

## The application of intelligent transportation concept in modern transportation comprehensive pollution control

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**Abstract:** In recent years, with the continuous advancement of China's urbanization, more and more rural population has begun to flood into the cities. This also makes the urban traffic, which has become increasingly busy, and at the same time makes the road traffic problem become increasingly prominent. In particular, the problem of urban road traffic congestion is becoming more and more serious, which directly affects the operation of urban vehicles and produces a large number of vehicle exhaust pollution problems. This has brought many challenges and obstacles to urban road traffic and environmental protection management. Today, with the continuous progress and development of The Times, the concept of urban smart transportation has emerged. This is a new traffic management thinking based on high and new technology. It can promote the improvement of urban traffic road management, significantly improve the level of traffic operation management, and help continuously optimize the efficiency and quality of urban traffic operation. At the same time, we can further improve the traffic development management system, and put forward a set of reasonable plans for urban road traffic travel, so as to solve the problem of comprehensive pollution control of urban traffic. This paper discusses the application of the concept of intelligent transportation in the treatment of modern traffic comprehensive pollution. Based on the concept of intelligent transportation, the paper studies the treatment of modern traffic comprehensive pollution, analyzes the role of the concept, and reasonably develops corresponding measures based on the actual situation.

### 1. Introduction

Introduction: In recent years, the global high-tech has made great development and progress, especially these new technologies began to gradually apply to people's production and life, profoundly changed the social production mode, but also changed people's thinking and management mode. At present, the scale of development of many cities in our country becomes larger and larger. However, the inner space of the city has become more and more narrow, and the utilization rate of urban space has reached the maximum, such as: urban green construction land and building land, traffic road construction, sidewalk construction, etc., have firmly occupied the urban space. In this context of urban development, urban travel problems and management problems have become a headache for the government, transportation departments and related departments. If the urban traffic problem is not solved, reasonable arrangements for urban traffic management, guidance programs, coordination of road safety management, improve the efficiency and level of traffic operation, reduce urban carbon emissions, reduce urban air, noise and accident pollution. Regarding the application of smart transportation to the comprehensive pollution control process of modern transportation, it is necessary to study the development scale and future development planning of the city where it is located, and the maturity of various technologies. At the same time, many different factors should be taken into account. The concept of intelligent transportation is a brand new term, which provides more problem solving ideas for urban road traffic operation management, and is also a smart new model for urban traffic planning and design. The concept of

intelligent transportation takes high-tech technology as the operation management idea, reflecting the main feature of "wisdom". This traffic concept provides more travel development paths for traffic operation managers. At the same time, it also provides more road traffic travel solutions for people who travel. The efficient application of the concept of intelligent transportation can help the urban transportation department to manage traffic congestion and pollution problems, so as to improve the efficiency and level of urban traffic intelligent management. At present, the application of intelligent transportation concept in modern traffic comprehensive pollution control is still in its infancy. Therefore, the application of this technical concept has yet to be developed. This is a major theme of this paper, in order to put forward some constructive suggestions.

## **2. Smart transportation concept**

The concept of intelligent transportation is a scientific and efficient traffic management method, which is mainly based on high-tech, with the help of big data, artificial intelligence and network technology, collects and manages urban traffic information to intelligently allocate traffic routes, rationally plan urban driving routes and management methods, and improve transportation management capabilities. The concept of intelligent transportation has a high application in the comprehensive pollution control of modern transportation, which can significantly reduce pollution and carbon emissions and become one of the important means to improve urban traffic congestion [1]. What is clear is that smart transportation technology is a complex of different advanced technologies. This technology mainly through the collection, processing and transmission of data information, so as to achieve the intelligent operation management of urban traffic system, optimize the efficiency of urban traffic operation, and constantly improve the level of traffic management to minimize vehicle carbon emissions. With the continuous advancement of urbanization, promoting the wide application of intelligent transportation can effectively improve the urban living environment, improve the quality of urban life, and create a good living environment [2].

