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Research on the Application of Intelligent Transportation System in Transportation Management

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Abstract: In order to cater to the development direction of the intelligent era, we should flexibly deal with various problems existing in transportation management, implement refined working ideas, and continuously update existing management schemes. Taking intelligent transportation system as the main object, we discuss its specific application in transportation management, and get the application methods of traffic monitoring system, emergency command and dispatch system, integrated information service system and intelligent monitoring system, so as to provide reference for relevant personnel.

Keywords: Intelligent transportation system, Transportation, Traffic monitoring system.

1. Introduction

When integrating ITS into transportation management, it is necessary to adapt to the intelligent development requirements of modern society, gradually improve the management level and functions of transportation, and expand the management functions of ITS to further ensure the management level of transportation. Through continuous exploration, a more mature intelligent transportation system will be built to prevent serious impact on transportation management and ensure the safety of transportation.

2. Overview of Intelligent Transportation System

Intelligent Transportation System (ITS) is a new technology model derived from the continuous improvement of China's science and technology level in recent years, also known as ITS. In the process of actual management, electronic information technology and geographic information technology are integrated with each other, and wireless communication technology is used to speed up information transmission, meet various management requirements in the traffic field, and realize the organic connection between vehicle drivers and roads on the road, thus establishing a more complete safety management system.In the process of system operation, a networked and electronic integrated management system can be built according to the functions of ITS. By using this system, various problems existing in previous traffic management can be solved, and at the same time, the scientific allocation of resources can be realized to further ensure the overall management effect.

In the process of using ITS, it is mainly composed of traffic information collection system. During the use of the system, it is necessary to install the corresponding electronic cameras and electronic speedometers on the roads, and cooperate with the GPS positioning system in the vehicles to collect the driving conditions of the vehicles on the roads in real time, such as knowing the real-time speed of the vehicles and the road traffic conditions. When the congestion problem occurs, it can quickly transmit the information to the corresponding management department, make an effective response, and avoid serious impact on transportation. In addition, it is also possible to collect the sudden weather around, and then transmit the information to the driver's mobile terminal, which is convenient for the driver to adjust his own driving route and reduce the probability of safety problems [1]. In the process of information collection, daily operations are carried out in strict accordance with the contents of traffic road command and decision issued by China's transportation departments, so that the overall performance and use effect can be comprehensively improved. Secondly, the system also includes an information release system, which mainly processes the collected information synchronously during information collection, and then sends it to all drivers through the Internet and radio technology, so that important information can be quickly transmitted. These two systems are important parts of intelligent transportation system. By complementing each other, they can further realize the collection and transmission of traffic information and ensure

3. The Role of Intelligent Transportation System in Transportation Management

3.1. Ensure the quality of transportation management

In the new era, China's traffic volume is increasing continuously. If the traditional traffic management scheme is still applied, it will not only lead to frequent safety problems, but also increase unnecessary contradictions, making the whole traffic management more and more complicated. Therefore, in practical work, it is necessary to give full play to the advantages of intelligent technology, construct intelligent transportation system, meet the requirements of modern transportation management, and flexibly deal with the problems existing in practical management, so that the application functions of intelligent transportation system can be fully highlighted. After using the intelligent system, the application level of the whole management is gradually improved, the traditional mode and method of transportation management are innovated, and the sense of dependence on

manual operation is reduced, so that all management work can have strong accuracy and ensure the smooth progress of transportation management. At the same time, in actual management, intelligent technology can also be used to improve the development level of the transportation industry, so that the transportation industry can continuously change from the previous extensive management mode to the direction of coordination and accuracy, and speed up the information transmission, thus providing an important foundation for the formulation of transportation management decision-making schemes. In the application process of ITS, there are different subsystems, which can integrate this system into different management departments, issue corresponding management tasks, speed up information sharing, really improve the effect of data circulation management, enable the transportation industry to meet the development trend of informatization, and further ensure the overall management quality. Therefore, managers need to give full play to the important advantages of intelligent transportation management system according to the requirements of transportation management, integrate high-quality ideas into different management links, and complete the current transportation management tasks.

