

Transportation for the Elderly & Handicapped

Programs and Problems 2

October 1980

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Transportation for the Elderly and Handicapped: Programs and Problems II

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Acknowledgement



In developing this document, the U.S. DOT Office of Technology Sharing at the Transportation Systems Center in Cambridge, Massachusetts is particularly indebted to Dr. William G. Bell, Professor of Planning at the Florida State University in Tallahassee, Florida.

Dr. Bell, director of the Multidisciplinary Center on Gerontology, served as conference coordinator for the Seventh Annual Conference on Transportation for the Elderly and Handicapped, sponsored by the Center, the Department of Urban and Regional Planning, the Florida Department

of Transportation, and the Transportation Research Board, Washington, D.C., which was held in December 1979 in Orlando, Florida. He also served as consulting editor for this document.

We are also grateful to the many contributors who have allowed their papers to be adapted for general distribution to patrons, planners, managers and others involved in transportation systems serving the elderly and handicapped. Their cooperation enables us to share their knowledge and experience with a wide audience.

This report is a companionpiece to an annotated bibliography, *Transportation and the Elderly and Handicapped: A Literature Capsule*, issued in January 1977, and *Transportation for the Elderly and Handicapped: Programs and Problems*, issued in December 1978 by the Office of Technology Sharing at the Transportation Systems Center. These publications are intended to be used by a wide range of readers. The Technology Sharing Office welcomes your comments and reactions.

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Foreword

This is the third publication on transportation for the elderly and handicapped issued within a four-year period by the Office of Technology Sharing at the U.S. DOT Transportation Systems Center in Cambridge, Massachusetts. Readers of previous publications will be interested in what appears to be a changing emphasis — from planning to implementation — which is reflected in the chapters in this present publication. Where former contributors were concerned with preparations for special transportation systems, the focus of current contributors appears to be on the ongoing problems of recently established systems.

Of course, the issue of accessibility to public transit, and the related issue of complete mobility for the elderly and handicapped, remain major concerns. These are the two main themes running throughout the individual papers, many of which discuss the efforts which public transit authorities have made to accommodate the needs of the elderly and handicapped. Other solutions involve special systems operated as an adjunct to public transit by these authorities. There are also a number of descriptions of special systems which operate completely outside the local public transportation systems. The trend reflected in the papers, however, is to consolidate these three methods of

accommodating the needs of the elderly and handicapped. Nearly one-third of the contributions to this publication deal with the problems of coordination of services and various brokerage arrangements which facilitate this coordination. Efforts to coordinate are stimulated by both federal and state funding requirements; these efforts are also stimulated at the local level by consumer and taxpayer pressure for unduplicated and cost-effective special services during an inflationary period.

Therefore, the questions of how much service to provide, when, and to whom, as well as whether, once the service is provided, people actually use it, are receiving increased attention. Again, nearly one-third of the papers are focused on issues of estimating demand for service and evaluating the impact of services on the lives of the target population.

Just as there are now requirements for maximum feasible coordination, there is official recognition that early involvement of potential users of special systems will improve the planning and realistic implementation of such systems. We expect that various strategies for stimulating citizen participation will receive further attention in the years ahead.

There are also two issues which are emerging: insurance — both coverage and cost, and the potential effects of the Section

13(c) labor protection provisions of the Urban Mass Transportation Act as amended, on the recent Section 18 programs to fund public transportation services for the elderly, handicapped, and rural populations. Both of these are complex issues, and it will take time for coherent policies to emerge as a result of their resolution at the state and local level.

There has been increasing recognition that drivers and others concerned with the operations of special systems for the elderly and handicapped need an augmented training program so that they can truly understand just how vehicle operation and the design of facilities help or hinder the users. Two successful training programs for bus operators are reported in this volume.

Finally, special systems require special vehicles. The selection of these vehicles is a recurring problem for operators, and some practical suggestions in this regard are given in the final section.

A list of original authors with their addresses appears at the end of the publication. Each individual paper has been abridged, and readers are encouraged to contact the authors directly for further information and answers to specific questions.

I MAJOR ISSUES

1. Accessibility
2. Coordination and Brokerage
3. Demand Estimation,
Needs Assessment,
and Evaluation
of Impact

The Biaggi Amendment: Ten Years Later

Mario Biaggi, Member of the House of Representatives from the State of New York
Chairman, Subcommittee on Human Services, House Select Committee, Washington, DC

Congressman Mario Biaggi, Representative from the State of New York, was a featured speaker at the Seventh National Conference on Transportation for the Elderly and Handicapped held in Orlando, Florida, December 1979. Portions of his address appear below.

The House Select Committee on Aging, in its five-year history, has clearly established itself as one of the most effective advocates of America's 22 million older citizens.

During the past ten years in Congress, there has been no one issue to which I have felt more committed than the issue of transportation accessibility for our elderly and disabled citizens. The first amendment I succeeded in having adopted was to have the following language added to the Urban Mass Transportation Act amendments: "It is hereby declared to be the national policy that elderly and handicapped persons have the same rights as other persons to utilize mass transportation facilities and services."

The years between 1970 and 1977 were disappointing in terms of having the amendment implemented. Buses, which carry 75 percent of all urban mass transportation users, were deemed by UMTA to be one of the least accessible forms of mass transportation, and it has been estimated that upwards of 13 million people cannot

use them. In the early 1970s, UMTA was awarding millions of dollars in contracts to subsidiaries of major bus companies to develop what were called "Transbus" prototypes. These prototypes were to have features such as low floors, wide doors, and ramps or lifts for people confined to wheelchairs. Meanwhile, with full knowledge of the UMTA efforts, other leading American bus manufacturers were developing their own "accessible" buses without consulting those most affected by transportation barriers, namely the elderly and disabled.

“ . . . as a group, the elderly and disabled population is growing, both in terms of actual numbers and political influence.”

As the years went by, there was a great deal of study and evaluation but very little in the way of significant progress in the development of a truly accessible bus. In 1975, I sponsored another amendment, this time to the appropriations bill providing funds to UMTA. It barred the use of funds for any buses unless they were designed to meet

the mass transportation needs of the elderly and handicapped. Unfortunately, the sole achievement of the amendment was to promote additional studies by UMTA to develop acceptable specifications.

However, less than three months after President Carter assumed office, the Secretary of Transportation, Brock Adams, announced the "Transbus mandate." It required that all buses purchased with federal funds after September 30, 1979 be equipped with the 22-inch floor, wide door, and ramp features to promote accessibility. Six months later, a consortium of three cities — Los Angeles, Philadelphia and Miami — agreed to purchase some 500 Transbuses.

The progress achieved by Secretary Adams' announcement was severely threatened just one year later when legislation came before the House which sought to postpone for 18 months the effective date of implementation of the Transbus mandate. Once again I went to the House floor with an amendment to delete that section of the bill seeking the postponement. The amendment prevailed and Congress overwhelmingly reaffirmed its commitment to Transbus. My amendment also provided that these buses could be equipped with either ramps or wheelchair lifts, depending upon the needs of each region.

The Department of Transportation had set May 2, 1979 as the deadline for bids on

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the first 500 Transbuses for use by the three-city consortium. But in March, Grumann announced that it would not submit a bid, and General Motors made a similar decision. Each company cited difficulties in developing a Transbus. No company, from the United States or abroad, bid on the contract.

Secretary Adams then commissioned a blue-ribbon panel to study the Transbus specifications. The report in effect endorsed the GM and Grumann decisions, but mostly on financial grounds. It is important to point out that the Mitre Corporation, which helped prepare the panel's report under contract to the Department of Transportation, concluded that the Transbus specifications were in fact capable of being met by bus manufacturers.

Although many felt that this was the end of Transbus, the Delorean Motor Company of New York indicated a genuine interest in producing the Transbus. The Delorean bus, known as the DMC-80, is fuel-efficient, getting twice as many miles per gallon as the buses now on the road. It is three tons lighter and three feet shorter than the Transbus specifications. It can carry more passengers than the GM Advanced Design Bus, and it is easier to maintain. It has the low floor and wide door, ramp or lift option. When in production, it will cost the same as current buses, considerably less than the

\$250,000 per bus cited by General Motors. This bus, presently manufactured in Germany, could, if a permanent commitment is given by the Department of Transportation, be produced here in the United States.

I have been advised personally by the succeeding Secretary, Neil Goldschmidt, that he has approved a proposal to provide some \$35 million for a demonstration project under which some 100 buses with accessible features will be tried out in the normal transportation operations of several major American cities.

The debate on the issue of accessibility continues. There are in fact several alternatives available to fulfill the requirements of barrier-free transportation. They include the following:

1. accessible fixed-route system or transit plans which require improvements in existing mass transit vehicles as well as the quality of service;
2. separate door-to-door service by taxi or other types of paratransit; and
3. subsidized purchase of special cars.

The cost factor mandates that we explore all options. A recent report by the Congressional Budget Office paints a stark picture of the cost of full accessibility. However, as a group, the elderly and disabled

population is growing, both in terms of actual numbers and political influence, and must be served.

When I offered my amendment in 1970, it was one year after America had achieved the technological miracle of landing a man on the moon. One might assume that American technology could produce a bus which is accessible to the elderly and disabled.

END

Providing Private Cars To Severely Disabled People

David L. Lewis, Associate Analyst
 Congressional Budget Office, Washington, DC

The Congress is finding it necessary to address the economic and budgetary implication of the DOT accessibility regulations promulgated in July 1979. The total cost of making the changes might be as much as \$6.8 billion over the next 30 years, a sum equivalent to two and a half times the current annual federal transit budget.

The argument has been advanced by many transit authorities, and a number of handicapped people, that transportation which takes passengers from door to door would help a far greater number of severely disabled people than would the adaptation of buses and trains called for by DOT. The potential role of private, specially equipped autos has been given little attention in public policy, however.

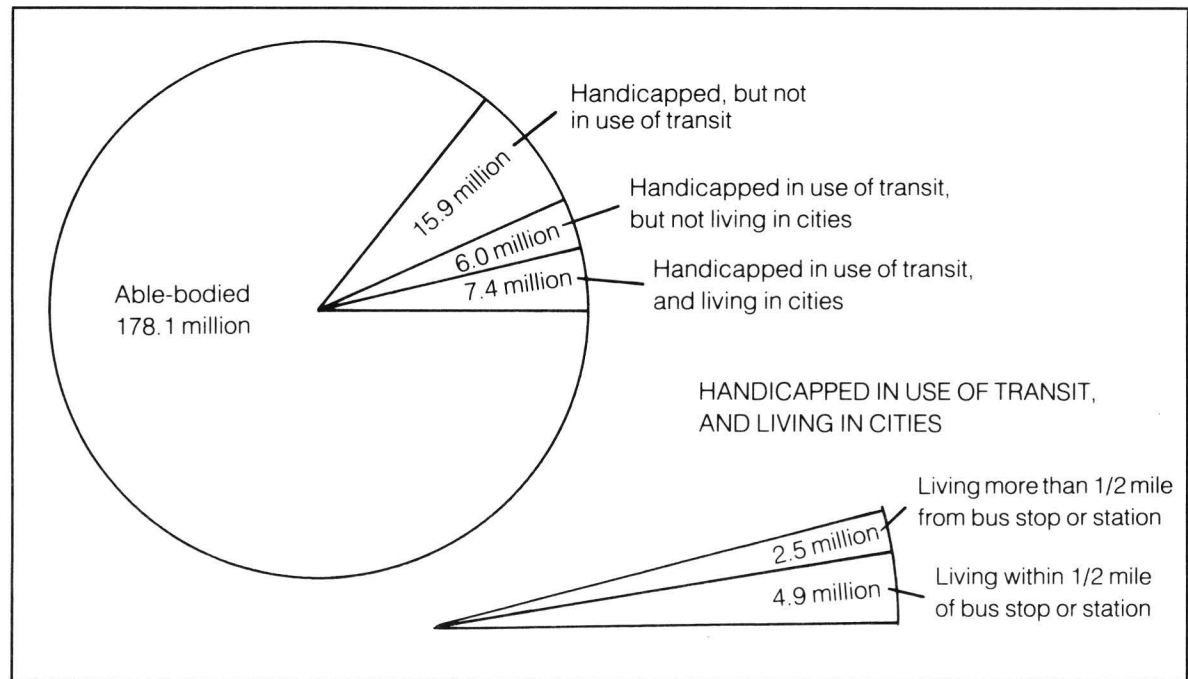
The Congress will find it necessary to examine the trade-offs between adaptations, such as those in the Transit Plan discussed below, that equalize access to current services, and the creation of new services, such as dial-a-ride, tailored to the special needs of handicapped people.

The Travel Needs of Handicapped People

An estimated 13.4 million people are handicapped in the use of public transportation. "Handicapped" here is defined as people who, because of medical problems or incapacities, experience more than average difficulty in using public transpor-

ation. About 7.4 million handicapped people live in cities served by public transportation (see Figure 1). By the year 2010, their number is likely to grow by 70 percent. Of the 7.4 million handicapped people living in cities, only 4.9 million are within half a mile

of a bus stop. Of these, 689,000 live near subway stations. The 2.5 million handicapped people living away from bus routes and subway stations would need plans built around flexible services like dial-a-ride, taxis, and privately owned autos.



Sources: CBO estimates based on *Limitations on Activity Due to Chronic Conditions*, U.S. Department of Health, Education and Welfare, June 1977; *The Handicapped and Elderly Market for Mass Transit*, U.S. Department of Transportation, October 1973; *Technical Report of the National Survey of Transportation Handicapped People*, U.S. Department of Transportation, October 1978. The data are for various years from 1973 to 1978 and hence not strictly comparable.

Figure 1. United States Handicapped Population by Category, 1977

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About 1.4 million people — 19 percent of all handicapped people in urban areas — are physically unable to use any form of public transit services. The remaining 6 million people can use transit services, but with difficulty. One-third of them, however, live more than half a mile from a transit stop. About 93 percent of all handicapped people in urban areas are physically capable of using taxis.

Severely Disabled People

Among the 1.4 million unable to use mass transit, about 278,000 use wheelchairs. Most paraplegic people can transfer from a wheelchair to a taxi. Others can manage to use a wheelchair in conjunction with operating a car. It is a simple procedure to adapt the foot controls of a car so they can be operated by hand, and to provide space behind the front seat to store a wheelchair.

About 40,000 handicapped people suffer from quadriplegia, disabilities in the arms, trunk, and lower extremities. It is possible, however, for many quadriplegic people to operate an adapted vehicle. A van can be equipped with a lift, with channels to lock the wheelchair into the driving position, and with power-assisted controls. Such adaptations make driving physically possible for nearly all quadriplegics except for some elderly, the blind, and the minority



Equipment is now available that would enable 30 percent of all wheelchair users to drive cars. The photographs show the control mechanisms for two lift-equipped vans that can be operated from a wheelchair. Left: hand-controlled lateral steering, acceleration, and braking require one-twentieth the effort of standard controls. Right: knee-controlled lateral acceleration and braking (showing electric wheelchair control at lower right.)

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who suffer total impairment of hand and finger movement.

The remaining six million people identified as handicapped in their use of transit can in fact use bus and train services, albeit with difficulty. Most are able to use taxis.

The Importance of Having Access to an Automobile

Lack of access to an automobile is the most important transportation problem confronting the handicapped. Those who have a car available to them make 54 percent more trips per day than those who do not own a car, or who do not have a friend or relative to drive them. The results of a national survey show that those who already have a car available for most of their trips would make hardly any extra trips if they owned the car, while those who usually do not have access to a car would travel 29 percent more if they owned a car. The main purpose of their trips would be shopping, and secondly, social and leisure activities. When neither a car nor public transportation is available, handicapped people either do not go out, or must incur very high travel costs.

Ranking Needs

One method for developing plans to solve transportation problems facing the handicapped is on the basis of severity of

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need. People who have nobody to drive them, are physically unable to drive adapted vehicles or use adapted transit, cannot get into conventional taxis, and cannot afford private lift-equipped van service have the greatest need. They probably number less than 5,000

The second priority of needs are those of quadriplegic and paraplegic people with relatively less severe cervical impairments who cannot use adapted transit facilities or can do so only with difficulty, but who could operate adapted automobiles (with training) and can travel by lift-equipped taxis. There are no reliable estimates of their number, but this group may include about 100,000 wheelchair users.

Of the 1.4 million people physically unable to use transit, 1.3 million are confined to wheelchairs or suffer disabilities that make it extremely difficult or impossible to walk to a bus stop; many can physically use conventional taxis, but they often restrict their travel to medically related journeys because of high fares.

The fourth priority needs are those of the 6 million people who are moderately handicapped. They are physically able to use existing transit services, but only with difficulty. They do not require large-scale transit adaptations such as lifts and elevators, but would be helped greatly by modifications in the existing system such as

lower steps on buses, more handrails better placed, priority seating, and vehicles with smoother acceleration.

Two alternative plans for serving the transportation needs of handicapped people are discussed below. The DOT regulations form the basis of one plan, termed here as the Transit Plan. The ranking of severity of needs, identified above, guided the development of the second plan.

“A (private) van can be equipped with a lift, with channels to lock the wheelchair into the driving position, and with power-assisted controls. Such adaptations make driving physically possible for nearly all quadriplegics . . .”

The Transit Plan

The Transit Plan complies with DOT's Section 504 regulations. The plan would require that all new buses purchased by transit operators who receive federal funds

have wheelchair lifts and special suspensions that lower the front steps of the bus; that cities served by a subway system either install elevators in their key stations and modify their rail cars to serve wheelchair users, or offer dial-a-ride service and taxi subsidies; and that all cities with rail systems link up unmodified stations with some other accessible service. It requires similar adaptations by commuter rail and streetcar systems: key stations on such systems, one car per commuter train, and half the fleet of streetcars, must accommodate wheelchairs.

The Auto Plan

The second plan, the Auto Plan, is not based on the DOT regulations; instead, it offers alternative services, each tailored to the needs identified above. The plan would give a capital grant to paraplegics and quadriplegics to cover the purchase price of specially adapted private cars or vans. It would also supply lift-equipped dial-a-ride vans, to transport wheelchair users who do not drive, from door to door at fares and frequencies broadly equivalent to transit fares and frequencies. Other people too severely disabled to use public transportation, but able to enter an ordinary taxi, would be offered subsidized taxi fares. For moderately handicapped people, the plan provides for a special suspension on every

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new bus that would lower the front steps to make boarding easier. Other provisions include special seating areas on buses, more handrails, a seat-before-accelerate rule, and bus routes linking all subway stations.

In analyzing these plans, it was assumed that handicapped passengers would pay no more for public transportation service than prevailing transit fares. For those who may find travel at such prices prohibitive, assistance might be provided through existing federal income maintenance policies. This analysis also assumes that half the cities with subway systems would choose to supply door-to-door service rather than install elevators.

Comparison of Alternative Plans

Table 1 presents a projection of the number of handicapped people likely to use each of the plans. The plan geared to the DOT regulations appears to help fewer handicapped people in general, and far fewer people with the highest priority needs than does the plan emphasizing door-to-door services and specially adapted automobiles.

The DOT regulations require transit systems to make changes that would accommodate severely disabled patrons. Yet most wheelchair users and other severely handicapped people who do not use transit today cannot get to bus stops

**TABLE 1
PROJECTED NUMBER OF HANDICAPPED PEOPLE WHO WOULD
BENEFIT UNDER ALTERNATIVE TRAVEL PLANS, 1980 - 2010**

Plan	Moderately Handicapped People ¹	Severely Handicapped People ²	All Handicapped People
Transit plan	638,386	103,585	741,971
Auto plan	592,000	419,544	1,011,544

¹ Users of existing transit services who would make more trips
² People currently not using mass transit

and rail stations, or have difficulty in doing so; many cannot travel without the assistance of another person. The vast majority of people who would gain under the Transit Plan have only mild to moderate disabilities that do not prevent them from using transit today. They are those for whom travel is made difficult by current vehicle and station design. If about one-third of these people were led by improvements to make more use of transit, about 638,400 or only about 10 percent of all moderately handicapped people would benefit from the DOT rules.

Approximately one million handicapped people would benefit from the Auto Plan, 36 percent more than would gain from the Transit Plan.

Providing wheelchair users with door-to-door van service increases fivefold the

number of wheelchair users who could travel more often. While six percent of all wheelchair users stand to gain from the DOT regulations as interpreted here, the door-to-door services would help 29 percent, or 110,000.

Other features of the plan would allow 54,000 severely disabled but ambulatory people to use buses for the first time. The plan would also extend bus routes to subway stations.

Adding a program providing specially adapted automobiles for paraplegic and quadriplegic people would benefit even more severely disabled people. Some of those who would otherwise use door-to-door van service would be enabled to purchase their own automobiles, reducing the need for expensive publically owned vans.

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In total, 80,000 paraplegic and 36,000 quadriplegic people could become auto users.

Operating and Capital Costs

The costs for each plan are closely linked to ridership. The cost of adapting public transportation facilities is broadly fixed, regardless of the use made of them by handicapped people. The cost of door-to-door transportation and provision of specially equipped autos, on the other hand, is relatively flexible; it depends heavily on the number of handicapped people who use them. This means that below a certain level of use, plans that emphasize door-to-door services will cost less than plans requiring adaptations of mass transit systems. The cost analysis and the patronage forecasts indicate that the costs of door-to-door service together with specially equipped automobiles could be less than those of implementing the DOT regulations.

These regulations project 30 years for implementation of certain elements of the Transit Plan, e.g. the rail station adaptations and the extended bus routes. The total expenditure for each of the plans at the end of 30 years has been calculated as a basis for comparison.

The gross cost of the Transit Plan would be about \$7.1 billion over the next 30 years. This is equivalent to two and one-half times

the current annual level of federal funding for transit. Gross expenditure on the Auto

Plan over that period would come to about \$6.7 billion, as shown in Table 2. The pro-

TABLE 2
GROSS CAPITAL AND OPERATING COSTS OF THE
TRANSPORTATION PLANS 1980 to 2010
(In Millions of 1979 Dollars)

	Transit Plan		Auto Plan	
	Total Cost at the End of 30 Years	Annual Cost	Total Cost at the End of 30 Years	Annual Cost
Public transportation modification costs				
Bus	4,873.5	181.2	382.8	23.2
Rail	832.9	7.0	N/A	N/A
Door-to-door service costs				
Dial-a-ride and taxi	1,404.1	51.1	2,798.5	101.8
Specially adapted autos	N/A	N/A	3,529.1	128.3
Total costs	7,110.5	239.3	6,710.4	253.3

The following assumptions are made: rail stations are adapted in half of the cities with rail transit by the year 2010; door-to-door services and the adapted automobile program are implemented within six years.

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jected level of use of door-to-door services is such that their total cost, plus the cost of public transit adaptations called for in the Auto Plan (which amount to about seven percent of the cost of transit adaptations called for by DOT), remains less than the total cost of implementing the DOT regulations. This forecast reflects the current low patronage of existing door-to-door services by those eligible to use them. Using data from six cities, Spear and others found that on the average only 41.5 percent of users of door-to-door service also could have traveled by auto, either as driver or passenger. Only eight percent of the users of door-to-door service could have driven their own cars.

Once all construction at rail stations is paid for, Transit Plan costs would go down to about \$239 million a year for bus replacement costs, fleet expansion costs, and the associated operating and maintenance costs. These continuing costs are about five percent below those of the Auto Plan. This analysis excludes the added fuel and maintenance costs incurred by disabled private motorists under the Auto Plan, and extra revenue from fares paid by handicapped passengers.

A useful guide to the cost-effectiveness of a new transportation investment is the sum of the capital and operating costs divided by the number of trips, or "cost per

trip." This index does not take into account factors such as convenience and the satisfaction of using the same services as the general public.

TABLE 3
USE AND COST OF ALTERNATIVE TRANSPORTATION PLANS
(In 1979 Dollars)

	Transit Plan	Auto Plan
Number of moderately handicapped people able to travel more	638,386	592,000
Number of wheelchair users and other severely disabled people able to travel more	103,585	419,544
Total net public cost (millions of dollars) ¹	\$6,841.4	\$6,364.0
Total net public cost per additional trip made by moderately handicapped people (dollars) ²	\$10.31	\$.41
Total net public cost per additional trip made by wheelchair users and other severely disabled people (dollars) ³	\$38.08	\$7.33
Annual net public cost per additional trip made by moderately handicapped people after one-time capital expenses are paid (dollars) ⁴	\$8.46	\$.46
Annual net public cost per additional trip made by severely disabled people after one-time capital expenses are paid (dollars) ⁴	\$31.93	\$7.45

¹ Total capital and operating costs incurred over the next 30 years, minus revenue through fares from handicapped passengers.

² Costs allocated among additional trips made by all handicapped people during the next 30 years.

³ Capital and operating costs per additional trip over the next 30 years allocated among the additional trips made by severely disabled people during that period.

⁴ Costs incurred every year once all construction is complete, allocated among the additional trips made annually.

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At present (1979), it costs only about 85¢ per trip to serve a transit passenger. The Transit Plan, however, with its emphasis on heavy capital equipment geared mainly to the needs of wheelchair users, would enable moderately handicapped people to make additional use of transit services at a cost of \$10.31 per trip, as shown in Table 3. Only 14 percent of all handicapped people who stand to gain from the Transit Plan have disabilities severe enough to prevent them from using unadapted transit services.

From this table we also see that costs of serving the handicapped rise sharply, to \$38 per trip, when they are allocated among the severely disabled individuals from whom the adaptations are mainly intended.

The final two items in Table 3 show the cost per trip of serving moderately and severely handicapped people, respectively, after all one-time investments have been paid for. The costs of the Transit Plan are still high compared with the alternative plan. When the costs are allocated among moderately handicapped passengers, the cost per trip is \$8.46. For severely disabled people, it is \$31.93.

The Auto Plan supplies 116,000 people, who might otherwise need dial-a-ride service, with a private car. This results in substantially lower operating subsidies to the public than a plan where all severely disabled people receive dial-a-ride or taxi

services. Also, people with access to their own cars travel more than those who must rely on public transportation, so that in generating more trips at the same time as serving more people, the cost per trip of supplying each adapted automobile falls below the cost per trip of dial-a-ride and taxi services. If fuel and maintenance costs were included, however, the cost of the Auto Plan might exceed that of a plan based on taxis.

The Congressional Choice

If the Congress views the choice between plans as a civil rights issue, and if it interprets the DOT regulations as the necessary protection of these rights, then it will soon need to appropriate the necessary funding for implementing the Transit Plan. If, on the other hand, the Congress is more concerned with serving a greater number of people, providing more convenient forms of service, and minimizing overall costs, then it will move to the Auto Plan and provide the necessary funding to implement it. **END**

A Transportation Credit Program

John Dickey, Center for Public Administration and Policy
Virginia Polytechnic Institute, Blacksburg, VA
Ronald Kirby, Ulrich Ernst
The Urban Institute, Washington, DC

Over the last 20 years or so, direct assistance to the user has been employed in the delivery of many services. These include food (food stamps), education (the G.I. Bill), home heating (energy payments for the poor and elderly), and health (Medicaid and Medicare). In fact, with the exception of transportation, there have been user assistance programs in almost every major human service area.

“A preliminary study [showed that] the Transportation Credits Program would generate about 3½ times as many new trips as the ‘transit-only’ scheme.”

The conventional way to help the poor obtain public services and enhance their assets and consumption is to provide for these through some type of supplier, e.g., a government agency, developer, or builder. This might be termed “supply-side assistance.” Funds usually are provided to agencies or firms, who then deliver the goods or services. The family or individual

with low income simply “receives” the service, sometimes paying for it through subsequent user charges of some sort. Examples are numerous: housing built by a construction firm and then turned over to a poor family; water supply and sewage disposal reticulation laid in the ground and connected with a low-income dwelling; local roads and highways constructed for user traffic; schools and health facilities developed by a government agency to provide outreach to families with low incomes.

Although this form of help has some merits, it also evidences substantial difficulties:

1. Unit administrative costs are high because of the number and salaries of the intermediary providers;
2. As in any trickle-down process, targeting is inefficient because of the difficulty of ensuring that the desired recipients receive the benefits of the service;
3. The very poor rarely are reached at all;
4. Providers generally know less about the real needs than do the recipients; and
5. There are few incentives for suppliers to integrate services to meet multiple needs.

An alternative is to provide directly to the user or consumer the resources needed

to obtain the goods or services, i.e., “user assistance.” This can be done either through loans, grants, or sales. The recipient then can purchase the goods or services when needed and from one of a variety of competitive suppliers. Examples include educational loans, food stamps, and more general income support programs such as the negative income tax.

Structurally, this form changes the relationships among agency, program participant, and the provider. In more traditional delivery systems the agency is in an intermediary position between suppliers and participants. User assistance reorganizes this arrangement, putting the client and the supplier in a direct, nonmediated relationship, and recasting the agency’s responsibility into facilitation of that relationship.

There are several benefits which might reasonably be expected to result. Among them are:

1. To put decision-making, negotiating, and purchasing power into the hands of the consumer may increase the likelihood that individual client needs will be met adequately;
2. The client’s participation in decisions about his or her own life may increase skills in dealing with a variety of institutions, and enhance self-esteem, sense of efficacy, and

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commitment to the accomplishment of his or her goals;

3. The client's power to give or withhold payment from a supplier may influence the latter to become more responsive to client needs; and
4. Shifting to the client some of the responsibility for arranging for the acquisition of goods or services might divert the energies of agency staff to other productive activities.

Despite these potential advantages, user assistance has not been commonly employed in passenger transportation, although it has been used in other settings, for example through the GI Bill for education.

User Assistance for Education

The benefits paid under the GI Bill are an example of the flexibility of such a system. The benefits can be used to cover living expenses as well as tuition and other direct costs. The amount that the veteran receives does not depend on the amount of tuition he or she pays, thus creating a powerful incentive for the veteran to seek out the provider who can give him or her the desired schooling or training at the lowest cost, because the lower the direct cost, the more he or she has left over to cover living costs. In addition, the veteran's benefits may be spent on any of a very wide range of

postsecondary education and training operations.

The WIN (Work Incentive) program uses a variety of ways to achieve its ultimate goal of permanent and productive employment for former welfare recipients. Among the most important methods of preparing WIN clients for the labor force is skill training, either in formal vocational training programs or through on-the-job training. In the WIN voucher training program tried in Baltimore, Maryland and elsewhere, the participant was provided with a letter of introduction (the voucher) to prospective trainers establishing the client's eligibility, and explaining the program and the terms under which the skill training was to be provided. The client was able to take a variety of training opportunities from a variety of providers, both public and private, up to a certain limit. Trainers were reimbursed by the WIN agency.

User Assistance for Health Care

Through Medicaid, eligible people are supplied health services from almost any doctor, hospital, or other medical establishment upon request. Providers are paid directly by the local health agency, which in turn gets its funds from the federal government. The transportation providers, who carry people to and from the medical services, also are reimbursed.

Housing

In 1970, Congress authorized HUD to establish an Experimental Housing Allowance Program (EHAP). The core of the housing allowance concept involves the provision of direct cash assistance to low-income households to enable them to obtain adequate housing. Under the program, a household selects housing of its own choice as long as the unit meets the housing requirements established for the program. Allowance payments are made directly to the household, instead of being attached to a particular unit. As of January 1976, EHAP had made a total of more than \$13 million in allowance payments to more than 14,000 households.

In addition, the Section 8 Rent Supplement Program, based to some extent on the housing allowance principle, is fast becoming the major housing program in the United States.

User Assistance for Energy Costs

The Community Services Administration, working through local agencies on aging, is reimbursing elderly and poor people up to a limit of \$250 for some of their winter fuel bills. Individuals must apply, giving their age, income, and other relevant socioeconomic characteristics. They also must supply evidence of paid and unpaid fuel bills, which are verified with the appro-

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appropriate company. The individuals and companies are repaid accordingly. Many states have similar supplementary plans.

User Assistance for Food Costs

The Food Stamp Program has been in operation nationwide since 1964; a similar demonstration was conducted in upstate New York prior to World War II. Recipients establish eligibility through the local welfare office. The stamps are obtained periodically at a local bank. The amount given depends on income, family size, and other criteria. The stamps can be used to buy food at participating grocery stores.

One finding from studies of the Food Stamp Program is that each dollar of tax money for food stamps transferred from the relatively rich taxpayer to the relatively poor recipient actually *increases* the Gross National Product (GNP) by an additional 14¢. This is significant because it indicates that the Food Stamp Program has a multiplier effect.

