U.S. Department of Transportation

TRANSIT PLANNING AND RESEARCH REPORTS

Annotated Bibliography
June 1997

Federal Transit Administration

Office of Research, Demonstration and Innovation

U.S. Department
of Transportation
**Federal Transit
Administration**

Administrator

400 Seventh St., S.W.
Washington, D.C. 20590

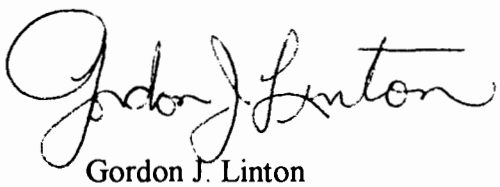
A Message from the Federal Transit Administrator:

As part of the Department of Transportation's efforts to create a seamless, world-class transportation network, the Federal Transit Administration (FTA) has called upon communities across America to help us with our efforts by putting people first and helping to make communities livable. The importance of transit's role in serving people and the diverse communities they call home, as well as advancing transit systems to take people from where they are to where they want to go, when they want to go, at a price they can afford, and do so safely and securely are the basis for FTA policies and programs which are reflected in the material referenced in the enclosed bibliography.

This bibliography is a reference tool designed to provide rapid and easy access to planning, research and safety project reports. It describes available research products of FTA's national planning and research programs, including the Transit Cooperative Research Program, and of other agencies in the United States Department of Transportation. The published material is relevant to the planning, development, operation and performance of transit systems and their components.

In addition, FTA has established a Home Page (site) on the World Wide Web of the Internet -- the road that is leading us into the information age of the 21st century. The Home Page provides the transportation community rapid access to a storehouse of electronic data and information, and direct communication links with other transit-related programs and systems.

We encourage you to visit the FTA Home Page on the Internet (http://www.fta.dot.gov) and to continue pursuing the information resources cited in this document as a means to address your local and regional transportation needs.



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TRANSIT PLANNING AND RESEARCH REPORTS

AN ANNOTATED BIBLIOGRAPHY

June 1997

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Federal Transit Administration
U.S. Department of Transportation

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FOREWORD

This is the fourth edition of the *Transit Planning and Research Reports: An Annotated Bibliography.* It references available planning and research publications sponsored by the Federal Transit Administration (FTA) of the United States Department of Transportation for the time period of September 1995 through December 1996. The intent is to inform the transit community and the general public of the published material available to assist state and local agencies in improving transit services and reducing the cost of public transit.

The bibliography is a reference tool designed to provide rapid and easy access to planning and research project reports. It describes research products of the FTA national planning and research programs, including the Transit Cooperative Research Program, and other agencies in the Department of Transportation. Transit subject areas covered include Safety and Security, Fleet Operations, Equipment and Infrastructure, Specialized Transit Services, Policy, Planning and Project Development, and Human Capacity Building.

Each publication is profiled separately accompanied by a report availability statement and a descriptive summary of the content. The index includes keywords that have been extracted from the full-text report as well as from the summary description cited in this bibliography.

The final section of this bibliography contains instructions on how to obtain FTA reports, including interlibrary services and ordering reports from the National Technical Information Service (NTIS). It also includes an evaluation form and a listing of FTA Regional offices. This bibliography is also available on the FTA Web Site of the Internet at the following address: *http://www.fta.dot.gov.*

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Accidents That Shouldn't Happen: A Report of the Grade Crossing Safety Task Force to Secretary Federico Peña
U.S. Department of Transportation Grade Crossing Safety Task Force; Prepared for the Secretary of Transportation, March 1996, 17pp.

Available from:
U.S. Department of Transportation
Office of Intermodalism, S3
400 7th Street SW, Room 10126
Washington, DC 20590 *Phone:* 202/366-5781 *FAX:* 202/366-0263
Order by Title

This report of the Grade Crossing Safety Task Force was developed following the tragic accident of October 25, 1995, in Fox River Grove, Illinois. Seven students lost their lives when the school bus they were riding in was struck by a commuter train. Representatives of the Federal Railroad Administration (FRA), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and the National Highway Traffic Safety Administration (NHTSA) collectively took up the task to examine grade crossing safety and to formulate recommendations to help prevent tragedies such as occurred at Fox River Grove from happening again. The findings and recommendations are documented in this report. The report explains how a lack of information and/or guidelines in the design, construction, operation, maintenance, and inspection of grade crossings led the Task force to identify and examine five safety problem areas: interconnected signals, vehicle storage space, high-profile crossings, light rail transit crossings, and special vehicle operations. Each problem area is discussed separately along with the lessons learned. The study recommends 24 specific follow-on actions to address both physical and procedural deficiencies. Recommendations encourage grade crossing safety through coordinated inspections, law enforcement, and driver education. The Department will work with their constituents in defining a cooperative strategy for improving grade crossing safety. The principal finding is consistent with and fully supports that of the *Rail-Highway Crossing Safety Action Plan* announced by the Secretary in 1994, namely: improved highway-rail grade crossing safety depends upon better cooperation, communication, and education among responsible parties if accidents and fatalities are to be reduced significantly.

Bus Occupant Safety: A Synthesis of Transit Practice. TCRP Synthesis 18
Rolland D. King, Columbus, Ohio, and Transportation Research Board, National Research Council; Prepared for FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 63pp.
Report Number: TCRP Report 18

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 18 *Price:* $15

This synthesis will be of interest to transit agency general managers, bus operations, safety, and risk management staffs, as well as agency human resources, personnel, and training staffs. It offers information on current practices of transit agencies to reduce injuries to bus occupants during collisions, and injuries to passengers while boarding, riding, and leaving the bus. Practices of agencies providing fixed-route service with heavy-duty buses were examined. An investigations was conducted on a number of topics including: driver selection and training, safety incentive programs, safety management considerations, guidelines for bus stops, passenger education and training, vehicle design considerations, and safety inspection practices. This synthesis integrates information gathered from a review of literature, site visits, surveys, and telephone conversations with personnel from local and state transit agencies and transit management companies. Of the 35 transit agencies providing information for this synthesis, all have procedures for reporting and reviewing accidents and incidents as well as programs to select, hire and train driver candidates; 85 percent reported having a system safety plan for bus operations; 89 percent conducted safety audits; 81 percent provided safety reports to top management; and 96 percent provided educational and training information for customers. Of the 32 state transit agencies responding to the survey, 75 percent provided some type of safety training assistance, and 72 percent reported performing vehicle safety inspections. Nine states reported having programs offering an insurance pool for public transit agencies. All responding management companies reported having policies and programs concerning safety training of their staff and safety audit programs.

Combating Workplace Violence: Guidelines for Employers and Law Enforcement
Department of Defense, Defense Personnel Security Research Center, Howard W. Timm, and Callie J. Chandler; Prepared for Private Sector Liaison Committee of the International Association of Chiefs of Police; Reproduced and Distributed by the Department of Justice, Bureau of Justice Assistance and FTA, March 1996, 25pp.
Project Number: 95-DD-BX-0166

Available from:
Federal Transit Administration
Office of Safety & Security, TPM-30
400 7th Street, SW, Room 9305
Washington, DC 20590 *Phone:* 202/366-0191 *FAX:* 202/366-7951
Order by Title

According to the Bureau of Justice Statistics, each year almost one million individuals become victims of violent crime while working. This document provides employers and law enforcement agencies with guidelines on how to reduce workplace violence hazards. The intent is to help employers better understand the important steps that can be taken to minimize the impact of workplace violence and threats. The study focuses on violence committed by non-strangers, (e.g., coworkers, bosses, clients, domestic partners) within a common worksite. *Section 2, Guidelines for Employers,* was developed with input from hundreds of subject matter experts and practitioners. The report provides the employer with step-by-step direction, case examples and graphic information regarding: pre-incident violence prevention and preparation; violent or threatening incidents; aftermath of an incident; and legal obligations and duties of employers.

Section 3, Guidelines for Law Enforcement Agencies was developed with input from over 300 chiefs and command level officers representing large, medium, and small departments. These guidelines will help police address workplace violence in their communities without overtaxing departmental resources. Employers are encouraged to read Section 3 to gain a better understanding of how police agencies can help combat workplace violence. This document offers a model policy on workplace violence for possible use by organizations without existing policies. It also provides sources for obtaining additional information.

Implementation Guidelines for State Safety Oversight of Rail Fixed Guideway Systems
Boyd, Maier & Associates, M. Annabelle Boyd, M. Patricia Maier, and Patricia J. Kenney, under contract to the Volpe National Transportation Systems Center; Prepared for the FTA Office Of Safety & Security (Roy Field, TPM-30), July 1996, 150pp.
Project Number: FTA-MA-90-7006-96-3

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 202/366-5781 *FAX:* 202/366-0263
NTIS Order Number: PB96-197827 *Price Code:* A08/$31

This report documents and discusses the FTA rule creating the first state-managed oversight program for rail transit safety and security which was published as *Rail Fixed Guideway Systems: State Safety Oversight* on December 27, 1995 (codified at 49 CFR Part 659), subsequently referred to as State Oversight Rule or Part 659. Only those states with Rail Fixed Guideway Systems (RFGS) meeting the definition specified in Part 659 must comply with FTA's State Safety Oversight Rule. These guidelines will assist states, oversight agencies, and rail transit agencies in developing safety and security programs that meet federal requirements. The report introduces the basic requirements of Part 659, describes how to use these guidelines, and includes all the materials necessary to establish a State Safety Oversight Program. Guidelines are organized by key steps that states, oversight agencies, and rail transit systems must take in establishing and administering effective rail safety and security oversight programs. The appendices (4) supplement material contained in the text, provide additional resources and references, define terms, and identify specific detailed information on subjects related to the guidelines or applicable only to certain situations of rail transit systems operations. The appendices also contain a complete copy of Part 659, as well as APTA's *Manual for the Development of Rail Transit System Safety Program Plans*.

Introduction to Railroad Crossing Technology and Safety
University of South Florida, Center for Urban Transportation Research, College of Engineering, F.Ron Jones, Ph.D., and Richard T. Stasiak, Ph.D., June 1996, 28pp.

Available from:
University of South Florida
Center for Urban Transportation Research
4202 E. Fowler Avenue, ENG 118

Tampa, Florida 33620-5350 *Phone:* 813/974-3120 *FAX:* 813/974-5168
Order by Title

Public awareness of rail-highway crossing safety has increased and stepped up efforts to investigate how improved methods of protecting crossings could save lives and property in Florida, and how best to integrate rail-highway crossing issues into the planning process. The study examines three types of rail-highway crossing treatments: At-Grade Crossing, Crossing Closure, and Grade Separation. Existing and emerging rail-highway crossing technologies are discussed from a planning perspective. Alternative treatments of rail-highway crossings are also discussed along with policy and operating issues. Policy issues relating to the choice of crossing treatment and technology are also documented along with conclusions and recommendations for further research. Findings show that existing crossing protection technologies are heavily dependent on driver attentiveness and compliance. Emerging technologies, however, are less dependent on vehicle operator, but require expensive retrofitting of crossings or vehicle fleet. Uncertainty about the fate of current and future passenger rail service has cast doubt on the economic wisdom of making substantial investments in rail corridors.

Perspectives on Transit Security in the 1990s: Strategies for Success
Boyd, Maier & Associates, under contract to the Volpe National Transportation Systems Center; Prepared for the FTA Office of Safety & Security (Judy Meade, TPM-30), April 1996, 241pp
Project Number: FTA-MA-90-7006-96-1

Available from:
Federal Transit Administration
Office of Safety & Security, TPM-30
400 7th Street, SW, Room 9305
Washington, DC 20590 *Phone:* 202/366-2896 *FAX:* 202/366-7951
Report Order Number: FTA-MA-90-7006-96-1
NTIS Order Number: PB96-185871 *Price Code:* A12/$44

This report will assist transit managers, transit police personnel and others in identifying and implementing appropriate security strategies that will help reduce the incidents of crime and improve patron perceptions of security. The study is designed to document the state-of-the-practice in security at transit agencies, to share information with the industry, and to open a dialogue concerning *best practices* in transit security. The report presents the findings of a nine-agency study which identified types and level of crime occurring in transit, security strategies used in transit systems, and best security practices. Based on information obtained from a literature search and phone interviews, twenty-eight specific crimes and crime-related issues were identified. Onsite assessments of participating agencies are discussed in terms of crimes experienced, methods of police/security personnel deployment, and security technologies and design features. Crime rates in the cities served by these nine agencies are profiled, along with agency characteristics, modes of service and security staffing types. The practices in place at these nine agencies serve as positive examples of security strategies used by transit police and security personnel working under a variety of operating conditions.

Safety Management Information Statistics (SAMIS) 1994 Annual Report
Unisys Corporation, under contract to the Volpe National Transportation Systems Center, Eric Aftandilian and Alison Thompson; Prepared for the FTA Office of Safety & Security (Carole Ferguson, TPM-30), July 1996, 84pp.
Project Number: FTA-MA-26-0009-96-2

Available from:
Federal Transit Administration
Office of Safety & Security, Room 9305
Washington, DC 20590 *Phone:* 202/366-0219 *FAX:* 202/366-7951
NTIS Order Number: PB96-210158 *Price Code:* A05/$21.50

This fifth edition of the 1994 Safety Management Information Statistics (SAMIS) report is a compilation and analysis of transit accident and casualty statistics uniformly collected from approximately 400 transit agencies throughout the country. The safety data presented in this annual report are collected via Form 405 of the FTA National Transit Database Reporting System. The 1994 SAMIS report is more user friendly. It contains several new trend analysis graphs and improvements such as rearrangement of tables and graphs in order to make comparisons easier. In addition, there is a one-page *Transit Safety Clock* which displays the time intervals before an incident occurs, and a listing of transit agencies. Transit safety data are collected and presented in four categories: collisions, derailments/buses going off road, personal casualties and fires. SAMIS reports safety statistics for the following transit modes: motor bus, automated guideway, commuter rail, heavy rail, light rail, demand response and vanpool.

Standardization of Availability, Location and Use of Safety Equipment on Urban Transit Buses
KETRON Division of the Bionetics Corporation, John N. Balog and R. Benjamin Gribbon, under contract to the Volpe National Transportation Systems Center, and the Cambria County Transit Authority; Prepared for the FTA Office Of Safety & Security (Judy Z. Meade, TPM-30), March 1996, 264pp.
Project Number: FTA-MA-26-0011-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-166343 *Price Code:* A14/$49

The purpose of this project was to develop guidelines that would standardize urban transit bus safety equipment/components, and thus help correct problems encountered by rescue forces while attempting to gain entry to the interior of the bus, shut down the system/engine, and evacuate passengers from the bus in an emergency or an accident. This report documents and discusses: location and function of each candidate safety component on six transit bus models; process used to develop standardized guidelines; and proposed guidelines for standardization of eight key safety components on transit buses. The draft guidelines developed in this report reflect input

from the Guidelines Committee and Members of the APTA Bus Safety Committee and the transit industry. They detail potential specifications for standardization of the availability, location, use and function of eight safety components: master run switch; driver side window; emergency engine shut down switch; front side door release control; rear side door release control; electrical/batteries switch; roof-mounted emergency ingress and escape hatches; and passenger side windows. The guidelines also present a new Universal Access Symbol to identify key entry points and emergency devices to rescue forces. This study clearly shows that standardization of safety equipment needs to be adopted by transit bus manufacturers and agencies as a goal so that emergency response personnel will be more effective in performing their life saving duties. Appendices list the names and addresses of the six bus manufacturers of bus models used in the study and references.

State Safety Oversight. Technical Brief
Federal Transit Administration, Office of Safety & Security (Roy Field, TRI-30), Summer 1996, 4pp.

Available from:
Federal Transit Administration
Office of Safety & Security, TPM-30
400 7th Street, SW, Room 9301
Washington, DC 20590 *Phone:* 202/366-2896 *FAX:* 202/366-7951
Order by Title

This Technical Brief provides an overview of the new *State Safety Oversight Program* which sets forth FTA's goal to improve the safety of rail fixed guideway systems, including light, rapid, and heavy rail; monorail; inclined plane; trolley; and automated guideway systems. The systems covered by this new rule, issued on December 27, 1995, are those included in FTA's Section 5307 (formerly Section 9) or systems that do not receive Section 5307 funds, but whose mileage is used by an urbanized area that receives these funds. Topics discussed in this brief paper include definitions of terms and the role of the state, oversight agency, transit agency, and FTA. The FTA Safety & Security Bulletin Board is discussed along with the Transportation Safety Institute and a recent publication titled the *State Safety Oversight Implementation Guidelines*, which will assist states, oversight agencies, and rail transit agencies in developing safety and security programs to satisfy the requirements of the regulation.

Advanced Public Transportation Systems/APTS Benefits
FTA Office of Research, Demonstration & Innovation, APTS Division (W. Raymond Keng, TRI-11), January 1996, 4pp.

Available from:
Federal Transit Administration
Office of Research, Demonstration & Innovation
APTS Division, TRI-11
Washington, DC 20590 *Phone:* 202/366-0195 *FAX:* 202/366-3765
Order by Title

This paper lists the benefits that transit systems in the United States (U.S.) and Canada have accrued in deploying various Advanced Public Transportation Systems (APTS) technologies. The benefits that the transit industry has received by adoption of advanced technologies in transit operations are presented in terms of customer convenience, safety, operational improvements, cost savings, revenue increases, and complaint resolution. The APTS program is the FTA's transit component of the United States Department of Transportation's (US DOT) Intelligent Transportation Systems (ITS) program which has been initiated to promote more efficient use of the nation's surface transportation system, increase safety and mobility, and decrease the environmental costs of travel. Basically, the APTS program uses the application of computer technology and state-of-the-art telecommunications and navigation technology to improve the convenience, efficiency, and safety of public transportation, and to provide timely transit information to transit passengers.

Advanced Public Transportation Systems/APTS Project Summaries
FTA Office of Research, Demonstration & Innovation, APTS Division (W. Raymond Keng, TRI-11), March 1996, 23pp.

Available from:
Federal Transit Administration
Office of Research, Demonstration & Innovation
APTS Division, TRI-11
Washington, DC 20590 *Phone:* 202/366-0195 *FAX:* 202/366-3765
Order by Title

This paper provides summary profiles of the research projects currently underway in the FTA 's APTS program. The projects profiled are listed under one of the following three technology areas of the program: *Smart Traveler Technology,* which focuses on providing both pre-trip and en route travel information to transit users before they make personal decisions on how to travel; *Smart Vehicle Technology,* integrates vehicle-based APTS technologies into a single system that is designed to improve vehicle and fleet planning, scheduling and operations; and *Smart Intermodal Systems,* that involve the integration of APTS technologies into transit management and other non-transit applications of ITS. This project summary paper is updated and disseminated periodically to keep the transit community well-informed of current research activities of the advanced technology projects sponsored by the FTA.

Advanced Public Transportation Systems/APTS: Publications Catalog
FTA Office of Research, Demonstration and Innovation, APTS Division (W. Raymond Keng, TRI-11), March 1996, 5pp.

Available from:
Federal Transit Administration
Office Of Research, Demonstration & Innovation
APTS Division, TRI-11, Room 6107
Washington, DC 20590 *Phone:* 202/366-0195 *FAX:* 202/366-3765
Order by Title

This publications catalog lists and briefly describes the available literature on the APTS program. The catalog includes information regarding the FTA Home Page on the World Wide Web of the Internet, as well as an APTS publications order form. For APTS information or for transit information, visit the FTA Home Page at this address: *http://www.fta.dot.gov.*

Advanced Public Transportation Systems Deployment in the United States
Volpe National Transportation Systems Center, Robert F. Casey and Lawrence N. Labell; Prepared for the FTA Office of Research, Demonstration & Innovation, APTS Division (W. Raymond Keng, TRI-11), August 1996, 31pp
Report Number: DOT-VNTSC-FTA-96-6

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB-96-210679 *Price Code:* A04/$21.50
FTA Office of Mobility Innovation *Phone:* 202/366-6667 *FAX:* 202./366-3765

This report documents work performed under the APTS Program, a program structured to undertake research and development of innovative applications of advanced navigation, information, and communication technologies that most benefit public transportation. The report is a compilation of existing and planned deployments of APTS technologies and services. Information was collected during the Fall of 1995 and was obtained through contacts with one or more persons at each agency. The objective was to include information from all agencies that submitted information for the 1993 National Transit Database Report Year. A total of 464 agencies provided information for this study. Agencies with no existing or planned APTS systems are not included in this report.

Advanced Public Transportation Systems: Intelligent Transportation System for Atlanta for the 1996 Olympics. Technical Assistance Brief 11
FTA Office Of Research, Demonstration & Innovation, APTS Division (Denis J. Symes, TRI-11), February 1996, 5pp.

Available from:
Federal Transit Administration
Office Of Research, Demonstration & Innovation
APTS Division, TRI-11, Room 6107
Washington, DC 20590 *Phone:* 202/366-6667 *FAX:* 202/366-3765
Order Number: Technical Assistance Brief 11

The 1996 Summer Olympic Games in Atlanta, Georgia, provided an opportunity to demonstrate to a worldwide audience how the American ITS and APTS technologies can move traffic and people in an efficient manner. A number of federal, state, regional and local agencies joined to sponsor and conduct a special ITS/APTS program for the Atlanta region. ITS Atlanta program is the US DOT's first fully implemented Intelligent Transportation Infrastructure. Technical Assistance Brief 11 discusses the operational test of the ITS Atlanta program and its three major integral components: ITS Metropolitan Atlanta Rapid Transit Authority, Georgia Department of Transportation's Advanced Traffic Management System, and the Atlanta Traveler Information Showcase. The paper also introduces the ITS and APTS concepts and discusses the resultant benefits these programs will bring to transportation. The Atlanta ITS program was placed in operation in April 1996 and tested before the Olympic Games began in July 1996.

Advanced Public Transportation Systems: Smart Fare Payment Systems for Public Transit. Technical Assistance Brief 10
FTA Office of Research, Demonstration & Innovation, APTS Division (Sean Ricketson, TRI-11), January 1996, 4pp.

Available from:
Federal Transit Administration
Office of Research, Demonstration & Innovation
APTS Division, TRI-11, Room 6107
Washington, DC 20590 *Phone:* 202/366-6667 *FAX:* 202/366-3765
Order Number: Technical Assistance Brief 10

This Technical Assistance Brief, *Smart Fare Payment Systems for Public Transit*, is designed to advance transit by improving information dissemination regarding the knowledge and use of advanced electronic systems in transit. This issue provides an overview of electronic fare payment systems. Early automation efforts, read-only passes and fare cards, automated fare card sales, smart fare cards, contact cards are discussed along with radio frequency coupled proximity cards, followed by a perspective of the future.

Advanced Public Transportation Systems: The State of the Art Update '96
Volpe National Transportation Systems Center, U.S. Department of Transportation, Robert F. Casey, Lawrence N. Labell, Rose Holmstrom, et al.; Prepared for the FTA Office of Research, Demonstration & Innovation, APTS Division (Ronald E. Boenau, TRI-11), January 1996, 212pp.
Report Number: FTA-MA-26-7007-96-1

Available from:
Federal Transit Administration
Office of Research, Demonstration & Innovation
APTS Division, TRI-11, Room 6107
Washington, DC 20590 *Phone:* 202/366-0195 *FAX:* 202/366-3765
Report Order Number: FTA-MA-26-7007-96-1
NTIS Order Number: PB96-136726 *Price Code:* A10/$38

The research objective was to increase the transit industry's knowledge of successful applications of advanced technologies with the expectation that this will lead to their widespread adoption. This status report documents work performed under FTA's APTS Program. The report is the latest in a series of state-of-the-art reports. It contains the results of an investigation of the extent of adoption of advanced technology in the provision of public transportation service in North America. The report focuses on some of the most innovative implementations, namely, four types of services/technologies: Fleet Management, Traveler Information, Electronic Fare Payment, and Transportation Demand Management. The report provides tables that list several FTA-sponsored field operational tests and research projects planned or in progress. Appendix A provides a listing of contact organizations and persons in the U.S. and Canada along with a listing of paratransit contacts and suppliers. Appendix B provides an alphabetical listing of the APTS projects mentioned in this 1996 state-of-the-art report.

APM/Automated People Mover Applications: A Worldwide Review
Florida International University, L. David Shen, Jian Huang and Fang Zhao; Prepared and delivered at the Transportation Research Board 75th Annual Meeting, January 7-11, 1996, Washington, DC, 15pp.
Paper Number: 960577

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Order Number: Paper Number 960577

Automated people mover (APM) systems consist of automated, electric-powered, driverless vehicles operated singly or in multi-car trains on steel or concrete guideways. APM systems provide quality service and are capable of moving 2,000 to 25,000 passengers per hour per direction. Over the past two decades, APM technology has been used for circulation service in airports, recreational parks, and central business districts. APM technology has also been used

for trunk line transit service, such as the VAL system in Lille, France, and the SkyTrain in Vancouver, Canada, both of which are successful. This paper attempts to conduct a worldwide review of APM applications for urban transit and airport circulation services to obtain a full understanding of the costs, benefits, capabilities, and efficiencies of this advanced transit technology. The urban automated people movers discussed in this paper are the VAL System in Lille, France; the SkyTrain in Vancouver, Canada; the Docklands Light Railway in London, England; and the Metromover in Miami, Florida. The airport automated people movers covered are the SK system in Paris Charles De Gaulle (CDG) International Airport, France; new Denver International Airport APM system in Colorado; and the Airport Monorail System in Newark International Airport, New Jersey. The paper also discusses and summarizes the system characteristics of the four urban and three airport circulation APM systems as well as the capital costs of line-haul APM systems. The paper concludes that APM systems are a suitable mode of high level-of-service for trunk line transit service in a medium population area and for circulation services in major activity centers such as airports, recreational and central business district areas.

Bellevue Smart Traveler: Design, Demonstration, and Assessment
University of Washington, Washington State Transportation Center, Mark Haselkorn, Jan Spryidakis, Cathy Blumenthal, et al. Prepared for FTA Office of Research, Demonstration & Innovation, APTS Division (Ronald E. Boenau, TRI-11) and FHWA, August 1995, 256 pp.
Project Number: FTA-WA-06-0039-95-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, VA 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-112743 *Price Code:* A11/$41

The goal of this phase of the Bellevue Smart Traveler (BST) project was to design and test an information system that would help decrease single-occupancy vehicle (SOV) travel to a downtown employment center by making alternative commuting options more attractive and easier to access. The report documents activities of the BST team to accomplish this goal, namely -- development, implementation, demonstration, and testing of a traveler information center (TIC) prototype in downtown Bellevue, Washington, east of Seattle. TIC was designed mainly to help commuters form dynamic rideshare groups and to provide traffic congestion and transit information. The TIC integrated phone and paging technology delivers three types of commuter information: dynamic ride matching, current traffic congestion and transit information. Usage patterns and various surveys that were conducted suggested that participants liked the idea of dynamic ridesharing, liked the presentation of the information, liked the technology, were willing to offer rides, and used BST to receive other forms of information. However, for various reasons they were either unable or unwilling to form ride matches.

Benefits Assessment of Advanced Public Transportation Systems
Volpe National Transportation Systems Center, Office of Operations Engineering and Assessment; Prepared for the FTA Office Of Research, Demonstration & Innovation, APTS Division (W. Raymond Keng, TRI-11), July 1996, 46pp.
Report Number: DOT-VNTSC-FTA-96-7 or FHWA-JPO-96-0031

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB97-103576 *Price Code:* A04/$21.50
FTA Office of Mobility Innovation *Phone:* 202/366-6667 *FAX:* 202./366-3765

This *Benefits Assessment of Advanced Public Transportation Systems* report documents work performed under FTA/APTS Program. The report presents the results of an analysis conducted to provide an "order-of-magnitude" estimate of the expected benefits to the transit industry with the application of APTS technologies. The study identified and quantified the major benefits derived from current applications of APTS technologies within the transit industry and projected current APTS benefits to a national level based on forecasts and reasonable assumptions on the future applications of such technologies within the transit industry. The four APTS program areas addressed with applications in the motorbus, demand responsive transit, and rail transit industries, were: Transit Management Systems, Automated Traveler Information Systems, Electronic Fare Payment Systems, and Demand Responsive Computer-Aided Dispatching. Overall, the study identified 265 APTS system deployments currently operational, under implementation, or planned for implementation over the next 10 years. The projected total benefits of these deployments are estimated to range from $3.8 billion to as high as $7.4 billion.

Building the ITI: Putting the National Architecture into Action
Mitretek Systems; Prepared for Federal Highway Administration, April 1996, 49pp.
Report Number: FHWA-JPO-96-011

Available from:
Federal Transit Administration
Office of Research, Demonstration & Innovation, APTS Division, TRI-11
400 7th Street, SW, Room 6107
Washington, DC 20590 *Phone:* 202/366-0195 *FAX:* 202/366-3765
Report Order Number: FHWA-JPO-96-01

This is a first generation document that introduces both public and private sector transportation managers and implementors to the architecture. The purpose of the handbook is to provide focused information about the National Intelligent Transportation Systems Architecture to those implementing the Intelligent Transportation Infrastructure (ITI) in a metropolitan area. The

architecture defines the framework for the complete set of anticipated ITS services, promotes national compatibility and represents the collective national view on how ITS should be defined and deployed. ITI is an integrated system, not just nine components. Each of the nine ITI components works smoothly with the others. The report discusses what the architecture says about the ITI and why a planner or implementor should be aware of the architecture. It also includes some answers to potential questions that users may have regarding deployment issues. Major architecture systems and information flow are discussed to the extent necessary to provide a basic understanding of what information architecture provides to implementors.

Customer Information at Bus Stops: A Synthesis of Transit Practice. TCRP Synthesis 17
Transportation Research Board, John J. Dobies (Kansas City, Missouri); Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 70pp.
Report Number: TCRP Synthesis 17

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Synthesis 17 *Price:* $18

Providing transit customer user information at bus stops is a fundamental part of a transit agency's customer information service. The bus stop is the customer's access point to the transit system. This synthesis will be of interest to transit agency general managers, bus operations, facilities and maintenance, and marketing and customer service staffs, as well as to other transportation and marketing professionals. It addresses user information systems and describes current transit agency practices regarding customer information at bus stops within the text and through the use of tables, and numerous graphic illustrations. The study focuses on gathering information on current transit industry practices and research activities related to customer information at bus stops and translating the information into usable practical ideas for transit agency managers to develop or enhance their information program. It also focuses on providing information on practical matters such as costs, staffing requirements, design considerations, ADA requirements, as well as on the cost-effectiveness or the *pay back* on the transit agency's investment in these programs and systems. Overall, this report covers types of signs and supplemental information displays, program implementation and effectiveness, and advanced technology applications. Selected transit agency case studies detail five different perspectives on the development and deployment of on-street programs. A survey of 45 transit agencies indicated that -- although transit managers accept the value and effectiveness of on-street information, they remain divided with respect to the cost-effectiveness of on-street information displays.

Demonstration of Video-Based Technology for Automation of Traffic Data Collection: Travel Time Origin-Destination Average Vehicle Occupancy
Center for Urban Transportation Research, University of South Florida; Prepared for the Hillsborough County Metropolitan Planning Organization, January 1996, 68pp

Available from:
University of South Florida
Center for Urban Transportation Research
4202 E. Fowler Avenue, ENB 118
Tampa, Florida 33620 *Phone:* 813/974-3120 *FAX:* 813/974-5168
Order by Title

This report documents the findings of a field demonstration project designed to evaluate the feasibility of a video-based technology application in the automation of traffic performance data gathering and analysis. The demonstration was coordinated with the Hillsborough County MPO to investigate a data collection automation application that is compatible with traffic performance measures needed for the Hillsborough County Congestion Management System (CMS). The report includes a background discussion of the more conventional techniques for collection of travel time, origin-destination, and average vehicle occupancy data; a discussion of comparative advantages and disadvantages of each technique; and findings of the video-based automation compared to effectiveness of collecting the same information through visual observation at each camera location. The findings of this field demonstration showed that when compared to conventional techniques for traffic data collection, automation provided greater accuracy and reliability and less labor intensive, thereby, eliminating or reducing human error. The study concluded that, over the long term, the total cost of automated data collection can be up to 30 percent less than manual traffic data collection.

