

Urban Transportation in China: Current State of Reform and Future Trends

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Abstract

Urban transportation in China is going through tremendous change—reform of institutions, new vision for planning, and improvement in facilities and their management. This is a result of fast urbanisation and motorisation, and a greater understanding of urban transportation—its development goals, phenomenon and underlying laws. At the same time, the future development of urban transportation in China has also become a focus of attention. In this context, this paper discusses the current state of urban transportation reform in China and its future trends, for the purpose of providing a useful reference for future urban transportation development in China.

Introduction

Along with fast social economic development, the pace of urbanisation and motorisation in China has been accelerating. This has resulted in rapid expansion of cities and great improvement in the standards of living in the cities. Demands for transport in cities have increased tremendously. This situation has brought about both challenges and opportunities for urban transportation in China. In response, the government has been carrying out institutional reforms, updating visions for planning, and improving facilities and their management. These changes aim to develop Chinese cities into ecological cities, and accelerate the development of sustainable urban transportation in China.

Current State of Urban Transportation in China

Fast urbanisation and motorisation

Urban population in China has increased from 332 million in 1993 to 607 million in 2008. The

level of urbanisation thus increased from 28% to 46%. It is estimated to reach 58-60% by 2020. This means that about 300 million people will move into cities from rural areas in the next 12 years.

Between 1987 and 2008, the average annual growth rate of motor vehicles exceeded 14%. By 2008, the total number of motor vehicles reached 169 million, of which over 38% are cars. China has entered the era of motorisation.

In this context of urbanisation and motorisation, urban population and areas are continuously expanding; the demand for transportation and infrastructure is constantly changing. The conflict between urban development and transportation demands has become one of the greatest challenges encountered by urban planners.

Transport demands

At a macroscopic level, demand for transportation inside cities and between cities is increasing rapidly.

At a microscopic level, different groups have diverse requirements on modes of transportation, environment and service level. There is thus a need to embrace the principle of equity and people-oriented planning in urban transportation.

Improvement in public transport

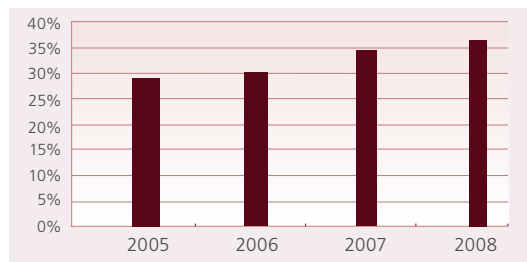
Urban public transport is promoted by both the central and local governments in China. It has become the strategic choice for the development of urban transportation in China.

Although the current share of public transport in personal trips in Chinese cities is generally not high, there has been a steady increase. Beijing, for instance, has shown this upward trend over the past few years (See Figure 1). The share has reached more than 30% in Beijing, Dalian and Changchun, as shown in Table 1. In Dalian, the public transport share has reached as high as 43%.

Table 1: Share of public transport in personal trips in major chinese cities (2006)

| Share of Public Transport | Major Cities |
|---------------------------|---|
| > 30% | Dalian, Changchun, Harbin, Beijing |
| > 20% | Shanghai, Guangzhou, Lanzhou, Chongqing, Wuhan, Changsha, Xi'an, Hangzhou, Shenzhen |

Figure 1: Share of public transport in personal trips in Beijing (2005- 2008)



Steady improvement in transportation infrastructure

In 2006, the total length and area of urban roads in China (county level and above) reached 241,350 km and 4,114.47 km² respectively. The urban road area has increased 2.5 times compared with that in 1995. There has been continuous urban road construction and network expansion to keep pace with the fast urbanisation and motorisation.

Urban Transportation Reform in China

Institutional reform

Institutional reform provides the basis for better integration of urban transportation. In recent years, Chinese cities have established new transportation committees. These committees, which include former transportation bureaus, take on functions such as managing the operation of public transport between urban and suburban areas, construction of public transport infrastructure and overall coordination of all transport functions.

Institutional reform provides the basis for better integration of urban transportation.

