



Capital Area
Regional Transit Coordination
Committee
(RTCC)

Literature
Review

May 11, 2010



**Capital Area Regional Transit Coordination Committee
Coordinated Plan Update Technical Report #1:
Literature Review and Survey of National Best Practices
May 11, 2010**

Purpose of this Report:

This report provides a review of national literature and highlights emerging trends in the coordination of public transportation, with particular attention given to demand response paratransit and specialized transportation services. This report will support a major update of the Capital Area Regional Transportation Coordination Plan, and will provide examples of best practices that the Capital Area RTCC could incorporate as we develop and implement the Coordinated Plan.

Best Practice Highlights

Travel Training and Financial Incentives for Using Fixed Route Transit

Travel Training

Travel training has proven to be an effective and long lasting technique that also enhances passenger mobility and travel options. This is illustrated by the following travel training case study.

Transit Adventures (Sandy, OR, Previously part of Tri-Met)¹

The Transit Adventure program, a guide-led travel training program, trains 4 to 15 people at a time on a day long trip that used all modes of transit in the metro Portland area . Training is open to all clients, however; most participants are age 55 or older. In order to train a group on several modes, a guide usually selects a “fun” destination, e.g., museum, tourist destination, museum, etc., to travel to. The trips begin at a rural/suburban location and proceed into the city where participants learn how to travel on urban transit and make transfers between services. The Transit Manager has estimated that the Transit Adventure Program cost between \$200 and \$300 per month (cost estimate includes time research and plan trip, eight hours to guide the trip, marketing expenses, and Non-SAM fares). As many and 50 individuals have taken the trip several times. Some of the participants have become travel trainers themselves. Participants have become comfortable using transit on their own for longer trips to medical appointments and have overall requested fewer paratransit trips.

Quantitative analyses of travel training programs have been performed on two similar travel training programs.

- RTC Washoe
- Northern Nevada Center for Independent Living

Results show that the age range of travel training participants as follows

- 20% between ages 18 to 22
- 54% between ages 23 and 59
- 27% age 60 or older

Results of the RTC Washoe travel training program

¹ Case study by TCRP from *Policies and Practices for Effectively and Efficiently Meeting ADA Paratransit Demand*, TCRP Synthesis 74

After 71 participants were trained, 44% of participants were able to complete trips on fixed-route only, 34% continued to use paratransit only, and 7% used a combination of fixed-route and paratransit (15% of participants did not complete the travel training). The 44% of participants who were able to make trips on fixed-route only took on average 264 rides per week (13,728 trips annually).

71 Trainees (44%) were able to ride fixed-route alone after training

Training Cost per Trainee	\$441
Cost of Providing Trips on Fixed-Route	\$36,000
Cost of Providing Trips on Paratransit	\$300,000
Savings	\$233,000

Results of the Northern Nevada Center for Independent Living travel training program

97 Trainees (regular riders who were assumed to be able to use fixed route were trained)

Travel Training Expenses per year	\$55,000
Cost Savings per trip (per rider switching from paratransit to fixed-route)	\$27 -\$30
Number of paratransit to fixed-route trips per month per rider	10
Savings	\$260,000

Financial Incentives for Using Fixed Route

Utilizing fixed route service as a tool for managing paratransit demand: Shifting passengers from paratransit services to fixed route is not only a cost containment and demand management strategy but also a strategy that can enhance travel and mobility options of passengers. Passengers benefit from switching to fixed route when fixed-route services have lower fares (savings vary by region and operator). A study by Center for Urban Transportation Research at the University of South Florida identified proactive steps that should be taken along with offering financial incentives to help encourage patrons to use fixed-route when possible:

- Provide accessibility information
- Improve accessibility to and from bus stops
- Invest in passenger amenities at the bus stop
- Continue to improve vehicle accessibility and accommodate passengers with special needs
- Ensure that bus operators announce bus stops or install automatic announcement systems

In addition to these proactive steps, financial incentives have been used to help switch users of paratransit to fixed-route when possible. Common financial incentives used by agencies are described below:

- Allowing ADA eligible riders to use fixed route for free
- Allowing person care attendants of clients to also ride free (important as many ADA clients would not feel comfortable riding fixed-route alone)
- Other agencies allow ADA clients to ride fixed route service at greatly reduced fares

Central Ohio Transit Authority (COTA)

COTA provides a financial incentive to patrons who are eligible to use ADA paratransit service to use fixed route regular bus service instead. All ADA cardholders can ride the fixed route bus service FREE by swiping your card through the fare box.

