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TCRP Report 9

Transit Operations for Individuals with Disabilities

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Report 9

Transit Operations for Individuals with Disabilities

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TRANSIT COOPERATIVE RESEARCH PROGRAM

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

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

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

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

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

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

The TCRP provides a forum where transit agencies can cooperatively address common operational problems. The TCRP results support and complement other ongoing transit research and training programs.

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The members of the technical advisory panel selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and while they have been accepted as appropriate by the technical panel, they are not necessarily those of the Transportation Research Board, the Transit Development Corporation, the National Research Council, or the Federal Transit Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical panel according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

Special Notice

The Transportation Research Board, the Transit Development Corporation, the National Research Council, and the Federal Transit Administration (sponsor of the Transit Cooperative Research Program) do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the clarity and completeness of the project reporting.

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FOREWORD

*By Staff
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This report will be of interest to transit managers and planners in urban rural areas engaged in providing accessible services to individuals with disabilities. In response to national laws and policies promoting nondiscrimination on the basis of disability and promoting greater independence for individuals with disabilities, transit agencies in North America have developed many innovative approaches to better serve customers with disabilities. Providing such transportation services, cost-effectively, to individuals with disabilities may require the integration of several services into one comprehensive transportation system. This report provides alternative operating models and possible enhancements to traditional public transit services that can be employed to encourage individuals with disabilities to use fixed-route services when appropriate.

Under TCRP Project B-1, research was undertaken by a team headed by EG&G Dynatrend to develop a methodology to design and evaluate integrated transit systems that (1) provide accessible integrated service complying with the Americans with Disabilities Act of 1990 (ADA); (2) facilitate the appropriate use of the ADA paratransit service; and (3) support service or system enhancements to encourage travel on accessible fixed routes by individuals with disabilities. Phase I of the study, described in this report, identified and defined possible options and enhancements; determined the applicability of each option to various situations and areas; and noted key implementation issues. An extensive literature search and a survey of all public transit providers in the United States and Canada was conducted. The survey identified 624 agencies that have implemented various service options and enhancements to better serve customers with disabilities. Many of these agencies have improved services to persons with disabilities by strengthening basic elements of their operation, such as vehicle and station design, equipment maintenance, driver training, accessible information, and communications. Beyond these basic and often required service improvements, 20 innovative service options and enhancements were identified. In some cases, these are innovations; in other cases, they are long-standing concepts that are being rediscovered. These 20 options and enhancements are discussed in detail in Chapter 3. Follow-up telephone contact was made with those transit providers who indicated that they had successfully implemented one or more of the identified service options. Information on service, cost, and implementation issues was obtained through these calls.

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, prepared under this project and entitled *Evaluating Transit Operations for Individuals with Disabilities*, provides evaluation methodologies for analyzing five successful service options identified and described in this report. It also examines, in detail, the implementation of these innovations by five selected transit systems. The options evaluated in the companion document are service routes, feeder service, route deviation, low-floor buses, and fare incentives.

This companion document (which analyzes the costs, savings, and operating issues of each service and then compares the cost-effectiveness of the different options used) is available on loan through the TCRP, 2101 Constitution Avenue, N.W. Washington, D.C. 20418.

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The research described in this report was performed under TCRP Project B-1 by EG&G Dynatrend and by Crain & Associates, Inc. EG&G Dynatrend was the primary contractor for the study. Work performed by Crain & Associates was under a subcontract with EG&G Dynatrend.

Russell Thatcher of EG&G Dynatrend was the principal investigator and was responsible for general supervision of the research. David Koffman coordinated the research activities of researchers at Crain & Associates.

Guidance was provided throughout the project by Stephanie Nellons Robinson, the TCRP Technical Advisor for the project, and a steering committee of transit professionals.

Descriptions of the various service options and enhancements included in this report were developed by a number of researchers. Linda Aeschliman of Crain & Associates researched and prepared descriptions of accessible taxi services and accessible bus stop programs. Karla Karash of EG&G Dynatrend prepared descriptions of service routes/community bus programs,

marketing programs, fixed-route planning, subscription bus services, flag-stop and request-a-stop services, and automated information and communication systems. David Koffman wrote sections describing low-floor buses, travel training, and facilitated travel. Lawrence Harman of EG&G Dynatrend researched and prepared sections on route deviation services, point deviation services, and general public dial-a-ride. Russell Thatcher wrote the descriptions of on-call, accessible, fixed-route bus programs; bus identifier systems; destination card programs; and trip planning services. Richard Weiner of Crain & Associates prepared descriptions of fare incentive programs, fare simplification mechanisms, and feeder services.

