Urbanization in the People’s Republic of China

Urbanization in the People’s Republic of China (PRC) has been on an extensive and accelerated path. In 2008, more than 600 million people were residing in 655 cities, pushing the urbanization level to 45.7%. Based on current trends, the urban population in the PRC is projected to cross the 1 billion mark in 2030 and eight megacities—each with a population of over 10 million—would be existing in the country by 2025 (Woetzel et al. 2008).

However, the rapid rate and sheer scale of urbanization is associated with increasingly pressing social, economic, and environmental problems. Clearly, new models of sustainable urban development are needed to cater to this phenomenal urban growth for the coming decades.

Bus Rapid Transit (BRT) Systems in the PRC

Fast-growing cities in developing countries are often plagued by the twin problems of congestion and inadequate public transport systems. In some cases, a Bus Rapid Transit (BRT) system can help to bridge the gap. By using dedicated bus lanes to develop a moderately rapid mass transit system, a BRT system generally requires lower infrastructure investment as compared with a subway or light rail system. And a BRT system can be implemented relatively quickly—in 5 years or less. BRT systems are not new in the PRC, and have been implemented in several cities including Beijing, Hangzhou, Xiamen, Dalian, Chongqing, Jinan, and Changzhou. However, the BRT system implemented in Guangzhou is of a different scale and featured some innovative ideas.

Designated as a special economic zone, Guangzhou is one of the most developed, wealthiest, and largest cities in the PRC. The city is an important export manufacturing and transportation hub in south PRC, and absorbs a large influx of rural migrants seeking employment. Congestion in the urban areas is a pressing problem, especially along Zhongshan Avenue, which is one of the busiest arterial commuter routes in the city.

As part of the public transport system, the bus services in the city were given priority lanes and signals. However, the free-for-all traffic conditions in Guangzhou made implementing these

The Guangzhou BRT system is the first in the world to be tightly integrated with the city’s existing metro system as well as other non-motorized means of transport.

Figure 1: Pedestrian-friendly features of the Guangzhou BRT system

* This is one of a series of case studies in sustainable urban development in the PRC.
regulations a herculean task. The BRT system was thus proposed by the Institute of Transport and Development Policy (ITDP), a US-based nongovernment organization for the promotion of environmentally sustainable and equitable transportation policies and projects worldwide, to the Guangzhou government.

Multi-Modal Approach of the Guangzhou BRT

The Guangzhou BRT system, which officially opened in February 2010, is a successful example of retrofitting sustainable urban development practices in a fast-growing city. The 26-station BRT system currently stretches over 22.5 km along Zhongshan Avenue, with more stations being planned. The key innovation of the Guangzhou BRT system was its multi-modal transportation approach.

• It is considered to be the first BRT system in the world to be tightly integrated with the city’s existing metro system, as well as other non-motorized transport means such as cycling and walking. Three BRT stations (Shipaiqiao, Gangding, and Chebei) feature connecting tunnels to the Guangzhou metro system, with three more under development (Shuanggang, Miaotou, and Xiayuan) when the Guangzhou Metro Line 5 expands to join up with the eastern end of the BRT corridor.

• To promote multi-modal transportation, the BRT stations are the first in the PRC to be equipped with bicycle parking and bicycle sharing facilities, and are integrated with the surrounding buildings through connecting bridges from the station. Other pedestrian-friendly and accessibility features include escalators and wheelchair lifts (see Figure 1).

• The bus-only BRT route is located within the center of the roadway, with pre-paid boarding platforms on the right side.

• Forty-two bus routes operate in the BRT corridor, with all but one operating both inside and outside the corridor. During peak hours, some 340 buses run per hour in each direction. All buses and stations are equipped with passenger information services.

• Buses plying the corridor are 12 meters (m) long and run on liquefied petroleum gas (LPG). More recently, 18-meter-long buses were introduced.

• Station sizes are among the longest in the world and range from 55 m to 260 m in length. The larger BRT stations feature multiple pick-up points.

• Affordability is a key consideration in developing a sustainable urban public transport system. A ride on the BRT system costs CNY2, and a smart card which offers discounted fares can be used. Passengers can also transfer for free to other BRT routes in the same direction.

• There are plans to enhance the areas around the BRT stations as public and green spaces.

Planning and Implementing the BRT System

The idea for a BRT system was first seeded with the Guangzhou government in 2003 by the ITDP. Trips were made by the local government to study existing BRT systems in South America.

Preliminary plans were then drawn up in 2004 by a team made up of ITDP and the Guangzhou Municipal Technology Development Corporation (GMTDC). Subsequent design and planning of the BRT project were led by ITDP GMTDC, and the Guangzhou Municipal Engineering Design and Research Institute. Funding for the BRT planning came from the Guangzhou Construction Commission, although some seed funding was originally provided by the Rockefeller Brothers Fund and the Hewlett Foundation.

The concept plan, demand analysis, and corridor comparison were completed in 2005, while the phase II planning was done in 2006. Final design, implementation, BRT construction, and metro integration took place in 2007 and 2008. The regulatory arrangement for the BRT system, procurement of vehicles as well as promotion and outreach to the public were conducted in 2009, and the system finally went into operation in February 2010. The final project cost was CNY30 million per kilometer.

The project had the strong support of the Guangzhou mayor, Zhang Guangming. Considerable political will was needed to push the project through, as it meant taking up stretches of some of the most congested roads in the city. Cars were relegated to side roads while pedestrians and commuters had to put up with construction and the shifting of bus stops.

Smother Ride with Guangzhou BRT

Despite the fact that the Guangzhou BRT system is still in a nascent stage, it has scored several early successes. Although conclusive
data have yet to be collected, traffic congestion along Zhongshan Avenue has visibly eased (see Figures 2 and 3).

The Guangzhou BRT system boasts a ridership exceeding 800,000 daily, with more than 25,000 passengers per hour in each direction. This is higher than any of Guangzhou’s five metro lines and is more than practically every metro line in the PRC except Beijing’s. Ridership is expected to increase to 1 million passenger trips a day by the end of 2010.

The planning of the BRT system is regulated by the Public Transport Management Office, while the BRT Management Co. regulates the BRT operations. Bus Rapid Transit Operation and Management Co. Ltd. is the BRT management agency. Private bus operators, including foreign operators, are already allowed to offer public bus services in Guangzhou. Unlike most BRT systems in the PRC, which typically have a single operator, the Guangzhou BRT system is operated by seven bus operating companies under three corporate groups. This has helped introduce competition and improve service levels.

There are other benefits. According to ITDP, the introduction of the BRT system might also have reduced about 20,000 tons of CO₂ emissions a year while helping ease traffic congestion in other parts of the city (Rahim).

References
C. Gunter. 5 March 2010. Guangzhou opens Asia’s highest capacity BRT system. Institute for Transportation and Development Policy.

Figure 3: Gangding BRT station after implementation of the BRT system