User Assistance in Transportation

User assistance has been employed to some degree in public transportation, although few applications have been monitored carefully enough to permit a comprehensive evaluation of the administrative costs or the quality of services obtained by client groups from the providers. The Medi-

caid program, as noted, has been subsidizing taxicab rides for its clients for some time, and several communities have used discretionary monies such as revenue-sharing funds to institute user assistance schemes for groups who have limited mobility. Recently, UMTA has been developing a series of demonstration projects designed to test the user subsidy technique in a variety of institutional and operational settings. Some examples follow.

In Los Gatos, California, a small city of some 23,700 people, elderly and disabled residents may purchase a maximum of 10 taxicab tickets a month at a cost of 50¢ per ticket. They can use one ticket per trip anywhere within the city limits. For each ticket used, the city reimburses the taxi operator \$2.10 out of revenue-sharing funds. In order to prevent cash flow problems for the taxicab operator, the city pays the operator a monthly advance based on average ticket use.

In December 1974, the City of Oak Ridge, Tennessee, started selling tickets at 25¢ each to people 60 years of age and over. Each ticket can be used in lieu of up to \$1.00, for a taxi fare, with the user paying the balance. The city pays 90¢ for each ticket turned in by the taxicab operator. On those rides with fares less than 90¢, the taxi oper-

ator makes a small profit, while on those over 90¢ the taxi operator sustains a small loss.

In November 1976, UMTA set an important precedent by approving the use of Section 5 funds to subsidize shared-ride taxicab services for the elderly and handicapped in Oklahoma City. A user assistance scheme is being employed in this pilot project to reimburse participating taxicab operators for the subsidized rides they provide. This particular project provides encouragement for other cities considering similar applications.

The statewide Transportation Remuneration Incentive Program (TRIP) in West Virginia combines both user and provider assistance to improve the mobility of elderly people with low incomes. The user portion enables those who are eligible to purchase \$8.00 worth of tickets monthly on a sliding fee scale dependent on income. Agreements have been worked out with public and private transportation providers across the state (including public transit, taxicab operators, Greyhound, and AMTRAK) to accept these tickets at face value as payment of fares. The provider subsidies permit certain providers to purchase new equipment and expand services for all users, particularly in rural areas.

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A user assistance program was adopted in May 1975 by the New Jersey State Department of Transportation to allow elderly and handicapped people to travel for half fare during off-peak periods on intrastate bus and rail lines. An expansion of the program in 1976 made some interstate travel eligible for the off-peak half fare. Ticket books containing 50 tickets are distributed free to eligible people through banks. When making a trip, the user gives the provider half of the fare in cash, along with one ticket. The provider then submits the ticket to the state and receives a payment based on an average fare established for that particular service and provider. Though this program was initially scheduled to operate for only one year, the state DOT has recently extended the program indefinitely.

The first UMTA demonstration project, initiated in December 1975, provided shared taxi services at reduced fares for the handicapped and elderly in the city of Danville, Illinois. An eligible user paid 25 percent of the taxi fare in cash, and signed a charge slip for the remainder of the fare, which the provider subsequently received from the city. A maximum of \$20 worth of taxi service per month was allowed for any one individual under the program. Each of three other UMTA demonstration projects in Montgomery, Alabama, Lawrence, Massa-

chusetts, and Kinston, North Carolina had a variation of the arrangements described above.

Automobiles have been provided to one special group, disabled veterans. Those who are able to drive using various kinds of adaptive equipment can apply to the Veteran's Administration for help in purchasing an auto or other vehicle and the required adaptive equipment. The one-time grant had a limit of \$3,800 in 1979.

A similar program, which includes all travel modes, but likewise is restricted to the severely handicapped, is the Mobility Allowance Program in Great Britain. About 100,000 people get up to £10 (about \$20) per week to help them purchase any form of transportation, including autos. In addition, a new voluntary organization, Motability, has been set up to help recipients to apply a portion of their allowance toward the lease or purchase of an auto or similar vehicle. This is being done in conjunction with the provisions of £100 million in loans from banks on favorable terms.

This approach has several advantages over traditional public transportation policies for the disadvantaged. However, current programs prevent recipients from taking advantage of the private automobile or truck. The possibility of subsidizing auto use has been recognized. Various Congressional ideas for oil deregulation and

gasoline rationing have called for broad user-side mechanisms to help reduce the impact of increased fuel prices on the poor.

A Transportation Credits Program

A basic alternative to subsidizing the provider, and to the limited user-side approaches, is the Transportation Credits Program (TCP). In this option, the voucher system, as used in West Virginia for public transportation, would be expanded to include a much wider range of transportation expenditures. Acceptable uses might include not only all forms of public transportation, but also operation or use of a private automobile. Thus, the transportation credits could be used to pay for items such as gasoline and oil as well as the purchase and maintenance of an auto. The basic structure of such a program might be as follows:

1. Eligibility criteria would be determined on the basis of income, family size, age of head of household, and disability status.
2. Eligible households and individuals would be identified through client lists of social service agencies, and through a process similar to the existing procedures for, say, the Supplemental Security Income, AFDC, or the food stamp programs.
3. Each eligible household would be offered a special credit card, rather

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than tickets or stamps. The special credit card might look like a VISA or MasterCharge card, with some feature that would restrict its use for transportation-related expenditures; for example, it might be a "VISA T" card, where the "T" would signal any merchant that the card could be used only for purchases permitted under the program.

4. The credit card would be issued and processed by the usual credit card company or companies; they would be reimbursed for any program-related expenditures.
5. Each household would "purchase" a certain line of credit on the trans-

portation credit card. The line of credit would depend on household characteristics such as size or handicapped status. The household contribution, i.e., the "purchase price," would also depend on income.

6. Members of each eligible household could then charge the exact amount of all permissible purchases at gas stations, automobile sales, and maintenance establishments, and at auto parts stores. Taxicab and transit services would also be covered.
7. Legitimate uses of the credit card

would include transportation-related purchases for third parties to "pay" for transportation services.

8. Business establishments would be reimbursed for any purchases under this plan in the same way they would for any other credit card purchases. Charges would be sent monthly to the TCP administration by the credit card company or companies.

A key feature of such an approach is that both the credit line and the extent to which it is subsidized by the program may vary with household characteristics. Table 1 provides an illustration of this by income category.

**TABLE 1
PROPOSED CREDIT PURCHASE, SUBSIDY SCHEDULE, AND ASSOCIATED LOCKED CREDITS**

Income Range (\$1000)	Mid Range (\$)	Current Transportation Expenditures (\$)	Purchased Credit (\$)	Credit Subsidy (\$)	Total Credit (\$)	Locked Credit (\$)	Unlocked Credit (\$)
0-1	500	180	140	160	300	120	40
1-2	1500	430	370	280	650	220	60
2-3	2500	560	480	240	720	160	80
3-4	3500	690	600	190	790	100	90
4-5	4500	810	740	130	870	60	70
5-6	5500	930	930	0	930	0	0

Assessment of a Transportation Credits Program

The TCP would appear to offer several advantages over more traditional approaches to improving the mobility of the transportation-disadvantaged. In a preliminary study, a rough comparison of the mobility benefits of a TCP of the type sketched here, and an equivalently funded "transit-only" approach was made for a predominantly rural district in Virginia. The funding level for both types of programs was assumed to be \$500,000 per year. The analysis suggested that the TCP would generate about 3½ times as many new trips as the "transit-only" scheme. Moreover, the trips generated would generally be more convenient and comfortable, and less time-consuming and expensive, since most would be made by automobile.

Other possible advantages of the transportation credits program include the following:

1. The transportation-disadvantaged would be the only benefactors; people outside the target population could not take advantage of the subsidy, as they can for generally reduced transit fares.
2. A larger proportion of the target population could be served.
3. The advantages in terms of con-

venience and comfort would apply in particular to the handicapped, most of whom find it much easier to get in and out of a car, van, or taxicab than a bus.

4. Users would have a much wider variety of work and shopping opportunities.
5. Much of the processing work would be handled by credit card companies which are experienced and which can take advantage of economies of scale. In addition, a portion of the administrative expenditures would be borne by the merchants, as is the case for regular credit card charges.
6. Some of the transportation currently provided by social service agencies could be paid for directly through the TCP.

These advantages must be weighed against a number of problems, for example, finding financial support for a transportation credits program, the choice of an agency to carry out the program, the cooperation of third parties, notably the credit card companies and the merchants in the area, and enforcement and elimination of fraud.

Unfortunately, the TCP program might contribute to the myth of the "welfare Cadillac." Since transportation is one of the more visible forms of consumption, assistance

that includes a private automobile might foster long-cherished notions about the waste inherent in public assistance programs. The political opposition created by such impressions could be formidable, jeopardizing continuation of the TCP.

However, it should be noted that the large scale, socioeconomic experiments carried out in this country with assistance for food, education, and medical care have helped to dispel many of the myths associated with user-side assistance, so that it now may be possible to make decisions about methods of providing goods and services, including transportation, to the poor in a more informed manner. **END**

Strategies for Providing Transportation to the Elderly and Handicapped

Tung Au, Professor of Civil Engineering and Public Policy
 Dwight M.B. Baumann, Professor of Engineering Design
 Carnegie-Mellon University, Pittsburgh, PA

A major factor in leading a productive and meaningful life in modern society is mobility, particularly for the elderly and handicapped. Because of the large capital expenditures required to meet recent federal legislation and guidelines for accessibility to various modes of public transportation, it is expected that interim transportation systems will become necessary for most urban areas. Even the most ardent advocates of "full accessibility" agree that a basic door-to-door system is needed as a feeder to an accessible transit system, and many may prefer paratransit systems to regular transit.

Although the 1970 census data clearly identifies the segment of the population aged 65 and over, it does not contain statistics about the physical and mental health of this group, or mobility limitations of the non-elderly. Unless more useful data can be extracted from the 1980 census, the planning of "interim accessible transportation" must rely to a large extent on self-identification in order to expedite initial delivery of service.

Aside from population changes in terms of age and handicap, there is also a changing distribution or trip demands by the elderly caused by many factors. The automobile-induced urban sprawl of the fifties has resulted in many people living some distance from mass transit facilities. When they are no longer able to drive their

own vehicles, for whatever reason, they are isolated. Thus, in the more urbanized regions, the equivalent of rural neighborly assistance is perhaps the neighborhood nonprofit paratransit organization. Medical care facilities have become more centralized; the patients must travel instead of

the doctors. Many of the self-help and mutual assistance strategies that have provided the mechanisms for the elderly to cope with their daily living in our society in the past no longer function in the same way.

In making estimates of travel demand, it is important to distinguish the requirements

**TABLE 1
 SERVICE REQUIREMENTS FOR THE ELDERLY AND HANDICAPPED**

Mobility Status	Percent of Transportation-Handicapped in Population			Percent among E&H	Requirements	
	Age 0-64	Age 65 and over	Total		Reasons for Escort	Vehicle
Confined to bed	0.10	0.12	0.22	3.3	Physical and psychological	Stretcher
Confined to house but not to bed	0.26	0.39	0.65	9.9	Psychological	Lift
Needs another person	0.11	0.17	0.28	4.3	Psychological	General aids
Needs a special aid	0.26	0.48	0.74	11.2	Physical	Lift
Has trouble getting around	0.72	0.56	1.28	19.5	Physical	General aids
Balance of the transportation-handicapped	1.67	1.74	3.41	51.8	None	General aids
Total elderly and handicapped	3.12	3.46	6.58	100		

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of various classes of the transportation-handicapped. A reasonable approach is to disaggregate data on the basis of activity and mobility limitations. This data is available at the national and regional level in the report prepared by the National Center for Health Statistics.

Table 1, adapted from an earlier report, shows the percentage of people with mobility problems in five categories of limitation as reported in the National Center for Health Statistics data. Service requirements are identified for each category and may include physical and psychological escort assistance as well as stretchers, lifts, or general vehicle aids. This classification admittedly contains some gross generalizations. For example, not all of those who need the help of a special aid require a lift. However, Table 1 gives some useful estimates for anticipating the required vehicle mix and escort requirements in many communities. In particular, it suggests that approximately 18 percent of the elderly and handicapped need an escort for psychological reasons, 34 percent need a vehicle with a lift.

Strategies

The strategies to be implemented by planners, public agencies, or private suppliers must be based on the complex of individual choices that the elderly and handicapped make in housing, employ-

ment if any, leisure and cultural activities, health care facilities, food and clothing, as well as other necessary and optional trip-making. Thus we should not expect a general solution to a complicated problem.

The proposed strategies must be perceived by the elderly and handicapped as better than the present alternatives, even though the improvement may be only incremental. Private, semipublic, and public actions should be included in the formulation of strategies. These may be arranged in a spectrum from informal to highly organized strategies requiring different degrees of public expenditures.

1. There appear to be a number of free trips made which are provided by friends, neighbors, or relatives. This strategy might be expanded to include travel in small groups, e.g., the carpool organized by matching drivers and riders. A specific application to elderly people is now being instituted in a church in Pittsburgh which has a large elderly membership. A list of telephone numbers of church members who normally drive, and those who need a ride, is compiled. Volunteer dispatchers operate from their homes through a call-forwarding device from the church. The volunteer dispatcher matches the trip request

with a volunteer driver. The small monthly service charge for a call-forwarding telephone constitutes the total cost of the service.

2. In thinly populated suburban or rural areas, a similar telephone strategy could work. In that case, a variation of the open party line might be effective. Alternatively, providing low-cost citizens' band radios to the elderly and handicapped in rural areas could be an inexpensive way to accomplish this kind of communication network. In general, a fixed community channel must be designated by legislation for dispatching a transportation service by citizens' band radio.
3. Another possible volunteer approach would be to offer a tax incentive to the provider of rides, with a plan for monitoring and verifying that the ride was, indeed, provided to a specific person registered for the service. In this scheme, the potential for fraud must be low enough to ensure low public cost.
4. If a formal transportation system or network is currently in existence for other purposes, the elderly and handicapped can be permitted to ride at reduced cost when the system is not fully used. In urban areas

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where mass transit is available, reduced fare or free rides for senior citizens in off-peak hours is now commonplace. Existing transportation might also be used in rural areas. For example, the rural mail carrier, and school buses serving rural areas, might also be used for the transportation of elderly and handicapped people.

5. Taxis are important to groups with low incomes who do not have a car available. Trips to destinations outside of transit corridors (such as many medical facilities), or trips that require carrying heavy packages (such as groceries), are often made by people with low incomes who are least able to bear the relatively high cost of exclusive-ride taxi service. Although there are many other arguments for developing shared-ride taxi service, one of the most convincing reasons may be the needs of the elderly and other people with low incomes who do not own automobiles.
6. For many areas, separate special services must be provided. For example, the topography of certain areas prevents the use of buses, and exclusive-ride taxis or private automobiles are prohibitively

expensive for much of the target population.

7. The category of the population listed in Table 1 as "Remainder of the Transportation-Handicapped" refers mainly to elderly people who require more than the normal time to perform specific functions such as climbing onto a bus. For these people, transportation mobility can be substantially improved with the development of relatively minor improvements in public transit facility design. Crucial improvements include adequate weather protection at bus stops, more negotiable steps on buses, and reducing the hazards inherent in standing on a moving vehicle. Even these minor modifications would address the needs of roughly half of the elderly and handicapped population.

Regulatory Issues

Since the "interim accessible transportation" for the elderly and handicapped can most easily be accomplished by paratransit services, innovative paratransit services are being encouraged by UMTA in the development of local mass transportation plans. Although UMTA encourages participation of existing private transportation carriers in the development and implementation of

local paratransit programs assisted with UMTA funds, a firm policy has not yet been defined.

“The proposed strategies must be perceived by the elderly and handicapped as better than the present alternatives. . .”

The reason that some complex regulatory problems have arisen is that, for the most part, separate special services did not exist when transportation regulations were written by state or local regulatory agencies. This means that there are no precise regulations as to how special services should be classified, who is allowed to provide them, under what terms, and subject to what restraints. Regulatory authorities should address the problem of separate special services for the handicapped and elderly, as well as other issues related to community paratransit services, and amend regulations as necessary.

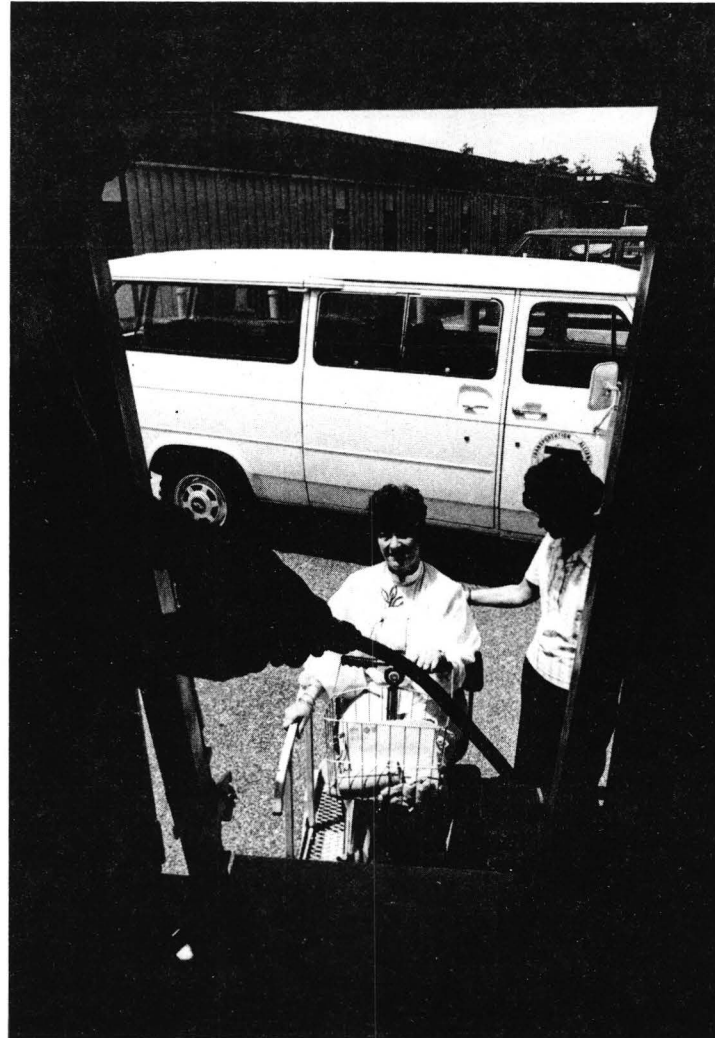
There are many factors involved in the cost structure of separate special services,

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e.g., efficiency, level of demand, form of subsidy, type of management structure, service priority, and many others. Of the many alternatives, integration of the para-transit and taxi markets offers an important potential.

The full impact of Section 504 of the Rehabilitation Act of 1973 on urban transportation has yet to be felt. The induced demand created by service level improvements may well exceed the present demand by elderly and handicapped people for transportation. In addition, a large part of this population has a relatively fixed income; in this highly inflationary period, this factor may create significant and increasing price sensitivity.

In moving towards compliance with Section 504, many transit agencies realize that, in the short run, alternative methods must be considered because of the huge costs of sudden changes in equipment and fixed facilities. Some expect that if fixed-route equipment and facilities are brought into compliance in an evolutionary manner and the additional patrons are accommodated slowly, the costs will be more reasonable. **END**



Evaluation of Lift-Equipped and Kneeling Buses

Kalisankar Mallik, Associate Research Professor of Medicine
Judith A. Frank, Occupational Therapist
Michael Osborne, Research Assistant
Rehabilitation Research and Training Center
The George Washington University, Washington, DC

To comply with Section 504 of the Rehabilitation Act of 1973 and the subsequent 1978 Amendment, the Washington Metropolitan Area Transit Authority (WMATA) instituted lift-equipped and kneeling bus service on selected routes in the Washington, D.C. metropolitan area in July 1979. The Rehabilitation Research and Training Center of the George Washington University, under a joint grant from UMTA and the HEW National Institute of Handicapped Research (NIHR), undertook a project to evaluate the new buses for both accessibility and safety. The primary objective was to identify features of the bus equipment, both new and standard, that would limit access to the bus by people with various mobility impairments or would produce potentially unsafe conditions in their use of the bus. The secondary objective was to propose solutions to the obstacles encountered.

The staff developed two comprehensive data collection forms. The first form listed physical characteristics and other background information on the disabled or elderly rider, e.g., medical diagnosis of disability; date of onset of disability (to indicate how familiar the person was with his or her capabilities); use of aids such as canes, walkers, and wheelchairs; wheelchair dimensions; and the level of independent functioning in such areas as walking, sitting down, standing up, grasping, reaching,

handling coins, and other abilities related to use of the bus.

The second form was a checklist of the steps required to enter, ride, and leave the bus. Two versions of this form were developed, one for the wheelchair user and one for the ambulatory person. The steps were organized to a fine level of detail. For example, the boarding sequence for the wheelchair rider was: approach bus, move onto lift, lock wheelchair, grasp hand rail, maintain position as lift rises, unlock wheelchair, move off lift, turn corner, get fare ready, show I.D. card, insert fare in box. The rider's degree of difficulty with each item on the checklist was rated by a trained observer. The form also included items relating to weather, the condition at the bus stop, mobility aids used, and the presence or absence of an attendant. Another column indicated elapsed time for the major activities, i.e., entering the bus, proceeding to seat or wheelchair tiedown location, and leaving the bus.

The physical characteristics and background data on the 58 disabled and elderly people who assisted with this evaluation were compared with data collected during their actual use of the bus. The group included wheelchair users, people with canes and walkers, and people who needed no assistance. Disability diagnoses such as cerebral palsy, spinal cord injury, blind-

ness, deafness, arthritis, and polio were represented. Ages ranged from teenagers to people in their 80s.

The background information was collected in interviews. The people assisting were then observed boarding, riding, and alighting from the bus in test situations, using the lift or the kneeling feature, or, in some cases, not using the special features. Wheelchair riders were observed turning inside the bus, parking in the wheelchair areas, and using the tiedown equipment. The bus trials were made with groups of people at such places as a meeting of the National Spinal Cord Injury Foundation, the centers for disabled students at the University of Maryland and Gallaudet College, the Rehabilitation Services Administration of the U.S. Department of Health, Education and Welfare, and two homes for the elderly. In addition to the test situations, two wheelchair riders were observed using the bus on the street during daytime and rush hour periods when the buses were crowded with passengers. Measurements and drawings were made of the bus interiors.

Initially, 18 different aspects of bus equipment were examined and 37 observations made as to ways in which accessibility and safety were impeded by the equipment configuration. One example was the endgate of the lift when used as a ramp for boarding and alighting. It was noted that

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the ramp had a steep slope because the endgate was about 10 inches long and the height of the lift surface from the curb or street was about 3½ inches. The slope caused the wheelchair leaving the lift to accelerate rapidly, and the wheelchair user entering the bus could mount the lift only with strong forward momentum. In addition, the slope and short length of the endgate ramp made it difficult for the ambulatory passenger to step on it, yet it was too long for people with walking difficulties to step over easily (see Figures 1, 2, and 3).

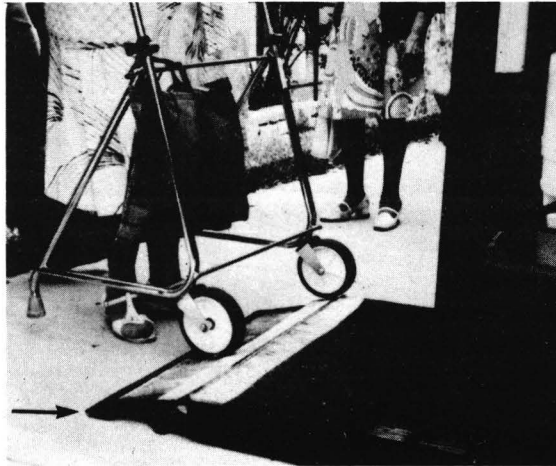


Figure 1 Endgate used as a ramp

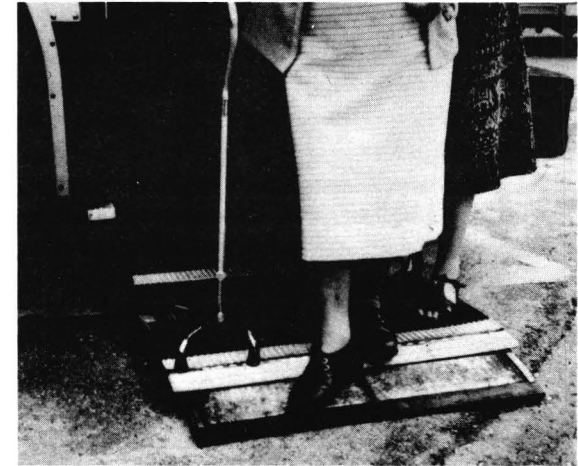


Figure 2

Figures 1, 2, and 3 demonstrate the difficulties encountered by persons using walkers, canes or wheelchairs in negotiating the steep slope of the endgate ramp. The figures suggest the need for platform "edge guards" on each side of the platform to prevent persons from slipping off; installation of handrails on both sides of the platform will provide increased support for users.

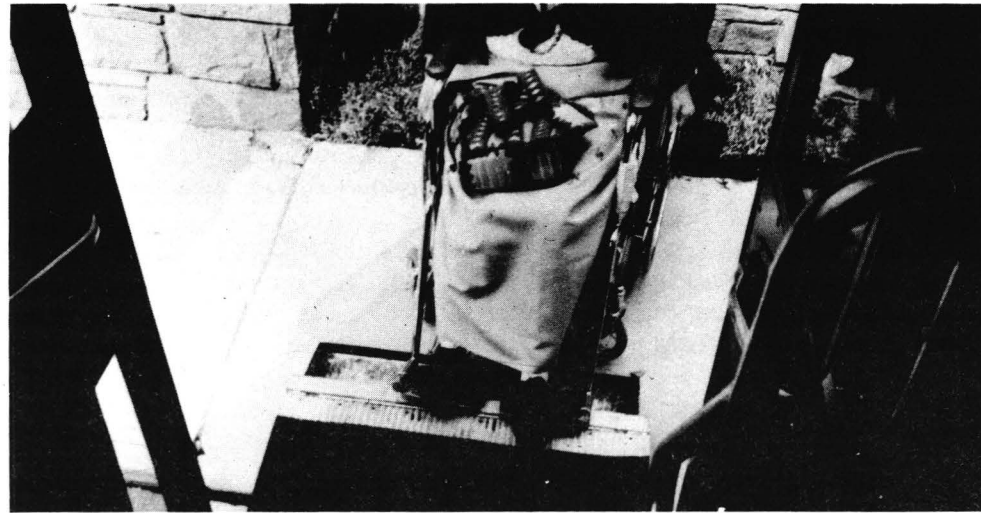


Figure 3

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Another example of difficulty caused by the equipment configuration was the control box used by the driver to activate the lift and the kneeling feature. The wording on the different buttons was unclear and their sequence did not correspond to the sequence in which they had to be used. The “kneel” button, not used with the lift, was not separated from the lift buttons, and a warning light was so similar to the buttons that it was easily mistaken for a control. The confusion resulting from the control box design caused operator errors in using the special features, thereby increasing the time required to enter and leave the bus, and, in some cases, making it impossible for some disabled people to enter.

Observations of loaded buses showed additional difficulties. The WMATA bus was 96 inches wide. The aisles in these buses were too narrow for easy passage by wheelchair users and those with walkers and crutches. The feet and knees of other passengers sitting in the front aisle-facing seats were an impediment to passage. If the bus was crowded, with passengers standing, it was very difficult to clear the way so that the wheelchair passenger could have access to tiedown areas. One further problem was that the driver was not able to distinguish the buzzer signal of the disabled or elderly rider from that of other passengers, and thus did not always take the necessary steps to

assist the user of the special features before continuing the trip.

The observations were listed on a chart which also indicated whether the item affected safety, accessibility, or both. The potential or actual difficulty encountered in each case was described, along with proposed recommendations, solutions, or procedures. In the case of the endgate cited above, the recommendations were 1) to institute a policy to have the operator prepared to assist lift users; 2) to educate lift

“... 18 different aspects of bus equipment were examined and 37 observations made as to ways in which accessibility and safety were impeded by the equipment configuration.”

users as to the difficulties and dangers in using the lift and the availability of assistance from the operators; and 3) to modify the design of the lift so that it would lower nearer to the pavement and a modified endgate which would form a longer, shallower ramp. The suggestions regarding the con-

trol box were 1) to rearrange and relabel the control buttons so that they would follow the control sequence, and state more clearly their function; 2) to separate the kneel button from the lift buttons; and 3) to mark the warning light differently from the controls.

The staff of the project met with representatives of the WMATA department responsible for ordering, installing, and maintaining equipment to discuss the preliminary findings. Many of the suggestions and observations were greeted positively and several of the recommended changes already have been, or will be, undertaken by WMATA. For example, bus operators are now permitted to leave the driver's seat and ride on the lift with passengers to provide assistance. The control box is being redesigned according to the recommendations. Stanchions (vertical handrails) will be moved and additional ones installed to alleviate another problem observed. WMATA's comments as to the feasibility of all items will be noted in the final project report; however, recommendations made will not be restricted only to those items considered feasible to the transit provider.

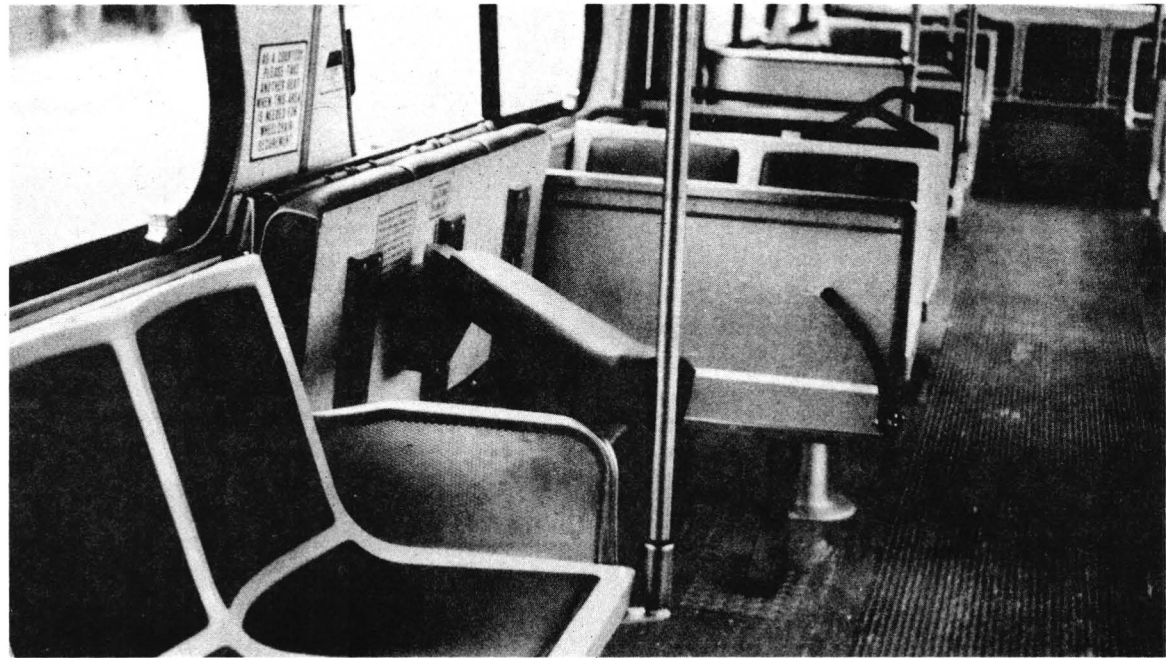
The WMATA staff expressed a desire for detailed specifications regarding dimensions of accessibility equipment, to which they would like to conform as closely as possible during a planned refurbishing of a number of older buses. A chart which shows

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recommended dimensions pertinent to solutions proposed by the project staff was prepared and indicates which party should address each item, i.e., the transit provider, the equipment manufacturer, UMTA, or the consumer.

One further goal was to contact manufacturers of lift and other accessibility equipment to communicate project findings and to influence future design of equipment. Contact has already been made with the manufacturer of the lift used in WMATA buses. Another product will be a short videotape showing some hazards and difficulties encountered by disabled and elderly users of the present WMATA lift-equipped kneeling buses. It is hoped that the combined results of this project will lead to increased accessibility, reliability, and safety of the WMATA transit system, as well as others which provide service to people with transportation handicaps.

END



The jolts of normal traffic can be dangerous as well as uncomfortable for wheelchair users. Shown here is one method for securing wheelchairs. A curved spring snaps over the rear left wheel and a padded bar protects the passenger.

Evaluation of the Metro

Don M. Coleman and Eric S. Graye
Urban Systems Engineering
Howard University, Washington, DC

The results of a recently completed one-year project to determine if the Metro system in Washington, D.C. is indeed usable by the elderly and handicapped are reported here.