3.2. Help to improve the efficiency of transportation management

The integration of intelligent transportation system will also help to improve the efficiency of transportation management. The effect of intelligent transportation system in modernization and information development is very significant. This process can further optimize the current management mode and improve the development level of transportation management. In the current era, the traffic congestion problem is very prominent, especially in the first-tier cities, which often exposes the problem of low management efficiency or untimely management, which affects people's normal travel. Therefore, in practical work, it is necessary to strengthen the scientific utilization of intelligent transportation systems, give full play to the functions of information technology itself, develop more convenient information exchange methods, and realize the mutual linkage between various departments when unexpected problems occur. Help managers solve various problems in the process of transportation, and at the same time, speed up the response of information, quickly put forward correct solutions, and ensure people's normal travel.

4. Problems Existing in The Application of Intelligent Transportation System

First of all, the information technology innovation is insufficient. From the perspective of China's transportation management in recent years, information technology is an important part, and the intelligent transportation system produced in this process provides important support for transportation management. However, due to the short application time of intelligent transportation system in China, the main technical points are not grasped in the process of technology implementation, and the innovation of technical mode is not strengthened according to the actual situation, which increases the limitations of system application. Compared with developed countries, there are serious deficiencies in the operation of intelligent transportation system in China, which has not formed the development trend of industrialization, and there is no sound management mechanism. In the process of system research and development, there is a low practicality, which affects the smooth progress of transportation management. Therefore, in practical work, it is necessary to grasp the core technology, innovate the technical mode, and learn from the advanced working experience of developed countries, so that the functions of ITS can become more perfect and provide the foundation for subsequent use.

Secondly, there is still a lack of financial guarantee in the process of intelligent transportation system operation. It takes a certain amount of money to integrate into ITS. If you want to do a good job in the early system development, you need to do a good job in the follow-up system maintenance. All management activities can't be separated from the support of funds. However, in the actual operation process, the existing fund management mode has not been improved, and the corresponding financing channels have not been widened, and the traditional management scheme is still adopted. Compared with the traditional management mode, ITS needs more funds. If there is a shortage of funds, it will not meet the operation requirements of ITS itself, and at the same time, it will increase the probability of system failure, resulting in serious consequences.

5. Specific Application of Intelligent Transportation System in Transportation Management

5.1. Traffic monitoring system

In the process of using the integrated monitoring system, the camera can effectively observe the whole monitoring area and realize synchronous video recording, which can not only quickly discover the potential safety hazards in transportation, but also help to quickly respond to the corresponding information and avoid serious impact on intelligent transportation management. The system includes different components such as camera control and image transmission. In the application process, it is necessary to scientifically arrange the number of computer cameras according to the area of the construction area, and install them in appropriate positions to realize all-round management of intelligent transportation [2]. In the follow-up work, it is also necessary to configure the automatic aperture lens in the integrated monitoring system, so that the light source can be sufficient at night, which is in line with the current monitoring system application standards. In addition, a pan/tilt and an electric variable lens can also be set inside the system to realize dead angle monitoring of the main roads.

5.1.1. Video intercom system

The application process of intelligent traffic monitoring system is inseparable from the support of each equipment. Therefore, in actual work, it is necessary to build different subsystems according to the application requirements to ensure the normal operation of the equipment. In the intelligent traffic monitoring system, the video intercom system is an important part. When applied, it is necessary to arrange the corresponding intercom power supply and networking module in the traffic monitoring area, set the corresponding system mode according to the traffic area, build a complete video intercom channel, and realize the

interconnection between the intercom system and the traffic management department, thus providing an important guarantee for the implementation of various monitoring and management activities. Connecting the signal line in the traffic management center is convenient for traffic police to know the actual situation of traffic operation, and make a good record of information, which provides an important guarantee for the intelligent management of the monitoring system. In the process of system application, it is necessary to do regular maintenance, integrate advanced communication technology, avoid serious impact on information transmission, and fully guarantee the application effect of intelligent monitoring system.

5.1.2. Computer Monitoring System

The computer monitoring system plays a prominent role in the intelligent traffic monitoring system. It can use the camera to monitor the traffic internal places in real time, complete the synchronous video recording, and interact with the burglar alarm system, so that the safety factor of the whole traffic internal can be comprehensively improved. The computer monitoring system includes different modules of the camera and transmission system, so as to optimize the computer monitoring system system together. At the same time, big data technology is connected into the system. In the actual monitoring process, information can be integrated into the background according to the situation on the spot. If there is an emergency in the subsequent operation, an effective response plan and optimization strategy can be put forward according to the previously recorded data to ensure the normal utilization of the monitoring system.