Carol Schweiger and Marsha Gangi of EG&G Dynatrend assisted in the design of the database that was created to store survey and follow-up call information. Follow-up calls to survey respondents were made by Linda Aeschliman, Russell Thatcher, and Richard Weiner.

TRANSIT OPERATIONS FOR INDIVIDUALS WITH DISABILITIES

SUMMARY

In response to national laws and policies prohibiting discrimination on the basis of disability and promoting greater independence for persons with disabilities, transit agencies in North America have developed many innovative approaches for better serving customers with disabilities. In the United States, innovations have been developed to more cost-effectively implement the Americans with Disabilities Act of 1990 (ADA). In Canada, new operating models and services have been developed in response to national and provincial policies and mandates.

A survey of transit agencies in North America, conducted in 1994 at the start of this study, identified 624 agencies that have implemented various service options and enhancements to better serve customers with disabilities. Many of these agencies have improved services to persons with disabilities by strengthening basic elements of their operation such as vehicle and station design, equipment maintenance, driver training, accessible information, and communications. Beyond these basic and often required service improvements, 20 innovative service options and enhancements were identified. In some cases, these are innovations; in other cases, they are long-standing concepts that are being rediscovered.

Eight new approaches for designing and operating paratransit, fixed-route, and hybrid modes have been documented. These include

- Service routes/community bus programs;
- On-call, accessible, fixed route bus services;
- Route deviation services;
- Point deviation services;
- Paratransit to fixed-route feeder programs;
- General public dial-a-ride services;
- Subscription bus services; and
- Flag stop and request-a-stop services.

Several new technologies are also being employed to improve the accessibility of public transit service. These include low-floor vehicle designs, including low-floor minibuses, full-size buses, and minivans for use in accessible taxi programs. Numerous technologies to improve information and communication access are also being employed, including

- Talking bus stops and signs,
- Talking buses and trains,
- Auditory maps and pathways,
- Automated speech recognition,
- Electronic information signage,

- Assistive listening devices, and
- Telecommunications systems.

Finally, a number of support services are being employed to make fixed-route transit a more attractive and usable travel alternative. Efforts in this area include

- Travel training and facilitated transportation,
- Fare incentive programs,
- Fare simplification mechanisms,
- Trip planning services,
- Targeted marketing and planning efforts,
- Accessible bus stop programs,
- Bus identifier systems, and
- Destination card programs.

Many of these options and enhancements appear to be applicable to transit agencies regardless of size and setting and are rapidly gaining popularity, in both the United States and Canada. One hundred and thirty-five systems reported that they have implemented travel training programs. Targeted marketing efforts were reportedly being used by 160 systems. Low-floor vehicles, which were being tested in only a few sites in the early 1990s, were reportedly being used by 77 systems with another 72 systems considering their use. On-call, accessible, fixed-route bus programs also appear to be widespread, with 74 systems reporting active programs.

Other options and enhancements are being used in more specific settings or are still being explored for more widespread use. Of the 63 systems reporting the use of route deviation programs, most were in rural areas. Some variations of the route deviation concept that limit the impact on fixed schedules are, however, being successfully used in urban settings. Similarly, paratransit feeder to fixed-route service is being used primarily in rural areas although interest is high among urban transit providers as they expand their paratransit service areas.