Future Ride: Adapting New Technologies to Paratransit in the United States. Working Paper
University of California at Berkeley, Institute of Urban and Regional Development, Alfred Round and Robert Cervero; Prepared for the FTA University Transportation Centers Program, January 1996, 48pp.
Working Paper: UCTC No. 306

Available from:
University of California at Berkeley
Transportation Center
108 Naval Architecture Building
Berkeley, California 94720-1720 *Phone:* 510/643-5454 *FAX:* 510/643-5456
Order Number: Working Paper UCTC No. 306

This research reflects the view that certain high technology enhancements can greatly improve the range of paratransit services, and hence the demand for these services, This paper investigates the possibility that the application of technological innovations can make paratransit into a mode that is cost-effective for both passengers and operators, relative to the private automobile. It

introduces the concept by providing background information, comparing it with other transit modes, and creating a typology of potential services offered by high-tech paratransit. High-technology enhancements that improve the range of paratransit services or create new ones are discussed. Four high-tech components proposed for smart paratransit are also described: automatic vehicle location (AVL), automated scheduling, database technology, and user interfaces. Three types of paratransit services that owe their existence or enhancements to these technologies are discussed: parataxis, special/ADA services, and general public transit. Special services paratransit is exemplified in the Winston-Salem Mobility Manager case which successfully serves local ADA clients, and general public paratransit is exemplified in the Ruf-Bus/FOCCS system implemented in Germany. Findings show that smart technology can substantially improve paratransit services. However, prototype transit systems for the general public were found to be few in number, and projects to date were technology-driven rather than market-driven. The study calls for investigating how paratransit in general, and advanced technology applications in particular, can be integrated with existing transit systems to provide net social benefits.

Impact of Radio Frequency Refarming on Transit Communications
Jeffrey J. Maul and John J. Greichen, Arthur D. Little, Inc., Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn Cooper, TRI-30), 1996, 47pp.
Report Number: TCRP Report 11

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Order Number: TCRP Report 11 *Price:* $20

The Federal Communications Commission (FCC) now uses *refarming* to help mitigate radio frequency (RF) congestion and increase spectrum efficiency in the private land mobile radio bands (frequencies below 512 MHz). Refarming is the term used for reduction in bandwidth allocated to radio channels in the designated bands. Base stations and mobile radio equipment operating within these bands may become obsolete if they cannot operate in the reduced bandwidth. The refarming of frequencies may have a significant impact on transit communications systems and capital procurement of communications equipment in the near future. This report will be of interest to general managers, operations managers, and communications specialists responsible for communication systems within transit and paratransit organizations. The report provides information concerning the FCC rules governing the refarming of the land mobile radio spectrum and their impacts on current and future transit communications systems requirements. The report contains a nontechnical executive overview (Chapter 2) that describes the rules issued in June 1995 by the FCC regarding the refarming of radio frequencies, provides an overview of the impacts of radio frequency refarming, and offers potential courses of action for transit and paratransit systems. In addition, the report provides more detailed technical information for

communications specialists, and includes several examples of potential cost impacts to transit and paratransit systems.

Intelligent Transportation Systems
Transportation Research Board, National Research Council; 1995, 91pp.
Report Number: Transportation Research Record No. 1516

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Order Number: TR Record No. 1516 *Price:* $26

The papers in this volume focus on various elements of ITS, automated highway systems (AHS), transportation modeling, defense conversion, and high-frequency automated traveler information systems (ATIS). One paper reviews electronic toll collection (ETC) systems and discusses the basic knowledge necessary for implementation of such systems. Two papers present results of ongoing studies of advanced traveler information systems in Los Angeles and Sacramento. Two papers focus on automated highway systems. One discusses comparable systems and the other examines lessons to be learned from the BART system. Two modeling papers discuss a methodological framework for evaluating operating and pricing policies in an intermodal auto-transit (commuter rail) network and the results of implementing a dynamic traffic assignment model. Two papers focus on information dissemination. One examines computer-integrated transportation as an integrated network of public and private organizations with a common mission of facilitating travel across all modes of transportation. The second presents a case for using a little-used part of the shortwave spectrum as a means of broadcasting digital traveler information to rural and innercity users.

Intelligent Transportation Systems Publications
Intelligent Transportation Systems Joint Program Office, U.S. Department of Transportation, November 1996, 11pp

Available from:
U.S. Department of Transportation
ITS Joint Program Office, HVH-1
400 7th Street, SW, Room 3422
Washington, DC 20590 *Phone:* 202/366-6363 *FAX:* 202/366-8712
FTA Office of Mobility Innovation *Phone:* 202/366-6667 *FAX:* 202./366-3765
Order by Title

This paper lists the ITS publications currently available from the US DOT. It provides descriptive summaries of FTA's APTS reports and the ITS project reports sponsored by the FHWA, FRA, and NHTSA. A publications order form is included.

Implementation of the National Intelligent Transportation Systems Program. A Report to Congress
FHWA/ITS Joint Program Office, Prepared for the Secretary of Transportation and the U.S. Congress, 1996, 144pp.
Report Number: FHWA-JPO-96-004

Available from:
U.S. Department of Transportation
ITS Joint Program Office, HVH-1
400 7th Street, SW, Room 3422
Washington, DC 20590 *Phone:* 202/366-9536 *FAX:* 202/366-8712
Order No: FHWA-JPO-96-0004
FTA Office of Mobility Innovation *Phone:* 202/366-6667 *FAX:* 202/366-3765
Order by Title

Intelligent Transportation Systems (ITS), formerly called Intelligent Vehicle Highway Systems (IVHS), provide tools that help address current surface transportation problems, as well as anticipate and address future demands. This report to Congress describes the US DOT's accomplishments over the past two years in advancing the National Intelligent Transportation Systems program. It conveys program status including accomplishments, challenges, and associated implications for future direction. Part 1 provides an overview of the federal ITS program, outlines the achievements, offers six approaches to advance program goals, and discusses emerging issues. Non-technical barriers and constraints to ITS implementation are also discussed. Part 2 reports on specific progress made within each ITS program area, such as Advanced Travel Management, Advanced Crash Avoidance Systems, Rural Applications, and others. Federal and non-federal contributions to corresponding programs are specified in the appendices including cost-share arrangements. The final section winds-up with actions to mainstream ITS into the transportation planning objectives of states and localities and to adopt roles that complement the product-based interests of industry while representing the public interest in safety enhancement. Ultimately, the Department's goal is to facilitate deployment of technologies that improve American lives.

Ramp Metering Status in North America. 1995 Update.
FHWA and FTA, Piotrowicz G, and Robinson J; Prepared for the FHWA and the FTA, June 1995, 62pp.
Report Number: DOT-T-95-17

Available from:
Technology Sharing Program
U.S. Department of Transportation
400 7th Street, SW, (M-45.3)
Washington, DC 20590
Report Order Number: DOT-T-95-17 *Web Catalog URL:http://www.tsp.dot.gov*

This document updates a previous report published in September 1989 titled *Ramp Metering Status in North America*. It provides an initial resource for agencies exploring the feasibility of ramp metering and offers a straight-forward look at the operational and institutional issues inherent in ramp metering along with current information on the state of the practice in ramp metering. The report is structured in sections. The first three parts present a sample of various ramp metering applications in several cities and describe benefits reported. The fourth section addresses factors for consideration and some of the capabilities and limitations of ramp metering. In the fifth section, guidelines for implementing ramp metering are discussed. The final section documents the lessons learned by agencies currently operating ramp metering. Supplemental materials include an overview of the status of ramp metering in North America, a list of ramp metering contacts, and a bibliography. Based on research results, ramp metering has proven to be one of the most cost-effective techniques for improving and maintaining the efficient operation of urban freeways during peak traffic periods. Ramp metering benefits include accident rate reductions of 24 to 50 percent, increased mainline speeds of 16 to 62 percent, and others. Results from the benefits include consistent commute times, less congestion, and reduced driver frustration.

Responsive Multimodal Transportation Management Strategies and IVHS.
Bellomo-McGee, Inc., Bellomo SJ; Prepared for the FHWA Office of Safety & Traffic Operations (Wayne Berman, HTV-31), and the FTA Office of Research, Demonstration & Innovation, APTS Division (Sean Ricketson, TRI-11), February 1995, 162pp.
Report Number: FHWA-RD-94-086

Available from:
Federal Highway Administration
Office of Safety & Traffic-Operations R&D
6300 Georgetown Pike
McLean, Virginia 22101-2296 *Phone:* 703/285-2680 *FAX:* 703/285-2680
Report Order Number: FHWA-RD-94-086

This report presents the results of a study of potential applications of new and emerging ITS technologies to multimodal transportation systems. It presents 27 candidate multimodal scenarios and discusses their potential benefits, costs, and feasibility, as well as related institutional and legal issues. It reflects the view of the authors as well as those of participants in a series of national workshops held to discuss the contents. This report will be of interest to ITS planners and implementing agencies seeking innovative ways to enhance the operations of highways, transit, paratransit, and goods movement. *Note:* the name, intelligent vehicle transportation systems (IVHS), has been changed to intelligent transportation systems (ITS).

Review and Assessment of En-Route Transit Information Systems
EG&G Dynatrend Inc., under contract to the Volpe National Transportation Systems Center; Prepared for the FTA Office of Research, Demonstration & Innovation, APTS Division (Ronald E. Boenau, TRI-11), July 1995, 128pp
Report Number: DOT-T-96-03

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q 75th Avenue
Landover, Maryland 20785
Report Order Number: DOT-T-96-03 *Web Catalog URL: http://www.tsp.dot.gov*

En-route transit information systems (ERTIS) are in their infancy in North America, primarily because the advanced technologies needed to support ERTIS are just beginning to be fully implemented. This report describes services which provide information to assist the traveler once public transportation begins. The study scope includes en-route transit information that can be provided not only onboard transit vehicles, but also at transit stops, in transit/transfer centers, and at other transit-served locations. The research includes a review of current efforts to design, develop and implement ERTIS, discussion of state-of-the-art and recommendations for future activities. In this report, the term "en-route transit information systems" is defined; information dissemination technologies are identified; and integration with advanced traveler information systems is discussed along with use of such services. The study found that North American systems are primarily manual and based on customers' use of printed timetables. Systems based on automated technologies are few. To date, automated information on real-time transfers and connections has not been available through existing systems. The study concludes that automated systems will help reduce the perceived barriers for customers to use public transit.

Traveling with Success: How Local Governments Use Intelligent Transportation Systems
Public Technology, Inc.; Prepared for the FHWA, ITS Joint Program Office (HVH-1), 1995, 55pp.

Available from:
U.S. Department of Transportation
ITS Joint Program Office, HVH-1
400 7th Street, SW, Room 3422
Washington, DC 20590 *Phone:* 202/366-6363 *FAX*: 202/366-8712
Order by Title

This booklet is designed to encourage cities, counties, and metropolitan areas across the country to design and implement ITS in such a way as to integrate them with future systems. The US DOT has launched a national campaign to integrate applications of ITS technologies. This initiative has been termed *ITS Core Infrastructure*, and it provides the building blocks needed to combine two or more of the following technologies: traffic signal control systems, freeway

management systems, transit management systems, incident management systems, electronic fare payment systems, electronic toll collection systems, and multimodal traveler information systems. This booklet presents thirty-one success stories of communities across the country who have applied aspects of the core infrastructure locally. Three examples illustrate successful results of combining several transportation systems into one efficient core infrastructure network. The report highlights the need for metropolitan areas to "Buy Smart" to achieve the benefits of an ITS core infrastructure, namely -- reduced congestion, real-time information on public transit services, faster emergency response, and improved quality of life.

Using Geographic Information Systems for Integrated Transit Service Delivery: Broward County Florida Transit Options Project
Broward County, Lawrence J. Harman, and Russell H. Thatcher: Prepared for FTA Project ACTION, National Institute for Accessible Transportation, 52pp.

Available from:
Project ACTION
700 Thirteenth Street, NW, Suite 200
Washington, DC 20005 *Phone:* 202/347-3066 *FAX:* 202/347-4157
TTD/Voice: 1-800-659-6428 *EBB:* 202/637-9607
Email: projaction@aol.com *Web Site:* www.projectaction.org
Order by Title

The purpose of this demonstration project was to design and develop an integrated, multimodal transportation system to serve persons with disabilities. Called the Broward County Transit Options Project (TOPS), the main goal was to develop a variety of options for travel including paratransit, fixed route, local community bus service, and accessible private taxi service. Seven innovative planning techniques and operating enhancements were identified for implementation. This report provides information about the applications of geographic information systems (GIS) in Broward County Transit Options Project. Background information about Broward County transit services is provided, followed by a statement of the problem, and the approach taken to develop an integrated, intermodal service. An attempt was made to use the latest GIS technology and data resources. The objective was to see if state-of-the art tools would be helpful in the design process. Chapter 4 presents the concepts and basic terms behind GIS, the approach used in applying GIS to integrated service delivery, strategies for data acquisition, and strategies for data analysis. The final Chapter 5 offers some reflections on the experience of using GIS technology as part of the demonstration project.

Vehicular Emissions and Fuel Consumption Estimation in PASSER IV
Texas A&M University System, Texas Transportation Institute, Nadeem A. Chaudhary; Prepared for Southwest Region University Transportation Center, April 1995, 49pp
Report Number: SWUTC/95/465060

Available from:
Texas A&M University System
Texas Transportation Institute
College Station, Texas 77843-3135 *Phone:* 409/862-2946 *FAX:* 409/845-9761
Report Order Number: SWUTC/95/465060 *Email:* d-burke@tamu.edu

It is well known that optimal coordination of traffic signals on urban signalized arterials improves traffic flow and reduces gasoline consumption and vehicular emissions. Many computer models are available to engineers, but none can estimate both fuel consumption and vehicular emissions to allow better assessment of proposed signal timing plans. This report describes work performed under the project titled *Fuel Consumption and Fuel Emission Estimation Models in Signal Timing Optimization Programs.* The objective was to enhance PASSER IV (a program for optimizing bandwidth-based signal timings in traffic networks) and incorporate fuel consumption and vehicle emissions estimates for signal timing plans generated by it. These enhancements to PASSER IV software will allow traffic engineers to better assess the impacts of alternate signal timing plans on fuel consumption and emissions of vehicles traveling in a signalized network. This report describes the new PASSER IV software. It discusses issues related to the estimation of vehicular fuel consumption and vehicular emissions; describes models/procedures incorporated into PASSER IV software; and Version 2.0. of PASSER IV. The total estimated gasoline savings over six years is 6.19 million barrels in the six largest urban areas of Texas. Supplemental materials include a List of References, MOBILE Emission Data from the Texas Counties, Texas DOT Procedure for Estimating Air Quality Benefits, and Modifications to PASSER IV Data Structures. Presently, PASSER IV is the only practical personal-computer-based network program for generating bandwidth-based signal timings. It is designed for off-line use and for present and future traffic management systems.

Leveraging Information for Better Transit Maintenance. TCRP Research Results Digest Number 13
Transportation Research Board, National Research Council, Christopher W. Jenks; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), November 1996, 21pp.

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Research Results Digest Number 13 - November 1996

This Digest summarizes the findings of TCRP Project E-1, *Innovative Maintenance Procedures for Transit Buses*. The project reflects the view that the "information age" is recasting the shape of work in many fields, including maintenance. It focuses on information for maintenance management, i.e., information usage as one of the most rapidly growing and changing areas in maintenance. Project activities included a survey of innovative maintenance practices being used in transit agencies or in related private firms, evaluation of their applicability to transit agencies in the U.S., and development of recommendations and strategies for implementation. The research was conducted in two phases. Phase 1 was mainly a series of site visits to public and private agencies and commercial firms as "best performers" to determine if there were lessons in effective performance applicable to the transit industry. Appendix A summarizes the lessons learned from those visits. In Phase 2 several candidates were studied. The focus was on three aspects of information in transit bus maintenance: production of information, use of information, and sharing of information between transit agencies (with electronic communication). The research noted that the capabilities and content of most maintenance management information systems in public and private organizations were similar. Computerization was the rule. The report concludes that information should be the main lever for maximizing efficient use of labor and capital resources.

Research Results Digest, Transit Cooperative Research Program
Transportation Research Board, National Research Council; Prepared for FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), July 1996, Number 9, 5pp.

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Research Results Digest, July 1996-Number 9

This TCRP digest provides a brief summary of findings for transit managers from TCRP Project C-4, *Enhancement of Vehicle Window Glazing for Vandal Resistance and Durability*, conducted by the University of Dayton Research Institute. Included in this digest are brief descriptions of current and emerging methods available to address the passenger window vandalism problem. The unpublished final report, *Enhancement of Window Glazing for Vandal Resistance and Durability*, provides the details of extensive surveys conducted during the project of domestic and foreign transit systems, window system manufacturers and suppliers serving transit and other industries, transit vehicle manufacturers, and vandalism and graffiti experts. Copies of this project's final report are available from the Transportation Research Board. See also TCRP Report 15.

Compressed Natural Gas Safety in Transit Operations: Clean Air Program
Battelle Laboratories, and Science Applications International Corporation, under contract to Volpe National Transportation Systems Center, David N. Friedman/SAIC, and Norman D. Malcosky/Battelle; Prepared for the FTA Office of Technology (Jeffrey Mora, TRI-20), October 1995, 160pp.
Report Number: FTA-MA-90-7007-95-2

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-139324 *Price:* A07/$28

This report presents an assessment of current industry practice and a summary of basic principles and general recommendations for the safe operation of compressed natural gas (CNG) transit programs. It examines safety issues of CNG buses as determined from a survey of seven transit agencies using CNG in revenue operations. The survey included site visits and interviews with transit personnel; review of records, procedures, and safety plans; examination of facilities and equipment; observation of operations; and measurement of methane concentrations in the air where the buses are fueled or stored. Recommendations are based on information gathered and lessons learned, as well as on prevailing practices in industrial engineering, safety and risk management. The report includes discussions and recommendations on CNG facility design, fueling, maintenance, vehicle storage, buses, operations, special concerns, emergency planning, management and safety awareness, and training. Survey findings show that CNG buses performed well and have achieved public acceptance. Some safety deficiencies were noted. Survey results pointed out differences that exist between agencies on hazard and consequence mitigation measures, such as methane monitoring in the facilities including procedures and action upon the detection of methane, control of strong ignition sources, and others.

Design Guidelines for Bus Transit Systems Using Alcohol Fuel (Methanol and Ethanol) as an Alternative Fuel. Clean Air Program
Technology & Management Systems, Inc., Phani K. Raj, Vincent R. DeMarco, et al., under contract to the Volpe National Transportation Systems Center; Prepared for the FTA Office of Technology (Jeffrey Mora, TRI-20), August 1996, 60pp
Project Number: FTA-MA-26-7021-96-3

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-210737 *Price Code:* A05/$21.50

This document addresses the need to develop comprehensive guidelines for the safe design and operation of alternative fuel facilities and vehicles for transit systems to follow in either retrofit or new facility design. The report provides design guidelines for the safe use of alcohol fuels,

methanol or ethanol. The purpose of this study is to provide guidance, information on safe industry practices, applicable national codes and standards, and reference data which transit agencies should review when considering modifications to their existing facilities or when planning new bus facilities to safely use an alcohol fuel (methanol or ethanol) as an alternative fuel for buses. Fueling facility, garaging facility, and maintenance facility requirements and safety practices are presented. A system safety assessment and hazard resolution process is also presented. This approach may be used to select design strategies that are economical, yet ensure a specified level of safety. Supplemental materials include a Glossary, Glossary of Graphic Symbols, and a List of References. This report is part of a series of published monographs by FTA on the safe use of alternative fuels. Documents similar in content to this report are published and available for CNG, liquefied natural gas (LNG), and liquefied petroleum gas (LPG). Each report in this series describes, for the subject fuel, the important fuel properties, guidelines for the design and operation of bus fueling, storage and maintenance facilities, issues on personnel training and emergency preparedness.

Design Guidelines for Bus Transit Systems Using Compressed Natural Gas as an Alternative Fuel. Clean Air Program

Technology & Management Systems, Inc., under contract to the Volpe National Transportation Systems Center, Phani K. Raj, William T. Hathaway, and Ronald Kangas; Prepared for the FTA Office of Technology (Jeffrey Mora, TRI-20), June 1996, 94pp

Project Number: FTA-MA-26-7021-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-195192 *Price Code:* A06/$25

This report documents design guidelines for the safe use of compressed natural gas (CNG). The report provides guidance, information on safe industry practices, applicable national codes and standards, and reference data that transit agencies need to review when considering modifications to existing facilities or when planning new bus facilities to safely use CNG as an alternate fuel. The study scope is limited to discussing issues related to bus facilities, i.e., bus fueling, storage, and maintenance facilities, and includes design issues related to vehicle safety and personnel training. Issues discussed also include fuel properties, potential hazards, fuel requirements for specified level of service, applicable codes and standards, ventilation, and electrical classification. Critical fuel related safety issues in the design of the related systems on the bus are also discussed. Supplemental materials include a Glossary of Graphic Symbols and References. This report forms part of a series of individual monographs published by the FTA on the safe use of alternative fuels. Documents similar to this one in content are available for LNG, LPG, and methanol/ethanol.

Design Guidelines for Bus Transit Systems Using Liquefied Petroleum Gas (LPG)) as an Alternative Fuel. Clean Air Program
Technology & Management Systems, Inc., Phani K. Raj, under contract to the Volpe National Transportation Systems Center, William T. Hathaway, and Ronald Kangas; Prepared for the FTA Clean Air Program (Jeffrey Mora, TRI-20), September 1996, 76pp.
Project Number: FTA-MA-26-7021-96-4

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB97-120422 *Price Code:* A05/$21.50

The purpose of this document is to provide guidance and information on safe industry practices, applicable national codes and standards, and reference data which transit agencies need to review when considering modifications to their existing transit facilities or when planning new bus facilities to safely use liquefied petroleum gas (LPG) as an alternative fuel. Design guidelines for the safe use of LPG are presented. Bus fueling facility, garaging facility, and bus maintenance facility requirements and safety practices are included. Fuel properties, potential hazards, fuel requirements for specified level of service, applicable codes and standards, ventilation, electrical classification, etc., are discussed. A system safety assessment and hazard resolution process is also discussed. This approach may be used to select design strategies which are economical, yet insure a specified level of safety. This report forms part of a series of published monographs by FTA on the safe use of alternative fuels. Documents similar to this one in content are published and available for CNG, LNG, and methanol/ethanol.

Dispersion of CNG Following a High-Pressure Release
Technology & Management Systems, Inc., EG&G Dynatrend, Robert L. Gaumer and Phani K. Raj, under contract to the Volpe National Transportation Systems Center; Prepared for the FTA Office of Technology (Jeffrey Mora, TRI-20), May 1996, 64pp
Project Number: FTA-MA-26-7021-96-2

Available from:
Federal Transit Administration
Office of Technology, TRI-20
400 7th Street, SW, Room 6429
Washington, DC 20590 *Phone:* 202/366-0215 *FAX:* 202/366-3765
Report Order Number: FTA-MA-26-7021-96-2
NTIS Order Number: PB96-188172 *Price Code:* A05/$21.50

This report will be of interest to personnel working in facilities where CNG buses are fueled, stored, or maintained. The report discusses the results of tests to determine the dispersive behavior of CNG when released in an enclosed area such as a transit bus facility, and presents the resulting conclusions. The tests attempted to evaluate the adequacy of the current convention concerning safeguards against CNG-related fires in transit buildings where CNG-powered buses

are fueled, stored, or maintained. This convention embraces the belief that precautions need to be taken only at or near the ceiling of the building. It is based on the premise that, since CNG is primarily methane and methane is approximately one-half the density of air at ambient temperature and pressure, any natural gas released would immediately rise to the ceiling as a buoyant plume. The experiments described in this report challenge this premise. Tests were conducted by Battelle Columbus Laboratories in February 1995 using infrared (IR) imaging to track the movement of the released gas. The conclusions presented were based on examination of calibrated IR images at 10-second intervals for the six tests for which data were post processed. Images from two of the tests are included as part of the discussion of results. Conditions inside the test facility differed from those in a typical bus garage or maintenance building. That is, the shape and size of the test chamber differ from those at a bus maintenance facility; the chamber was unheated and contained no bus or equipment to alter the movement of gas. The smaller size of the building could also tend to understate the results. The effects of those differences should be considered. An unpublished report prepared by Battelle is included in Appendix A. The results of tests show no evidence that CNG released horizontally from a high-pressure source that is close to the floor would rise as a buoyant plume toward the ceiling of a building. Instead, the results suggest that natural gas released under such conditions will remain in various locations (not only at or near the ceilings) of CNG-bus facilities long enough to pose a potential fire hazard. The point made is that a fire hazard could exist in the parts of transit facilities not normally regarded as areas of concern.

Liquefied Natural Gas Safety in Transit Operations. Clean Air Program
Battelle, and Science Applications International Corporation (and subcontractors), David M. Friedman and Norman D. Malcosky, under contract to Volpe National Transportation Systems Center; Prepared for the FTA Office of Technology (Jeffrey Mora, TRI-20), March 1996, 132pp.
Project Number: FTA-MA-90-7007-95-3

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This report examines the safety issues of LNG buses as determined from a survey of four transit agencies using LNG in revenue operations. It presents the results and the experiences gained from the onsite surveys conducted by Battelle of Columbus, Ohio, and Science Applications International Corporation (SAIC) of McLean, Virginia. Each contractor visited and surveyed two different agencies, and submitted individual reports which are reproduced separately in this document. The surveys included extensive interviews; review of records, procedures, and plans relating to safety; examination of facilities and equipment; observation of operations including fueling, maintenance, morning start-up, and revenue service; and measurement of methane concentrations in the air where the buses were fueled or stored. Interviews included all job categories and examination of occupational hygiene aspects of LNG use. Although each contractor surveyed different agencies and each presented their material separately, many of the observations and conclusions were similar. In both reports, recommendations and conditions were presented for safe use of LNG in transit operations. In general, operations at the sites

visited were found safe. Survey results showed that differences existed between transit agencies in their mitigation of LNG hazards. Workers involved with LNG operations appeared highly motivated and interested in safety, but the agencies varied widely in terms of the type of training given. Some safety deficiencies were noted and are detailed in this report.

Properties of Alternative Fuels
Battelle, Michael J. Murphy; Prepared for the FTA Office of Technology (Jeffrey Mora, TRI-20), October 1994, 40pp
Project Number: FTA-OH-06-0060-94-1

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This report is intended to serve as a convenient reference tool for transit managers and other fleet managers on the properties of alternative (vehicle) fuels. The report contains information on a variety of fuel properties for a number of alternative fuels that are under consideration for transit bus fleets. Properties of conventional fuels are included for comparison purposes. The data is presented on charts/tables that profile the following fuels: hydrogen, compressed natural gas, propane gas, methanol, ethanol, biodiesel, gasoline and diesel. For each fuel, key properties are listed under the following categories: Physical Properties, Chemical Composition, Combustion Properties, Energy Content, Energy Comparisons, and Health Properties. The accompanying literature reference and glossary provide additional information in terms of the origin, derivation, and meaning of the data in the tables.

Summary Assessment of the Safety, Health, Environmental and System Risks of Alternative Fuel. Clean Air Program
Battelle, and Technology & Management Systems, Inc., Michael J. Murphy, H. Norman Ketola, and Phani K. Raj; Prepared for FTA Planning Office, Department of Energy Alternative Fuels Utilization Division, and Volpe Center, August 1995, 144pp.
Project Number: FTA-MA-90-7007-95-1

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NTIS Order Number: PB95-271326 *Price Code:* A07/$28

The objective of this summary assessment is to organize, analyze, and present existing information about the potential hazards of the alternative motor fuels (AMFs) selected for this study. The intent is to provide a systematic assessment of the safety hazards of AMFs from a fleet operations perspective. The specific focus is on hazards associated with leaks and spills of AMFs in the bulk transport, unloading, fleet storage processes and fleet operations. This report is a handbook of

safety, health, and the environmental issues that deals primarily with the transport and bulk storage of alternative fuels. It is divided into two sections: 1) hazards associated with the bulk transport and storage of alternative fuels; and 2) hazards associated with the operation, fueling, and maintenance of alternative-fuel vehicle fleets. Both sections of the hazard assessment discussion include information on the following alternative fuels: CNG, LNG, propane, methanol and methanol blends, ethanol and ethanol blends, biodiesel blends, hydrogen and electricity. Material in the handbook is organized by fuel and by the following topics: 1) fuel properties that effect fire hazards; 2) fire hazards during bulk transport and during unloading to bulk storage; 3) fire hazards during fleet storage; 4) fuel toxicity; and 5) environmental effects of spills onto land or water. This report will be of interest to transit agency maintenance managers, operators and other persons concerned with the operation of bus fleets using alternative fuels to meet national and local requirements related to air quality and energy security.

Applicability of Low-Floor Light Rail Vehicles in North America.
TCRP Report 2
Booz-Allen & Hamilton, Inc. and Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 179pp.
Report Number: TCRP Report 2

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TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 2 *Price:* $31

This report will be of interest to transit managers, engineers, and policymakers considering the introduction of low-floor light rail vehicles (LRV) in existing or planned light rail systems. The report investigates the state-of-the-art of LRVs, assesses applicability of their use in North America, and describes the growing trend toward low-floor LRVs. Categories were developed to clarify different types of vehicles and their applications. Critical factors that should be examined before considering low-floor vehicles are identified and discussed. The report provides an extensive compilation of data on low-floor LRVs, information on North American light rail system characteristics, and key issues relevant to the applicability of this technology in North America. Two examples are developed in a realistic North American setting to show the cost-effectiveness of using low-floor LRVs and the source of risk and trade-offs regarding the use of low-floor versus high-floor LRVs. The report concludes that low-floor LRVs provide improved accessibility and are more easily integrated into the existing environment than conventional light rail vehicles. An extensive database record of available European low-floor LRVs is provided in the appendices along with descriptions of light rail transit system in 14 North American cities. A glossary of terms is included.

Evaluation of Houston's Turnkey Experience
Booz-Allen & Hamilton, Inc., Donald C. Schneck and Richard S. Laver; Prepared for the FTA Planning Office (Salvator Caruso, TPL-20), July 1994, 157pp.
Project Number: FTA-MD-26-0001-94-1

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NTIS Order Number: PB96-167051 *Price Code:* A09/$35

This report provides a review and description of Houston METRO's recent experiences (lessons learned) with the turnkey procurement process during its attempt to develop the Houston Fixed Guideway Project. Although the Houston Project was canceled for local reasons, it remains a valuable source of information in terms of selection of the turnkey procurement method, impact

on technology selection, selection of the turnkey contractor, contract design, project management and funding, and other aspects of fixed guideway procurement. These lessons learned and the context of the overall turnkey procurement approach are the intended purpose and value of this report. The evaluation focused mainly on the turnkey process and the turnkey contract. It was designed to provide the reader with a solid understanding of the turnkey project proposed by METRO, and the agency's experiences in attempting to execute the project. This case study reviews the comparative differences between the turnkey procurement process and the traditional procurement methods in terms of cost effectiveness, development time, and the introduction of new technologies. In addition, the report summarizes the ISTEA legislation that established the turnkey demonstration program; examines how the Houston turnkey project interacted with the FTA project development processes; and provides conclusions and recommendation that include references to the general application of the turnkey approach, as well as those more specific to the Houston Fixed Guideway Project experience. Basically, this review of the Houston turnkey experience offers transit agencies assistance in determining whether or not the turnkey method offers them advantages over a conventional procurement approach, and a real world example of the steps taken and lessons learned by one agency in developing a turnkey procurement.