For this research an extensive review of relevant literature was made. Surveys of a sample of 123 elderly or handicapped people were conducted as well as on-site observations of Metro and other rapid rail systems. Openended interviews with transit planners, rehabilitation and geriatric professionals, and representatives of advocacy organizations for elderly and disabled people contributed to the findings.

The scope of the study was limited to an investigation of the characteristics of Metro station areas and Metro trains, specifically, the mobility problems associated with the negotiation of Metro parking areas, station exteriors, station interiors, and rail car interiors. Although it was recognized that many barriers, e.g., inaccessible buses connecting to Metro stations, and physical barriers surrounding stations also acted to inhibit or preclude the use of the Metro by the disabled, indepth consideration of these barriers was beyond the scope of the study.

One of the major problems in planning accessibility features in new public transportation systems has been the general lack of knowledge about what modifications the handicapped require. The evolution of the



Wheelchair patron entering Metrorail platform area via elevator.

San Francisco Bay Area Rapid Transit System (BART) is a case in point. The initial lack of commitment to the elderly and handicapped by the planners and operators of the system, coupled with the omission of features desirable for these people in the original comprehensive plan, continue to cause some problems for the elderly and handicapped who use the San Francisco

subway. For example, few special features were provided for people with sight and hearing difficulties; because elevators were included in the plan only after the designs were completed and initial construction had begun, they are located inconveniently in many areas.

Due, in part, to the BART experience, the original plan for the Washington DC

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metropolitan area Metro system included features designed to make this system more accessible to the elderly and physically disabled. For example:

1. The escalators which carry passengers between each of the various levels of the station and its entrance are a particularly important asset for those passengers unable to tolerate the physical exertion of stairs.
 2. Blind or partially sighted people are assisted by bronze handrails between the mezzanine areas and entrance escalators. The granite edge of the platform, which provides a different texture from the hexagonal tile used throughout the station, allows blind people to feel the platform edge with their feet or canes. Station and onboard announcements of train destinations and stops also assist this group.
 3. People who are deaf or have hearing problems are warned of approaching trains by pulsating lights set flush along the platform edge. Maps of the system and neighborhood are provided in each station to help patrons to orient themselves visually.
- Unfortunately, elevators were omitted in the original comprehensive Metro plan.

Although they were included later, some of the elevator locations do not facilitate their use by the elderly and handicapped.

Description of Research

The sample populations who responded to the questionnaires in an interview situation consisted of 1) disabled people of any age, 2) people over 60 years of age but not necessarily physically handicapped, and 3) people who were confined to the home or institutions.

In addition to the questionnaire survey, a Subway Barrier Checklist was developed to assess the actual subway facility. The checklist was used in onsite observations of Metro, BART, and the Toronto subway. The barriers surveyed included those in the areas around the station (e.g., parking lot and the station entrance area), the areas inside the stations, and the trains.

Several orientation tours sponsored by Metro officials to familiarize members of the elderly and handicapped community with the Washington rail system were observed also. In addition, an indepth tour of some Metro facilities was conducted by a paraplegic. His observations and difficulties were recorded and included as part of the research.

Finally, open-ended interviews were conducted with a representative from a number of groups concerned with the trans-

portation problems of the elderly and handicapped, including: 1) Metro, BART, and Toronto Transit Commission staff members; 2) rehabilitation and geriatric professionals; 3) elderly and handicapped patrons of Metro, BART, and the Toronto subways; and 4) members of organizations and institutions concerned with the welfare of the handicapped.

Access to and from Metro Stations

Bus Transfer. Typically, at those stations where the Washington Metropolitan Area Transit Authority (WMATA) exercises jurisdiction over surface design (primarily at surface stations located in suburban Maryland and the District of Columbia), the bus bay areas appeared to be situated within close proximity of station entrances and elevators. However, at several of those stations where surface design is not within WMATA authority (primarily at those stations located in suburban Virginia and some downtown areas of the District of Columbia), potential physical barriers existed for people moving between bus stops and rail station entrances. As one example, though curb cuts were frequently provided on surface areas near downtown Metro stations, they were often too steep for nonambulatory people to negotiate the slopes. Another example of this was at the Metro Pentagon station. Here, the lack of curb cuts provided be-

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tween bus stops and station entrances was considered to be hazardous for some elderly and handicapped people who had to cross bus lanes.

In addition, at the time of the study, accessible buses equipped with wheelchair lifts were not standard in WMATA's Metrobus fleet. Bus/rail transfer for nonambulatory people was precluded. (WMATA has included accessible buses in the fleet since the study was completed.)

Auto Transfer. Several parking spaces designated for use by the handicapped were provided at those stations where WMATA-sponsored public parking was available, but they were frequently occupied by automobiles driven by non-handicapped drivers. Further, in two stations situated on inclined terrain, other problems were presented to handicapped people who attempted to use their automobiles to reach Metro stations which did not provide readily accessible reserved parking areas.

For those people residing near Metro stations who were in need of level access, the lack or inadequacy of curb cuts (and rough or steep terrain) presented significant access barriers to the system.

Accessibility within Metro Station Areas

When facilities were functioning properly and station attendant personnel were



Wheelchair patron entering Metrorail car from station platform.

available to assist patrons, access to station and fare payment areas appeared adequate for members of many classes of the disabled. For the blind, bronze handrails were provided along the mezzanine walls of stations to assist entry to and exit from station platform areas. In addition, Metro stations generally had uniform design features (e.g., in terms of station layout and facility

locations) which also served to assist this group.

The problems encountered by the blind were significant, although not highly obvious. Often, these individuals had to grasp mezzanine railings and move closely along station walls in order to move within stations. They frequently encountered railings which were dirty, and the path occasionally was

interrupted by trash receptacles. Another problem faced by the blind was that the locations of some station facilities, e.g., automatic bus transfer machines, were not standardized within station areas.

At some stations, there were elevators which provided the nonambulatory with direct access to station platform levels from the street level. Controls on farecard vending machines appeared reachable, and their digital displays readable, from wheelchair level. Service gates were provided as alternatives to faregates to facilitate the movement of the nonambulatory between unpaid and paid station areas. As an added accessibility measure, a major function of station attendants was to assist the disabled in the use of farecard vending machines and faregate equipment. However, despite such accessibility features, there were other problems limiting the accessibility of the disabled to station paid areas.

The use of elevators which bypassed fare collection equipment and allowed direct access to the station area where fares had already been paid presented potentially frustrating problems to those who required level access by elevator. One obvious problem concerned fare payment. Generally, such elevators were kept under close supervision by station attendants and were placed on operational status only when a call for service had been received

by an attendant in a station kiosk. However, attendants were often away from their booths and thus unavailable to answer calls for elevator service for intermittent periods of time. Other problems remained even when prompt elevator service was rendered. For example, if an attendant was aware that a nonambulatory patron was using the elevator, he was required to travel down to the platform level to meet the patron, obtain money from the individual to purchase a farecard (assuming one was not

“Unlike the able-bodied, [the elderly and handicapped] would find it difficult or impossible to exit from a train, climb onto a catwalk, and move down a rail tunnel to safety.”

already in the patron's possession), return to the mezzanine to purchase and process the farecard, and return again to the platform level to present the card to the disabled traveler. Another related problem occurred if a disabled individual gained entry into a station by elevator without an attendant's knowledge. In such a case, the person

either had to ask a fellow rail passenger to assist in purchasing or processing a farecard, wait for an attendant to appear, or board a train and continue the trip without paying.

Escalators. Many disabled people were able to use escalators. However, they presented some problems to the blind. The surface areas at the top and bottom of all Metro escalators had changes in floor texture which served to warn the visually impaired of their presence. Considerable skill and confidence were required of the blind in order to develop a safe and effective technique for negotiating the escalators, particularly at those stations where they were very long and steep.

Elevators. The disabled could experience several problems using the Metro elevators. Some of the problems observed or reported by disabled people were:

1. Many elevators frequently were not operating, due to either mechanical failure or the unavailability of station attendants to activate them.
2. Station attendants did not seem to have a way of knowing that elevators had broken down unless they had been informed by a patron.
3. Elevator doors closed too quickly to allow time for convenient entry and exit.

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4. Elevator floors were frequently not flush with station surfaces at access points.
5. Several elevators had poor ventilation and insufficient lighting.
6. Elevators occasionally were found to smell of urine, or to have trash and bottles thrown about.
7. The controls of several elevators were difficult to reach from wheelchair level.
8. Directional graphics and signs to elevators were usually provided, but were inadequate.
9. Steep slopes, inappropriate for wheelchair use, characterized the terrain around the outside approaches to several elevators.

Public Telephones. Public telephones were provided in each Metro station. Typically, several were located on both sides of the fare barriers separating paid and unpaid areas of station mezzanine levels. To assist the hard-of-hearing, at least one phone at each station was equipped with an amplification aid. However, several stations were observed to have no amplified phones located within paid areas of mezzanine levels. Thus, a hearing-impaired patron within the paid area of one of these stations could be forced to pay an additional fare to re-enter the paid area after using the telephone.

Train Platform Interface. Problems with the discontinuity between rapid rail car floors and station platforms were particularly severe for people with ambulatory problems, and the blind. Disabled individuals using Metro observed this gap to be as high as four to six inches vertically, and range between two and six inches horizontally. People using mobility aids, i.e., wheelchairs, canes, crutches, and walkers, could experience difficulties and hazards getting on and off Metro trains.

Attendant Service. Metro required station attendants to assist elderly and disabled patrons with any problems that they encountered in negotiating the station areas. Attendants frequently played an integral role in the level of service provided to people using station entrance elevators, and could be called upon to assist in the use of fare collection equipment and in the provision of information. In this regard, attendant service seemed more than adequate when it was available. However, it was observed that during Saturday operations, several Metro stations occasionally were left totally without an attendant for periods of time. At some of these stations, the station entrance elevators were shut off, presumably as a measure to guard against the possibility of fare evasion. However, with no attendant available to activate these devices,

access for the nonambulatory was precluded. In addition, security during weekend periods could be seriously compromised.

Accessibility within Metro Trains

Priority seating for senior citizens and the handicapped was available on Metro vehicles. Several such seats were provided; they were situated next to each of the three sets of sliding doors of every rail car. Signs indicating priority status were placed just above these seats. It was noted that although train operators occasionally announced the rules of public conduct on trains with regard to eating and smoking, they did not routinely request able-bodied passengers to observe priority seating rules for elderly or disabled patrons.

Areas to accommodate wheelchair users were situated at either end of rail cars and were accessible through the two sets of doors closest to the ends of these vehicles. These areas allowed adequate room to maneuver and were positioned away from the bulk of passenger movement.

Metro trains operated at speeds of up to 75 mph and averaged about 35 mph between station stops. Individuals in wheelchairs could experience stabilization problems when the trains accelerated and decelerated.

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Emergency Preparedness

Fire is among the most frequent and potentially hazardous emergency situations. Fires usually result from malfunctions in the intricate electronic system used in rapid rail cars. The difficulty in reaching a distressed train in a tunnel, as opposed to a station stop, creates a potentially dangerous situation, particularly for the disabled.

Metro has instituted safety measures to address this problem: firefighting equipment and smoke exhaust fans are provided at various locations in train tunnels; a direct communication system between train operators and Metro central headquarters has been installed; cars are equipped with neoprene seating and flooring material, which burns more slowly and gives off fewer toxic fumes than polyurethane when ignited. However, almost no information was provided aboard rail cars to inform passengers what to do in the case of an emergency. In addition, the emergency handles that open the doors in the cars were situated behind advertising signs, and the emergency intercom system, located at either end of the rail card, was not marked clearly.

Metro policy at the time of the study required passengers to wait aboard trains in the event of an emergency in a tunnel until they could be reached by authorities who could supervise evacuation procedures. This is a far more orderly and safer proce-

dure than to allow passengers to crowd along rail tracks.

However, it was unclear as to whether Metro was prepared to accommodate the evacuation of the elderly and handicapped from a rail tunnel. Unlike the able-bodied, such people would find it difficult or impossible to exit from a train, climb onto a catwalk, and move down a rail tunnel to safety. The nonambulatory, semiambulatory, and the blind would have severe problems. The deaf might be unable to realize the existence of an emergency, because no visual warning signals were provided.

It should be noted that BART is currently considering placing printed placards inside rail cars which describe evacuation procedures for people with various disabilities, and distributing such information to the residences of all handicapped people identified by the transit authority. In addition, BART has conducted onsite drills with both the able-bodied and the handicapped in an effort to better prepare for emergency situations.

With the exceptions to complete accessibility noted above, and when Metro facilities and equipment were functioning as designed, and station attendant personnel were available to assist patrons, WMATA's attempt to provide an accessible rail system for its elderly and handicapped constituency was commendable. **END**

Commuting Problems In Rural Areas

Hal S. Maggied
Maggied and Associates, Atlanta, GA

Lack of mobility is an economically limiting condition, particularly in rural areas. Accessibility to employment sites plays an important role in determining where a person seeks employment. When workers or jobseekers cannot walk to a workplace within a reasonable period of time, other modes of transportation are necessary. In most rural areas of Georgia, there are more jobseekers than jobs, and most employ-

ment cannot be reached easily and safely by walking.

ment cannot be reached easily and safely by walking. Distance is not the only important factor. Activities can be reached only circuitously; natural barriers, such as streams which are not bridged, impede access to

them. Such situations are typical of Georgia's rural areas.

In order to investigate some of the relationships between mobility in rural Georgia and work, an analysis was made of two sample counties, one in the mountains and the other on the coastal plains. Neither county had incorporated towns or villages with over 5000 inhabitants. In each county, two "link routes" having a common terminus (base node) in the largest center where, presumably, there were the most job opportunities, were selected. From them, a "transit loop" was constructed, which resulted in triangular routes. The routes also linked areas outside the county where, hypothetically, jobs existed. The travel times, distances, and cost of travel were then determined. Figure 1 shows the transit loop for Baker County.

"It is important that . . . policy planners recognize . . . the social and economic cost to the whole community when lack of transportation prevents employment."

ment cannot be reached easily and safely by walking.

Distance is not the only important factor. Activities can be reached only circuitously; natural barriers, such as streams which are not bridged, impede access to

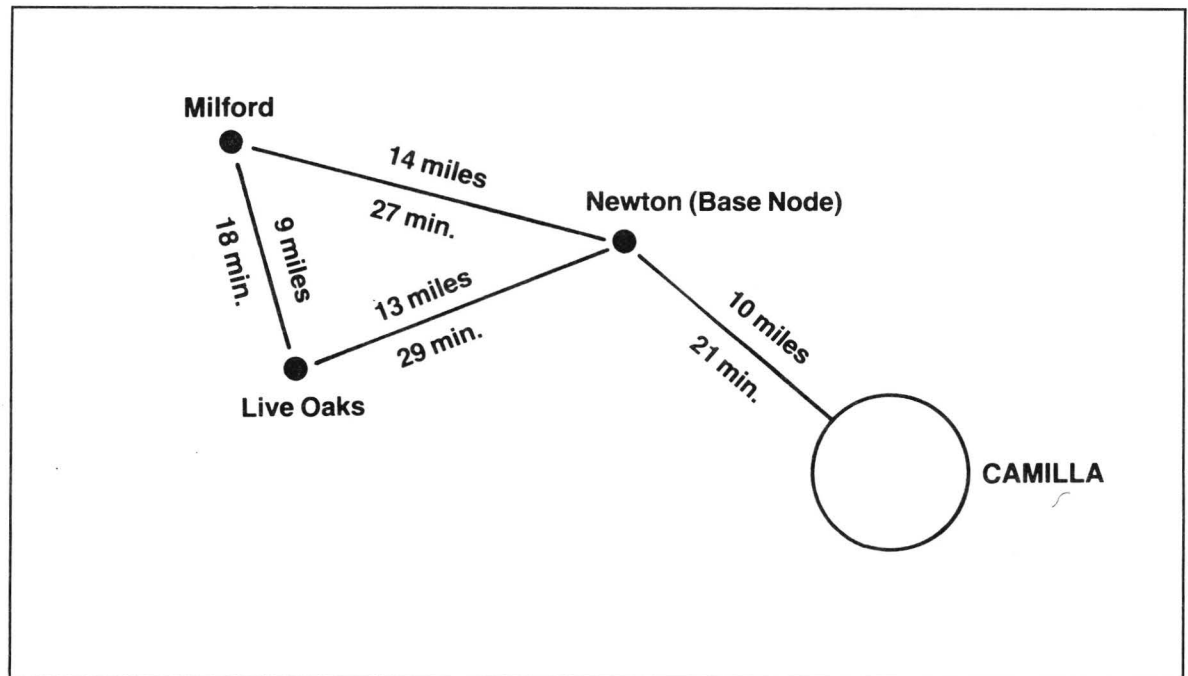


Figure 1. Hypothetical Transit Loop for Baker County, GA

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Table 1 lists the nodes for each county and the travel times between the base node and the connecting node.

In both counties, the minimum travel time along any link route required approximately 20 minutes, and travel to the nearest growth center took over a half-hour. The relationship between travel time and travel costs has deep significance for rural residents. Within the two counties, relatively few people were in the labor force, and of those that were, over 41 percent had to commute beyond the county line. Seventeen percent of the residents did not have use of an automobile.

Over half the families in the two counties had incomes below the poverty level. Poor people spend a greater part of their personal budget on purchasing and operating an automobile than do people who are above the poverty level. Attempts to gather vehicle operating costs which were representative of rural Georgia proved fruitless. However, a study providing such information for areas similar to the two counties was conducted for the State of Arkansas for the year 1977, and showed operating costs ranging from 12.6¢ to 17.9¢ per mile. Based on this study and a similar study conducted for the Bureau of the Census, a cost per mile of 17.9¢ was assigned to the distances identified in the two sample counties. Costs for sample work trips for a typical commuter

TABLE 1
TRAVEL TIME FOR LINK ROUTES IN TWO RURAL GEORGIA COUNTIES: 1973

Base County	Base Node	Connecting Node	Connecting County	Travel Time (Minutes)
Baker	Newton	Milford	Baker	21
	Newton	Bainbridge	Decatur	59
	Newton	Camilla	Mitchell	18
	Newton	Damascus	Early	48
	Newton	Leary	Calhoun	32
	Newton	Albany	Dougherty	43
Dawson	Dawsonville	North Dawsonville	Dawson	18
	Dawsonville	Silver City	Forsyth	22
	Dawsonville	Gainsville	Hall	36
	Dawsonville	Nelson	Pickens	39
	Dawsonville	Jasper	Pickens	50
	Dawsonville	Dahlonega	Lumpkin	26

Source: *1973 Travel Time Data*, Georgia Department of Transportation, Statewide Planning Office, Division of Planning and Programming.

in each county were computed and are shown in Table 2.

It is clear that rural commuters from the sample counties would have to spend an inordinately large share of their gross personal income for work trips. We must conclude that the high cost of work trips con-

tributes directly to unemployment.

The effect of immobility on the rate of employment and the amount of personal income in rural areas has been obfuscated by transportation projects designed to assist the elderly and handicapped. To be sure, elderly and handicapped programs

ACCESSIBILITY

**TABLE 2
COSTS OF COMMUTING TO WORK BY PRIVATELY OWNED AUTOMOBILE**

Work Trip Route	Time (in minutes)	Distance (in miles)	Cost (17.9¢ per mile)	
			One Way	Round Trip
Baker County				
Milford to Camilla	48	24	\$4.30	\$8.59
Live Oaks to Camilla	50	23	\$4.12	\$8.23
Dawson County				
Silver City to Dahlonega	48	19	\$3.40	\$6.80
Armvets to Dahlonega	56	21	\$3.76	\$7.52

are sorely needed, but these programs do not fit the needs of employable people who might commute to work if less expensive transportation were available.

It is important that public administrators and policy planners recognize the interrelationships among mobility, employment, and personal income, as well as the social and economic cost to the whole community when lack of transportation prevents employment. **END**

Coordinating Delivery of Rural Transportation Services

Joseph S. Revis, Senior Associate
Institute of Public Administration, Washington, DC

Coordinating transportation services in rural areas is a particularly important, though difficult, part of assuring the most effective use of resources. Although recent work suggests that there are a number of inhibiting factors relating to coordination, the opportunities exist and efforts at coordinating transportation services have spread throughout the country. The range of these efforts is indicated by the coordination activities of twenty social service projects listed in Table 1.

With the Surface Transportation Act of 1978, and the availability of funding for rural areas under Section 18, rural communities will have to consider a range of options, including use of public as well as private providers, and conventional and paratransit modes.

The benefits of coordinating or consolidating transportation services, in specific terms, are: 1) reduced duplication and administrative activities; 2) increased service capacity; 3) improved vehicle productivity through more effective use of that capacity; and 4) reduced costs through group purchasing of supplies and other services.

The benefits of coordination are both quantitative and qualitative. The quantitative aspects include such elements as more vehicles offered more frequently. The qualitative aspects involve improved comfort,

safety, and more personalized service. Cost-effectiveness can only be measured after one considers very carefully the relative importance of each of these components.

In developing a program to take advantage of whatever benefits may accrue from coordination, a careful identification of specific areas in which savings can be achieved is essential. It must include sub-

“The broader the user base one develops, the more cost-effective the service will be, and the greater the opportunity for coordinating among a variety of service providers.”

stantial participation by political and community decision-makers. The specific advantages of coordination need to be quantified as much as possible, especially in terms of their effect on fixed and variable costs.

Rural areas may be less complex than urban areas, but they are generally poorer

in the availability of resources. Analytic planning and good operational techniques must be used in both settings. In addition, it must be clearly understood in advance that there are costs associated with coordination. Specific provision should be made for the added planning and staffing costs which may be anticipated. Furthermore, coordination may generate added costs in terms of operations, and this must also be considered in developing the program.

In rural areas a number of additional problems also need to be taken into account. These include the following:

1. There is generally a greater scarcity of resources, particularly staff resources. Specific provisions should be made to assure an adequate supply of staff support time and appropriate budgeting for that staff support.
2. There is a substantially smaller and more dispersed population. This makes planning and communicating more difficult; there must be specific plans to provide for means of communicating over long distances; travel and required attendance at meetings must be minimized.
3. There are fewer local sources of technical assistance of the kind offered by a Metropolitan Planning

COORDINATION AND BROKERAGE

**TABLE 1
COORDINATION ACTIVITIES OF TWENTY SOCIAL SERVICE PROJECTS**

Project Name	Public Transit	Coordination Activities Other Special Transport Projects	Social Service Agencies
Appalachian Ohio Region Transit Association (counties in Ohio)	None	Back-up vehicles for a few projects	Shared office and garage, information-sharing
Belknap-Merrimack Community Action (counties in New Hampshire)	None	Back-up vehicle	Coordinated planning
Broward County Social Service (Florida)	Transit authority on advisory board	None	Vehicle maintenance, office space, information exchange
Cape May County Free Fare System (Cape May, New Jersey)	None	Incorporated into Cape May System	Office space in county offices, garage, facilities
City Wide Senior Transportation Service (Chicago, Illinois)	Chicago CTA estimated costs, did financial analysis, selected equipment	None	Planning survey participation
Community Action Transportation (Akron and Summit Counties, Ohio)	None	Back-up emergency vehicle	Preliminary coordination planning
Consolidated Agencies Transportation System (Brevard County, Florida)	Route planning, vehicle maintenance, emergency service, taxi, garage	Back-up emergency service	Liaison
Cranston Transvan (Cranston, Rhode Island)	R.I. Transit Authority provides driver and maintenance at cost	None	Information-sharing, client referral, participate on steering committee
Easter Seal Service (37 counties in Tennessee)	None	Information exchange, client referral, share maintenance, garage	None
Help on Wheels (El Paso and 5 counties in western Texas)	Assist with 16(b)(2) grant	Passenger referral	Advisory committee, routing and scheduling, project promotion

COORDINATION AND BROKERAGE

**TABLE 1 (Continued)
COORDINATION ACTIVITIES OF TWENTY SOCIAL SERVICE PROJECTS**

Project Name	Public Transit	Coordination Activities Other Special Transport Projects	Social Service Agencies
Human Services Transportation (Chattanooga, Tennessee)	None	Fully integrated	Fully integrated
Lift Line (Palm Beach County, Florida)	Fully integrated	None	Participate in planning
Maricopa County Motor Service (Phoenix and Maricopa Counties, Arizona)	Limited	Scattered service supplied	None
Older Adults Transportation Service (Missouri - statewide)	Taxi service, contract with transit company	Joint use of equipment, information exchange	Information-sharing, planning, shared office space, equipment leasing
Roanoke Agency Dial-a-Ride (RADAR) (Roanoke Valley, Virginia)	City sponsors both transit and RADAR	Limited shared office space	Participate in planning, client referral
Senior Citizens Transportation, Inc. (Rhode Island)	Limited, planning coordination	None	Client referral
Senior Handi-Bus (Lincoln and Lancaster Counties, Nebraska)	Transit authority operates project	Tries to avoid duplication	Client referral
Ten County Rural Transportation (Southern Iowa)	Very little	Unknown	Planning, information- sharing
Valley Transit District (4 cities in Connecticut)	Little to poor	None	Planning and public relations
Whistlestop Wheels (Marin County, California)	Transit provides funding, evaluation, accounting, taxi discounts	None	Information-sharing, client referral, some sharing of drivers and vehicles

Source: *Coordinating Transportation for the Elderly and Handicapped*, Institute of Public Administration, Washington, DC, November 1976.

COORDINATION AND BROKERAGE

Organization, or a transit agency. Ties should be established as early as possible with the state Department of Transportation or regional agencies to provide the technical assistance needed.

The availability of funding through Section 18 may help to overcome some of the problems ordinarily associated with coordination. In many cases in rural areas, transit agencies are likely to be new, or extended functions of existing social agency operations. It is essential to consider the role and the possibilities of the organizations that are available to do the job, including the private sector, through taxi services, user subsidies, or contracts for services. It should not be assumed that transportation can only be provided by public agencies. In that context, there are a number of formats that may be used, including brokerage systems, integrated systems, contracts for services, as well as the direct provision of service.

The means for achieving coordination are almost as varied as the number of communities which have participated in such efforts throughout the United States. A substantial range of approaches and tech-

niques has been used, including such elements as uniform cost accounts and service definitions, cost-sharing formulas, service legal agreements, common accountability forms, taxi operator agreements, and contractual agreements among agencies. It is important to consider carefully all the possible options, and use an incremental approach.

In developing coordinated services, the objective should be to develop a fully integrated set of transportation service categories that can provide mobility to a broad range of users in rural areas. The broader the user base one develops, the more cost-effective the service will be, and the greater the opportunity for coordinating among a variety of service providers.

The degree and complexity of the organization should match the scope of the objectives of the coordination effort. Simple cooperative information-sharing requires substantially less organizational complexity, whereas consolidation of services will require greater organizational linkages. **END**

Factors Affecting Coordination

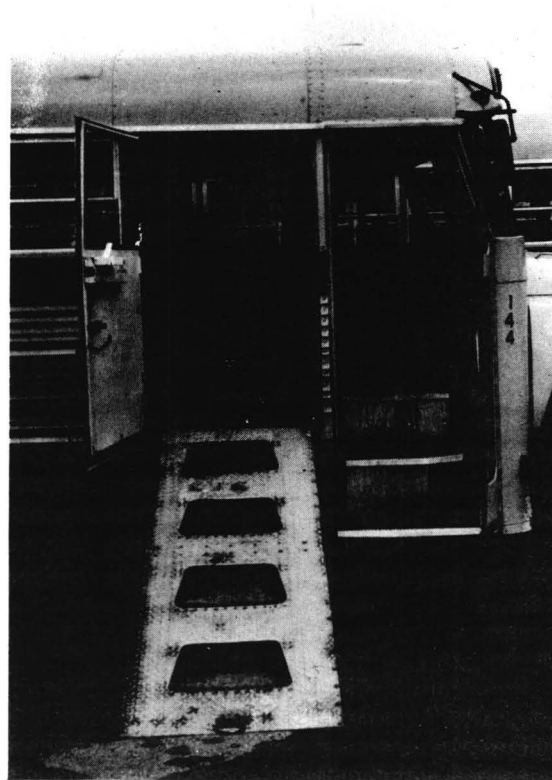
Arthur Saltzman, Director
Transportation Institute
North Carolina A&T State University, Greensboro, NC

During the past decade, human service agencies have added a new dimension to their services: provision of transportation for their clients. Volunteer drivers and agency staff have been helping clients meet their mobility needs for many years, but it was not until the occurrence of dramatic increases in social welfare and health programs in the late 1960s that agency directors became aware of their clients' mobility problems, and began to develop systematic transportation techniques.

Transportation now comprises a significant portion of many agency budgets, and there is considerable interest in ways to make it more cost-effective. Since the usual arrangement is for each agency to have its own transportation system, a seemingly obvious approach to reducing transportation costs is to coordinate the separate transportation services. Unfortunately, this approach also has some obvious disadvantages, including the individual agency's loss of control over a vital part of its operation, and the problem of harmonizing the different transportation needs of separate client groups. Thus, coordination is not embraced by all agencies.

Human service agency transportation represents the coalescing of two activities: human services and public transit. Although coordination has long been of concern to the planners of human services, the devel-

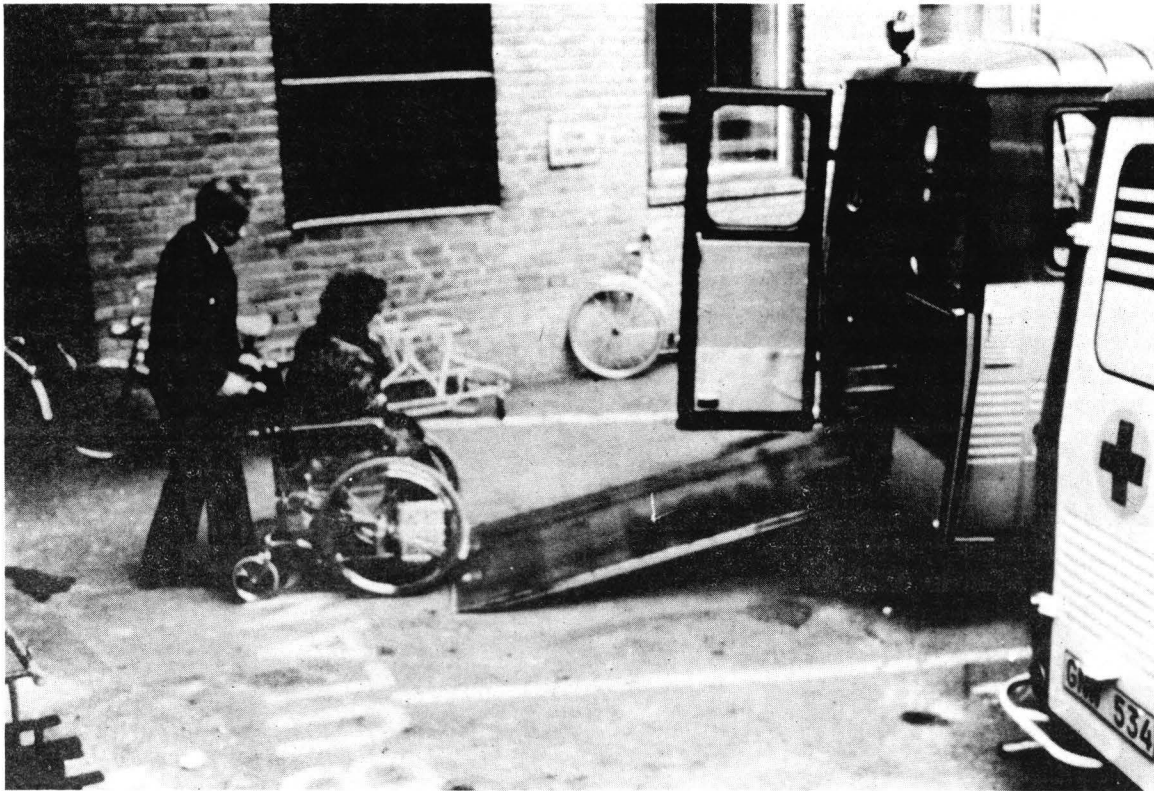
opment of social welfare programs still has been fragmented. The shift from private to public assistance, and the increased involvement of multiple layers of government, impinge upon the process of coordination.



Recent concern with coordination on the part of public transit authorities is a result of the federally mandated transportation planning process which must include all modes of transportation and be done cooperatively among municipal, state, and federal transportation agencies. However, human service agency transportation operations developed outside of the conventional transit industry, and therefore were excluded from consideration by transportation planners. No discernable policy at any level of government guided the early growth of these paratransit systems. Thus, in cities, and also in many rural areas, there are fragmented, overlapping, and duplicated services.

