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Xi 'an Intelligent Transportation System Construction Platform Research

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Abstract.

The field of intelligent transportation has pointed out the goal for the future development of transportation and brought people convenient, scientific and standardized modes of transportation. In recent years, with the emergence of Internet of things, mobile Internet, cloud computing and other new technologies, large and medium-sized cities at home and abroad are developing rapidly in the construction of intelligent transportation and gradually evolving into intelligent transportation system. In this paper, starting from how to build the intelligent transportation system platform, starting from the establishment of the five layers, one main body and three departments of the Internet of things, some solutions and Suggestions are put forward from the technical level. It is also hoped that this will be a theoretical and practical exploration for the construction of intelligent transportation in China's megacicities (such as xi 'an).

Keywords: The sensor; Traffic management; Intelligent transportation; Information technology (it)

1. Introduction

Intelligent transportation is an important part of a smart city. It makes full use of intelligent technologies such as the Internet of things.At the same time, it integrates cloud computing and other information network knowledge,

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speeds up communication transmission speed and improves information processing Ability to systematize the transportation system and expand the scope of space [1].

Intelligent transportation is a new interpretation of intelligent transportation in the context of mobile Internet, Internet of things, 3g / 4g wireless communication network and other new technologies and industrial environment. According to China's smart transportation urban development ranking in 2018 (as shown in the following table) :

Table1, China's smart transportation city development ranking in 2018

Beijing	95.17	1
chengdu	85.20	2
Guangzhou	81.69	3
Shanghai	80.68	4
shenzhen	80.33	5
chongqing	76.18	6
suzhou	73.27	7
nanjing	71.79	8
wuhan	70.95	9
hangzhou	69.86	10

As can be seen from the above table, xi 'an is still some distance away from the city with strong intelligent traffic. Xi 'an has a population of more than 10 million, urban transportation is concerned about every citizen's travel; How to enter the strong city of intelligent traffic? Firstly, the economic feasibility and technical feasibility of intelligent traffic management should be clarified.

2 Economic Feasibility of Intelligent Management of Public Transportation in Xi 'an

The implementation of intelligent transportation can realize the comprehensive improvement of social and economic benefits in multiple links. Specifically, its advantages lie in:

1.1. Save travel time, reduce the waste of driving resources and alleviate traffic congestion

Urban population and increasing number of vehicles, a large area of traffic congestion phenomenon, resulting in the cost of waste, its amount is huge. Intelligent transportation system improves the efficiency of road traffic network, saves costs and creates corresponding economic benefits. Intelligent traffic system provides travelers with various characteristics of traffic services and traffic information, enabling travelers to choose the best route, thus effectively reducing the delay time of driving [2].

1.2. Realize low-carbon environmental protection and advocate green transportation

Some data show that doing a good job in the management and control of urban traffic can enable travelers to choose the best path and improve speed and efficiency, so as to reduce the emission of tail gas and reduce the use of fuel. At the same time, due to the promotion of smart bus and other related technologies, the public will choose more public transportation, which is also one of the effective means to achieve low-carbon, environment-friendly and green travel [3].

1.3. effectively reduce the harm and loss of traffic emergencies

Intelligent traffic system can make people get all kinds of traffic information, receive the corresponding transportation decisions, can do a good job of traffic incident early warning, but also for sudden accidents, incidents can do instant emergency response, increase the safety of transportation in the process of operation management, effectively reduce accident loss.

1.4. Reduced the cost of road infrastructure construction

Construction and transportation road planning, the two complementary intelligent transportation system also belongs to the city. Through intelligent decision support provided by intelligent transportation, traffic planning can be more reasonable and effective and avoid repeated waste of infrastructure construction.

1.5. Industrial development provides employment opportunities for the majority of workers

Intelligent transportation covers a wide range of fields, such as road communication, automobile navigation, computer, intelligent transportation construction to promote the development of related industries network technology and other fields of knowledge can better promote economic development, promote social harmony.

2. Technical Feasibility of Xi 'an Public Transportation Intelligent Management

In order to realize the intelligent management of public transportation in xi 'an, it is necessary to establish an intelligent transportation technology system suitable for xi 'an. With the arrival of the new technology era represented by Internet of things, mobile Internet and cloud computing, tradition

The combination of intelligent transportation technology and these new technologies not only provides necessary technical support for the establishment of intelligent transportation system, but also opens up new ideas for the improvement of framework and the innovation and development of application mode of intelligent transportation system. The core technologies of intelligent transportation mainly include the following aspects:

2.1. Traffic information collection technology

With the continuous development of traffic information collection technology and its integration with Internet of things, video and other technologies, the current traffic information collection technology is more diversified in terms of information collection and processing methods, the accuracy of information collection has been greatly improved, and it has more advantages economically [4].