Integration of Light Rail Transit into City Streets. TCRP Report 17
Transportation Research Board, National Research Council, Korve Engineering, Inc., and Herbert S. Levinson: Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 268pp.
Report Number: TCRP Report 17

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TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 17 *Price:* $56

This report will be of interest to personnel in transit agencies that operate light rail transit; to traffic engineers in LRT cities; and to planners, traffic engineers and transit personnel in cities planning future LRT systems. It addresses the safety and operating experience of LRT systems operating on shared rights-of-way at speeds generally under 35 mph. The report is based on agency interviews, field observations, and accident analyses of 10 LRT systems in the U.S. and Canada. It includes a description and analysis of the operating practices, safety concerns, accident experiences, innovative features, and state-of-the-art enforcement and safety education programs at each of the 10 LRT systems surveyed. The objective of the research was to improve safety for passengers, motorists, and pedestrians by identifying effective traffic control devices, public education techniques, and enforcement techniques. This report will lay the groundwork for establishing nationwide standards for LRT-related traffic control devices. It suggests a standard classification system for various LRT alignments, proposes LRT planning guidelines, and proposes standard LRT-related traffic control devices in the format of the *Manual on Uniform Traffic Control Devices* (Appendix A1). The findings and guidelines presented should prove useful for LRT system planning and retrofit efforts. Some of the principal findings state that:

across the U.S. and Canada, there is significant variation in LRT system design of signs, signals, pedestrian barriers, and other traffic control systems; the largest numbers of LRT accidents are reported in mixed traffic, which usually constitutes the smallest proportion of the total system mileage; and the failure of motorists and pedestrians to accurately perceive and obey warning devices is a common theme underlying safety problems in LRT operations.

Materials Research and Technology Initiatives
Volpe National Transportation Systems Center, Dr. Aviva Brecher; Prepared for the Research and Special Programs Administration/RSPA, U.S. Department of Transportation, November 1995, 57 pp.
Report Number: DOT-T-96-01

Available from:
U.S. Department of Transportation
Publications Division (M-45.3)
Washington, DC 20590
Report Order Number: DOT-T-96-01 *Web Catalog URL: http://www.tsp.dot.gov*

This report examines materials research programs across all operating administrations within the US DOT. It is the department's first report on ongoing and planned research and technology efforts in advanced materials. The report was published in support of the Administration's initiative to establish an integrated program of research designed to enhance the performance and longevity of the Nation's transportation infrastructure. It is intended to provide customers with a consolidated report of materials-related research projects. The report highlights opportunities for joint research and near-term applications of advanced materials technologies. It discusses the department's research efforts in two major areas: 1) advanced materials research for transportation infrastructure applications, such as the use of solid waste materials in highway construction, or the development of high performance concrete for bridge construction, and 2) advanced materials-related research for vehicles and other applications, such as the use of composite materials to construct lighter-weight and stronger containers to transport hazardous materials, or the use of new inspection procedures to determine the structural integrity of aircraft.

Metro-Dade Graffiti Prevention Project
ICF Kaiser Engineers, Inc., Miami, FL, Metro-Dade Transit Agency, Miami, FL 33128; Larry G. Smiley and Joseph D. Abbas; Prepared for the FTA Office of Technology (Jeffrey Mora, TRI-20), September 1995, 270pp.
Project Number: FTA-FL-26-0001-95-1

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NTIS Order Number: PB96-157722 *Price Code: A13/$47*

Graffiti removal is an ongoing seven billion dollar problem to both the public and private sectors in the U.S. The purpose of this project was to identify and test readily available coating materials suitable to use for graffiti prevention on rail transit elevated structures. Coating products were selected that were graffiti resistant, uncomplicated to apply, user and environmentally friendly, and required minimal materials and equipment as well as little or no maintenance. This report summarizes Metro-Dade Transit Agency's planning and preparation efforts to implement the graffiti removal project. It contains numerous charts and pictures depicting the graffiti prevention coatings procedures, field inspection reports, and the six manufacturers' product information. This graffiti prevention project report describes the selection, application and testing of graffiti preventive coatings; observations of the coating materials' ability to resist graffiti; and findings relating to the manufacturers' recommended removal processes. The test site selected was the Metrorail guideway system located at the Miami River Crossing. Of the 18 companies solicited to participate in the project, the following six manufacturers were considered: Aquarius Coatings, Inc., Carboline Company, Chemprobe Corporation, Rainguard Products Company, Seal-Krete, Inc., and Textured Coatings of America, Inc. Project findings indicated that the removal of graffiti on a coated concrete surface is unaffected over time. The removal process was no easier nor more difficult when the graffiti remained on the coated surface for weeks and baked in the Florida sun. A water blasting process increased removal capabilities.

Morgantown Personal Rapid Transit System Computer Upgrade Study
The Boeing Company, Richard E. Alberts, Marilynn B. Goo, Robert J. Schroder, and Paul D. Weis; Prepared for the West Virginia University Research Corporation, and the FTA Office of Technology (Ronald Kangas, TRI-20), May 1996, 86pp.
Project Number: FTA-WV-26-7000-96-1

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NTIS Order Number: PB96-181409 *Price Code:* A06/$25

For more than twenty years, the Morgantown Personal Rapid Transit (Morgantown-PRT) system has been providing efficient service to the students of West Virginia University (WVU) and the people of Morgantown. The system carries 2 million passengers per year. Morgantown-PRT was a state-of-the-art system at its conception (1975) and remains one of the most advanced public transportation systems today. Currently, it has problems of wear-out and computer technology obsolescence, namely, the Control and Communications System. The purpose of this study is to evaluate the various options available for upgrading the existing Morgantown-PRT control system to a computing architecture compatible with the system goals for safety, reliability and maintainability. Persons who were involved in the original design and deployment of the Morgantown-PRT computers and software conducted the study. Their recommendations are based on knowledge of current technology and understanding of how the system works. This report defines current and potential computer problems and assesses their impact. It identifies alternative solutions and evaluates best candidates, discusses the approach for converting and testing of rehosted software, and presents cost and schedule estimates for the Morgantown-PRT.

Based on this evaluation, the new system will be less complex and more reliable than the existing dual-string system. Cost of computer maintenance will be a fraction of the $68,000 per year currently expended on the service contract. The system can be upgraded in 15 months at an estimated cost of $5.3 million.

Probabilistic Risk Analysis for Turnkey Construction: A Case Study
Abacus Technology Corporation, Victoria Chaney, Kathryn Derr, Bibi Rawoof, Jessica Weissman, and Ali Touran (Boston, MA); Prepared for the FTA Office of Planning (Nancy Strine, TPL-20) June 1996, 146pp.
Project Number: FTA-MD-26-7001-96-1

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NTIS Order Number: PB96-186234 *Price Code:* A09/$35

This project will assist FTA in evaluating risk in turnkey construction. The study was undertaken to assess the usefulness of the probabilistic risk analysis methodology in measuring risk for federal transit construction. It provides an opportunity to review and document risk mitigation methods used by the U.S. Army Corps of Engineers (USACE) and the Baltimore Maryland Mass Transit Administration (MTA), as well as to observe turnkey construction in practice -- from bid through build phases. The study objectives were to examine the use of the probabilistic method, to perform risk analysis, and to highlight risk mitigation techniques for two large, non-traditional turnkey transportation projects currently under construction: 1). *Tinker Air Force Base Alternate Runway Extension,* USACE; and 2) *Baltimore MTA Central Light Rail Line Phase II.* Conclusions are based on findings regarding the two case studies, turnkey approach, and the utility of probabilistic risk analysis as a method of measuring risk in large construction projects. Study results affirm that turnkey contracting by the USACE is a formalized and highly disciplined process and risk mitigation for military turnkey includes a high level of project definition at bid time. It also affirms that design-build is an evolving concept for USACE work. Results show that the Baltimore MTA Phase II is a low risk project, i.e, project cost contingencies are adequate and the likelihood that project funds will be exceeded is low. Some key features noted of turnkey are: risk assessment is mainly focused on the bid stage; schedule is a key variable for turnkey risk; Quality Assurance/Quality Control and project oversight are critical decisions for turnkey contracting; and the turnkey approach leads to time savings which translates into cost savings over traditional design-bid-build contracting. The Baltimore MTA project demonstrated that the probabilistic risk analysis produces useful results and insights at several stages of the project, and the method is well suited to owner-based project control and oversight activities. A Glossary of Terms and a Bibliography are included in this report.

Turnkey Demonstration Program: Expert Roundtable Workshop on Techniques for Successful Design/Build for Transit
FTA Office of Planning (Sharon Pugh, TPL-20), and Volpe National Transportation Systems Center, March 1994, 20pp.

Available from:
Federal Transit Administration
Office of Planning, TPL-20
400 Seventh Street, SW, Room 6100
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The purpose of the workshop was to exchange information of the Design/Build Process (Turnkey) financial and procurement techniques, as well as to advance the understanding of applying Design/Build concepts in transit projects. More than 50 persons attended the session, representing various participating transit agencies, general engineering firms, investment bankers, industry consultants, and other disciplines. This brochure presents a synopsis of the major highlights of the workshop presentations and discussions, namely: FTA Turnkey Policy, Project Teaming, Transit Agency Project Profiles, Turnkey Financing, Contracting, and Designing, and Turnkey Technology Selection.

Turnkey Demonstration Program Expert Workshop for Successful Transit Design/Build, Los Angeles, May 4-5, 1995: Synopsis of Highlights
FTA Office of Planning (Sharon Pugh, TPL-21), Brochure, 50pp.

Available from:
Federal Transit Administration
Office of Planning, TPL-21
400 7th Street, SW, Room 6100
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This brochure presents a synopsis of the major highlights of the FTA-sponsored workshop, *Turnkey Forum: Design and Construction Experiences*, that took place on May 4-5, 1995, as part of the continuing industry expert outreach for the FTA Turnkey Demonstration Program. The purpose of the workshop was to facilitate an exchange of information on design/build (turnkey) techniques, with a special focus on the design and construction experiences of the Los Angeles County Metropolitan Transportation Authority's Union Station Gateway project. Design and construction progress on other FTA demonstration projects in Baltimore, San Juan, and San Francisco were also reviewed, along with plans for other transit turnkey projects in New York and New Jersey. Approximately 80 persons, representatives of the participating transit agencies, general engineering firms, investment bankers, industry consultants, and other disciplines, attended the workshop sessions.

Aids for Rail Car Side-Door Observation. TCRP Report 4
The Telephonics Corporation and Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 129pp.
Report Number: TCRP Report 4

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TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 4 *Price:* $30

This report will be of interest to transit specialists concerned with the safe operation of rail car doors in stations and to rail station facility designers seeking to incorporate car side-door observation aids in station facilities. The report documents the findings of a research program designed to 1) evaluate current door observation practices and procedures and assess how they relate to transit system characteristics, such as facilities, vehicle configurations, and operating procedures; 2) identify existing observation aids and assess their merits; 3) identify promising observation technologies and define conceptual observation aids based on them; and 4) develop guidelines for transit system use in the selection and implementation of observation aids. A review was conducted of rail car side-door observation practices, procedures, and devices in use in North American heavy rail systems and in selected foreign systems. Site visits were made to 17 rail systems in North America and some people mover systems to observe operations and collect data. Based on this study of current and conceptual observation data, researchers developed and documented a set of usage guidelines for closed-circuit TV, mirrors, and sensor-based door observation aids. The report includes recommendations for ways to enhance the effectiveness of observation aids and criteria for the selection of appropriate aids. In addition, the report provides a vision of the application of new and emerging technology to car side-door observation aids. Part 2 of this report contains the supporting technical information of the transit systems visited (case studies).

Procurement Specification Guidelines for Mass Transit Vehicle Window Glazing. TCRP Report 15
University of Dayton Research Institute, Daniel R. Bowman, Thomas J. Whitney, and Marc A Huelsman, and Transportation Research Board, National Research Council; Prepared for FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 53pp.
Report Number: TCRP Report 15

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Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 15 *Price:* $23

This report will be of interest to transit maintenance and procurement specialists concerned with purchasing windows and window systems. It provides detailed guidelines for development of specifications for procurement of durable and vandal-resistant bus and rail vehicle passenger-side windows and window systems. The guidelines provide information on different types of window systems and materials, namely -- their strengths, weaknesses, special features, costs and other information. New materials are discussed including sacrificial plies, peel-ply protective film, anti-spall films for glass, aerospace coating and transparency technologies. The guidelines also include specific tests and acceptance criteria that can be used to assess durability, as well as recommend practices for ensuring that the procured window glazing system is easily replaced, and that repair and refurbishment are considered during the initial specification-development process. The guidelines also include lessons-learned discussions for each type of specification requirement. This specification establishes the format and content of window-glazing system technical specifications produced by and for the mass transit industry. The purpose is to establish recommended uniform practices for specification preparation, to ensure the inclusion of essential requirements, and to aid in the use and analysis of specification content.

Reducing the Visual Impact of Overhead Contact Systems. TCRP Report 7
Transportation Research Board, National Research Council, John S. Kulpa, New York, NY, and Arthur D. Schwartz, Reston, VA, with Skidmore, Owings and Merrill; Prepared for the FTA Transit Cooperative Research Program (Jeffrey Mora, TRI-20), 1995, 96pp.
Report Number: TCRP Report 7

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TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 7 *Price:* $26

Electric transit vehicle applications will make positive contributions to reducing mobile source air quality problems in most urban areas. A major obstacle to electric transit vehicle applications is the need for an overhead contact wire system which is unfamiliar to much of the U.S. population and is perceived as visually obtrusive. This report will be of interest to planners, engineers, transit professionals, hardware suppliers, and others interested in light rail and trolley bus systems. It describes various ways to minimize the visual impact of overhead contact systems (OCS) using various types of hardware, support structures, construction techniques, and streetscape treatments. The report provides good and poor examples of OCS in the U.S. and abroad. The report contains a comprehensive review, compiled from OCS manufacturers, of OCS hardware and design techniques currently in use in North America and Europe. The report focuses on trolleybus and light rail systems in the street environment.

MTA Minority/Women Owned Businesses Utilization Study
D.J. Miller & Associates, Inc., under contract to the New York Metropolitan Transportation Authority; Prepared for FTA Region II (R. Ritter), December 1995, 146pp.
Project Number: FTA-NY-08-0188-96-1

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Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-212311 *Price Code:* A08/$31

The New York Metropolitan Transportation Authority (MTA) sponsored this project to examine the impact of federal and state disadvantaged, minority and women owned business (M/WBE) programs and to develop a record of the use of these firms by its operating agencies. Case studies of the following six operating agencies are presented: MTA Headquarters, Metro-North Railroad, Long Island Rail Road, Triborough Bridge and Tunnel Authority, New York City Transit Authority, and Metropolitan Suburban Bus Authority. The study reviewed quantitative, anecdotal and descriptive evidence to evaluate the MTA program. It examined federally regulated and nonfederally regulated procurement activities, MTA procurement and contracting practices, and impact the reinstatement of the State's Article 15-A mandatory goals program had on the use of M/WBEs by the MTA. Evidence presented regarding the availability and utilization of M/DBE firms created an inference of discrimination in the procurement program.

National Indian Tribal Transit Report
National Congress of American Indians, Robert Holden and Paul Moorehead (Editors); Prepared for the FTA Office of Research Management (Roger Tate, TRI-30), March 1996, 76pp.
Project Number: FTA-DC-26-7022-96-1

Available from:
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Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-167036 *Price Code:* A06/$25

This report documents the first comprehensive nationwide survey of Indian tribal transit needs, i.e., the American Indian/Alaska Native tribal governments and their existing transit systems. The survey serves as a research tool that provides information on current and projected transit and related infrastructure needs on Indian land throughout the U.S. It provides policymakers with a more informed view of Indian tribes and their transit needs. The document is based upon 95 tribal survey responses which are representative of all regions in the nation (23 states). It includes a cross-section of tribes reflecting differences in tribal income and population, tribal lands and reservations and other geographic and demographic differences. This document introduces the National Congress of American Indians, provides background information of the National Indian tribal transit needs, statistical profiles of Indian country and population, and a summary of the state-by-state survey. The report clearly states that the state of Indian tribal transit systems is

inadequate to their needs. It calls for tribal governments involvement in transit development and policy, as well as for development of transit systems that will hold tribal economies and societies together. Poor transit systems are said to be holding back tribal efforts to attract and maintain outside investment in infrastructure, water systems, waste disposal plants, and job-creating businesses. The Appendix provides a copy of the Presidential Memorandum, dated April 29, 1994, along with Congressional Resolutions.

Operational Strategies for Rural Transportation: Florida Coordinated Transportation System
Management Analysts of Ormond Beach, Florida and Hyperdyne of Alexandria Virginia; Prepared for the Florida Department of Transportation, March 1996, 15pp.
Report Number: DOT-T-97-01

Available from:
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3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-97-01 *Web Catalog URL:http://www.tsp.dot.gov*

The *Operational Strategies for Rural Transportation* report describes Florida's coordinated transportation system. The system's intent is to assure the highest possible passenger loading and lowest vehicle costs. The report focuses on the system's advanced technologies and the resulting new strategies developed for managing growth while reducing costs. It provides an overview of the Arc Transit Automatic Vehicle Location (AVL) project. Fourteen vehicle modules, the AVL base station, and several vehicle radios were purchased for the project. Overall, the system consists of an onboard credit card reader, digital odometer, Global Positioning Satellite (GPS) receiver, and radio interface. Data is transmitted from the vehicle's radio to the transportation system's base station where it is received by the base PC 486 computer. Use of this technology is discussed in terms of the new operational strategies developed to reduce vehicle-related and passenger-related costs and to manage Florida's Medicaid program. Currently, the system is being phased into operational use. The technology of this system is expected to be a major factor in the elimination of both passenger and provider fraud. Projected savings in the State of Florida for one year is expected to exceed 11 million dollars -- over and above the cost of the system. Data improvement and its immediate availability is one of the added benefits of the system.

Rural Transit Assistance Program at Work: A State by State Survey of 1994
American Public Works Association, Cynthia Nearman, Beth Denniston, and the RTAP National Review Board; Prepared for the FTA National Rural Transit Assistance Program (Mary Martha Churchman, TPM-11), 1996, 96pp.
Project Number: FTA-DC-26-7032-96-1

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American Public Works Association
1301 Pennsylvania Avenue, NW, Suite 501
Washington, DC 20004 *Transit Hotline:* 1-800-527-8279
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This survey report presents the findings from state programs that participated in the 1995 Rural Transit Assistance Program (RTAP) Monitoring Survey. The survey purpose was to gather information about state RTAP organizations and their levels of service measured in program activity, including number of transportation professionals who have been served or trained, and to identify exemplary state technical assistance activities and services that can be replicated in other states. This 1995 RTAP Monitoring Survey is the second attempt to quantitatively measure the effectiveness of state programs. It presents an overview, examines the structure and operations of the state RTAP programs, and discusses the survey effort and purpose. In addition, the report presents a summary and analysis of the state programs and describes both specific and general state RTAP activities and services. The final section of the report provides state-by-state profiles of the program, including an overview of the successes, products, and services as well as up-to-date (1996) phone numbers and addresses for state RTAP representatives. The appendices contain a copy of the survey instrument and a listing of the 1995-1996 FTA/RTAP National Program Review Board. Overall, the survey results show that the state programs benefit a lot of people at every level of service. In addition, the volume and quality of service provided is said to be improving and increasing rather rapidly.

Service Routes, Route Deviation, and General Public Paratransit in Urban, Suburban, and Rural Transit Systems
University of Arizona, The Drachman Institute, Dr. Sandra Rosenbloom; Prepared for the FTA University Research & Training Program (Elizabeth Solomon, TRI-30 and Paul Marx, TBP-10), January 1996, 90pp.
Project Number: FTA-AZ-26-7000-96-1

Available from:
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5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-166319 *Price Code:* A06/$25

The purpose of this study was to synthesize and bring together the operating experiences of transit operators across the U.S. and Canada who have implemented three major types of non-traditional transit options: route deviation services, service routes or community buses, and general public paratransit (demand-responsive systems or dial-a-ride). The study was designed to evaluate how each of the three service options integrated into the overall operational patterns of each system, conformed to ADA requirements and impacted ridership patterns on ADA-mandated paratransit services. More than 40 different systems or services were interviewed. This report provides background information, discusses ADA requirements, and offers a look at the

operational experiences of the following: route deviation services in 15 different transit or community systems; service routes in 10 different systems; and general public paratransit experiences in 6 systems. Each of these 31 systems is profiled separately (Appendix) in terms of service offered, rationale, eligibility requirements, fares, costs, advertising, demographics, and contact person. Study findings showed that communities across America are implementing these service concepts, namely, systems in small or rural areas with no or very little paratransit experience prior to 1990. Service options were implemented or altered in the 1990s to respond to ADA regulations. In spite of their ADA driven objectives, many of these systems were probably not in conformity with ADA regulations. The study states that the issues raised by many of the operations described in this report need attention soon.

Study/Assessment of Rural Transportation and the Impact Upon Delivery of Health Care Services in Non-Urbanized Areas of Alabama, Georgia, Louisiana, Kentucky, Mississippi and West Virginia

National Council of Negro Women, Fannie M. Munlin; Prepared for the FTA Office Of Research, Demonstration & Innovation, 1995, 34pp.
Report Number: FTA-TRI-30-95-2

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, VA 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-132014 *Price Code:* A03/$19.50

The purpose of this research was to assess the rural and tribal transportation needs of residents to determine the impediments to the delivery of health care services in the rural areas of Alabama, Georgia, Kentucky, Louisiana, Mississippi, and West Virginia. The study identified and discussed the regulatory, administrative, and legislative barriers to the integration of health care transportation needs with existing rural and tribal transportation programs. Specifically, the study explored impediments to the coordination of Health and Human Services (HHS) Title XIX (Medicaid) non-emergency health care transportation with FTA Section 18 rural public transit services. Information was collected through focus group meetings, questionnaires, personal interviews, surveys and through round table discussions, and examination of community life styles. The research findings showed that the lack of coordinated transportation services hindered access to health care services in rural areas and that lack of knowledge about available resources and legislative mandates were also barriers to transportation services. Ninety-four percent of the officials interviewed and involved in non-emergency medical transportation stated that the survey meetings were the first time that individuals met to discuss common interests in rural transportation.

Users' Manual for Assessing Service-Delivery Systems for Rural Passenger Transportation. TCRP Report 6
Ecosometrics, Incorporated, Beth Hamby and Adam T. McGavock, ATE Management & Service Company, Inc., Urbitran Associates, Inc., and Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 226pp.
Report Number: TCRP Report 6

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 220418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 6

This user's manual of recommended practices will be of interest to agencies engaged in planning, operating, or funding passenger transportation services in rural areas. The manual will assist in designing public transportation service-delivery systems in communities where no systems now exist or in restructuring and improving existing rural transportation. The manual provides detailed methods that allow local planners and operators to identify and analyze transportation services in rural areas. It includes methods to decide which types and what levels of service to provide and highlights case studies of a variety of successful rural transit operations. Information for contacting specific operators is also provided. Three other products were developed under this project, namely: Rural Transportation Services (RTS) Computer Program; Users' Manual for RTS Computer Program; and Service-Delivery Systems for Rural Passenger Transportation (Final Report). Both the computer program and the users' manual for the computer program are available for downloading in the Rural Transportation Assistance Program TAP-IN Bulletin Boards maintained by the Community Transportation Association of America at 202/628-2537. The final report is available on loan from the Transportation Research Board.

Workbook for Estimating Demand for Rural Passenger Transportation. TCRP Report 3
SG Associates, Inc., Leigh, Scott & Cleary, Inc., C.M. Research Inc., and Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program, (Gwendolyn R. Cooper, TRI-30), , 1995, 131pp.
Report Number: TCRP Report 3

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 3 *Price:* $28

This report will be of interest to agencies engaged in planning, operating, or funding passenger transportation services in rural areas. The purpose of the research was to provide methods for forecasting rural passenger transportation demand. The newly developed methodology for estimating demand for rural passenger transportation presented in this workbook is based on a comprehensive review of previously developed methods; discussions with agencies that would use these procedures; collection of data from a sample of 39 selected counties across the nation; and detailed analysis of relationships among county population characteristics, services provided, and actual rural passenger transportation served. This report describes the types of information required to develop estimates of passenger demand and step-by-step instructions with examples and computation forms for developing the demand estimates. The methodology recorded is applicable to rural counties. The companion workbook, which presents the methodology in simplified form, is included in this report. The methods described apply to transportation services in low-density areas. They do not apply to, and should not be used for estimation of demand in small cities, even those with populations less than 50,000, where public transportation service is provided by small fixed-route, fixed-schedule transit systems.

Bus Route Evaluation Standards. Synthesis of Transit Practice 10
Transportation Research Board, National Research Council, Howard P. Benn of Barton-Aschman Associates, Inc.; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 60pp.
Report Number: TCRP Synthesis 10

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Order Number: TCRP Synthesis 12 *Price:* $12

Bus route evaluation standards comprise several criteria that measure the quality and quantity of service offered by a public transit system's bus routes. This synthesis compiles current activity and assesses the state of the art of evaluating individual bus routes. The synthesis examined industry practice in late 1993 to early 1994 by means of a multiple choice questionnaire. Information on bus route evaluation standards and criteria used by transit agencies in the U.S. and Canada is summarized. The survey of transit agencies in North America indicated that 44 different evaluation criteria are currently used in the transit industry. These criteria cover activities related to bus route design and operation, ranging from location of bus stops to the hours of service. The report provides updated information to the 1984 U.S. DOT report entitled *Bus Service Evaluation Methods: A Review*. Copies of the 1984 and 1994 surveys are provided in Appendices A and B. This synthesis will be of interest to transit agency general managers, as well as operations, scheduling, maintenance, and planning personnel. This synthesis is an immediately useful document.

Commuter Vanpool System for Satellite Cities
University of Texas at Austin, Center for Transportation Research, Gregory C. Han and C. Michael Walton; Prepared for Southwest Region University Transportation Center, July 1995, 95pp.
Report Number: SWUTC/95/465540-1

Available from:
University of Texas at Austin
Center for Transportation Research
3208 Red River, Suite 200
Austin, Texas 78705-2650
Report Order Number: SWUTC/95/465540-1

This report reflects the efforts of the City of Austin, Texas, to develop commuter vanpool services as an alternative to the single occupant vehicle (SOV) for residents residing outside of the central city. By the year 2010, the population of Austin is forecasted to expand from 700,000 to 1,112,000 -- most of the growth occurring in communities outside of the central area. These satellite cities do not have the population density to merit a fixed route transit service, even

though a large number of residents commute to Austin to work. This report proposes a framework for analyzing and implementing a self-sustaining intermodal commuter vanpool system to serve commuters traveling from satellite cities to employment sites in Austin. It identifies employment sites with the greatest potential for implementing the proposed vanpool system, the candidate employers and employees that commute to the same worksite. Methodologies are explored for demand estimation, rider matching, vanpool routing, and vanpool scheduling. Benefits of ridesharing are discussed in terms of commuter, employer, community, state, and national benefits. Findings show that ridesharing has one of the greatest potential to serve as an alternative to the private automobile in Texas. Although TMAs have been active organizers of ridesharing activities, their projects have not been as successful as those sponsored by individual companies. The proposed system will reduce congestion and air pollution by encouraging employers to implement ridesharing programs.

Destination Jobs: A Summary of the Hennepin County, Minnesota Reverse Commute Employment Program. A Practitioner's Guide
Written by Harry Woodward of Woodward Learning International, and Editor and Project Manager, Jeffrey S. Hardin of Hennepin County; Prepared for the FTA Office of Research, Demonstration & Innovation (Stewart McKeown, TRI-12), and Hennepin County, Minnesota, 1996
Project Number: FTA-MN-26-7002-96-1

Available from:
Federal Transit Administration
Office of Mobility Innovation, TRI-11
400 7th Street, SW, Room 6107
Washington, DC 20590 *Phone:* 202/366-9267 *FAX:* 202/366/3765
Order Number: FTA-MN-26-7002-96-1

Destination Jobs is a successful collaboration of business, community and government connecting urban workers with suburban employers. It is a four year old reverse commute employment program operating in Hennepin County, Minnesota, between innercity Minneapolis and its southwestern suburbs. Destination Jobs focuses on a simple idea: connect people who need jobs with employers who need workers. The overall intent of the program was not only to create jobs, but also to address key issues affecting cities today. This user-friendly Practitioner's Guide details all aspects of establishing a reverse commute employment project. It is a valuable resource for anyone starting or working to improve a reverse commute employment program. The guide describes the roles of each collaborative partner, highlights and explains how to implement a Job Fair -- the central event that gave this project a focus, a "how to", a place to begin, and the vehicle that coordinated the overall effort. The guide describes potential pitfalls and how to avoid them. It includes sample forms, flyers, letters and other useful documents. The contents and ideas of this manual will be of particular interest to employers, government agencies, chambers of commerce, training and employment agencies as well as transit agencies. The *Destination Jobs Videotape* is also available. It provides a comprehensive overview of the entire project in live action. The video conveys the essence of this successful project for audiences of individuals and small or large groups.

Do-It Yourself Vanpool Guide
Washington State Department of Transportation, Washington State Ridesharing Organization, August 11994, 60pp.
Report Number: DOT-T-95-15

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q 75th Avenue
Landover, Maryland 20785
Report Order Number: DOT-T-95-15 *Web Catalog URL: http://www.tsp.dot.gov*

This *Do-It Yourself Vanpool Guide* was published as a public service for the citizens of Washington State. The guide was written for those who wish to own or lease their own vans and operate vanpools that recover the commute portion of their fixed and operating costs. It was not written for making a profit. The guide provides helpful information and examples on how to start and manage your own vanpool. References are made throughout to various agencies and contacts for obtaining additional information. Appendix C contains Washington State Ridesharing Law taken from the Revised Code of Washington.

Earthquake Vulnerability of Transportation Systems in the Central United States
Central Earthquake Consortium; Prepared for the U.S. Department of Transportation, Research and Special Programs Administration's Office of Emergency Transportation, September 1996, 25pp.
Report Number: DOT-T-97-12

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-97-12 *Web Catalog URL: http://www.tsp.dot.gov*

The purpose of this report is to increase public awareness of the real earthquake risk in the Central U.S. and the vulnerability of transportation systems to a New Madrid earthquake. The report examines the unique nature of earthquake risk, discusses the effects of earthquakes on each component of the nation's transportation system, and the effect on each response and recovery effort. Challenges and opportunities are discussed for transportation officials, emergency managers and others in developing a comprehensive approach to reducing the vulnerability of the transportation system in the Central U.S. to earthquakes. Because of the large area that would be impacted (up to 10 states in four federal regions), the study calls for an "umbrella" plan that addresses transportation priorities and coordination issues for a New Madrid earthquake. The

New Madrid transportation plan and strategy called for is to be a product of an intergovernmental-private sector planning process.

Evaluation of an Innovative Transit Pass Program: The UPASS Program
University of Wisconsin-Milwaukee, The Center for Urban Transportation Studies, James A. Meyer and Edward Beimborn; Prepared for the Wisconsin Department of Transportation, March 1996, 257pp.
Report Number: DOT-T-96-16

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Order Number: DOT-T-96-16 *Web Catalog URL: http://www.tsp.dot.gov*

This report examines a discounted transit pass program, UPASS, at the University of Wisconsin, Milwaukee (UWM). UPASS is an innovative transit program developed by the University and the Milwaukee County Transit System (MCTS) in which all UWM students receive an unlimited transit pass as part of their tuition. UPASS provides students with unlimited travel on any MCTS route at anytime, anywhere, for any trip without any additional fare required. This employer-based transit pass offers users a deeply discounted fare while providing the transit system with a guaranteed revenue. The concept has the potential to serve as a model for other universities, institutions and employers considering a transit pass program and/or a TDM Strategy. This report examines the impact the UPASS program had on mode choice, transit ridership, traffic congestion, parking and other transit-related issues. It could have significant impact on transit usage and ultimately lead to changes in land use patterns and provide community-wide advantages, such as reducing traffic congestion, improving air quality, and reducing tax dollars spent on the construction of parking lots and garages. The findings indicate that UPASS has been effective in reducing vehicle trips, increasing transit ridership, and reducing the impact of the automobile on the environment.