In order to understand the dynamics underlying coordination, or lack of it, human service agency transportation systems in California were studied. A mail survey of 159 responding agencies, and extensive interviewing in five localities chosen with the cooperation of the California Department of Transportation, Caltrans, were conducted.

The focus of the research was on the individual agencies and their willingness to coordinate. Coordination is not likely to occur unless there is some willingness of agency directors to enter into cooperative arrangements with other agencies. Although a number of factors influence an agency's basic willingness to coordinate, it



was found in this study that the most significant factor was whether the agency perceived that the potential financial benefits outweighed the loss of control which might result from coordinating with other units. This finding underscores the need for

more accurate projections of both benefits and costs which might result from coordination.

Agency directors also were sensitive to the fact that coordination requires some administrative effort. They were more willing

to coordinate if they felt that they had the time available to enter into the negotiating process required to achieve coordination.

Another factor which was related to willingness to coordinate was the nature of the agencies' commitment to transportation. To enhance coordination they needed to "legitimize" their transportation function. This means that agencies which provide transportation to their clients through an identifiable subunit should be more willing to coordinate than those which provide transportation *ad hoc*.

“No discernable policy at any level of government guided the early growth of these para-transit systems.”

Two factors which did not seem to affect willingness to coordinate were the agencies' perception of regulatory barriers to coordination, and their current financial security. Some agencies were concerned with how to overcome regulatory barriers, and virtually all of them were seeking more financial stability. However, these factors were not good predictors of a basic willingness to coordinate their transportation services with others. **END**

Coordination in Pennsylvania from the Local Perspective

James H. Miller, Director, Public Transportation Program
The Pennsylvania State University, University Park, PA

In spite of the apparent benefits of coordinated transportation programs, progress toward implementing them has been slow and often has been marked by failure at the planning stage or even after implementation.

The failure to implement effective integrated systems results in frustration at all levels of government. Several national surveys have been taken in order to identify barriers to coordination. Responses show that bureaucratic red tape in the form of guidelines, regulations, and user and financing restrictions are felt to prevent successful coordination. While these conflicting requirements are sometimes confusing and cumbersome, the success of many coordinated transportation systems belies the fact that the red tape prevents coordination.

If federal and state regulations are not the problem, then why has coordination not been more successful? Based on the experience in Pennsylvania, it appears that factors crucial to the success of a coordinated system are controlled at the local level.

The Pennsylvania Experience

Pennsylvania was one of the first states to promote rural public transportation through a Department of Agriculture project dating back to the early 1970s. In 1974, the governor issued a major state policy sup-

porting rural public transportation, and a statewide rural transportation plan was completed in 1976. Subsequently, 15 Section 147 Rural Highway Public Demonstration Projects were funded. Additional projects were funded by the Appalachian Regional Commission (ARC).

In the 13 urban areas of the state, coordinated specialized transportation services were stimulated by the UMTA Section 5 requirement for "special efforts" for the elderly and handicapped. The UMTA 16(b)2 capital grant program also stimulated the formation of coordinated systems in both urban

and rural areas of the state.

Throughout the state, the 49 Area Agencies on Aging (AAA) have been key participants in coordinated systems. Unlike AAAs in many states, in Pennsylvania they directly provide services, including transportation. The state Department of Public Welfare and the new (1979) Department of Aging also have encouraged the formation of coordinated systems.

The results of the efforts to provide coordinated services, initiated in about half of the counties in the state, are summarized in Table 1. A majority of the urban counties

TABLE 1
SUMMARY OF COORDINATION EFFORTS IN PENNSYLVANIA, 1979

	Number of Counties Involved	Number of Operating Systems ¹	Number of Counties with Coordinated Systems ²	Number of Counties with Partial Coordination	Number of Counties with No Plan for Coordination	Number of Counties Planning Coordinated Systems
Urban	19	13	8	9	0	2
Rural portions of urban counties	16	10	7	7	0	2
Rural	48	9	14	1	11	22

¹ Some multicounty systems include fully and partially coordinated systems.

² Defined as being organized to serve all potential needs.

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have a transportation system which is partially or totally coordinated. Social service agencies in most cases took the lead in establishing the systems, although transit authorities have encouraged development of these systems to serve as providers of special transportation for the elderly and handicapped. Only two urban areas lack coordinated systems, and efforts are under way in these areas to implement systems within the next year.



The experience in rural areas is not as promising. Less than one-third of the counties (15 of 48) are served by coordinated systems. While much must still be done to make specialized transportation in urban areas more efficient, the failure to form viable transportation systems in rural areas is of greater concern to local, state, and federal parties since rural residents typically lack all but a minimal form of public transportation service. Two Pennsylvania state departments, transportation and aging, have formed an interdepartmental task force to recommend ways of improving the mobility of all rural residents, but in particular, the elderly.

Factors in Successful Coordination

A review of a sample of "successes" and "failures" in Pennsylvania suggests that the presence or absence of four elements are the determining factors. For coordinated transportation systems to succeed, the following factors must be present: 1) self-interest on the part of participating agencies, 2) local political support, 3) competent personnel, and 4) strong local leadership.

1. Self Interest

The establishment of coordinated transportation systems is voluntary. For social service agencies to agree voluntarily to be part of a coordinated system they must

perceive some rewards. Agencies are supposed to receive better transportation services at a lower cost per unit as a result of coordination. Experience suggests that while this is usually possible, many of these financial and service benefits are long-range. A key to successful implementation is to persuade the agency that the long-term benefits are worth working through the short-term obstacles.

State and federal agencies stimulate an agency's self-interest by offering funding, contingent on participation in coordinated systems. In Pennsylvania, state regulations related to the transportation programs funded by Titles III and VII of the Older Americans Act and Title XX of the Social Security Act, encourage, but do not require, coordination. However, the funding levels within these programs have not grown in proportion to the need for, or cost of, providing transportation services. The result has been only an indirect incentive for agencies to coordinate.

Fifteen Section 147 Rural Highway Public Transportation Demonstration projects were

funded in the state, resulting in the formation or expansion of 11 rural coordinated systems. This funding helped overcome a major obstacle to coordination, the high initial costs associated with merging a number of previously independent systems. Agency directors found it in their self-interest to participate in coordinated systems which offered low-cost transportation through the use of Section 147 funding. Unfortunately, there was no basis for continued participation once the funds ran out.

The Appalachian Regional Commission (ARC) provided funds to the Area Transportation Authority of North Central Pennsylvania. Recently, ARC awarded four demonstration grants to county or multicounty sponsors to implement coordinated systems.

Three federal DOT programs have helped create the self-interest which encourages coordination. The UMTA 16(b)2 capital grant program for specially equipped vehicles for the elderly and handicapped requires that the vehicles be used in a coordinated manner. In administering the program, the state Department of

Transportation has held up approval of grants to nonprofit agencies until it felt that there was reasonable progress toward coordination. Unfortunately, in several cases, once the vans were obtained, coordination efforts slackened.

The UMTA requirement for "special efforts" for the elderly and handicapped on the part of Section 5 recipients encouraged transit authorities in urban areas to establish specialized coordinated transportation services. For example, over 20 agencies, including the local transit authority, now buy transportation from Wheels, Inc., in Harrisburg.

Pennsylvania has had a program similar and complementary to the Section 18 Rural Transportation Assistance Program of the U.S. DOT since 1976. Social service agencies seeking to expand their funding sources are now participating in planning efforts which will establish general-purpose public transportation systems which qualify for Section 18 funding, and which also provide coordinated client transportation.

One other aspect of self-interest should be noted. In several successful coordination projects, agency directors and staff appeared to be advocates for reasons of personal professional development. The assumption on the part of directors was that they were viewed as more competent and successful managers after the agency had become part of a coordinated transportation system.

While the potential availability of new funding sources often provides the necessary motivation for an agency to participate in a coordinated transportation system, this factor alone is not sufficient to assure success.

2. Local Political Support

Support by the elected bodies that control the flow of local tax dollars and approve the budgets of many social service agencies is perhaps the most important of the four factors necessary for successful coordination. With strong support from, say, the county commissioners, the organizers of a coordinated system can obtain the necessary cooperation of agencies, local shares of funding programs, and substantial tech-

nical, legal, and other types of assistance needed to start a system.

While there are isolated cases in which elected officials initiated interest in coordinated transportation, usually officials have to be persuaded. This is especially difficult in rural areas, which tend to be both fiscally and programatically conservative. Even offers of free programs, such as the Section 147 projects or ARC demonstrations, were viewed with suspicion, because the local authorities anticipate problems when the grant funds end.

Since local political support is not likely to be generated spontaneously, the other three factors must be present to achieve political support. An ideal way to obtain political support is for a local "mover and shaker," a person with leadership ability, clout, and credibility, to generate the enthusiasm for coordinating a system. Such a person can serve as a catalyst to bring together the social service agencies, state funding and technical assistance agencies, and others, to develop a viable plan. The plan then can be presented to the elected officials, who may pro-

vide the funds, serve as the applicant for funds, or form the necessary board, department, or authority to operate the system. A strong advocacy role is required in many cases to achieve the necessary local political support.

An alternative to initial strong political support is to obtain enough support for approval of a demonstration grant, in order to make a small beginning. It is often possible to demonstrate concretely the benefits of coordination and the need for additional transportation resources by successfully operating a pilot program. The major risk in this strategy is that the commitment of resources and moral support may be below that critical threshold necessary for a minimum level of operating success. The demonstration then leads to the unfortunate conclusion that coordination is unworkable. However, a lack of political support can be overcome through good planning, agency cooperation, and strong advocacy by agencies and their clients.

3. Competent Personnel

Successful coordination of transportation systems require

technically competent planners, managers, and other staff. Besides technical competence, the key attribute of the professionals is credibility. Since individual agencies are, in many cases, taking a risk by turning over their transportation systems to an unknown agency, confidence in the capabilities of the system manager is crucial. Systems can fail due to poor personnel selection.

This is a new field and there is a shortage of qualified personnel, particularly managers, and to some extent planners. Project sponsors and elected officials responsible for creating positions and setting salaries often try to minimize the cost by paying low salaries. (In numerous cases in Pennsylvania, project directors were hired under the Comprehensive Employment and Training Act (CETA) program at salaries as low as \$6,600 per year.) Low salaries result in a high turnover rate of key personnel.

4. Local Leadership

The final indispensable element in the successful establishment and operation of a coordinated system is local leadership —

the catalyst, the mover, and shaker. Behind every successful system is at least one individual who relentlessly pursued the goal of improving transportation in his or her local area.

There are at least three models of local leadership which have been successful in Pennsylvania. The first is the volunteer civic leader with strong connections to the political and economic base of the community, and with the time and energy to devote nearly full-time to the project, possibly for several years. Such a person seeks out technical advice and funding sources, serves as a catalyst to bring agencies together, and will not take "no" for an answer.

In rare cases, it is the elected official who takes the lead and serves as the catalyst. Perhaps the most common but least successful method is to arbitrarily assign a staff member of an existing agency the job of implementing a system.

Social service agency staff members, while competent in their own programmatic areas, often lack the technical transportation

skills necessary to plan and implement a system. Planning commission staff also often lack the operational planning skills and legal background to take the lead in implementation.

In summary, local leadership, so crucial in the development of a coordinated system, is most successful when generated spontaneously; it cannot be imposed or created by funding a position.



Recommendations

Local Level

1. Obtain local political support as early as possible.
2. Seek a local leader to organize the effort.
3. Insist that competent staff is hired to plan and operate the system.
4. Seek technical help from state agencies, universities, and other organizations with the necessary skills.

State Level

1. Tie funding programs to coordination.
2. Provide technical assistance to local leaders.
3. Develop and offer training seminars for planners and managers.
4. Seek to reduce state-level red tape, unnecessary regulations, and reporting requirements.

“A key to successful implementation is to persuade the agency that the long-term benefits are worth working through the short-term obstacles.”

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Federal Level

1. Continue to coordinate planning funding program requirements.
2. Provide increasing and predictable funding for coordinated systems.
3. Continue to develop and disseminate technical information about planning and operating coordinated systems.

END



Coordinated Transportation in Massachusetts

Jackie Hunt, Director, Coordinated Transportation Project

Lawrence J. Harman, Consultant

Massachusetts Executive Office of Transportation and Construction, Boston, MA

Providing transportation in rural areas is difficult, and requires the cooperation of people from many groups and levels of public service. The Coordinated Transportation Projects (CTP), initiated with the assistance of an UMTA grant in 1977, is a major effort by the Commonwealth of Massachusetts to develop a statewide response to the problem of coordinating human services transportation programs. The CTP is located within the Executive Office of Transportation and Construction (EOTC), which serves as the Massachusetts state DOT, but involves the active cooperation of many other state and local agencies.

After initial organizational work had been accomplished, and data collection and preliminary analysis had taken place in a demonstration area, it was apparent that a mechanism to provide the appropriate federal involvement was necessary. *The White House Initiative: Improving Transportation in Rural America*, announced in June 1979, provided this federal partnership and intergovernmental context for problem-solving. With the acceptance of the CTP under the aegis of the White House Rural Initiatives, the process of problem identification and problem resolution began.

This initiative, the sixth in a series on rural development, addressed railroad rehabilitation, commuter airlines, and ride-

sharing in rural areas, as well as focusing on "social service and public transportation in rural America." In making the announcement the White House noted the following:

Emphasis has been placed on improvements in the coordination and delivery of federal programs, and on making these programs more accessible and more workable for the more than 50 million people living in the non-metropolitan areas of our country. Included in these initiatives are "agreements and actions to improve the coordination and effectiveness of social service and public transportation programs in rural areas; . . ."

Actions are being taken to improve local rural transportation through:

- increasing the availability of needed transportation resources;
- improving the delivery and effectiveness of local transportation programs through better coordination and simplification of administrative procedures;
- resolving the difficult problems of relating statutorily mandated Section 13 (c) labor protection provisions to transportation systems receiving Section 18 funds;

- initiating specific actions to make insurance more available, flexible, and affordable for social service and public transportation providers; and
- improving and coordinating federal technical assistance and training programs.

The rhetoric of coordination and simplification of resource delivery was backed up by a precedent-setting Memorandum of Understanding which included as signatories the principal federal agencies affecting social service and public transportation

“At the state level, the program in Massachusetts parallels the[se] cooperative relationships among federal agencies.”

(see Exhibit 1). The memorandum was signed by representatives of the federal Departments of Transportation; Health, Education and Welfare; Agriculture; Labor; the Community Services Administration; ACTION; and the General Services Administration, among others. At the state level, the program in Massachusetts parallels these cooperative relationships among federal agencies.

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EXHIBIT 1

MEMORANDUM OF UNDERSTANDING
among
DEPARTMENT OF TRANSPORTATION
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
COMMUNITY SERVICES ADMINISTRATION
ACTION
DEPARTMENT OF AGRICULTURE
DEPARTMENT OF LABOR
GENERAL SERVICES ADMINISTRATION
concerning
IMPROVED SOCIAL SERVICE AND PUBLIC TRANSPORTATION
in
RURAL AREAS
June 1979

A substantial number of social service programs are providing transportation services to rural Americans in support of the achievement of their individual agency goals. Some programs to provide more generally available transportation for rural residents have also been created, most notably the "Formula Grant Program for Areas Other Than Urbanized Areas" established by the Surface Transportation Assistance Act of 1978 (the Section 18 program). This agreement is intended to help enhance the access of people in non-urbanized areas to health care and social services, as well as to shopping, education, recreation, other public services, and employment by encouraging the maintenance, development and use of coordinated transportation services. It specifically focuses on assuring that necessary transportation resources are available in the context of ongoing programs, removing administrative barriers to coordination of services as fully and expeditiously as possible, and providing technical assistance and support to State and local officials in the development and evolution of such services.

The signatories to this agreement mutually agree to the following principles and procedures for administering their programs which affect the provision of transportation in non-urbanized areas.

- I. Resources. The following actions shall be undertaken to increase the availability of resources for use in rural public transportation:
 - A. DOL will assist in training and assigning CETA workers to public transportation systems funded under the Section 18 program and to social service systems which are coordinated with them.
 1. DOL's Office of National Programs will provide up to 1,500 slots during fiscal years 1979 and 1980 (under the Comprehensive Employment and Training Act and Title V of the Older Americans Act) for placement in Section 18 programs in 12 demonstration states.
 2. DOL will utilize training materials jointly supplied by DOT and HEW and will contract with one or more appropriate organizations to train these 1,500 CETA workers (as drivers, mechanics, dispatchers, etc.).
 3. DOL will work with balance-of-state prime sponsors to develop and encourage programs for the effective utilization of state CETA resources in Section 18-funded and coordinated transportation systems, and will contract with the National Governors Association to organize national and regional workshops to further this end.
 - B. ACTION will assign volunteers to rural and small community public transportation systems funded by the DOT Section 18 program and social service systems which are coordinated with them.
 1. ACTION will include in its program procedures for volunteers some mechanism for highlighting transportation-relevant experience.
 2. ACTION will utilize training materials jointly supplied by DOT and HEW and utilize, where appropriate, training facilities established by DOL for the training of CETA workers.
 3. ACTION will provide information on the potential role for, and availability of, volunteers in transportation services available to the other signatories of this agreement on a regular basis.

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- C. The Farmers Home Administration (FmHA) of the USDA will give priority in consideration for long-term, low interest loan guarantees to those applicants who currently are providing transportation services to the general public. Specifically included are those systems funded by the DOT Section 18 program.
 - 1. USDA and DOT will cooperate in informing their respective field staffs of the availability of these guarantees and the procedures for application.
 - 2. The utilization of this option will be the subject of periodic review by USDA and DOT.
 - D. CSA will provide fiscal year 1980 funds for additional training and technical assistance, management systems, a program support for CAAs which operate and/or are coordinated with Section 18 systems.
 - E. The Urban Mass Transportation Administration (UMTA) of DOT will on a competitive basis, make available funds of its Section 3 and Section 16 (b) (2) capital assistance programs for a period of no less than two years from the activation of the Section 18 program.
 - 1. Funds will be administered through regular UMTA channels, but coordinated with the activities under Section 18.
 - 2. This funding will be available to States which can demonstrate their probable capital needs exceed their Section 18 allocations for the full period of the Section 18 program's duration.
 - F. GSA will notify FHWA Regional Offices on a regular basis of the availability of surplus vans and other equipment suitable for rural public transportation, and will give FHWA first priority among purchasers in order to enable this agency to purchase vans at fair market price, etc., for lease or donation to Section 18 providers.
 - G. HEW, CSA, and ACTION will undertake special measures to assure a continuation of current transportation funding levels to small urban and rural areas. In those Federal agencies which share assistance programming with States, these measures shall be effected through active encouragement with State and local counterparts to maintain current spending levels for transportation services.
 - H. The signatories of the Memorandum of Understanding will assess which of their funding programs are unrestricted and may be used as match for other Federal grant programs which provide transportation services. This assessment will include a formal legal review of existing grant authorities for this purpose. This information will be used to develop a consolidated list of unrestricted funding sources which can be used by the States in connection with the Section 18 program and similar efforts. This list will be made available by the signatories to their headquarters and field staffs, with guidance that use of these funds as match is legitimate.
- II. Coordination and Administrative Simplification. To overcome the barriers that inhibit the coordination and implementation of rural and small urban public transportation systems, the following actions will be taken:
- A. HEW, CSA, and ACTION will issue policy memoranda and otherwise encourage those grantees currently operating transportation services to participate in coordinated efforts to form the basis by which general rural public transportation services can be structured.
 - B. The signatories will encourage those agencies which now purchase transportation to coordinate with rural operators funded under Section 18 by establishing supportive relationships wherever it is more cost efficient and service effective.
 - C. A task force composed of representatives from DOT, HEW, OMB, and six selected states will be established to develop simplified and standardized accounting, reporting, and billing procedures for use in social service/public transportation programs, and will work with the six selected states to implement and test these procedures in the first (demonstration) phase of a nationwide effort to dramatically simplify the paperwork and other administrative burdens associated with the current accounting, reporting, and billing requirements of federal and state social service agencies.

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- D. The signatories to this Memorandum of Understanding will assign senior representatives to an Interagency Transportation Committee to facilitate and monitor the implementation of the agreements contained herein.
- III. Technical Assistance. To provide needed technical assistance to State and local governments in administering rural public transportation, and local operators of rural public transportation services, the following actions will be taken:
- A. The signatories to this agreement will designate formal points of contact in the field for State and local governments and operators to answer questions and solve problems on rural transportation related issues.
- B. The signatories to this agreement will cooperate in an assessment of existing technical assistance resources, and determination of what new initiatives are needed to integrate them more effectively.
1. An inventory of planned and ongoing research and technical assistance resources on rural and specialized transportation will be developed and periodically updated, with all signatory agencies developing lists of their own relevant activities. DOT shall be responsible for compiling these submissions and publication of a summary. The summary will be updated and reissued quarterly.
 2. DOT and HEW will review the list of interagency technical assistance projects to determine gaps and in cooperation with state and local governments and service providers, recommend development of new initiatives.
 3. An agenda of needed products and initiatives will be presented by staff of the two agencies to their management no later than 90 days after the signing of this agreement for possible co-funding. The opportunity to participate, financially and technically, will also be given to the other signatories.

4. A strategy for more effective dissemination of existing products will also be developed and implemented.
- C. HEW and DOT will co-sponsor a series of technical assistance and training activities.
1. A series of workshops on the general topics covered by this agreement will be held in conjunction with each of the Federal Regional Councils.
 2. A regional series of two-day training courses on rural public transportation, targeted at Federal field staff and State-level employees, will be conducted.
- IV. Agreement Duration. This agreement will be reviewed one year after its approval date by the head of each of the signatory agencies for renewal or modification.

Signed by:

Bob Bergland
Secretary
Department of Agriculture

Joseph A. Califano, Jr.
Secretary
Department of Health, Education,
and Welfare

Ray Marshall
Secretary
Department of Labor

Paul E. Goulding
Acting Administrator
General Services Administration

Brock Adams
Secretary
Department of Transportation

Graciela Olivarez
Administrator
Administration

Samuel W. Brown
Director
ACTION

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The CTP is an innovative effort in which the EOTC and the Executive Office of Human Services (EOHS) have joined forces to focus on the mutually perceived problem of providing efficient special transportation for the elderly, the handicapped, and the general client population of human service agencies. A basic contention in the initial grant application was that a wide diversity of special transportation services was currently being provided by a variety of providers, but that there were critical gaps and overlapping efforts caused by the fragmented nature of the services. The net effect was a range of generally inefficient special transportation services, with the targeted groups suffering. The primary focus for the CTS was to coordinate and improve the quality of available special transportation services so that a better quality of social services could be provided.

The choice of four counties in western Massachusetts, EOHS Region I, as the demonstration area reflected the goals and priorities of the CTP:

1. It was necessary to designate an entire EOHS region (one of six in the state) including subareas of the various state agencies involved in the provision of special transportation. Since none of these agency service areas was coterminous, the coordination of transportation ef-

orts needed to be addressed on a regional scale.

2. It was necessary to focus on a largely nonurbanized area of the state where lack of efficient special transportation had a major negative impact on the target groups.
3. There was a high degree of interest and support for this type of a coordination project by groups and individuals in this particular region.

The announcement of the White House initiatives to improve transportation in rural and small urban areas coincided with the conclusion of the CTP data collection, analysis, and planning phase in the demonstration area and the CTP was able to move more quickly into statewide implementation of efforts to provide coordination among federal and state-supported transportation activities. The CTP has provided information, staff resources, and most importantly, an interagency and intergovernmental approach to the examination of public and special transportation programs.

CTP Objectives

CTP began with the following objectives:

1. To develop coordinated transportation strategies tailored specifically to local conditions, building on existing viable institutions, including

private, public, and nonprofit transportation providers. Available local financial and human resources would be preserved and developed to the greatest extent possible.

2. To utilize Section 18 and Section 16 (b)(2) program resources to improve the cost-effective delivery of transportation services.
3. To increase the availability of appropriate federal and state transportation services.
4. To develop strategies and mechanisms which simplify and facilitate the federal and state administrative processes required to accomplish a coordinated transportation program in the selected target areas.
5. To create an environment at the local level which would foster the matching of transportation programs appropriate to the client groups served with the characteristics of the available vehicles, in a manner which accomplishes a higher quality of service delivery, economies of scale, and better management.
6. To develop federal and state strategies to insure that financial management procedures, grant and contract administration policies,

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and reporting requirements assist rather than impede collaborative efforts in the target area.

7. To develop coordinated transportation implementation strategies which will provide for adequate protection of affected employees in the target areas in accordance with the Special 13(c) Warranty.
8. To make maximum use of available technical assistance and training resources at the state, regional, and local levels for collaborative efforts in the target areas.

The project will try to demonstrate the benefits of administrative consolidation of closely related transportation program resources at the local level, enabling these projects to effectively draw upon a broader base of federal, state, and local agency support. We also hope to demonstrate better overall management of the transportation resources of the federal and state government by promoting an integration of funding support for local transportation operations that yield higher levels of service delivery for lower unit costs.

A major attempt will be made to intensify the impact of federal and state resources on users of public and special transportation services, particularly elderly and handicapped persons, by addressing critical

management issues at the local level in the target areas.

These management issues include:

1. the coordinated timing of funding decisions among integrated program participants,
2. overcoming barriers to cash flow at the operational level,
3. elimination of real or perceived barriers to coordination among agency participants at the local level,
4. insuring timely capital outlay, particularly capital replacement decisions, and
5. development of uniform accounting and program reporting procedures at the local level.

Description of the Project

The project addresses the problems of coordination by using an intergovernmental and interagency task force approach, focused on a small number of target areas.

CTP selected a manageable number of initial target areas based on 1) the diversified service and institutional characteristics of the selected areas, 2) a history of providing transportation services, 3) the potential of the management capacity of the provider for further growth, 4) the presence, or availability of, a "critical mass" of transit and paratransit vehicles, 5) the receptivity of the

target area to coordination, and 6) the small urban or rural setting of the service.

Current and projected funding sources for the four subareas are shown in Table 1.

The CTP organization is designed to provide for maximum information and interaction among state, regional, and local human service agencies involved with the provision of special transportation services. The two full-time staff members, the project director working at the state level, and the project manager working in the regional demonstration area, rely heavily on the interest and expertise of a variety of project participants. At the state level, there is direct involvement by the two Secretariats that jointly administer the CTP, the EOTC, and the EOHS. The full spectrum of state level agencies concerned with special transportation is represented on an Interagency Advisory Committee comprising representatives of EOTC and EOHS complemented by representatives of eleven other state agencies which have cosigned an interagency agreement at the state level, similar to the federal agreement, attesting to their shared interests.

There is also a Regional Interagency Discussion Group (RIDG), which includes representatives from each of the five EOHS subareas in the demonstration area, as well as representatives from key regional offices of state agencies and regional human ser-

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vice councils. Specific planning and transit concerns are brought out by representatives from each regional planning agency (RPA) and regional transit authority (RTA), and a staff member from one of these groups serves on the Project Advisory

Committee (PAC), which also includes the CTP director and project manager, and representatives of EOTC and EOHS.

In November 1979, the New England Federal Regional Council convened a federal Regional Task Force on Transporta-

tion to address the rural transportation development initiative in Massachusetts. Present were principal regional officials from the U.S. Department of Transportation, the Urban Mass Transportation Administration, the Federal Highway Administration,

**TABLE 1
COLLABORATIVE FUNDING MATRIX FOR RURAL TRANSPORTATION
DEVELOPMENT IN MASSACHUSETTS PHASE I TARGET AREAS**

	Title III OAA	Title VII OAA	Title XIX SSA	Title XX SSA	16(b)(2) UMTA	Sec. 3 UMTA	Sec. 18	EOTC	RTA	LINKS	COUNTY	TOWNS	C.S.A.	CETA	PRIVATE GRANTS	VOLUNTEERS	YOUTH CORPS	OTHER
Berkshire region		o	*		*	o	*	o	o		o		o	o	o		o	
Franklin Co. region	o	o	*	o	*	o	o	o	o	o	o	o		o	o			
Hampden & Hampshire Co. region	o		*	*	o		*				o	o		o	o			
Cape Ann region	o	*	o	o	o		o	o	o			o	o	o	o	o		o ¹

Symbols: o Funding source under contract
 * Proposed source of funds
¹ Senior Community Service Employment Program

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the Department of Health, Education and Welfare (Office of Human Development Services, Administration on Aging), Community Services Administration, and the General Services Administration.

In the original proposal to the Federal Regional Council it was suggested that a process of problem identification and problem resolution be developed by which the joint federal-state task force would set up a work program with the following elements:

1. presentation of project activities in the target areas by local providers;
2. identification of problem areas and issues appropriate for task force consideration (i.e., special timing consideration, cash flow, reporting processes, etc.);
3. development of an action agenda for resolution of identified problem areas and issues;
4. ongoing monitoring and evaluation of target area projects; and
5. development of transference mechanisms for replication of demonstration achievements to regular program administration.

There have been a number of parallel activities supportive of the CTP. For example:

1. The New England Federal Regional

Council, supported by DOT's Transportation Systems Center, convened a two-day conference on rural transportation in Durham, New Hampshire in March 1979. Most of the federal, state, and local participants in the CTP rural initiatives project participated.

2. EOTC, the prime state sponsor of the CTP rural transportation initiatives project, administers the new rural public transportation program, Section 18 of the Urban Mass Transportation Act, within the same staff organization as the CTP, and strives to keep close communication between the two activities.
3. Similarly, EOTC administers a revitalized Section 16 (b)(2) program within the same organizational context.
4. The EOTC held a two-day conference in western Massachusetts on paratransit solutions, in September 1979. The program featured, among other topics, a discussion of the White House initiatives.
5. An HEW Task Force on simplified billing, accounting, and reporting requirements was established. CTP staff, with the assistance of the New England Federal Regional Council, expects to become directly involved

in this activity.

6. At the state level, CTP staff is working with the Massachusetts Departments of Elder Affairs and Public Welfare to simplify transportation service cost determination and accounting issues involved with their respective funding of Title XX and Title XIX (Medicaid) transportation services.

During the fall of 1979, considerable efforts took place to identify problems in coordination experienced by local transportation providers in the target areas. CTP wished to identify problems which evolved out of actual operations in the target areas, and also were validated by a regional advisory process as being appropriate for interagency and intergovernmental consideration. The results were summarized for project advisory groups in a memorandum from the project manager which noted that an effort was being made to rank the problems based on the geographic potential of their impact, the jurisdictional influence of task force members, and the immediate and long term potential for their resolution.

An intensive effort was conducted to analyze, synthesize, and rank the problem statements in order to select problem areas which were generic and intergovernmental in nature rather than merely local, and whose solution would have regional and na-

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tional applicability. The problem statements included 1) gas allocation contingency planning for human services transportation in rural areas, 2) acquisition of capital equipment, and 3) conflicts between operational data requirements, implementation of confidentiality requirements, and program eligibility constraints posed by varying agency definitions.

Subsequently, the state CTP staff and the Federal Regional Council staff met to discuss the problem resolution process, and to assign staff from the identified appropriate federal and state agencies to the problem areas.

It became clear that the various federal, state, and local roles and responsibilities varied according to the nature of the problem. In one instance, it might be that the most important federal role in a discussion of a problem area is to confirm state authority to act in a given instance. Or, there may be a problem area in which responsibility among federal and state agencies must be shared.

The local response to the initiative has been cooperative in general, with some occasional scepticism. The federal and state response has been realistic in terms of the large scale issues, but also committed to the effort to contribute to the solution of some real problems that affect the efficiency and effectiveness of local transportation pro-

viders. The outlook for a successful conclusion of the initiative appears to rest on the ability of the participants to 1) carefully identify those problems of providing coordinated transportation that have some chance for resolution, and 2) shepherding those problems through the intergovernmental processes to a timely conclusion. If it works, it should be worth repeating. **END**

Statewide Coordination of Special Transportation in Florida

Kelly Parrish, Assistant Director, Project on Section 504
National Governors Association, Washington, DC

Mary Ellen Early, State Department of Health and Rehabilitative Services

Billy Pelham, Administrator, Special Programs Section
Bureau of Surface Transportation, Tallahassee, FL

In June 1979, Florida passed legislation mandating the coordination of transportation services to elderly, disabled, and impoverished people: The Coordinating Council on the Transportation Disadvantaged Act (FL 79-180). Provisions in the law are regarded as a creative and comprehensive effort by a state to develop a more efficient and effective special transportation program.