## **3. The role of intelligent transportation concept in the comprehensive pollution control of urban traffic**

### **3.1 Reasonable allocation of car driving path, reduce car carbon emissions**

In recent years, with the continuous advancement of urban integration, the scale of urban construction has become larger and larger. This has narrowed the space for urban development and made the contradiction between man and land increasingly prominent, which, coupled with the continuous increase of urban population, has aggravated this contradiction. Due to some urban traffic roads, there are still some deficiencies in the design, leading to the urban traffic congestion problem is becoming increasingly prominent, and long-term traffic congestion will cause the increase of automobile carbon emissions. As a result, it causes the emergence of urban pollution problems. The concept of intelligent transportation is a scientific and flexible traffic management method, which can realize the intelligent autonomous operation of urban traffic system and the networked traffic operation mode [3]. The introduction of this technology into the comprehensive pollution control of urban traffic can minimize the time of vehicle congestion on the road and reduce the carbon emissions of vehicles through reasonable optimization of routes. At the same time, traffic command technology can significantly improve vehicle traffic safety and minimize casualties [3].

### **3.2 The platform network monitors an important line of defense and collects road traffic conditions**

With the continuous development of the city, the problems of road traffic safety, traffic congestion and environmental pollution are becoming more and more prominent. The three factors influence each other and produce each other, which is caused by the superposition of various different factors [3]. After the use of traffic command technology, it can significantly improve the ability and level of urban road traffic management, and reduce urban road traffic safety problems

through network monitoring, data collection and analysis, and reduce congestion and pollution, can improve the driving time of urban vehicles on the road, and greatly improve the traffic efficiency, such as: Daily monitoring of key roads when designing and optimizing road path analysis. At the same time, the path driving information is reasonably sent, and then sent to the driver by the way of navigation information prompt, and then the optimal driving plan is provided in the most destination. In this way, the waiting time on the road section can be reduced and the driving efficiency of the car can be improved<sup>[4]</sup>.

#### **4. Basic idea of the application of intelligent transportation concept in modern transportation comprehensive pollution control**

In recent years, with the rapid promotion and application of the concept of urban intelligent transportation in our country, the concept has played an increasingly important role in the treatment of modern urban traffic comprehensive pollution. To a large extent, it can significantly optimize the operation of urban transportation. Smart transportation is achieved through the innovation of many new technologies, including: Big data technology, cloud computing technology, artificial intelligence technology, etc., is based on the high integration and application of modern science and technology, providing a variety of service applications for urban travel, providing more driving paths for people's travel, reducing a large number of vehicle exhaust pollutants generated because of traffic congestion, and realizing the efficient and free allocation of vehicles.

##### **4.1 Integrate urban road traffic driving data**

(1) Integrate real-time dynamic data of traffic roads and rationally arrange driving paths

At present, the difficulty of urban road traffic management is increasing day by day, and the degree of traffic congestion is increasing. In order to solve the problems of urban road traffic congestion, pollution and management, the concept of intelligent traffic can be introduced to optimize the driving state of traffic roads and formulate corresponding countermeasures reasonably. By strengthening the collection of traffic road data and real-time integration of traffic road dynamics, it can be more reasonable to arrange driving routes, keep roads unblocked, reduce vehicle exhaust emissions, and reduce urban pollution index.

(2) Combined with historical road traffic information, do a systematic early warning in advance

In the context of the rapid development of big data technology, urban road traffic management departments can collect the road traffic congestion situation in real time through the use of big data technology to carry out road traffic management, and do a pre-forecast analysis of possible road traffic congestion in advance, and timely road traffic warning. Then, the early warning information issued by the traffic system platform can effectively reduce the occurrence of congestion, and timely traffic intervention programs can be made to avoid the phenomenon of road traffic congestion, reduce the stopping and waiting of cars, and thus reduce the production of carbon emissions of cars..

##### **4.2 Using the data positioning technology, the positioning of road traffic accidents is analyzed**

With the continuous growth of urban population, urban road traffic is increasing day by day, and many people buy cars, resulting in urban road traffic congestion becomes more and more serious. When the number of cars increases, the number of unsafe factors on the road increases, resulting in frequent traffic accidents. Once a traffic accident occurs, the failure to remove the faulty car in time will seriously affect the safety and efficiency of road driving. In the context of big data, precise positioning analysis is carried out on the specific location of traffic accidents that have occurred through road traffic conditions. Then, we need to collect the specific information and severity of traffic accidents, understand the situation of road traffic models around the accident section, and reasonably arrange relevant traffic departments and personnel, or medical personnel to carry out medical accident rescue, so that it can improve the accessibility of urban road traffic, effectively alleviate urban traffic congestion, and reduce car carbon emissions.