Evaluation of the Team Transit Program
Mathcraft Inc., and JHK & Associates, Alexis L. Verzosa and Don Samdahl; Prepared for the FTA Office Of Research, Demonstration & Innovation (Stewart McKeown, TRI-12), September 1996, 33pp.
Project Number: FTA-VA-26-7005-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB97-137459 *Price Code:* A05/$21.50

This report documents an evaluation of the operational history of the Metropolitan Transit Commission's Team Transit Demonstration Program. Team Transit is an intergovernmental partnership initially established in 1993 to quickly implement solutions to transit mobility and congestion problems in the urban and suburban areas of Minneapolis and St. Paul, Minnesota, as well as to develop innovative intergovernmental partnerships that improve transit services. This means, developing partnerships that lessen red tape and quickly implement road improvement projects that speed transit vehicles through congested areas. The evaluation was conducted to learn what elements of the program were unique in planning and implementing interjurisdictional road improvements, and what elements were transferable to other metropolitan areas. Twelve projects were evaluated from four categories, namely: shoulder bus lanes, ramp meter bypasses, traffic signal prioritization, and route-o-matic. Three criteria used to evaluate the 12 Team Transit projects were speed, reliability, and patronage. Some of the lessons learned include: obtaining a policy level agreement among participating agencies at the highest level of management possible; performing work "in the trenches" without jurisdictional boundaries; keeping project sizes manageable; implementing some easy, non-controversial projects first in order to gain support; and celebrating successes with media coverage.

Fare Policies, Structures, and Technologies. TCRP Report 10
Transportation Research Board, National Research Council; Multisystems, Inc., Daniel Fleishman and Nicola Shaw; JW Leas & Associates, Ashok Joshi and Richard Freeze; and Oram Associates, Richard Oram; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 212pp.
Report Number: TCRP Report 10

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 10 *Price:* $45

This report will be of interest to policymakers and managers at transit agencies developing and implementing fare policies to meet their social, financial, and service needs. The report presents the results of a comprehensive study of fare policies, fare strategies and structures, fare collection, distribution technologies and systems and their interrelationships. The report highlights the issues to be considered in making fare-related decisions, the experiences of transit agencies in selecting and using the various approaches, and the advantages and disadvantages of emerging developments. A companion document, *Transit Fare Decisionmaking Guidelines*, has been designed to assist policymakers and managers in making fare-related decisions; it is reproduced in Appendix D. The case studies discussed in this report are presented in a separate document, *Fare Policies, Structures, and Technologies: Case Studies*. The document is available for loan by request to the TCRP, 2101 Constitution Avenue, NW, Washington, DC 20418. This study sought to compile and present information designed to assist agencies in decisionmaking related to both fare structure development and the choice of an appropriate fare collection approach. It is

the intent of this report to provide, if not all of the answers, at least the right questions to be considered in making these decisions.

Guidance for the Consistent Collection, Categorization, and Dissemination of Bus Transit Loss Data. TCRP Research Results Digest Number 11
Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program, September 1996-Number 12, 4pp.
Report Number: TCRP Research Results Digest Number 11

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Research Results Digest Number 11

Historically, bus transit systems have experienced difficulty in collecting, categorizing, and disseminating loss information on a consistent and uniform basis. This TCRP digest presents the results of Task 6 of TCRP Project G-3, *Tools for Transit Risk Exposure Identification and Treatment for Bus Systems.* The digest offers guidelines for the consistent collection, categorization, and dissemination of loss data that are compatible among transit bus systems to assist in the successful procurement of lower cost insurance products and services. Inconsistencies in the transit industry's tracking and accounting of loss information has led to problems in procuring insurance coverage because insurers receive inappropriate or inaccurate loss records. Adherence to the recommended guidelines in this digest will bring transit systems into compliance with standard insurance practices, therefore enabling insurers to more accurately underwrite transit system risks. The guidelines also include standard insurance underwriting and claim management definitions to assist transit agencies in the successful procurement of insurance products and services.

Handbook for Acquiring Demand-Responsive Transit Software. TCRP Report 18
Transportation Research Board, National Research Council, Roy E. Lave of SYSTAN Inc., in association with Roger Teal of Logitrans, Inc.; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 88pp.
Report Number: TCRP Report 18

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 18 *Price:* $26

This handbook was written for staff members and policymakers of organizations that provide shared-ride, flexibly routed, on-demand transit service, called demand-responsive transit (DRT).

It is intended to help demand-responsive providers in making their decisions about automating administrative and operating functions by helping them select, acquire, and implement software. Additionally, it is intended to assist the process of incorporating other automated technologies into DRT to improve operations. Overall, this handbook provides a history of DRT service and describes how DRT works. It discusses DRT software, including a description of the existing state-of-the-art based on a survey of DRT providers and experts in the field.

Innovative Suburb-to Suburb Transit Practices: A Synthesis of Transit Practices. TCRP Synthesis 14
Transportation Research Board, National Research Council, Katherine S. Hooper (Falmouth, Maine): Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 56pp.
Report Number: TCRP Synthesis 14

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Synthesis 14 *Price:* $14

This synthesis will be of interest to transit agency general managers and their marketing and planning staffs, as well as to state department of transportation, metropolitan planning organizations, and other professionals in the private sector concerned with the provision of suburban transportation services. Employment growth as well as population and housing shifts away from the central city have resulted in the emergence of two new principal transit commute markets, namely, reverse commute and suburb-to-suburb commute. This report provides a comprehensive view of the state of the practice by examining survey results of 23 agencies that provide suburb-to-suburb service. It describes some elements of success among all the transit agencies surveyed. The synthesis documents current transit agency practice regarding targeted marketing, partnerships with the private sector, site design and land use issues, and transit's role both as *mobility manager* and in taking corrective actions to attain national air quality standards. The study examines four case studies (U.S. and Canada) where exemplary practices and innovative approaches were being used to meet increased travel demands of suburb-to-suburb commuting. Conclusions state and include a need for more specific ridership and financial information about suburban services, as well as a need for more information on what constitutes a state-of-the-art marketing plan, how plans can be used to enhance suburb-to-suburb services, and how advanced public transit systems and various traffic operations techniques can be used to enhance suburban transit operations. This synthesis is a useful document that records practices that were acceptable within the time of its preparation.

National Conference on High-Occupancy: HOV Systems in a New Light.
Texas A&M University System, Katherine F. Turnbull, and Sarah M. Hubbard, Editors; Presented by the Transportation Research Board, National Research Council; Prepared for FTA Office of Research, Demonstration & Innovation and FHWA, July 1995, 122pp.
Report Number: Transportation Research Circular 442

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 220418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TR Circular 442

This report documents the papers delivered at the *7th National Conference on High-Occupancy Vehicle Systems* which was held at the Biltmore Hotel, Los Angeles, California, on June 5-8, 1994. The conference brought together transportation officials from state, local, and federal governments as well as from the private sector to discuss important issues related to HOV facilities, to discuss what has changed and what has not changed with HOV facilities, and to share their experiences with different approaches and techniques. Part 1, Plenary Sessions, presents papers and discussions related to the following subject areas: National and International Status Report; HOV System Development in California; Experiences from the U.S. and Abroad; Experiences from the Northridge Earthquake: Applying HOV Treatments in an Emergency; and Emerging Issues, Research, and Vision for HOV Systems. Part 2 of this report contains the keynote speeches: *HOV as a System-Wide Solution* and *Responding to Mobility Challenges Following the Northridge Earthquake*. Part 3 of this report documents the workshop reports which discuss recent experiences with HOV planning, implementation, and policy development, as well as advanced transit and HOV roadway systems. The report also provides a conference attendance list.

Passenger Transfer System Review: A Synthesis of Transit Practice. TCRP Synthesis 19
Transportation Research Board, National Research Council, Richard Stern of Booz-Allen & Hamilton, Inc. Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 42pp.
Report Number: TCRP Synthesis 19

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Synthesis 19 *Price:* $14

This synthesis will be of interest to transit agency general managers and agency staff in customer service, operations, budget, marketing, and financial divisions. It documents the types of transfer policies and systems currently in use at North American transit agencies and offers user

information on a variety of transit agencies' approaches to transfer programs. Policy and operational issues, service design, and transfer automation are discussed, based on the experience of transit agencies in the U.S. and Europe. The report covers practices dealing with fare levels, and alternatives to transferring. Information was collected mainly through a survey of selected transit agencies. The survey questionnaire is included in Appendix A, followed by Appendix B which provides a list and profile of individual survey respondents (58 percent responded, i.e., one fifth of the U.S. fixed-route motor bus industry). An overview of the methodology used to collect data is included in this report along with an overview of survey respondents and transfer use. Conclusions drawn from the study are presented including areas of potential improvement in transfer system design. The survey showed that most agencies have not considered transfer rules as part of their overall service delivery policy. Policy often related to whether and how much to charge for the transfer privilege. However, the majority of respondents expressed satisfaction with the way their transfer system was functioning.

Transit Bus Service Line and Cleaning Function. A Synthesis of Transit Practice 12
Transportation Research Board, National Research Council, Schiavone JJ (Guilford, Connecticut); Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 55pp.
Project Number: TCRP Synthesis 12

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Synthesis 12 *Price:* $14

This synthesis provides a variety of approaches to transit bus service line and cleaning functions so transit agencies can evaluate the effectiveness of their own operations. It updates material contained in a previous TRB synthesis series, *National Cooperative Research and Development Program (NCTRP) Synthesis 1: Cleaning Transit Buses: Equipment and Procedures (1982).* This synthesis also addresses daily servicing and mechanical inspections, areas not covered originally. It examines how transit agencies in the U.S. and Canada collectively approach service line and cleaning functions. Included are traditional approaches as well as innovative methods and technologies. The synthesis contains discussions on defining a clean bus, a properly serviced bus, and on labor and equipment costs. Exterior washing, interior cleaning, and graffiti prevention and removal are discussed in detail. Case study examples highlight unique service line and cleaning conditions at New Jersey Transit, Phoenix Transit, and Santa Monica Municipal Bus Lines. This synthesis will be of interest to transit agency maintenance managers and other maintenance and operations personnel, as well as to equipment suppliers, consultants, and others concerned with bus maintenance operations.

Transit Risk Manager: Risk Management Software for Bus Transit Systems. TCRP Research Results Digest Number 12
Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program, September 1996-Number 12, 4pp.
Report Number: TCRP Research Results Digest Number 12

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Research Results Digest Number 12

In this digest, identification of risk exposure is highlighted as the cornerstone of the risk management process. All other elements of risk management rest upon the accuracy and completeness of this portion of the process. Historically, public bus transit systems (both fixed-route and paratransit) have not developed a systematic approach to analyzing property and casualty risk exposure. Thus, having a user-friendly methodology for identifying and prioritizing risk exposures was determined to be beneficial and enable transit systems to make informed decisions about risk treatment alternatives. This TCRP digest describes a new software product developed under TCRP Project G-3, *Tools for Transit Risk-Exposure Identification and Treatment for Bus Transit Systems.* This software product, called *Transit Risk Manager*, is a PC-based, user-friendly, menu-driven, Windows TM-operated computer tool designed to help bus transit systems of all sizes identify exposure to loss, evaluate their loss control practices against best practices, and make informed decisions about financing risk. The program provides the means to assess current risk management programs as well as risk financing alternatives. Ancillary tools such as insurance specifications, loss triangle templates, policy statements, and a self-insurance plan are provided for export into word processors or spreadsheets. Richard O'Hare of the Risk Management Center, Inc., was the principal investigator for the development of the software. The research team also consisted of Multisystems, Inc., Concise Techniques, MacDorman & Associates, and Walther Consultancy.

Transportation Demand Management and Ridesharing. Transportation Research Record No. 1564
Transportation Research Board, National Research Council; Prepared for the 75th Annual Meeting of the Transportation Research Board in January 1996, 63pp.
Report Number: Transportation Research Record No. 1564

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TR Record No. 1564 *Price:* $23

The papers in this report were included on the program for the 75th Annual Meeting of the Transportation Research Board in January 1996. Many papers listed on the program were not presented at the meeting because some participants who planned to attend could not reach Washington, DC as a result of a severe snowstorm in the area. This report documents seven such papers: Developing a Travel Time Congestion Index; Measuring and Estimating Congestion Using Travel Time-Based Procedures; Evaluation of Speed Measurement and Prediction Techniques for Signalized Arterials; Estimating Effect of Operational Improvements in the Houston Area; Toward a Common Parking Policy; Optimization Model for Parking in the Campus Environment; and How Do We Know Employer-Based Transportation Demand Management Works?

Using Credit Cards to Pay Bus Fares in Phoenix
Volpe National Transportation Systems Center, Judith C. Schwenk; Prepared for the FTA Service Innovation Division (Bert Arrillaga, TRI-12), January 1996, 44pp.
Project Number: FTA-MA-26-0006-96-2

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-162375 *Price Code:* A04/$21.50

In 1991 the City of Phoenix Public Transit System, first in the nation to install magnetic card readers on electric fareboxes in buses, implemented the *Bus Card Plus* program. It billed employers for trips made by employees using employer-issued credit cards. Four years later, Phoenix was again the first system to introduce a commercial credit card bus fare payment program which also relied on magnetic card reader equipment. This report documents these two innovative programs describing their backgrounds, objectives, development, equipment, operation, growth, and issues. The *Bus Card Plus* program was designed to attract riders to the bus system and to provide employers a means to accurately record employees use of public transit. The program attracted new riders, sales tripled and were estimated to represent seven percent of annual Valley Metro bus boardings. Use of commercial credit cards to pay fares has expanded rapidly and expected to continue as the farebox software expands to accept more credit instruments. As of September 1995, there were about 2,500 monthly boardings using commercial credit cards. Electronic transactions for paying bus fares benefit the transit agency by making bus loading more efficient, reducing resources needed for cash handling, and producing more accurate ridership counts. Both programs have helped move Valley Metro toward cashless electronic fare transactions.

Access for Persons with Disabilities to Passenger Vessels and Shore Facilities. The Impact of the Americans with Disabilities Act of 1990
Volpe National Transportation Systems Center; Prepared for the Office of Environment, Energy and Safety of the Office of the Secretary of Transportation, July 1996, 295pp
Report Number: DOT-T-96-20

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
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Report Order Number: DOT-T-96-20 *Web Catalog URL: http://www.tsp.dot.gov*

The Office of the Secretary of Transportation (OST) heads the investigation of access for persons with disabilities on passenger vessels. This report is an assessment of the feasibility of implementing ADA in the passenger vessel industry. It is an exploratory study of implementation issues that will serve as the basis for future decisionmaking by OST regarding access to waterborne transportation and accommodation assets. In this study, cost calculations include new construction and alterations for the Coast Guard inspected passenger vessel fleet, and access provisions to the vessels over the piers and docks serving the fleet. It does not include foreign flagged cruise ships. Only the projected costs of ADA implementation are addressed. Basically, the text discusses: access solution sets for vessels, docks and piers; particulars of the solution sets; unit and industry costs; results of several cost scenarios developed for small business operators; and the effects of elevator installations on vessel stability. The final chapter contains conclusions that sum up the completed and planned work on the passenger vessel access cost study, and recommendations that identify several areas where more work is needed to fully understand implementation of ADA. The study has significantly advanced the knowledge of watercraft access.

Automated On-Board Next Stop and Route Identification System Using GPS Technology
Rochester-Genesee Regional Transportation Authority; Prepared for the FTA (Roger Tate, TRI-30) Project ACTION program of the National Easter Seal Society, 1995, 116pp.
Report Number: 95-0046

Available from:
Project ACTION
700 Thirteenth Street, NW, Suite 200
Washington, DC 20005 *Phone:* 202/347-3066 *FAX:* 202/347-4157
TTD/Voice: 1-800-659-6428 *EBB:* 202/637-9607 *Email:*projaction@aol.com
Order Number: 95-0046 *Web Site:* www.projectaction.org

This research relates to the transportation regulations that implements ADA. It specifies that fixed-route transit providers shall announce transfer points, major intersections and destination points, and intervals along a bus route sufficient to permit individuals with visual impairments or

other disabilities to be oriented to their location. The report documents a study conducted by the Rochester-Genesee Regional Transportation Authority (RGRTA), the Regional Transit Service, Inc., the Luminator Company and local advocacy groups for the disability community to implement and test an automated onboard next stop and route identification system using Global Positioning technology. The system is intended to provide totally automated visual and audible announcements to waiting transit passengers. Two urban routes were selected to test the Integrated Next Stop Information System, designed by Luminator. Although the concept of an automated system providing audio and visual information about bus stops and transfer points was an excellent way of making public transit easier to use for patrons with visual and auditory impairments, unfortunately, the RGRTA staff was not able to monitor system performance as closely as necessary. The study results showed that the automated system reduced but did not eliminate the need for driver intervention, and that the RGRTA version of the Next Stop Information System lacked the upgradeability comparable to the investment. Transit operators considering the purchase of automated announcement systems should be certain that their choice allows for upgrades over at least a two-year period.

Detectable Warnings in Transit Facilities: Safety and Negotiability
Boston College, Billie Louise Bentzen; Prepared for the FTA Project ACTION, National Institute for Accessible Transportation, 26pp.

Available from:
Project ACTION
700 Thirteenth Street, NW, Suite 200
Washington, DC 20005 *Phone:* 202/347-3066 *FAX:* 202/347-4157
TTD/Voice: 1-800-659-6428 *EBB:* 202/637-9607
Email: projaction@aol.com *Web Site:* www.projectaction.org
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Recent research sponsored by Project ACTION indicates that some properties of detectable warning surfaces lead to greater safety and negotiability than others. A detectable warning is a *standardized surface feature built in or applied to walking surfaces or other elements to warn visually impaired persons of hazards on a circulation path.* It is intended to function like a stop sign. This research was undertaken to determine the impact of various characteristics of detectable warning surfaces on safety and ease of negotiation for a wide variety of persons who have physical impairments. Tests were conducted on slopes (1:12). This report introduces, defines and illustrates the uses of detectable warnings in transit facilities. It discusses prior research and experience with safety of detectable warnings on transit platforms. Nine warning surfaces on a slope (1:12) were tested in comparison with brushed concrete and are illustrated. Objective data were obtained by videotaping all performance on ramps with and without detectable warnings. Results showed that persons using "tips" accounted for 59 percent of observed difficulties, persons using "wheels" for 38 percent of observed difficulties, and persons using "no aid" for 3 percent of observed difficulties. The surface rated as best was an unglazed porcelain tile surface having truncated domes on a square grid and wide inter-dome spacing. This report will be useful to transportation planners, engineers, service providers and persons with disabilities.

Improving Transportation for a Maturing Society
Office of the Assistant Secretary for Transportation Policy (Don Trilling, P-10), U.S. Department of Transportation, January 1997, 147pp.
Report Number: DOT-P-10-97-1

Available from:
U.S. Department of Transportation
Office of the Assistant Secretary for Transportation Policy, P-10
400 7th Street, SW, Room 9222
Washington, DC 20590 *Phone:* 202/366-4220 *FAX:* 202/366-7618
Internet World Wide Web URL: http://www.dot.gov/affairs/index.htm
Report Order Number: DOT-P-10-97-1

This report presents an overview of the US DOT's long-range transportation strategy to support the safety and mobility needs of older adults. It is a Department-wide effort to develop a comprehensive overview of what needs can be anticipated from the changing demographic demands on the nation's transportation system, and what improvements might be made to accommodate the growing population of Americans over the age of 65 who will be providers and users of transportation in the 21st century. The report is based on literature reviews, ongoing Departmental programs, input from five expert panels, and guidance by a Departmental Steering Committee. It describes and reviews the aging process and medical issues, risk management systems, safety issues including crash involvement, and issues of older operators of trucks, buses and others. Emphasis is placed on ways of helping older adults to operate independently and safely as well as on mobility alternatives for those who can no longer drive. *Safe Mobility, For Life* is offered as the theme for future strategic planning. More than 20 remedial initiatives are considered for integration into the Department's ongoing programs. This report is the first step in developing recommendations, priorities, and budget estimates for a definitive, long-term strategic plan. The findings show that older drivers do not currently present a serious safety problem. However, changing demographics do raise possible concerns for the future.

Positioning and Securing Riders with Disabilities and Their Mobility Aids in Transit Vehicles: Designing and Evaluation Program
Emergency Care Research Institute; Prepared for the FTA (Roger Tate, TRI-30) Project ACTION program of the National Easter Seal Society, 1995, 227pp.

Available from:
Project ACTION
700 Thirteenth Street, NW, Suite 200
Washington, DC 20005 *Phone:* 202/347-3066 *FAX:* 202/347-4157
TTD/Voice: 1-800-659-6428 *EBB:* 202/637-9607 *Email:* projaction@aol.com
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This report documents the results of a study that addresses the problem of positioning and securing of riders with disabilities and their mobility aids in transit vehicles. It provides a better understanding of the issue of positioning mobility aids on transit vehicles. The research objectives

were to critically review current information regarding the positioning and securement of riders with disabilities and their mobility aids on transit vehicles, to identify gaps in this knowledge, and to provide recommendations based on how to proceed in resolving the issue of positioning mobility aids in transit vehicles. The study was based on and provides a critical review of information available in the areas of biomechanics, accident statistics, physical testing and research, existing standards and guidelines, ergonomics, human factors, and transit vehicle and service characteristics. Information was collected through literature reviews, operator surveys, personal contacts, questionnaires, and other sources. Based on the data examined, the study recommended supporting the policy requiring forward- or rearward-facing mobility aid securement systems with respect to the direction of travel; providing securement and occupant-restraint systems that meet specified performance requirements; and examining the policy requiring transit vehicles to transport riders seated in all "common" mobility aids. Currently, not all mobility aids can be transported safely while occupied.

Special Evaluation of the Hillsborough County Community Transportation Coordinator
University of South Florida, Center for Urban Transportation Research; Prepared for the Hillsborough County Metropolitan Planning Organization, November 1995, 55pp.

Available from:
Center for Urban Transportation Research
University of South Florida, College of Engineering
4202 E. Fowler Avenue, ENB 118
Tampa, Florida 33620-5350 *Phone:* 813/974--3120 *FAX:* 813/974-5168
Email: winters@eng.usf.edu
Order by Title

This report documents a special evaluation of the Hillsborough County Community Transportation Coordinator (CTC). The Board of County Commissioners is the official CTC designated by the Florida Commission for conducting the transportation disadvantaged (TD) program. The CTC is responsible for coordinating the provision of transportation services for the TD persons which includes developing and implementing its financial monitoring responsibility over the program. Recently the TD program was moved from Department of Social Services to Department of Financial Services. This report focuses and evaluates the following four proposed strategies that will improve the program and control costs: developing revised rates, establishing trip priorities, implementing a passenger co-payment, and refining and enforcing a passenger no-show policy. Each of the four strategies is evaluated separately. Based on the conclusions, recommendations are provided that directly relate to the four strategies reviewed. Each strategy appeared to have the potential to accomplish its intended purpose. However, their effectiveness have not been proven because they have not been fully implemented. The report notes that if the County was not the CTC, it is likely the program would shrink because access to funding would be difficult.

Talking Signs Remote Infrared Signage: A Guide for Transit Managers
The Smith-Kettlewell Eye Research Institute; Prepared for the FTA (Roger Tate, TRI-30) Project ACTION program of the National Easter Seal Society, June 1995, 21pp.

Available from:
Project ACTION
700 Thirteenth Street, NW, Suite 200
Washington, DC 20005 *Phone:* 202/347-3066 *FAX:* 202/347-4157
TTD/Voice: 1-800-659-6428 *EBB:* 202/637-9607
Email: projaction@aol.com *Web Site:* www.projectaction.org
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This guide is designed to provide the scope of information needed by transit agency managers to evaluate, specify, purchase, and install the technology *Talking Signs* (remote infrared signs) in transit facilities for use by visually impaired or print-disabled passengers. The project task was to install *Talking Signs* in a tri-level station in San Francisco and to test their effectiveness in providing wayfinding information to visually-impaired patrons. Project activities were guided by a Steering Committee comprised of administrators of agencies providing services to blind persons, and accessibility officials from the San Francisco Municipal Railway (MUNI) and the Bay Area Rapid Transit District (BART). At the conclusion of the project, the Steering Committee unanimously approved a final recommendation recommending remote infrared audible signage (*Talking Signs*) as the preferred technology enabling print-handicapped persons to travel independently in transit facilities.

Transit Operations for Individuals with Disabilities. TCRP Report 9
Transportation Research Board, National Research Council, EG&G Dynatrend, Burlington, MA, and Crain & Associates, Menlo Park, CA; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 125pp.
Report Number: TCRP Report 9

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-3214
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 9 *Price:* $27

This research is about transit agencies in North America that have developed innovative approaches to better serve customers with disabilities. The research purports to develop a methodology to design and evaluate integrated transit systems that 1) provide accessible integrated service complying with ADA, 2) facilitate use of ADA paratransit service, and 3) support service or system enhancements to encourage travel on accessible fixed-route by individuals with disabilities. Eight new approaches to the design and operation of such services are identified, including dial-a-ride and paratransit services that connect to fixed route service. Travel training programs, fare incentives, marketing efforts, and trip planning services are

identified as customer support services. A literature search and a survey of all public transit providers in the U.S. and Canada identified 624 agencies that have implemented various service options and enhancements to better serve customers with disabilities. Agencies improved such services by strengthening basic operational elements, such as vehicle and station design, equipment maintenance, accessible information and communications. Charts of information relating to transit providers reporting the use of each option are contained in Appendix B and referenced in sections of the text. This report will assist transit managers and planners in designing and evaluating integrated services that can be employed to encourage individuals with disabilities to use fixed-route services. An unpublished companion document entitled *Evaluating Transit Operations for Individuals with Disabilities* provides evaluation methodologies for analyzing five successful service options (service routes, feeder service, route deviation, low-floor buses, and fare incentives) identified in this report and examines the implementation process. This companion document, which analyzes costs, savings and operating issues of each service and compares the cost-effectiveness of the different options used, is available on loan from TCRP, 2101 Constitution Avenue, NW, Washington, DC 20418.

Tri-Wheeled Scooters Transported on Buses and Vans: Assessment of Securement and Restraint Issues

Volpe National Transportation Systems Center, U.S. Department of Transportation, David Spiller; Prepared for the FTA Office of Program Management (Robert Stout, TPM-10), October 1995, 178 pp.

Report Number: FTA-MA-26-9003-95-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, VA 22161 *Phone:* 703/487-4650FAX: *FAX:* 703/321-8547
NTIS Order Number: PB96-132030 *Price Code:* A08/$31

Transit systems are required under the ADA to accommodate all *common wheelchairs and mobility aids*, including tri-wheeled scooters. This report is a response to the expressed concerns of several transit systems regarding the safety of transporting tri-wheeled scooters and their occupants. It provides a comprehensive assessment of securement and restraint issues related to the transport of tri-wheeled scooters and their occupants on buses and vans used in public transit service. The study is limited to securement and restraint issues as they affect tri-wheeled scooters only. This report provides background information on scooter characteristics, mobility aid securement and occupant restraint systems, and mobility impaired population. It examines the complexity of the mobility-aid user system and provides an assessment of securement and restraint issues. Current and proposed standards are reviewed. An analysis of accident data and securement-related injuries and a discussion of issues related to the quantification of risk are also discussed. Key research findings are summarized followed by recommendations for US DOT-sponsored research and administrative action.

Conference on Household Travel Surveys: New Concepts and Research Needs
Transportation Research Board, National Research Council; Sponsored by the Transportation Research Board, Federal Highway Administration, Federal Transit Administration, and the Bureau of Transportation Statistics, 1996, 191pp.

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
Order by Title *Price:* $34
TRB Bookstore URL: http://www2.nas.edu/trbbooks

The purpose of the *Conference on Household Travel Surveys: New Concepts and Research Needs* which was held at the Beckman Center in Irvine, California, March 12-15, 1995, was to bring together researchers and representatives of federal, state, and local governments and private industry to determine the research needs and new concepts in household travel surveys. Concurrent workshops were held in which resource papers and changes were presented. The workshop topics included nonresponsive issues, interactive stated-response methodologies, data collection and new technologies. Summaries of each workshop are documented along with recommendations on research directions. This report documents the Keynote Address, *Household Travel Surveys: Cutting-Edge Concepts for the Next Century.* It also documents the following papers: *Nonresponse Issues in Household Travel Surveys; Scope and Potential of Interactive Stated Response Data Collection Methods; Resource Paper for Survey Methodologies Workshop; Travel Behavior Survey Data Collection Instruments; and New Technologies for Household Travel Surveys.* Biographical sketches of the Steering Committee members and a list of participants are included in this report.

Data Tables For the 1994 National Transit Database Report Year
DIGICON Corporation; Prepared for the FTA Office of Program Management (Linda Barnes, TPM-20), December 1995, 418pp
Project Number: FTA-MD-23-7001-95-3

Available from:
Federal Transit Administration
Office of Program Management, TPM-20
400 7th Street, SW, Room 9315
Washington, DC 20590 *Phone:* 202/366-6161 *FAX:* 202/366-7951
Order by Title
NTIS Order Number: PB96-188420 *Price Code:* A19/$57

The *Data Tables For the 1994 National Transit Database Report Year* is one of the three publications comprising the 1994 annual report of the National Transit Database (NTD) Reporting System. The purpose of the NTD Reporting System is to provide the necessary information upon which to base planning for public transportation services and making public sector investment decisions at all levels of government. This statistical report details the

individual financial and operating data submitted to the FTA by 489 of the nation's public transit operators. Data is reported on a disaggregate basis by transit agency, mode, and type of service provided. Numerous tables identify purchased and directly operated services. *Data Tables* consists of two chapters: *Introduction* -- designed to aid in interpreting and using the data presented; and *Data Tables* -- contains financial and operating data by specific mode for individual transit agencies. The Data Tables are organized in four major groups: transit revenues, transit expenses, non-financial operation data, and performance indicators. Of the 489 transit agencies reporting, 58 percent contract for some or all of their transportation service from private or public agencies. All data in this report are from transit agencies whose fiscal years ended between January 1 and December 31, 1994. This annual report is available on the FTA Home Page of the Internet at *http://www.fta.dot.gov*.

Fax-On-Demand Service
Bureau of Transportation Statistics, U.S. Department of Transportation, January 1996

Available from:
Bureau of Transportation Statistics,
400 7th Street, SW, Room 2104
Washington, DC 20590 *Phone:* 202/366-3282 *FAX:* 202/366-3640
Internet URL: http://www.bts.gov.
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The Bureau of Transportation Statistics (BTS) of the U.S. Department of Transportation has created a toll-free fax-on-demand system. This system is designed to provide statistical information via your fax machine using a touch-tone telephone. Materials include various statistical table from BTS products as well as preliminary *1993 Commodity Flow Survey* data, Census Transportation Planning Package subject locators, BTS press releases, and a BTS product order form. To obtain additional information or any BTS product, contact the Bureau of Transportation Statistics by telephone, 202/366-DATA; fax, 202/366-3640; or the Internet at www.bts.gov.

Florida Transportation Almanac
University of South Florida, Center for Urban Transportation Research, College of Engineering, May 1995, 281pp.

Available from:
University of South Florida
4202 E. Fowler Avenue, ENB 118
Tampa, FL 33620-5350 *Phone:* 813/974--3120 *FAX:* 813/974-5168
Email: ball@eng.usf.edu
Report Order Number: CUTR/Almanac 1995

This is the first annual edition of the 1995 Florida Transportation Almanac. It was prepared to assist transportation planners, managers, decisionmakers, and the general public by compiling transportation statistics and other transportation-related information in one volume. The Almanac

contains data from existing data sources throughout Florida and the U.S. It consists of the following eight sections: Demographics, Travel Behavior Characteristics, Modal Statistics (modal statistics for highways, aviation, public transportation, rail, seaports, transportation demand management, freight, and intelligent transportation systems), Tourism, Transportation Financing, Transportation Education and Research, Directory of Contact Information, and Miscellaneous (list of frequently used acronyms and metric conversion chart).

Forum on Future Directions in Transportation R&D: Conference Proceedings
Transportation Research Board of the National Research Council, and the National Science and Technology Council, 1995, 180pp.

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 220418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
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The *Forum on Future Directions in Transportation Research and Development,* cosponsored by the White House Office of Science and Technology Policy and the Transportation Research Board, was held at the National Academy of Sciences in Washington, DC, on March 6-7, 1995. The conference purpose was to bring together representatives from the transportation industry, academia, state and local governments, public interest groups, and other concerned parties to assist in the National Science and Technology Council's (NSTC) work of reexamining and refocusing the federal agenda for research and development (R&D). What was new about this event was the concerted effort to assess the federal transportation R&D agenda from the perspective of its customers -- those who implement and use the results of research. The input provided by the 170 participants was an important first step in establishing a long-term framework for developing a national transportation R&D agenda. This report documents the proceedings of the conference which include background presentations by representatives from the current Administration and Congress, resource papers, and discussions by participants.