A 1997 TCRP report described the results of free fixed route fare incentive case studies: such incentives resulted in a shift from paratransit to fixed route in the order of 5% to 20%. Regions that saw greater shift also had a greater degree of accessible fixed route services.²

Mobility Management

A 2007 TCRP report titled *Paratransit Manager's Skills, Qualifications, and Needs*, provides a detailed overview of recruitment, training, and retention practices used by agencies which have mobility management positions. It is useful for both agencies that already have mobility management positions and agencies that wish to create such positions. The following topics are discussed.

Current mobility management position requirements:

- Current education requirements for the position
- Current years of experience needed for the position
- Current years of supervisory experience needed for the position
- Current skills required for the position
- Starting salary ranges for the position

Actual experiences of mobility managers in the following regards:

- Education achievement (level of education attained and area of study)
- Longevity in current position
- Years of experience in passenger transportation
- Years of supervisory experience
- How recruited for current position
- Attraction of the position
- Skills training received in the past five years
- Current salary ranges

Agency surveys and interviews were conducted and results are reported.

In addition, the report provides and short history of mobility management in the U.S. and loosely identifies job duties, technologies that are commonly used, and training, professional memberships and conferences attended.

Other studies have looked at gained efficiencies and cost savings experienced due to the creation of a mobility management position.

²TCRP Web Doc 2 Evaluating Transit Operations for Individuals with Disabilities: Final Report (1997) Transportation Research Board (TRB) http://www.nap.edu/openbook.php?record_id=6348&page=4

Fares for service beyond ¾ mile

Paratransit fare charges are limited by ADA to twice the amount of the fixed-route fare for service within three-quarters of a mile of fixed-route lines—it is unrestricted for trips beginning or ending beyond that distance. Transit providers do not have the ability to increase fares for rides beginning or ending within three-quarters of a mile of fixed-route service unless the fixed-route fare was increased.

Metro Washington Council of Governments Extended Service Fares³

- Washington Metropolitan Area Transit Authority (WMATA) charges a base fare of \$2.60 per paratransit trip that begin and end inside the ¾ mile ADA minimum required boundary.
- In 2003, WMATA commissioned a Regional Task Force to identify options for improving paratransit services and reducing the cost of providing services. The Task Force made 10 recommendations: one recommendation, aimed at improving cost containment, was to charge a supplemental fare for MetroAccess paratransit service beyond ¾ mile corridor and fixed routes service area. The annual cost savings estimated by the Task Force was \$360,000.
- The recommendation was implemented at a later date.
- Current fares for service beyond the ¾ mile ADA minimum requirement are described below.
 - A trip that begins or ends more than ¾ mile from the closest bus stop or is more than 1.5 miles from the nearest Metrorail station will have a supplemental fare charge on top of the \$2.60 regular fare.
 - Passengers are notified at the time of reservation how much the supplemental fare will be.
 - Paratransit riders may travel up to four zones beyond the weekday, peak period, public transit service area. A \$1 per zone supplement is charged in addition to the \$2.60 base fare as follows:

Zone	Distance	Price
Zone 1	Up to 3 miles	\$1
Zone 2	Between 3 and 6 miles	\$2
Zone 3	Between 6 and 9 miles	\$3
Zone 4	More than 9 miles	\$4

³ Committee Documents, Metro Regional Taskforce on Paratransit Service, Metropolitan Washington Council of Governments (MWCOG), 2004: <http://www.mwcog.org/uploads/committee-documents/o11WX1020041130073035.pdf>

MetroAccess Customer Guide, Washington Metropolitan Area Transit Authority:
http://www.wmata.com/accessibility/metroaccess_service/customer_guide.cfm#fares

Omnitrans Access Paratransit Service, Southern California⁴

Omnitrans, a public transportation agency in the San Bernardino County Valley, CA, provides paratransit services to clients in Southern California. Like MetroAccess in Washington D.C., Omnitrans has implemented a zone-based fare structure for riders who wish to use services beyond the $\frac{3}{4}$ mile ADA minimum requirement. The following is a summary of service fair for trip within and outside of the $\frac{3}{4}$ mile boundary.