5.1.3. Electronic Patrol System

Electronic patrol system is mainly used in the traffic with large traffic volume, and effectively guarantees the safety factor of people in traffic. In the process of intelligent traffic safety management, in addition to scientific inspection by manual means, it is also necessary to cooperate with electronic patrol system to do a good job in site safety management, and at the same time, it can also cooperate with patrol stations to ensure the smooth operation of the system. The electronic patrol system covers an independent system which is different from the microelectronic technology, and it can also be effectively linked with the monitoring system to realize all-round management and reduce the occurrence probability of various security problems.

5.2. Emergency command and dispatch system

In the process of using the emergency command and dispatch system, it is mainly to cooperate with the geographic information system to realize the effective collection and collation of road area information, to construct the corresponding geographic space model in the traffic area, to effectively query and simulate the whole traffic situation, and to avoid serious emergencies. If there is a traffic accident, the emergency dispatch command can quickly transmit the information to the corresponding command center, dispatch the police force for the command center, arrange the rescue plan, provide valuable time for the rescue, and reduce the impact on people's travel. In addition, when traffic emergencies occur, such as fire trucks and ambulances need to pass quickly, when the emergency command and dispatch system receives the information, it can provide the best driving scheme for vehicles through geographic information system, rationally arrange the corresponding traffic routes, and prevent serious impact on normal work, and all information can be displayed in the corresponding command platform in time, so as to improve the overall dispatching management effect [3]. Secondly, during the operation of the emergency dispatching command system, the emergency situation can be displayed on the big screen of the office according to the requirements of the traffic command center, so as to realize electronic and visual management and facilitate the smooth progress of subsequent decision-making. At the same time, in the process of implementing the technical scheme, advanced model technology can also be integrated to simulate the feasibility of implementing the emergency scheme and possible problems, so as to fill the gaps in emergency command in time and improve the application effect of the emergency command and dispatch system in an all-round way.

5.3. Integrated information service system

In the process of vehicle driving, unexpected situations are often encountered, which will interfere with normal driving, such as traffic congestion and sudden changes in weather conditions. In serious cases, it will also cause serious interference to the normal operation of the city. Therefore, in practical work, it is necessary to give full play to the advantages of intelligent transportation system, build a comprehensive information service system, speed up the transmission of information guidance, and facilitate drivers to adjust their travel routes to prevent the aggravation of traffic congestion. In this process, after collecting the road driving information, the transportation department should inform the driver of the current road condition information through certain processing with the help of Internet and car broadcast. If the driver has to upload and apply the road condition information after an emergency or traffic jam, the information can be quickly transmitted through this communication platform, which can help the traffic management department to judge the situation, make correct decisions and meet the requirements of normal road operation.

5.4. Intelligent monitoring system

Intelligent monitoring system is also an important part of intelligent transportation system, including different detection devices, which can monitor traffic flow and abnormal conditions in real time and strengthen traffic supervision ability. In this process, the most important component is the vehicle inspector. It is necessary to obtain the traffic situation through the coil embedded in the road structure, and it is also necessary to make an effective judgment on the traffic situation according to the closed state of the switch contact points. At the same time, it is necessary to analyze the light transmission with ultrasonic detection devices to assist in judging the vehicle running situation in the detection range, so as to realize the technical mode. In the process of using vehicle detection technology, we can also cooperate with image recognition technology and digital communication technology to quickly complete the effective collection of vehicle information, analyze the differences between different images, and quickly find out the abnormal situation, and then put forward scientific solutions and management measures to meet the requirements of normal traffic operation. When this system is used, it can effectively monitor the objective environment, for example, it can collect climate data in extreme weather such as rain, snow and strong wind, and then transmit the information to the traffic control center.

6. Conclusion

In the process of transportation management, it is necessary to give full play to the advantages of ITS, effectively organize different technical schemes, form an integrated work scheme, strengthen the optimization of transportation management, and make a quick response to accident information, so as to facilitate the transportation management department to put forward scientific management schemes and command strategies according to the transportation situation, promote the normal operation of ITS, and meet the requirements of transportation management.

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