

Analysis on Current Situation and Present Development of Intelligent Transport System Traffic

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ABSTRACT This article introduces the constitution of intelligent transport system and the development of intelligent transport system in home and abroad. At the same time it analyzes the current situation development and suggestion of intelligent transport system in national.

KEYWORDS

Intelligent transport
Current situation
Development

1. Introduction

Intelligent Transportation Systems, the English called “Intelligent Transportation System” (abbreviated ITS), refers to the high-tech development, so that intelligent transportation systems. In the intelligent, the entire transport systems have become “smart” up: intelligent vehicles on their own freedom on the road; the road by its own intelligence will adjust traffic flow to the best. With the large-scale system of intelligent, well aware of the driver’s traffic management personnel is crystal clear on the whereabouts of the vehicle. ITS closely reflects the “people-Setting car-Road”, which can greatly improve the efficiency of traffic safety, systems, environmental quality and energy efficiency.

2. Composed of intelligent transportation systems and foreign development

2.1. Composition intelligent transportation system

Intelligent Transportation Systems (ITS) is a new transport system developed in the traditional traffic engineering basis, due to different national circumstances, the development of transportation are not consistent with the focus of the content of the ITS research more different. But in general, it is generally believed ITS is information, communication, control, and computer technology and other modern technology integration applied to the transport sector, and establish a comprehensive role in real time, ac-

curate and efficient transport management system, it is a the formation of “people-vehicle-road-environment” four in one system [1].

An ITS consists of six major components, wherein the information management center is the core of ITS, ITS provides the basis for the sharing of traffic information.

2.1.1. Roadside System

Task roadside system is real-time detection and driving traffic, including road vehicles off the road sign parameters and line distance, roadside system also includes measuring vehicle speed radar, traffic lights and junctions’ electronic toll devices.

2.1.2. Car system

Automotive systems include dynamic real-time monitoring system, navigation system (including the road network database, path selection algorithm, video and audio output navigation information tips) and the like.

2.1.3. Demand management system

Requirements management system occupies a very important position in ITS, whose role is to analyze the needs of users, in order to manage the development of control systems and efficient services strategy, in real-time to the user, including the user is traveling and a predetermined vehicle travel.

2.1.4. Traffic management and control system

ITS traffic management and control system is the decision-making center, the use of application software to analyze information about the entire transportation system, and draw policy control and management system operation, enable ITS to achieve its objectives: to improve user safety, reduce congestion and save energy and improve environmental protection [2].

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ITS system components have two-way transmission of information between the various systems in which, while the sub-regional management center is an information management center, also a two-way transmission of information between the different regional management center in order to achieve management and information across the region shared.

In the ITS system components, the people and goods transportation system elements are moved, and moving people and goods along with the flow of information. Intelligent Transportation Systems emphasized that the use and sharing of information sufficient information technologies to improve the efficiency of the transport system, according to the information collection, transmission, processing, utilization process can be intelligent transportation system is divided into physical layer, transport layer, processing layer 4 level, service level, which is four levels of actual realization process services.

The physical layer mainly refers to the road infrastructure, including the road network itself and ancillary facilities such as road signs, roadside sensors. ITS emphasize information sharing and make full use of the information flow and transport in which to complete the transport layer, including short-range microwave communications, satellite, fiber optic communications. Processing layer is responsible for the completion of the extraction and processing of information, to produce a database that contains various data, and can provide different information requirements for different departments or different services. Service layer on the one hand according to the processing layer functions provided for different service areas, on the other hand constantly on the function expansion process layer depending on the service requirements. ITS is a means of an open network architecture, physical layer facilities, the way the transport layer, processing layer, the service layer will range of services and the level of scientific and technological progress and with the growth of people's needs continue to expand and improve.

From the perspective of generalized information, ITS can be considered as the specific application of information technology in the transport sector, while sensing technology, communication technology, information processing technology, control technology collectively known as IT Four primitives are the development and utilization of information resources information technology. IT basic content is: the use of sensing systems, communications systems, information processing systems and control systems, information on natural and artificial detection, transmission, processing, and ultimately act on the outside world. Correspondingly, four hardware: sensors, communications network, processor and controller [3].

