

АВТОМОБИЛЬНЫЙ ТРАНСПОРТ

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SUSTAINABLE DEVELOPMENT OF URBAN TRANSPORT

1 Introduction

As is said in the report of the 15th congress of C.P.C. by president Jiang Zemin, "Since China is a country with large population and lack of resources, we must take the strategy of the sustainable development in the modernization". Since the reform and the opening-up to the outside world, Chinese national economy has entered a new era of sustained, stable and high-speed development, which has accelerated the process of citification. In the early time of liberation, there were only 136 established cities and 5 metropolitans with more than one billion people in China, but 668 established cities and 37 metropolitans in 1998, whose ratio rose from 10.6% to 30%. It is estimated that there will be more than 1,000 established cities by 2010, whose ratio will be over 40%. The citification can be fulfilled by increasing the number and scale of cities, which is sure to cause some serious problems such as traffic jams, environmental deterioration and shortage of resources. So now it is urgent in city planning to keep social economic development, keep the sustainable development of a city and its traffic.

2. Urban Sustainable Development

The concept of the sustainable development was first used in the report of United Nations Environment Program (UNEP) in 1978. The 21st Century Agenda was published in the global-environment and development conference in Rio de Janeiro, Brazil, in 1992, in which the strategic aim of urban sus-

tainable development was proposed for the fair and rational disposition of material and spiritual wealth between the current generation, the current and following generations. The development aims to change the city functioning system of energy and resources consuming into a system of cycling and economizing, the inner basic change will regulate the pattern of a city's social and economic organization and the relevant space pattern. [1]. It was clearly stated in the White Book of China's 21st Century Programmer-Population, Environment and Development that Man had to reexamine his social economic behavior and his history, realize that the traditional "polluted-regulated" development pattern going after economic growth by high consumption does not conform to the present and future development, and we must manage to find a way to keep population, economy, environment and resources in harmonious relation, and meet the present generation's requirements with no harm to the following generation.

To fulfill the sustainable development, we must do as follows: Firstly, pay attention not only to the economic growth, but quality, effect, energy saving, exploitation of land space, and less waste discharge. Secondly, resources and bearing capacity of environment should be coordinated to protect life supporting system and the ecological balance for human's development within the bearing capacity of the earth. Thirdly, living standard's rising should be suited to the advance of society with development and

poverty considered together. Such are the three features in the development as the development of natural resources and ecological environment, economic and social development. Ecological continuation is the root, and economic continuation the condition, social continuation the purpose [1]. Man is going after the sustained, stable and healthy development of nature, economy and society.

3. Restriction of urban transport on the urban sustainable development

Urban transport has become a striking problem in many big and medium sized cities in China. The reasons lie in the proportion of road area in a city and its average per a person are too low, and there are too many vehicles per a kilometer, e.g. 506 per kilometer in changhai. Traffic features have changed obviously in some fairly developed big and medium sized cities: more cars are blocked, air pollution deteriorated, going out by vehicle become more and more difficult and more time is consumed, vehicles stopping is obvious, and public transportation speed has reduced to walking pace in the centers of some cities.

3.1. Car owning increases continuously, which brings heavy traffic pressure to cities

With the development of the city upper space and the construction of high, ultra-high rise buildings on a large scale, people and cars crowd together at the rush no hours, and traffic condition will be more severe. Besides, the car industry in China is prosperous. According to the investigation, the car owning has in-

creasing by 15% per a year in recent years. As China enters WTO, more cars will appear. Take Beijing as example, with the development of its economy and the expansion of city scale, the number of motor vehicles has reached 1,360,000 by the end of 1998, which surpasses the number of 700,000-800,000 in 2000 ratified in "Beijing city overall planning" by the state ministry made in 1993. Due to the high increase of motor vehicle owning, the road network construction doesn't match the increase, which cause an average load increase of 90% of the road network in traffic peak in some centers, and an less average of 20km/hour speed in the urban roads [2].

3.2. Continuous increase of various motor vehicles results in severe pollution

Because the general technique level of motor vehicles in use is still very low in China, the majority of which release more pollutants than that of developed countries. In addition, the comparatively slow construction of city road network and the poor status of roads have been resulting in a prolonged time when cars are in unsteady state: low speed, sudden, sudden brake and slow speeding, which consequently cause more pollutant release. A comprehensive survey in Beijing shows that the NO_x in atmosphere increases from $90\mu\text{ g/m}^3$ in 1986 to $220\mu\text{ g/m}^3$ in 1998, in the contour, the CO and NO_x in the main road and crossing exceed the National Air Quality Standard yearly.[2]

The realization of urban sustainable development objective is decided by its traffic sustainable development to a large degree. We should start from improving the traffic condition and environmental quality, adjusting the idea and content of our traffic planning, and making a comprehensive planning of sustainable development on traffic and environment oriented to the 21th

century.

4. Outlets for city traffic

Urban transport is a highly comprehensive and complex system, which differs from highway and railway. It is an important part of the city function, having its own laws, and limited by the social economy, city forms and developing modes. Dealing with traffic problems concerns great extent, big investment and complicated coordination [4].

