



CHINA URBAN TRANSPORT DATABASE (CUTD)

AUTHORS: *Dr. Cheng LI and Dr. Xianglong LIU*

THIS BRIEF TARGETS

- Executives of transit authorities, operating agencies and corporations searching for data and applications to address operating, financial, political and planning challenges.
- Academics, researchers and students working in the fields of transit management, planning, and big data technologies.

KEY MESSAGES

- The CUTD project has accomplished data exchanges between the Ministry of Transportation, provinces, cities, and private companies.
- The application systems with monitoring, evaluation and comprehensive analysis functions have been improved, enabling evaluation and comparison of the urban transit development level of cities.
- Research results have been widely disseminated through communication activities, and appropriate permitted data has been made available online.

This Research Brief presents research achievements and experience gained in constructing the China Urban Transport Database (CUTD), which has been developed according to the principles of operability, sustainability, scalability, and accessibility.

The major objectives of CUTD, as the first comprehensive nationwide urban public transport database in China, are to provide data and a scientific basis for policies and planning decisions and a firm basis for scientific research in urban transport. In 2015-2016, the main objective was to develop the prototype system and support monitoring and evaluation of public transport development in the pilot cities of the China Ministry of Transportation's (MOT) China Transit Metropolis Project.

The first stage of the CUTD was completed in November 2016, including archiving MOT city passenger statistics and urban passenger vehicle operating subsidy data for 2011-2015. In accordance with the MOT open-data mechanism and authority requirements, a part of the data is available online. Automatic data exchange has been established with Beijing, Henan, and Zhejiang at the city, province, and national levels. Data for 37 "Transit Metropolis" cities has been incorporated. The system has significantly improved decision-making for MOT and

- ▶ operating agencies at all levels in promoting the China Transit Metropolis Project.

There are three key functions of the CUTD:

- **Monitoring:** to obtain comprehensive, accurate and timely original information about the basic condition of urban transit in China;
- **Evaluation:** to enable evaluation and comparison of the urban transit development level of cities, and;
- **Comprehensive analysis:** to enable analysis of urban transit development and trends nationwide.

Key lessons

The CUTD database was designed and developed in strict accordance with the following principles:

- **Operability:** The database was built to facilitate the data collection process and to be user-friendly;
- **Sustainability:** A sustainable operating procedure was developed, which ensures system robustness to future changes and technological advances;
- **Scalability:** Advanced cloud computing technologies and modularized system design have been applied deeply;
- **Transferability:** The differences between cities have been considered and the modules and middleware have been customized to increase transferability, and;
- **Accessibility:** In accordance with the open-data policies of MOT, the appropriate permitted data has been made available on a website and the more detailed data has been provided to partners within the data-exchange system for analysis and research.

Research achievements and impacts

The system supported by this project has become an official tool for MOT, greatly enhancing management of the China Transit Metropolis Project. The research results have also been applied by MOT to the Advanced Public Transport Systems (APTS) Pilot Projects, including incorporation in a construction guideline and eleven technical standards. The project team provided inputs to an update of the *Annual Report of China Urban Passenger Transport*, participated in compiling the urban public transport part of *The China Intelligent Transportation Industry Development Yearbook*, and related chapters of the book *Intelligent Urban Public Transport Research and Practice*.

The project team organized four seminars with international experts, representatives of MOT, and local agencies.

More than ten training sessions have been organized and over 800 trainees from local cities have studied the MOT demonstration project guidelines.

The research results have played an important supporting role in compiling the *China 13th Five-year Plan of Public Transport Development*, including accomplishing the following key tasks: “To construct the urban public transport data resource exchange system and mechanism to speed up the data collection” and “To establish the national urban public transport database and the urban public transport development performance evaluation system to achieve regular evaluation of cities.”

Future work

PERFORM FURTHER RESEARCH to build upon the CUTD database and develop the “Integrated and Applied Big Data Platform of China Advanced Public Transport Systems (IABDAP/CAPTS)” as a national platform for addressing changing needs.

EXTEND THE CUTD DATABASE to continuously support the “China Transit Metropolis Project.” The application of the database will be extended from the current 37 cities to 80 to 100, and provide the analysis required to allow both vertical and horizontal comparisons across cities/provinces/regions.

EXPAND CUTD APPLICATIONS to address congestion mitigation, subsidies, and social benefits. Decision making to alleviate environmental impacts, refine bus subsidies based on actual usage, support energy-efficiency improvements and reduce emissions will be supported.

INTEGRATE THE CUTD DATABASE to support “National New, Alternative Energy Bus Implementation.” Long-term operational safety and efficiency monitoring will be supported, and operational management practices for new vehicles will be enhanced.

ABOUT THE AUTHORS

The China Urban Sustainable Transport Research Center (CUSTReC), a VREF supported Center of Excellence, is the official think tank for China’s Ministry of Transportation and aims to explore integrated solutions to realizing the sustainable development of urban transport. CUSTReC has played a key role in promoting the China Transit Metropolis project and developed the information required for the China Urban Transport Database (CUTD).

Dr. Cheng LI and Dr. Xianglong LIU are Associate Professors at CUSTReC and the principal researchers for the CUTD project.