In the ITS, the study of information technology four primitives are a variety of specific traffic information, policy information about the person such as the four elements of transportation, vehicle, road and environmental

real-time information or forecasting information, and the system obtained after treatment and control target information or control information used. Its research also traffic information for a variety of operations, including information gathering, transmission, processing, and utilization. Therefore, one of the sensing technology-related traffic information, road parameters, vehicle speed, vehicle spacing, weather, fees, parking for obtaining; communications technology for transmission of information acquired and processed information to be transmitted, which It contains the relevant protocol used for communication; information processing technology for the analysis of traffic volume, speed, lane characteristics of transmitted information, and accident prediction, choose Control Strategy. ITS will control the use of traffic control technology, such as the role of guiding the vehicle control information applied to vehicles, pedestrians or traffic signs. Therefore, the traffic information in the ITS is circulating, it comes from traffic four elements, and finally in an appropriate form to act on four elements, in order to achieve an efficient transport system regulation.

2.2. Foreign intelligent transportation system development

Traffic congestion and road obstruction has become an important issue in many countries, waste transportation overcrowding caused by automobile delay, gasoline, vehicle exhaust emissions are multiplied. At the same time, due to land resource constraints so as to provide the infrastructure is greatly limited, so since the 1980s, with Europe, the United States and Japan on behalf of the developed countries to expand the road network from relying on to address the growing traffic demand transfer to use high technology to transform the existing road transport system and its management, so as to improve the road network line capacity and service quality, improve environmental quality, the purpose of improving energy efficiency, ITS is in this condition occurs and developed [4].

2.2.1. Development of ITS in Japan

ITS development in Japan began in the 1970s, 1973-1978, Japan successfully organized a "dynamic route guidance system" experiment. Mid 1980s-mid 1990s for 10 years, we have completed a road-vehicle communication system (RACS), Vehicle Information and Communication System (TICS), wide area travel information systems, super intelligent vehicle systems, security systems and new transportation vehicle research systems and other aspects of management. Founded in January 1994 VETIS (bus transportation intelligent Association), founded in July 1995 VICS (Vehicle Information and Communication System) center, was officially launched in April 1996 VICS, the first in the capital and then to the circle Osaka, Nagoya and other places , 1998 to the nation forward. VICS ITS Japan is practical first step in the world leading level.

2.2.2. Development of ITS America

ITS is the prototype of the United States began in the 20th century, the late '60s electronic route guidance systems (ERGS), intermediate pause for over a decade, the mid-1980s the California Department of Transportation study PATHFINDER system to be successful, then we conducted a series of studies in this area, 1990 US Department of Transportation set up intelligent vehicle road system (IVSH) organization, in 1991 Congress enacted the ISTEA (integrated surface Transportation Efficiency Programme), in 1994 renamed IVHS ITS. Its implementation strategy for the 21st century by implementing "intelligent road traffic" in order to address and mitigate the problems of accidents, road hybrid, energy waste and other traffic fundamentally [5].

2.2.3. Development of ITS in Europe

1988 invested by more than 50 European countries more than 10 billion dollars, aimed at improving the implementation of a joint road infrastructure, improving service quality DRIVE program, its meaning is for vehicle safety in Europe dedicated road infrastructure, has now entered the second research and development stage. European countries currently underway TELEMATICS comprehensive application development, plans to build a dedicated wireless data communication network traffic within the whole Europe. Traffic management intelligent transportation system, vehicle and electronic toll collection and so on around the whole of Europe TELEMATICS and expanded wireless data communication network. European folk also jointly engage in a program called PROMETHEUS, the European plan safe and efficient transportation system. In addition, the emerging industrial countries and the developing countries have also started a comprehensive research and development of intelligent transportation systems.

3. Status and development of recommendations intelligent transportation system

Intelligent transportation is changing the way people live. The impact will be enormous and far-reaching. China is currently facing a situation of urban road congestion, using the traditional repair more roads and control of the vehicle increased by 2 ways to solve all the more difficult. Only experience of developed countries, our country fully integrated, intelligent transportation research and development work as soon as possible to address this growing problem as soon as possible.

3.1. Current development of intelligent transport systems

In recent years, the rapid development of the transport sector, road transport in the future for a long period of time will continue to show an upward trend. From another aspect of the matter, only one set of data can be clearly seen China's current problems of the transport sector: 1998

car ownership China is only 11th in the world, while road traffic fatalities in the world, but the first bits, the number of deaths per million vehicles use statistics are second only to India, ranked second in the world (the number of deaths per million vehicles of the 2215 people, 116 people in Japan only). Visible serious problem of security of our country. Such an environment and the status quo means that China has a pressing need ITS development and broad space. First of all, security is an urgent need to develop applications to improve road safety performance of systems and products, which is the international development of ITS a major trend. But with China's national conditions of different countries, nearly 40% of our traffic fatalities are in disrepair by the speeding, overloading or vehicle dystrophy caused by a large number of natural disasters western regions and harsh environments is the direct cause of frequent accidents arising. Research and development must be the actual situation of our country can improve traffic safety systems and products. Second, traffic management advanced traffic control system will effectively improve transportation efficiency, reduce traffic congestion, but high costs and too sophisticated equipment is not conducive to widespread use, it is necessary to develop a number of practical and applicability and low cost products to generally improve the management level of the road. In addition, the construction of basic database design from the highway surveying to basic data management requires a lot of support, geographic information system GIS United States and other developed countries have already perfect, making them very convenient road construction and management, and our lack in this area inconvenience to traffic development [6].

