

**Transit Cooperative Research Program**  
Sponsored by the Federal Transit Administration  
**RESEARCH RESULTS DIGEST**

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Subject Area: VI Public Transit

Responsible Senior Program Officer: Christopher W. Jenks

## Synthesis of Information Related to Transit Problems

*This is a staff digest of the progress and status of TCRP Project J-7, "Synthesis of Information Related to Transit Problems," for which the Transportation Research Board is the agency conducting the research. Individual studies for the project are managed by Donna L. Vlasak, Senior Program Officer, with assistance from Jon Williams, Manager, Synthesis Studies, serving under the Studies and Information Services Division of the Transportation Research Board, Stephen R. Godwin, Director.*

### BACKGROUND

The Transit Cooperative Research Program (TCRP) was established in 1992. The U.S. Department of Transportation proposed the TCRP, and it was authorized in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The program was reauthorized in the Transportation Equity Act for the 21st Century (TEA-21). On May 13, 1992, a memorandum agreement outlining operating procedures for the TCRP was executed by three cooperating organizations: the Federal Transit Administration (FTA); the National Academy of Sciences, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a non-profit educational and research organization established by the American Public Transportation Association (APTA). The memorandum agreement was updated on January 12, 1999.

### INTRODUCTION

Administrators, transit general managers and their staff, and researchers continually face problems on which much information already exists, either in documented form or in terms of undocumented experience and practice. Unfortunately, this information is frequently fragmented, scattered, and underevaluated. Often it is unknown to the person normally responsible for making decisions related to the topic. As a consequence, full knowledge of what has been learned about a problem is frequently not brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

A storehouse of information exists on nearly every subject of concern to the transit industry. Much of this information has resulted from both research and the successful application of solutions to the challenging issues faced by practitioners in their daily work. Because there has been no systematic means for compiling such useful information and making it available to the

Suggestions for synthesis topics may be sent to the TCRP Manager or Synthesis Staff at any time (see address on back). You can submit your suggestions at <http://www4.trb.org/trb/synthrep.nsf>, under **Suggest a TCRP synthesis topic**. Topics suggested must be accompanied by a brief scope statement, including a discussion of the problem (a paragraph or two). A title (preferably 10 words or less) and the name and affiliation of the submitter are also necessary. Identification of information sources is appreciated. Suggestions for updates of published syntheses would also be appreciated. If a topic is not selected, the problem statement must be resubmitted the following year to be considered. Annually, synthesis topics are typically due by the end of March. The TCRP Oversight Panel for the project meets in May/June to select new topics based on funding available.

Interested in writing a synthesis? For details contact Donna L. Vlasak by e-mail at [dvlasak@nas.edu](mailto:dvlasak@nas.edu) or by phone at 202/334-2974 or Jon Williams at [jwilliams@nas.edu](mailto:jwilliams@nas.edu) or by phone at 202/334-3245.

entire transit community, the TOPS Committee—an independent governing board organized by the TDC and designated the TCRP Oversight and Project Selection Committee—authorized TRB to undertake a series of studies to search out and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in the subject areas of concern. Reports from this endeavor constitute a TCRP report series, *Synthesis of Transit Practice*, that collects and assembles the various forms of information into single concise documents pertaining to specific transit problems or sets of closely related problems.

## THE SYNTHESIS PROGRAM

This synthesis series reports on various practices, making recommendations where appropriate. Each document is a compendium of the best knowledge available on measures found to be successful in resolving specific problems. To develop these syntheses in a comprehensive manner and to ensure inclusion of significant knowledge, TRB analyzes available information assembled from numerous sources including a large number of transit agencies. A panel of experts in the subject area is established to guide the researchers in organizing and evaluating data collected on each topic and to review the synthesis report.

For each topic, the project objectives are (1) to locate and assemble documented information; (2) to learn what practice has been used for solving or alleviating problems; (3) to identify all ongoing research; (4) to learn what problems remain largely unsolved; and (5) to organize, evaluate, and document the useful information that is acquired.

Each synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As the processes of advancement continue, new knowledge can be expected to be added to that which is now on hand; eventually the synthesis may need to be updated or redone. If you believe that a synthesis should be updated, please contact TRB and let us know.

### Selection of Topics

TCRP Project Panel J-7 meets each year (typically in May) to select topics for study using funds from the upcoming fiscal year. The membership of this committee is given in Table 1. Current funding allows for initiation of approximately four syntheses per year.

The following factors are considered in the selection process for synthesis topics:

- The problem should be widespread enough to generate broad interest in the synthesis.
- The problem should be timely and critical with respect to economic impact, safety, or social impact.