1994 Federal Radionavigation Plan
U.S. Department of Transportation, Office of the Secretary (P-10), and U.S. Department of Defense, May 1995, 250 pp.
Report Number: DOT-VNTSC-RSPA-95-1

Available from:
U.S. Department of Transportation
Volpe National Transportation Systems Center, DTS-90
Kendall Square
Cambridge, Massachusetts 02142 *Phone:* 617/494-2117 *FAX:* 617/494-3125
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The Federal Radionavigation Plan (FRP) delineates policies and plans for radionavigation services provided by the U.S. Government to ensure efficient use of resources and full protection of national interests. Developed jointly by the U.S. Departments of Defense and Transportation, the FRP sets forth the federal interagency approach to the implementation and operation of radionavigation systems. The FRP is updated biennially. This eighth edition of the plan describes respective areas of authority and responsibility, and provides a management structure by which the individual operating agencies can define and meet radionavigation requirements in a cost-effective manner. It also contains the current policy on the radionavigation systems mix. This edition of the FRP builds on the foundation laid by previous editions and further develops national plans towards providing an optimum mix of radionavigation systems for the foreseeable future.

1995 Statistical Summaries Grant Assistance Programs
FTA Office of Program Management, Resource Management and State Programs Division, Jo Tucci, TPM-20; Prepared for FTA Office of Program Management, February 1996, 174pp.

Available from:
Federal Transit Administration
Office of Program Management, TPM-20
400 7th Street, SW, Room 9311
Washington, DC 20590 *Phone:* 202/3366-1657 *FAX:* 202/366-7951
Order by Title
NTIS Order Number: PB96-172796 *Price Code:* A09/$35

This annual report presents FY 1995 funding data for FTA's major discretionary and formula grant programs. Usage of these funds is identified by program, program element, urbanized area and state. For a longer range view of federal transit expenditures, historical data is included in this report. FY 1995 was an excellent year for transit. FTA grant obligations surged to $6.4 billion, the highest level ever achieved in the history of the programs. Capital obligations rose to a record of $5.4 billion. Of this amount, $1 billion was used to finance the purchase of nearly 9,000 transit vehicles; all of them are identified in this statistical report by type and size. Specific information about fixed guideway modernization and new systems expenditures are also cited. Statistical data are presented in the form of tables, charts, and graphs. A key factor in the rise of capital obligations is the flexibility provision of ISTEA, which created opportunities for increased funding for transit. Since FY 1992, almost $2.2 billion in ISTEA flexible funds have been transferred to FTA for use on transit projects. This report is available on the FTA Home Page of the World Wide Web at the following address: *http://www.fta.dot.gov.*

1995 Status of the Nation's Surface Transportation System: Condition and Performance. Report to Congress
U.S. Department of Transportation, Federal Transit Administration, Office of Policy Development (Richard Steinmann, TBP-10), Released November 1995, 400pp.
Report Number: FTA-TBP-10-95-2

Available from:

National Technical Information Service/NTIS
Springfield, VA 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-145479 *Price Code:* A18/$57

This 1995 *Conditions and Performance Report* is a US DOT report to Congress on the status of the Nation's surface transportation systems. It is the second in a series of combined documents (FHWA and FTA) on the conditions, performance and capital investment requirements of the nation's highway and transit systems. Key topics addressed in this report include detailed examinations of personal travel behavior, including demographic and economic trends, along with population movements and land use patterns; the nation's highway, bridge and transit systems and the financing, expenditures and usage associated with these systems. Projections of future investment levels needed to maintain and improve these systems are included. The study compares 1994 investment requirements with 1993 capital expenditures for all units of government for highway, bridge, and transit capital improvements. The average annual cost to maintain 1993 transit conditions and performance levels through the year 2013 is estimated at $7.9 billion; and the average annual cost to maintain overall 1993 conditions and performance on arterial, collector and local systems is estimated at $49.7 billion. Improving the highway system would require an average annual investment of $65.1 billion. The average annual cost to improve conditions and performance on the nation's transit systems is estimated at $12.9 billion through the year 2013. Four appendices are discussed in this report: Highway Data, Highway Methodology, Bridge Methodology, and Transit Methodology.

National Transit Summaries and Trends For the 1994 National Transit Database Report Year
DIGICON Corporation; Prepared for the FTA Office of Program Management (Linda Barnes, TPM-20), April 1996, 112pp
Project Number: FTA-MD-23-7001-96-1

Available from:
Federal Transit Administration
Office of Program Management, TPM-20
400 7th Street, SW, Room 9315
Washington, DC 20590 *Phone:* 202/366-6161 *FAX:* 202/366-7951
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NTIS Order Number: PB96-188404 *Price Code:* A07/$28

The *1994 National Transit Summaries and Trends* (NTST) report provides an overview of the national transit industry. NTST was developed from the National Transit Database (NTS) and highlights the aggregated financial and operating characteristics and trends for key statistics and performance indicators of the nation's transit industry. This fifth annual edition provides a picture of the entire transit industry in 1994, as well as 5-year and 10-year compilations of selected transit industry statistics. The report serves as a reference for transit professionals, researchers and policymakers. It is organized to offer a national transit profile with chapters on key modal characteristics of transit agencies, capital and operating funding and expenses, service supplied and consumed, safety, reliability and maintenance effectiveness. An appendix displaying an

aggregated national transit database report is included. The report shows that the number of NTD reporters by mode and type of service has grown by 11 percent since 1990, the number of reporters for bus declined between 1990-1992 and increased from 1992-1994, and the number of demand response reporters has increased steadily each year (20.5 percent more in 1994 than 1990). Purchased bus service has increased by 21.3 percent since 1990, while purchased demand response service has increased by 22.3 percent since 1990.

National Transportation Statistics 1996 *and* Transportation Statistics: In Brief
Bureau of Transportation Statistics, U.S. Department of Transportation, January 1996

Available from:
Bureau of Transportation Statistics,
400 7th Street, SW, Room 2104
Washington, DC 20590 *Phone:* 202/366-DATA *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet:* www.bts.gov
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This twenty-fourth edition of the *National Transportation Statistics 1996* (NTS) is a compendium of transportation and transportation-related statistics from a wide variety government and private sources. The purpose is to make accessible basic information on the nation's transportation system. The data illustrate transportation activity for the major transportation modes - air, automobile, bus, truck, transit, rail, water, and pipeline. Summary statistics, in five-year increments, are provided for 1960-1993, and 1994 where available. In some instances, data extend back to 1955 and are forecast through 1998. Information on transportation finances, performance, and safety; energy relationships; and the effect transportation has on the environment are illustrated. Additionally, preliminary statistics from the 1993 Commodity Flow Survey are presented. Metric Conversion tables are also provided where appropriate. The NTS 1996 is also available on the Bureau's *Transportation Data Sampler-3* CD-ROM in Excel format. The companion volume to the NTS publication is the *Transportation Statistics Annual Report* (TSAR) which provides a summary of the state of transportation systems and state of transportation statistics.

Nationwide Personal Transportation Survey CD-ROM
Bureau of Transportation Statistics, U.S. Department of Transportation, January 1996

Available from:
Bureau of Transportation Statistics,
400 7th Street, SW, Room 2104
Washington, DC 20590 *Phone:* 202/366-DATA *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet URL:* www.bts.gov
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The CD-ROM, Nationwide Personal Transportation Survey (NPTS), released by BTS contains statistics from the 1983 and 1990 Nationwide Personal Transportation Surveys conducted by the FHWA. These surveys measure daily travel patterns of individuals by economic, demographic,

and other characteristics, representing a sample of approximately 6,500 households in 1983 and 22,000 households in 1990. Topics such as household vehicle availability and use, annual miles per licensed driver, household travel rates, vehicle occupancy, and home-to-work trips are included. The CD-ROM also contains the Statistical Export and Tabulation System (SETS) software from the National Center for Health Statistics that allows users to browse and search the NPTS data and documentation; create customized tabulations; and export user-defined subsets of data to spreadsheet, database, and statistical software applications. This is the first time that these data are available in their entirety and in PC-accessible format. See BTS Home Page on the Internet at *www.bts.gov*.

Program of Research for HOV Systems. Transportation Research Circular.
Committee on High-Occupancy Vehicle Systems, Transportation Research Board, National Research Council; April 1995, 34pp.
Report Number: TR Circular No. 441

Available from:
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2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TR Circular No. 441

This document establishes a national research program for HOV systems. It has resulted from deliberations by members and friends of TRB's High-Occupancy Vehicle Systems Committee, open forums conducted at National HOV Systems Conferences, and from members of the research subcommittee. The report provides background information on both the committee's and subcommittee's activities and accomplishments. Two chapters cover program highlights, including key statistics, individual research problem statements and a plan for implementation. The final three chapters cover three main areas of HOV research: planning and design, operations and enforcement, and HOV systems on arterials. One of the first studies to be undertaken in the program is development of an HOV Systems Manual. It is proposed that the manual be updated periodically, thus, integrating current knowledge with the results of completed research projects.

Public Transportation 1995: Current Research in Operations
Transportation Research Board, National Research Council, 1995, 151pp.
Report Number: Transportation Research Record No. 1503

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TR Record No. 1503 *Price:* $30.00

This volume addresses the operational aspects of public transportation and presents new research. New ideas are explored and improved practices discussed. Potential application is real and holds significant promise of improved utility and better customer service. Part 1, *Bus, Paratransit and Electric Trolley Bus,* explores 10 topics: survey of feeder bus service in Miami central business district; electric bus operations in California; private bus service in Seoul, Korea; bus priority at traffic signals technology in Portland, Oregon; vehicle scheduling problem; optimal mixed bus fleet; paratransit in developing countries; electric trolleybus economics; and visual impacts of trolleybus overhead catenary system. In Part 2, eight topics related to rail, intermodal, and light rail research are presented: CBD-Midway Airport line in Chicago; historical perspective of street-running transit; diesel or electric power for commuter rail; intermodal passenger transfer facilities; rail access to airports; track noise mitigation; light rail transit safety in Calgary, Canada; light rail collision accidents analyses in San Jose, California.

Research Problem Statements for Design and Construction of Transportation Facilities. Transportation Research Circular Number 464
Transportation Research Board of the National Research Council, October 1996, 143pp.
Report Number: Transportation Research Circular Number 464

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TR Circular No. 464

This Circular supersedes Circular 417, November 1993. It reflects the TRB effort to stimulate research toward the solution of problems facing the transportation industry. Technical committees have developed and prepared the 173 research problem statements for dissemination. The aim of this activity is to provide guidance to financial sponsors such as governmental agencies, research institutions, industry, the academic community and others in allocating scarce funds and manpower to the solution of transportation problems. This Circular documents the 173 problem statements developed by 40 of the Group 2 Council's committees. The Circular is being distributed to a wide range of interest areas.

Telephone Contacts for Users of Federal Transportation Statistics 1996
Bureau of Transportation Statistics, U.S. Department of Transportation, January 1996, 23pp

Available from:
Bureau of Transportation Statistics,
400 7th Street, SW, Room 2104
Washington, DC 20590 *Phone:* 202/366-DATA *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet URL:* http://www.bts.gov
Order by Title

The *Telephone Contacts for Users of Federal Transportation Statistics 1996* is a 23-page document that lists the name, telephone and fax numbers, and e-mail addresses of transportation data professionals in the federal government, by mode, cross-referenced by their area of expertise. These individuals are points of contacts for data users requiring detailed knowledge about transportation statistics. Additionally, telephone numbers of federal transportation libraries and public affairs offices are cited. See BTS Home Page on the Internet (www.bts.gov).

Transit Planning and Research Reports: An Annotated Bibliography
Federal Transit Administration, Office Of Research, Demonstration & Innovation, Marina Drancsak, TRI-30, August 1995, 120pp.
Report Number: FTA-TRI-30-95-1

Available from:
National Technical Information Service/NTIS
Springfield, VA 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
Internet URL: http://www.fta.dot.gov
NTIS Order Number: PB96-111257 *Price Code:* A06/$25

This is the third edition of the *Transit Planning and Research Reports: An Annotated Bibliography*. It references the most current and available planning and research reports published as of August 1995 and sponsored by the FTA. The bibliography is a reference tool designed to provide easy and rapid access to FTA research products. It describes published research products of the FTA National Planning Research Program and the Transit Cooperative Research Program, as well as transit-related research materials from other agencies. In this bibliography, each project report is listed separately as a bibliographic entry accompanied by a report availability statement and a summary description of the published material. The final section of this report contains instructions on how to obtain FTA reports including ordering FTA sponsored reports from the National Technical Information Service/NTIS. It also includes a list of the FTA Regional Offices along with their street addresses, telephone and fax numbers.

Transit Profiles: Agencies in Urbanized Areas Exceeding 200,000 Population For the 1994 National Transit Database Report Year
DIGICON Corporation, T.N. Black, and Douglas A. Kerr/TPM-20; Prepared for the FTA Office of Program Management (Linda Barnes, TPM-20), December 1995, 317pp
Project Number: FTA-MD-23-7001-95-1

Available from:
Federal Transit Administration
Office of Program Management, TPM-20
400 7th Street, SW, Room 9315
Washington, DC 20590 *Phone:* 202/366-6161 *FAX:* 202/366-7951
Order by Title
NTIS Order Number: PB96-187356 *Price Code:* A05/$21.50

Transit Profiles summarizes the financial and operating data submitted to the FTA by the nation's public transit operators (489), pursuant to 49 USC 5335 (formerly Section 15 of the Federal Transit Act, as amended). These data represent a portion of the 1994 annual report and consists of individual profiles for each reporting transit agency located in an urbanized area with a population exceeding 200,000. Each profile consists of general and summary data, as well as modal, performance, and trend indicators. Specific financial and service characteristics, as well as capital funding and performance measures are listed for each mode. *Transit Profiles* provides the user with a comprehensive overview in graphic and summary format of an individual transit agency's financial and operating statistics for the 1994 report year with summaries of key data items for prior years. All data in this report are from transit agencies whose fiscal years ended between January 1 and December 31, 1994. This report is one of three publications comprising the 1994 annual report of the National Transit Database:: *(1) National Transit Summaries and Trends; (2) Transit Profiles (3 Volumes... The Thirty Largest Agencies, Agencies in Urbanized Areas With a Population of Less Than 200,000, and Agencies in Urbanized Areas Exceeding 200,000 Population);* and *(3) Data Tables for the 1994 National Transit Database Report Year.*

Transit Profiles: Agencies in Urbanized Areas With a Population of Less Than 200,000 For the 1994 National Transit Database Report Year
DIGICON Corporation; Prepared for the FTA Office of Program Management (Linda Barnes, TPM-20), December 1995, 255pp
Project Number: FTA-MD-23-7001-95-2 or FTA-MD-26-9002-95-3

Available from:
Federal Transit Administration
Office of Program Management, TPM-20
400 7th Street, SW, Room 9315
Washington, DC 20590 *Phone:* 202/366-6161 *FAX:* 202/366-7951
Order by Title
NTIS Order Number: PB96-188099 *Price Code:* A13/$47

This statistical report summarizes the financial and operating data submitted to FTA by the nation's public transit operators (489). These data represent a portion of the 1994 annual report and consists of individual profiles for each reporting transit agency located in an urbanized area with a population of less than 200,000. Each profile consists of general and summary data, as well as modal, performance, and trend indicators about a particular transit system for the 1994 report year. Specific financial and service characteristics, as well as capital funding and performance measures are listed for each mode. General information includes the size of the urbanized area, service area, service supplied and consumed, and the number of vehicles operated in maximum service. Financial information includes the sources of operating funds expended, summary of operating expenses, sources of capital funds expended, and use of capital funds. For 1994, information on operating funds expended is provided including retained and returned fares as part of passenger fares, and subsidies from other sectors of operations with local funds. Another new sections in the 1994 report includes reconciling cash expenditures, such as expense, rentals, and leases. The three appendices in this report provide a national profile of the reporting

agencies, list of transit agency reporting exemptions, and a cross-reference table. All data are from transit agencies whose fiscal years ended between January 1 and December 31, 1994.

Transit Profiles of the Thirty Largest Agencies For the 1994 National Transit Database Report Year
DIGICON Corporation; Prepared for the FTA Office of Program Management (Linda Barnes, TPM-20), December 1995, 85pp
Project Number: FTA-MD-23-7001-95-4

Available from:
Federal Transit Administration
Office of Program Management, TPM-20
400 7th Street, SW, Room 9315
Washington, DC 20590 *Phone:* 202/366-6161 *FAX:* 202/366-7951
Order by Title
NTIS Order Number: PB96-188412 *Price Code:* A06/$25

This publications consists of consolidated profiles for the 30 largest transit agencies in the U.S. Criterion used to determine these agencies is operating expense. Data contained in each profile consists of general and summary reports, as well as modal, performance, and trend indicators for the 1994 report year. Each agency profiled provides general information (size of urbanized area, service supplied and consumed, and the number of vehicles operated in maximum service) and financial information (sources of operating funds, summary of operating expenses, sources of capital funds expended, and uses of capital funds). Specific financial and service characteristics, as well as capital funding and performance measures are listed for each mode. The appendices provide aggregate data for the 30 largest agencies including the following modes: automated guideway, cable car, ferryboat, inclined plane, trolleybus, and vanpool. Modal data have also been totaled for the primary modes (bus, heavy rail, commuter rail, and light rail).

Transportation Acronym Guide
Bureau of Transportation Statistics, U.S. Department of Transportation, 1996, 64pp.

Available from:
Bureau of Transportation Statistics
U.S. Department of Transportation
400 7th Street, SW, Room 3430
Washington, DC 20590 *Phone:* 202/366-1270 *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet URL:* www.bts.gov
Order by Title

This second edition of the *Transportation Acronym Guide* is a reference document that identifies transportation and transportation-related acronyms used throughout the Department of Transportation, other U.S. government agencies, private transportation organizations, and Canadian and Mexican agencies. The acronyms are arranged in alphabetical order and are

followed by the definition and source citation. Specific documents, publications, or databases used to compile the Guide are identified in the Source Index.

Transportation Data Sampler-3 CD-ROM
Bureau of Transportation Statistics, U.S. Department of Transportation, January 1996, 23pp

Available from:
Bureau of Transportation Statistics,
400 7th Street, SW, Room 2104
Washington, DC 20590 *Phone:* 202/366-DATA *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet URL:* www.bts.gov
Order by Title

The CD-ROM, *Transportation Data Sampler-3* (TDS-3) is a compendium of information resources available from DOT and its allied agencies. It is a sequel to the TDS-2 released in 1994. Sampler-3 contains several new information resources as well as updates to a number of files contained on the TDS-2. New files include: the 1992 Truck Inventory and Use Survey (TIUS); Trucks Involved in Fatal Accidents; Worldwide Transportation Directory; Air Travel Consumer Report; Federal, State and Local Transportation Financial Statistics; Transportation Expressions; Transportation Acronym Guide; and the Transportation Statistics Annual Report, 1994. Sampler-3 also contains information in a variety of file formats, including several Macintosh-accessible resources. The CD-ROM also contains software that allows users to access documentation for the on-disc statistics and reports. Statistical Export and Tabulation System software from the National Center for Health Statistics is also provided for use with the TIUS data.

Transportation Expressions
Bureau of Transportation Statistics, U.S. Department of Transportation, 1996, 264pp.

Available from:
Bureau of Transportation Statistics
U.S. Department of Transportation
400 7th Street, SW, Room 3430
Washington, DC 20590 *Phone:* 202/366-1270 *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet URL:* www.bts.gov
Order by Title

This is the second edition of *Transportation Expressions*. The document contains a comprehensive set of transportation-related definitions used throughout the Department of Transportation, other U.S. government agencies, private transportation organizations, and Canadian and Mexican agencies. The terms are organized by their common name and are followed by the definition and source citation. Specific documents, publications, or databases used in *Transportation Expressions* are identified in the Source Index. Terms are cross-referenced within the document as well as within the Term Index.

Transportation in America 1996: Statistical Analysis of Transportation in the United States. Fourteenth Edition
Eno Transportation Foundation, Inc.; Sponsored by Bureau of Transportation Statistics/US DOT, with Cooperation of National Transportation Trade Associations, Private Organizations, and U.S. Government Agencies, 1996, Fourteenth Edition, 76pp.

Available from:
Eno Transportation Foundation, Inc.
44211 Slatestone Court
Lansdowne, Virginia 22075 *Phone:* 703/729-7200 *FAX:* 703/729-7219
Order by Title

Transportation in America is published annually by the Eno Transportation Foundation, Inc. This edition provides statistical data and other vital information for monitoring the many trends across a wide spectrum of the transportation picture in the U.S. The report provides statistical profiles of transportation in America in terms of the national economy, employment, gross national product, national economic and transport trends, freight and passenger bills, as well as domestic intercity freight, petroleum consumption and demand, annual earnings of employees, and others. The report provides one of the broadest and most comprehensive views of transportation in America today.

Transportation Research Information Services (TRIS) Database. Information Packet
Transportation Research Board of the National Research Council; Sponsored by FHWA, FTA, and NHTSA of the US DOT; Highway and Transportation Departments of 50 States; U.S. Army Corps of Engineers; American Automobile Manufacturers Association; National Asphalt Pavement Association; and Association of American Railroads

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Order by Title

This packet presents information about the Transportation Research Information Services (TRIS) database, a computerized information file maintained and operated by TRB. TRIS is available online through Knight-Ridder Information's DIALOG service as File 63 and SilverPlatter's CD-ROM Transport. TRIS contains information on transportation modes and practices, including planning, design, finance, construction, maintenance, equipment, traffic, operations, management, and marketing. TRIS contains more than 350,000 abstracts of completed research and summaries of research in progress. UMTRIS (Urban Mass Transportation Research Information Services) is FTA's computerized online database on worldwide transit research embodied in the TRIS database. It covers all phases of conventional, new and automated public transit. Literature searches are available to all customers. One free literature search from the database is offered each month to transit agencies.

Transportation Statistics Annual Report 1995
Bureau of Transportation Statistics, U.S. Department of Transportation, January 1996, 23pp

Available from:
Bureau of Transportation Statistics,
400 7th Street, SW, Room 2104
Washington, DC 20590 *Phone:* 202/366-DATA *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet URL:* www.bts.gov
Order by Title

The *Transportation Statistics Annual Report 1995* (TSAR) provides a summary of the state of the nation's transportation systems and the state of transportation statistics. This second edition of TSAR includes a thematic treatment of the Economic Performance of Transportation. The theme illustrates the trends in and factors governing productivity of transportation service providers, the contribution that public investments in transportation make to the overall economy, and the impacts of economic growth and change on the use and costs of highways, aviation, water transportation, and public transit. The companion to the TSAR publication is the *National Transportation Statistics* (NTS) which is a compendium of transportation and transportation-related data from a wide variety of government and private sources. NTS 1995 is the accompanying volume and currently in circulation. Together, these publications represent a continuing evolution of the effort to make the nation aware of its transportation resources.

Worldwide Transportation Directory
Bureau of Transportation Statistics, U.S. Department of Transportation, January 1996, 23pp

Available from:
Bureau of Transportation Statistics,
400 7th Street, SW, Room 2104
Washington, DC 20590 *Phone:* 202/366-DATA *FAX:* 202/366-3640
Toll Free: 800/671-8012 *Internet URL:* www.bts.gov
Order by Title

The *Worldwide Transportation Directory* lists, by continent, 1,751 contact points in 189 countries, plus 36 dependencies and areas of special sovereignties. Data entries are restricted primarily to government and quasi-government agencies and organizations. In addition to these, there are 59 transnational organizations that span the interests and responsibilities of several countries, and, in some cases, continents. Principal elements include country, continent, government transportation agencies and quasi-government agencies, contact person, telephone numbers, and addresses. Information also includes embassy e-mail addresses where available. See BTS Home Page on the Internet (www.bts.gov).

Art in Transit. Circular
FTA Office of Policy Development (Fred Williams, TBP-10), 1995, 14pp.

Available from:
Federal Transit Administration
Office of Policy Development, TBP-10
400 7th Street, SW, Room 9310
Washington, DC 20590 *Phone:* 202/366-4060 *FAX:* 202/366-7116
Order by Title

The FTA endorses the goal of making public transportation in every respect a first-rate experience. Circular 9400.1A, which is part of this brochure, revises FTA Circular 9400.1, reaffirms that costs for design and art are eligible costs for FTA-funded projects, provides guidance for the incorporation of quality design and art into transit projects funded by FTA, and, within recommended limits, leaves the allocation of funds for art to the discretion of the local transit agency. This brochure also illustrates the added value that art has brought to transit systems in metropolitan areas throughout the U.S.

Art in Transit...Making it Happen
New York State Metropolitan Transportation Authority, Wendy Feuer and Todd W. Bressi (Editor); Prepared for the FTA Office of Policy Development (Fred Williams, TBP-10), 1996, 42pp.

Available from:
Federal Transit Administration
Office of Policy Development, TBP-10
400 7th Street, SW, Room 9310
Washington, DC 20590 *Phone:* 202/366-4060 *FAX:* 202/366-7116
Order by Title
NTIS Order No: PB96-178611 *Price Code:* A04/$21.50

To provide the quality transit service necessary to attract new riders, FTA encourages agencies to pursue art and design excellence in their transit systems. Artists can play a unique role in this search for quality, as the case studies in this booklet demonstrate. Ten cases illustrate ways in which transit agencies have engaged artists, civic leaders, community residents, and businesses to change the way transit vehicles and facilities are designed. They illustrate the added value that art has brought to transit systems in metropolitan areas throughout the U.S. Each case study is descriptively and graphically profiled and accompanied by the "Lessons Learned." The projects profiled are models for agencies that are planning new transit investment and modernizing existing systems.

Bus Industry Summit Proceedings
FTA Office of Policy Development, William B. Menczer, TBP-10, December 1995, 92 pp.
Report Number: FTA-DC-26-6028-95-1

Available from:
Federal Transit Administration
Office of Policy Development, TBP-10
400 7th Street, SW, Room 9310
Washington, DC 20590 *Phone:* 202/366-4060 *FAX:* 202/366-7116
Report Order Number: FTA-DC-26-6028-95-1
NTIS Order Number: PB96-132055 *Price Code:* A06/$25

This *Bus Industry Summit Proceedings* report contains the results of the FTA-sponsored Bus Industry Summit that was held in Washington, DC on September 22, 1995. The summit brought together more than 35 representatives of bus manufacturers, suppliers, consultants, transit operators, and federal officials. The goal was to stimulate dialogue on the issues and challenges faced by the bus industry and to identify actions to address them. The report summarizes the discussions and outcomes of the summit. Chapter one presents remarks from the Secretary and Deputy Secretary of the US Department of Transportation, and from the Administrator of FTA. Chapter two includes presentations made by four representatives of the bus industry. Chapter three provides a summary of discussions that resulted from the presentations. Chapter four includes the papers presented at the summit. Chapter five contains the conclusions and the summit agenda. A list of participants is included in the appendix.

Commuter Choice Initiative
Association for Commuter Transportation, Washington, DC; Prepared for the FTA Office of Policy Development (William B. Menczer, TBP-10), FHWA, and US Environmental Protection Agency, June 1996, 54pp.
Project Number: FTA-DC-26-6029-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-186937 *Price Code:* A05/$21.50

The objective of this study was to analyze transportation commute choices and travel options and to select one or more options that potentially reduce the use of single-occupancy vehicles (SOVs). This study analyzed how changes in the treatment of transportation commute benefits in the Internal Revenue Code (IRC) could assist employers in providing these benefits to employees. It examines commute benefits currently offered to employees by their employers (transit passes) and proposed commute benefits (parking cash-out). Six scenarios were developed to explore changes to the IRC which could help shift the commute mode to non-SOV modes. Information about employer-practices and transportation benefits was obtained through a national telephone survey of 603 employers (June 1995), and through two regional symposia and two focus group meetings

of stakeholders. Based upon survey responses and public outreach activities, the results showed that over 81 percent of employers offered transportation benefits to employees; nearly all parking (99 percent) owned by employers is offered free to employees; transit benefits are provided by less than one percent of employers; and local land use policies heavily influence the amount of employer-provided parking. Recommendations endorsed changes in the IRC and increased the level of transit and vanpool benefits. The appendices list members of the Steering Committee and Task Force, document the paper *Parking Valuation Techniques and Methodologies*, and report on the two focus group meetings.

Federal Transit Administration 1996 Report Update
FTA Office of Policy Development (Fred Williams, TBP-10), 20pp

Available from:
Federal Transit Administration
Office of Policy Development
400 7th Street, SW, Room 9310
Washington, DC 20590 *Phone:* 202/366-4060 *FAX:* 202/366-7116
FTA Home Page on World Wide Web: http://www.fta.dot.gov
Order by Title

This report describes the benefits that our nation gains from transit investments and points to transit's importance in the years ahead. The nation faces many transportation challenges, from managing traffic growth to ensuring access to jobs and sustaining the environment for future generations. Public transit can help meet these needs by providing high-quality service in congested corridors, offering low-cost transportation access for millions of Americans, and supporting pedestrian-oriented business districts and neighborhoods. This report introduces estimates of the value of these benefits. These findings demonstrate the power of economic analyses as a tool for addressing many future transportation needs in the U.S. This *Transit 1996 Report* is also available on the FTA Web-site at *http://www.fta.dot.gov*.

How To Keep America Moving: ISTEA Transportation for the 21st Century
U.S. Department of Transportation, Office of Governmental Affairs, January 1997, 56pp.

Available from:
Office of Governmental Affairs
U.S. Department of Transportation
400 7th Street, SW, Room 10408
Washington, DC 20590 *Phone:* 202/366-4563
Order by Title

How To Keep America Moving is a report on the US DOT outreach program on reauthorization of ISTEA. Citizens and communities across America were called upon to discuss the issues of ISTEA and to help DOT prepare the reauthorization proposal that will carry the nation's transportation system into the next century. Regional forums were conducted and focus groups convened in every section of the country. The purpose of program was to take stock of where we

are with respect to ISTEA by gathering information from a diverse group regarding recommendations for changes. This report provides a summary of major themes highlighted by participants and serves as a resource during consideration of ISTEA's reauthorization. Four policy cornerstones structure the organization of this report: Economic Development and Competitiveness in Global Markets; Maximizing Return on Investment and System Performance; Partnerships and Flexibility in Making Transportation Choices; and Focusing on Outcomes for People and Communities. Within each are the themes and policy issues raised by the participants in the regional forums. Other sections include reports on the Secretary's objectives for ISTEA reauthorization, and nationwide ISTEA reauthorization focus groups conducted by FHWA, FRA, FTA, MARAD, and NHTSA.

1995 Status of the Nation's Surface Transportation System: Condition and Performance. Report to Congress
U.S. Department of Transportation, FTA Office of Policy Development (Richard Steinmann, TBP-10), Released November 1995, 400pp.
Report Number: FTA-TBP-10-95-2

Available from:
National Technical Information Service/NTIS
Springfield, VA 22161 *Phone:* 703/487-4650 FAX: 703/321-8547
NTIS Order Number: PB96-145479 *Price Code:* A18

This 1995 *Conditions and Performance Report* is a US DOT report to Congress on the status of the nation's surface transportation systems. It is the second in a series of combined documents (FHWA and FTA) on the conditions, performance and capital investment requirements of the nation's highway and transit systems. Key topics addressed in this report include detailed examinations of personal travel behavior, including demographic and economic trends, along with population movements and land use patterns; the nation's highway, bridge and transit systems and the financing, expenditures and usage associated with these systems. Projections of future investment levels needed to maintain and improve these systems are included. The study compares 1994 investment requirements with 1993 capital expenditures for all units of government for highway, bridge, and transit capital improvements. The average annual cost to maintain 1993 transit conditions and performance levels through the year 2013 is estimated at $7.9 billion; and the average annual cost to maintain overall 1993 conditions and performance on arterial, collector and local systems is estimated at $49.7 billion. Improving the highway system would require an average annual investment of $65.1 billion. In addition, the average annual cost to improve conditions and performance on the nation's transit systems is estimated at $12.9 billion through the year 2013. The four appendices discussed are: Highway Data, Highway Methodology, Bridge Methodology, and Transit Methodology.