## **5. Analysis of the application of intelligent transportation concept in modern transportation comprehensive pollution control**

### **5.1 Optimize the organization form of road traffic and reduce automobile pollution emissions**

With the continuous improvement of social production efficiency and the continuous development and progress of cities, people are more and more yearning for urban life. As a result, the urban population has expanded dramatically, the number of vehicles has increased, and the pollution problem has also increased. When the vehicles are congested and the driving efficiency is not high, the carbon emissions of cars will continue to increase. By using intelligent transportation system to optimize and design road traffic routes, road traffic routes can be reasonably allocated and timely drainage guidance can be done. The details are as follows.

Firstly, using data analysis to analyze the daily traffic flow of vehicles on the road, calculating specific results, and making reasonable traffic flow diversion, and conducting traffic intervention and diversion in congested sections, guiding car driving reasonably, reducing waiting time for car parking, and causing car exhaust emissions to arrive at the destination in a timely manner. Different technologies can be fully applied to traffic management in combination with actual needs, and high-tech IT technologies such as the Internet of Things, cloud computing, big data and mobile Internet can be integrated to achieve accurate data collection. At the same time, the traffic carrying capacity can be calculated, and then the daily traffic flow limit can be analyzed, and relevant traffic guidance schemes can be formulated. The implementation of the assessment of road conditions, and timely warning information, so that later vehicles detour, reasonable distribution, reduce the number of road traffic vehicles, in addition, you can use this kind of technology to do a good job of traffic control, reduce traffic roads due to vehicles do not comply with traffic rules caused by congestion accidents, resulting in traffic jams, causing more air pollution, noise pollution, such as: The driver is required to drive in accordance with traffic rules and regulations in the process of driving, to avoid car congestion caused by car driving problems, or because of traffic failures caused by safety and road traffic congestion, which helps to further alleviate the phenomenon of congestion.

Secondly, utilizing various technologies such as intelligent prediction methods, continuously optimizing the form of urban traffic organization, and reasonably adding different traffic diversion intervention plans, coordinating the traffic flow of vehicles, in order to guide vehicles to pass in an orderly manner, while minimizing vehicle emissions and reducing pollution.

Third, in the formulation of relevant cities combined with different actual needs, the intelligent traffic signal control system is used to reasonably arrange the vehicle passing time, while the urban road traffic adaptive control and management, to minimize the traffic light waiting time, can timely avoid the vehicle continuous idle, and produce excessive vehicle exhaust emissions.

Fourth, the application of intelligent transportation technology can real-time road traffic conditions, and do a good job of road traffic actual analysis. In combination with certain actual conditions, the optimal driving path of the vehicle is optimized and the driving speed of the vehicle is increased, so as to reduce the occurrence of traffic congestion to the maximum extent and thus reduce the occurrence of vehicle emissions to the maximum extent <sup>[5]</sup>.

### **5.2 Improve the efficiency of urban public transport use, and use big data to arrange routes**

Under the background of green environmental protection concept, vigorously developing urban public transport plays a certain role in solving urban congestion, pollution and reducing road traffic accidents. Through the introduction of intelligent transportation technology, collecting road traffic routes, formulating reasonable driving routes, and rationally arranging departure time, people's travel efficiency can be improved, more traffic travel time can be saved, and more people can be attracted to take public transportation and reduce driving cars, which helps to alleviate the traffic pressure on urban roads and thus reduce vehicle exhaust emissions. At the same time, by improving the level of intelligent application of public transport, map and other bus services are provided to facilitate more passengers to view and understand the driving situation of public transport and the distance to the station. In this way, it can alleviate the anxiety of travel personnel, and better choose their own transportation. In addition, through the introduction of real-time navigation on public

transportation roads, it is easier for drivers to understand road conditions and traffic flow, analyze road conditions, and reduce collisions with other vehicles. Therefore, adopting this design scheme can effectively improve the safety and convenience of car driving. For example, the introduction of intelligent traffic information management system, the optimization of routes, reasonable arrangement of routes and departure time of public transport are conducive to improving the travel efficiency of public transport and further improving the travel experience of passengers <sup>[6]</sup>.