Base Fares for service within $\frac{3}{4}$ mile boundary:

Standard Service: per trip fare	
Eligible Rider and Companion	
1-3 zones	\$ 2.75
4 zone trips	\$ 3.75
5 zone trips	\$ 4.75
6 zone trips	\$ 5.75

Fares for service beyond $\frac{3}{4}$ mile boundary:

Beyond Access Service: per trip fare	
Eligible Rider and Companion	
1-3 zones	\$ 7.75
4 zone trips	\$ 8.75
5 zone trips	\$ 9.75
6 zone trips	\$ 10.75

Other Transit Agency Fare Structures

- Santa Clara Valley Transportation Authority (VTA) Outreach Paratransit Service

As required by federal Americans with Disability Act regulations, VTA's paratransit service area is defined as a $\frac{3}{4}$ -mile corridor around all of VTA's bus routes and light rail system. Extended Service Area Trips are an additional 1 mile beyond the VTA paratransit service area. The fare for this premium service is four times the regular one-way trip fare (\$16.00). Customers who live or travel outside the service area are still eligible for paratransit service, however they now need to go to the paratransit service area and pay the base paratransit fare to use the service.

- King County, WA, Metro Access

Paratransit trip fares within and beyond the $\frac{3}{4}$ mile ADA minimum are currently \$1.00. King County, WA residents approved the Transit Now initiative in 2006 which allowed a 0.1-percent sales-tax increase to have a dedicated funding source for transit programs. Among other things, the funding has been used to expand paratransit services, i.e., longer service hours and provide service beyond $\frac{3}{4}$ ADA minimum at no additional cost to the rider. However, in 2009, the King County Auditor's Office recommended that fares be increased as part of a cost containments strategy.

⁴ Paratransit Policies For Persons With Disabilities, Omnitrans, 2009:
<http://www.omnitrans.org/routes/AccessBrochure.pdf>

Vehicle lending programs

Community Access Transportation Program (Vehicle Sharing): King County, WA⁵

Access Paratransit vehicle sharing program, Community Access Transportation (CAT), was established in 2003. The program lends used transit vehicles to community agencies to provide their own transit services to clients and to ADA eligible clients who would otherwise qualify for Access Paratransit services. Studies have found that the cost of a paratransit trip provided by a community agency is cheaper than a similar trip provided by Access.

- In 2008, the average cost of a CAT trip was \$4.80, and an average Access trip cost \$39.17 (155,456 trips were provided on CAT vehicles in 2008. Roughly 38 percent of these trips would have been eligible for regular ADA service)
- Access provides lift-equipped vans or 15-passenger vans (vehicles are either retired or new)
- Access provides maintenance, and driver training,
- Community agencies provide van drivers and scheduling, comprehensive and liability insurance, and transportation service
- The program requires that community agencies provide 50 one-way trips per month for Access eligible customers
- Community agencies that provide at least 100 one-way Access eligible trips per month are eligible to receive operating funds from Access (funds are not guaranteed and May not be used for driver salaries)
- More information about the vehicle sharing program and program recommendations from the King County Auditor can be found in Performance Audit or Transit, Technical Report D: Paratransit, by the King County Auditor's Office and TCRP Synthesis 74.

⁵ Performance Audit or Transit, Technical Report D: Paratransit, by the King County Auditor's Office, 2009:
<http://www.kingcounty.gov/operations/auditor/Reports/Year/~//media/operations/auditor/documents/2009Documents/ParatransitTechRepD.ashx>

ITS and Farecards

Maturation of ITS Technologies and Paratransit Technology Matrix

ITS technologies are becoming more mainstream and affordable. As they become more common, these technologies will allow for better coordination and integration of paratransit services.

ITS technology has matured to the point that its widespread implementation is realistic and provides a real solution for improving coordination among multiple providers while reducing cost. With the help of ITS, transit agencies will be enabled to choose a tailored service design that best works without technological restrictions. From the operational perspective, cost and complexity are associated with managing too many schedules, vehicles, and services types, and ITS allows planners to optimally manage such complexity.

NCTS has developed an ITS technology matrix which provides a list of key/common technologies, technology purpose, example of agency using technology, selected vendor and/or product name (See NCST Technology Matrix, 2007⁶).

