

# Control Measures of Energy Consumption and Carbon Emission in Urban Traffic

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**Abstract.** Industry, construction and traffic are called the three major energy consuming sectors of the whole society, and the position and function of the traffic sector are becoming more and more prominent. In developed countries, the proportion of traffic energy consumption to total social energy consumption is significantly higher than that of developing countries. In our country, with the rapid development of traffic, the traffic department and the rapid growth of energy consumption far exceeds the growth rate of the whole society consumption growth. Therefore, the control of urban traffic energy consumption and carbon emissions is particularly important. Based on the author's learning and practical experience, this paper first analyzed the difficulties of urban traffic energy consumption and carbon emission control, and then put forward the countermeasures to control the energy consumption and carbon emissions of urban traffic.

## Introduction

The continuous development of urban economy and the continuous expansion of space will lead to the improvement of urban residents' motorization degree and energy consumption level. As energy consumption is dominated by fossil energy, energy consumption of passenger traffic are bound to be one of the important carbon sources of the city. With the awareness of environmental protection has been strengthened, the vehicle emission pollution caused by more and more people's attention. In recent years, the haze situation is becoming more and more serious, so more and more time is being affected, and the visibility is getting lower and lower. The emission of automobile exhaust is one of the important causes of haze formation. Therefore, this research achievement can provide reference for the control of traffic pollution emissions, so that to reduce pollution, protect the environment and promote the healthy development of low speed automobile industry.

## Controlling Difficulties of Urban Traffic Energy Consumption and Carbon Emissions

**Energy consumption and carbon emission management technology is very difficult.** Urban traffic is a complex system. From the nature of vehicle operation, urban traffic can be divided into operational traffic (including bus, rail transit, taxi, travel cart, logistics vehicles, etc.) and non-operating traffic (private cars, institutional vehicles, etc.). However, the taxi in operational traffic and private car in non-operating traffic with institutional vehicles are equipped with the characteristics of large quantity, wide surface, scattered, complex model, different operating conditions and many owners. This makes the urban traffic energy consumption and carbon emission statistics very complicated and tedious. Based on such situation, energy consumption and carbon emissions control become more difficult. The complexity of urban traffic system is the technical obstacle that leads to the urban traffic energy consumption and carbon emissions cannot be effectively controlled.

**The development of public traffic is slow and prior.** The development of public traffic is an effective means to solve the urban road traffic problems and control the energy consumption and carbon emissions of the traffic. At the same time, giving priority to the development of city public traffic can reduce the construction of urban traffic facilities and maintenance costs, improve the efficiency of urban traffic system and save the cost of city economy. But in reality, due to the lack of financial resources of urban public traffic facilities, poor service level, low efficiency, unreasonable various factors of public traffic planning with low level of traffic management technology, the bus priority in many urban has not been effectively implemented. At the same time, due to the cognitive preference of urban managers, they regard the individual traffic development as the epitome of urban development and the means of reducing the public traffic expenditure. The wrong cognition further inhibited the development of public traffic.

**Lack city traffic management system or a mere formality.** At present, China's energy and energy conservation management unit is generally the Department of Reform and Development and their controlling object is the key energy consuming enterprises. Although the total energy consumption of urban traffic is large and its growth rate is fast, it is even close to industrial energy consumption in some big cities. However, the energy consumption of a single traffic operation enterprise is still smaller than that of the key energy consuming enterprises, which makes the traffic enterprises in most cities free from the scope of energy conservation supervision. In some mega cities, even if individual traffic enterprises are incorporated into the category of energy saving management, they are only formal management. There is no way to verify its true energy saving effect. For example, Tianjin Yinjian Taxi Company as the scale of 75 taxi business enterprises in the city as the largest one, has been incorporated into the tens of thousands of energy consumption enterprises supervision. However, the competent department (Tianjin city passenger traffic management office) has no knowledge of energy and energy conservation management, nor is it equipped with professionals without any penalty power. This energy-saving management and assessment failed to truly implement.

**The cooperation between departments is not effectively play.** The control of traffic energy consumption and carbon emissions is highly consistent with the prevention and control of motor vehicle pollution. Urban traffic energy consumption and carbon emissions control, involving the development of change, environmental protection, traffic control, quality inspection and other functional departments. At present, in the comprehensive prevention and control of traffic energy saving and traffic pollution, we have no laws and regulations to specify the specific division of labor and the power and responsibility of each department, and the effective coordination mechanism has not yet been established between different departments. For example, how to organize traffic operators to complete the energy-saving target assessment for the traffic control and the development and reform department? Moreover, the problem of how to complete the old vehicle inspection has not been solved by traffic control department and environmental protection departments.

## **Countermeasures of Controlling Urban Traffic Energy Consumption and Carbon Emission**

**Improve vehicle emission standards to control the total amount of pollution discharge.** The automobile emission limits have crucial influence on the vehicle emissions of pollutants. Low emission standards also led to lower automobile and engine manufacturing industry standards, restricting the development of related new technologies. Therefore, if we want to control haze, we must first perform stringent vehicle emission standards. In developed countries, Japan's control of automobile exhaust emissions is later than that of the United States, but it has a great progress.

Japan's emission standards and regulations have reached a level comparable to that of the United States. European emissions control is later than the United States and Japan, which is obviously ahead of China. In recent ten years, with the rapid development of automobile industry and the substantial increase of car ownership in China, the impact of automobile exhaust emissions on the environment has aroused public concern. Because of the late emission control in China, there is still a large gap between Europe and the United States in emission control technology. There is still a big space for improvement of vehicle emission limits in china. If we can gradually implement more stringent emission standards, the relevant enterprises will lead to increase technical inputs and emissions of oil quality upgrade. At the same time, the improvement of emission standards will inevitably lead to a significant decline in total emission of automobile exhaust emissions.