The focus, at first, has been on elderly Floridians as a target group because of the state's unique population characteristics. Florida has the highest ratio of elderly to nonelderly of any state in the nation. Nearly 600,000 of the two million elderly Floridians are 75 years of age or over. Though many of the "old-old" are still active, advanced age frequently results in physical and mental limitations that reduce mobility and threaten independence. As mobility decreases because of frailty, the need for medical and social services usually increases. Lack of transportation becomes a barrier to receiving these services. Experts believe that the disengagement from activities frequently associated with old age is not always voluntary, but rather a result of factors such as immobility and poverty. Inaccessibility to community programs often leads to placement in nursing homes, a situation which might otherwise be avoided, or at least postponed.

According to recent statistics, only 51 percent of Floridians aged 65 or older have a current driver's license. A driver's license is not necessarily an accurate indicator of transportation status; not everyone who has a license owns an automobile or has the resources to maintain one. Nearly half of the older population must rely on friends, family, or public and private transportation systems to get where they want or need to go.

According to the Governor's Committee on Employment for the Handicapped, Florida's mild climate is not only attractive to retirees, but also to handicapped people who have fewer mobility problems than they would in northern climates. While the President's Committee on Employment for the Handicapped estimates that 10 percent of the national workforce is mentally or physically handicapped, the staff of the governor's committee believes that the percentage is probably greater in Florida.

Although many physically handicapped people are self-sufficient and able to drive, unemployment is five times as great for handicapped people than for other employable adults. Relatively few can afford a private automobile. Even when public transportation is available, vehicle design and operational procedures prevent or discourage many people with special needs from using it. It is estimated that 30 percent of the

elderly living within a very short distance of the bus route are unable to use the public service.

Transportation is even more of a problem in rural areas where people frequently must commute to larger communities for medical care and other support services. Because of relatively low Medicaid reimbursement rates and heavy service demand, physicians in small communities sometimes limit the number of Medicaid patients they serve. Even minor medical problems often require travel to another community. According to the National Rural Center, Florida is one of 10 states with the largest number of nonmetropolitan poor. For rural residents who are poor or frail, transportation resources have a direct relationship to health care.

Coordination

Lack of coordination among public and private transportation providers further complicates existing transportation problems, e.g., specialized buses for the elderly transport only elderly people, Head Start buses are used only by Head Start children, and so on. Vehicles often sit idle for part of the day while people go without service. Nonprofit transportation providers compete for the same limited funds and purchase their own vehicles, which are frequently underutilized because of failure to coordinate

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the planning and delivery of transportation services. These providers must be encouraged to capitalize on each other's expertise and resources in planning, funding, and operating transportation programs.

For example, a report from North Carolina (a state noted for designing transportation systems) which assessed current special transportation systems noted that "over 50 percent of the vehicles carried less than a full load of passengers per day. Over 80 percent of the vehicles were utilized by only one agency. Roughly 50 percent of the vehicles were used less than three hours a day and remained idle the rest of the time. Over three-fourths of the counties in North Carolina could meet their current needs with existing capital equipment if all these resources could be used in an effective and efficient manner."

Legislative Action

The 1978 session of Florida's "Silver-Haired Legislature," a mock legislature of people 60 years of age and older, recognized the need to coordinate transportation services. The group approved a bill which called for a state coordinating council for the transportation-disadvantaged charged with overseeing all state and federal funds spent on transportation for special groups.

At the same time, the Florida House of Representatives Health and Rehabilitative

Services Committee and its Subcommittee on Aging was conducting a comprehensive study of the needs of the elderly in Florida. Study findings indicated that the greatest problems of elderly Floridians were health care and transportation. Lack of transportation to and from medical services was identified as a major barrier to obtaining timely diagnosis and treatment of illnesses.

"... the disengagement from activities, frequently associated with old age, is not always voluntary, but rather a result of . . .immobility and poverty."

In April 1979, the Florida Senate passed a bill, similar to one which the House had already considered, addressing the transportation problems of the elderly, handicapped, and other disadvantaged groups. The governor signed the bill into law; the effective date of implementation was October 1, 1979.

Scope of Human Services Transportation

The state's Department of Health and Rehabilitative Services is the largest, and in many communities, the only, provider of ser-

vices to the transportation-disadvantaged in Florida. The department provides transportation to its clients in three different ways. First, funds are available to nonprofit agencies, e.g., Older American Act projects and retardation workshops, most of which provide transportation as part of another service such as home-delivered and congregate meals, medical appointments, shopping, and occupational and physical therapy. Second, the department purchases transportation as a primary service from available providers. In urban areas, providers are mainly paratransit and mass transit systems, taxi cabs, and ambulances. In rural communities which lack established public or private systems, individuals are reimbursed for mileage, or for mileage and an hourly rate. Third, and as a last resort, departmental staff members often transport clients to essential health and social services. The Department of Health and Rehabilitative Services is spending in excess of \$10 million annually on transportation and escort services for its clients.

A cursory review of projected expenditures taken from the State Plan on Aging, Medicaid expenditure information, and the Title XX Comprehensive Annual Service Plan, indicates that there were expenditures of over \$8.5 million on transportation in Florida in 1979. This total does not include transportation services funded by Florida's

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Vocational Rehabilitation, Mental Health, and Children's Medical Services Programs. In addition to transportation expenditures, a total of \$1.4 million was spent on escort services, which are essential for many impaired people.

Federal and State Incentives to Coordination

UMTA requires applicants, including those applying for Section 18 funds, to demonstrate coordination efforts. For several years, HEW has been working on ways to eliminate or reduce restrictions which discourage coordination. The impact of the energy crisis on transportation problems is reflected in the White House Rural Transportation Initiatives, announced during the summer of 1979. The initiatives deal mainly with incentives to coordinate transportation funds and programs. HEW, the Department of Labor, and the Community Services Administration, among others, all have announced plans to foster coordination and improve efficiency and effectiveness in the delivery of transportation services.

The combined efforts of the federal and state governments to improve transportation are expected to result in the development or expansion of comprehensive community resources which will be available to elderly people not directly served by an Older Americans Act project, or to handi-

capped people who have been trained for employment, placed on a job, and are therefore no longer eligible for a transportation subsidy from the Department of Vocational Rehabilitation.

The Florida law has two main objectives: 1) to coordinate the planning for all state and federal funds available for the transportation-disadvantaged, and 2) to use these funds to support the development of coordinated community transportation providers. The Florida Department of Transportation is the lead agency in planning for the implementation of the program.

The law mandates establishment of a coordinating council for the transportation-disadvantaged. The council is composed of the secretary of the Department of Transportation, the secretary of the Department of Health and Rehabilitative Services, and the secretary of the Department of Community Affairs. Also on the council are representatives of elderly and handicapped citizens appointed by the governor, and the president of the Florida Association of Community Action Agencies.

The responsibilities of the State Coordinating Council are to:

1. compile all available information on the needs of the transportation-disadvantaged;
2. establish statewide objectives for

providing transit services to disadvantaged people;

3. analyze barriers prohibiting the effective coordination of state and federal funding sources, and develop programs to eliminate problems so that funds can be channeled to coordinated transit providers without undue delay;
4. serve as a clearinghouse for information on the funding and operation of special programs;
5. assist communities in the development of transit services for the disadvantaged, particularly in rural areas;
6. assure that all procedures, guidelines, and directives issued by member departments regarding transportation are conducive to the overall coordination of funding and services;
7. develop standards covering coordination, operation of systems, and use of services by the transportation-disadvantaged;
8. develop rules and procedures to implement the Act and coordinate with the existing A-95 review process; and
9. approve all designated planning agencies and coordinated community transportation providers.

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The Department of Transportation has the primary responsibility for coordinating the fund application process. In areas that do not have metropolitan planning organizations, the coordinating council will designate a body to plan for transportation coordination. That body will, in turn, designate a coordinated community provider. Lastly, the state Department of Transportation will coordinate all proposed programs with appropriate state agencies, regional planning agencies, local agencies and governments, and consumers, to insure the compatibility and efficiency of all programs which are developed.

This law also includes the provision that no funds for the transportation-disadvantaged may be expended unless they are included in the annual element of the state Department of Transportation's Five-Year Plan. Also, unless otherwise prohibited by law, all funds for the transportation-disadvantaged shall be used to purchase services from coordinated public, private, or private nonprofit providers. However, the law allows agencies to provide the service directly to people with unique handicaps or illnesses that preclude their using a coordinated transportation system.

Metropolitan planning organizations in urban areas, and designated planning agencies in rural areas, will play a key role in the coordination and development of

needed services. These agencies will be responsible for a number of tasks, some of which are:

1. to develop realistic transportation improvement programs (TIPS), after consultation with affected agencies;
2. to designate a single coordinated community transportation provider subject to the approval of the State Coordinating Council, from which each agency shall contract for services;
3. to see that if a single coordinated provider cannot be designated, a plan is developed to insure acceptable levels of coordination among providers.

FL 79-180 took effect on October 1, 1979, and is scheduled for "sunset review" on July 1, 1984. The plan calls for all rules and procedures to be in place prior to July 1, 1980, and for coordinated community providers to be designated in all areas of the state by October 1981. **END**

A Postscript to TRIP in West Virginia

L. André Roy, Former Senior Transportation Planner
West Virginia Department of Finance and Administration, Charleston, WV

The State of West Virginia began bus transit systems for its rural and small urban areas through a demonstration project, the Transportation Remuneration Incentive Program (TRIP), which was extended over a six-year period beginning in 1973. Before that time, West Virginia, like other rural states, was experiencing the problem of how to resolve unmet transportation needs for various segments of its population. Any decrease in the limited service then avail-

“A few years ago they [small urban public transit systems] . . . were looked upon as special ‘welfare’ services for the elderly and handicapped.”

able would have had the greatest impact on the elderly and the handicapped. Public transit was also suffering from deteriorating rolling stock and support facilities, both of which were victims of escalating inflation. The transit properties had only two courses of action: to increase fares or decrease levels of service.

In West Virginia, bus systems were going out of business at the rate of about three per year. As a result of the rapidly declining availability of public bus transit services, the state was a logical site in which to carry out a federal demonstration project. Initial funding was obtained from the Office of Economic Opportunity (now the Community Services Administration), and subsequent funds were received from the Urban Mass Transportation Administration (UMTA), the Federal Highway Administration (FHWA), the Administration on Aging (AOA) of the Department of Health, Education and Welfare (HEW), as well as the state.

In separate projects in the demonstration program, TRIP planned to:

1. Use discounted transportation tickets to subsidize transportation costs for up to 160,000 elderly and handicapped people with low incomes. This aspect of TRIP was administered by the West Virginia Department of Welfare.
2. Establish a statewide public transportation network by forming systems where there were none, and by improving inadequate systems.

As it turned out, only six regions, comprising 22 of the 55 counties, participated in the project. Up until June 30, 1977 the project was administered by the Department of Welfare; from July 1, 1977 until

June 30, 1978, the project was administered by the Governor's Office of Economic and Community Development; and finally, from July 1, 1978 until the end of the project on June 30, 1979, the Public Transportation Division of the West Virginia Department of Finance and Administration was the administering agency.

At no time did any one of the administering agencies operate all of the public transit authorities created by TRIP. Each agency acted as applicant for federal and state funds and was responsible for passing through federal funds to the various TRIP authorities. As a condition for receiving federal funds, the state agreed to hold title to the rolling stock with the understanding that the equipment would be turned over to the transit authorities on the fourth anniversary of the beginning of service.

The actual operation of the public transit system, was, and remains, the responsibility of each transit property's board of directors, who provide policy direction. The state's only interest in the transit properties has been to insure that their equipment was being used to provide services in accordance with the vehicle lease agreement and the operating subsidy contract.

A number of special features, such as demand-responsive services and fixed-route deviation, which were not included in the initial planning phase, were introduced.

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Although these services met with little success, they paved the way for the "rides-for-everyone" approach, in which the intent was to make available statewide services that traditionally were associated only with urban public transit systems. Services added included fixed routes or contractual arrangements to accommodate the work force; fixed routes to accommodate students attending vocational schools and colleges; charter service, both local and regional; and bus transfer scheduling. What evolved was a total public transit system image for each of the properties.

A ridership survey undertaken during March through May of 1979 showed that total ridership had increased on an average of 100 percent over that for the previous three years. Increase in operating revenues was attributed, in the first place, to work trips, which accounted for 66 percent of the ridership surveyed. The next leading category was shopping, which included grocery purchases, and the combined, work-related and shopping trip categories accounted for 80 percent of the ridership surveyed. A significant finding was that approximately 75 percent of the riders had one or more vehicles in their households. In other words, people were supporting the service even though, for the most part, they had access to other means of transportation. This degree of participation shows that West Virginia's

rural and small urban public transit systems are gaining general acceptance, whereas a few years ago they were, for the most part, looked upon as special "welfare" services for the elderly and handicapped. However, these groups do not appear to be the predominant users. The survey produced significant user age data: the predominant user age was concentrated in the 25 to 45 year range, accounting for 80 percent of the total number of users. The results also showed that a number of these users were driving up to 10 miles to transfer to the bus, to finish the commute to work.

Each system had a specially equipped bus to accommodate the needs of the ambulatory handicapped and the wheelchair-bound. This group, most of whom identified themselves as frequent users, accounted for less than one percent of the ridership surveyed. The elderly made up a little over 19 percent of the ridership surveyed, and most of their trips were made for medical or social reasons, as was true for the handicapped.

Along with the increase in ridership, revenues have increased at an average rate of 144 percent over the past three years. A greater dollar amount of the operating expenses has been met by this increase in farebox revenues, and revenues are increasing at a rate greater than the increase in expenses. The cost per mile has de-

creased by 10 percent whereas the revenue per mile has increased by 33 percent. Other revenue sources such as charters and advertising are also showing increases. All evidence indicates that these favorable trends will continue even though the TRIP demonstration period ended on June 30, 1979, and the transit authorities are presently making an adjustment in financial management. The transit properties must now contend with the realities of competing economics as providers of a public service; one-third of the funding must be raised locally.

In this transportation year (July 1979-June 1980), the former TRIP transit authorities are guaranteed some federal and state funding as the result of a first-year discretionary allocation of funds available from the new Section 18 of the UMT Act. This new federal funding source, unlike the Section 147 demonstration project funds, requires local matching funds. Political consensus-building at the local level, achieved through Section 147, will continue only if rural and small urban area public transit systems are supported by local politicians. Locally elected officials have to make decisions on how best to use scarce financial resources. The responsibility for administering the Section 18 funds, totalling approximately \$1.2 million, has been delegated to the Public Transportation Division of the West Virginia

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Department of Finance and Administration.

Although the future for rural and small urban area public bus transit systems in West Virginia shows promise, they still inherit the effects of TRIP's uneven history. TRIP has had an uncertain existence, partly due to the wavering support of the governor and the legislature, and partly due to inexperience in transportation management at the state level. West Virginia does not have a formal Department of Transportation and does not have an operating transit assistance program. As a result of minimal concentrated state-level support, responsibility for public transportation has been fragmented.

The distinction between rural public transportation needs, and travel demands, is that the latter are most crucial when expansion of service is contemplated. Demand must be recognized and dealt with early in the design stage. Unlike need, demand is based on a willingness to pay, and is measured by the amount of travel occurring in relation to the cost. People with low incomes and no automobile must restrict their travel demands to essential needs.

A continuing problem for the planning professional responsible for establishing rural and small area public transportation needs has been the lack of a comprehensive data base. In early 1979, the West Vir-

ginia Public Transportation Division undertook to produce a comprehensive data base through the development of a state-wide transit development program. This effort is still pending a state-level decision on whether to complete the document, which, of course, must be done before implementation is begun.

Another major factor in operating a multipurpose publicly supported bus transit system in rural and small urban areas is to maintain the confidence and support of local government officials responsible for budgetary decisions. In West Virginia, as elsewhere, the state is experiencing a period of keen competition for scarce local monies. As 1979 came to a close, there was some question whether the highly relied-upon Federal Revenue Sharing program would be continued beyond FY 80. If these monies for local public services are not available, it is likely that new or relatively new public services will find themselves competing with the established public services considered to be more essential. This means that the transit managers must be capable of conveying to the city councils and county commissions that their public service is worthy of receiving funding support, at least to match the federal monies available to them. To overcome the real possibility that transportation funds may receive low priority in the local budgetary

decision process, the transportation authority should have a manager who has seasoned experience in political, administrative, and planning matters. The ability to operate a public transit authority on sound business principles, to be as responsive as possible to the needs of the users, and to be able to communicate tactfully with government officials, business leaders, and other community leaders is necessary to obtain support.

Finally, in West Virginia, as elsewhere, public transit authorities created as a result of Section 147 and delegated to operate within a defined political boundary, have been realizing only a fraction of the effectiveness they would have if they were in a position to define their own operational boundaries. Recently, some of these boundaries have been extended to accommodate realistic travel demands of the riders.

Although the transit systems in West Virginia created by TRIP have survived beyond the end of the demonstration period, their future is by no means secure. However, 1980 is a gubernatorial election year, and because of the inflationary pressures on alternative transportation modes, TRIP may receive support in the legislature as well as becoming a platform issue for the present governor and his challengers.

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**TABLE 1
FUNDING SOURCES FOR PUBLIC TRANSPORTATION BUS TRANSIT AUTHORITIES
CREATED BY TRIP
(July 1, 1979 - June 30, 1980)**

Transit Authority	UMTA Section 6	FHWA Section 147 ¹	Governor's Counter-Cyclical Fund	Local ²	State	UMTA Section 18
Central WV Transit Authority	X				X	
Eastern Panhandle Transit Authority		X	X	X	X	X
Fairmont-Marion Co. Transit Authority	X				X	X
Monogalia Co. Transit Authority	X				X	X
Mountain Transit Authority				X	X	X
Ohio Valley Regional Transit Authority	X				X	X
Potomac Valley Transit Authority		X	X	X	X	X

¹These funds are expected to be exhausted in early 1980.

²Some of the local contributions have a conditional clause.

Table 1 presents a projection of how the former TRIP bus transit authorities may be supported through FY 80 with funds from federal and state sources. **END**

Behavioral Dynamics and Coordination

Barri J. Standish, Director
Urban Rural Transportation Alliance, Inc., Columbia, MD

Coordination of specialized transportation is vital in light of increasing needs and decreasing resources. This coordination is a threefold effort; federally, through coordination of programs and funds; statewide, through coordination of programmatic guidelines and applied funding regulations; and locally, through coordination of service delivery.

“...the greater the agency’s resources, the more it may fear a loss of identity when coordination takes place.”

The importance of understanding human behavior has been recognized increasingly in business, labor relations, provision of human services, and a myriad of other fields. The experience in Howard County, Maryland, one of five recipients of a grant from the Office of Human Development for a transportation coordination demonstration program shows the importance of applying behavioral principles for

well-planned and managed coordination at the local level. It was found that several barriers to coordination might have been averted earlier in the project if there had been a better understanding of human behavior.

Identification of the environment and intergroup relationships is the first step in the planning phase. The following list of environmental concerns should be fully investigated:

1. geographical boundaries for proposed project,
2. documented needs within those boundaries,
3. existing resources within the boundaries (e.g., vehicles and their uses, personnel, programs served, funds available),
4. agencies requiring specialized transit as program support,
5. structure of such agencies,
6. relationships of agencies to clients and to each other, and
7. relationship of local government to agencies and extent of its support to human services.

Note that several of the items refer to group attitudes or relationships. Basically, there are three groups involved: clients, agencies, and governments. Each group is made up of individuals; thus, interpersonal relations build into intergroup relationships

which, when nurtured adequately, support strong commitments. It is the extent of this commitment that determines the degree of support during planning and implementation. In Howard County, the high level of commitment saw the coordination process through two traumatic management changes and a vehicle accident causing personal injury to elderly clients.

Examination of intergroup relationships, must begin on the interpersonal level, which requires knowing the identity of all of the people involved. The following list of questions can be used as a guide in evaluating the relationships important to making coordination work:

1. What representative from each agency or group will be involved at each stage?
2. What other agreements, contracts, or program-sharing exist among the people involved?
3. What power, influence, or control does each representative have within the group?
4. What resources are available to each group member?
5. What contribution, formal and informal, can each representative bring to the group?
6. What conflicts exist among members?

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7. What agency philosophies must be upheld by each member?
8. What risks are apparent to members? (E.g., one agency may have a majority of vehicles and feel it has more to "lose" by coordination.)
9. What gains, both personal and in service, might each member anticipate?

This list is by no means complete; however, most ingredients for effective coordination are there. It was evident several times during the evolution of the Urban Rural Transportation Alliance of Howard County, Inc. (URTA) that behavioral understanding, particularly applied skills such as team building, helped to hold the project together when otherwise there might have been total system collapse.

Eight months after URTA operations began, the project manager and administrative assistant resigned, and many management deficiencies were uncovered. Each of the four founding agency directors took active leadership by assuming specific management roles, e.g., fiscal, maintenance, personnel, and administrative management. These interim task assignments and their acceptance were the result of the previously effective group development. Important to that development was the initial inclusion of each agency director in concept and goal development, system design,

and operational planning. This inclusion assured that each member of the group had a personal involvement in the project. Joint responsibility based on individual skills is seen in many successful coordination efforts, particularly team sports. It is well recognized as the single most effective use of many people with a shared goal.

Reliance of each member on the others to handle their own responsibilities also indicates a high level of trust within the group. High trust level is the result of several elements in management of positive group dynamics, e.g.,

- membership is welcomed within the group,
- open information sharing,
- equal attention to each member's concern,
- sensitivity to feelings as well as thoughts,
- satisfactory conflict resolution, and
- respect of members' power, authority, and influence.

These factors encourage positive interpersonal relationships to develop within the group.

Each member of the group then managing URTA had to act simultaneously as URTA liaison to his or her own groups, i.e. the agency boards of directors, staff, and clients. Strong support within the URTA group enabled the members to maintain a

positive attitude within their own agency settings. URTA, as a consolidation of four agencies, risked failure if any one agency withdrew its resources.

This group of agency directors was a content-oriented group with high productivity demands. Nonetheless, good group dynamics stands out as a major factor in meeting task accomplishments. The tasks, daily management of the system, administration of management and fiscal records, and searching for and hiring new administrative staff, were all carried out in addition to administration of their respective agencies — a heavy burden which lasted four and one-half months.

It is necessary to look at the mechanisms which make best use of the environmental and personal factors which have been described. A community coordinator enlists and imparts information, clarifies and elaborates when necessary, summarizes related ideas, and tests repeatedly for consensus. In addition, he or she supports individual and group needs. These needs include personal feelings about identity, power, influence, and position within the group. Recognizing and supporting these personal and group needs strengthen the agencies' relationship within the community.

The more complex the coordination effort, the greater the number of behavioral

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issues to be dealt with. For example, the greater the agency's resources the more it may fear a loss of identity when coordination takes place. This is true whether coordinating actual service delivery, statewide funding, or policies and guidelines.

Anxiety results both from environmental stimuli such as fiscal resources, client needs, governmental regulations, and from personal stimuli like conflict, authority, territorialism. Reduction of the anxiety helps to assure trust and foster commitment, the two most important elements in coordination.

END



A Mass Transit Agency Provides Coordinated Service

David J. Pearl, Deputy Administrator
Brockton Area Transit Authority, Brockton, MA

Although some have questioned the ability of a mass transit agency to provide cost-effective paratransit service, the Brockton Area Transit Authority (BAT) paratransit system, which has been operating almost three years, carries over 12,000 people per month, at an average cost of less than \$2 per trip. Agency charges and general public fares cover over 50 percent of the operating costs, and are supplemented by UMTA Section 5 operating assistance funds and state and local transit subsidies.

The City of Brockton at first contributed 100 percent of the local subsidy to BAT, and the BAT operating policies reflected the city administration's high priority on needs of the elderly and handicapped. When BAT was initiated, buses were routed to stop at the front door of each of Brockton's numerous elderly housing projects. In mid-1976, after only one year of fixed-route operation, a special door-to-door service serving those who had trouble using fixed-route buses was planned.

BAT hoped to meet the limited requirements of UMTA regulations issued in 1976 and also to improve special needs transportation generally. Required by state law to contract with private organizations for the operation of its service, in late 1976 BAT signed a contract with Self-Help, Inc., a local nonprofit human service agency which

operated a transportation program. Under the agreement, Self-Help, Inc. would operate the new DIAL-A-BAT system, and that system would provide transportation to Self-Help programs. BAT quickly established agreements for service with other agencies, and in February 1977, DIAL-A-BAT began operations.

At present, DIAL-A-BAT provides cost-effective door-to-door transportation to clients of over 35 human service agencies and programs as well as to unaffiliated elderly and handicapped people in Brockton. Operating statistics are shown in Table 1.

**TABLE 1
DIAL-A-BAT OPERATING STATISTICS FISCAL YEAR 1979**

	Dial-a-ride	Subscription	Grand Total
Total ridership	30,866	118,934	149,800
Total operating cost	\$156,248	\$131,387	\$287,635
Total revenue	\$ 59,565	\$ 93,090	\$152,655
Total net deficit	\$ 96,683	\$ 38,297	\$134,980
Total vehicle miles	113,951	87,009	200,960
Total vehicle hours	10,477	8,810	19,287
Average speed (mph)	N/A	N/A	10.4
Service efficiency			
Cost/vehicle mile	N/A	N/A	\$ 1.43
Cost/vehicle hour	N/A	N/A	\$14.91
Cost/passenger	\$5.06	\$1.10	\$ 1.92
Revenue/passenger	\$1.93	\$.78	\$ 1.02
Deficit/passenger	\$3.13	\$.32	\$.90
Recovery ratio (revenue cost)	38.1%	70.9%	53.1%
Service effectiveness			
Productivity (passengers/vehicle hour)	2.95	11.00	6.62 ¹

¹Excludes 22,053 subcontracted subscription trips.

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Problems that typically reduce the quality and increase the cost of special needs transportation include service duplication, lack of management expertise, poor vehicle maintenance, inability to obtain insurance at reasonable rates, and incompatible agency service and accounting requirements. Since many of these problems result from the proliferation of programs and providers, theoreticians and practitioners alike call for “coordination” to reduce present inefficiencies. But if coordination is needed, there is no real agreement on how to achieve it. The effectiveness of any approach ranging from cooperation to consolidation depends on the given environment. The savings projected from a plan to integrate all special needs transportation functions within a single agency may be negated by the political improbability of using such an approach.

An analysis of the success in planning and implementing DIAL-A-BAT suggests that “leverage” is the dynamic principle of coordination. In the context of special needs transportation, leverage may be defined as the use of outside transportation resources to increase the productivity of present service, also the resultant increase in service effectiveness. The term “transportation resources” refers to transportation funds, equipment, operating and management expertise, and market share. Rather

than benefitting a single entity, as in finance, leverage here benefits all parties involved in the transaction; it is a mechanism to motivate agencies to participate in coordination schemes which would benefit them by improving service at equal or reduced cost.

Organization

Although DIAL-A-BAT operations are substantially consolidated, the system encompasses several organizations and operational concepts. Operations and maintenance are contracted out, and in some cases the operating contractor serves in a brokerage role, subcontracting trips to private providers.

BAT is responsible for making policy, setting rates and fares, and establishing agreements with participating human service agencies for DIAL-A-BAT service. BAT owns or leases all facilities and equipment used in the operation. Self-Help, Inc., the nonprofit community action agency overseeing a number of human service programs in the Brockton areas, operates DIAL-A-BAT under contract, employing drivers, management, and office staff. Baystate Bus Corporation, operator of BAT’s fixed-route bus service, maintains all DIAL-A-BAT equipment under contract. In accordance with BAT’s labor agreement with the Amalgamated Transit Union (ATU), two of the DIAL-A-BAT vehicles are operated by

ATU drivers employed by Baystate Bus Corporation. Subcontractors have included a private school bus company and a private cab company.

Self-Help, Inc., the DIAL-A-BAT operator, has played a critical role in DIAL-A-BAT’s success, and both BAT and Self-Help have benefited from the dynamics of leveraging. Prior to the organization of DIAL-A-BAT, Self-Help, Inc. had operated the largest agency transportation program in the area. With an existing fleet (albeit old and poorly maintained) and an experienced group of drivers, Self-Help was the ideal contractor for BAT when it initiated dial-a-ride service for the elderly and handicapped. Through the negotiated contract for Self-Help’s operation of DIAL-A-BAT service, both agencies “leveraged” their existing resources: in Self-Help’s case, current expenditures, capital investment, transportation expertise, and an established market; in BAT’s case, capital and operating funds, available maintenance and the storage facilities, management expertise, and office space.

BAT reimburses Self-Help for all expenses incurred in operating DIAL-A-BAT according to BAT’s specifications. The resulting system provides each agency with a better quality of service at a lower unit cost than either could have received from its individual investment. In addition, Self-Help’s

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cash flow has been greatly improved, since BAT advances projected monthly expenses.

Funding

Funding for DIAL-A-BAT operations is fully coordinated: each of the many agencies that use the service, in addition to unaffiliated individuals who are over 60 or handicapped, contributes to offset opera-

ting costs. These contributions cover over 50 percent of the costs, and BAT makes up the difference according to the same deficit funding formula that applies to fixed-route operations, i.e., UMTA Section 5 operating assistance covers up to 50 percent of the deficit, and the remaining amount is split between the city and the state.

Elderly and handicapped users and human service agencies contribute to the

cost of operating the system according to a schedule of rates. The fare for unaffiliated elderly and handicapped people is \$1 for a one-way dial-a-ride trip, and 50¢ for a one-way subscription trip. The riders pay fares in cash as they board the vehicle. Agency clients pay nothing when they ride. Agencies are billed monthly for both DIAL-A-BAT subscription and dial-a-ride service. Subscription service is billed on the basis of hours of service, and dial-a-ride is billed on a per trip basis. Rates for transportation, listed in Table 2, cover about 80 percent of the actual costs.

**TABLE 2
DIAL-A-BAT FARES**

Type of Service	General Public (Elderly and Handicapped, Companions ¹ Nonprofit Agencies)	Publicly Funded Agencies
Dial-a-ride Regular Wheelchair	\$1.00/one-way trip N/A	\$3.50/one-way trip \$7.00/one-way trip
Subscription (6 or more traveling together)	50¢/one-way trip	\$11.50/vehicle hour
Out-of-town service (covers full operating costs)	N/A	\$14.50/vehicle hour

¹Necessary aides ride free.

Agency Participation

The principle of leverage is particularly appropriate to describe how agencies were encouraged to participate in DIAL-A-BAT. Rates were established to assure that current service requirements could be met at or below present program costs. Where agencies had contracted with private providers, new DIAL-A-BAT costs were often substantially lower. Where agencies previously had operated their own service, transportation expenditure levels usually remained constant, but service quality greatly improved. Thirty-seven public and private nonprofit agencies and programs currently use DIAL-A-BAT, including many locally funded programs, as well as many federally sponsored programs.

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DIAL-A-BAT does not provide all human service agency transportation. The Brockton Multi-Service Center, an umbrella agency administering mental health programs, continues to operate most of its own transportation due to requirements of a number of their live-in programs, as well as

state restrictions on the use of their vehicles. Similarly, the large Veterans' Administration Hospital operates its own transportation for group activities. However, certain Multi-Service Center programs do use DIAL-A-BAT, and many individuals living at the VA Hospital pay their own way on DIAL-A-BAT.

DIAL-A-BAT's target market consists of anyone who is over 60, or certified as handicapped. On the basis of these criteria, BAT estimates some 16.2 percent of Brockton's population, or 15,400 people, are eligible to use DIAL-A-BAT. There are no restrictions on trip purpose.

Human service agency clients are transported when the trips are authorized in advance by a participating agency. With the exception of approximately 350 children attending preschool programs, almost all agency clients meet DIAL-A-BAT's own elderly and handicapped eligibility requirements. By providing a substantial amount of dial-a-ride service to agency clients, and by eliminating complex eligibility and trip criteria for general public riders, DIAL-A-BAT increases the density of demand.

To accommodate the various needs of DIAL-A-BAT agencies and programs, DIAL-A-BAT offers two types of shared-ride services within the City of Brockton, both designed to make maximum use of vehicles. Riders are grouped without regard to agency affiliation, but riders with special requirements (e.g., wheelchair users) or groups of riders (e.g., preschool children) are grouped together. All service is door-to-door, and whenever necessary, drivers assist riders from the vehicle to the door.



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Subscription service is provided primarily for the transportation of groups of agency clients to and from regularly scheduled agency programs, such as preschools or nutrition programs for the elderly. Subscription trips are arranged by the agencies through the DIAL-A-BAT office. The client is not directly involved except in the case of trip cancellations. A group of six or more unaffiliated elderly or handicapped people traveling together also may arrange for subscription service. Subscription service operates Monday through Friday between 7 a.m. and 6 p.m.