A main focus of the ITS Technology report for the Transportation Research Record⁷ was placed on scheduling software and its role in improving transit coordination and states that demand-response fleets with more than 30 vehicles, use software to assist in taking requests, and assigning passenger requests to particular runs. The minimum estimated fleet size for fixed route to justify the software may be larger because of the nature of the service. For large demand response fleets, schedule possibilities increase and manual scheduling cannot be as efficient as software and algorithms. Small efficiency gains from software scheduling may easily result in large absolute savings for a service provider.

Such scheduling software is intimately tied to computer aided dispatching-automatic vehicle location (CAD-AVL) systems, mobile data terminals (MDTs), and real-time passenger information... Transit signal priority (TSP).

A matrix of ITS technologies prepared by the Community Transportation Association for the National Center on Senior Transportation provides an overview of commonly used ITS technologies, its purpose, and examples of agencies that currently use each technology.

Farecards/Smartcards

TCRP Report No. 115 titled *Interoperability of Smartcards in the Transit Industry*, provides an in-depth look at the use of smartcards in the transit industry and discusses the following topics.

- The future of smartcards: use expected to increase with time
- Provides a good introduction to smartcard technology and necessary ITS architecture for successful implementation.
- Key information that needs to be exchanged between agencies in order to successfully achieve interoperability.
 - Hypothetical case study explains how system could work between two agencies
 - Obstacles and strategies for overcoming obstacles are presented
- Case studies from agencies in the U.S. that are currently using smartcards and sharing information with partnering agencies

⁶ NCTS Technology Matrix (Passenger Related Technologies)

⁷ Maturity of Key Technologies Provides More Options for Transit and Paratransit Planners, *Transportation Research Record: Journal of the Transportation Research Board*, No. 1992, Transportation Research Board of the National Academies, Washington, D.C., 2007, pp. 35–42.

Performance Measurement⁸

A study for the Transportation Research Record titled “Performance Metrics and Data Mining for Assessing Schedule Qualities in Paratransit” separated performance measurement data into two groups: those that the authors believed showed a positive effect on paratransit service performance and those believed to show a negative effect on paratransit service performance. A list of measures in each group is shown below.

Positive Effects on Quality

- Passengers per hour
- Trips per hour (average number of stops per hour on a given run)
- Number of wheelchair passengers per hour that are served

Negative Effects on Quality

- Deadhead time: total amount of time that a vehicle runs without a passenger on it
- Total cumulative delay time for passengers (difference in estimated time and actual arrival time)
- Total cumulative ride time for passengers (total duration that passengers spend on a vehicle)
- Number of passenger rides which last more than 45 minutes
- Average ride time per passenger
- Average trip distance
- Maximum trip distance
- Percent of total trips that are great than or equal to 5 kilometers
- ‘Zig-zag’ metric which is designed to detect sharp turns and trips that traverse an entire region

Performance Measurement, King County, WA—Measures of Overall Service Productivity⁹

In a paratransit service technical report completed in 2009 by the King County Auditor’s Office, King County acknowledged that the establishment and implementation of performance indicators for the ACCESS paratransit system would help monitor and understand productivity from year to year. Below is a list of King County’s factors that are believed to impact productivity. Factors have been broken into two categories: those outside Access’s control and those within Access’s control. Performance measures that allow planners to understand if these factors are having more or less of an influence in productivity are recommended.

Factors Affecting Productivity Outside Access’s Control

- Traffic congestion (loss of operator time stuck in traffic)
- Density (affects length of client trips)
- Development patterns (affects length of client trips)

⁸ R. Shioda and M. Shea , Performance Metrics and Data Mining for Assessing Schedule Qualities in Paratransit, *Transportation Research Record: Journal of the Transportation Research Board*, No. 2072, Transportation Research Board of the National Academies, Washington, D.C., 2008, pp. 139–147.