Institutional Barriers to Intermodal Transportation Policies and Planning in Metropolitan Areas. TCRP Report 14
Crain & Associates, Inc. with Pacific Consulting Group, and Transportation Research Board, National Research Council; Prepared for FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 185pp.
Report Number: TCRP Report 14

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 14 *Price:* $47

This report is a valuable resource for executives, decisionmakers, managers, and planners from transit systems, local governments, MPOs, state DOTs and other individuals involved in implementing ISTEA, namely, those involved in planning, approving, and financing intermodal surface passenger transportation projects. The research objective was to develop strategies to overcome barriers and achieve a national intermodal transportation system to improve surface passenger mobility. This report identifies institutional barriers to intermodal transportation policies and planning, examines opportunities for improvement, and provides ten strategies to overcome current barriers and more effectively implement ISTEA. The research showed that the regulatory processes and culture of many federal, state, regional and local transportation entities impede the enactment of an intermodal vision, and that most decisionmakers and executives are pleased with the primary policies of ISTEA but have been frustrated by many of the implementing regulations.

Measuring and Valuing Transit Benefits and Disbenefits Summary. TCRP Report 20
Transportation Research Board of the National Research Council, Cambridge Systematics, Inc., with Apogee Research Inc.; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 50pp.
Report Number: TCRP Report 20

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 20 *Price:* $21

This research project (TCRP Project H-2) was designed to assess and advance the state-of-the-art in the measurement and valuation of transit benefits and disbenefits. The project developed a compilation and comparison of the transit benefits and disbenefits and measurement techniques found in previous studies and currently used in practice. This summary report categorizes and describes transit benefits and disbenefits. It presents the dimensions of transit's economic impact,

and addresses the linkages between increased transit investments and use, along with changes in long-term, regionwide economic conditions that can be measured with current analytic methods. The report also provides examples of transit benefits and disbenefits based on recent analysis. Results of this research are intended for use by transportation professionals and policymakers responsible for transit-investment decisions. Two reports were prepared by the research team: *Summary* (this report), and the *Final Report on Measuring and Valuing Transit Benefits and Disbenefits* (available on loan from TCRP).

Report on Funding Levels and Allocations of Funds for Transit New Starts. Report of the Secretary of Transportation to the United States Congress Pursuant to 49 U.S.C. 5309(m)(3) (Formerly Section 3(j) of the Federal Transit Act)
FTA Office of Policy Development (John Day, TBP-11); Prepared for the U.S. Congress, August 1996, 245pp
Report Number: FTA-TBP-10-96-3

Available from:
Federal Transit Administration
Office of Policy Development, TBP-10
400 7th Street, SW, Room 9310
Washington, DC 20590 *Phone:* 202/366-4060 *FAX:* 202/366-7116
NTIS Order Number: PB96-210927 *Price Code:* A12/$44
FTA Home Page: http://www.fta.dot.gov/library/money/3jfund/1998/3jFY1998.htm

The *Report on Funding Levels and Allocation of Funds for Transit New Starts* (commonly referred to as the "Section 3(j) Report") is an annual report to Congress recommending funding for new fixed guideway systems and extensions (new starts), such as a light rail line, a subway or a busway/HOV facility. This 1996 report (for FY 1997) recommended funding in the amount of $800 million for 17 projects, all of which have existing federal funding commitments (Full Funding Grant Agreements), or are expected to have a federal commitment before the end of FY 1997. The text of this report discusses the FY 1997 budget, the principles for allocation of funds, and the funding recommendations. The Appendix includes profiles of all projects with existing Full Funding Grant Agreements along with other projects and Major Investment Study activities for which funds have been appropriated or authorized in prior years.

Activity-Based Modeling System for Travel Demand Forecasting
RDC Inc.; Prepared for the Metropolitan Washington Council of Governments, U.S. Department of Transportation, and the U.S. Environmental Protection Agency, September 1995, 220pp
Report Number: DOT-T-96-02

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q 75th Avenue
Landover, Maryland 20785
Report Order Number: DOT-T-96-02 *Web Catalog URL:http://www.tsp.dot.gov*

This project is the first attempt to develop and implement a full-fledged activity-based policy analysis tool for a metropolitan region, and thereby examine whether activity-based approaches can be put to practical use. The project explores the feasibility of using activity-based methodologies to evaluate selected transportation demand management (TDM) policies. The study team implemented a prototype Activity-Mobility Simulator (AMOS), which is a dynamic microsimulator that replicates household responses to TDM measures, and applied it with data from the Washington, D.C. metropolitan area. AMOS was structured modularly. The study demonstrated that such a modeling approach can be implemented using data available from a typical metropolitan planning organization and can produce aggregate statistics of travel demand at levels comparable to conventional trip-based modeling systems.

Alternative Performance Measures for Transportation Planning: Evolution Toward Multimodal Planning
Georgia Institute of Technology, Dr. Michael D. Meyer; Prepared for the FTA University Research and Training Program (Elizabeth Solomon, TRI-30), December 1995, 82pp.
Project Number: FTA-GA-26-7000-95-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-172770 *Price Code:* A06/$25

ISTEA established an important foundation for multimodal planning in the U.S. Its focus on transportation system performance has created professional interest in a new planning concept called *performance-based planning*. This report presents the results of a project which examined the evolving understanding and use of multimodal performance measures within the transportation planning community. The study focused on incorporating mobility and accessibility concepts into performance-based planning. It discusses the historical evolution of the use of performance measures in transportation planning, a typology for incorporating performance measures into planning, and case studies of performance-based planning. Specific recommendations are

provided on how the planning profession should incorporate a broader definition of system performance into the planning process. In conclusion, mobility and accessibility are highlighted as important mobility measures. The study calls for incorporating accessibility measures into project, plan and system evaluation approaches, and for market segmentation and distribution affects of mobility and accessibility changes to be part of measuring system performance.

Building on the Past Traveling to the Future: A Preservationist's Guide to the ISTEA Transportation Enhancement Program
FHWA Office of Environment & Planning, and the National Trust for Historic Preservation, I. Mei Chan, Editor; 1996, 86pp.

Available from:
Federal Highway Administration
Office of Environment & Planning, HEP-32
400 7th Street, SW, Room 3301
Washington, DC 20590 *Phone:* 202/366-2065 *FAX:* 202/366-3409
FHWA Transportation Enhancement Clearinghouse: 202/463-064; 1-888-388-6832
Order by Title

Under ISTEA of 1991, the historic preservation and highway communities have new opportunities, such as the revitalized planning requirements and new National Scenic Byways Program, to reaffirm existing partnerships and establish new ones. This booklet's purpose is to describe and graphically portray some of the Transportation Enhancement projects and to show potential project sponsors what can be accomplished. The primary goal of the booklet is to provide a general understanding 1) of the way the Transportation Enhancement provision works at both federal and state levels and 2) of the implementation of the Transportation Enhancement provision, including its application process and project requirements. This document is both a how-to as well as an informational booklet written with a special focus on the preservation community. It is also an answer to such questions as the following: What are Transportation Enhancements? What is the application process for funding? What should I know or be aware of before applying for funding? What should I expect as a project sponsor? and To whom do I go for assistance? In addition to describing the application process for funding and the successful historic preservation projects, the booklet (appendices) provides supplemental information, namely, FHWA 1995 Guidance on Sources of Matching Funds and Guidance on Historic Preservation Enhancement Projects, a listing of State DOT Transportation Enhancement Managers, State Historic Preservation Officers, and National Trust for Historic Preservation Regional Offices. The 29 projects, described and graphically portrayed in this document, demonstrate that historic preservation is not only rewarding on its own terms, but also that investment in historic preservation can help revitalize a neighborhood, rebuild a community, and stimulate economic growth.

Conference on Major Investment Studies in Transportation (MIS)
Transportation Research Board, National Research Council, September 1996, 83pp
Report Number: Transportation Research Circular Number 463

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: Transportation Research Circular Number 463

This report documents the proceedings of the *Conference on Major Investment Studies in Transportation (MIS)*, held in San Francisco, California, on February 25 - 28, 1996. The FHWA and the FTA called for this conference on major investment studies (MIS) regulations, which have been in effect for more than two years, to bring together state and local practitioners who were performing major investment studies to decide how well the process is working and whether improvements were needed. The report documents the conference focus, namely, four topics: policy issues, the relation of MIS to the overall planning and project development process, management and institutional issues affecting MIS, and the transportation decision process for the MIS. Highlights of panel discussions and workshop deliberations for each issue are also presented.

Consideration of the 15 Factors in the Metropolitan Planning Process: A Synthesis of Highway Practice
Transportation Research Board, National Research Council, Thomas F. Humphrey; Prepared for the TRB National Cooperative Highway Research Program, 1995, 62pp.
Report Number: NCHRP Synthesis 217

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: NCHRP Synthesis 217 *Price:* $14

This synthesis will be of immediate interest to land use and transportation planning officials, with special interest to state, regional, and local planners and administrators who must respond to the requirements of ISTEA. The purpose is to summarize, document and better understand the manner in which MPOs are meeting the requirements for metropolitan planning as defined by ISTEA. The overall significance of this synthesis lies in its summary of the early struggles and successes by several MPOs in meeting new federal requirements imposed by ISTEA and the 1990 Clean Air Act Amendments (CAAA). This synthesis documents some of those evolving experiences that helped transform the urban transportation planning process to meet the new challenges. It discusses the process for incorporating the 15 factors contained in ISTEA into land use and transportation plans by the MPOs and the 23 factors into statewide plans by state

planning agencies, as well as requirements for reductions in air pollution under the CAAA. All of these are discussed in this report. In-depth case study material is presented on MPOs for each of the following four urbanized areas: Albany, New York; Boston, Massachusetts; Charlotte, North Carolina; and Pittsburgh, Pennsylvania. The overall observations and conclusions are summarized in this document and provide a view from the MPO perspective. The study concludes that ISTEA has helped to place more emphasis on planning elements such as freight planning, land use planning, and intermodal considerations, and to focus resources on immediate needs rather than on old problems.

Corridor Preservation: Case Studies and Analysis Factors in Decision-Making
Rivkin Associates; Prepared for the FHWA Office of Real Estate Services, HRE-20 (formerly Office of Right-of-Way), 1996, 208pp.
Report Number: FHWA-PD-96-044

Available from:
Federal Highway Administration
Office of Real Estate Services, HRE-20
400 7th Street, SW, Room 3221
Washington, DC 20590 *Phone:* 202/366-0142 *FAX:* 202/366-3780
Order Number: FHWA-PD-96-044

ISTEA encourages both state transportation agencies and MPOs to consider transportation corridor preservation in formulating transportation plans, to identify corridors whose protection would be in the public interest, and to establish strategies for protecting those corridors. This Volume One study presents a range of tools or strategies that have been used to preserve highway corridors during the pre-ISTEA era. It reviews the background of current interest in corridor preservation and examines experience in nine states engaged in preservation activities: Arizona, California, Delaware, Florida, Georgia, Nevada, North Carolina, Oregon, and Utah. Volume 1 study provides guidelines to transportation officials who must determine priorities for corridors to preserve, allocation of resources and strategies for preservation efforts. Part One presents the *Context for Corridor Preservation* and describes the study methodology and activities investigated in the case states. Part Two presents a *Typology of Corridor Preservation* which identifies three types of programs, outlines their basic characteristics, and provides detailed examples of experience for the case states. Part Three presents *Guidelines for Decision-Makers* based on lessons learned from case studies. The text portion of the 1994 Report to Congress on Preservation of Transportation Corridors is included in the appendix along with the Executive Summary of the 1990 AASHTO Task Force on Corridor Preservation.

Corridor Preservation: Study of Legal and Institutional Barriers
Daniel R. Mandelker, AICP, and Brian W. Blaesser, Esq. of Robinson & Cole; Prepared for the FHWA Office of Real Estate Services, HRE-20 (formerly Office of Right-of-Way), 1996, 189pp.
Report Number: FHWA-PD-96-045

Available from:
Federal Highway Administration
Office of Real Estate Services, HRE-20
400 7th Street, SW, Room 3221
Washington, DC 20590 *Phone:* 202/366-0142 *FAX:* 202/366-3780
Report Order Number: FHWA-PD-96-045

This Volume Two study addresses corridor preservation as a planning and implementation strategy for transportation programs. Its purpose is to identify and present an analysis of legal and institutional barriers surrounding the acceptance and use of corridor preservation strategies, and to propose measures for removing those barriers that can create an effective corridor preservation program. Techniques are examined that can make corridor preservation more successful. The study indicates that police power measures and access management have the most potential as techniques to be used in corridor preservation. The report includes six appendices: Glossary of Terms; Federal Programs Pertaining to Railroad rights-of-way; Documents Obtained Through Individuals and Agencies Contacted; Bibliography; Selected Statutes Authorizing Corridor Maps, and Author Profiles.

Data Collection in the Portland, Oregon Metropolitan Area Case Study.
Travel Model Improvement Program
Cambridge Systematics, Inc.; Prepared for the FHWA, FTA, Office of the Secretary, and U.S. Environmental Protection Agency, June 1996, 200pp.
Report Number: DOT-T-97-09

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Order Number: DOT-T-97-09 *Web Catalog URL: http://www.tsp.dot.gov*

The need to update Portland's current travel demand system, which is based on a 1985 household survey, generated this study. In this report, the Portland Metropolitan Service District (Metro) is showcased as an example of innovative and comprehensive data collection. Portland is one of the first urban areas in the country to undertake a region-wide home interview survey that is explicitly designed to support the development of a new generation of travel demand models. This case study report describes the data collection program and the associated travel demand modeling system improvements that these data support. It discusses the Household Activity and Travel Behavior Survey carried out in 1994-95, presents the overall data collection program that

supports Metro's travel demand modeling activities, and discusses the use of past surveys in estimating and updating Metro's current model system. Metro is highlighted as a successful program using state-of-the-art techniques. The use of GIS in the travel demand modeling process is recommended to help coordinate land use and transportation planning. This case study concludes with an assessment of Metro's data collection program, recommendations to other agencies, and a discussion of the applicability of the Portland experience elsewhere.

Developing Effective Congestion Management Systems: Four Case Studies
Capital District Transportation Committee, Metropolitan Washington Council of Governments, North Central Texas Council of Governments, and Puget Sound Regional Council; Prepared for FHWA and FTA of the U.S. Department of Transportation, November 1995, 230pp.
Report Number: DOT-T-96-06

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q 75th Avenue
Landover, Maryland 20785
Report Order Number: DOT-T-96-06 *Web Catalog URL:http://www.tsp.dot.gov*

The objective of this research is to develop an improve understanding of the technical and institutional issues related to the development, implementation, and operation of ISTEA Congestion Management Systems (CMS). Four case study reports are presented that chronicle early CMS development and implementation experiences in the following metropolitan areas: Albany, New York; Washington, DC; Dallas/Ft. Worth, Texas; and Central Puget Sound, Washington. The reports are intended to increase professional knowledge of those working to develop, implement, and sustain congestion mitigation and mobility enhancement activities. Examples of practice are presented which have potential application to any number of local, regional or statewide performance-based planning initiatives. The four reports vary in discussion from the technical and institutional to the planning process in general. The information presented is relevant to MPO and state DOT staffs working with CMS -- one of the six management systems outlined in ISTEA.

Enhanced Planning Reviews. Final Reports
Volpe National Transportation Systems Center; Prepared for the FTA Office of Planning (Candy Noonan, TPL-10), and the FHWA Office of Environment and Planning (Sheldon Edner (FHWA), 1996.

Available from:
Federal Transit Administration
Office of Planning
400 7th Street, SW, Room 6100
Washington, DC 20590 *Phone:* 202/366-1648 *FAX:* 202/493-2478
Volpe Center, DTS-49 *FAX:* 617/494-3260

Email: vanderwild@volpe2.dot.gov
FTA Home Page/World Wide Web: http://www.fta.dot.gov/
Order by Title

The FTA and the FHWA have initiated a series of joint Enhanced Planning Reviews (EPRs) to assess the impact of ISTEA on the transportation planning processes in metropolitan areas. The EPRs examined the impact of planning on transportation investment processes and provided a technical evaluation of planning and programming processes, covering such topics as: Financial Constraint and Planning, Major Investment Studies, Congestion Management Systems, Links Between Transportation and Air Quality Conformity, Public Involvement, ISTEA Planning Factors, and Travel Demand Forecasting. The EPRs highlight national issues and trends, and document national case studies of best professional practice with implications for national policy and current transportation planning practice. Copies of EPR final reports, published in 1996, are available for the following cities: Honolulu, Miami, New York, and Salt Lake City. Also available are Independent Planning Review reports for the following: Chicago, Denver, Houston, Kansas City, Minneapolis-St. Paul, Pittsburgh, Portland, Sacramento, and Southern California. All planning review reports can be downloaded from the FTA Home Page on the World Wide Web of the Internet at URL: *http://www.fta.dot.gov.*

Examples of Statewide Transportation Planning Practices
Balloffet and Associates, Inc.; Prepared for the FHWA and the FTA, January 1995, 131pp.
Report Number: FHWA-PD-95-018

Available from:
Federal Highway Administration
Intermodal and Statewide Programs Division
400 7th Street, SW, Room 3301
Washington, DC 20590 *Phone:* 202/366-0233 *FAX:* 202/366-7660
Order Number: FHWA-PD-95-018

Statewide transportation planning as required by ISTEA is new and in its infancy. This report, *Examples of Statewide Transportation Planning Practices,* presents 21 case studies that document the innovative approaches and practices employed by states in response to ISTEA statewide transportation planning. The purpose of the report is to disseminate these innovative practices across the country to enhance the approaches states use in addressing statewide transportation planning including the 23 planning factors. It will enable states to better understand and assess their own efforts and make the necessary changes to improve or streamline their own practices. To simplify the organization of this report, elements of the 23 planning factors were grouped into eight categories: Coordination of Statewide and Metropolitan Planning; Form and Content of Statewide Transportation Plans and Improvement Programs; Comprehensive Transportation Planning; Management Systems; Public Involvement; Social, Economic and Environmental Issues; Transportation System Management and Operations; and Investment and Finance Issues. Each case study practice is profiled separately under one or more of the eight categories. A list of acronyms and a glossary are included in this report.

Florida's Commute Alternatives Systems Handbook
University of South Florida, Center for Urban Transportation Research; Prepared for the Florida Department of Transportation, May 1996, 120pp.

Available from:
University of South Florida
Center for Urban Transportation Research
4202 E. Fowler Avenue, ENB 118
Tampa, Florida 33620-5350 *Phone:* 813/974-3120 *FAX:* 813/974-5168
Order by Title

This manual was developed to inform developers, planners, employers, and others about transportation demand management (TDM) and how it can enhance the quality of life in Florida. It explains how to prepare a TDM plan and develop a TDM program or transportation management organization, and how to carry out TDM strategies via trip reduction ordinances. Basically, TDM reduces traffic congestion and pollution by influencing changes in travel behavior. The manual is divided into six sections. The manual defines and provides a general overview of TDM and the Florida Commuter Assistance Program. It focuses on transportation, growth management problems, and state and federal legislation that require the use of TDM strategies. Various TDM strategies are examined including: ridesharing pools, alternative work hours, telecommuting, parking management, HOV lanes, pedestrian and bicycle alternatives, trip reduction ordinances, and ITS applications. The final section describes state, federal and other funding organizations and provides a glossary and a bibliography

Guide to Metropolitan Transportation Planning Under ISTEA: How the Pieces Fit Together
FHWA Office of Program Development, and FTA Office of Policy Development, U.S. Department of Transportation, July 1995, 42pp.
Report Number: FHWA-PD-95-031

Available from:
Federal Highway Administration
Office of Environment & Planning, HEP-41
400 7th Street, SW, Room 3240
Washington, DC 220590 *Phone:* 202/366-2069 *Hotline:*202/366-2069
Report Order Number: FHWA-PD-95-031

This *Guide to Metropolitan Planning* was prepared in an easy-to-read format to provide a framework for linking the various elements of ISTEA's transportation planning process together, and to provide information, suggestions, and examples of ways to carry out the metropolitan planning process. The Guide is designed for transportation professionals, elected officials, and policymakers, as well as community and business interests, who want to understand and participate in the transportation planning and decisionmaking process.

Guidelines for Development of Public Transportation Facilities and Equipment Management Systems. TCRP Report 5
Transportation Research Board, National Research Council, Parsons Brinckerhoff Quade & Douglas, Inc.; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 60pp.
Report Number: TCRP Report 5

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 220418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 5 *Price:* $22.00

The guidelines documented in this report are intended to be a useful and complete reference for those developing Public Transportation Facilities and Equipment Management Systems (PTMs) throughout the U.S. They are written for the staffs of various stakeholder agencies in each state, including DOTs, MPOs, and transit agencies, to clarify the intent of the federal PTMS regulations and to assist in formulating systems that meet the needs of their state. Basically, a PTMS is a tool to help states and regional planning agencies make sound investment decisions regarding their transit assets. These guidelines were developed to identify those benefits and help stakeholders understand the PTMS process and their role in that process, determine which type of PTMS is appropriate to meet their needs, and provide some standardization or communication among the systems that are implemented. The summary portion of the report provides answers to questions asked most often about the PTMS process. The text reviews the legislative history of the PTMS, its benefits and relationship to other management systems, and discusses federal requirements and types of PTMS. The text also provides an overview of the PTMS process, defines issues related to successfully implementing a PTMS and describes implementation steps. Appendices A and B are intended as guides to define transit assets and determine the level of detail to be used in a PTMS. Appendices C-F present a list of reference documents, list of published standards for transit assets, bibliography, and a glossary of acronyms.

Guidelines for the Development of Wetland Replacement Areas
Transportation Research Board, National Research Council, URS Consultants, Inc., and Environmental Concern, Inc.; Prepared for the FHWA National Cooperative Highway Research Program, 1996
Report Number: NCHRP Report 379

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: NCHRP Report 379 *Price:* $65

This report presents procedural guidelines and techniques for state highway agencies, their consultants, and others for the design and construction of replacement wetlands. It contains a well-defined eight-step, wetland replacement process which includes techniques for locating, designing, constructing, maintaining, and monitoring wetland replacement sites. The report is supplemented by appendices that discuss various aspects of wetland creation and restoration. The research included examination of existing wetland replacement literature and scientific data, interview of personnel with wetland replacement experience, development of procedures for a wetland replacement process and preparation of this document. The guidelines will be of interest to those involved with wetland replacement areas (e.g., engineers, environmentalists, planners, and regulators) and to those involved with wetland banks. Wetland replacement is defined as a design or implemented design for a constructed, restored or enhanced wetland.

Guidelines for Transit Facility Signing and Graphics. TCRP Report 12
George A. Earnhart, KRW Inc., Alexandria, Virginia, and the Transportation Research Board, National Research Council; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 71pp.
Report Number: TCRP Report 12

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 12 *Price:* $24

Signs and symbols in transit operations convey vital information needed by riders to successfully use the system. This report presents a comprehensive set of guidelines that will assist transit operators in the use of appropriate signs and symbols for their facilities, and in the provision of passenger information systems that encourage use of transit. The guidelines were developed to provide an understanding of three principal elements of a signage system design, namely: defining and understanding user needs; applying the principles of wayfinding design; and providing basic guidelines for copy style and size, terminology, uniform symbols, colors and shapes, and placement signs. Guidelines were developed from numerous sources and include the best practices in the use of signs and symbols. The intent is to lead transit providers through the entire process from wayfinding design to actual installation of the signs. Overall, more than 30 agencies nationwide and in Canada were surveyed and their current practices reviewed. Project activities included the review and documentation of the state of the practice, as well as the design of candidate symbols and signs and their evaluation by a broad cross section of transit riders and non-riders, graphic designers, and transit personnel. Included in this report is the set of graphic symbols recommended for use in transit facilities.

Impact Assessment of the Virginia Railway Express Commuter Rail on Land Use Development Patterns in Northern Virginia
Northern Virginia Planning District Commission: Prepared for the Federal Transit Administration Region III Office, December 1993, 253pp.
Report Number: DOT-T-95-18

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q 75th Avenue
Landover, Maryland 20785
Report Order Number: DOT-T-95-18 *Web Catalog URL:http://www.tsp.dot.gov*

This report will assist local officials and planners to better understand the potential impacts that a new commuter rail system might have on land use changes and local economic development in suburban areas. It will help communities better understand linkages between commuter rail service, attraction of the rail corridor, and the suburbanization process. The study is based on two hypotheses: 1) introduction of a new commuter rail service into a metropolitan suburban area results in future land use changes which may not have occurred if the rail service had not been introduced, and 2) characteristics and intensity of these land use changes would decrease with distance from rail stations. The study purpose was to establish a starting point, identify variables and document conditions in Northern Virginia against which future conditions may be compared. This report assesses the impact of a new commuter rail system, the Virginia Railway Express (VRE), on land use changes and economic development in suburban areas of Northern Virginia. It provides background information, discusses commuting conditions prior to VRE service and effects of VRE on commuters with low and moderate incomes. It also compares local transportation plans in effect in 1984 with those in effect in 1992, and discusses private sector initiated land use activities such as zoning and building permit trends. In surveys of persons familiar with the VRE, 34 percent indicated that two miles or less in distance was "near" a VRE station and 36 percent felt up to five miles was near.

Incorporating Feedback in Travel Forecasting: Methods, Pitfalls and Common Concerns. Travel Model Improvement Program
COMSIS Corporation; Prepared for the FHWA Office of Environment and Planning, FTA, Environmental Protection Agency, and Department of Energy, March 1996, 120pp.
Report Number: DOT-T-96-14

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-96-14 *Web Catalog URL: http://www.tsp.dot.gov*

The purpose of this research is to support states and MPOs in their responses to the new regulatory requirements for emission modeling and to support continuing improvement of travel demand modeling. The research examines the feasibility and impacts of introducing feedback into the traditional four-step forecasting process, which is the common method for producing regional and metropolitan travel forecasts. This report explores a variety of methods for introducing feedback into the four-step method. It provides guidance on when, where, and how to implement the basic feedback mechanisms within the four-step travel forecasting process; examines issues and concerns that the practitioner should be aware of when implementing feedback; describes the mechanics of how to implement feedback within the process; and provides an examination of results from application of feedback for two test cases (Memphis, TN and Salt Lake City, UT). The final chapter addresses complex issues and identifies common pitfalls in the practical application of feedback.

Innovations in Transportation and Air Quality: Congestion Mitigation and Air Quality Improvement Program. Brochure
FHWA Office of Environment and Planning, and FTA Office of Planning (Abbe Marner, TPL-20), 1996, 34pp.
Report Number: FHWA-PD-96-016

Available from:
Federal Highway Administration
Office of Environment and Planning, HEP-41
400 7th Street, SW, Room 3240
Washington, DC 220590 *Order by FHWA Hotline:* 202/366-2069

The Congestion Mitigation and Air Quality Improvement (CMAQ) program has come a long way. The 12 projects highlighted in this brochure illustrate the distance CMAQ has come, namely, its creative opportunities to build new partnership in the public and private sectors and CMAQ's flexible funding opportunities to develop transit and intermodal improvement projects that focus on the customer (*guaranteed ride home programs)*, as well as on vehicles and fuels. Inspection and maintenance programs, estimated to reduce emissions by 28 percent, and the conversion of public fleets to cleaner fuels are examples of newly eligible program activities. Currently underway and showcased in this brochure are CMAQ projects ranging from Phoenix *Clean Air Campaign,* a public education and outreach program, to San Francisco's *Freeway Service Patrol,* an incident management program; and from New York's *Red Hook Barge*, an intermodal freight operation, to Glendale's award winning *Parking Management Program*. Projects in this brochure show that the CMAQ program has been in step with ISTEA's effort to revamp the transportation planning process toward an intermodal focus.

Institutional Aspects of Metropolitan Transportation Planning
Transportation Research Board, National Research Council, Katherine F. Turnbull (editor) of the Texas Transportation Institute; Prepared for the FTA and the FHWA, December 1995, 62pp.
Report Number: TR Circular Number 450

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-3214
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TR Circular Number 450

These proceedings summarize the highlights from the *Conference on Institutional Aspects of Metropolitan Transportation Planning* which was held on May 21 - May 24, 1995, at Williamsburg Hospitality House in Williamsburg, Virginia. It brought together 150 individuals from throughout the country to discuss the status of metropolitan transportation planning in light of new roles and responsibilities associated with ISTEA. The conference objectives were to assess MPO responses to ISTEA requirements, examine MPO resources and capabilities of assuming new responsibilities, assess relationships between MPOs and state and local agencies, and identify additional research and technical assistance needs to help meet ISTEA mandates. This report documents the keynote address, general session presentations, and workshop summaries. Issues and opportunities, strategies, actions and research needs identified by each workshop are also documented. Results will benefit FHWA, FTA, TRB, MPOs, states and other groups interested in enhancing the metropolitan planning process.

Intermodal Freight Terminal of the Future
Transportation Research Board of the National Research Council; Prepared for the Maritime Administration, American Association of Port Authorities, American Trucking Associations, and Intermodal Association of North America, July 1996, 278pp.
Report Number: Transportation Research Circular Number 459

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: Transportation Research Circular Number 459

Concern about escalating capital pressures on U.S. seaports prompted the Maritime Administration (MARAD) to initiate with the Transportation Research Board (TRB) a national conference on the *Intermodal Freight Terminal of the Future.* It was held in conjunction with another TRB conference, *National Conference on Intermodalism: Making the Case, Making It Happen.* Pairing of the two conferences was stimulated by ISTEA which set forth a new transportation agenda for the U.S. The participation and feedback from the 575 attendees validated the timeliness of these complementary conferences. Papers in this Circular describe the state-of-practice in management and technology issues as perceived by leaders in North American and European terminal planning. The papers also address the evolving nature of the intermodal industry. Topics covered range from Global Economics and Forecasting Tomorrow's Terminal to European Perspectives, Information Technologies and New Directions. A list of participants is included in this conference report.

Long Island Rail Road Transportation Hub Integration Study. Volume 1
Buckhurst Fish & Jacquemart, Inc., in association with Urbanomics, Inc., and John W. Follis: Prepared for New York Metropolitan Transportation Authority, July 1995, 51pp.
Project Number: FTA-NY-08-0001-95-1

Available from:
Buckhurst Fish & Jacquemart Inc.
72 Fifth Avenue
New York, NY 10021 *Phone:* 212/620-0050 *FAX:* 212/633-6742
Report Order Number: FTA-NY-08-0001-95-1

This 2-volume study documents the findings and recommendations of a study to evaluate the feasibility of developing integrated regional transportation hubs for Long Island Rail Road (LIRR) stations. The purpose for developing hubs was to increase suburban mobility and use of public transit on Long Island through better multimodal service coordination, more convenient and attractive station facilities, and through increased amenities at the rail stations. The study focused on the key issues of hub services and amenities. Phase 1, documented in Volume 1, involved a literature review of other transportation hubs as well as customer services and amenities associated with hubs and selection of candidate hub sites. Appendix B provides a summary table and a one page profile of customer services and amenities of the six commuter rail hub stations surveyed. Appendix C provides station plans for Toronto's Oakville Station, New Jersey Transit's Metro Park Station, San Diego's 12th and Imperial Station, and Los Angeles' proposed Chatsworth Station. Volume 2 focuses on development of hub concepts for the five candidate hub sites. The findings and hub concepts of this study may be applicable to other rail operators to enhance station areas and improve mobility.