Dial-a-ride service is available to elderly and handicapped people and to clients of participating agencies whose trips are authorized. Unaffiliated elderly and handicapped people request service by calling DIAL-A-BAT. Clients of participating agencies arrange their trips through their agencies. All requests for service, whether by agency clients or the general public, must be made at least one day in advance. Patrons call the DIAL-A-BAT office to arrange for return trips. These are usually provided within twenty minutes of making the request. Dial-a-ride service operates Monday through Friday, between 8 a.m. and 6 p.m.

Since the city of Brockton is the only source of local funds subsidizing DIAL-A-BAT service, subsidized rates are available

only for the transportation of Brockton residents. DIAL-A-BAT currently provides a limited amount of transportation to agencies for trips outside Brockton at hourly rates that cover the full operating cost. Such service is subject to vehicle availability. Until autumn, 1979, DIAL-A-BAT did not have enough vehicles to meet the agency demand for transportation outside the DIAL-A-BAT service area, and most agencies contracted with private providers.

“An analysis of the success in planning and implementing DIAL-A-BAT suggests that ‘leverage’ is the dynamic principle of coordination.”

Capital Equipment

By virtue of BAT's sponsorship, all participating DIAL-A-BAT agencies leveraged their respective investments by taking advantage of an effective 100 percent subsidy of BAT capital purchases. Under UMTA's Section 3 program, 80 percent of capital costs are reimbursed by the federal government, and retirement of the bonded indebtedness for the remaining 20 percent

is split between the city and state. BAT's ability to purchase safe, new vehicles and equip them with two-way radios to improve security and operating flexibility was a major incentive for Self-Help to support BAT in establishing DIAL-A-BAT.

DIAL-A-BAT's current fleet consists of 21 new vans especially designed and manufactured for transportation for the elderly and handicapped. All are equipped with two-way radios and nine have wheelchair lifts. The lift-equipped vehicles are used primarily in dial-a-ride service, while the other vehicles are used in subscription runs which do not require the lift.

Operating Labor

One of the many barriers to operation of special needs transportation by a mass transit agency is thought to be the prohibitive cost of full-time unionized labor. BAT's precedent-setting Section 13(c) agreement with the local ATU bargaining unit averted the problem for DIAL-A-BAT and as a result, DIAL-A-BAT's labor costs are moderate. Leverage made possible by coordination was the key.

The fact that a substantial portion of DIAL-A-BAT service would be provided to human service agencies established a rationale for using a predominately non-union labor force. This rationale was bolstered by BAT's decision to contract with

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Self-Help for the operation of DIAL-A-BAT. The ATU agreed that work that had previously been performed by nonunion drivers should continue to be performed by those drivers. Since union drivers had been operating two lift-equipped mini-buses that were transferred from BAT's fixed route fleet to DIAL-A-BAT, BAT agreed to a supplementary contract provision stating that at least two paratransit vehicles would be operated by union drivers.

Many of the nonunion drivers employed by Self-Help are mothers who receive public assistance from the Aid to Families with Dependent Children (AFDC) program. Most of the drivers work part-time, allowing them time to take care of their children. In addition to their AFDC support, they receive wages ranging from \$3.50 to \$4.50 per hour. ATU drivers earn over \$7 an hour.

All drivers have received training in first aid, cardio-pulmonary resuscitation, and sensitivity to problems of the elderly and handicapped. Turnover among paratransit drivers has been low and there have been few problems associated with their relations with patrons.

Maintenance and Insurance

BAT's extensive existing investment in fixed-route service provides leverage necessary to greatly reduce maintenance and insurance costs of paratransit.

DIAL-A-BAT vehicles are maintained along with BAT's 46-bus fixed-route fleet by Baystate Bus Corporation in the BAT maintenance facility. BAT reimburses Baystate for direct labor, fringe benefits, and parts costs associated with maintenance of these vehicles, amounting to under \$20,000 in FY 79, or less than 10 percent of total DIAL-A-BAT operating costs. The arrangement also allows bulk wholesale fuel purchases, which further reduce costs.

The transit authority's ownership of DIAL-A-BAT vehicles also allows far lower insurance rates than those which can be obtained by most human service agencies. The present rate is \$1,200 per year for each 13-passenger van.

In summary, leverage characterizes the strategy used to design DIAL-A-BAT, encourage agency participation, and assure efficient operation. BAT took advantage of the Self-Help agency's existing paratransit expertise. Self-Help's transportation infrastructure was strengthened by new equipment, high quality vehicle maintenance, and greatly improved cash flow. Enhanced service and economies of scale greatly increased the attractiveness of DIAL-A-BAT to other human service agencies, and led to the system's rapid acceptance and growth. **END**

Share a Fare Transportation Program

Robert B. Patterson, Director of Special Transit
Kansas City, MO

The city council of Kansas City, Missouri has recognized the need to increase efforts to provide public transportation services. Two common problems associated with public transportation services for the elderly and handicapped are vehicle accessibility on fixed-route transit buses, and prohibitively high passenger costs for special transportation services.

In May 1977, Kansas City implemented a citywide transportation system called "Share A Fare," funded through a city transportation sales tax of one half cent per dollar, earmarked to provide low-cost, door-to-door transportation services for elderly and handicapped residents. The Share A Fare program demonstrates how comprehensive special transportation services can be provided in a cost-effective manner.

Kansas City is located almost in the exact center of the continental United States, and covers a 314 square mile area divided by the Missouri River near the center of the city in almost equal land areas. The population is about 550,000, of whom approximately 60,000 are over the age of 65.

In 1975, the city council approved funding for two systems to provide low-cost transportation services to senior citizens living in various communities where there was a high concentration of people 60 years of age or older. During that year, the Transportation Department prepared a report for

the city manager and city council outlining recommendations and considerations for the development of a citywide demand-responsive transportation system for elderly and disabled residents. The city council adopted a resolution directing the city manager and director of transportation to design specifications and solicit proposals for the implementation of such a plan.

Effective lobbying by the taxicab industry resulted in the approval of a plan in June 1976 to initiate a special transportation system using taxis as the primary transportation mode. In May 1977, the contract negotiations were concluded and the citywide program implemented. At that time, the city had eight licensed taxicab companies holding 543 vehicle permits. Four of the eight companies agreed to participate as service providers, with 168 vehicles available for service. After six months of operation, three other transportation services for the elderly, operated by social service agencies, were absorbed into the citywide system. The city also initiated an employee vanpool program and three ten-passenger vans were purchased and made available for use in the elderly and handicapped program during normal work hours. Use of the city-operated vans for both programs has assured the cost-effective deployment of the vehicles. Wheelchair ramps and tiedown equipment were installed in two of the city vans to ac-

commodate the needs of people confined to wheelchairs.

"Share a Fare service users are permitted their choice of carrier, which creates a healthy competitive climate among the transportation providers to assure a high level of service delivery and performance."

Before the end of the first year of operation, two of the smaller taxicab companies requested termination of their service agreement with the city because their vehicle fleet was not large enough to serve both their regular business and the additional demand for special transportation services. During the second year of operation, the city expanded the service by contracting with a local for-profit transportation carrier specializing in the transportation of disabled and wheelchair-bound people. (An agreement for transportation services with the largest local taxicab operation has been negotiated and is pending final approval by the city; this addition will increase the total vehicle fleet by 25 vehicles.)

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In January 1979, the city entered into an agreement with the state to provide free transportation services to eligible clients of the Division of Family Services, funded through the Title XX Program. Since the inception of this service, the Title XX ridership has grown from 37 to slightly over 1000 passenger trips each month. In addition, the city entered into an agreement with the Area Agency on Aging to provide transportation to sites where the Title III Nutrition Program is being administered.

Service and Management

Share A Fare provides low-cost door-to-door transportation services limited to residents certified as elderly or physically disabled. The "elderly" are people 65 years of age or older; the "physically disabled" are people 15 years of age or older who require the use of a cane, crutches, walker, wheelchair, or other mechanical aids to assist their personal mobility.

Service is provided six days a week, excluding Sunday, between the hours of 8:00 a.m. and 5:00 p.m. Travel reservations must be requested a day in advance by telephoning City Hall. A one-way trip up to four miles costs the user 50¢; a trip exceeding four miles incurs an additional, but reduced, fare based upon travel rates established through a zone fare schedule.

The city coordinates and contracts transportation services with six transportation providers. Three of the carriers are classified as nonprofit social service agencies, and three are classified as for-profit transportation carriers. In addition, the city operates a fleet of four vans. Share A Fare service users are permitted their choice of carrier, which creates a healthy competitive climate among the transportation providers to assure a high level of service delivery and performance.

Potential service users may request registration for transportation service through approximately twenty community organizations designated as certifying agencies, or through direct request to the city. Required documentation for service eligibility is limited to proof of age or physical disability. Eligible people are issued a laminated plastic identification card with 25 nontransferable travel tickets monthly. The travel tickets are then used as a voucher for reimbursement of transportation service by the contract carriers.

The system serves over 15,000 individuals, and a computer system accepts and stores user registration data and prints user identification cards and travel tickets. In addition, the system maintains daily travel requests for each transportation provider. Off-site, on-line computer terminals are made available to transportation service

providers to facilitate immediate receipt of travel requests, thus providing sufficient time for the carriers to schedule passenger trips. Transportation providers who receive only a small number of travel requests daily, get their trip request information via telephone at the end of the work day from special transit dispatch.

Providers submit monthly billings, along with passenger travel tickets collected by the providers during the reporting period, to the city for reimbursement. The travel tickets represent a fairly good audit trail, in that each ticket has an identifying number which corresponds to the passenger's identification number for verification purposes.

The special Transit Office within the city Transportation Department is responsible for the brokerage functions and contracts and coordinates the services of the six provider organizations. Open and direct communication between the city and the contract carriers has resulted in an atmosphere of mutual understanding and cooperation. The providers have developed an information forum for exchanging ideas and techniques to improve the system. Using both profitmaking and nonprofit carriers has increased the effectiveness of the system as a whole and the effectiveness of each operator. The social service agency providers have increased their ability to integrate

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sound business practices with the commitment to provide needed social services. Conversely, the for-profit organizations have exhibited an increased sensitivity toward the special client group served, thus improving the effectiveness of their public relations.

Management flexibility is a key ingredient in meeting the changing demands expressed by the provider organizations and the system users. There is some disparity between the providers and the users with regard to cost concerns. The providers are concerned with a break-even or small profit margin guarantee, whereas the users are concerned with an affordable means of transportation. The concerns of both groups have been addressed through legislative changes implemented in the city taxicab regulations, which now permit ridesharing in taxis operated for the elderly and handicapped. The user subsidy is provided to reduce their fares and is calculated from a zone fare system acceptable to both groups.

Service Monitoring

The effectiveness and degree of acceptance of the service by elderly and handicapped participants are determined through several monitoring techniques. An annual user opinion survey is conducted by an independent consultant, and is consid-

ered an invaluable tool in determining the degree of program awareness and the level of service satisfaction of users and potential users. The results of the survey serve as an excellent index in identifying service deficiencies and as an aid in planning service improvements.

The user survey is augmented by an ongoing citizen participation redress program which is administered by another city department. Numerous suggestions and inquiries are generated through this mechanism. Most inquiries are addressed within ten days of receipt; however, a large number of the suggestions for improvements are reviewed for longer periods of time to determine their compatibility with existing service parameters. The staff is represented on a citizen advisory committee for special transportation and also attends community meetings sponsored by handicapped and senior citizen organizations. Through these activities the staff gains information about the concerns of the residents.

Cost

The system in Kansas City is anchored to a solid funding mechanism through the public mass transportation sales tax authorized by the state legislature. The estimated revenue expected from the sales tax for Fiscal Year 1979-80 is \$15 million, and the

legislation provides that up to five percent of the total revenue collected may be used for "motor pool operations," or, as defined in the legislation, transportation services designed to meet the special transportation needs of the elderly, handicapped, or people with low incomes. Therefore, with council approval, up to \$750,000 in funding for the program is available from the transportation sales tax. It is estimated that the projected 1979-80 costs will be about \$338,000 to provide 130,000 passenger trips, or an estimated average cost per non-lift passenger trip of \$2.87. The average cost for a lift-equipped passenger trip is estimated at \$4.35. The total operating budget for the 1979-80 fiscal year is \$424,650; the total budget for administrative expenses only \$88,603. In September 1979, a new contract was negotiated with carriers of the system that provides for user subsidies of \$2.35 per passenger for nonlift trips, and a flat rate of \$14.00 per hour of operation for ramp and lift-equipped vehicles.

Besides expansion of service, several positive economic effects have resulted from the Share A Fare program. These include increased revenues for taxi operators and social service agency providers; an increase in employment opportunities for elderly and disabled people, and finally, an increase in sales volume reported by local retail establishments.

END

Special Transportation in Two Texas Cities

Thomas Urbanik II, Assistant Research Engineer
Texas Transportation Institute
Texas A&M University, College Station, TX

Specialized services for the elderly and the handicapped in two Texas cities, El Paso and Lubbock, were investigated.

El Paso

In 1978, the population of the El Paso metropolitan area was approximately 425,000, and the city covered an area of 159.5 square miles. There was a relatively low percentage (5.7) of residents age 65 or older and a relatively low percentage (4) of residents aged 18 to 64 with work disabilities. In 1970, the median family income was \$7,983, also relatively low. Approximately 57 percent of the city residents had a Spanish surname.

Public transportation is provided principally by the city through the Sun City Area Transit system (SCAT). In 1978, SCAT carried 8.7 million passengers, and in the same year instituted a demand-responsive system called HandySCAT, for handicapped people unable to use conventional public transportation.

Two other systems were studied: the City-County Nutritional Project and Project Bravo. The City-County Nutritional Project is a program funded by HEW under Title VII of the Older Americans Act of 1965, as amended. Project Bravo provides transportation in support of its Community Services Administration programs and as a

contractor for Medicaid transportation for the Department of Human Resources.

HandySCAT. HandySCAT is a special transportation service for the physically disabled of El Paso offered jointly by SCAT and the area chapter of the American Red Cross. The system uses seven 10-passenger buses equipped with hydraulic lifts and wheelchair tiedowns in a 24-hour advance call demand-responsive service. The service uses volunteer drivers supervised by a paid Red Cross staff. No fare is charged, as required by Red Cross policy. The service operates Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. within the city limits of El Paso.

In order to qualify for the service a person must be certified by a personal physician or qualified social service agency using eligibility guidelines determined with the assistance of the HandySCAT Advisory Committee. No limitations with regard to income or institutional requirements are placed on participation in the program. However, in the event of excessive demand, the following priorities are observed:

1. nonemergency medical and work trips,
2. education and rehabilitation trips,
3. personal business trips, and
4. shopping, recreation, and other trips.

Practically all of the daily operation is performed by Red Cross except maintenance, which is provided by SCAT. Driver assignments for the following day are made in the late afternoon along with rider information including name, address, destination, appointment time, disability, and type of trip. The driver records actual trip times and mileage. Information is summarized monthly.

“...taxi service is not a direct substitute for special services to the handicapped.”

Table 1 summarizes HandySCAT ridership statistics for 16 months of operation. Table 2 estimates the average total monthly cost for the 15 months from February 1978 to April 1979, and includes costs for the value of contributed services and straight-line depreciation of the vehicles over their estimated four-year life. The average cost per passenger was \$10.14. When contributed services were deducted from total costs, the cost per passenger was \$5.78.

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**TABLE 1
HANDYSCAT RIDERSHIP STATISTICS**

	1978												1979				Total (16 months)
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	
Elderly Number of handicapped passengers	49	369	545	538	471	417	388	520	511	410	516	504	697	639	812	741	8,027
Nonelderly Number of handicapped passengers	281	506	725	704	749	822	825	991	1,029	1,000	871	782	925	1,098	1,126	927	13,361
Total number of elderly and nonelderly handicapped passengers	330	875	1,270	1,242	1,220	1,213	1,511	1,540	1,540	1,410	1,387	1,622	1,622	1,737	1,938	1,668	21,488
Number of nonambulatory passengers	88	272	394	325	219	283	436	481	481	420	359	274	278	393	367	340	5,228
Percent of total number of passengers	27%	31%	31%	26%	18%	23%	29%	31%	31%	29%	26%	21%	17%	23%	19%	20%	24%

Source: City of El Paso, Texas (1979).

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Costs of HandySCAT and taxis were compared. Taxis had an average cost of approximately \$3.88 per passenger, compared with a total HandySCAT cost of \$10.14 per passenger. The cost per passenger without the cost of the contributed services was approximately \$5.78. However, taxi service cannot be considered a direct substitute for the type of service being provided by HandySCAT.

HandySCAT's productivity varied from nearly zero to more than three passenger trips per vehicle hour on one day of observation. The average for the three vehicles surveyed was two passengers per hour. The overall system productivity was estimated to be 1.6, assuming five vehicles operating eight hours per day and 22 days per month. Further analysis of alternative configurations, including taxi operation, as well as ways to improve the efficiency of the present operation, appears to be warranted.

Project Bravo. Project Bravo is El Paso's Community Action Agency. It is also the Department of Human Resources contractor for Medicaid transportation. The service is a 24-hour advance call demand-responsive service, with seven 11-passenger vans, none of which is lift-equipped. Disabled clients are referred to HandySCAT. The service is available

TABLE 2
COST ESTIMATES FOR HANDYSCAT
(For an average operating month)

Transportation Costs	Subtotals	Totals
5 bus drivers @ \$752 per month ¹	\$3,760.00	
Salary benefits 14% of \$3,760	526.40	
Depreciation of vehicles (7 vehicles @ \$216.67)	1,516.69	
Operating and maintenance costs		
Maintenance and repairs	\$1,093.78	
Fuel and oil	1,202.20	
SCAT-other operations	351.72	
Advertising and printing	584.97	
Vehicle storage (SCAT)	96.15	
Other	302.55	
	\$3,631.37	
Red Cross insurance for vehicles and drivers	923.00	
Radio lease for 2 years @ \$3,675/2 yrs.	153.13	
Radio antenna rental @ \$1,210.80/year	100.90	
		\$10,611.47
¹ Estimated cost for contributed services		
Sources: 1) <i>HandySCAT-The First Year-1978</i> , City of El Paso, April 1979		
2) Monthly reporting form for private nonprofit organization receiving 16(b) (2) UMTA funds		
3) HandySCAT budgets for 1977-1979 provided by El Paso American Red Cross		

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**TABLE 2
COST ESTIMATES FOR HANDYSCAT (Continued)**

(For an average operating month)

Transportation Costs	Subtotals	Totals
Administrative Costs		
Personnel		
Salary for transportation director @ \$11,760/year	\$ 980.00	
Fringe benefits 18% of \$980	176.40	
Salary for office manager @ \$8,900/year	695.50	
Fringe benefits 18% of \$695.50	125.19	
Volunteer coordinator 1/2 time @ \$4,400/year	366.66	
Fringe benefits 14% of \$366.66	51.33	
Bookkeeper @ \$1,200/year ¹	100.00	
Fringe benefits 14% of \$100 ¹	14.00	
Salary for dispatcher @ \$7,800/year ¹	650.00	
Fringe benefits 14% of \$650 ¹	91.00	
		\$ 3,250.09
Office Operation Expenses		
Telephone and utilities	\$ 241.66	
Postage	41.66	
Supplies	33.33	
Travel and training	54.17	
Office space	50.00	
		420.82
	Total with contributed services	\$14,292.38
	Total without contributed services	\$ 8,131.83

Monday through Friday from 7:00 a.m. until 5:00 p.m. The operation consists of a supervisor, a clerk, a van driver/clerk, and six drivers. All vehicles are radio-equipped.

The cost for providing service in an average month was approximately \$8400. Operating statistics are summarized in Table 3. The cost per passenger was \$6.00 based on an average of 1396 one-way passenger trips. Total vehicle miles per trip average 6.93, significantly less than the 10.3 total vehicle miles for HandySCAT. Average productivity was estimated at 1.3 passengers per vehicle hour. There was insufficient data to make a reliable comparison with taxi costs; however, it appears that Project Bravo warrants an examination of alternatives, as was suggested for HandySCAT.

City-County Nutrition Project. The City-County Nutrition Project was established in 1973 for people aged 60 or older. It provides transportation to 11 senior citizen centers within the county. Lunch is provided at the centers, and some lunches are delivered to homes. Transportation service is provided by four 55-passenger buses and nineteen 12-passenger buses.

The county is divided into areas based on the location of senior centers. The centers provide the drivers with a list of pickups for the entire week. The driver selects the

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**TABLE 3
OPERATING COST STATISTICS FOR PROJECT BRAVO
FOR THE PERIOD BETWEEN JANUARY 1979 - APRIL 1979**

Month	Operating Cost (\$)	Total Clients	Total Passenger Trips	Total Miles	Cost Per Client (\$)	Cost Per Passenger Trip (\$)	Cost Per Vehicle-Mile (\$)	Vehicle-Mile Trip
Jan.	8392.98	845	1534	10,235	9.93	5.47	0.82	6.67
Feb.	8392.98	826	1427	9,717	10.16	5.88	0.86	6.81
Mar.	8392.98	838	1419	10,223	10.02	5.91	0.82	7.20
Apr.	8392.98	660	1204	8,498	12.72	6.97	0.99	7.05
Average	8392.98	792	1396	9,668.3	10.59	6.01	0.87	6.93

Operating cost includes vehicle depreciation.

route to follow in picking up passengers; several vehicle trips are necessary to meet the demand in some cases. The many origins and single destination of the passengers make this operation inherently more efficient than the "many-to-many" type operation more typical of the other two El Paso systems. However, the use of a weekly schedule appears to result in an abnormally high number of "no shows."

From the limited amount of data collected from the projects, there appeared to be little compatibility with the other two operations. Productivity was in excess of eight passengers per vehicle hour, but there was some slack time during the

middle of the day while seniors were at the centers.

Lubbock

In 1976, the Lubbock metropolitan area had a population of approximately 200,000 living in an area of 83.8 square miles. The percentage of people aged 65 and older (6.0) and of people with a work disability (4.1) was relatively low compared with other U.S. cities. The 1970 median family income was \$8464, and more than 13 percent of the families had an income below the poverty level.

Citibus, Lubbock's transit system, transported approximately 2.3 million pas-

sengers in 1978. The city owned 25 twenty-one passenger vehicles and 17 larger transit buses. The bus system is operated by Lubbock Transit, a subsidiary of American Transit Corporation under the administration of the Lubbock Transit Department. The 1978 operating expenses were approximately \$993,000. It was estimated that three percent of the city residents were handicapped and 21 percent of these were semiambulatory or nonambulatory.

Citizens for Improved Transportation. In 1976, Citizens for Improved Transportation (CFIT) was organized with the goal of providing coordinated transportation for the elderly and handicapped. CFIT's vehicles include two buses (24- and 28-passenger), three vans, and one lift-equipped van. In addition, CFIT provides scheduling and dispatching of the Citibus lift-equipped bus. Both lift-equipped vehicles respond to a 24-hour advance call. The vehicles operate in prescheduled semifixed-route service principally for the city's Title VII nutrition program. CFIT also provides a limited number of trips to several other agencies.

CFIT unit costs are shown in Table 4. The cost per passenger was approximately \$4.06; the cost for the lift service was \$11.04 per passenger, while the cost for the semifixed-route service was \$2.94 per passenger.

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**TABLE 4
SUMMARY OF CFIT'S OPERATING STATISTICS FOR
THE MONTH OF APRIL 1979**

Type of Operation	Total Cost	Vehicle Miles	Passenger Trips	Cost Per Vehicle-Mile	Cost Per Passenger-Trip	Vehicle-Miles/Passenger-trip
Centers and special trips	\$5299	3889	1800	\$1.36	\$ 2.94	2.16
Handibus and lift van	\$3203	2164	290	\$1.48	\$11.04	7.46
Total system	\$8502	6053	2090	\$1.40	\$ 4.06	2.90

These costs can be compared with current taxi fares. Effective May 1, 1979, the Lubbock taxi fare was \$1.00 plus 70¢ per mile plus 25¢ for each additional passenger. The cost per trip averaged \$3.92, and cost per passenger, \$2.61. Again, it must be noted that taxi service is not a direct substitute for special services for the handicapped.

The Department of Human Resources also uses taxis to provide Medicaid transportation in Lubbock. The cost per passenger trip was \$3.00. Based on a one-month sample of the data, the average number of people per trip was 1.17; the average length of the trip was 4.2 miles.

Evaluation

Although the scope of the case studies was limited, it appears that there would be potential benefits from coordinating the various services. There were sizable differences in cost among the different types of transportation.

The number of nonambulatory people was a relatively small percentage of the total. According to the National Survey of the Transportation Handicapped by Grey Advertising, only 5.5 percent of people without transportation use wheelchairs. It is, therefore, reasonable to conclude that only a small percentage of people cannot use taxicabs as a means of transportation. Estimates of the potential savings by using

taxicabs are limited due to the lack of separate operating statistics for nonambulatory clients. However, the total monthly HandySCAT cost averaged \$14,300 per month. If all trips could be handled by taxi, the cost would be approximately \$5,500. The difference, \$8,800, would be available to cover excess costs of nonambulatory service.

Computation of the data for Lubbock's CFIT yielded \$11.04 as the cost per passenger for the two lift-equipped buses as contrasted with \$2.61 for taxi fare. The difference in cost is approximately \$3200 per month. However, if new vehicles appropriate for carrying wheelchairs were purchased, it is estimated that with amortization, taxi service would cost approximately \$18 per hour, which is more costly than the present operation. **END**

Brokerage in Houston

David Warren, Paratransit Program Manager
Metropolitan Transit Authority, Houston, TX

Service Description

Metrolift is a special paratransit service in Houston for those who are unable to ride conventional transit buses due to disability, or who are clients sponsored for agency trips. The service is provided by specially equipped vans which carry disabled people who are ambulatory as well as those confined to wheelchairs. The service area covers approximately 300 square miles with a total population of roughly one million. The service provides curb-to-curb transportation; drivers provide boarding assistance to the rider if necessary. Attendants accompanying patrons do not have to pay a fare.

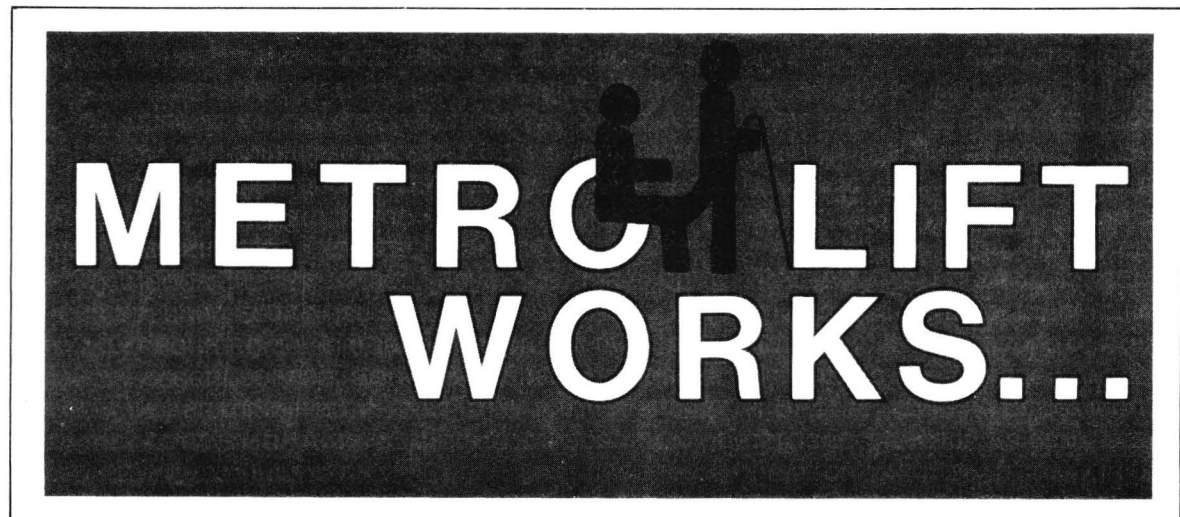
Metrolift currently uses 21 vans. Fifty percent of this fleet is radio-dispatched, the rest are prescheduled by vehicle manifests. The Houston Metropolitan Transit Authority (MTA) contracts with private companies as well as nonprofit agencies to provide transportation and routing and scheduling. In order to increase trip densities and reduce unit trip costs, Metrolift contracts with various human service agencies. By pooling the funds from many fragmented transportation programs, Metrolift creates efficiencies through economy of scale.

MTA has assumed the responsibility and related developmental costs for creating and refining this paratransit brokerage program. Although presently MTA is subsidizing all trips regardless of program, ul-

imately many of these programs will pay their own way. When the agency involved serves people who are handicapped and therefore eligible for Metrolift under MTA criteria, a "fair-share" cost is negotiated with the agency based upon trip characteristics. As the unit cost of Metrolift trips continues to drop, it is expected that the cost will be borne by the agency with no MTA subsidy.

Individuals call the Metrolift office, at which time the intake clerk attempts to determine the services for which the caller may be eligible. For example, if callers are Medicaid recipients, they are referred to

Medicaid for appropriate screening. If the same caller wants to go shopping and has a disability that prevents him from riding the regular bus, the Metrolift clerk conducts the screening according to MTA handicap criteria. If the individual is eligible, a permanent eligibility form along with a ticket order form is mailed to him. Upon receipt of this material, the individual completes both forms, encloses a check or money order payable to Metrolift for the desired number of tickets, and returns it by mail to the Metrolift office. Once payment is received, the tickets are mailed to the patron.



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Tickets are 50¢ each. Trips under four miles require only one ticket. Users must call the Routing and Scheduling office by 4:00 p.m. on the day before service is desired. Subscription trips, i.e., same trip, three or more times per week, need to be requested only once. Riders are strongly encouraged to notify Routing and Scheduling of any changes in their trip plans to facilitate efficient and timely service delivery.

Each agency funding transportation for its clients controls the disbursement of its own transportation resource. If the client calls the Routing and Scheduling office directly for service, the agency provides tickets which are used as documentation of the trip. If the agency calls to request service for clients, no tickets are required. No cash is handled by the driver.

Billing Procedure

A key issue in a coordinated arrangement for special transportation services is billing. A good billing procedure must 1) be simple and take minimal driver and processing time; 2) demonstrate fiscal responsibility; and 3) provide and demonstrate equity for participants, both providers and funders of transportation.

In addition, it is essential to demonstrate to participating agencies any efficiencies the system as a whole is providing

them. The key to efficiency in a coordinated transportation program lies in the ability to increase trip densities, thus increasing shared rides. Under the Metrolift billing system, ridesharing is accomplished in two ways. First, requests for service can be restricted by the funding agency to specific times or to specific areas by so instructing



the Routing and Scheduling office, thus forcing rides into specific "time windows." Secondly, by pooling their overall demand with other agencies, programs can increase trip densities under Metrolift as a whole.

Since most of the costs associated with the program are time-related, Metrolift allocates costs based on passenger time. Even so, some programs have a higher vehicle use simply by the nature of the trip. For example, senior nutrition transportation is

more cost-effective than Medicaid service. To reflect this difference, the most cost-effective shared rides are given a discount. Shared rides where there are two or more riders with the same origin and destination in any given program are also discounted as well. The discount procedure assumes that the marginal cost of each rider after the first one in a shared mode is 20 percent of the initial cost. Otherwise, the passenger time billed to the agency is simply the actual passenger time for the trip.

At the end of the billing period, each program is billed on the basis of its share of billable passenger time as a percentage of total billable passenger time carried by Metrolift. These percentages are applied to the actual cost of operating the service to get the dollar amount each agency owes. Although MTA has assumed the cost of routing and scheduling as a developmental expense, this will be added as a direct cost by April, 1980.

It quickly became apparent that many agencies could not accommodate the fluctuating unit cost that the above procedure might create. To respond to this concern, a ceiling price was set in the funding contracts, and the maximum unit price per passenger that can be charged to the agency is now clear.

For the first five months, record-keeping was done manually, but this be-

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came extremely burdensome, and this function has since been automated. This has enabled some cross-tabulations that before had been too time-consuming, and also it has freed the staff to focus on other operational issues and problems.

Pricing

The problem of pricing service for the Metrolift program was not anticipated in the early planning. The assumption had been made that agencies would naturally accept the premise that a coordinated program underwritten by MTA would save them money.