⁹ Managing Paratransit Costs by King County, WA, Auditor’s Office:
<http://www.kingcounty.gov/operations/auditor/Reports/Year/~/media/operations/auditor/documents/2009Documents/ParatransitTechRepD.ashx>

- Client residential patterns (clustered versus scattered)
- Configuration of popular trip origins and destinations (may increase loading and unloading time and time to reach customers)

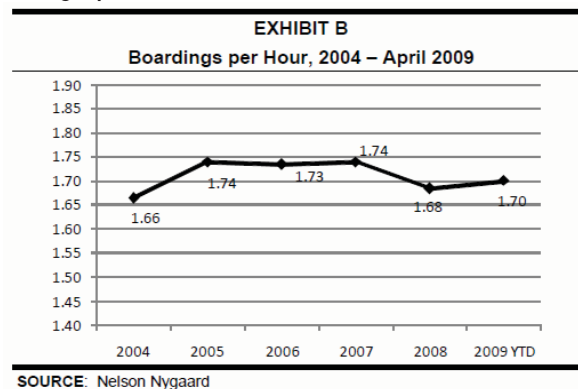
Factors Affecting Productivity Within or Partially Within Access’s Control

- Scheduling effectiveness (grouping trips, minimizing slack time, optimizing operator assignments)
- Dispatch effectiveness (use of slack time, utilizing nearest vehicle, time loss recovery techniques.)
- No show customers
- Lost operators
- Searching for addresses
- Operators not using most efficient routes between points
- Communications and paperwork
- Passenger escort
- Late cancellations

Research by the County Auditor’s Office shows that,

While there is no industry standard that defines an optimal goal for trips per hour, a Transit Cooperative Research Program (TCRP) survey of the largest urban demand response systems (which included Access) revealed a range of productivity as measured in trips per hour of 1.3 to 2.3 trips per hour.

Access has recorded boardings-per-hour data since 2004 and found the following:



Between the years 2005 and 2007 productivity remained relatively constant but declined 3.4 percent in 2008. These changes in productivity may seem insignificant; however, very small changes in productivity result in very large changes in expenditures—for each .04 increase in boardings per hour it is estimated that Access saves \$1 million per year.

The following cost data is collected and computed by King County:

- cost per hour to provide services
- cost per mile,
- cost per boarding

Literature Review

Efficiency and General Coordination

1. Title:	Creative Ways to Manage Paratransit Costs
Date:	July 2008
Author/Organization:	Prepared by the Center for Urban Transportation Research University of South Florida
Other Information:	Project #BD549-28 Prepared for the Florida Department of Transportation Research Center
Summary/Topics:	<p>Report on all public and private transportation that is in-between private automobiles and conventional public transit. The report provides information for 3 paratransit classification types: complementary, general, and user-side subsidized. The report is centered on the concern of rising costs of paratransit services by documenting major expense factors and identifying best practices for paratransit cost containment.</p> <p>NTD ADA data and Florida Transportation Dependent cost data used for major expense analysis (analysis based in 67 Florida counties both urban and rural).</p>

2. Title:	Policies Practices for Effectively and Efficiently Meeting ADA Paratransit Demands
Date:	2008
Author/Organization:	TCRP Report Transportation Research Board David Chia Planner Collaborative, Inc. Boston, MA
Other Information:	TRCP Synthesis 74 Source: TCRP Online
Summary/Topics:	<p>Paratransit ridership is approximately 1% of total ridership, but paratransit cost is approximately 9% of total transit operating cost—room for efficiency improvement. Average cost of ADA paratransit trip in 2004 was \$22.17, whereas for other modes, cost per trip averaged \$2.75. Data source for the report: 900 surveys sent to transit agencies on APTA and CTAA mailing lists—124 agencies responded. Researcher followed up in 17 of the responding agency.</p>

Key Findings and Content:

Noted policies that agencies have used to achieve gains in efficiencies:

- More precise eligibility determinations
- Use of taxi contractors for flexible capacity
- Coordination with social agencies and other potential paratransit providers
- Integrated paratransit services for use by the general public
- Improvements to fixed-route service and

- Incentives to use fixed-route services
(Each of the these are discussed in more detail)

Some increased efficiencies and cost saving have been quantified—examples of cost saving calculations are provided.

Case Studies

Dallas Area Rapid Transit (DART)

Reports that DART has an automated system that allows riders to request and confirm trips over the phone without a call taker (less labor intensive system with increased efficiency). Report provides details on how the system works constraints of system and observed benefits since the system has been in place.

Transit Authority of River City (Louisville, KY)

Vehicle maintenance and vehicle lending (Transit Authority of River City, Louisville, KY) and other examples of achieved efficiency and better coordination. Local Mobility Council: offering other agencies free vehicle maintenance and operating a vehicle lending program.

