Research And Design Of Highway Information System Based On Interoperation

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Abstract. Interoperation is a feasible solution in research and design of highway information system that used between different departments and different areas. We talk about the main issues existing in traffic information construction in China, and the structure of information system widely used is also discussed. Conclusion of analysis of system needs in both Ministry of Transportation and provincial ones is given. At last, inter-provincial interconnection charges security management and highway emergency response and service systems is realized and the structure is given.

Keywords: highway; interoperation; information system; system design; highway management;

1. Introduction

Information technology has become an important part and necessary technical means of traffic construction and management which is indispensable, also played an important role in the enhanced industry performance, improving the efficiency of industrial operations, enhancing the level of traffic information services. Promoting the development of traffic information has been the internal demand of there structuring of traffic and transportation.

Although the traffic information construction in China has made great achievements, there still exits problems. At present, the main factors restricting the development of traffic information is not just technology, but the ideas, mechanisms and the establishment of the system that more important. The main issues include:

Lack of knowledge in using of information technology means to standardize business processes, implementation of scientific management, and services to the public and decision support. The status of decision supporting that providing based on traffic information is: 4% of the province reached an advanced level, 40% of the province to reach the intermediate level, and 56 percent of the province are at the primary level, as shown in Figure 1-1.

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As for the road construction, maintenance, management, informationalization of collection, respectively is that 8%, 9%, 30%, 78% of the province reached an advanced level; and 63%, 57%, 57%, 22% of provinces achieve the intermediate level; 25%, 31%, 13%, 0% of the provinces are at the primary level, shown in Figure 1-2.

Information technology management, running the institutions and mechanisms is not perfect, the lack of co-ordination between business management and information management department. The development of traffic information in the internal integration stage and there is no province is in the demand-driven process. Currently, only 14% of the provinces leading develop into the management phase; 48% of the provinces in the internal integration stage; 38% of the provinces of traffic information is still in the process of individual stage, shown in Figure 1-3.

Traffic information resource collection, sharing, reporting, and publishing mechanism is not perfect, there is not enough timely information updates, information sources and different caliber, and other phenomena;

No long-term management and maintenance mechanisms of the formation of business information systems is established, also, data cannot be updated timely and the system cannot be maintained, upgraded, resulting in good business information systems not in using without any effect.

Through analysis of the existing Ministry of Transportation Highway Information System and the provincial highway information system, the structure is shown in Figure 1-4.
2. Interoperation needs analysis of highway informationalization

2.1 Interoperation needs analysis of Ministry of Transportation highway information system

Interoperation requirements are:
(1) Between the traffic management department and other administrative departments
(2) Between the two different traffic management departments
(3) Between the traffic management departments at the same level
(4) Between the different levels of traffic management department
(5) Between the traffic management sector and transportation enterprises
(6) Between traffic management departments and the public

2.2 Interoperation needs of provincial highway information system construction

The provincial highway system is for the purpose of road daily maintenance and management services business systems, and integration between the systems is low, systems are used mainly in their respective areas of business, the crossover between the different areas and the scope of management is little. Yet haven’t got a unified platform to a variety of systems integrated to provide a unified service for all aspects, also, data sharing between the various systems is low.\(^1\)

(1) Demands of transportation management departments.
(2) Demands of transport enterprise
(3) Demands of High Grade Highway Administration
(4) Demands of highway management departments

3. Realization

At present, all kinds of traffic information system is discrete, independent service for a single business sector management, but from view of public service, these information is incomplete. Therefore, the project to the class information, combined with the application system for the integration of information in order to provide better information support.

The system consists of a set of data sources, an interoperation platform, three applications, two major security system and five layers\(^3\), shown in Figure3-1.

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\(^1\) Data from https://www.transportation.com.
\(^3\) Data from http://www.transportation.com/security.
4. Conclusion

Based on interoperation, the inter-provincial interconnection charges security management and highway emergency response and service systems provide interactive services for the inter-provincial public data: provide support to inter-carrier settlement of the national highway network. In order to promote the insurance of inter-regional electronic no-parking charging and non-cash payment, to provide data base for the toll road as well as public trans-provincial travel, to give technical support for the Ministry of Transportation and better trade management, also ensure a richer and more convenient services for the public.

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6. References


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