The first rate established was with the Texas Department of Human Resources for Title XIX Medicaid transportation. Because the contract was already held by one of the participating Metrolift providers who wanted to cooperate in the development of the program, Metrolift became a subcontractor to this Medicaid provider. To stay within the contract limits, a price of \$5 per one-way trip was calculated as the maximum the prime contractor could accept and still cover the overhead.

The next contract dealt with the Center for the Retarded, Inc., (CRI) a nonprofit agency which wanted MTA to serve its school trips. The agency had no line item for transportation in its budget but was simply reimbursed \$24 per day per student for all

services. Prior to Metrolift, it had been paying as much as \$18 per day to get some of its wheelchair-bound students to school. Realizing they had little money and a great need, and that, by definition, every one of their students was eligible, Metrolift negotiated a ceiling price of \$2 per ride. This

yields \$1 to \$1.50 more revenue per trip than if these riders were under MTA's program, and it saves CRI a great deal of money.

The natural tendency of agencies to divert clients to Metrolift for agency-related trips is limited in several ways. First, MTA's

METROLIFT ELIGIBILITY CARD

Name _____
(Last) (First) (Middle)

Address _____

City _____ State _____ Zip _____ Phone _____

1. Can you use the present bus system? Yes _____ No _____

2. Do you ever use other Social Service Agencies for your transportation needs?
Yes _____ No _____

if yes, please answer the following

What agency? _____

What type of trip(s)? _____

3. What is your greatest need for transportation?

a. Employment _____

d. Recreational _____

b. Shopping _____

e. Other _____

c. Medical _____

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program will not accept requests from an agency to transport clients unless that agency is under contract with Metrolift. Since many agencies cannot give money directly to their clients, this precludes them from using Metrolift except under contract terms.

The current price ceilings will be reviewed in light of the data gathered in actual operations. Each additional provider, or change in Metrolift service, will have an impact on every participant's unit cost, and during the expansion period the exact charges will be difficult to predict.

Contracts

Routing and scheduling, provision of transportation services, and funders' purchase of services are all secured and arranged through three sets of contracts. These contracts have evolved over time and have changed with every new one that has been written. The key is to have a basic agreement from which to work.

The routing and scheduling contract ties the providers and funders together, and outlines point by point each concern that has to be covered in an effective scheduling operation.

Provider contracts and funder contracts are form documents that are modified to accommodate the specific or special needs of each contractor. Experience has shown that the document is not so important as the process for arriving at it. The negotiations with multiple contractors raised many issues that had not been considered in the initial stages of planning. Even so, actual operating experience created situations that had been overlooked, but for the most part these too were accommodated by the general provisions of the contracts.

Contract monitoring is critical, and if there has been a weakness in Metrolift, it has been here. Although it is a time-consuming and costly task, strict monitoring is essential.

4. How many local one-way trips per week do you take? _____
5. What bus route is nearest to your home? _____
6. How far away from your home is the nearest bus stop? _____
7. What problems would make it difficult for you to use the present system?
8. What is your disability? _____
9. What is the degree of your disability? Slight ___ Moderate ___ Severe ___
10. Are you confined to a wheel chair? Yes _____ No _____
11. Are you over 60? Yes _____ No _____

Date _____

Signature _____



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There are several specific concerns that are resolved through the contract mechanism, insurance being one of the most crucial. The provider of actual transportation services bears the primary exposure and therefore the primary coverage. Initially, MTA asked for automobile liability insurance coverage of \$250,000 per person, \$500,000 per occurrence for bodily injury, with umbrella catastrophe of \$1,000,000. This was reduced to \$100,000 and \$300,000 after the MTA's liability exposure was limited to this level by state law. To date, there have been no claims filed to test either the indemnification or the exposure limitation of MTA.

Of course, the standard provisions were made for all such functions as billing, amending, terminating and other such routine contract issues. Although the contract serves as the medium to get things done, without open communication and sincere cooperation between the contracting parties, the contract alone would not have been sufficient to develop the program.

Politics and Bureaucratic Conflicts

Initially, Metrolift was designed from the pure perspective of planning. The promise of economies of scale through coordination and central dispatch were naively perceived as sufficient to sell the program to the

various agencies in the program. However, the politics and bureaucracy within agencies were quickly recognized as issues in the complex chore of implementation. Although these elements did not present insurmountable barriers, they did tend to frustrate those implementing the brokerage program.

“The key is to set a goal . . . take advantage of the opportunities that arise . . . After that, common sense and good lawyers can finish the job.”

The primary reason these frustrations did not stymie the effort was because the initial approach included so many different agencies. When politics or bureaucratic considerations created barriers, they were either overcome, or pursuit of that agency was shelved, and discussions were shifted to other interested parties. During this

process, the staff managed to plant the brokerage concept in the minds of key agency people. Although it was not known at the time, these “seeds” were the most important part of the early developmental work. This phase of implementation was highly visible, and a great deal of time was spent explaining the more salient aspects of brokerage. Although it often seemed that nothing was coming from this effort, in the first six months of the actual operations, five major public agencies approached MTA and have since contracted with Metrolift.

The procurement process in the public sector is generally done through a Request for Proposal (RFP), i.e., a request for bids. In the case of the Title III Nutrition Program administered by the local Area Agency on Aging (AAA), this RFP was oriented to a nonprofit social service agency interested in providing a nutrition program with transportation as the linking component. The proposal required a 10 percent match by the contractor in the first year, and escalated to 30 percent by the third year. Metrolift accommodated this requirement by assuring the AAA that at least 10 percent of the cost of its trips would be subsidized by MTA. As the unit costs are lowered because of efficiency, the subsidy will decrease. In future years, MTA plans to work with the AAA to change not only the match requirement, but its whole procurement process.

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Medicaid also uses the RFP system, and even though it is a more sophisticated document than the AAA's, MTA's experience with this procurement mechanism illustrates a basic conflict between the RFP process and brokerage. The Texas Department of Human Resources competently administers the court-ordered Medicaid transportation program, and is very thorough in urging all potential contractors to respond to the RFP in order to build competition. However, in this case, Metrolift was forced to bid in competition with its own service contractors. If another contractor had won the bid, it would have inhibited the brokerage effort. Such rigid procurement policies put both the broker and the other operators contracting with the broker in an awkward position.

To develop brokerage it is important to identify the individuals within agencies who can be most effective in forwarding the concept in that organization. Although Metrolift had its origin in an ad hoc transportation committee, very few of the key agency people served on that committee. In order to develop the brokerage concept, the appropriate decision-maker has to be convinced. It is normally assumed that these people will be found at the administrative top of the agency, but this is not always the case. It is not only necessary to identify and then sell the idea of brokerage to the key

person, but also to understand the administrative process within the agency.

The broker is the link among the funder, the provider, and the routing and scheduling component. This role need not rest with the area transit authority, but the advantages in doing so are several. For example, MTA had the resources to commit a substantial amount of local money to develop Metrolift. In addition, transportation resources beyond the curb-to-curb services offered by its contracted fleet can be coordinated easily with the fixed-route system. Finally, MTA does not threaten nonprofit agencies politically, nor does it threaten the taxi industry. Therefore, it can serve to link the special needs of the human service programs to the efficiency of the profit-making transportation sector.

In the final analysis, the brokerage approach will never work the same way twice. The key factors found in all applications of this approach are people and politics, neither of which is consistent. The key is to set a goal, then take advantage of the opportunities that arise, all the while being conscious of the fact that most opportunities require the appropriate groundwork. After that, common sense and good lawyers can finish the job.

END

The ACCESS System

Ervin S. Roszner, Manager, Project Office, ACCESS Transportation Systems, Inc.
Thomas V. Letky, Manager, Elderly and Handicapped Services
William W. Millar, Special Assistant to the Director
Port Authority of Allegheny County, Pittsburgh, PA

ACCESS is a door-to-door, advance reservation, shared-ride transportation service for elderly and handicapped people in Allegheny County, Pennsylvania. It is sponsored by the Port Authority of Allegheny County (PAT) and funded by a demonstration grant from UMTA under the Service and Methods Demonstration program. ACCESS services are managed by a broker, ACCESS Transportation Systems, Inc., who is charged with the responsibilities of organizing and managing service delivery, and of coordinating the demands of individuals and agencies for this service.

ACCESS was designed to fulfill four major objectives. First, it was intended to provide an alternative means of transportation to elderly and handicapped people who are not physically able to use the fixed-route PAT transit services. Door-to-door service is the only practical way to transport most nonambulatory and many semiambulatory people, particularly in the Pittsburgh area, which has steep hills. Second, it has tried to provide a uniformly high quality service available throughout the county. Since it is centrally managed, ACCESS has power to enforce service standards and to resolve problems. Third, it set up a framework for aggregating the demands of various social service agencies. Through central coordination, transportation services can be scheduled more efficiently, with less duplication,

and at lower cost. Fourth, it sought to reduce costs to elderly and handicapped riders by promoting ridesharing, and by offering an alternative to paying exclusive-ride taxi rates. In addition, it provided the mechanism for passing through user subsidies, such as the one offered by PAT to non-ambulatory patrons.

The Service

ACCESS transportation services are provided through the use of vehicles operated by private carriers, including taxi companies and nonprofit agencies, under con-

ACCESS provides transportation to elderly and handicapped people who are not physically able to use the fixed-route service.



tract to ACCESS Transportation Systems, Inc. These carriers, of which there are now eight, are responsible to the broker for providing service and meeting service standards as specified in their ACCESS contracts. The broker, in turn, pays for service delivered on the basis of a negotiated hourly rate or on the basis of the metered fare.

ACCESS carriers were selected on the basis of their capability and interest in serving the specialized transportation market. Each carrier's responsibilities are clearly delineated, in geographic terms, and in terms of the type of service offered, so that there is no conflict between carriers, particularly between taxi companies and nonprofit agencies.

ACCESS offers service from 6:30 a.m. to 10:30 p.m., Monday through Saturday, including holidays. The service is available throughout Allegheny County, which covers 729 square miles. There are virtually no constraints on the number or type of trips an individual or agency can request.

Trip requests must be made by 3:00 p.m. on the weekday preceding the trip. Exceptions are made in the case of emergencies, but ACCESS is not intended to provide emergency medical transportation.

ACCESS requires that most trips be scheduled directly with its carriers and that dispatching be entirely the responsibility of

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the carriers. The ACCESS carrier network is linked by a Bell Telephone Centrex system, which requires the users to remember only one number. Calls are transferred easily among carriers, and between carriers and the ACCESS office, and also are forwarded automatically both within the system and to numbers outside the system.

The ACCESS system has a zone-based fare schedule which subdivides the county into 195 zones and computes fares on the basis of airline distance between the center of the zones. Current fares amount to a minimum charge of \$1.50 and a charge of \$1 per airline mile for trips between zones. A standard zone map and fare schedule allow users to determine their fare in advance of a trip. Agencies which schedule trips through ACCESS for their clients are also charged on the basis of this fare structure. In addition, ACCESS offers special group rates for trips arranged by agencies or private parties.

A special feature of the ACCESS system is the opportunity for nonambulatory people to travel at reduced cost. For people unable to use transit buses, the Port Authority provides financial assistance to cover 75 percent of the purchase price of scrip used on the ACCESS system. As a result of this subsidy, the amount paid by the user for each trip is comparable to a similar trip by

bus. Eligibility for this subsidy is based on certification by ACCESS.

The ACCESS system allows payment for service in one of two ways. Individuals may buy scrip tickets by mail from ACCESS, and give the tickets to the driver. The Port Authority's user subsidy is administered by selling these scrip tickets at 25 percent of face value to eligible users, and invoicing PAT for the remainder. Or, agencies may set up billing accounts with ACCESS for trips arranged by agency staff. Trips are then

Applicants for the PAT 75 percent fare subsidy are certified in a simple interview conducted by a physical therapist. A mock-up of a PAT bus entrance is provided and those who are able to climb the steps are not certified.



documented and billed to the agency at the end of the month.

Ridership and Trip Characteristics

Over the first seven months of operation, ridership increased sharply until by September 1979, ridership totaled 4,900 passenger-trips per month. Of these trips, 3,600 were made by individuals using scrip, while 1,300 were billed to agencies. With the current rate of growth, the percentage of all trips billed to third parties could reach 65 to 70 percent.

“Drivers are ‘handicapped’ with blindfolds, crutches, or wheelchairs, and then required to negotiate an obstacle course, to go out on a downtown street, and to board and ride a van.”

A total of about 4,300 trips in September were by individuals who were not able to use the fixed-route services provided by PAT. This included about 1,700 trips which were taken by people using wheelchairs. Of the total, 3,200 trips were subsidized by PAT, while 1,100 were sponsored by agencies.

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Trips tend to be concentrated in two daily peaks, with 33 percent of trips in the 6:30 a.m. to 9:00 a.m. period and 28 percent in the 1:30 p.m. to 4:00 p.m. period. As can be expected from this distribution, a substantial percentage of the trips are for work or school. It is estimated that 32 percent of trips are taken primarily for educational purposes, 30 percent to paid employment or other work-related activities, 21 percent are taken for medical reasons, and 17 percent are taken for social and recreational reasons.

Quality of Service

ACCESS has made available high quality transportation service for elderly and handicapped people throughout Allegheny County. Efforts were undertaken to increase insurance protection, improve driver training, sponsor comprehensive inspection, improve service reliability, and encourage consumer advocacy.

In conjunction with increased insurance coverage, ACCESS supervised a half-day driver training program which all regular ACCESS drivers must complete. The program puts heavy emphasis on understanding the nature of handicapped consumers' disabilities and on sensitivity training. For example, drivers are "handicapped" with blindfolds, crutches, or wheelchairs, and then required to negotiate an

obstacle course, to go out on a downtown street, and to board and ride a van. Many drivers have commented favorably on the usefulness of this course, regardless of the number of years of experience they have had in driving the handicapped.

Of all the day-to-day services that ACCESS performs, one of the most important is the ombudsman role. The ACCESS central phone receives many calls from people who have been stranded because of a delay at the clinic, a "lost" return pick-up by the carrier, or other unforeseen circumstances. ACCESS serves these people by articulating their needs to the appropriate carrier and arranging back-up service. In addition, all service-related complaints are documented and followed up by telephone or in writing, to both the carrier involved and the complainant, and pursued until there is a satisfactory resolution.

ACCESS also plays an important role in providing information to elderly and handicapped consumers about transportation and other services available to them in the community. For example, many callers are referred to agencies which provide transportation at no cost to their clients. From this activity has evolved a comprehensive guide to transportation services available to all elderly and handicapped people in the county.

Impacts on the Individual Rider

In addition to the significant improvements in service availability and quality, ACCESS consumers are enjoying a considerable reduction in the cost of transportation service. Lower fares are made possible by effective ridesharing and coordination of demand. These savings, although substantial, are overshadowed by the 75 percent fare subsidy provided by PAT to severely physically disabled people. Because PAT chose to use the ACCESS program to provide accessibility to those people, they travel much more cheaply than they would if they were paying regular shared-ride rates.

Under the PAT program, users are certified through a simple interview conducted by a physical therapist. A mock-up of a PAT bus entrance is provided and those who can climb the steps are not certified. In direct contrast with many programs, statements by the individual's own physician are given only secondary consideration. At the recommendation of consumers themselves, PAT maintains strict eligibility restrictions, but sets no limits on travel within the ACCESS system by those who are certified. In the first seven months of operation, ACCESS has certified over 1,100 people for PAT's subsidy program. Of these, about 60 percent use wheelchairs.

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Although the ACCESS service is available to all the elderly and handicapped people in the area, ridership by ambulatory people who are not eligible for the PAT subsidy has been disappointing, accounting for less than 10 percent of scrip-paid trips taken to date. Apparently, the inconvenience of mail-order scrip purchase and day-in-advance reservation outweighs the potential cost savings for most of these people. In contrast with the number of people certified for the PAT subsidy, there are only about 100 riders paying the full fare.

Impacts on Social Service Agencies

By September 1979, 24 social service agencies and other community organizations were purchasing transportation services through ACCESS. The general level of satisfaction with the services provided has been encouraging. Among the benefits cited, the most common relate to improvements in service quality, lower costs, and a reduction in the administrative problems of trip scheduling and monitoring.

Although ACCESS is now providing services for a considerable number of agencies that had previously made separate arrangements for transporting their clients, there are still a number of larger agencies that are not participating directly in this program. It was originally assumed, for example, that the Adult Services/Area

Agency on Aging (AS/AAA) would form the cornerstone of ACCESS, with about 5,000 contracted trips per month. Many design features were incorporated on this assumption. However, AS/AAA did not join the program as expected. At the time ACCESS began operation, AS/AAA was just recovering from a severe cutback in its transportation budget. For this and a variety of other reasons, it decided not to participate at the outset. In a renewed effort to involve AS/AAA, ACCESS conducted a two-week mini-demonstration of its services. The objectives were to show that the quality of service available to AS/AAA clients would not deteriorate as a result of increased ridesharing, and that cost savings would result for both AS/AAA and ACCESS from the coordination of services and ridesharing.

Productivity

ACCESS has to date had somewhat less success in promoting ridesharing and improving the efficiency of vehicle utilization than had been hoped. Currently, the productivity of vehicles is about 1.3 passenger trips per vehicle hour. With the realization that there is an inherent trade-off between service quality and service productivity, a conscious decision had been made to emphasize the former until the service was well established. The objective of enhanc-

ing vehicle utilization will be pursued vigorously in the future.

As comparisons with vehicle productivities achieved elsewhere are inevitable, it should be pointed out that ACCESS has a number of features that differentiate it from other services for the elderly and handicapped. These include the following:

1. The service is available over an extensive area, comprising 729 square miles;
2. The service is provided 16 hours a day, Monday through Saturday, including holidays;
3. There are virtually no restraints on the type or number of trips an individual can take;
4. There is a diversity of clients, including the physically handicapped, mentally retarded, nonhandicapped elderly, and preschool age handicapped children;
5. Most ACCESS riders are nonambulatory or semiambulatory;
6. The majority of trips are related to work or education, resulting in a concentration of trips in two peak periods; and
7. The average trip is over five miles in length.

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Future Plans

With the insights gained from over eight months of operating experience, ACCESS is now in the process of planning for its second year of operation. A key part of this process is the renegotiation of service provider contracts. It is likely that a number of new carriers will join the ACCESS system, and that the service delivery network will be altered to assure adequate vehicle capacity throughout the county and to increase competition among carriers. To improve scheduling efficiency, ACCESS intends to provide greater coordination of trip scheduling and carrier assignment. As part of this effort, the use of computers in the scheduling process will be investigated.

ACCESS will continue to make its services as responsive as possible to the needs of the elderly and handicapped. There are, for example, plans under way to tailor services to specific needs such as groups of elderly people going grocery shopping. In addition, the advance reservation feature of the ACCESS service is being evaluated, with the expectation that individual trips will eventually be scheduled on a modified or completely demand-responsive basis.

END

The RTA Brokerage Program

Dale Fitschen, Director, Paratransit Planning and Development
Regional Transportation Authority, Chicago, IL

The Regional Transportation Authority (RTA) of northeastern Illinois has undertaken one of the most ambitious paratransit programs in the country. As of January 1980, 28 projects were programmed, of which 21 were operational. In addition, two formal countywide special transportation coordination efforts have begun, with projects in three additional counties in preparation. Lastly, a regionwide employer-oriented ridesharing program has been initiated. An account of the structure of the program and a brief description of some of the generic problems encountered in its development follow.

The RTA is an umbrella transportation authority that plans, coordinates, and funds nearly all conventional surface transportation in the six-county region surrounding Chicago. The region covers 3,700 square miles or an area roughly the size of the state of Connecticut. It contains about seven million people and 260 municipalities, with densities ranging from 55,000 people per square mile to less than one person per square mile in some rural areas. The RTA oversees and funds the Chicago Transit Authority (CTA), as well as some 19 suburban bus operators, and seven commuter railroads.

In 1974, when the RTA was created through a slim majority vote of the Illinois General Assembly, there was little or no

transit service in many suburban areas, and existing services were in danger of collapse. Within a short time, RTA was under heavy pressure to establish conventional service in the suburban areas, which generate a substantial amount of RTA operating



subsidies. This pressure eventually led to concern about developing experimental programs with specialized and innovative services. At least three pressures stimulated the establishment of the RTA paratransit brokerage program:

1. RTA board members, especially those from suburban areas, were looking for innovative ways to provide transportation in low-density suburban areas where fixed-route services were highly inefficient and fifty-foot buses unwelcome.
2. Local agencies began to request funding for non-conventional service.
3. The federal government, in 1975, required federally funded transit agencies to plan for and provide special transportation services for the elderly and handicapped.

As a result of these pressures, the RTA created the Service Development and Demonstration Grant Program in 1976 to broker innovative paratransit services. The RTA was ideally suited to play a brokerage role. It had an independent board, without formal ties to the carriers and capable of representing regional consumer interests. In addition, the definition of public transit which it had the power to fund, regulate, contract with, or operate was broad enough to include most potential paratransit modes.

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The RTA contracts directly with a provider and usually funds 100 percent of the deficit for conventional fixed-route, fixed-schedule operations. In developing conventional services, the RTA may work through the municipalities, or the RTA staff may select areas that warrant service. They then seek a service provider who, in most cases, is established in the area in which the service will be implemented. The RTA staff, to the extent that resources are available, monitors the conventional service and provides centralized functions such as preparation of capital grants, funding, and fare coordination. RTA also provides in-house expertise for such elements as equipment, scheduling, and radio services to the provider of conventional service on request, or this service may be provided automatically, if, during the monitoring process, RTA discovers that there are problems.

Agreements with providers are normally funded on an annual basis. As of Fiscal Year 1980, the RTA had over 30 agreements amounting to almost \$312 million. These ranged in size from \$240 million for the Chicago Transit Authority to \$46,500 for the village of Bensenville.

Service Development and Demonstration Grant Program (SD/DGP)

The primary purpose of the program was to gain experience in providing non-

conventional, special transit services for both the general public and people with limited mobility. Individual projects were expected to be small, personalized services tailored by local communities to meet local needs. RTA could not, as a regional author-

ity, provide the close day-to-day supervision such services require; therefore, it designed its program to ensure local government sponsorship and local involvement in management, determination of type of service and costs, and assurance of qual-



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ity and maximum use. Equally important was coordination of existing resources. The primary guidelines for the program were as follows:

1. Only general purpose governments (townships, municipalities, etc.) were considered eligible. Priority was given to areas where conventional service was inadequate or nonexistent.
2. Communities could apply for both capital and operating funds for up to 75 percent of the net project cost for projects which did not receive direct federal operating assistance.
3. RTA would not fund operating expenses of a project where the fare exceeded an average of \$1.50 per one-way passenger trip.
4. RTA funding for noncapital expenses was limited to a maximum of \$100,000 per project per year.

The first step in initiating the program was the development of program guidelines for applicants, funding guidelines, and all required application materials. These were then sent to roughly 260 municipalities in the RTA region with an invitation to apply.

From the initial applications, twelve were selected. They provided a full range of learning experiences for RTA; no two were the same. They varied in fare structure, mode, geographic coverage, clientele, and

contractual and organizational agreements.

RTA then negotiated informally with UMTA for a Service and Methods Demonstration Grant. From the 12 projects selected by RTA, six projects and two alternates were finally agreed upon. A formal application was submitted in March 1977.

Section 13(c) of the Urban Mass Transportation Act requires that the Department of Labor concur on most transportation grants. Including the informal contacts with labor representatives which began in January 1977, it took about one year to obtain a fairly standard labor agreement which has worked well so far.

“Elaborate procedures for estimating demand have had limited value.”

Funding from UMTA began in March 1978. While the first projects were getting under way, RTA completed studies of McHenry County, which had no bus service, and planned seven additional paratransit services, along with intercity services, which were to provide the general public system for the county.

Current SD/DG Program

The current program (see Table 1) includes a wide range of projects, for example:

- a general public daytime dial-a-ride combined with a rush hour feeder service operated by a small municipality with Mercedes buses;
- a service for wheelchair users in a small area otherwise served well by transit;
- a coordinated project for the elderly and handicapped which uses a combination of agency and mass transit funds and buses countywide;
- a subsidized taxi project for the elderly sponsored by several towns; and
- a general public dial-a-ride service covering three municipalities, to be operated with taxi vehicles by the local taxi operator.

The projects also vary widely in service area (three to 875 square miles), fares, organization, and contractual agreements.

The RTA staff became involved in a much wider range of activities than was originally foreseen. For example, they

1. developed a grant program for RTA;
2. developed a program application to UMTA;
3. concluded a 13(c) agreement with the ATU;

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4. acted as consultants to applicant municipalities in project selection: assisted them in structuring their service proposals, service designs, and budget estimates, and in meeting all legal requirements; frequently engaged in roundtable negotiations, of service terms with operators, community organizations, and elected officials, followed by presentations to municipal councils;
5. developed operating and vehicle lease contracts;
6. exchanged legal opinions with project sponsors;
7. mediated disagreements among multiple sponsoring agencies and helped to work out joint agreements;
8. took into consideration existing interests and local resources, e.g., transit operators, taxis, and special service operators, both in the interest of economy and to minimize the possibilities of incurring lawsuits for damaging private operators;
9. wrote schedules, brochures, and advertisements;
10. provided assistance with financial records; and
11. monitored monthly financial reports by line item.

**TABLE 1
RTA PARATRANSIT PROJECTS**

Project	Project Type	Grant Amount (dollars)	RTA Vehicles	Start Date
1. Cary/Fox River Grove	Dial-a-ride for all residents	\$129,000 ²	3	4/80
2. Crystal Lake ¹	Dial-a-ride for all residents	195,000	4	12/79
3. Harvard	Dial-a-ride for all residents	49,918	2	12/79
4. Marengo	Dial-a-ride for all residents of Marengo and Union	58,026	2	12/79
5. McHenry	Dial-a-ride for all residents	129,000 ²	3	N/A
6. Woodstock	Dial-a-ride for all residents	103,000 ²	3	4/80 ²
7. Once-A-Week McHenry County	Fixed-route deviation for residents of six smaller communities	140,000 ²	3	4/80 ²
8. Deerfield ³	Dial-a-ride for all residents	77,850	3	1/80
9. Lake Villa Township	Dial-a-ride for all residents	24,975	1	2/80
10. Libertyville ³	Dial-a-ride for residents of three villages	54,000	0	4/80 ²
11. Elgin	Dial-a-ride for mobility-limited residents	63,960	3	2/80
12. St. Charles/ Geneva	Dial-a-ride and Shared-ride taxi for E & H of the townships	31,500	1	7/78
13. Bensenville	Dial-a-ride for all residents	40,948	1	7/78
14. Bloomington Township	Dial-a-ride for all residents	24,416	1	10/79
15. Milton Township ³	Shared-ride taxi for E & H	\$ 33,300	0	7/78

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**TABLE 1
RTA PARATRANSIT PROJECTS (Continued)**

Project	Project Type	Grant Amount (dollars)	RTA Vehicles	Start Date
16. Bellwood/ Stone Park³	Dial-a-ride for E & H of Proviso Township	53,730	2	7/77
17. Chicago (MOSCH)	Dial-a-ride for mobility-limited residents	100,000	3	10/79
18. Chicago (DHS)	Subscription bus for Chicago residents to north suburban work places	40,000	0	N/A
19. Evanston/ Skokie	Dial-a-ride for wheelchair users in Evanston, Skokie and Morton Grove	30,531	0	6/78
20. Forest Park	Dial-a-ride for E & H residents	3,096	1	1/80
21. Franklin Park	Dial-a-ride for all residents	30,180	0	3/80
22. Palatine Township	Dial-a-ride for E & H residents	33,525	0	7/78
23. Park Forest	Dial-a-ride for all residents	77,040	3	12/79
24. River Grove	Dial-a-ride for all residents	19,035	0	7/79
25. Schaumburg³	Dial-a-ride for all residents of the township area	171,000	7	10/79
26. Bolingbrook	Dial-a-ride for E & H of the Bolingbrook area	12,484	0	7/79
27. Franjfort Township	Subscription feeder and dial-a-ride for all residents	14,201	0	12/78
28. Joliet (HEPT)³	Dial-a-ride for all E & H of Will County	126,000	4	7/78

¹Projects in bold face are operational

²Estimated

³UMTA/Service and Methods Demonstration Projects

In addition, extensive effort was spent on the development of tools for monitoring and evaluating operational projects. Monthly phone surveys of users of the services have been conducted with the limited assistance of local project representatives. The surveys have provided a relatively quick method of determining how well a project is providing convenient, comfortable, and reliable service.

Development of a program like this places high demands on its staff. The initiation of each of these small projects has as many subject areas to be mastered as one large transit operation.

Problem Areas and Some Lessons Learned

Some brief observations on various problems encountered in the initial stages follow:

1. Extensive lead times frustrate staff and aggravate political relationships; more importantly, local staff turns over and local leadership and expertise is lost. Worse, long lead times have resulted in budgets increasing by as much as 100 percent.
2. Equipment selection and acquisition may cause extensive delays. When initiating a program, find contractors with vehicles, and lease or

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buy equipment off the shelf immediately. Waiting may result in losses due to inflation.

3. In high-density areas, radio frequencies are in short supply and may be difficult to obtain. Find expert assistance in working out new radio systems and allow for long lead times. Contracting with existing operators may avoid problems in this area.
4. Insurance is a problem in terms of both cost and availability. RTA has adopted a risk insurance program which relieves localities from having to obtain insurance, standardized coverage, and ensures that all parties, the public, operators, and RTA are protected. This program began in July 1979 and it will take time to judge its cost and effectiveness.
5. Operating costs have been underestimated, most often because of long lead times in conjunction with inflation. In addition, ridership has been overestimated, and therefore local applicants occasionally have under-budgeted.
6. The 25 percent local match requirement, in combination with the \$1.50 per trip subsidy limit, has contributed to sound fiscal management.

The \$1.50 limit has been particularly effective; since all costs above this amount must be borne by revenues or the local community, the limit generally inhibits casual spending and administrative overstaffing, curbs enthusiasm for low fares or no fares, and encourages interest in productivity and the maximum efficient use of resources.

7. Experience has indicated that the project selection process can take less time and be somewhat less complex.
 - a. No matter how complete an initial application is, a great deal of staff time will be spent educating and assisting applicants. Project designs and budgets are likely to change several times.
 - b. Elaborate procedures for estimating demand have had limited value. Budgets usually estimate the supply below the projected demand for paratransit service. In the beginning, low productivity should be assumed; when higher ridership is achieved, there will be a revenue cushion in the budget.
 - c. Final legal documentation should not be required of a community until it is reasonably

certain that the project will be selected, and that the community will implement it.

- d. To avoid time wasted in the application process, the community should be made aware of its complete obligations under the contractual requirements at the outset.
 - e. Phone discussions in place of field meetings save time, money, and effort on many occasions.
8. The majority of local operating contracts in these paratransit projects have been fairly easily executed. Most municipalities have come to RTA with previously identified operators: the only taxi operator in the area, or a local agency or small bus service for senior citizens. A few municipalities simply have contracted local charter bus operators.

Thus far, taxi owners either have not bid at all, or have bid much higher than experienced small bus operators, sometimes by as much as 100 percent. This has been a disappointment since it was assumed that taxi operators would be familiar with the service area, would have dispatching capability, and could operate at a somewhat lower cost.

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9. Routine reporting is a necessary but time-consuming nuisance. Contractors are required to submit monthly financial and operating data. They are provided with a cash advance on the first two months of operation. No further payments are forwarded until monthly reports are submitted containing actual expenditures. Even with this financial incentive, reports are often late, and there are fairly frequent local cash flow crises. Lack of accuracy in bookkeeping is most often the cause of problems, which has meant repeated attempts to rebalance books and retrain bookkeepers.
10. Training needs are now being given formal attention. While the RTA paratransit staff gave aid as needed to local projects, no systematic training program existed. The paratransit staff could have profited from advance training, which would have helped them adapt more quickly to the variety of roles required. A generic program is now being developed which can be adjusted to individual project needs.
11. When a new project begins, it may take a year or more to stabilize operations.
12. The need for local management and local financial commitment appears critically important for program effectiveness. The required local share and subsidy constraints have been effective in insuring concern and involvement on the part of many sponsors. There are, however, some limitations with the brokerage arrangement, for example:
 - a. The administrative sequence in a few cases has caused delays in decision-making. The greater the number of administrators involved, the greater the possibility for misunderstandings, and the more time is spent clearing them up.
 - b. A broker cannot fire an operating employee, or otherwise apply direct coercion. Fortunately, the need for this has rarely occurred.
 - c. The requirement for local government sponsorship, in some cases, places a demand on already burdened small local governments to develop familiarity in yet one more area. However, once the initial contracts have been established, RTA's technical assistance has usually kept this burden minimal.