Regional Transportation Commission Washoe (Reno, Nevada)

Shopping routes for the elderly case study. Case study explains how shopping program for the elderly works and benefits reported by the RTC. Route efficiency measures were used to quantify benefits (passenger per hour compared to other modes and total cost savings).

Taxicab and other Flexible Capacity Vehicles (Various agencies)

- Accessible Minivans
- Accessible Sedans
- Accessible Minivans (King County Metro). Metro owns vehicles and allows other agencies to operate them through agreement. Challenges are reported—some benefits are also reported.
- For each of these the issue of insurance and driver training arises.

Report Conclusions

- Summary of survey responses (what responses seem to indicate)
- Comments on case studies

3. Title:	Integration of Paratransit and Fixed-Route Transit Services
Date:	2008
Author/Organization:	Transit Cooperative Research Project
Summary/Topics:	<ul style="list-style-type: none"> • Highlights experiences of other transit agencies and highlights a variety of ways to integrate services (provides many case studies from the US) • Operations considerations, i.e., client eligibility, fares and transfers, etc., • Examples of marketing and technologies in integrated service models • Types of service integration models

4. Title:	Transit Agency Participation in Medicaid Transportation Programs
Date:	2006
Author/Organization:	Transit Cooperative Research Project
Summary/Topics:	<ul style="list-style-type: none"> • Provides additional case studies of various US Transit Agencies

5. Title:	Medicaid Transportation and Urban Public Transit: Strategies and Opportunities for Increasing Transit Ridership
Date:	2008
Author/Organization:	Ken Hosen, KFH Group
Summary/Topics:	Reports that urban transit providers can take advantage of the market for Non-Emergency Medical Transit (researcher places emphasis on NEMT because it is largest HHS transportation program). The author presents factors that are found to be present in successful coordination models, factors that are helpful, and factors that make coordination more difficult.

6. Title:	The United We Ride National Dialogue FINAL REPORT
Date:	February 2010
Author/Organization:	Gregory Lashutka, Chair* Edward T. Jennings Jr.* Nan Roman* * National Academy Fellow NATIONAL ACADEMY OF PUBLIC ADMINISTRATION <i>For the Federal Interagency Coordinating Council on Access and Mobility</i>
Other Information:	Academy Project Number: 2143-000
Summary/Topics:	<p>Online dialogue regarding CCAM and regional transit coordination at all levels of government. The main question to be answered through the dialogue is: <i>What ideas can improve access to affordable and reliable transportation for people with disabilities, older adults, and people with limited incomes?</i> 4 priority areas were identified by respondents and Panel provided program responses to suggestions. A break down of respondents is provided in the report (mostly non-profit agencies and even proportions of respondents from urban, suburban, and rural locations).</p> <p>Source has a lot of good information but is mostly useful at higher levels of government. Report can be used to help local governments and agencies understand program and policy barriers at higher levels of government.</p>

7. Title:	Organizational Structures for Brokerage of Paratransit Services
Date:	2006
Author/Organization:	Anthony M. Pagano and Paul Metaxatos, Urban Transportation Center, University of Illinois at Chicago

Summary/Topics:	<ul style="list-style-type: none"> • Service brokerage model in Lake County, IL (Suburban, Chicago) • Present and compares conceptual models of alternative organizational structures for implementing a paratransit brokerages
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8. Title:	Paratransit Manager's Skills, Qualifications, and Needs, Mobility Management
Date:	2007
Author/Organization:	Transportation Research Board, TRCP Synthesis 71
Summary/Topics:	<ul style="list-style-type: none"> • Benefits • Coordination Strategies • Mobility Manager Profiles

Client Eligibility

9. Title:	Impacts of More Rigorous ADA Paratransit Eligibility Assessments on Rides with Disabilities
Date:	May 2009
Author/Organization:	Prepared by the Center for Urban Transportation Research University of South Florida
Other Information:	Project #BD549-44 Prepared for the Florida Department of Transportation Research Center
Summary/Topics:	<p>Because of soaring costs, transit agencies have taken steps to limit paratransit demand by creating more rigorous standards for client eligibility. This study reports the impacts that more rigorous standards have on riders. It describes changes in eligibility requirements that transit agencies have implemented and what impacts they have had. The reported goal behind such changes was to reduce overall cost by restricting demand. Finding is that changes have negatively impacted segments of the disability community.</p> <p>Report data: Survey of 39 transit agencies across the nation. Survey covered eligibility requirements (certification procedures). 10 of the original 39 respondents were chosen for in-depth interviews and case studies (providing an overview of agency approach, certification process, ADA policies and processes, and alternative mobility option for the disability community).</p>

Key Findings and Content:

Budgetary pressures provide motivation for agencies to examine ADA complementary paratransit services—innovative and comprehensive practices were used by agencies who chose to examine and change such services.