3.2. Recommendations for the development of intelligent transport systems

3.2.1. Set up a special research and development institutions

By the relevant state ministries and commissions, set up a special intelligent transportation systems research and development institutions, research in intelligent transportation systems nationwide unified leadership, coordination of various research and development institutions, and reasonable allocation of funds, in order to better focus on various aspects, and organize national academic exchange activities. Research and development of intelligent transport systems is by no means a department matter, need the support of the whole society. In this sense, under the leadership of relevant ministries, the establishment of specialized intelligent transportation systems research and development institutions is necessary.

3.2.2. Starting from the base, lay the foundation for future development

Research multitude of intelligent transportation systems, if you do not pay attention to the basic work, will cause

difficulties in development work, and directly affect the play its true role. To grasp the main basis of the current work includes: the establishment of a database of traffic; improving public transport facilities to reach the scientific and modern management level as soon as possible; do the underlying hardware research and development work; improve the scientific management level of the existing traffic management team, in particular, the management towards standardization direction; combined with our realities, Learning foreign developments in intelligent transportation systems.

As we all know the lack of traffic data rather, imperfect statistics, which too many of the city traffic management, planning and control has brought great difficulties. A requirement for intelligent transportation systems is information collection, dissemination of information, information sharing fully flexible. Strengthen the construction of transportation database, and lay a good foundation for intelligent transportation systems research, at the same time, can make computer technology to play a greater role in the transport sector. For China's urban transport is concerned, an important issue now is contradictory with the limited number of vehicles on the road space resources, to develop public transport has reached a consensus on foreign experts and scholars, the loud voice of bus priority. However, for various reasons, our public transport system obsolete equipment, low level of management and scheduling, cannot meet the requirements of modern urban development. To this end, as the public transport system an important component of intelligent transportation systems should receive priority. United States, Japan, Sweden and other countries proposed to establish an advanced public transportation systems (APTS) can take advantage of such as computers, closed-circuit television systems to provide the public with travel time and route selection consulting trips. Such a system, if applied in public transport in the country, will undoubtedly improve public transport efficiency.

Intelligent transportation systems at all levels, together with the various aspects of coordination, in order to play its due role. Otherwise, intelligent transportation systems, even if established, if there is no common with the various agencies, organization and coordination, but also cannot play a role, reach the purpose of improving traffic conditions. In addition, the introduction of foreign advanced technology, but also pay special attention to the potential for its application in our country. Intelligent Transportation Systems developed very rapidly in recent years in foreign countries. It is based on a certain level of management. However, the current level of traffic management compared with developed countries still have a certain gap, without the support of high-level management, no matter how advanced intelligent transportation systems are not functioning. Only management level, the real role of intelligent transportation systems can play, that is, intelligent

transportation system must first establish the basis of high-level management, the need to improve the scientific management level of the existing traffic management team, in particular the management towards standardization direction.

3.2.3. From the demand of transport departure

Select some intelligent transportation system demonstration project as a leader, major breakthroughs, selectively track. The key objective is to focus on resolving the operational and intelligence management technology, integrated information service, dedicated short range communication and standards and other research suitable for China's intelligent transportation system development model and technology to lay the intelligent transportation system development, application and industrialization base, improve the transportation system management level, service levels and security, in order to stimulate the development of manufacturing and service industries, and promote the transformation of traditional industries through high-tech, information technology to stimulate industrialization process.

3. Conclusion

Intelligent Transportation Systems as the use of modern information technology will transport four elements "vehicle-road-environment" organic combination of systems engineering, will solve the problems of modern security, smooth, energy saving and environmental protection of the fundamental problems of traffic. As the Internet has changed the way people think, like, intelligent transportation will also change the way people live. In Europe and Japan as the representative of the developed countries have been fully aware of this, have developed national strategies measures a step ahead and made some worth learning experience, China should not hesitate to follow the trend in the world of intelligent transportation development, in close connection with China's national conditions, development of the road out of an intelligent transportation system with Chinese characteristics.

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