- The problem is appropriate if current practice is non-uniform or inconsistent from agency to agency, or if the validity of some practices appears to be questionable.
- The quality and quantity of useful available information should indicate a need to organize and compress that which has already been learned and written on the topic.
- The topic should not be one where ongoing research or other activities in progress might be expected to render the synthesis obsolete shortly after completion.

The continued success of this project depends on a constant supply of worthy synthesis topics solicited annually from a variety of other sources, including transit officials, equipment and service suppliers, research organizations, FTA, APTA, and TRB committees. The interest of those who have recommended topics is sincerely appreciated, and they are urged to continue.

### Conduct of the Studies

Throughout the year, following the J-7 project panel's selection of topics, studies are initiated in the order of priority assigned by the committee. A panel consisting of practitioners and researchers is formed for each topic. At its first meeting, this topic panel thoroughly discusses the topic, refines the tentative scope, suggests sources of information, and selects potential topic consultants.

Following this meeting, an agreement is negotiated with a consultant to gather information on the topic, synthesize it, and draft a report. Typically, the agreement covers a period of 12 months. Information gathering and preparation of the first draft of the synthesis report usually takes 8 months. This draft is then reviewed by the topic panel with the consultant, often at a second panel meeting. Subsequent drafts and a meeting are scheduled if needed, although this rarely occurs.

After the staff is substantially satisfied with the report, a final draft is sent to the members of the TCRP Project Panel J-7 for their approval. At the same time, members from the topic panel have their last chance to review the report. Comments from these reviews are incorporated into the final report, which is usually published as a TCRP *Synthesis of Transit Practice*.

### Studies in Progress as of July 2003

Work is currently under way on the topics listed in Table 2. Questions on these topics should be addressed to the Project Study Manager, Donna L. Vlasak (e-mail: [dvlasak@nas.edu](mailto:dvlasak@nas.edu) and 202/334-2974) or the Synthesis Studies Manager, Jon Williams (e-mail: [jwilliams@nas.edu](mailto:jwilliams@nas.edu) and 202/334-3245).

**Available Publications**

The Syntheses of Transit Practice that have been completed under this project are listed in Table 3. Copies of these syntheses can be obtained from the Publications Office, Transportation Research Board, 500 Fifth Street, N.W., Washington, D.C., 20001; by calling 202/334-3213; and through the Internet at: <http://www.trb.org/trb/bookstore>.

Please send check orders to: TRB, Lockbox 289, Washington, D.C., 20055 or fax to: 202/334-2519.

**Index of Topic Studies**

Table 4 is a key word index of published syntheses and studies currently in progress.

TABLE 1  
TCRP PROJECT PANEL J-7

	Name	Affiliation
Chair	Frank T. Martin	Santa Clara Valley Transportation Authority, San Jose, CA
Member	Debra W. Alexander	Capital Area Transportation Authority, Lansing, MI
Member	Gerald L. Blair	Indiana County Transit Authority, Indiana, PA
Member	Dwight Ferrell	Consultant, Dallas, TX
Member	L.G. Fuller	Transpo Enterprises, Inc., Dallas, TX
Member	Henry Hide	Halliburton/Brown & Root, Suffolk, England
Member	Robert H. Irwin	British Columbia Transit, Victoria, BC, Canada
Member	Paul J. Larrousse	National Transit Institute, New Brunswick, NJ
Member	Wade Lawson	South Jersey Transportation Authority, Atlantic City, NJ
Member	David A. Lee	Connecticut Transit, Hartford, CT
Member	Peter Shaw (Liaison)	Transportation Research Board, Washington, D.C.
Member	Joel Washington (Liaison)	Federal Transit Administration, Washington, D.C.
Member	David Phelps (Liaison)	American Public Transportation Association, Washington, D.C.

TABLE 2  
SYNTHESIS STUDIES—In Progress as of July 2003

No.	Title
SA-15	Use of Computer-Aided Dispatch (CAD) for Demand-Responsive Transit Services
SB-09	Operational Experiences with Flexible Services in Transit Systems
SB-10	Transit Advertising Sales Agreements
SC-06	Accommodation of Common Wheelchairs on Transit Buses Using Rear-Facing Position
SC-07	CNG Protocols in a Public Transportation Setting
SE-02	Maintenance Productivity Practices
SF-11	Transit Operator Health and Wellness Programs
SG-10	The Role of Performance-Based Measures in Allotting Funding for Transit Operations
SH-03	Applications of Geographic Information Systems (GIS) in Transit Planning and Operations
SH-04	The Use of Strategic Planning in Transit Operations

