Guangzhou, China’s bus rapid transit system

High-quality investment matters

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Key points

- **Bus rapid transit can be a cost-effective mode of public transport for cities experiencing congestion, given the high carrying capacity, compared with conventional buses, and the smaller upfront investment needed, compared with the rail-based transport.**

- **Although the government’s ability to overcome public resistance was critical to jump-start change in Guangzhou, investment in a high-quality BRT system enabled the operation of financially viable services by attracting passengers with the increased speed, convenience and connectivity.**

There was a problem...

Guangzhou is one of the fastest-growing cities in the world. Rapid motorization had taken place in the city for three decades, leading to congestion and an unhealthy environment.

What was done?

In 2010, Guangzhou began a scheme to improve both public transport and the local environment and reduce the level of greenhouse gas emissions from the transport sector. A key part of this package was the development of a bus rapid transit (BRT) network.

The city’s BRT system was launched in February 2010. Working with the Guangzhou Municipal Engineering Design and Research Institute, the International Institute for Transportation and Development Policy (ITDP) led the design and planning of the project. The ITDP works with cities worldwide to bring about sustainable transport solutions that cut greenhouse gas emissions, reduce poverty and improve the quality of urban life.

The infrastructure costs for the following components were US$4.4 million per kilometre and were financed by the Government:

- **Quality infrastructure**: Sensitive designed infrastructure enables efficient transit between different modes of transport and easy access to all citizens. The scheme is the first in China to include bicycle parking at the stations and to include direct tunnels between the metro and BRT stations. Platforms are at grade with the bus floor, ensuring easy access for mobility-impaired passengers.

- **Integrated fare system**: The BRT and metro fare systems are integrated, which helps ensure a seamless transition between the two modes.

- **Synergies with the non-motorized transport (bicycle)**: To further support the uptake of non-motorized transport, new bicycle lanes were developed that run parallel to the BRT stations. A bike-sharing scheme was launched in June 2010, with 1,000 bikes initially.

- **Supplementary measures aimed at improving liveability and environmental resilience**: As part of the integrated process, polluted waterways were reclaimed as public space. Tree-lined bicycle lanes were developed that immensely improved the look and feel of the environment.

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2. Ibid.
Results

- **Integrated transport network:** The BRT system is well integrated with other public transport modes, including bike sharing and the metro railway system. The system won the 2011 Sustainable Transport Award from ITDP.
- **Increased ridership in public transport:** It currently carries 26,900 passengers per direction per hour, with a daily ridership level of roughly 800,000, supporting a modal shift of 10-15 per cent from private vehicles.
- **CO₂ emission reduction:** It is estimated that the scheme has reduced CO₂ emissions by approximately 20,000 tonnes a year.
- **Time saving:** The BRT is estimated to have saved 30 million passenger hours in the city in its first year.
- **New employment and business opportunity:** Guangzhou’s BRT opened up a range of employment and business opportunities for people who were previously restricted by the time and cost required to move along the Zhongshan Avenue corridor.

Lesson learned

Investment in the improvement of the quality of the BRT system led to the long-term financial sustainability of the operation. The high-quality service is expected to cover all operating costs, including bus depreciation and the installation, operation and maintenance of the fare-collection system.

Success factors

- **Political leadership:** There was significant opposition to the introduction of the scheme from car owners and the media. But that was met with strong and unwavering political support for the scheme from the city mayor. In addition, all provincial and city officials have ridden and endorsed the system.
- **Clearly defined responsibilities:** The new BRT scheme was to be integrated with improvements to non-motorized transport and the metro, so there was a need to ensure clearly defined responsibility and effective communication. The BRT system is regulated by the Public Transport Management Office (planning) and the BRT Management Co. (control). The BRT Management Company oversees the private companies that are responsible for the operations.
- **Appropriate regulatory arrangement for operators:** There are seven operating companies in three large corporate groups that are responsible for managing the operation of the service. This makes some aspects of regulation more complicated but helps to ensure a good service by providing regulators with more options. Bus operators are paid per kilometre rather than per passenger.

Considerations for replicating

Countries with a lack of planning and design capacity may resort to the support from an international organization or research institute. Guangzhou turned to the Institute for Transportation and Development Policy to help ensure the ongoing sustainability of its vision and system. Minor route changes and the gradual introduction of express routes and larger buses will result in significant operational improvements to ensure increasing passenger demand continues to be met.

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4 ibid.
7 ibid.
Further reading