speed growth to high-quality development is not achieved overnight, it needs a process. All kinds of problems will inevitably arise from the speed of blindly demanding too fast, and the implementation in stages and steps is an effective means. In view of the existing problems in product quality, it is feasible to give priority to solving the problems closely related to people's life and travel, such as those in the field of traffic engineering.
2. Related concepts

2.1. collaborative products
The collaborative products proposed in this paper refer to two or more kinds of product combinations that are applied to the same area and need to be used together. The products here include both the concept of macro products and microscopic products. Macroscopically, collaborative products may be the planning and design of the entire city. Through comprehensive consideration of multiple factors, the optimal combination of planning and design in various fields can be realized, and the design effect that is close to optimal in a certain period of time can be achieved. Microscopically, the collaborative product may be a combination of several mechanical products used in the same location, and enhance the synergistic use of the overall layout or installation process requirements and specifications, thereby improving the overall quality and experience of the collaborative product.

2.2. High quality regulation
The high-quality regulation mentioned in this paper refers to the overall supervision and management of product quality in accordance with the requirements of relevant standards under the requirements of high-quality development, so as to ensure that it can meet the high-quality development needs. This includes both the regulation of a single product quality and the overall regulation of collaborative product quality.

3. Analysis of the problem
The report of the 19th National Congress of the Communist Party of China pointed out that China's economy has shifted from a high-speed growth stage to a high-quality development stage. The high quality mentioned here is also a macro concept, which includes both the improvement of the overall quality of macro products and the improvement of the quality of micro products. In the early stage, the quality inspection department usually pays more attention to the improvement of the quality of a single product, and the regulation of the quality of the coordinated products is still not perfect, which leads to the existence of some collaborative product quality problems.

3.1. Analysis of product quality issues

3.1.1. Analysis of typical cases of micro-product quality problems
Microscopic products can take the overall flatness of urban roads as an example. In the field of urban road construction, in the past period of time, the focus on product quality often stays on the quality of a single product, lacking the standard of quality of collaborative products. For pavement materials, more consideration will be given to the water stability, fatigue resistance, high temperature stability and durability of asphalt mixtures[1-4], but there is a lack of uniform high standard requirements and specifications for the collaborative product of urban highway, including asphalt pavement, various pipeline wells, drainage system, bridge joints, etc. Different installation or laying manufacturers are respectively responsible for the effect of their own products, and lack of specific standard requirements in mutual coordination. Often, after the pavement is laid, various pipeline wells are opened and installed, resulting in uneven joints, serious impact on the overall flatness of the road, and the lack of corresponding regulatory measures, resulting in the uneven situation on the well covers of public roads is particularly common. There may be historical reasons for this. For example, with the development of economy, a large number of roads in various regions of the country have been continuously widened, resulting in the situation that originally planned cable wells and sewer wells in sidewalks, non motor vehicle lanes, green belts and public roads are converging. But even on many new roads there are the same problems.

However, uneven road surface can easily cause bumps and vibrations, making it impossible for drivers and passengers to drive safely and comfortably. Moreover, vehicle vibration caused by uneven road surface has a direct impact on vehicle wear, fuel consumption, driving comfort, driving speed,
road damage and traffic safety[5]. It is easy to cause traffic accidents when the car is driving at high speed[6]. Especially in the freight traffic lanes with large cargo loads, the losses caused by accidents will be even greater. According to the statistics of the Ministry of transport, from 2014 to 2018, China's highways developed rapidly, as shown in Figure 1. By the end of 2018, the total mileage of China's highways had reached 4.8465 million kilometers, including 4.4659 million kilometers of class IV and above highways, an increase of 127300 kilometers over the past year; 851500 and 55685900 meters of national highway bridges, an increase of 19000 and 3429700 meters over the past year; 17738 and 17236100 meters of national highway tunnels, an increase of 1509 and 1951000 meters. And, in the first three quarters of 2019, the commercial cargo volume was 38.90 billion tons, of which the road volume was 30.28 billion tons. Road transport freight volume accounts for 77.84% of the total freight volume, which shows the importance of the high quality of this urban roads collaborative products. This is a typical example of a micro level of collaborative product quality improvement.

3.1.2. Analysis of typical cases of macro product quality problems
Macro products can take the quality of urban master planning as an example. In the early stage, the planning and development of many cities in China pursued economies of scale, resulting in imbalanced production and transportation, severe traffic congestion, and reduced overall efficiency. Luo Yong[7] used the relevant data of Jiangsu textile industry, Guangdong Electronic and communication equipment manufacturing industry and Shanghai transportation equipment manufacturing industry from 1987 to 2004 to empirically study the relationship between industrial clusters and regional economy. The results show that industrial clusters can significantly improve the level of regional economic development, but also lead to the aggravation of the unbalanced development of regional economy[8]. In the early stage, the planning and development of many cities in China, due to the one-sided understanding similar to the theory of economic development, too much to pursue the speed of economic development, only the number of GDP is determined, and the situation associated with the performance evaluation of managers abound. Therefore, in the past, for a long time, in the process of urban planning and development, trying to continuously improve the industrial agglomeration effect of economic development[9], many urban planning and design considerations are not comprehensive, there is imbalance in production and production, and severe traffic during peak hours. The situation of congestion has become more and more prominent, and it has become a serious problem in the development of big cities, and has even become an important factor limiting the economic development. As early as 1998, boarnet[10] investigated the relationship between transportation infrastructure investment and economic development at county level in California from 1968 to 1988. It was found that transportation infrastructure construction promoted the

![Figure 1. Total mileage and density of national highways in 2014-2018](image-url)
reallocate economic resources in the region, and the developed regions with better development would have stronger competitive advantages than the neighboring backward regions. Another study[11] pointed out that the development of transportation infrastructure can effectively improve the efficiency of resource allocation. For example, Copenhagen, the capital of Denmark, has achieved good results by using urban rail transit construction to guide urban development. It has become a famous successful case of TOD (transit oriented development) in the world. Its finger shape planning is shown in Figure 1[12]. Under the requirements of high-quality development, the transformation of social contradictions requires that high-quality urban planning and development in the future should not only consider the role of industrial agglomeration in promoting economic development, but also make overall planning, just as many principles should be considered in the strategic planning of urban standardization[13], we should pay attention to the high quality of urban life and travel. Efficient travel is also conducive to improving work efficiency, thus promoting economic development. This is a typical example of macro urban planning and design to achieve high-quality development through collaborative product optimization design.