Initial research findings indicate that a number of transit agencies have employed a combination of these options and enhancements to successfully encourage the appropriate use of fixed-route and paratransit service. The following are a few of the exemplary programs described in this report:

- Madison County Transit (Madison County, Illinois) reported an increase in general public ridership (from 4,000 to 6,500 trips per day) as well as a decline in the need for paratransit service (from 12,000 trips per month to 7,500 trips per month) after establishing a network of service routes throughout the county. The service route program was supported by a travel training program and an aggressive marketing campaign.
- Successful on-call, accessible, fixed-route bus programs have been implemented by the Massachusetts Bay Transportation Authority (Boston, Massachusetts), the Transit Authority of River City (Louisville, Kentucky), the Rogue Valley Transportation District (Medford, Oregon), the Southeastern Pennsylvania Transportation Authority (Philadelphia, Pennsylvania), and the Washington Metropolitan Transportation Authority (Washington, D.C.).
- BC Transit (Vancouver, British Columbia) has established an accessible taxi program to supplement its existing paratransit service. This "Taxi Saver" service provides a 50 percent user-side subsidy while the standard paratransit service is 92 percent subsidized. A total of 50,000 taxi rides are provided each year as part of this program.

- After replacing a traditional, radial, fixed-route system with a sectored, point deviation program, Transit Management of Hamilton, Inc., (Hamilton, Ohio) reported an increase in overall ridership and a 36 percent decrease in bus mileage.
- Island Transit (Coupeville, Washington), which operates long routes connecting communities on Whidbey Island, serves about half of all paratransit customers by providing paratransit feeder service to the fixed routes. Over 3,000 paratransit feeder trips are arranged each month.
- After starting a service route, Richmond Hill Transit (Richmond Hill, Ontario) found that over 50 percent of its paratransit trips could be accommodated by this new route. Cost per trip on the service route was reported as \$5 compared to \$13 for the paratransit program. The switch made the paratransit service available for other riders who needed this service.
- The Sacramento Regional Transit Authority (Sacramento, California) reported providing transportation for 350 clients of work and work-training programs using a fixed-route subscription bus service. Forty program participants have also been travel trained to use other fixed-route buses.

As innovative service designs are developed and employed, there is a need to document key implementation issues, costs, and benefits. This information will help to guide other transit agencies as they seek to expand and improve services for riders with disabilities.

CHAPTER 1

INTRODUCTION

PROBLEM STATEMENT

Passage of the Americans with Disabilities Act of 1990 (ADA) fundamentally changed the relationship between paratransit and fixed-route service. Paratransit service is no longer considered a substitute for accessible fixed-route service—both are required. Paratransit is a complementary service to be provided whenever fixed-route service is unable to or not appropriate to meet a customer's needs.

The ADA has also changed the way in which individuals are determined eligible for public paratransit service. Eligibility is no longer to be based solely on a person's particular disability or on the type of mobility aid that a person uses (for example, those who use wheelchairs are eligible for paratransit). Instead, ADA paratransit eligibility is determined on the basis of a person's ability to use the fixed-route system (given that system's current characteristics) and on related environmental factors. ADA-paratransit-eligible individuals are not necessarily granted access to the paratransit service for all travel needs—the fixed-route system is to be used whenever possible and appropriate.

This new relationship between fixed-route and paratransit service has important implications. First, provision of the most efficient, effective transportation now requires that fixed-route and paratransit service be designed, developed, and operated as one system rather than as separate systems. The expressed demand for paratransit service should be considered in the design or redesign of a total public transit program. Options and enhancements that better integrate fixed-route and paratransit service need to be considered.

Second, the transit industry's ability to implement the ADA may depend on its ability to take full advantage of fixed-route services and develop integrated paratransit and fixed-route systems. The Federal Transit Administration's (FTA's) recent review of ADA paratransit plans found that the requirement that posed the greatest problem to the industry is, not surprisingly, the elimination of capacity constraints. Shortcomings in addressing this service criterion were noted in 44 percent of the plans reviewed (1). Many transit providers project significant increases in travel demand by customers with disabilities. Expanding paratransit systems to meet this need will require significant increases in funding. Better use of available fixed-route capacity could, however, greatly reduce the financial impact of this aspect of the law.

Third, transit systems, which are likely to incur significant financial burdens meeting the paratransit requirements of the ADA, must consider the most efficient, appropriate integration of fixed-route and paratransit service. Before an undue financial burden can be claimed, providers must demonstrate that paratransit service is being provided only

when it is needed and required. Costs associated with providing paratransit service for trips that could have been accommodated on the fixed-route system cannot be counted in any calculation of undue financial burden. It is vital in these instances that all appropriate service options be explored for meeting the needs of ADA-paratransit-eligible individuals in the most integrated, cost-effective way.