MPO Capacity: Improving the Capacity of Metropolitan Planning Organizations to Help Implement National Transportation Policies
U.S. Advisory Commission of Intergovernmental Relations; Prepared for the FHWA, May 1995, 70pp.
Report Number: Commission Report A-130

Available from:
U.S. Advisory Commission on Intergovernmental Relations
800 K Street, NW, Suite 450 South Building
Washington, DC 20575
Report Order Number: Commission Report A-130
FTA Office of Planning *Phone:* 202/366-4884 *FAX:* 202/493-2478

New expectations and new roles for the nation's 339 MPOs under ISTEA generated this capacity-building study. The study purpose was to explore the MPO universe and to identify the type of assistance MPOs need to build their capacities to more fully implement ISTEA. The study begins on the premise that many of the MPOs need help in fulfilling ISTEA expectations and outlines their initial experiences in seeking to comply with the law. Interviews (240) were conducted with a broad range of persons along with examination of MPO documents. Basically,

the study takes a close look at the new expectations created by ISTEA; summarizes the findings of recent conferences, surveys, and studies that have addressed MPO capacity issues; and briefly reviews capacity-building assistance. In addition, the report summarizes field observations of 18 MPOs providing federally required transportation planning in the 12 representative metropolitan areas selected for this case study. Charts and tables profile the capacity-building needs of MPOs along with 58 separate types of requested help and other related characteristics. Based on the findings, the Commission concluded that efforts to improve the capacity of MPOs to perform their ISTEA tasks should be built around three interrelated principles: education more than regulation, common understanding among all partners about what ISTEA requires in a practical working sense, and a closer working relationship among all partners in the MPO process.

National Conference on Intermodalism: Making the Case, Making It Happen
Transportation Research Board of the National Research Council; Prepared for the FHWA, FTA, Maritime Administration, and Office of Intermodalism, 1996,
Report Number: Conference Proceedings 11

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: Conference Proceedings 11 *Price:* $45

This conference and the *Intermodal Freight Terminal of the Future* conference ran concurrently on December 7-9, 1994. The second focused on technical and institutional issues related to freight terminal planning and design. Papers from the second conference appear in the Transportation Research Circular Number 459, July 1996 (see p.93). The two concurrent conferences were intended to serve as an interactive idea fair. Participants commented that an intermodal future would be characterized by a paradigm shift, continuous innovation, and market-driven decisions. This proceedings report documents the plenary sessions including keynote addresses and reports from members of the National Commission on Intermodal Transportation. The appendix includes case studies, corporate profiles and a listing of conference participants. The case studies developed by the participants are snapshots of progress toward realizing intermodal systems, i.e., snapshots ranging from policy funding innovations to technical solutions. The conference proceedings provides the reader with a workbook of ideas and a directory of diverse national initiatives upon which to draw.

National Transportation Network Analysis Workshop Proceedings
Cambridge Systematics, Inc.; Prepared for the Office of the Secretary of Transportation, U.S. Department of Transportation, 1997, 95pp.
Report Number: DOT-T-97-05

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-97-05 *Web Catalog URL: http://www.tsp.dot.gov*

This report documents the proceedings of the *National Transportation Network Analysis Workshop* held September 6-7, 1995, in Arlington, Virginia. The workshop was designed to develop a National Transportation Network Analysis Capability (NTNAC) for the National Transportation System (NTS). NTNAC is an analytical process at the OST level. The report begins by introducing NTS as a system that will "allow planners to study the national transportation system as a whole." It is presented as a system that will build on ISTEA intermodal concepts, identify bottlenecks and gaps, and assure that transportation decisions respond to real user needs. Workshop papers and oral presentations focus on the issues and challenges associated with the development of NTNAC. The report includes a summary of the discussions and workshop conclusions along with closing remarks, workshop agenda and participant list. The workshop concluded that DOT needs to position itself to make wise choices. It needs a more systematic, analytical process as well as a data-oriented program.

National Transportation System Performance Measures. Final Report
Cambridge Systematics, Inc.; Prepared for the Office of the Secretary of Transportation, U.S. Department of Transportation, April 1996, 145pp.
Report Number: DOT-T-97-04

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-97-04 *Web Catalog URL: http://www.tsp.dot.gov*

This study's purpose is to collect, review and craft a representative set of performance measures for the NTS being developed by OST. The report consists of four sections. Section 1 makes the case for transportation performance measurement on a national scale and describes the design parameters for such an effort. Section 2 discusses past efforts in transportation performance measurement, explores the link between policy and performance measures, evaluates the federal role in transportation, provides an overview of issues, and sets forth a model for understanding

the process through which policy concerns may become translated to performance measures. Real-life examples illustrate the process of translating policy concerns to performance measure frameworks. Section 3 contains material presented at the November 1995 National Transportation System Performance Measures Conference. The fourth section presents the final list of recommended performance measures for the NTS. OST will use this list as the starting point for developing its own performance measurement set. These measures represent a move away from sole reliance on system-based measures towards greater use of user-based measures. Accompanying this list is a summary of the lessons learned.

Network Optimized Congestion Pricing: A Parable, Model and Algorithm
Volpe National Transportation Systems Center, Robert B. Dial; Prepared for FHWA, FTA, Office of the Secretary of Transportation, and the U.S. Environmental Protection Agency, May 1995, 33pp.
Report Number: DOT-95-20

Available from:
U.S. Department of Transportation
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Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-95-20 *Web Catalog URL:http://www.tsp.dot.gov*

Road pricing suddenly emerged four years ago as a player in U.S. transportation policy. This paper recites a parable, formulates a model and devises an algorithm for optimizing tolls on a road network. It provides an algorithm for determining the best tolls, where to impose them and how much to charge. Such tolls induce an equilibrium traffic flow that is system- and user-optimal. The parable introduces the network-wide congestion pricing problem, emphasizing the significance of the variability of users' value of time and the importance of not restricting tolls to certain links *a priori*. The model permits the marginal value of time to be a random variable with a different distribution for each origin-destination pair. It shows that to minimize the total perceived cost of time, the best toll for a link is its expected value of the social component of its marginal cost. The algorithm determines this best toll for each link in the network. Being both space-time-efficient, it can solve networks with thousands of nodes in reasonable time on a 486-class PC. This paper is part of the Travel Model Improvement Program.

New Start Handbook: Tips and Resources for Planning and Implementing a Successful Commuter Rail Enterprise
American Public Transit Association Commuter Rail Committee, Richard K. Taube, March 1996, 125pp.

Available from:
American Public Transit Association (APTA)
Information Center
1201 New York Avenue, NW

Washington, DC 20005 *Phone:* 202/898-4089 *FAX:* 202/898-4049
Email: rgandee@apta.com
Order by Title *Price:* Member: $25 plus $5 Handling/
Non-Member: $100 plus $5 Handling

APTA's Commuter Rail Committee has released its *New Start Handbook* with approximately 125 pages of helpful tips and citations to resources that will assist planners, consultants, elected officials, and citizens interested in exploring the potential benefits of new or expanded commuter rail service. The handbook serves as a compendium of resources with emphasis on how to organize and accomplish such commuter rail expansions. It compiles information from experts at existing commuter rail systems and from professionals engaged in planning and implementing new and expanded systems in the U.S. and Canada. The information is organized to provide 1) an indication of where and why commuter rail can be the best alternative for serving markets for commuter transportation, and 2) ideas on how to plan such a system. Lessons on implementation are included along with suggestions on how to create growth capacity and build momentum for long-term success. This handbook offers tips on how to find answers to some of the most frequently asked questions. To that end, the database associated with this handbook is important. The three Appendices include the names and addresses of senior contacts at each of the 19 commuter rail system in the U.S. and Canada; descriptions, maps, and contacts for over 30 areas actively considering new or expanded commuter rail service; and a glossary. Overall, the commuter rail industry is enjoying a remarkable resurgence. Systems are operating and growing in 18 locations throughout the U.S. and Canada, with a new system in Dallas, Texas, set to open later in 1996. For information about the committee and the handbook, contact Dan Foth, Executive Director-Commuter Rail at APTA (202/898-4113).

Participation Empowerment Guide: A Guide to Public Involvement in the Public Transportation Decisionmaking Process
The City College of New York, Institute for Transportation Systems of The City University of New York, Dr. Neville A. Parker, and Mary Nagel Kim; Prepared for the FTA Office of Planning, 1997, 41pp.
Project Number: FTA-NY-26-0009-96-1

Available from:
The Institute for Transportation Systems of The City University of New York
The City College of New York
138th Street and Convent Avenue
New York, New York 10031 *Phone:* 212/650-8050 *FAX:* 212/650-8374
Report Order Number: FTA-NY-26-0009-96-1
NTIS Order Number: PB97-135248 *Price Code:* A04/$21.50

This report is a comprehensive and introductory guide to public involvement in the public transportation decisionmaking process. It is designed to empower New Yorkers to play a role in their public transportation system by describing ways in which they can participate in the decisions that are made about the system. The report describes New York City public transportation system, decisionmaking process, public involvement process, public transportation calendar of

meetings, community boards, and issues related to transportation planning. This *Participation Empowerment Guide* is a "How to Find Out" report about community boards, transportation meetings and decisions that influence the New York public transportation system. It offers the citizens opportunities to have a say in what those decisions will be.

Predicting High Occupancy Vehicle Lane Demand
Dowling Associates, Prepared in Association with Cambridge Systematics, Systan Inc., and Adolf D. May; Prepared for FHWA Traffic Operations Division, Office of Traffic Management/ITS (Wayne Berman, HPN-23), June 1996, 275pp.
Report Number: FHWA-SA-96-073

Available from:
Federal Highway Administration
Office of Traffic Management and ITS Applications, HTV-3
400 7th Street, SW
Washington, DC 20590 *Phone:* 202/366-4082 *FAX:* 202/366-8712
FTA Office of Mobility Innovation *Phone:* 202/366-6667 *FAX:* 202/366-3765

This report presents the results of a literature review and data collection effort of the project *Predicting the Demand for High Occupancy Vehicle (HOV) Lanes.* The project is a two year effort to develop a methodology and micro-computer software model for quickly analyzing HOV lane demand and operations. The methodology is designed to be applied by planners and engineers with limited or no access to or experience with regional travel demand modeling. It provides a set of quick response procedures for predicting and evaluating the impacts of HOV lanes on person demand, vehicle demand, auto occupancy, congestion, delay, and air quality. The methodology is applicable to corridor, network, and system level HOV demand analysis. Overall, this report provides: a literature review and public agencies' experiences with current methods for predicting demand for HOV lanes; new methodology for predicting demand; and data on existing HOV lane projects in the U.S. that was used to calibrate and validate the new HOV lane demand estimation methodology.

Operational Design Guidelines for HOV Lanes on Arterial Roadways Including Planning Strategies and Supporting Measures
McCormick Rankin, and Greater Toronto Area Mmunicipal/Provincial HOV/TDM Committee; Prepared for the Ministry of Transportation of Ontario (Canada), November 1994, 181pp.
Report Number: DOT-T-95-14

Available from:
U.S. Department of Transportation
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Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-95-14 *Web Catalog URL:http://www.tsp.dot.gov*

This document summarizes relevant information and proven guidelines for planning, design, and operation of HOV facilities. It includes an extensive discussion of strategic planning for HOV networks, both at the regionwide and corridor levels. The facility planning material explores eligible vehicles and their impact, vehicle occupancy, time of HOV designation, usage criteria, and enforcement issues. Operational design issues discussed in this report include roadway types, queue bypasses, intersection treatments, transitions, enforcement provisions, and link to HOV priority programs. The document is intended for reference by planners, designers, and decisionmakers involved in developing municipal transportation programs.

Planning and Environmental Resources Catalog
Texas Transportation Institute, Travel Model Improvement Program, Lynette J. Engelke and Kimberly M. Fisher; Prepared for the FHWA Travel Model Improvement Program (HEP-22), and FTA Office of Planning (Joseph Ossi, TPL-22) September 1996, 185pp
Report Number: FHWA-PD-96-039

Available from:
Federal Highway Administration
Environmental Operations Division, HEP-22
400 7th Street, SW, Room 3232
Washington, DC 20590 *Phone:* 202/366-4054 *FAX:* 202/366-3713
Report Order Number: FHWA-PD-96-039
FTA Office of Planning *Phone:* 202/366-4884 *FAX:* 202/493-2478

This *Planning and Environmental Resources Catalog* was prepared by FHWA and FTA as a service to the planning and environment community. Its purpose is to serve as a guide to the storehouse of resources, both human and information, that have been developed in support of transportation planning and the environment. The intent is to make the catalog one part of a multi-faceted strategy to ease the difficulty customers have in obtaining the assistance that FHWA and FTA provide. The catalog is a printed version of an electronic database that will soon be on-line along with an electronically accessible version of many of the documents it references. The catalog provides descriptive profiles of the documents/products listed along with a Product Title Index. The documents/products listed relate to the following subject areas: Air Quality Policy/Guidance; Environmental, Social and Resource Impacts (Natural Resources, Noise and Policy/Guidance); and General, Statewide and Metropolitan Planning. A staff directory and index is also provided along with a regional and state personnel directory and a list of acronyms.

Planning and Managing Intermodal Transportation Systems: A Guide to ISTEA Requirements
Central Transportation Planning Staff, Dr. Russell B. Capelle, Jr.: Prepared of Federal Highway Administration, Intermodal Division of Office of Environment and Planning, November 1994, 106pp.
Report Number: DOT-T-95-03

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-95-03 *Web Catalog URL: http://www.tsp.dot.gov*

This report describes a structured process for information and data collection, analysis, and evaluation of alternative strategies to support strategic and policy decisionmaking on intermodal issues by transportation officials at the state and metropolitan level. It builds upon requirements in the ISTEA. The report describes structuring a work plan to evolve such a system, evolving technical teams and coordinating committees, developing advisory councils to foster private sector involvement and input, and establishing needed 'issue-based data' to focus the effort. Particular emphasis is placed on intermodal freight issues, data, and implications. Basically, the document highlights freight forecasting and urban goods models which are needed for such an approach.

Project and Construction Management Guidelines 1996 Update
EG&G Dynatrend, Karla H. Karash and Thomas J. Luglio, Jr: Prepared for the FTA Office of Planning (Sal Caruso, TPL-20), June 1996, 255pp.
Project Number: FTA-MA-90-7005-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
Internet World Wide Web URL: http://www.fta.dot.gov
NTIS Order Number: PB96-182969 *Price Code:* A13/$47

Project and Construction Management Guidelines 1996 Update (Guidelines) is the first update of the original September 1990 document. It is intended to help local transit agencies in developing management structures and work programs to effectively plan and implement the various phases of FTA-sponsored capital improvement projects and to assist the FTA staff in assessing the management of capital grant projects. Rather than procedures, guidelines present management objectives along with positive and negative features associated with alternative approaches. Guidelines address the full range of issues and present management principles applicable to all FTA-funded capital improvement projects, including a variety of modes and improvements.

Changes in national policies since the 1990 edition are discussed along with new techniques and approaches currently used in project and construction management, namely: innovative project delivery approaches such as turnkey and design-build; project risk assessment and management; alternative project financing; joint development; project and financial control systems; dispute resolution approaches such as partnering, agency and community outreach; and quality assusrance/quality control. The transit capital project development process is reviewed in Chapter 2, general project management principles are highlighted in Chapter 3 followed by application of those principles in the various project phases: planning, preliminary engineering, final design, construction, testing and start-up, and revenue service. These guidelines are intended to be firm in their definition of management principles and objectives, flexible in their application of alternative approaches and techniques, and dynamic in their ability to consider new approaches and techniques in the future.

Public Involvement Handbook for Median Projects
University of South Florida, Center for Urban Transportation Research, Kristine M. Williams, Margaret A. Giery, and Janet Becker; Prepared for the Florida Department of Transportation Systems Planning Office, October 1995, 80pp.

Available from:
Center for Urban Transportation Research
University of South Florida, College of Engineering
4202 E. Fowler Avenue, ENB 118
Tampa, Florida 33620-5350 *Phone:* 813/974-3120 *FAX:* 813/974-5168
Order by Title

The objective of this handbook is to assist planners and engineers in developing a public involvement strategy for access management issues. The strategies are designed to facilitate open communication with affected parties and to assure adequate public involvement at key steps in the decision process. The emphasis is on median projects and state practices. The report introduces the concept and discusses the principles of public involvement, as well as public involvement techniques such as opinion surveys/polls, focus groups, task force, and others. The report also discusses how to develop a public involvement plan and provides case study examples of public involvement programs. A Resource Kit is presented in Appendix A, which includes a sample public involvement plan, an environmental scan worksheet, a sample project newsletter and other materials that will help others develop public involvement activities. Community Awareness Plan Guidelines and materials related to public involvement programs are also included in the appendix of this report.

Public Transportation 1996: Planning, Management, Marketing, New Technology, and Safety and Security. Transportation Research Record No. 1521
Transportation Research Board of the National Research Council; Prepared for the 75th Annual Meeting of the Transportation Research Board in January 1996, 171pp.
Report Number: Transportation Research Record No. 1521

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TR Record No. 1521*Price:* $37

The papers in this report were not presented at the 75th Annual Meeting of the Transportation Research Board in January 1996 because some participants who planned to attend could not reach Washington, DC as a result of a severe snowstorm in the area. This Record documents 21 such papers. The papers are arranged accordingly: Planning (5), Management (3), Marketing (6), Technology (2), and Safety and Security (5). Subject areas covered include: comparing automobile vs transit use; developing transit service index; planning innovative public transportation systems in Arlington, Texas; building ridership and revenue through infrequent riders; assessing information systems and technologies; explaining the car's success and transit's failure; and applying technology to provide information. Other areas researched include: management framework for transit pricing; effects of smartcards on transit operations; guideways and greenways; wheelchair loads; light rail accident involvement; fire and life safety system; and subway station during fire emergency.

Rail Transit Capacity. TCRP Report 13
Transport Consulting Limited, with University of British Columbia, Tom Parkinson, and Ian Fisher, and Transportation Research Board, National Research Council; Prepared for FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 201pp.
Report Number: TCRP Report 13

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX*: 202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 13 *Price:* $39

The objective of this research was to obtain current information on rail transit capacity and to provide methodologies for estimating the capacity for future rail transit systems and of modifications to existing systems. This report provides a comprehensive description of the rail transit industry in North America along with capacity issues and focuses on achievable capacity of four rail transit modes: rail rapid transit, light rail transit, commuter rail and automated guideway transit. Factors that determine rail transit capacity are described along with easy-to-use procedures for estimating practical achievable rail transit capacity under a variety of conditions. In this report, rail transit capacity includes both the number of people and the number of vehicles past a point per unit of time, and it relates to stations, routes, junctions, and other controlling transit system features. Examples of applications for the new rail transit capacity information include: analyzing project planning and operations for new starts and extensions; evaluating transit line performance; establishing and updating service standards; assessing the capacities of new

signaling and control technologies; and, estimating changes in system capacity and operations for environmental impact assessments and land-use variations. This report includes a step-by-step User's Guide, recommendations and suggestions for future research, a bibliography and glossary. Appendices summarize the literature reviewed and rail transit survey, and tabulate data used in the project. Table A3.3 provides a listing of all North American individual transit routes and riderships. This report will be of interest to transportation and rail-transit planners, designers, and operators responsible for determining the passenger-carrying capacity of rail lines for these four rail transit modes.

Scan of Recent Travel Surveys. Travel Model Improvement Program
Cambridge Systematics, Inc.; Prepared for the FHWA, FTA, Office of the Secretary, and U.S. Environmental Protection Agency, June 1996
Report Number: DOT-T-97-08

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-97-08 *Web Catalog URL: http://www.tsp.dot.gov*

The objectives of this scan of recent travel surveys is to facilitate the exchange of information among agencies and individuals interested in the design and conduct of household and other types of travel surveys. This report reviews recent travel surveys conducted by metropolitan planning organizations (MPOs) to determine the state-of-the-practice, the types of surveys being conducted, frequency of data collection, how they compare with survey practices with those of other countries, and the degree to which state-of-the-art survey techniques are being introduced into practice. Nine types of surveys are examined: 1) household, 2) vehicle intercept and external station, 3) panel or longitudinal, 4) stated preference, 5) visitor, 6) transit onboard, 7) commercial vehicle, 8) workplace, and 9) special generator. Information was gathered from telephone conversations with about 50 MPO representatives. Results are summarized in the main text. More specific information on individual survey activities is provided as a series of appendices. The findings highlight the recent increase of survey and data collection activities, namely -- the broader range of survey types in use and the new forms of data collection practices currently being introduced.

Statewide Transportation Planning Under ISTEA: A New Framework for Decision Making
FHWA Office of Environment & Planning (Dee Span, HEP-12), and FTA Office of Planning (Sean Libberton, TPL-20), 1996, 35pp
Report Number: FHWA-PD-96-026A

Available from:
Federal Highway Administration
Office of Environment & Planning, Room 3301
Intermodal & Statewide Programs Division
Washington, DC 20590 *Phone:* 202/366-4086 *FAX:* 202/366-7660
Report Order Number: FHWA-PD-96-026A

ISTEA calls for sound transportation planning and emphasizes the need to broadly consider the impacts of transportation investments. This report discusses the ISTEA Statewide planning process and the opportunity it offers to states to update their approaches to planning; to ensure that transportation investments reflect the economic, environmental, and quality-of-life goals of the states; and to seek and consider public input and involvement in the decisions public officials make on future investments. The guide aims to provide elected officials and policymakers with a clearer understanding of how sound transportation planning can be conducted by states, and presents a new framework for transportation decisionmaking as envisioned in ISTEA. It also provides information on statewide planning for others interested in the decisionmaking process for infrastructure investments, and discusses innovative financing techniques now available to state and local governments. Overall, the five chapters in this report cover the following topics: statewide transportation planning, products of statewide planning, statewide planning process, innovative financing techniques, and communication strategies.

Synopsis of Seismic Threats in the Western United States: Impacts to the National Transportation Infrastructure
Doug Bausch and Matthias Borner of the Western States Seismic Policy Council; Prepared for the U.S. Department of Transportation, Research and Special Programs Administration's Office of Emergency Transportation, March 1996, 60pp.
Report Number: DOT-T-97-13

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-97-13 *Web Catalog URL: http://www.tsp.dot.gov*

The earthquake risk to the national transportation infrastructure is high throughout Western U.S. This report was compiled by the Western States Seismic Policy Council (Council) -- the oldest of the multi-state consortia that addresses earthquake hazards. Founded in 1978, the Council includes a mix of emergency management and geoscience professionals. The region covered by

the Council includes 13 western states and the U.S. territory of Guam, the Canadian Province of British Columbia, and the Canadian Yukon Territory. This report provides national transportation officials with a synopsis of the threat and impacts of earthquakes to the transportation infrastructure in western states. Information was obtained from publications provided by member states. The report begins with a conceptually clear description and easy to understand overview of earthquake hazards, including the movements of the North American tectonic plate which runs along the west coast through the states of Alaska, California, Washington and Oregon. The regional threat from earthquake area sources are discussed and profiled separately, namely: the San Andreas Fault System, Cascadian and Aleutians Subduction Zones, Basin and Range, Rio Grande Rift, Intermountain Seismic Belt, Hawaiian Volcanic Chain, and the Marianas Subduction Zone. The report focuses on these earthquake sources and provides summary descriptions of the threat and impacts to the transportation infrastructure of each of the 13 western states along with the status of their mitigation programs. The final section of this report includes study findings, recommendations for additional study, a glossary, and a list of references. The study shows that earthquake threats throughout the Western U.S. are a direct result of seismic source areas that do not follow state lines. The study points out that the effective application of technical knowledge and experience is the fundamental tool for earthquake risk mitigation.

System-Specific Spare Rail Vehicle Ratios. A Synthesis of Transit Practice
Transportation Research Board, National Research Council, Judith T. Pierce, Los Angeles, California; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 49pp.
Report Number: TCRP Synthesis 15

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 FAX: 202/334-2519
Report Order Number: TCRP Synthesis 15 *Price:* $13

This synthesis will be of interest to transit agency general managers; rail planning, operations, maintenance, and policy personnel; and FTA staff, transportation consultants and engineers; and vehicle manufacturers. It addresses the system-specific variables that directly impact fleet size, and the spare ratios that are maintained by individual transit agencies. The intent is to identify and document the specific operating, service, and other factors that affect rail system spare ratios; to highlight those practices and programs in place at specific agencies that increase fleet efficiency and decrease spare ratios; and to identify the needs of fleet management in resolving the issues raised in this study. The report explores the many factors that influence the number of spare vehicles an agency chooses to own and operate at any particular time. It surveys and describes operating practices, impediments, and strategies used to size fleets at 21 heavy rail, light rail, and commuter rail systems in the U.S. and Canada. Survey results revealed wide variances not only in the actual spare ratios reported by transit agencies, but also in the methodologies used to calculate the ratios. Table 1, *Spare Vehicle Ratios*, identifies responding agencies and provides information such as fleet size, age, and characteristics; ridership statistics; reported spare ratios; and

maintenance performance and practices. Although survey results of the 21 rail systems showed that maintenance officials were eager for innovation in fleet planning as a way to cut costs, improve fleet reliability, and decrease fleet size, they did not advocate spare ratio regulations, nor did they agree about establishing a uniform spare ratio for all rail systems.

Summary of NJTPA Planning Studies for Fiscal Years 1992 - 1994
North Jersey Transportation Planning Authority, Inc., Metropolitan Planning Organization for Northern New Jersey: Prepared for FTA Region 2 (Carmen Orta), June 1996,

Available from:
North Jersey Transportation Planning Authority, Inc.
One Newark Center, 17th Floor
Newark, New Jersey 07102
Order by Title *Phone:* 201/639-8400 *FAX:* 201/639-1953

This report contains descriptive summaries of projects sponsored by the FTA and the FHWA for fiscal years 1992, 1993, and 1994. The directory purpose is to inform the public and all interested parties of Section 8 Technical Studies, Subregional Supportive Tasks and Local Corridor Studies conducted in the Northern New Jersey Region during those fiscal years. This document brings these transportation planning studies under one cover, so that counties and cities in the region and others are aware of what has already been done in the Northern New Jersey region.

Transit and Urban Form: Volume 1. TCRP Report 16
Transportation Research Board, National Research Council, Parsons Brinckerhoff Quade & Douglas, Inc.; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 172pp.
Report Number: TCRP Report 16

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 16 *Price:* $65

TCRP Report 16, *Transit and Urban Form*, presents results from Project H-1, *Evaluation of the Relationships between Transit and Urban Form*, in two volumes. The research addresses the relationship between land use and public transportation. These relationships are re-examined, explained, evaluated, and documented to facilitate cost-effective multimodal public transportation investment decisions. Volume 1 consists of two parts. Part I, *Transit, Urban Form, and the Built Environment: A Summary of Knowledge*, synthesizes findings and conclusion of Project H-1 and the existing body of literature on transit and urban form. It discusses how the characteristics of urban form influences demand for light rail and commuter rail transit and the cost of providing that service. Evidence from this project combines with previous research to demonstrate that transit and urban form relationships is significant. Part II of Volume 1, *Commuter and Light Rail*

Transit Corridors: The Land Use Connection, provides guidance on the land use characteristics that support new fixed-guideway transit services in a corridor. The work builds upon research conducted in the 1970s by Pushkarev and Zupan that established thresholds necessary to support transit in a cost-effective manner. That work is updated with data from current light rail and commuter rail cities and extended by considering the cost-efficiency (annual operating costs plus depreciation per vehicle mile) and effectiveness of service (daily passenger miles per line mile). This TCRP Report 16 will be of interest to a broad cross-section of individuals involved in transportation and land use planning and development.

Transit and Urban Form: Volume 2. TCRP Report 16
Transportation Research Board, National Research Council, Parsons Brinckerhoff Quade & Douglas, Inc.; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 204pp.
Report Number: TCRP Report 16

Available from:
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2101 Constitution Avenue, NW
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TRB Bookstore URL: http://www2.nas.edu/trbbooks
Report Order Number: TCRP Report 16 *Price:* $65

Volume 2 consists of Parts III and IV. Part III, *A Guidebook for Practitioners*, offers guidance to communities on patterns of development that encourage alternatives to the automobile for work and nonwork travel. It summarizes key relationships between transit and urban form, outlines the role of transit in regional and corridor planning, and discusses principles and tools for station-area planning and development. This guidebook will assist state and regional land use and transportation planners, developers, and decisionmakers with land use regulation, development program, and transit investment and service planning decisions. Part IV of Volume 2, *Public Policy and Transit-Oriented Development: Six International Case Studies*, uses case studies to determine public policies and institutions necessary for transit-supportive development to occur. Case studies include three cities with rail systems and three with HOV lanes or exclusive busways. The six case study cities are: Houston, Texas; Washington, DC; Portland, Oregon; Vancouver, British Columbia, Canada; Ottawa-Carleton, Ontario, Canada; and Curitiba, Brazil. Research findings are clear: transit-oriented regions must adopt policies that support more compact urban form and encourage land use mix and transit-friendly design. In addition, other institutional and financial supports must be in place to help provide dependable, high-quality transit services.

Transit Noise and Vibration Impact Assessment
Harris Miller Miller & Hanson Inc.; Prepared for the FTA Office of Planning, April 1995, 193pp.

Available from:
U.S. Department of Transportation
Publication Division (M-45.3)
Washington, DC 20590
Report Order Number: DOT-T-95-16 *Web Catalog URL: http://www.tsp.dot.gov*

Noise and vibration assessments are key elements of the environmental impact assessment process for transit projects. This manual provides guidance in preparing and reviewing the noise and vibration sections of environmental submittals from grant applicants. The manual is designed to promote quality and uniformity in assessments, and will be used by project sponsors and consultants in performing noise and vibration analyses for inclusion in environmental documents. The manual sets forth the methods and procedures for determining the level of noise and vibration impact resulting from most federally-funded transit projects and for determining what can be done to mitigate such impact. This manual is divided into two parts, noise and vibration, with a common introduction. Each part has parallel organization according to the following subject areas: Basic Concepts, Criteria, Screening Procedure, General Assessment, and Detailed Analysis.

Transportation Action: A Local Input Model to Engage Community Transportation Planning. Notebook
North Central Regional Center for Rural Development of Iowa State University, and the Transportation and Marketing Division of the U.S. Department of Agriculture (Eileen Stommes), Timothy O. Borich (Iowa State) and Janet Ayres (Purdue University), April 1996, Notebook
Report Number: RRD 174

Available from:
North Central Regional Center for Rural Development
Iowa State University - 404 East Hall
Ames, Iowa 50011-1070 *Phone:* 515/294-8321 *FAX:* 515/294-2303
Email: jstewart@iastate.edu
Report Order Number: RRD174 *Price:* $15

The North Central Regional Center for Rural Development developed a curriculum titled *Transportation Action: A Local Input Model to Engage Community Transportation Planning.* The Transportation Action model seeks to marry technical information with a decision making process that assists rural communities in transportation planning. The process includes creating public dialogue, identifying transportation issues, and developing solutions. Successful completion of the program will provide a blueprint for local action. The model consists of 10 steps, including four meetings, through which a community might learn more about transportation and take a more proactive role in planning its transportation future. A suggested agenda is provided along with preparation material for the facilitator, camera-ready copy of exercises for community participants, and masters for overhead transparencies.

Transportation Air Quality: Selected Facts and Figures. Factbook
FHWA Office of Environment and Planning (HEP-42), 1996, 34pp.
Report Number: FHWA-PD-96-006

Available from
Federal Highway Administration
Office of Environment and Planning, HEP-42
400 7th Street, SW, Room 3240
Washington, DC 20590 *Phone:* 202/366-9173 *FAX:* 202/366-3409
FTA Office of Planning *Phone:* 202/366-1648 *FAX:* 202/493-2478
Order by Title

This *Transportation Air Quality Factbook* shows the connection between air quality and transportation, beginning with the economic trends and ending with the air quality trends. Policy responses to air quality problems are discussed, including transportation control measures. Additional information is provided in this booklet, including: a definition of terms; a listing of available publications from the EPA, the FHWA, and other sources; and a listing of available statistics and facts.

Transportation Planning, Management Systems, Public Participation, and Land Use Modeling
Transportation Research Board, National Research Council, 1995, 109pp.
Report Number: Transportation Research Record No. 1499

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 220418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
Report Order Number: TR Record No. 1499 *Price:* $26

This volume focuses on statewide and metropolitan transportation planning, management systems, and land use-transportation issues. The papers on statewide and metropolitan transportation planning concern an interactive planning modeling process (Wyoming), an area transportation partnership to assist in the development of the state transportation improvement program (Minnesota), the development of a customer perspective in the statewide transportation planning process (Colorado), a pilot transportation plan for an Indian reservation in western North Carolina, and a community-based, strategic, comprehensive planning process (Ithaca, New York). The papers that concern management systems fall into two categories - congestion management and management systems. Two papers discuss congestion management (data requirements, comparisons and the congestion management program in Ventura County, California); the remaining papers discuss management systems for transport infrastructure. Three papers discuss transportation-land use issues: transportation planning and hazard mitigation (North Carolina coast), parking restrictions in employment centers and implications for public transport and land use, and transportation sketch planning with land use inputs.