**Making tax plan scientifically and playing the role of policy adjustment.** The government should formulate reasonable tax and financial subsidy policies to produce effective incentives for the production enterprises and consumers, and promote the automobile manufacturers to develop high-tech, low pollution and environment-friendly products. At the same time, the government should guide consumers to choose the right way to travel. The focus of automobile taxation in developed countries is on automobile use rather than purchase stage. The developed countries are mostly used in fuel tax to reduce fuel consumption and reduce traffic congestion and environmental pollution. Fuel tax is also beneficial to the research and development of low pollution, new technology and new energy. Even some alternative energy sources such as bio-diesel, fuel cells, natural gas and so on are more attractive, Fuel tax is also beneficial to guide people to choose economic and environmental protection of small displacement car or public traffic. At present, the tax rates of three stages of purchase, maintenance and use of automobiles in China are 66%, 12% and 22% respectively. There are some problems such as high tax in purchase phase and low tax in use phase. As a result, this makes large displacement cars and small displacement cars pay the same tax in the use phase. This has failed to limit the production and consumption of high fuel consumption and high emission vehicles through a sound fiscal and tax policy. Therefore, we should appropriately improve the tax burden on the use of automobiles, and guide people to choose car with good fuel economy and small displacement models.

**Develop new energy vehicles and expand the use of clean energy.** The development of new energy vehicles, especially electric vehicles, can achieve zero emissions in the use of links and effectively reduce the urban air pollution. *The energy saving and new energy vehicle industry development plan (2012 - 2020)* has been passed by the Standing Committee of the State Council on 4 December 2012. This is of great significance to speed up the cultivation and development of new energy automotive industry. At present, we should increase the policy support of new energy automotive industry and accelerate the research and development of power battery and its management technology, motor drive control and other key technologies; at the same time, we should provide tax relief and financial subsidies for the purchase and use of new energy vehicles, and encourage consumers to give priority to the environmentally friendly vehicles with low energy consumption and low emission.

**Strengthen the city traffic management and give priority to the development of public traffic.** The rapid increase of car ownership not only brings great pressure to the city traffic, but also becomes an important driving force for the worsening air quality indicators. Giving priority to the development of urban public traffic and encouraging citizens to choose the green way of travel are also effective measures to control emissions. Compared with the use of cars, road occupation for the use of public traffic is only 1/10 of the latter, and the harmful gas emissions is only 1/16. Therefore, city managers should increase public traffic facilities and improve the public transport

network. Moreover, they should encourage people to use public transport, so that to reduce the desire to buy private cars and effectively reduce the total amount of pollutants emissions through public traffic subsidies and increasing public transport coverage.

**Perfect the supervision and management system of vehicle and reduce exhaust emissions from vehicles.** The control of excessive emission of vehicles in use is an important aspect of urban air pollution control. For example, "yellow standard car" emissions have reached the 20 times of the Europe IV standard car compared with same level. Foreign countries mainly implement inspection and maintenance system (I/M) for emission management of vehicles in use. For example, the United States, the European Union and other countries have taken coercive measures. The government carries out legislation and the relevant laws and regulations with mandatory regular inspection on the vehicles, so that they can timely find out the excessive emission vehicles and repair the over rated vehicles to restore or maintain the factory standards. Since 2008, Beijing has formulated a timetable for the elimination of high emission yellow cars. At the same time, the government increased the intensity of the yellow limit line. This has played an important role in controlling the total amount of motor vehicle exhaust pollutants in Beijing, which is worth learning from other cities in China.

## Summary

The control of automobile exhaust pollution has become one of the most prominent and urgent problems in the protection of urban environment and the strengthening of air pollution control. Therefore, this paper thought that in order to solve the serious problem of air pollution in the city, we should implement more stringent emission standards to control the total amount of pollutants and formulate tax policies scientifically to guide people to consume rationally. Moreover, we need to develop new energy vehicles and city public traffic, and constantly improve the regulatory system to reduce vehicle exhaust emissions.

## References

- [1] Li Hongfu. Current Situation and Countermeasures of Automobile Exhaust Emission Control in China[J]. Heilongjiang Science and Technology Information, 2016, (13): 24.
- [2] Zheng Zhangli. Situation and Countermeasures of Automobile Exhaust Emission and Control[J]. Enterprise Technology and Development, 2016, (05): 61+63.
- [3] Hou Rong. Discussion on Automobile Emission Standards and Emission Control Measures[J]. Journal of Taizhou Polytechnic College, 2014, (02): 36-38+51.
- [4] Wang Chunxu. Current Situation and Countermeasures of Automobile Exhaust Emission Control in China[J]. Wireless Interconnection Technology, 2014, (02): 185.
- [5] Cao Yuefang, Yin Zepu, Li Shijun. Study on Emission Control Measures of Low Speed Vehicles in China[J]. Environment and Sustainable Development, 2013, (06): 9-11.
- [6] Zhang Qing, Tao Xiaoma, Yang Peng. Study on Countermeasures of Carbon Emission and Reduction of Passenger Traffic in Big City[J]. Population, Resources and Environment in China, 2012, (01): 35-42.
- [7] Wang Weidong. Current Situation and Comprehensive Countermeasures of Automobile Emission Control Level in China[J]. Diesel Engine Design and Manufacture, 2005,(03):1-4+41.