The role of intelligent transportation in the development of green transportation

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Abstract: In recent years, with the rapid development of China's social economy and urbanization development process constantly moving forward, urban traffic problems become increasingly prominent, among them, the urban traffic inefficient, road congestion and pollution problems, has become the green city create obstacles, is also a big challenge and problems facing the modern urban development. In order to be more scientific and efficient to solve these problems, it should be reasonable corresponding measures, vigorously the introduction of intelligent transportation technology, optimize traffic management mode, combined with the actual, to reasonable arrangement of traffic lines, using wisdom system to improve urban traffic and travel environment, vigorously build green traffic sustainable development system, so as to improve the quality of urban life, convenient people living in the city travel, improve efficiency. This paper discusses the role and countermeasures of smart transportation in realizing the sustainable development of green transportation. In the paper, the current situation and problems of urban transportation development will be analyzed, and a set of feasible solutions will be proposed at the end of the paper.

1. Introduction

In September 2020, China officially promised to the world to achieve a "carbon peak" by 2030 and a "carbon neutrality" by 2060. In this context, different countries around the world, through vigorously implementing the "dual carbon" strategy, to improve the global environment, pollution, and reduce carbon emissions, has great help. In addition, by advocating a new green production management mode, environmental sustainable development can be achieved. Secondly, it helps to accelerate the rapid transformation of the industry constantly, so as to improve the core competitiveness of the whole society and the efficiency of resource utilization, and improve the core competitiveness of a country. At present, in the face of the increasing traffic flow and the chaotic traffic management status quo of the city, the traditional traffic production and operation management mode has been difficult to play its role, and it is very powerless. Once the traffic management is difficult to play a role, it will lead to the aggravation of urban pollution problems, and seriously affect the traffic travel, and will cause a large number of vehicle congestion, people are difficult to appear, which will inevitably directly affect the travel efficiency, which will also lead to the increase of energy consumption, affect the use of energy. In this context, many cities in China have been exploring a new social sustainable development model, by introducing more scientific and efficient methods to improve the efficiency of resource utilization. Among them, the application of urban traffic management in intelligent traffic can optimize the traffic management system, and use various digital technologies to guide the operation of urban traffic vehicles, and provide more traffic solutions for traffic managers.

2. The role of intelligent transportation in realizing the sustainable development of green transportation

Under the influence of "double-carbon" background, the management mode of intelligent transportation technology is becoming more and more important. Wisdom traffic management mode and concept is closely linked with time development, draw lessons from the digital

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technology, green environmental protection concept, etc., and into the traffic operation mode, improve the efficiency of traffic operation management and quality, and reduce various air pollution, and improve the efficiency of traffic models, and traffic management department provides a lot of technical countermeasures and reference basis, realize the diversification of green traffic management target[1].

2.1 Improve the efficiency of urban traffic management and reduce urban vehicle exhaust pollution

Intelligent transportation is not only a new management technology, but also a new scientific management idea. This technology plays a huge role in the sustainable development of urban green transportation. By using traffic command technology to design traffic routes, the urban traffic operation and management department can formulate reasonable traffic guidance schemes and control measures to reduce the large amount of vehicle exhaust generated by vehicles waiting for idle speed, reduce urban pollution, and promote the sustainable development of urban green transportation [2].

2.2 Improve the operation thinking of traffic management departments and optimize the way of road traffic management

Urban traffic operation management department, the application of smart traffic technology to urban road traffic management, can optimize the operation idea. In particular, by optimizing technical management methods, more data can be collected to grasp the traffic conditions of different sections in real time. Then, in combination with different traffic road conditions, reasonable management measures and schemes are formulated, and better driving schemes are put forward reasonably to improve efficiency and quality, strengthen driving guidance for drivers, give the optimal driving route, and effectively alleviate traffic congestion. In this way, it can reduce the waste of a lot of resources caused by repeated driving, and cause excessive carbon dioxide emissions [3].

2.3 To achieve the "double-carbon" goal and promote the sustainable development of green transportation

Double carbon, namely carbon peak and carbon neutralization abbreviation. Dual carbon includes two different goals, carbon peak and carbon neutrality. Since the 1990s, China has paid great attention to the cause of green environmental protection, began to formulate various green development policies and measures, and very actively participated in the world environmental protection and green cause and publicity. In order to further promote the development of green and environmental protection cause. In this context, the introduction of intelligent traffic management methods, optimize the traffic management scheme, through the use of big data, data analysis, transportation system analysis of urban traffic conditions, improve the level of urban traffic road management, reduce air pollution, noise pollution, to achieve any requirements and goals of green traffic sustainable development[4].