As a result, interest in service options that better integrate fixed-route and paratransit systems and in programs that can enhance fixed-route systems has risen since the passage of the ADA. A significant number of ADA paratransit plans include travel training programs, on-call lift-bus programs, expanded marketing efforts, and other improvements. The development of service options and enhancements has also been promoted and facilitated by programs such as Project ACTION; demonstration programs and policies established by Transport Canada; and by workshops and seminars sponsored by the FTA, industry associations, and state transit agencies.

Technical information and research on the many types of service options and enhancements are limited. Certain types of enhancements (such as travel training, marketing, and employee training) are described in recent Project ACTION reports. For service options (such as route deviation services, feeder services, and service routes), few detailed studies exist that describe costs, benefits, and implementation issues. Available information is limited in many cases to promotional materials and articles in industry journals describing the efforts of specific providers. Without the benefit of research and detailed information, many providers are implementing programs without adequate knowledge of the likely costs, benefits, or effects on existing services and riders.

PURPOSE AND OVERVIEW OF THE STUDY

The goal of this research was to develop information and data to facilitate the efforts of local transit providers to implement appropriate service options and enhancements for serving individuals with disabilities. Specific objectives consistent with this goal include developing a way for transit managers and planners to design and evaluate integrated transit systems that do the following:

- Provide accessible, integrated service that complies with the ADA
- Facilitate the appropriate use of paratransit service
- Support service or system enhancements that encourage individuals with disabilities to travel on accessible fixed routes.

Research was conducted in two phases. In Phase I, service options and enhancements being used by transit systems in North America were identified and described. To develop a comprehensive list and to compensate for the limited body of knowledge that exists, a three-step approach was used. The first step involved an extensive literature review. Second, using readily available mailing lists, a brief information request was mailed to 624 public transit systems in the United States and Canada. This request asked providers to indicate if they had implemented or planned to implement certain service options and enhancements. It also asked for descriptions of other innovative options and enhancements that may not have been identified in the survey. Third, on the basis of the information received from the mailing, follow-up telephone calls were made to 95 transit providers that indicated relative success with one or more options and enhancements. Service and cost information, as well as information about local system characteristics, was collected through these calls.

Phase II of the research involved selecting five transit systems, which had implemented certain service options and enhancements, for a detailed evaluation. Evaluation methodologies were developed to guide the review of each

system and option. The effectiveness of each option was examined, and key implementation issues were determined. Options and enhancements studied included service routes, feeder service, route deviation, low-floor buses, and fare incentive programs. A companion document, *Evaluating Transit Operations for Individuals with Disabilities (2)* was prepared and is available through the Transportation Cooperative Research Program.

ORGANIZATION OF THE REPORT

This report contains descriptions of each of the service options and enhancements identified and detailed information about innovative programs from the 95 systems contacted. Chapter 2 provides a more detailed summary of the research undertaken. Chapter 3 contains descriptions of each of the service options and enhancements identified.

A copy of the survey sent to transit providers is included in Appendix A. Information about selected transit providers, obtained from the survey and follow-up calls is presented in a series of tables in Appendix B.

SUMMARY OF RESEARCH APPROACH

IDENTIFICATION OF CURRENT INNOVATIVE PRACTICES

As discussed previously, research focused on identifying and describing the service options and enhancements being used in North America to promote fixed-route use and the appropriate use of paratransit by individuals with disabilities. To identify current practices, several research activities were undertaken, including an extensive literature search, a review of first-year ADA complementary paratransit plans prepared by public transit providers in the United States, and a survey of transit providers in both the United States and Canada.

Literature search activities included the following:

- A manual search of the holdings at the U.S. Department of Transportation (USDOT) library in Washington, D.C., for information about service options and enhancements
- A search through the Transportation Research Records from 1980 to date and of selected earlier records
- A search of the Massachusetts Institute of Technology's (MIT's) libraries using MIT's on-line search capability
- A search of the Volpe National Transportation Systems Center's library using its on-line search capability
- A search of the bulletin board Tap-In system maintained by the Community Transportation Association of America (CTAA)
- A search of articles, in the American Public Transit Association's (APTA's) *Passenger Transport*, focusing on the last 3 years but also searching indexes covering much of the 1980s
- A search of Project ACTION project summaries and newsletters
- A review of ADA paratransit plans in all ten FTA regional offices
- A review of recent Canadian research projects based on research summaries received from Transport Canada
- A search of National Technical Information Service and Dialog
- A review of national and international conference proceedings.