The establishment of transportation committees in Beijing, Shanghai, Wuhan, Chongqing and Chengdu helps to promote better coordination in the management and development of urban transportation. Take the Chengdu Transportation Committee established in 2006 as an example. Its functions include: all the functions of the former transportation bureau; the former Chengdu Municipal Highway Bureau's functions in the management of urban public transportation, planning of bus routes, issuing of taxi licences and managing taxi operation; the Public Security Bureau's functions in technical planning, safety facility planning and parking management; and the Economic Committee's functions in the coordination of railway, highway and airline transportation, and the management of railway lines and the logistics sector.

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The establishment of the Transportation Committee in Chengdu has the following advantages: firstly, it promotes the coordination and integration of different transportation modes; and secondly, it promotes rational distribution of resources. The new railway station and the airport are good examples. During the construction of the railway station, the different transportation modes—subway, bus, taxi—as well as their integration are well planned through the coordination of the committee. In the case of

the airport, connections with intercity railway, subway and buses are planned and provided as an integral part of the services at the airport. Without the Transportation Committee, such planning and coordination would have been nearly impossible.

New visions for planning

Planning plays a critical role in the development of urban transportation. Scientific urban transportation planning is the key to sustainable development. A clear vision is core to planning. The visions and ideas behind the planning of urban transportation in China are spelt out below:

a. Sustainable transportation

The objective of a sustainable urban transportation system is to meet the demand for mobility, optimise use of resources, improve environmental quality, promote social harmony and increase the level of safety. This is to realise the virtuous development cycle of society, economy, mobility and environment, which is also the objective of China's transportation development.

b. Giving priority to public transport

Giving priority to public transport development is not only an effective measure to relieve urban congestion, improve living environment and promote sustainable development, but also a requirement for a people-oriented and harmonious society. The central government places great emphasis on the development of public transport and integrates it into the overall strategy of realising a resource-saving, environment-friendly and people-oriented society.

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c. Integration of urban and rural public transport

As the process of urbanisation accelerates, the industry experiences radical restructuring and communication between urban and rural areas becomes increasingly more frequent and convenient. The strategy of building a new socialist countryside, the implementation of the Town and Country Planning Law¹ and the Decision by the Chinese Communist Party Central Committee to promote the reform and development of the rural areas² show that the integration of urban and rural areas is placed at the top of the government's agenda so as to create an equal environment for residents in both urban and rural areas.

The integration of urban and rural public transport is being promoted by all levels of government in China. The implementation plans for some cities such as Chengdu and Kunming have been approved.

d. People-oriented principle in bike and pedestrian systems

An integrated, effective and people-oriented transportation system that caters

to both motorised and non-motorised traffic is critical in creating a livable environment. A safe, comfortable, convenient, effective and non-motorised system well connected to public transport can help to create a comfortable, healthy and sustainable city. Therefore people-oriented pedestrian and bicycle systems are integral parts of the transportation system in cities such as Xiamen and Hangzhou.

e. Effective transfer at comprehensive hubs

Comprehensive transport hubs are the connecting points for multi-modal transportation. They play an important role in both freight and passenger transport. Many cities in China emphasise the concept of effective transfer. The Xizhimen station in Beijing, for example, is a transport hub for a comprehensive range of services—railway, subway, buses, cars and bicycles.

f. Integration of land use and transportation system

Different city configurations and land use priorities lead to different transport demands. The integration of land use and transportation is thus important to create an optimal model for urban development. Transport plays an important role in guiding land use planning and development. The objective is to achieve a comprehensive transportation system integrated with land use.

g. Traffic safety in planning, construction and management

In line with the people-oriented principle,

great emphasis is given to traffic safety in the planning, construction and management of urban transportation in China. Traffic safety occupies a strategic position on the agenda of both central and local governments.

Innovation in service

New mobility choices have emerged in China in response to the diverse demands of its people. Rental bikes and electric cars, as shown in *Figure 2*, are two such new services.

Measures to Ensure Smooth Transport During 2008 Olympic Games

To deliver a smooth and efficient transportation system for the 2008 Olympic Games, meticulous planning and safeguard measures were taken as the city prepared for the Games. The organisation of transportation for Beijing Olympics has kept Beijing’s promise of satisfying the international community, the athletes and its people.