4.1. Keep strengthening the development of city traffic management system and organization

The ultimate object of city traffic management system is to realize the traffic synthesis, making the city traffic under the unified government of management organization, establishing a unified management system from policy study to policy carry-out, from planning, construction to management, from setting up technical normal standard to training professional technicians [3].

The development of city traffic management organization will help to establish a unified national city traffic management organization, which holds responsibility for studying and making the traffic technical policy and development strategy, making and revising traffic technical norm and standard, coordinating the planning, project construction, investment, management, city traffic and other transportation means of the adjacent areas [3].

4.2. Improve traffic passing capability of the city roads

With the continuous increase of city population and motor vehicles, the absolute magnitude of people's going out will also increase, so will the personal cars on the city roads. In the city of Guangzhou, the ratio of using personal cars is higher than that of cabs. At present, the biggest passing capacity is 1600~2000 standard cars per a hour on the express road in China, while

2000~2500 in some foreign countries [4]. To satisfy the increasing traffic of the city citizens, China should emphasize on the study and exploration of improving the passing capacity of city roads.

Furthermore, while vehicles are moving, the frequent change of speed and the shift of gears may result in extra consumption of fuels which only makes the emission of tail gas even worse. If the environmental carrying capacity can no longer bear more tail gas and noise intensity, one area may easily get seriously polluted. To reduce the air pollution as well as noise pollution, it is, therefore, must to allow the passage of more vehicles on the road while keeping them moving at high and steady speed.

4.3. Develop the urban public transit and improve the relevant service

In contrast with the urban mass transit, the individual transit refers to other various means of transportation such as the use of the bicycle, motorbike, minibus, car or walking. Since the mid of 1990s, China's auto industrial bases have been constructed on certain scales because of the adoption of new policies which encourage the manufacture of more cars. As a result, there is a sharp decrease in the price of cars and more and more private cars and minibuses are found in cities nowadays. It is estimated that, by the year 2005, more than 3800~4000 households will be able to afford the cars across the nation and the number of cars for home use will be 5 million with a potential demand of 1.2 million.

The effective way to maintain the sustainable development of the urban traffic is to develop the public transit and to prevent the overuse of individual transit which can not only reduce the traffic jams and pollution but also save the parking lot and fuel. In most of the modern cities worldwide, there is usually a modern

public transit system favored by most of the citizens. People who use the urban public transit in New York, London, Masco, Tokyo, HK, Singapore account for 86%, 80%, 92%, 71%, 90%, 74% respectively; but, in Beijing, only 24% of the population use the public transit and 36% in Shanghai, 18% in Guangzhou, 10% in Shenyang. This shows clearly that China lags far behind the developed countries in the development of the urban traffic.

The figures above demonstrate that the majority of the city residents in China still use private means of transportation. If this situation continues, on one hand, the urban traffic facility capacity will soon reach its saturation point though large sums of money has been spent on more facilities for the purpose of meeting the increasing demand of the traffic, and on the other hand, the overuse of motorbikes, minibuses, and cars in a city will pollute the environment seriously, doing harm to people's health.

The conflict between the increasing demand of the traffic and the shortage of traffic facilities will exist forever. But, it is a must to develop the public transit. This is the key to the development of a city.

4.4. Pay attention to the construction of the urban high-speed traffic system

To solve the increasingly serious traffic problems of cities of

large scale, China has planned to, within the coming five years, invest 130 billion yuan (RMB) on the construction of a total of 400 kilometers urban tracks, mainly in 13 cities including Beijing, Shanghai, Tianjin, Shenyang, Nanjing, etc, and to lift the ban on the track construction approval in other cities of middle or large scale. The fast-speed railed traffic refers to all the fast-speed vehicles, powered by electricity, moving on light rails or underground tracks. If a city has a population of more than 2 million, vehicles usually fail to move at high speed because of the large number of passengers like the long distance travelers and the traffic jam and stops, so, it is necessary to have an effective fast-speed track system.

The fast-speed rail traffic has many advantages. It can carry more passengers, provide better service, take less time, be punctual and do less harm to the environment. It can not only reduce the traffic pressure caused by the construction of more skyscrapers but also help people move to the suburbs and other places from the city center allowing more places to be used as greenery patches. As an isolated system from the traditional ground traffic system, however, it involves advanced technology, large sums of money, and costly maintenances. As far as the sustainable development is concerned, China should, from

the beginning of the 21st century, carry out research and construction of the fast-speed track traffic in cities which are under heavy traffic pressure and are economically powerful. As for the cities of medium or small scale, it is also necessary to make room for the possible construction and development of such kind of traffic system.

4.5. On the public parking lots in a city

The parking lots refer to the area in a city used for the parking of the motor vehicles, bikes of the city and motor vehicles from other places. In cities of China, there is a severe shortage of parking area and facilities, and as a result, it is

5. Conclusion

The traffic problem of a city has aroused general concern in many countries throughout the world. Measures must be taken to reduce the traffic jams, to protect the environment and to control the air pollution in a city. This not only has a lot to do with people's life and health, but also has great effect on the sustainable development of a city. Therefore, city planners and other officials at different levels need pay attention to the traffic problem and do their utmost to solve it. It is necessary to carry out research on the relationship between the city traffic and the land utilization, the traffic development policies and the city planning.

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