The researchers wrote an article describing the effort and requesting that readers bring innovative local programs to the attention of the research team by calling a toll-free telephone number, usable in both the United States and Canada. The article was sent to the CTAA, the APTA, and Project ACTION for printing in the *Community Transport Reporter*, *Passenger Transport*, and *Project ACTION Update* respectively.

Finally, an information request was sent to all public transit providers in the United States and Canada. This included 548

transit providers in the United States and 76 providers in Canada. The list of providers was developed with the assistance of Transport Canada, the FTA, and Project ACTION. The survey included a list of options and enhancements identified in the literature search. Respondents were asked whether they had tried, were using, or planned to implement each of the listed options and enhancements. They were also asked to rate the effectiveness of each option with which they had some experience. Finally, they were asked if they were aware of other options and enhancements not listed. A copy of the information request form is provided in Appendix A.

There were 309 responses to the industrywide survey—a return rate of 50 percent. Information from each response was entered into a database, and summary statistics and findings were prepared. Charts listing all providers using each option and enhancement were developed. These charts were used to identify possible case study sites and to direct follow-up call activities.

Follow-up calls were made to providers who indicated that they are using one or more of the listed options and enhancements. Because of the number of respondents, calls were made only to those providers who rated their local efforts as moderately effective to very effective (ratings of 3 or better). Calls were also focused on options and enhancements that were considered most appropriate for further study. Options and enhancements targeted for follow-up data collection included the following:

- Feeder services
- Travel training and facilitated travel
- Low-floor buses
- Service routes/community buses
- Route deviation services
- Point deviation services
- Accessible taxi programs
- On-call, accessible, fixed-route bus service
- Fare incentives programs.

The follow-up calls served several purposes. First, they verified that the provider was using the option or enhancement as described. In several cases, providers misunderstood the descriptions provided in the survey. For example, several agencies reported that they provide feeder service but understood this to mean general public feeder service using two fixed-route modes (such as bus feeder to rail service). Once it was confirmed that the provider was indeed operating an option/enhancement as described, additional information about the provider and the service was obtained. This included the following information:

- The population of the service area
- The size of the service area
- The total fixed-route fleet size
- The percent of fixed-route vehicles that are accessible
- The number of paratransit trips provided yearly
- The date when the option/enhancement was implemented.

If the contact person did not have this information readily available, data from available Section 15 reports were used. The tables in Appendix B provide this service information for selected systems identified through the survey.

Finally, follow-up calls were used to determine the suitability of the systems contacted for possible case study work. Information about local consumer involvement, such as the existence of advisory groups and how frequently such groups meet, was obtained. A general sense of the receptiveness of the provider to being studied was also noted.

Ninety-five transit providers were contacted for more detailed information about local services and programs. Where appropriate, this information was used in preparing the detailed description contained in Chapter 3 of this report. Data tables summarizing the information collected are provided in Appendix B.

DESCRIPTION OF OPTIONS AND ENHANCEMENTS

The second major task of the study involved preparing detailed descriptions of the service options and enhancements

identified. From the literature review and survey, 20 basic service options and enhancements were identified. Four other aspects of the operation of an accessible transportation system (vehicle and facility design, equipment maintenance, employee training, and the provision of accessible information and communications) were identified as essential elements rather than options.

Chapter 3 provides, in a consistent format, descriptions of options and enhancements. Each begins with a concise definition. The definition is followed by a detailed description of the option or enhancement. Next, information is provided concerning the following:

- Ways in which the option/enhancement can promote fixed-rate use and the appropriate use of paratransit
- Applicability to particular situations and areas
- Key implementation issues
- Service and cost information.

Most sections end with a graph indicating the effectiveness of the service option as reported by transit systems responding to the survey. In a few cases, descriptions of options identified during the follow-up calls to the survey do not contain this information.

A list of additional sources of information discovered during the literature search and used to develop this report is provided after the list of references. These sources are grouped by option and enhancement.