2.2. Traffic information processing technology

With the increase of traffic data acquisition sources, users of traffic information have a great demand for real-time traffic information gradually improve. In recent years, cloud computing, big data and other technologies have been gradually applied to sea traffic at home and abroad Information processing. cloud computing distributed computing, dynamic resource allocation, mass storage and other technologies traffic decision analysis based on mass traffic data processing and analysis and public travel services and other applications multi-level technical support.

2.3. Traffic network communication technology

Intelligent traffic data collection, remote control and application services are inseparable from the support of network communication technology brace. Mature optical communication technology has been widely used in the transmission network and core network of intelligent transportation system extensive use; ZigBee and DSRC as the representative of wireless sensor network technology in intelligent traffic traffic number data collection and control, signal priority, vehicle positioning and other fields are now being comprehensively promoted; 5G mobile communication with the advent of the era, monitoring data transmission bandwidth has been improved, and vehicle

mobility and delivery can be gradually solved the implementation difficulty of monitoring network caused by the wide distribution of infrastructure; Xi 'an should put forward the implementation of "5G" strategy as soon as possible, and put forward the 5G communication pilot city.

2.4. Traffic geographic information technology

Traffic geographic information system is to collect, analyze, integrate, store and analyze urban traffic information GIS technology and various traffic information are the supporting platforms to provide visualized traffic information services and traffic decision-making the combination of analytical processing techniques. The main applications in the field of intelligent transportation include: the application of electronic map, road network planning, road infrastructure maintenance, transportation enterprise operation and management, etc.

Through the analysis of some core technologies required by intelligent transportation, it is not difficult to see that the great development of today's information society has been able to provide necessary technical support for xi 'an public transportation to realize intelligent management.

3. Establish Intelligent Transportation System Construction Platform Based on Internet of Things

As can be seen from the above two points, intelligent traffic should be established; It is necessary to establish intelligent transportation information system platform in large cities. The platform should be able to integrate and optimize traffic flow, and coordinate all links to improve the timeliness of traffic services. According to the existing problems of urban traffic operation information system, an integrated information service platform for urban traffic operation is constructed by combining the Internet of things and intelligent transportation technology. This platform is based on the Internet of things five layers, one main body and three departments; Intelligent traffic information system platform in big cities is divided into five levels, one main body and three departments. The five layers are job layer, perception layer, network layer, application layer and user layer. The first part is that the traffic database of big cities is the core of information transmission, and the third part includes the traffic police supervision department, the city management department and the cost management department. Among them, the sensing layer collects all kinds of on-site information from the actual traffic situation of the operating layer through RFID radio frequency sensing technology, on-site video acquisition device, GPS positioning device, GIS geographic information system and other sensing devices (mainly applying the principle of sound sensor and smoke sensor). The collected data are transmitted to the network layer through the Internet. The collected data are organically integrated with the data of the Internet of things management system of the traffic operation terminal at the network layer. After fusion, the generated information is transmitted to the application layer to form sharable traffic accident information, disorderly parking information and traffic congestion information. These information are transmitted to the application layer, through which the government regulatory departments can strengthen the monitoring of the whole process of traffic operation in large cities to ensure the orderly traffic. Scientific research institutions can understand the distribution of traffic in large cities and other data through information, so as to provide a basis for relevant government departments to formulate measures and plans to alleviate traffic congestion. The investigation and consulting agencies may, based on the information, provide the first-line traffic police with reference services and timely adjust the traffic operation; According to the information, consumers can understand the urban traffic operation and environment and bring convenience to their travel. The upper and lower reaches of the traffic operation supply chain can adjust the travel speed of the traffic operation according to the information, close the cooperation between the upper and lower reaches, and minimize the traffic congestion. Through the traffic information supervision platform, the rights and interests of consumers can be guaranteed and parking Spaces can be found timely. GPS and GIS systems can be used to query the density of vehicles in cities. The traffic light time can be adjusted at any time according to the density of vehicles. Xi 'an's current practice of opening up guillotine, striving for branch capacity, diversion of the pressure of the second ring and the third ring; In order to ensure the effective implementation of intelligent traffic, xi 'an has opened up the expressway between the south second ring road and the south third ring road, namely the completion of the overpass of the west extension road, which greatly improves the urban traffic. Next, the expressway on the east second ring road and the east third ring road,

The expressway between the west second ring road and the west third ring road, and the expressway between the north second ring road and the north third ring road should be repaired as soon as possible to ensure the effective operation of the intelligent traffic information platform.

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