### **5.3 We will vigorously promote new-energy vehicles and reduce emissions from traditional vehicles**

In recent years, with the continuous popularization of new energy vehicles in China, new energy vehicles are beginning to be accepted by more and more users. Compared with traditional fuel vehicles, new energy vehicles have better environmental advantages. Therefore, the rapid increase in sales of new energy vehicles, coupled with the strong encouragement and support of the Chinese government for the development of new energy vehicles, so that new energy vehicles have been greatly promoted. The efficient application of intelligent transportation technology can solve urban road traffic congestion and management problems, and provide intelligent new energy vehicle charging services by establishing a new energy vehicle traffic management network. This has played a relatively large role in the promotion of new energy vehicles, which can attract more drivers to choose to buy new energy vehicles. In this way, it will help promote the development of the green cause of urban transportation, achieve the goal of low emission control of automobiles, and thus minimize the problem of urban pollution.

### **5.4 Build urban intelligent transportation system and innovate traffic operation and management mode**

Intelligent transportation system mainly includes: self-service analysis, information release, autonomous collection and other functional modules, different modules are independent individuals. However, they are interrelated. These different functional modules are mainly based on the data analysis of the chain of command. Aiming at government command and dispatch and traffic control, it is one of the key common methods of urban traffic. The government, transportation and related departments should strengthen the cooperation and communication in the urban traffic system, so as to achieve the purpose of joining forces and better carry out urban traffic management. By utilizing big data to analyze the operational status of urban road traffic, monitoring the urban pollution index daily, analyzing the pollutant components of different road sections, and obtaining first-hand data, different response measures are formulated based on the traffic conditions of road sections. In this way, the traffic efficiency of this section can be further improved. The details are as follows.

Firstly, we will vigorously build an urban intelligent traffic command and management center, which is the biggest management method for integrating urban traffic resources. By establishing an intelligent traffic intelligent center, we can optimize the urban traffic roads and management system, and intelligently manage the entire city's traffic signal lights. In the event of a traffic accident, we will immediately take intelligent measures and arrange relevant rescue vehicles or traffic police personnel to handle it, Effectively improving urban transportation efficiency, making the entire urban transportation operation more efficient, and improving management efficiency.

Secondly, we need to strengthen the construction of urban parking systems. By constructing urban parking systems, the entire city's parking spaces can be included in the management. The number of parking spaces can be viewed through mobile apps, making it convenient for vehicles to park, reducing the time spent searching for parking spaces, minimizing the occurrence of pollution, or waiting for cars.

Thirdly, we need to build an intelligent traffic guidance system, analyze the traffic road conditions of the entire city through the use of intelligent means, plan traffic road routes reasonably, guide citizens to choose a suitable way to travel, thereby reducing the use of private cars and promoting green travel.

## 6. Conclusion

Smart city traffic concept applied to modern traffic can significantly reduce a variety of traffic management problems, it can combine the traffic status and vehicle driving path, line road conditions to adjust the driving path, can effectively reduce traffic congestion problems, improve vehicle operating efficiency, access to traffic on the road vehicle driving conditions, control traffic flow, to ensure traffic congestion. With the support of intelligent transportation technology, urban transportation has become more convenient and faster, and people can more easily choose low-carbon travel modes such as public transportation and bicycles, thereby reducing traffic and carbon emissions. At the same time, intelligent transportation technology can also improve traffic safety, thereby minimizing the occurrence of traffic accidents and casualties. When the intelligent traffic reduces the traffic congestion problem, it can reduce the large number of car pollutants caused by congestion and reduce the appearance of urban pollution problems. At the same time, it also effectively prevents the discharge of a large number of pollutants, thus helping to protect the role of the urban atmospheric environment and improve the livable environment of the city.

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