3. Application method of intelligent transportation technology

The urban traffic operation management department, through the construction of the urban traffic information management system center, unified and coordinated management, to strengthen the information linkage of various areas within the urban traffic lines, promote the flow of urban traffic information, and optimize the information management mode in a timely manner. Then, the city information and transportation center will uniformly deploy different data to achieve the maximum reduction of vehicle carbon emissions. On this basis, the traffic management department is setting a sustainable development goal[5].

3.1 Urban traffic and road data collection

Urban traffic road data collection can help urban traffic managers, in the shortest possible time for the main means of urban road traffic conditions, such as: through within the scope of urban road add cameras, sensors, etc., to obtain related road traffic data, and fine collection, and the different vehicles of mobile data flow for efficient collection, unified upload to the background system.

3.2 Big data processing

The urban traffic operation management department can improve the data processing capacity of the traffic operation department by building a traffic big data center. Through real-time collection of daily data, the availability of data can be improved, which is more conducive to improving the management level of urban traffic managers. Through the construction of a unified traffic big data processing center, the timely collection of daily data can achieve fast and efficient feedback.

3.3 Data processing center planning

Urban traffic operation management departments should vigorously build data processing centers to achieve efficient data collection and management. Urban traffic operation management department, through the construction of communication network connection server, is to complete the collection and processing of different data, including: collection, storage, processing, analysis, and then the processing of the data in time to feedback to different technical application platforms. Thus, the data information can be visualized or concretized.

3.4 Public network release

The communication network used by various equipment in the city is not completely consistent. A complete information service management center has been built, and relevant departments shall uniformly release relevant information, formulate a reasonable management and transmission mechanism, and push relevant traffic information for users regularly or at any time.

4. Green Transportation Overview

4.1 Green transportation definition

Green traffic usually refers to the traffic operation management system built to minimize traffic congestion, reduce the pollution to the natural environment, reduce energy consumption and promote the efficient operation of traffic and the development of a harmonious society, and the ultimate goal is to promote the sustainable development of green traffic.

4.2 The meaning of green transportation

Green traffic is designed to reduce urban traffic pollution, and reduce road traffic congestion, specifically by reducing the frequent use of personal motor vehicles, and encourage people to choose green transportation, or walking, bicycle, etc., and encourage people to use new energy vehicles. In addition, the significance of vigorously promoting green transportation also lies in the coordination of traffic and realizing the sustainability of traffic, including the following aspects.

First, green transportation advocates the coordination of transportation, environment and human psychology, and builds a reasonable coordination mechanism to promote the development of the three.

Second, green transportation focuses on the sustainable development of transportation and the future, and the long-term transportation development interests are not just focused on the present.

Third, green transportation pays attention to the coordination of transportation and social operation, adhere to the people-oriented, adhere to the safe travel for human beings as the core element, so as to make people travel safer.

Fourth, green transportation focuses on the coordination of transportation and resources, that is, adhere to the green travel as the main principle to reduce energy consumption.

5. Problems existing in the modern urban traffic operation

5.1 Urban road system management and planning is unreasonable

In recent years, with the continuous increase of the number of motor vehicles in China, and the continuous acceleration of the process of urban integration, the urban traffic problems have become more and more serious. Mainly reflected in the urban traffic congestion time concentrated in the morning and evening peak hours, although many cities in urban road route planning and design, completes the scientific planning, however, part of the city is not reasonable increase city bus line, makes it difficult to meet the morning and evening peak time traffic, far more than it bear the load. At the same time, some urban traffic signal lights adopt the timing control method. Although this control method can artificially extend the traffic time during the peak period of the traffic flow, it still cannot adapt to the short-time traffic flow in the special time period. In this way, it will lead to a short vehicle running time, resulting in traffic congestion. Moreover, because the design of the bus stop is too concentrated, the bus running time is prolonged, and the traffic congestion behind it occurs, so that the whole road traffic line is greatly hindered.