Use of Intermodal Performance Measures by State Departments of Transportation
New Mexico State University, Robert Czerniak, Sandra Gaiser, and Darren Gerard; Prepared for the FHWA Office of Environment and Planning, and the New Mexico State Highway and Transportation Department, June 1996, 60pp.
Report Number: DOT-T-96-18

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-96-18 *Web Catalog URL: http://www.tsp.dot.gov*

This report clarifies the role of performance measures in the revised planning process brought about by ISTEA. The report identifies specific intermodal performance measures developed by 15 state departments of transportation. The performance measures are classified by goals and analyzed by frequency of use. The report discusses the role of performance measures in the transportation planning process and their relationship to intermodal management systems. Research reports that relate to the topic of performance measures are also summarized.

Back From The Brink: Saving American Cities by Design - Videotape
GVI, Washington, DC (Producer); Fry Communications, Arlington, VA (Created by); Charles Royer, Host; (FTA Office of Planning, Livable Communities Initiative Consortium Member, Effie Stallsmith, TPL-20)

Videotape Available from:
The American Architectural Foundation
1735 New York Avenue, NW
Washington, DC 20006-5292 *Phone:* 202/626-7524
Order by Title *Price:* $15

Back from the Brink: Saving America's Cities by Design is a one-hour television program created by the American Architectural Foundation to demonstrate to a national audience that the problems of America's cities can be addressed--by design. The one-hour program tells the story of three American cities that have revitalized themselves using architecture and planning as tools for restoring a sense of community, improving livability, and enhancing economic viability. *Back from the Brink* focuses on elements common to the three cities (Portland, Suisun City, and Chattanooga), namely: a downtown-first strategy, active public involvement in design and planning, aggressive and innovative public-private redevelopment strategies, strong public sectors willing to provide the civic infrastructure necessary to ensure livability, and the creation of vibrant urban environments strong at their hearts and reconnected to their histories and cultural identities. The program opens with the challenges of American cities followed by four parts and a conclusion. Part One discusses the City of Portland, Oregon, in terms of the elements of livability and community, and the downtown first strategy. Part 2 discusses Suisun City, California, highlighting the power of design and planning to restore community and guide development, the public sector's lead, and the creative approaches to municipal financing and small business development. Part 3 discusses the City of Chattanooga, Tennessee, emphasizing the importance of community development, the need to create new institutions, the importance of public/private partnerships, and the ability of public/civic projects to stimulate private development and revitalization. Part 4 discusses the suburbs of Portland, Oregon, pointing out the value of a regional approach, transit as a tool for managing growth, and designing new models for suburban development that enhance community. The Conclusion highlights the principles of revitalization.

Building Livable Communities Through Transportation
Federal Highway Administration and FTA Office of Policy Development (TBP-10), October 1996, 24pp.

Available from:
Federal Transit Administration
Office of Policy Development, TBP-10
400 7th Street, SW, Room 9310
Washington, DC 20590 *Phone:* 202/366-4060 *FAX:* 202/366-7116
Order by Title

This report reaffirms FTA and FHWA commitments to rebuild America's infrastructure in a way that supports community needs. The stories of five jointly sponsored projects are presented which reaffirm the view that customer-friendly, community-oriented transit facilities and services don't just happen, but are the results of community-based planning process and people-oriented design. The five projects presented herein are located in Los Angeles, California; Clarksdale, Mississippi; New York, New York, Corpus Christi, Texas; and San Francisco, California. This Livable Communities report is intended as both an inspiration and resource. Each project emphasizes a different aspect of the planning process that the US DOT advocates. Following each project is a supplemental case that describes how another locality handled a similar challenge. The facts and contacts for the projects and supplemental cases, the location of regional offices of FTA, FHWA and others are listed to encourage follow-up.

Community Impact Assessment: A Quick Reference for Transportation
FHWA Office of Environment and Planning, HEP-30, September 1996, 40pp.
Report Number: FHWA-PD-96-036

Available from:
Federal Highway Administration
Environmental Operations Division, HEP-30
400 7th Street, SW, Room 3301
Washington, DC 20590 *Phone:* 202/366-2062 *FAX:* 202/366-3713
Order Number: FHWA-PD-96-036

This guide was written as a quick primer for transportation professionals and analysts who assess the impacts of proposed transportation actions on communities. It outlines the community impact assessment process, highlights critical areas that must be examined, identifies basic tools and information sources, and stimulates the thought-process related to individual projects. The primer aims to increase awareness of the effects of transportation actions on the human environment and emphasize that community impacts deserve serious attention in project planning and development. The guide is intended to provide some tips for facilitating public involvement in the decisionmaking process.

Planning, Developing, and Implementing Community-Sensitive Transit. Livable Communities Initiative
Deane Evans, American Institute of Architects, and Adrienne-Sasser Gardner, Gardner Consulting Planners; Prepared for the FTA Livable Communities Initiative of the Office of Planning (Effie Stallsmith, TRI-20), May 1996, 41pp.
Project Number: FTA-DC-26-7043-96-1 and FTA-CA-26-0009-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
FTA Home Page/World Wide Web: http://www.fta.dot.gov
NTIS Order Number: PB97-165575 *Price Code:* A04/$21.50

This FTA Livable Communities Initiative publication reaffirms FTA's commitment to meet the mobility needs of the American public and highlights some of the efforts underway across the country. The Livable Communities Initiative is demonstrating that transit can provide an important means of strengthening the link between transportation and land use. This booklet describes and illustrates some of the ways the transportation planning, development and implementation processes are producing community-sensitive transportation facilities and services. It describes how the concepts and objectives of the FTA Livable Communities Initiative are incorporated into the ongoing planning, programming, project development, and project implementation processes. Examples are used to illustrate these phases, as well as operations and maintenance aspects. The Appendices provide descriptive profiles of the 16 projects that demonstrate the characteristics of community-sensitive transit. By applying the techniques outlined in this booklet, transportation agencies, metropolitan planning organizations, local governments, and communities can help achieve the broader transportation, economic, social and environmental benefits of transit investments. The Livable Communities Initiative, described in this booklet, empowers communities with the tools to develop the kind of transit facilities and services that meet their needs.

Access Ohio Public Transportation Funding Study
CGA Consulting Services, Inc., in association with RLS & Associates, Inc., and the University of Wisconsin-Milwaukee Center for Transportation Education and Development; Prepared for the Ohio Department of Transportation, Division of Public Transportation, June 1995, 208pp.
Report Number: DOT-T-96-10

Available from:
U.S. Department of Transportation
Subsequent Distribution Office
Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-T-96-10 *Web Catalog URL: http://www.tsp.dot.gov*

The purpose of this study was to evaluate state-wide transit funding mechanisms which appear to be both successful and feasible for use as a permanent dedicated annual source of transit funding in Ohio. This report explores funding methods used throughout the U.S. and recommends the top few options that appear to be most promising for use in Ohio. It reviews the legal limitations on developing a transit funding mechanism, summarizes estimates and projections of total funding needs for all existing transit systems (56), as well as for 40 rural counties currently without service. The most promising funding mechanism are discussed including three recommended for implementation: motor vehicle rental tax, motor vehicle lease purchase tax, and parking lot excise tax. Results of a state-wide public opinion poll of 1027 Ohio households to test support for the three funding options suggest that citizens consider transit a vital public service for both urban and rural areas and deserves tax funding support, even ahead of highway construction.

Cash Management Best Practices Guide
KPMG Peat Marwick LLP, Roger Figura and Rachel Jones; Prepared for the FTA Office of Planning (Nancy Strine, TRI-21), June 1996, 265pp.
Project Number: FTA-VA-26-0002-96-07

Available from:
Federal Transit Administration
Office of Planning, TPL-20
400 7th Street, SW, Room 6100
Washington, DC 20590 *Phone:* 202/366-8051 *FAX:* 202/493-2478
Report Order Number: FTA-VA-26-0002-96-07
NTIS Order Number: PB96-192240 *Price Code:* A12/$44

This *Cash Management Best Practices Guide* is designed to help transit agencies in formulating policies and developing procedures across the various functions which constitute cash management. The Guide was developed from onsite interviews with eight transit agencies to assess cash management procedures. Coverage included agencies with large bus only operations, combined bus-rail operations, and smaller sized operations. An indepth review of investment policies and procedures and banking relations was conducted along with reviews of forecasting

and budgeting, cash and fare media collection procedures, benefit accrual provisions, and planning with respect to FTA, FHWA, and ISTEA requirements. The best practices described in this manual represent a collection and mixture of policies and procedures from participating transit agencies (Metropolitan Atlanta Rapid Transit Authority, Atlanta GA; Metropolitan Transit Authority of Harris County, Houston TX; Suburban Bus Division of RTA, Chicago IL; Regional Transit Authority, Orlando FL; Ann Arbor Transportation Authority, Ann Arbor MI; Utah Transit Authority, Salt Lake City UT; and Santa Cruz Metropolitan Transit District, Santa Cruz CA).

Fixed Guideway Capital Costs Heavy Rail and Busway/HOV Lane
Booz-Allen & Hamilton, Inc., Richard M. Amodei and Donald C. Schneck; Prepared for the FTA Office of Planning (Salvator Caruso, TPL-20), September 1994, 380pp.
Project Number: FTA-MD-26-0001-94-02

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-177571 *Price Code:* A20/$57

The purpose of this study is to help transit planners and engineers improve the accuracy of capital cost estimates for proposed fixed guideway projects by documenting as-built unit costs for heavy rail systems and busway/HOV lanes completed in recent years. The benefit to the industry is the opportunity to check the reasonableness of capital cost estimates against actual costs for similar systems developed in the U.S. Documentation and analysis of actual capital costs for the following eleven rapid transit projects are recorded: *HEAVY RAIL* -- Atlanta MARTA North-South Line, Baltimore Metro, Boston Southwest Corridor Project, Chicago Orange Line & O'Hare Extension, Los Angeles Metro Red Line, Miami Metrorail, and Washington, DC Metro; and *BUSWAY/HOV LANE* -- Houston Busway & HOV Lanes, Minneapolis I-394 Project, Pittsburgh South & East Busways, and Seattle Downtown Tunnel. Capital costs are based on actual experience of recently completed transit projects and are presented in a database structure that describes cost categories and project elements typically encountered in development of major transit projects. The resulting normalized cost category estimates and unit cost ranges are readily available for application to each and every stage of the major capital investment planning process.

Innovative Financing Handbook
U.S. Department of Transportation, FTA Office of Policy Development (Paul Marx, TBP-10), Released in November 1995, 31pp.
Report Number: FTA-TBP-10-95-1

Available from:
Federal Transit Administration
Office of Policy Development, TBP-10
400 7th Street, SW, Room 9310
Washington, DC 20590 *Phone:* 202/366-4060 *FAX:* 202/366-7116
Order Number: FTA-TBP-10-95-1

This *Innovative Financing Handbook* contains guidance on and examples of innovative financing techniques that may be used by transit agencies to enhance the effectiveness of their infrastructure investment program. The report includes the FTA *Innovative Financing Federal Register Notice (FRN),* published May 9, 1995, to promote many of the innovations undertaken by transit systems nationwide. This handbook is intended as a reference document to provide FTA grantees with general guidelines on selected types of financial structures that they may propose in support of a wide variety of capital projects. The transaction types described have either been used with FTA concurrence, or they have been proposed and are being recommended for use. An example of a "tested" transaction is the use of Certificates of Participation to facilitate a sale-leaseback of buses. This report discusses the following innovative financing techniques: Repaying Bonds and Certificates of Participation, State Revolving Loan Funds, Lease Payments, Joint Development of Transit Assets, Cross Border Leases, Super Turnkey and Private Financing, Delayed Local Match, and Toll Revenue Credits.

Intermodal Surface Transportation Efficiency Act: Flexible Funding Opportunities for Transportation Investments
FTA Office of Planning (Sean Libberton, TPL-11) and FHWA, 1996, 177pp

Available from:
Federal Transit Administration
Office of Planning, TPL-11
400 7th Street, SW, Room 6100
Washington, DC 20590 *Phone:* 202/366-0055 *FAX:* 202/493-2478
Order by Title
FTA Home Page on Internet: http://www.fta.dot.gov/planning

This fifth annual report describes ISTEA's flexible funding programs. These programs provide transportation planners and decisionmakers with the opportunity to fund transportation projects and initiatives which best meet locally determined goals and objectives for mobility, economic opportunity, and air quality. The first edition focused mainly on providing transportation planners and community with a summary of ISTEA's unprecedented flexible funding opportunities. Subsequent editions aimed to clarify some of the administrative and eligibility issues associated with the new programs. The intent of this edition of *Flexible Funding Opportunities* is to describe what a multimodal transportation system provides for the community it serves, and how flexible funding can support state and metropolitan area efforts to develop and maintain a system which provides users with multiple options for meeting mobility and accessibility needs. Several examples/case studies are presented that show how flexible funds have worked for communities around the nation, and how the key elements of a multimodal planning process (planning partnerships, integration of transportation and land use, and problem-solving approach to transportation planning) can help areas maintain mobility, reduce congestion, and provide more options for travel, while promoting community and economic development goals. From Santa Barbara, California to Worcester, Massachusetts, these case studies demonstrate how flexible funding is helping planners, officials, and citizens develop innovative and efficient transportation plans, programs, and projects which both enhance the movement of people and goods and provide opportunities for economic and community

development. *A Summary of FY-1996 Multimodal Apportionment, by States* is included in this report.

Liability Cost and Risk Analysis Studies. Task 1: Assess Liability Expense and Claims Experience for Selected Bus Transit Agencies
Abacus Technology Corporation, Victoria Chaney and Kathryn Derr; Prepared for the FTA Office of Planning (Nancy Strine, TPL-20), January 1996, 90pp.
Project Number: FTA-MD-26-7001-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 *FAX:* 703/321-8547
NTIS Order Number: PB96-164942 *Price Code:* A06/$25

This study examines contemporary risk management and risk financing practices which are in effect at six bus transit systems (3 large and 3 medium-sized). It reviews casualty and liability expense in the context of federal reporting (object class 506) and examines contemporary transit loss experience and risk financing. The study builds on earlier research which analyzed the cost of risk for U.S. public transit, and reviewed transit agency loss potential as a result of tort claims and national and state tort reform. This study examines contemporary loss and claims experience with the objective to document current practice and identify recent trends in the areas of 1) auto/bus vehicular liability losses, 2) claims processing and management for bodily injury and property damage incidents, and 3) casualty and liability expense reporting. Information was obtained from a literature review, site visits, and site surveys. Findings recorded that larger bus systems showed a consistent trend (1991-94) for lower relative cost (per million passenger miles) than smaller systems in terms of casualty and liability expense, claims paid, and outstanding reserves. Statutory maximums or jurisdictional legislated caps were found to reduce the incidence of number of large claims, but total liability relative to rider fees was higher for systems operating under statutory maximums. Regression analysis showed passenger miles as an excellent predictor of casualty and liability expense for all agencies sampled. Risk management information systems were found to be out-dated and inadequate with poor or no connectivity to transportation and financial data sources. Risk financing practices were stable with risk managers reporting no problems obtaining coverage or renewals. Supplemental materials include: a bibliography, performance indicator tables, survey questionnaire/responses, sample casualty and liability reports for large and smaller systems, and sample accident and risk management reports.

Paying Our Way: Estimating Marginal Social Costs of Freight Transportation, Special Report 246
Transportation Research Board, National Research Council, Committee for Study of Public Policy for Surface Freight Transportation; 1996, 175pp.
Report Number: Special Report 246

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 20418 *Phone:* 202/334-3214 *FAX:*202/334-2519
Report Order Number: Special Report 246

This is a study of one of the oldest debates in transportation policy, namely: the extent to which the various users of transportation systems pay for the services that they use. The study is a preliminary examination of whether shippers of domestic surface freight pay the full social costs of the services that they use. Freight carriers and shippers do not pay directly for all of the costs of providing freight service. Some costs are borne by government, such as cost of roads and ports; other costs, called external costs, are borne by nonshippers or the general public, such as health and other damages caused by air pollution and noise generated by trucks, and so forth. Social costs are all costs of the shipment, whether borne by the shipper, carrier, government, or public. This study is intended not to provide definitive answers as to whether shippers pay their full social costs but rather to determine the feasibility of making such estimates. The study uses the concept of marginal social costs in measuring whether freight users are subsidized or not. Four case studies are presented to illustrate the challenges of defining and measuring external costs and subsidies. The case studies demonstrated that it would be possible to make reasonably reliable estimates of marginal social cost and subsidy for specific freight movements. Recommendations called for research to improve information on the costs of domestic surface freight transportation and for application of this information in public decisionmaking.

Public Transit Industry Internal Audit Practices
KPMG Peat Marwick LLP, in association with the American Public Transit Association/APTA Internal Audit Committee; Prepared for the FTA Office Of Planning (Nancy Strine, TPL-20), August 1995, 23pp.
Project Number: FTA-VA-26-7005-95-1

Available from:
Federal Transit Administration
Office of Planning/TPL-20
400 Seventh Street, SW, Room 6100
Washington, DC 20590 *Phone:* 202/366-8051 *FAX:*202/366-3765
Email: nancy.strine@fta.dot.gov
Report Order Number: FTA-VA-26-7005-95-1
NTIS Order Number: PB96-131958 *Price Code:* A04/$21.50

This report is a product of FTA's Financial Management Oversight Program. It summarizes the best transit internal audit practices and innovative techniques currently in use. Internal audit departments (IADs) are expected to oversee the operations and effectiveness of existing internal controls and to design new controls for changing operations and more. This report highlights the importance of IADs and reflects the need to move transit IADs beyond their traditional audit functions (testing for compliance with policies and procedures) to become business "partners" that help transit agencies become more cost effective and efficient. The report focuses on current internal audit efforts, discusses current organizational structures and different practices employed by transit IADs, and transit governing bodies' support of the function. A survey questionnaire was mailed to 54 transit agencies to determine the current role of transit internal audit, to summarize the scope of activities and operating practices, and to capture various attributes of IADs. Of the 24 respondents, 3 operated rail vehicles only, 9 operated both rail and bus vehicles, and 12 operated buses only. Interviews with senior management members from the nine sites visited showed that most general managers wanted internal auditors to be *in-house consultants* and to become more proactive regarding emerging business risks. The survey showed that the average operating budget of agencies surveyed was approximately $300 million (eight with operating budgets above the average, 16 below). Recommendations regarding IAD effectiveness and future directions called for marketing the internal audit function, developing skills to become business consultants to transit agencies, and having the capability to offer objective assessments and solutions to business concerns. The findings and observations made in this report also apply to transit agencies looking to benchmark, expand, or establish internal audit functions.

Public Transit Industry Internal Audit Practices: Site Visit Summaries
KPMG Peat Marwick LLP, Ralph Koch and Rachel Blackwell; prepared for the American Public Transit Association Internal Audit Committee and the FTA Office of Planning (Nancy Strine, TPL-20), November 1995, 63pp;
Report Number: FTA-VA-26-7005-95-2

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, VA 22161 *Phone:* 703/487-4650FAX: *FAX:* 703/321-8547
NTIS Order Number: PB96-131958 *Price Code:* A04/$21.50

This report highlights the importance of internal audit departments (IADs) and current internal audit practices. It also discusses organizational structures, summarizes best practices, and presents considerations for a model internal audit function. The purpose of this companion report is to share additional information about the following nine transit internal audit departments visited during the research project: Dallas Area Rapid Transit District, Greater Cleveland Regional Transit Authority, Metropolitan Atlanta Rapid Transit Authority, MTA-New York City Transit, Niagara Frontier Transportation Authority, Societe de transport de la Communaute urbaine de Montreal, Toronto Transit Commission, VIA Metropolitan Transit, and Washington Metropolitan Area Transit Authority. In this second report, each of the nine transit systems is profiled separately and summarily discussed in terms of the following topics: mission and organization, audit planning and risk assessment, technology use, quality influencers, and

departmental strengths or best practices. This report will be of interest to IADs as well as to those transit agencies contemplating forming an internal audit function.

Risk Management for Small and Medium Transit Agencies: A Synthesis of Transit Practice. TCRP Synthesis 13
Transportation Research Board, National Research Council, Advanced Risk Management Techniques, Inc., Michael M. Kaddatz; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 37pp.
Report Number: TCRP Synthesis 13

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 220418 *Phone:* 202/334-3214 *FAX:* 202/334-2519
Report Order Number: TCRP Synthesis 13 *Price:* $13.00

This synthesis will be of interest to general managers of small and medium-sized transit agencies, as well as to risk management professionals in both the public and private sectors and to insurers. It provides information on how small and medium-sized transit agencies can evaluate various approaches to risk management and can access risk management services at reasonable cost. The study addresses risk management practices, their systematic application, and measurement of program results. It emphasizes liability and workers' compensation risks and insurance; the discussion also applies to property risks and insurance. The report contains information on differing transit agencies' risk management experiences including transit agency approaches to financing risk and the size of areas they serve. Case studies exemplify programs currently used at the Regional Transportation Commission of Reno, Nevada; the City of Jackson, Michigan Transportation Authority; and the Baldwin Rural Area Transit System of Robertsdale, Alabama. This synthesis is an immediately useful document that records practices that were acceptable within the time of its preparation.

Transit Capital Cost Index Study
Booz.Allen & Hamilton, Inc., Transportation Consulting Practice, Richard S. Laver and Donald C. Schneck; Prepared for FTA Office of Planning (Nancy Strine, TPL-21), July 1995, 165pp.
Project Number: FTA-MD-90-7001-95-1

Available from:
Federal Transit Administration
Office of Planning/TPL-20
400 Seventh Street, SW, Room 6100
Washington, DC 20590 *Phone:* 202/366-8051 *FAX:*202/366-3765
Email: nancy.strine@fta.dot.gov
Report Order Number: FTA-MD-90-7001-95-1
NTIS Order Number: PB96-111240 *Price Code:* A09/$35

This report is intended for use by local, state, and federal officials responsible for development and/or review of capital budgeting plans for the development and modernization of light and heavy rail transit systems. The weak track record in forecasting the future price of transit system capital elements helped generate this study to improve/develop an estimation methodology capable of predicting project development costs with greater accuracy. This report documents the research aimed at improving the estimation of future capital costs for light and heavy rail fixed guideway projects. It addresses the problem of devising a set of transit element cost indices designed to account for inflation in capital cost projections for fixed guideway projects. The research produced a set of cost indices for over sixty different fixed guideway project elements, eight groupings of related elements and for overall cost of developing such systems. The research compares properties of these transit specific cost indices with broader measures of inflation, suggests how they should be incorporated in cash flow projections for proposed fixed guideway projects, and suggests directions for future research. Unlike most cost indices which use actual unit cost data in their construction, indices developed in this study are constructed as aggregations of other cost indices already available from public sources, such as the Bureau of Labor Statistics. The study concludes that the Composite Input Method represents the most effective means of developing capital cost indices for fixed guideway projects. Annual frequency cost indices at several levels of detail for both light and heavy rail projects were also produced and may serve as the basis for future work relating to inflation and transit planning.

Benefits Gained by the Transit Industry through UTCP Funding
Massachusetts Institute of Technology, Center for Transportation Studies, Chris Caplice, Timothy Boesch, and Paula Magliozzi; Prepared for the FTA University Transportation Center Program April 1996, 92pp.

Available from:
Massachusetts Institute of Technology
Center for Transportation Studies
77 Massachusetts Avenue, Room 1-153
Cambridge, Massachusetts 02139 *Phone:* 617/253-4978 *FAX:* 617/258-5942
Order by Title *Email: tfh@mit.edu*

This report documents the University Transportation Centers Program's (UTCP) positive impact on the transit industry since its formation in 1988. The publication summarizes information retrieved from the New England UTC database and focuses upon the transit element of their regional program. It highlights the contributions that the New England UTCP has brought to the transit industry through its education, research, and technology transfer programs. The report discusses the new, innovative and successful courses, as well as the UTCP impact on the students. Summary profiles of transit projects, multimodal, and intelligent transportation systems research projects are included in this report.

Bus Operator Selection Survey Manual
American Public Transit Association (APTA); Prepared for the FTA Office Of Research, Demonstration & Innovation (Charles Morison, TRI-30), 1996, 30pp
Project Number: FTA-DC-20-2043-96-1

Available from:
National Technical Information Service/NTIS
5285 Port Royal Road
Springfield, Virginia 22161 *Phone:* 703/487-4650 FAX: 703/321-8547
NTIS Order Number: PB96-202742 *Price Code:* A04/$21.50

Improved selection techniques that screen out undesirable drivers and select applicants with the potential for lower absenteeism rates and safer driving habits result in more cost-effective operations. The objective of this research was to develop an innovative, comprehensive and validated bus operator test and selection process specifically designed for use in the transit industry. This study identified potential predictors and developed criterion measures to assess the validity of a variety of measures that might aid in the forecasting of job performance for a sample of 864 bus operators representing 9 bus systems across the U.S. and Canada. Job analysis information converged on a tripartite theory of performance described as requiring a bus operator to "Be There," "Be Safe," and "Be Courteous." A predictor composite was created that successfully predicted supervisory ratings of performance as well as objective absence and accidents. Utility analysis indicated that the predictor composite could be employed to reduce the overall operating expenses of bus transit agencies by over $500,000. The benefits that can be achieved through consortium-type arrangements that develop and use such selection systems are

also discussed. The point made in this study is that attendance-based selection should be treated as a first step in a process that brings to the organization more qualified candidates.

Changing Roles and Practices of Bus Field Supervisors. A Synthesis of Transit Practice 16
Transportation Research Board, National Research Council, Gayland K. Moffat and Diane R. Blackburn, Salt Lake City, Utah; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1996, 53pp.
Report Number: TCRP Synthesis 16

Available from:
Transportation Research Board
2101 Constitution Avenue, NW
Washington, DC 220418 *Phone:* 202/334-3214 FAX: 202/334-2519
Report Order Number: TCRP Synthesis 16 *Price:* $13

This synthesis is intended to provide information about current and innovative supervisory practices. It covers a wide range of topics, including what organizations expect of supervisors; training, recruitment, and selection practices; impacts of new or revised regulations, and impacts of new technologies. Most of the information is based on the results of a May 1995 survey sent to 148 transit agencies with bus operations of at least 100 bus operators, as well as to a few organizations known to have implemented or to be considering such programs (30 percent responded to the survey). This synthesis presents survey data and information gathered from telephone interviews and meetings with respondents, theory, current beliefs, and recommendations. Examples of innovative processes and programs are included to provide managers with suggestions for making the most of their field supervisory positions. Special emphasis is given to the supervisor success criteria and to new regulations or technologies that have impacted field supervisor job responsibilities. Brief descriptions of the changes are presented along with examples of successful programs or ideas. The synthesis closes with conclusions and information from the field about other actions that would improve the state of the practice. Appendices provide a copy of the survey, list of survey respondents and lists of national standardized front line supervisor training programs. This synthesis will be of interest to transit agency general managers, personnel, human resources and training staffs, bus operations staffs, as well as to other transportation, human resources, and training professionals.

Customer-Based Quality in Transportation. NCHRP Report 376
Transportation Research Board, National Research Council; Howard/Stein-Hudson Associates, Inc., Kathleen E. Stein-Hudson, Robert K. Sloane, et al.; Prepared for the FHWA National Cooperative Highway Research Program, 1995, 62pp.
Report Number: NCHRP Report 376

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This project, with its emphasis on departments of transportation (DOTs) customers, has used the term customer-based quality (CBQ) to focus on those aspects of total quality management (TQM) that are especially concerned with the customer part of the TQM process. CBQ means tuning in to customer wants and needs, and developing ways to respond to them more effectively, and then assessing DOT performance and customer satisfaction. The purpose of this research was to investigate existing and potential uses of CBQ in transportation, namely, to determine (1) what the transportation customer needs, desires and expects; (2) the components and indicators of quality as discerned by the customer; (3) transportation program objectives and performance measures for the movement of both people and goods; and (4) strategies for improving product development and employee efforts. The research was accomplished by examining CBQ techniques and practices through interviews with the American Association of State Highway and Transportation Officials (AASHTO) members; conducting telephone interviews with 10 state DOTs; conducting focus groups in nine states to contact customers; and preparing guidelines on the use of focus groups in CBQ. Results from these interviews and focus groups are recorded in Chapters 2 and 3. The focus group guidelines are presented in Appendix A. This research project is designed to help transportation agencies improve the ways they identify and serve their customers' needs through implementing CBQ processes and performance measures as part of TQM. Those interested in TQM or Continuous Quality Improvement efforts or customer input to a state DOT will benefit from this report.

Customer Service Standards. Brochure
Federal Transit Administration, U.S. Department of Transportation, 1996

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Operation Performance Measurement: Developing Commonality Across Transportation Modes - Proceedings of a September 1994 Workshop
Research and Special Programs Administration, Volpe National Transportation Systems Center, Beverly Messick Huey, and Mary D. Stearns; Prepared for US DOT Human Factors Coordinating Committee, November 1996, 92pp.
Report Number: DOT-VNTSC-RSPA-95-2

Available from:
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Ardmore East Business Center
3341 Q75th Avenue
Landover, Maryland 20785-0001
Report Order Number: DOT-VNTSC-RSPA-95-2 *Web Catalog URL: http://www.tsp.dot.gov*

This report presents summary results of the *Workshop on Human Factors Research* held in Reston, Virginia, on September 20-21, 1994. It highlights operator performance measurement in terms of commonality across transportation modes. The workshop objectives were to foster an interchange of experience in measuring and analyzing operator performance; encourage commonality in operator performance measurement and analysis; identify opportunities for cross-modal research and analysis on performance; and recommend directions for joint research on operator performance. The DOT Human Factors Coordinating Committee sponsored the workshop with the intent of enhancing coordination between modal human factors R&D programs and developing commonality in measuring and analyzing operator performance data so that operator performance data can be useful across modes. Participants included members of DOT modal administrations, representatives from other federal agencies, and selected experts in human factors and transportation from the private sector. Papers in this report include: DOT's Coordinated Vision for R&D; Cross-Modal Approaches to Measuring Operator Performance; Interpretation and Use of Operator Performance Data; and Recommendations for Human Factors Research Within DOT. Workshop results will help identify cross-modal research and analysis opportunities, encourage commonality in standards, exchange experience, and recommend directions for future cross-modal research.

Quality Journey: A TQM Roadmap for Public Transportation. TCRP Report 8
Transportation Research Board, National Research Council, Littleton C. MacDorman of MacDorman & Associates, Inc., John C. MacDorman of American Quality Group, Inc., and William T. Fleming of Fleming & Associates; Prepared for the FTA Transit Cooperative Research Program (Gwendolyn R. Cooper, TRI-30), 1995, 76pp.
Report Number: TCRP Report 8

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This guidebook will be of interest to managers, labor leaders, and members of governing boards who have an interest in applying the principles of TQM to public transit. The objectives of this project were to identify, evaluate, and recommend applications of potentially successful methods of implementing TQM in public transit, namely, methods that held promise for increasing ridership, improving customer satisfaction, increasing productivity and reducing costs. TQM stands for Total Quality Management, an approach designed to reform American business and now the transportation industry. TQM moves organizations from a traditional outdated mode of operating to a newer and more progressive mode. Basically, the TQM change is about how organizations perform work, satisfy customers, and get better at what they do, as well as how they inspire, reward and retain the people who make them tick. This report is a guidebook that describes how to implement TQM in a transit agency. The guidebook can be used like a roadmap to help a transit organization plan its quality journey. It provides a picture of the terrain, specific examples from four pilot transit systems, a variety of tips, and additional resources keyed to stages of the TQM journey. The guidebook translates the findings into "how to" tips and examples that focus on the three phases of TQM implementation: the foundation phase, the momentum phase, and the commitment phase. Key leadership development and responsibilities are outlined for each phase. The appendices provide a glossary and a listing of suggested references to assist with the quality journey.

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