Figure 2. Copenhagen long-term planning period fingers forms.

In summary, through the typical cases of macro and micro levels, it is not difficult to find that with the transformation of China's economy to a high-quality development stage, we should focus on strengthening the regulation of the quality of collaborative products while improving the quality of a single product.

3.2. Analysis of quality regulation issues
In the early period, the quality inspection department paid more attention to the quality of a single product, while the quality regulation of the collaborative product was less. The reason may be multi-faceted. First of all, in the past, there were problems such as unclear boundaries of departmental functions, long-term cross-enforcement, and regulatory gaps. This often leads to problems such as unregulated and difficult coordination of quality control of some products, especially collaborative products; In terms of policy and system, there are some problems such as less punishment for quality violations and lower cost of violations, which lead some food production enterprises to take risks regardless of the possible punishment for violations; In terms of law enforcement basis, the regulation of collaborative product quality lacks the standard basis for regulation and audit or the evaluation index is difficult to obtain, which leads to the fact that although we understand the objective facts, we can not supervise and manage. For example, most of the existing urban road related standards are standards for indication, identification and coding, and there is no standard for overall requirements of collaborative product related to road flatness. In terms of human factors, there are problems such as inadequate regulation and follow-up, and many regulatory loopholes. However, with the institutional reform plan adopted in 2018, after the establishment of the State Administration of Market Regulation, the responsibilities have been gradually clarified and the boundaries of various departments have been drawn. The first responsibility of the General Administration of Market Regulation is to be responsible for the comprehensive supervision and management of the market, draft laws and regulations related to market supervision and management, formulate relevant rules, policies and standards, organize the implementation of the strategy of strengthening the country through quality, food safety and
standardization, formulate and organize the implementation of relevant plans, standardize and maintain market order, and create a market environment of honesty, faithfulness and fair competition. However, due to the field of market regulation, many are related to the vital interests of the people. Once there is a problem, it is easy to quickly cause widespread public concern, so it puts forward higher requirements for the innovation of regulation methods.

4. Standardization strategy recommendations

"Standardization is the building block for innovation, defining the requirements that enable myriad interconnected technologies and systems to work together safely and efficiently," noted S. Joe Bhatia, ANSI president and CEO[14]. As the technical basis for high-quality market regulation in the new era, the standard can effectively build a bridge between administrative management and professional technical product quality. In addition, standards have been juxtaposed with laws, regulations and policies, and have become an important manifestation of the modernization of the national governance system and governance capacity. Therefore, there is still a lot of work to be done in the current standardization of service product quality regulation. We should continue to strengthen the reform of standardization work, encourage innovation, and promote the high-quality development of collaborative products. Specifically, the following aspects are included.

4.1. Speed up to make up for the lack of standards

Standards play a major role in ensuring high quality of life. However, life is comprehensive, and the standards of single product domain have become more complete than existing mature products. However, there is still a lot of work to be done in terms of quality of collaborative products. The quality of the collaborative products also needs to be guaranteed by the synergistic standards. For example, in view of the problems mentioned in the article, it is necessary for the overall responsible department, overall coordination agency or public welfare organization of urban road technology to take on their responsibilities, and promote the overall quality of urban roads, enhance the urban traffic experience, improve the travel efficiency, and promote the overall quality of the economy and society by organizing the formulation of urban road coordination standards.

4.2. Improve standard technical index requirements

With the improvement of people's living standards and people's pursuit of high-quality life, national standards can't still stay on the minimum standard technical requirements, many standard technical indicators need to be further improved, give full play to the driving effect of standards, and realize the survival of the fittest. Of course, it also needs a process of development. We should gradually study and comprehensively improve the national standard technical indicators to improve product quality and collaborative product use effect, and comply with the current high-quality development requirements.

4.3. Promote the integration of regulation and standards

In the new era, the market regulation department will play an increasingly important role in ensuring fair competition in China's market and ensuring product quality. It has also creatively put forward many effective methods. In the future, the market regulation department should also strengthen the full integration of market regulation and various relevant standards. For example, we should push forward the innovative development of new tools and new methods in the process of market regulation, and develop Internet platforms such as mobile clients and public numbers, design tools similar to law enforcement recorder, and quickly link all kinds of professional product regulatory requirements with relevant technical standards. At the same time, we should strengthen law enforcement and punishment mechanism, or study the corresponding punishment mechanism and standard. We will increase the transparency of regulatory work and expand publicity. We will actively guide economic and social development in the direction of high quality.
5. Summary
The development of the economy and society should be shifted to the stage of high-quality development. First of all, we should start from improving the quality of products related to the vital interests of the people. We must not only improve the quality of a single product, but also make up for loopholes as soon as possible and improve the quality of collaborative products. The improvement of product quality is inseparable from government intervention. Under the new situation, while strengthening market regulation, it promotes the continuous integration of standards and market regulation, and continuously strengthens standardization and innovation. In addition to the standardization perspective, innovative research proposes more practical methods and tools to improve product quality, which is a research direction that needs to be deeply considered in the future.

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