5.2 Urban rail transit lines are limited

The role of urban rail transit in the development of urban transportation cannot be ignored. It carries and solves the transportation problem of most of the urban flow of people. However, at present, the rail transit routes in many big cities are still relatively limited, which still cannot meet the travel needs of urban people. In this regard, the urban rail transit department is also required to solve the problem of urban rail transit, and to formulate more travel and transportation plans reasonably.

5.3 Urban traffic and environment pollution is becoming increasingly serious

With the continuous increase of the number of motor vehicles in China, the urban traffic problems have become increasingly prominent, and the urban environmental pollution problem has become more and more serious. Motor car operation will produce a large number of car exhaust and toxic substances, such as: nitric oxide and nitrogen oxide and other substances, these materials will bring great harm to the urban traffic operation. It will have a great impact on the whole urban environment, and it will also cause a great harm to human health. And the process of vehicle operation will also bring great wear and tear to the road traffic or foundation. At the same time, once the urban traffic becomes congested, it will cause the urban noise, which will have a great impact on the urban environment, pollution and people's health, and restrict the sustainable development of the urban economy.

6. Problem solution of intelligent transportation in modern urban transportation operation

6.1 Urban traffic planning should be strengthened

With the continuous development of the city, the government and the transportation department should timely change the original urban road system management and planning mode, adhere to the concept of sustainable development, and at the same time adhere to the people-oriented as the starting point of road planning, and actively optimize and plan the urban traffic road. Only then, then can improve the urban traffic design and management ability, in the process of urban planning and traffic facilities construction, should fully consider people's travel demand, at the same time more reasonable to the layout of road and bus stops and parking facilities, etc., thus constantly improve the efficiency of people's traffic, minimize traffic congestion, reduce automobile emissions at the same time, in addition, also should attach importance to the development of non-motorized travel way, actively create a comfortable and pleasant urban living environment. The urban traffic operation management department should plan and design traffic routes in combination with the current situation and future development of the city, reasonably increase bus dedicated roads to reduce bus parking time, thereby improving bus operation efficiency, so as to continuously strengthen the management and guidance of traffic roads, and timely do daily data analysis.

6.2 Urban rail management system should be constructed and built

Green traffic refers to energy conservation, emission reduction or conservation, environmental protection as the main characteristics of transportation. Green transportation refers to the use of certain new automobile transportation technology to transform the vehicle condition, or provide new power, and maximize the control of automobile exhaust emissions, or the use of mobile Internet technology to change and plan the transportation route, in order to improve the economic benefits of transportation, reduce carbon emissions[6]. In recent years, with the rapid development of China's cities, various digital technologies have been widely applied in the urban rail transit, and the rail management system has also begun to enter the era of high-tech development. In order to solve the difficulties in rail transit management, the relevant rail transit departments should actively use the network technology to establish the reservation service, and should reasonably arrange the train transport quantity, and do a good job in maintaining the order work in the subway station. At the same time, the rail transit department should strengthen the cooperation with the city bus department, timely do a good job of people flow diversion, collect network data information, grasp the dynamic people flow, and do a good job of dredging and drainage.

6.3 Introduce digital technology to build a smart traffic management system

Government and traffic management departments and related departments, should vigorously build intelligent traffic management system, vigorously introduce digital technology, improve the digital technology application ability and level, further optimize technology application management level, timely collect traffic information, optimize the technical service level, master the road traffic operation, develop different traffic drainage scheme, after data center analysis and processing information can be processed by GPS technology or GIS information efficient feedback, transmission to the user mobile client, the user can consult through the mobile phone. These different information to the user timely understanding of urban traffic and route guidance planning has great help, can avoid congestion, using the optimal route travel, or take peak travel and improve driving efficiency, reduce car congestion and automobile emissions, save more resources and money, and reduce the loss of urban traffic infrastructure, reduce the expenditure of urban traffic funds.

7. Conclusion

With the increasing attention of different countries to the "double carbon" economy, more and more countries have begun to introduce the concept of green transportation, through the use of various high-tech technologies to improve the level of traffic management, improve the efficiency of urban traffic operation, and achieve the goal of green environmental protection management of urban traffic. From the perspective of today's social development, strengthen the wisdom traffic application and research, to realize the sustainable development of green traffic has great help, by optimizing the digital resources, reasonable management of urban traffic management system, to improve the efficiency of urban traffic operation and comfortable and pleasant, green natural environment is of great help, improve the management level and efficiency of urban management department, so as to further promote urban sustainable development, reduce urban energy consumption, improve people's living standard and quality.

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