Substantial construction of transportation infrastructure

One key factor in the success of the Olympic transportation was the enhancement of transport infrastructure in Beijing. *Table 2* shows some of these efforts.

Enhancing mobility services

Transport information services and trip guidance were provided during the Olympic Games. Information on transportation was enhanced and made more accurate through feedback from the public. The enhanced

Figure 2: Rental bikes and electric cars on Tsinghua University’s Campus



Table 2: Construction of transport infrastructure for the Olympic Games

| | Enhancement of Transportation Infrastructure |
|------------------|---|
| Intercity | <ul style="list-style-type: none"> • Capital International Airport enlarged • Beijing South Railway Station put into use |
| Road | <ul style="list-style-type: none"> • Construction of new roads: the fifth ring road (98km); new expressways providing better connection for existing urban network (35km); urban main road (105km) • Dedicated Olympic Lanes for vehicles serving the Olympic Games • 85% of Stadiums are near the Olympic transportation rings, with more than 2 roads to Olympic Green³ |
| Railway | <ul style="list-style-type: none"> • 7 lines (total 191.9 km), with 1 line to Olympic Green |
| Bus | <ul style="list-style-type: none"> • 650 bus lanes, 4.5 billion passengers per year • Dedicated bus ways |

information allowed drivers to select alternative routes which were less congested while public transport users could access the information for their choice of modes and routes.

At the same time, there was a campaign for public participation. Volunteers were trained to guide traffic, especially cyclists and pedestrians, and to be tour guides. More buses were also put into operation and the subway operating hours lengthened.

Detailed traffic organisation plans were established for every stadium as well as for the opening and closing ceremonies. For the opening ceremony, the 90,000 audience evacuated the stadium in 75 minutes, a 15-minute improvement over the original plan. Dedicated bus routes and lanes were provided to meet the diverse demands of people attending the Games.

Traffic demand management

To ensure smooth traffic during the Olympic Games, several traffic management measures were implemented. These included restrictions on the use of cars based on license plate numbers where private cars with even and odd license plate numbers were allowed on the roads on alternate days; restrictions on through traffic in the city; flexible working hours; and regulated access into the city for commercial vehicles. It is estimated that these measures reduced the total number of vehicles running on the roads by as much as 1/3.

Transportation culture

People-oriented planning, humane management, justice and social equity and

promotion of public participation—all these will remain key principles as the city takes on the task of creating a healthy transportation culture.

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Future Trends of Urban Transportation in China

The coming years will be a critical period in the development of Chinese cities into ecological cities with sustainable urban transportation systems. Public transportation will be a main focus in the strategy. Full consideration will also be given to resources, environment, equity and safety to achieve people-oriented harmonious transportation. The integration of land use and transportation systems as well as the application of intelligent transport systems (ITS) will play key roles in the achievement of this goal.

Conclusions

As cities in China continue with their development and transformation to ecological cities with sustainable urban transportation systems, the process will be a creative and dynamic one which promotes the coordinated development of man and nature, economy and transportation, and different transportation modes.

To realise this objective, the government will commit to the people-oriented principle and the strategy of giving priority to public transport. The institutional reform which led to

more coordinated and integrated development of urban transportation, and scientific transportation planning and policies will serve to bring China closer to its development goal.

Notes

1. The Town and Country Planning Law (the full text in Chinese can be accessed at http://news.xinhuanet.com/newscenter/2007-10/28/content_6966622.htm), effective from 1 January 2008, is the first legal document in the Chinese history that integrates the urban and rural planning process. It marked the end of the dual systems for urban and rural development that had been in practice for decades.
2. The Decision by the Chinese Communist Party Central Committee to promote the reform and development of the rural areas (the full text in Chinese can be accessed at http://news.xinhuanet.com/newscenter/2008-10/19/content_10218932_1.htm), issued on 12 October 2008, is the guideline for further rural reform and development. It is the result of an extensive review of the 30-year rural reform. The document pledged to balance urban and rural development and push the integration of these areas.
3. Olympic Green is where 50% of the competition venues were located for the Beijing Olympics, and is located at the northern end of the city.

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