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Volume 1: Case Studies in
Bus Rapid Transit

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Subject Areas
Public Transit

Research Sponsored by the Federal Transit Administration in Cooperation with the Transit Development Corporation

Transportation Research Board
Washington, D.C.
2003
www.TRB.org
TRANSIT COOPERATIVE RESEARCH PROGRAM

The nation’s growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands. Research is necessary to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry. The Transit Cooperative Research Program (TCRP) serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

The need for TCRP was originally identified in TRB Special Report 213—Research for Public Transit: New Directions, published in 1987 and based on a study sponsored by the Urban Mass Transportation Administration—now the Federal Transit Administration (FTA). A report by the American Public Transportation Association (APTA), Transportation 2000, also recognized the need for local, problem-solving research. TCRP, modeled after the longstanding and successful National Cooperative Highway Research Program, undertakes research and other technical activities in response to the needs of transit service providers. The scope of TCRP includes a variety of transit research fields including planning, service configuration, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices.

TCRP was established under FTA sponsorship in July 1992. Proposed by the U.S. Department of Transportation, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). On May 13, 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA, The National Academies, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Committee.

Research problem statements for TCRP are solicited periodically but may be submitted to TRB by anyone at any time. It is the responsibility of the TOPS Committee to formulate the research program by identifying the highest priority projects. As part of the evaluation, the TOPS Committee defines funding levels and expected products.

Once selected, each project is assigned to an expert panel, appointed by the Transportation Research Board. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, TCRP project panels serve voluntarily without compensation.

Because research cannot have the desired impact if products fail to reach the intended audience, special emphasis is placed on disseminating TCRP results to the intended end users of the research: transit agencies, service providers, and suppliers. TRB provides a series of research reports, syntheses of transit practice, and other supporting material developed by TCRP research. APTA will arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by urban and rural transit industry practitioners.

The TCRP provides a forum where transit agencies can cooperatively address common operational problems. The TCRP results support and complement other ongoing transit research and training programs.
The National Academy of Sciences is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Bruce M. Alberts is president of the National Academy of Sciences.

The National Academy of Engineering was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. William A. Wulf is president of the National Academy of Engineering.

The Institute of Medicine was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The National Research Council was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy’s purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both the Academies and the Institute of Medicine. Dr. Bruce M. Alberts and Dr. William A. Wulf are chair and vice chair, respectively, of the National Research Council.

The Transportation Research Board is a division of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. The Board’s mission is to promote innovation and progress in transportation by stimulating and conducting research, facilitating the dissemination of information, and encouraging the implementation of research results. The Board’s varied activities annually engage more than 4,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. www.TRB.org

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TCRP Report 90: Bus Rapid Transit, which is published as a two-volume set, identifies the potential range of bus rapid transit (BRT) applications through 26 case studies and provides planning and implementation guidelines for BRT. This report will be useful to policy-makers, chief executive officers, and senior managers.

Increasing levels of urban congestion create the need for new transportation solutions. A creative, emerging public transit solution is BRT. While a precise definition of BRT is elusive, it is generally understood to include bus services that are, at a minimum, faster than traditional “local bus” service and that, at a maximum, include grade-separated bus operations. The essential features of BRT systems are some form of bus priority, faster passenger boarding, faster fare collection, and a system image that is uniquely identifiable. BRT represents a way to improve mobility at relatively low cost through incremental investment in a combination of bus infrastructure, equipment, operational improvements, and technology.

Despite the potential cost and mobility benefits, however, the transportation profession lacks a consolidated and generally accepted set of principles for planning, designing, and operating BRT vehicles and facilities. Transit agencies need guidance on how to successfully implement BRT in the political, institutional, and operational context of the United States. Volume 1: Case Studies in Bus Rapid Transit provides information on the potential range of BRT applications, planning and implementation background, and system description, including the operations and performance elements. Volume 2: Implementation Guidelines discusses the main components of BRT and describes BRT concepts, planning considerations, key issues, the system development process, desirable conditions for BRT, and general planning principles. It also provides an overview of system types.

This report was prepared by Herbert Levinson of New Haven, Connecticut, and DMJM+HARRIS of Fairfax, Virginia, in association with Scott Rutherford of Seattle, Washington; Rodney L. Smith of Carter & Burgess, Inc., Houston, Texas; John Cracknell of Maidenhead, United Kingdom; and Richard Soberman of Toronto, Canada. Volume 1 examines BRT systems and services in 26 cities located in North America, Australia, Europe, and South America; the 26 case studies are on the accompanying CD-ROM (CRP-CD-31). The report covers a geographically diverse group of communities and a broad range of applications. For each city’s BRT system, information is provided on design features, operating practices, institutional arrangements, costs, benefits, and relevance.

Both volumes issued under TCRP Report 90 can be found on the TRB website at national-academies.org/trb.
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<th>Abbreviation</th>
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<tr>
<td>AASHO</td>
<td>American Association of State Highway Officials</td>
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<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
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<td>APTA</td>
<td>American Public Transportation Association</td>
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<td>ASCE</td>
<td>American Society of Civil Engineers</td>
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<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
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<td>ASTM</td>
<td>American Society for Testing and Materials</td>
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<td>ATA</td>
<td>American Trucking Associations</td>
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<td>CTAA</td>
<td>Community Transportation Association of America</td>
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<td>CTBSSP</td>
<td>Commercial Truck and Bus Safety Synthesis Program</td>
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<td>FAA</td>
<td>Federal Aviation Administration</td>
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<td>Federal Motor Carrier Safety Administration</td>
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<td>Federal Transit Administration</td>
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<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<td>ITE</td>
<td>Institute of Transportation Engineers</td>
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<td>NCHRP</td>
<td>National Cooperative Highway Research Program</td>
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