- Agencies aim to cut cost of expensive paratransit services
- Disability community responds with concerns, fearing the loss of mobility

- Some reports support the notion that more rigorous eligibility requirements hinder disability community and have negatively impacted this segment of the population
- Looks at how agencies have adapted to rising paratransit costs as demand for such services has grown

Overview of Eligibility: 3 Categories

Category 1
<i>Any individual with a disability who is unable, as the result of a physical or mental impairment (including a vision impairment), and without the assistance of another individual (except the operator of a wheelchair lift or other boarding assistance device), to board, ride, or disembark from any vehicle on the system which is readily accessible to and usable by individuals with disabilities.</i>
Category 2
<i>Any individual with a disability who needs the assistance of a wheelchair lift or other boarding assistance device and is able, with such assistance, to board, ride, and disembark from any vehicle which is readily accessible to and usable by individuals with disabilities if the individual wants to travel on a route of the system during the hours of operation of the system at a time, or within a reasonable period of such time, when such a vehicle is not being used to provide designated public transportation on the route.</i>
Category 3
<i>Any individual with a disability who has a specific impairment-related condition which prevents such individual from traveling to a boarding location or from a disembarking location on such system.</i>

Emerging Eligibility Determination Practices

Trip-by-trip determination. (Page 11) “Transit agencies attempt to determine and identify the specific barriers that prevent riders from using fixed-route service. If such barriers do not impact all passenger trips, the rider can be classified as conditionally eligible. This means that the rider is sometimes able to use fixed-route service as conditionally eligible and given a code identifying the types of barriers that prevent fixed- route use.”

Fixed-Route Travel Training. (Page 12) “Transit agencies attempt to determine and identify the specific barriers that prevent riders from using fixed-route service. If such barriers do not impact all passenger trips, the rider can be classified as conditionally eligible. This means that the rider is sometimes able to use fixed-route service as conditionally eligible and given a code identifying the types of barriers that prevent fixed- route use.”

Supplemental Fare Charge for Service Beyond the ¾ Mile Corridor or Fixed-routes. (Page 12) “This strategy addresses the travel needs of riders who would otherwise be eligible for ADA paratransit service but have an origin or destination outside the minimum

3/4 mile service corridor. Some agencies provide service outside the minimum required service areas but charge a higher or premium fare for this service.”

Free or Reduced Fare Fixed-Route Service may be offered to Persons Eligible for ADA Paratransit and to Companions and PCAs of Persons (Page 12) “Many transit agencies offer financial incentives to ADA paratransit eligible individuals to use fixed-route transit services for those trips that the individual might be able to undertake. These incentives are also sometimes extended to persons accompanying the ADA paratransit eligible rider.”

Same-Day Taxi Subsidy Program (Page 12) “A few agencies have instituted a same-day taxi subsidy program to supplement the normal next-day ADA paratransit service, providing ADA riders with a more spontaneous option for travel and providing cost savings to the extent ADA riders chose the same-day program over the normal next-day service. This alternative service is offered with a lower per-ride passenger subsidy and costs the passenger more for his/her share. This practice provides a higher quality and spontaneous transit option, diverts trips from the normal ADA paratransit service, and results in a savings to the transit agency.”

Equipment, ITS, and Fleet Management

10. Title:	Advanced Small Transit Vehicle Technology Study
Date:	August 2007
Author/Organization:	Del Peterson* Michael Molloy Small Urban & Rural Transit Center Upper Great Plains Transportation Institute North Dakota State University
Summary/Topics:	Study examines state of small transit vehicles and includes market and technological analysis of transit vehicles fewer than 30 feet in length. Goal of study is to facilitate improvements of small transit vehicle design and understand transit provider concerns regarding these types of vehicles. The study summarizes vehicles that are available, analyzes small vehicle market and provides future projections, and examines emerging technologies. Vehicle types are discussed; their accessibility is described as well as other characteristics (i.e., fuel source, pros and cons, and capacity). Various ITS technologies are discussed. And finally, transit agency perspectives are summarized (vehicle maintenance cost is number 1 concern when buy these types of vehicles, and fuel efficiency is described).