TABLE 3  
PUBLISHED TCRP SYNTHESSES

No.	Title/Pages/Price
1	Safe Operating Procedures for Alternative Fuel Buses (1993) 48 pp., \$16.00
2	Low-Floor Transit Buses (1994) 43 pp., \$12.00
3	Incentive Programs to Improve Transit Employee Performance (1994) 44 pp., \$12.00
4	Integration of Bicycles and Transit (1994) 58 pp., \$12.00
5	Management Information Systems (1994) 77 pp., \$19.00
6	The Role of Performance-Based Measures in Allocating Funding for Transit Operations (1994) 52 pp., \$11.00
7	Regulatory Impacts on Design and Retrofit of Bus Maintenance Facilities (1994) 50 pp., \$12.00
8	Retrofit of Buses to Meet Clean Air Regulations (1994) 48 pp., \$12.00
9	Waste Control Practices at Bus Maintenance Facilities (1995) 26 pp., \$10.00
10	Bus Route Evaluation Standards (1995) 54 pp., \$12.00
11	System-Specific Spare Bus Ratios (1995) 46 pp., \$12.00
12	Transit Bus Service Line and Cleaning Functions (1995) 48 pp., \$14.00
13	Risk Management for Small and Medium Transit Agencies (1995) 31 pp., \$13.00
14	Innovative Suburb-to-Suburb Transit Practices (1995) 50 pp., \$14.00
15	System-Specific Spare Rail Vehicle Ratios (1995) 43 pp., \$13.00
16	Changing Roles and Practices of Bus Field Supervisors (1996) 45 pp., \$13.00
17	Customer Information at Bus Stops (1996) 64 pp., \$18.00
18	Bus Occupant Safety (1996) 55 pp., \$15.00
19	Passenger Transfer System Review (1996) 37 pp., \$14.00
20	Transit-Focused Development (1997) 55 pp., \$16.00
21	Improving Transit Security (1997) 36 pp., \$15.00
22	Monitoring Bus Maintenance Performance (1997) 48 pp., \$16.00
23	Inspection Policy and Procedures for Rail Transit Tunnels and Underground Structures (1997) 95 pp., \$25.00
24	AVL Systems for Bus Transit (1997) 47 pp., \$16.00
25	Light Rail Vehicle Compression Requirements (1997) 34 pp., \$15.00
26	Bus Transit Fare Collection Practices (1997) 29 pp., \$14.00
27	Emergency Preparedness for Transit Terrorism (1997) 73 pp., \$21.00
28	Managing Transit Construction Contract Claims (1998) 50 pp., \$17.00
29	Passenger Counting Technologies and Procedures (1998) 50 pp., \$23.00
30	ADA Paratransit Eligibility Certification Practices (1998) 38 pp., \$16.00
31	Paratransit Contracting and Service Delivery Methods (1998) 35 pp., \$16.00
32	Transit Advertising Revenue: Traditional and New Sources and Structures (1998) 58 pp., \$20.00
33	Practices in Assuring Employee Availability (1999) 69 pp., \$27.00
34	Data Analysis for Bus Planning and Monitoring (2000) 62 pp., \$27.00
35	Information Technology Update for Transit (2000) 98 pp., \$31.00
36	Identifying and Reducing Fraudulent Third Party Tort Claims Against Public Transit Agencies (2000) 58 pp., \$25.00
37	Communicating with Persons with Disabilities in a Multimodal Environment (2001) 48 pp., \$26.00
38	Electronic Surveillance Technology on Transit Vehicles (2001) 57 pp., \$28.00
39	Transportation on College and University Campuses (2001) 62 pp., \$28.00
40	A Challenged Employment System: Hiring, Training, Performance Evaluation, and Retention of Bus Operators (2001) 72 pp., \$29.00
41	The Use of Small Buses in Transit Service (2002) 72 pp., \$15.00
42	Use of Flexible Funds for Transit Under ISTEA and TEA-21 (2002) 40 pp., \$15.00
43	Effective Use of Transit Websites (2002) 79 pp., \$16.00
44	Training for On-Board Bus Electronics (2002) 63 pp., \$15.00
45	Customer-Focused Transit (2002) 100 pp., \$17.00
46	Diversity Training Initiatives (2003) 59 pp., \$15.00
47	Corporate Culture as the Driver of Transit Leadership Practices (2003) 91 pp., \$17.00
48	Real-Time Bus Arrival Information Systems (2003) 61 pp., \$15.00
49	Yield to Bus Programs—State of the Practice (2003) In Press

TABLE 4  
INDEX TO TCRP SYNTHESIS AND STUDIES\*

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- \*Simple numbers represent published syntheses; alphanumeric designations represent studies in progress.
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