11. Title:	Maturity of Key Technologies Provides More Options for Transit and Paratransit Planners
Date:	2007
Author/Organization:	Eric C. Bruun Transportation Research Record: Journal of the Transportation Research Board, No. 1992, Washington, D.C.
Summary/Topics:	Status update on the maturity of key technologies, e.g., ITS technologies, scheduling software, . Provides overview of service delivery designs and options for more efficient use of vehicles.

12. Title:	Successful Flex-Route Case Study, OmniLink (Potomac and Rappahannock Transportation Commission, Virginia)
Date:	2006
Author/Organization:	Transportation Research Record
Summary/Topics:	<ul style="list-style-type: none"> • ITS Procurement (FTA Grant) • Cost-Benefit analysis of ITS technology • Lessons for other agencies

13. Title:	Howard County Shared Facility Cost-Benefit
Date:	2009
Author/Organization:	KFH Group
Summary/Topics:	<ul style="list-style-type: none"> • Shared maintenance operations in Howard County, Maryland • Analysis shows great cost savings in the region when operation and maintenance facilities are shared by multiple transit service providers

14. Title:	Smart Card Interoperability Issues for the Transit Industry
Date:	2006
Author/Organization:	Study by the Transit Cooperative Research Program
Summary/Topics:	<ul style="list-style-type: none"> • Smartcard technology and uses •

15. Title:	Insurance Issues and Strategies
Date:	Spring 2006
Author/Organization:	United We Ride National Resource Center for Human Service Transportation
Summary/Topics:	<ul style="list-style-type: none"> • Issues and strategies for overcoming obstacles • Debunking myths and presenting realities • Understanding how insurers make decisions about insurance • Insurance issues when sharing vehicles and using volunteer drivers (Myths and Realities)

Performance Measurement and Planning Tools

16. Title:	Paratransit Performance Measures
Date:	2008
Author/Organization:	Transportation Research Record
Summary/Topics:	<ul style="list-style-type: none"> • Paratransit performance measurement • Metrics that show positive effects on quality • Metrics that show negative effects on quality • Perspectives of 'good' paratransit

	*Article is more technical than others and also includes information on transit data mining
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17. Title:	Guidebook for Measuring, Assessing, and Improving Performance of Demand-Response Transportation
Date:	2008
Author/Organization:	Transportation Research Record, TCRP Report 124
Summary/Topics:	<p>Provides discussion on how to measure, assess, and improve transit performance, focusing on DRT in urban areas</p> <ul style="list-style-type: none"> • Key performance data (in-depth discussion of traditionally available data) • Factors that influence performance • Considerations for comparison between types of DRT service • Collection and analysis of Data • Management actions (improving performance)

18. Title:	Rural Transit/Demand Response Demand Forecasting
Date:	2009
Author/Organization:	UT Center for Transportation Research, TxDOT,
Summary/Topics:	Review of TxDOT-developed tool (applied to Brownsville, TX)

19. Title:	Guidebook for Evaluating, Selecting, and Implementing Suburban Transit Services
Date:	2006
Author/Organization:	Transit Cooperative Research Project
Summary/Topics:	<p>This report is a follow up to an earlier (1999) TCRP report on suburban transit services. The earlier, companion report contained 8 case studies of suburban transit services from various regions in the U.S. The case studies described the following:</p> <ul style="list-style-type: none"> • Types of transit services offered • Funding arrangements • Marketing strategies • Performance Measurement • Lessons learned: successes and challenges <p>This report provides additional case studies and an updated summary of the status of suburban transit in the U.S. Authors recognize the challenge that suburban land uses place on transit services and provide an in-depth discussion. A description of suburban transit service by type is also provided. Case study findings are presented and key issues and trends are described—like the earlier case studies, performance measurement and funding arrangements are given special attention.</p>

20. Title:	Toolkit for the Assessment of Bus Stop Accessibility and Safety
Date: 2005	
Author/Organization:	Easter Seals Project Action
Summary/Topics:	Toolkit presents bus stop accessibility myths and related counter discussion. Principles of creating accessible and safe bus stops are detailed (checklist is included)