Finally, politically, in spite of the long lead times, brokering services through local municipalities has been quite successful, both for RTA and for local municipalities. Even the anticipation of a service has generated immediate, sometimes dramatic, changes in the attitudes of local officials and citizens in favor of public transportation, and has warmed local public opinion toward public taxation for transit.

END

Brokerage of Special Transportation Services

Viktoria W. Fox, Acting Director, EASYRIDE
 Peninsula Transportation District Commission, Hampton, VA

The Peninsula Transportation District Commission, funded by UMTA and the Cities of Hampton and Newport News, Virginia, has committed itself to coordination through the creation of the EASYRIDE program. EASYRIDE operates as a broker, bringing those who wish to provide transportation together with those who have a special transportation need.

EASYRIDE has three basic goals: 1) the identification of all vehicles traveling into, out of, or within the Virginia Peninsula; 2) the identification of individuals, agencies, or employment sites in need of transportation; and 3) the matching up of the vehicles to the people. EASYRIDE addresses a large audience ranging from an Area Agency on Aging (AAA) to an employment site of over 20,000 workers. The underlying theme of the program is to reduce some of the Peninsula's problems such as energy shortages, traffic congestion, air pollution, and of course public and private expenditures.

Brokerage, as applied to specialized services, began with a survey of all of the organizations on the Peninsula. The results showed that there were approximately 30 agencies and clubs which operated some 90 vehicles for their respective clientele. The majority of the vehicles had high mileage, minimal maintenance, were not filled to the maximum seating capacity, and often duplicated routes. The agencies and clubs

operated only on certain days of the week and for limited hours of the day, thus leaving available vehicles unused.

In addition, there were numerous other agencies and clubs which were in need of specialized transportation services. Most of these agencies conduct valuable specialized programs for their clientele, but are hampered by nonexistent or insufficient transportation services.

“Most of these agencies conduct valuable . . . programs . . . , but are hampered by . . . transportation services.”

The first step was to develop a citizens advisory group composed of representatives from all of the area social service agencies, special interest organizations, and advocacy groups. The idea of coordination was discussed and a type of “re-education” was conducted to put forward the many benefits and savings to be gained through coordination. A 16(b)2 policy statement then was developed which defined the

Peninsula Transportation District Commission (PTDC) position and role as the single unified public transportation entity on the Peninsula. This policy provides nonprofit organizations requesting vehicles with a step-by-step process and a set of alternatives designed to alleviate duplication of services and vehicles and reduce the overall public expenditure. The policy was adopted by the Peninsula Association of Special Services. One result, for example, is that the transit authority is leasing an idle vehicle to a 16(b)2 applicant for a small charge, thus reducing the expenditure for the agency and the local government.

The next step was to investigate the services currently being provided by individual agencies, and evaluate, if possible, the savings or improvement in quality of service which could be provided through coordination. For example, PTDC had been operating a program called “Handi-Ride” for eighteen months to serve the handicapped residents of the Peninsula. The service was operated by two area cab companies and provided door-to-door transportation for people who could not board or negotiate a transit bus. The majority of the trips were to medical appointments, work, educational or social facilities, and the cost per trip averaged \$4.23. Ridership on this program increased 129 percent over a 12-month period, and this demand put a seri-

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ous strain on the service. Concurrently, the Peninsula AAA was providing transportation services to its clients over 60 years of age. The AAA had a limited budget and faced a severe reduction in services. An investigation showed that 60 percent of the Handi-Ride members were also over 60, and participated in programs conducted by the AAA. The two organizations joined efforts and funding to provide one comprehensive service. Currently, Handi-Ride operates out of the AAA with drivers, schedulers, and dispatchers funded through the Older Americans Act, and PTDC provides vehicles from its fleet surplus. The cost per trip has decreased to \$3.57 as the ridership continues to grow. In addition, since PTDC is a transit authority, local money can be matched with UMTA funds to provide yet more service.

Since the first EASYRIDE grant in 1978, PTDC and the residents of the Peninsula have been committed to ridesharing and coordination. The successful program has been viable and well received by the media, local governments, special service agencies, employers, and citizens. **END**



Data Collection Issues in Transportation Planning

David P. Middendorf, Senior Consultant
 Amin B. Hassam, Consultant
 Peat, Marwick, Mitchell and Co., Washington, DC

In planning and designing transportation services accessible to elderly and handicapped people, some information about these people and their transportation needs will be necessary. Two important questions face local transportation planners and transit operators: what information is needed, and how can it be obtained economically and efficiently?

Preparation for Data Collection

Before any information is gathered, the objectives of the data collection effort should be firmly established. Although this first step is critical, too often it is not given sufficient attention. As a result, time and money often are spent collecting information that ultimately is not useful. Many organizations begin by designing a questionnaire before the reasons for collecting specific data have been thought through.

The collection of data is not an end in itself. Its main purpose is to provide the information needed to make decisions on types of vehicles, transportation routes, fares, and schedules, which will help meet the needs of people without transportation.

Closely related to the question of how the data are to be used in decision-making is the question of how the data are to be analyzed. There are many methods of analysis ranging from simple manual tabulations to sophisticated techniques for esti-

imating travel demand, the size and characteristics of the elderly and handicapped population, cost-effectiveness, and routing and scheduling techniques. Because the method of analysis usually dictates the type of data needed, the analytic methods also should be determined beforehand.

If some of the data is to be collected through a survey, the precise definition of each of the variables should be determined. This involves specifying the units of measurement or the "stratification" of each variable.

For example, the frequency with which an elderly or handicapped person travels by bus can be measured as the actual number of bus trips taken over a specified period. Alternatively, it can be measured as an estimated average over the same period, such as the following: "almost every day"; "two to three times a week"; "about once a week"; or "less than once a month." Actual measurements are very useful because they can be analyzed in many ways. Estimated average figures, on the other hand, are less precise.

Certain variables are categorical and cannot be measured numerically. These include such variables as type of disability, trip purpose, and mode of transportation. They, too, must be carefully defined so that all of the categories are specified before any survey data are collected.

Before determining the variables, the planning agency or transit operator should first review the research that has already been done at both the federal and local level on the transportation problems of the target group. The agency or transit operator should also consult senior citizens and handicapped people and the organizations which serve or represent them. They can assist in the design of the survey by suggesting questions to be asked, by providing guidance on the wording of sensitive questions, and by giving the planning agency or transit operator a better understanding of the issues involved.

“The two most *ineffective* techniques appear to be self-identification by phone, and self-administered questionnaires printed in newspapers.”

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In addition to the above considerations, the desired level of accuracy of the data must be specified. The level of accuracy will affect the usefulness of the existing sources of secondary data (for example, census data), the suitability of various ways of surveying the elderly and handicapped, and the cost of the data collection. If a high level of accuracy is required, many existing secondary sources will not be useful, and new data may have to be collected. The level of accuracy depends on the size of the sample, the way the sample is selected, the rate of response to the survey, the presence and nature of biases in the responses, and the degree of care taken to validate the results.

Some Useful Data Items

Data requirements will vary from area to area. The following items of data are generally useful for most surveys.

Location of Target Group. Knowing the geographic distribution of the elderly and handicapped people in the area can help planners and transit operators to determine which existing transit services should be made accessible first, and where new transportation services are needed.

Type of Disability. Ideally, the planning agency or transit operator would like to know whether or not a handicapped person

can walk to the bus stop, stand and wait at a bus stop, read the route and destination signs on the buses, enter and leave the buses, and so on. It appears that many handicapped people have never used the public transit system; therefore, they are unable to determine whether they can perform these actions.

A useful indicator of type of disability is the ability to perform certain fundamental physical and mental tasks. Exhibit 1 presents a list of functional disabilities not specifically linked with using public transportation. In using this or a similar list of functional disabilities, the planning agency or transit operator does not have to depend on an individual's experience with transit. The severity of a disability is often the factor that determines whether or not a person is transportation-handicapped. The survey instrument should also allow for the fact that many handicapped people have more than one functional disability.

Special Aids and Personal Assistance. Also useful for planning is information on the types of special aids used, the ability of a handicapped individual to travel alone, and the need for personal assistance. The most important special aids are wheelchairs, walkers, crutches, canes, and Seeing Eye dogs. In addition, the researcher should determine how many handicapped

people cannot travel without a companion, and how many can travel alone only with personal assistance from the driver or other passengers.

Reasons for Not Using Transit. Information on why a handicapped person does not use a particular transit service is useful in several ways. First, it indicates the extent to which the lack of use is *not* related to the person's disability. Other factors, such as unfamiliarity with the service, unavailability of the service, the quality of the service, and access to an automobile may be as, or more, important than the disability. Secondly, the reasons for not using a particular transit service, in conjunction with data on functional disabilities, can suggest possible changes in the type of service, vehicles, facilities, policies, and practices that might attract more elderly and handicapped riders. Finally, this type of information can be useful for assessing the latent demand for alternative types of public transportation.

Ability to Drive, Auto Ownership, and Auto Availability. Studies have shown that auto ownership or availability are important in determining the demand for public transportation. Whether the elderly or handicapped person has a driver's license, whether the person owns a car, and the number of

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cars owned by, or available to, the household to which the person belongs are important data items.

Current Travel Data. Information about the trips currently being made by people without transportation can be useful for assessing the need and planning for accessible transportation services. The most important data items on current travel are the following:

1. trip rate or frequency of travel,
2. origins and destinations of trips,
3. trip purposes,
4. modes of transportation used, and
5. times of the day during which trips are made.

Approaches to Data Collection

In general, there are two major approaches to gathering information on the elderly and handicapped. First, secondary data that have already been collected for another purpose can be used. Secondly, researchers can collect original data by interviewing, surveying, or observing the population group. Researchers also can choose a combination of these two strategies, using data that are already available and supplementing this information by further data collection.

EXHIBIT 1

TYPES OF FUNCTIONAL DISABILITIES

Inability to walk

- Unable to walk at all
- Unable to walk more than a few blocks

Inability to negotiate abrupt changes in elevation

- Unable to go up or down a few steps at all
- Able to go up or down a few steps but only with great difficulty
- Able to go up or down a few steps without too much trouble, but unable to go up or down stairs at all
- Able to go up or down stairs but only with great difficulty

Inability to stand

- Unable to stand at all
- Unable to stand for more than 2 or 3 minutes
- Unable to stand for more than 10 minutes.

Inability to sit down or get up from a seat

- Unable to sit down or get up from a seat at all
- Able to sit down or get up from a seat but only with great difficulty

Inability to stoop or bend over

- Unable to stoop or bend over at all
- Able to stoop or bend over but only with great difficulty

Inability to reach

- Unable to reach at all
- Able to reach but not very far

Inability to use hands and fingers

- Unable to use hands and fingers at all
 - Able to use hands and fingers but only with great difficulty
-

EXHIBIT 1

TYPES OF FUNCTIONAL DISABILITIES

Inability to lift objects

- Unable to lift anything at all
- Unable to lift anything weighing more than 2 or 3 pounds
- Unable to lift anything weighing more than 10 pounds

Inability to see

- Unable to see at all
- Able to see well enough to tell if a light is on, but unable to see moving objects, such as cars moving or people walking, even with glasses on
- Able to see well enough with glasses on to see moving objects, such as cars moving or people walking, but unable to see well enough with glasses to read a sign up close

Inability to hear

- Unable to hear at all even with a hearing aid
- Able to hear sounds and noises, but unable to hear and understand what a person says in a quiet place even with a hearing aid

Inability to speak

- Unable to speak at all
- Unable to speak well enough to be understood by most people

Inability to reason

- Unable to understand spoken words and sounds at all
- Able to understand spoken words and sounds but only with great difficulty

Susceptible to fainting or sudden loss of consciousness

Secondary Sources of Data

Table 1 presents a list of possible secondary sources of data on the elderly and handicapped, and summarizes the

advantages and limitations of each source. The table shows that no single secondary source provides complete, accurate, and

reliable information on all of the people in this group in a particular urban area. Because these data were collected originally for other reasons, they are not exactly in the form desired for planning special transportation programs. Nevertheless, using information from secondary sources can reduce the cost of collecting primary data.

A comprehensive list of names and addresses of elderly and handicapped people is generally difficult to obtain. Social service agencies and related organizations often have records on their clients; however, these records are usually confidential.

Despite the questionable reliability of census data on work-disabled and transportation-handicapped people, the national census is currently the best secondary source of estimates of the size and geographic distribution of these groups in specific urban areas. However, information on transportation needs and problems, and current travel patterns are not included.

Primary Data

Collecting primary data involves gathering information directly from the target group by interviews, surveys, or observations. Generally, it is unnecessary or impossible to contact every person in the target group, and therefore a sample is used to represent the total.

**TABLE 1
ADVANTAGES AND LIMITATIONS OF VARIOUS SECONDARY SOURCES OF DATA
ON ELDERLY AND HANDICAPPED PEOPLE**

Secondary Data Source	Advantages	Limitations
<p>1. U.S. Census of Population and Housing (1970, 1980)</p>	<ul style="list-style-type: none"> • Data source provides information on the number, geographic distribution, and social and economic characteristics of elderly people in each urbanized area. • Location of elderly people can be determined by city block and census tract. • Data source provides information on the number and the social and economic characteristics of persons with a work disability (1970, 1980) and transportation handicapped people (1980) in each urbanized area of 50,000 or more. • Location of work-disabled persons and transportation handicapped persons can be determined by census tract. • This data source includes all elderly people. • It is a recurrent source of data. • Published reports and computer tapes are quickly and easily obtainable. • Cost of obtaining standard reports and tapes is relatively low. • Information is available in many forms: magnetic tapes, published reports, microfiche, and computer printouts. 	<ul style="list-style-type: none"> • Data source provides no information on transportation needs, transportation problems, and travel behavior of elderly and handicapped people. • 1970 census includes only handicapped people between the ages of 16 to 64 who have a health or physical condition that either limits the amount or kind of work they can do at a job or prevents them from working at a job. • Estimates of the number of work disabled and transportation handicapped people may be unreliable and inaccurate, based on results of pretests of 1980 census questions. • Data become out of date in the 10 years between each census. • Names and addresses of elderly and handicapped people cannot be obtained.

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TABLE 1 (Continued)

Secondary Data Source	Advantages	Limitations
<p>2. Annual National Health Interview Survey (HIS)</p>	<ul style="list-style-type: none"> ● Data source provides statistics on the prevalence of selected chronic physical, mental, or health conditions that limit mobility or activity; the incidence of acute conditions which cause temporary disabilities; the prevalence of various impairments; and the prevalence of particular special aids. ● Data cover all types of elderly and handicapped people in the civilian, noninstitutionalized population. ● Recording, processing, and nonresponse errors have been reduced through elaborate survey and quality control procedures. ● Household interviews are conducted each year throughout the year. ● Estimates are based on probability sample of households. ● HIS is a recurrent source of data. ● Information is readily available from published reports and computer tapes. ● Published reports are free; standard computer tapes cost up to \$485 per reel. 	<ul style="list-style-type: none"> ● Data do not specify number of people who would be limited or prevented from using public transportation because of physical condition. ● Data source provides no information on transportation needs, transportation problems, and travel behavior of elderly and handicapped people. ● Data source does not provide information for specific urban areas. ● Local area geographic distribution of elderly and handicapped people cannot be determined. ● Names and addresses of elderly and handicapped people cannot be obtained. ● Accuracy is limited by willingness and ability of respondents to describe their physical and mental condition. ● Information on limitation of mobility and use of special aids is collected infrequently or irregularly.

TABLE 1 (Continued)

Secondary Data Source	Advantages	Limitations
<p>3. UMTA National Survey of Transportation-Handicapped People</p>	<ul style="list-style-type: none"> ● Data source provides national statistics on social, economic, and demographic characteristics; number of people; availability of mass transit; physical dysfunctions; regional geographic location; travel behavior (trip rates); auto ownership and availability; physical problems; transportation problems and barriers; latent travel demand; and perceptions of alternative transportation solutions for transportation handicapped people in urban areas. ● Data source includes all types of transportation handicapped people in urban areas of 2,500 or more; includes institutionalized handicapped people. ● Estimates are based on a national probability sample of urban households. ● Report is readily available from National Technical Information Service. 	<ul style="list-style-type: none"> ● Names and addresses of elderly and handicapped people are not available. ● Location of elderly and handicapped people within urban areas cannot be determined. ● Data source does not provide data for specific urban area; contains only national and regional estimates. ● Number of transportation handicapped persons interviewed in each urbanized area is too small to make statistically reliable estimates. ● Accuracy and reliability of data on latent travel demand is uncertain. ● Statistical reliability of estimates is not specified. ● Survey was conducted in December 1976—January 1977; it may not be repeated. ● Computer tapes of survey data are not available.

DEMAND ESTIMATION

TABLE 1 (Continued)

Secondary Data Source	Advantages	Limitations
<p>4. Social Survey Agencies and other Public and Private Agencies, Organizations, and Businesses:</p> <ul style="list-style-type: none"> ● private nonprofit organizations; ● area agency for the aging; ● health centers; ● neighborhood centers; ● housing projects for elderly and handicapped people; ● senior citizens centers; ● hospital and clinics; ● rehabilitation centers; ● employment centers; ● schools and boards of education ● churches; ● private volunteer groups; ● state health, welfare, education, rehabilitation, and economic agencies; ● local fire departments; ● emergency services; ● employment agencies; ● businesses that supply or repair wheelchairs, hand controls, and other special aids; 	<ul style="list-style-type: none"> ● Data source provides basic demographic data on the elderly and handicapped clients of these agencies at the local level; may provide health or medical data. ● Available data are free of charge in most cases. ● Data source provides a useful way of contacting elderly and handicapped people, although not always directly. ● Requesting information from these various entities is an important means of encouraging public participation. ● Data source is common to all urban areas. 	<ul style="list-style-type: none"> ● Data are not always organized, up to date, or complete; data collection and updating are often done on an informal basis. ● Amount and kinds of data available varies widely between agencies. ● Data storage on regular paper files may present information retrieval problems. ● Data are maintained for the agency's or organization's clientele only; excludes elderly and handicapped persons not registered with one of these sources. ● Accuracy of data varies; definitions of elderly and handicapped people also vary. ● Addresses of elderly and handicapped people may not be disclosed due to confidentiality. ● Contacting a large number of agencies and organizations may entail considerable time and cost. ● Cooperation of agencies is not always assured.

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TABLE 1 (Continued)

Secondary Data Source	Advantages	Limitations
<ul style="list-style-type: none"> ● welcome wagons; ● visiting nurse groups; ● real estate agencies; and ● elderly and handicapped advocacy groups. <p>5. Social Security Administration (SSA)</p>	<ul style="list-style-type: none"> ● Data source provides counts of elderly and handicapped social security beneficiaries by state, county, and zip code area. ● Computerized data are available, subject to legal constraints to protect confidentiality. ● Counts are continually updated. ● Special surveys are conducted occasionally, providing additional information on elderly and disabled people. ● Data are available in published reports. ● Data are available for states, counties, and zip code areas. 	<ul style="list-style-type: none"> ● Definitions of a retired worker and disabled worker tend to leave out a large number of handicapped persons, and result in an indistinguishable overlap of retired and disabled workers. ● Records of retired and disabled workers appear only when applications have been submitted for benefits; not all persons qualify for social security benefits. ● Addresses of retired and disabled beneficiaries are not disclosed, due to confidentiality. ● Cost of special tabulations depends on type and amount of information requested.
<p>6. Previous Local Studies and Surveys in own Urbanized Area and in other Urbanized Areas</p>	<ul style="list-style-type: none"> ● Data sources collectively, may provide population estimates and socioeconomic, demographic, and transportation-related information on the local elderly and handicapped population. 	<ul style="list-style-type: none"> ● Definitions of the elderly and handicapped vary between different studies, and data items are not always comparable between studies nor subject to stringent accuracy checks; thus, the direct use, or cross-sectional compilation and comparison of data is not always possible.

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TABLE 1 (Continued)

Secondary Data Source	Advantages	Limitations
<p>7. Registration Files for Reduced Fare Programs and Special Transportation Services</p>	<ul style="list-style-type: none"> • Data source provides basic demographic data on elderly and handicapped registrants; may provide data on handicaps and use of special aids. • Data source provides a sampling frame for subsequent surveys. • Data source is a form of self-identification, and provides opportunity to collect data on transportation needs during registration. 	<ul style="list-style-type: none"> • Accuracy of the data varies considerably. • Future update and availability of data are unknown. • Age of the data varies considerably. • Data are specific to particular localities and are not necessarily transferable or applicable to other localities. • Precise locations of the elderly and handicapped are frequently not disclosed due to confidentiality. • The time and cost of acquiring and analyzing available data may be considerable. • Data are not always organized, up-to-date, or complete; difficult to maintain current registration files. • Many transit operators do not maintain registration files; source not available in all communities. • Data storage on regular paper files may present information retrieval problems.

TABLE 1 (Continued)

Secondary Data Source	Advantages	Limitations
<p>8. State Motor Vehicle Registration and Driver's License Files</p>	<ul style="list-style-type: none"> • Data source provides a mailing list for informing elderly and handicapped persons about new or improved transportation services. • Data source provides basic demographic and disability data on handicapped drivers. • Data are usually current; may be computerized. • Data are usually accurate since certification of physician is usually required. • Summary data are readily available in some states; cost of acquiring data is usually small. 	<ul style="list-style-type: none"> • Data are specific to registrants of special programs and services, and therefore do not necessarily represent all elderly and handicapped people. • The number and types of handicapped people included depends on how the transit operator defines and certifies a handicapped person. • Precise locations of the elderly and handicapped registrants may not be disclosed to outside agencies due to confidentiality. • Data are for handicapped drivers only. • Definitions of handicapped persons vary between states. • Precise locations of handicapped drivers may not be disclosed due to confidentiality. • Information is not available in all states.

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Sample Selection. There are a number of ways to draw a representative sample. If the target group is the elderly and handicapped population, one of the following three methods is generally used.

The first method is to locate the elderly and handicapped people by using existing lists of names and addresses. If no such list exists, a list can be developed by prescreening all or part of the general population. Prescreening can be done by telephone or by door-to-door canvassing. Telephone screening is less expensive and can be conducted more quickly. Telephone interviewers can be supervised more easily, and because telephone screening is less physically demanding than door-to-door canvassing, elderly and handicapped people can be employed to make the phone calls.

The second method involves self-identification of the elderly and handicapped. People in these groups are asked to identify themselves and report their transportation needs to the planning agency or the transit operator.

The third means of selecting a sample of the elderly and handicapped is to contact them as they appear at social service agencies, senior citizens' centers, sheltered workshops, hospitals, clinics, vocational rehabilitation centers, schools, and other places they are likely to visit.

Of these three methods, telephone screening usually has the most satisfactory results. The sample is apt to be more representative than that obtained from self-identification techniques or from lists of clients of social service agencies. The results of telephone screening can be used to estimate, with some degree of confidence, the number of elderly and handicapped people in the community.

Surveys

Again, there are many ways to obtain information from the sample of the target group which has been selected. Some of the most common methods are described below.

Household Surveys. A random sample of elderly and handicapped people who have been located through prescreening can be surveyed either by a home interview, by mail, or by telephone.

The home interview is preferred when a long or complicated questionnaire is involved. If the questionnaire is well designed and the subject is made interesting, respondents will usually be willing to spend an hour or possibly longer answering questions. The major drawback of the home interview method is its high cost, which can range between \$40 and \$70 depending on the size of the area, the number of return

visits needed, the length of the interview, the amount paid to the interviewers, and other factors.

Mail surveys are often preferred because they cost relatively little in both money and time. A large number of people can be interviewed within a period of a few weeks. Households which are widely scattered, particularly in rural areas, can be reached much more easily and cheaply by mail. However, mail survey response rates below 50 percent are common, and thus the results are not necessarily reliable.

Telephone interviews are often conducted when some of the advantages of the home interview are desired but the costs are prohibitive. Of course, this technique excludes people without telephones who are apt to be living in low-income households. Because a large proportion of the target group are apt to have low incomes, supplementary home interviews may have to be conducted.

Surveys of Self-identified Target Group. If a completely random sample of the target population is not considered feasible, there are many ways of collecting data by having the elderly and handicapped population identify themselves. The four most common methods are by asking them to:

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1. complete and return a questionnaire,
2. telephone a certain number,
3. appear at designated locations, or
4. register for special service programs.

If the first method is used the questionnaire should begin with a clear definition of all terms used including "elderly" and "handicapped," or with a series of questions that enable people to decide whether or not they should complete the form. The questionnaire should be short and simple so that it does not discourage people from responding. Statements must be worded very carefully; otherwise, it will be difficult to interpret the data. A list of reasons for not using transit should clearly refer to either the person's disability, the environment, or a characteristic of the transit service.

Self-identification by telephone involves asking people to call the surveying agency. They then may be interviewed during the telephone call.

Instead of telephoning, elderly and handicapped people may be asked to appear at a designated location to discuss their transportation needs and problems. When they appear, they either may be interviewed in person or be given a questionnaire to complete.

Most publicly owned transit systems in the United States have some type of re-

duced fare program for elderly and handicapped people. In addition, many transit operators also provide special transportation services for this group. To take advantage of these programs and services, the eligibility of these people must first be certified. In some areas this is done by registering with the transit operator or another designated agency. The act of registering for a reduced fare program or special transportation service is a form of self-identification. It provides disaggregate information on the location and transportation needs of this group.

One of the advantages of self-identification techniques is their low cost compared with surveys involving pre-selected samples. Self-identification eliminates the need for such costly activities as developing a sampling frame or list of addresses of elderly and handicapped people; screening a large number of households by telephone or door-to-door canvassing to obtain a representative sample; training, supervising, and compensating a large number of interviewers; and completing interviews with people who were not available originally. A self-identification survey involves mainly the cost of planning and designing the survey, mailing questionnaires (if that is the method), publicizing the survey, and processing the data.

In general, the level of response to self-identification surveys has been low, regardless of the technique used. The two most *ineffective* techniques appear to be self-identification by phone, and self-administered questionnaires printed in newspapers. Somewhat better sample sizes and rates of response may be obtained by asking people to register for a reduced fare program or special transportation service, since the tangible benefits of registering provide an incentive. None of the self-identification techniques, however, has been particularly successful at locating or surveying a high percentage of the elderly and handicapped population in a community. Finally, there is no objective way of measuring the degree of bias in a self-identified sample.

Survey of Social Service Agency Clients. Another alternative is to survey elderly and handicapped clients of public and private agencies and organizations. Some of the types of organizations that should be contacted are social service agencies, senior citizens' centers, hospitals, private nonprofit organizations, and housing projects. In large urban areas, there often is a large number of such agencies, and locating and contacting them can be time-consuming. In addition, this approach will not produce a representative sample of elderly and handicapped people.

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Collectively, social service agencies and organizations may not cover all the elderly and handicapped people in the community. A third shortcoming is that much of the data maintained by social service agencies and other organizations is confidential and not available to the public. These agencies may, however, be willing to assist by distributing questionnaires or by contacting their clients to make arrangements for a personal interview.

Monitoring Accessible Transportation Services

When a public transit system has been made accessible to elderly and handicapped people, or when a new special transportation service has been provided, the service should be closely monitored and evaluated to determine how well it is satisfying the transportation needs of elderly and handicapped people.

Many of the data items collected before implementation will also be important for monitoring and evaluation. By collecting the same kinds of information before and after a project is implemented, the managers of the project can make comparisons to determine whether the project is meeting its original goals. **END**

Diffusion of Information about Special Transportation

William E. Arnold, Chairman
James Bley, Kathryn French

Communication Department, Arizona State University, Tempe, AZ

A corollary to availability of transportation is knowing that such facilities are provided. How well does the provider of transportation, whether special purpose or mass transit, make the services known?

Most research on the diffusion of information focuses on the question of whether or not the information goes directly to the public from the mass media, or through an opinion leader and then to the public. In 1972, Rogers and Shoemaker summarized this process as the "one-step" or "two-step" flow of information. While much has been done on diffusion of information, little has been done on the relationship of this communication process to human services for the elderly. Diffusion research which has been conducted in other areas, such as crisis prevention services, may be relevant to dissemination of information about transportation services for the elderly and handicapped.

Arnold (1972) concluded that the best way to give information about crisis centers would be through the mass media. In all cases, respondents tended to see the mass media as their first source of information about crisis centers. Giallourakis (1971), studying the same crisis center, found that the faculty and staff of the university within the community received their information about the crisis center from the same mass media. Finally, a study by Janus and Sandell

(1972) found that 71 percent of the students at the university had heard about the crisis center through mass media channels, and only 29 percent had received their information through interpersonal channels.

“ . . . mass media informs a person of service, but interpersonal channels motivate people to actually use the service.”

A distinction, not always made in the literature on diffusion of information, is that we may hear about information from one communication channel, but information received by a different communication channel may motivate us to use a given service. For example, one may find out via the mass media — television or radio — that there is a twenty-four hour hotline for alcoholics available in the community. On the other hand, when considering using such services, one may take the word of a close friend or family member. Thus, it could be

concluded that the mass media informs a person of service, but interpersonal channels motivate people to actually use the service.

Arnold, Liddell, and Findling (1974) studied the effects of communication channels as both information and motivating sources. During a two-week period, they asked all callers to a community crisis center questions with regard to where they had heard about the crisis center, as well as what motivated them to call. The results indicated that the two-step flow of information switched to the interpersonal communication channel as the motivating source. The study suggested that when an agency is seeking to establish a crisis or suicide prevention center, it should rely on every channel of communication to inform the community of its services. On the other hand, when trying to get people to use the service, the interpersonal channels of communication were the most effective.

Means and Mann (1976), in a study of general social service, found that the elderly used the mass media to gain awareness of social service agencies, and that the newspaper was the most effective source. Nevertheless, they concluded that less than one half of these elderly people were aware of social services, and that lack of knowledge, and lack of transportation, prevented their use.

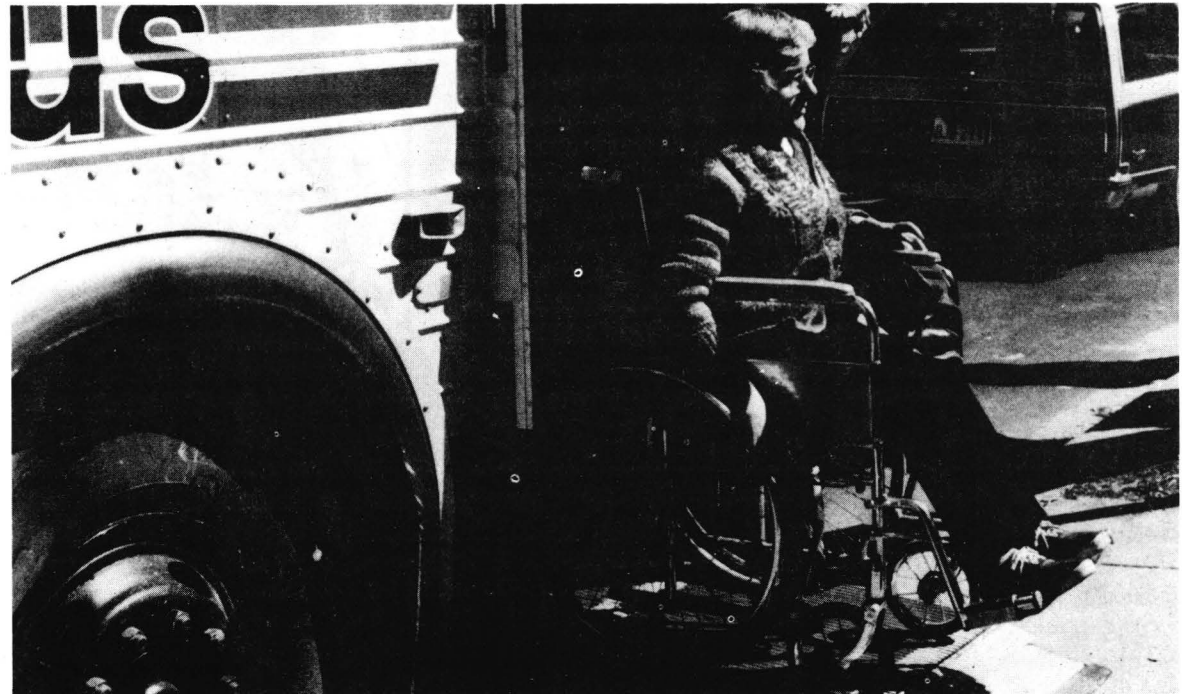
EVALUATION OF IMPACT

The Communication Department at Arizona State conducted a descriptive field study addressing this question. A sample of elderly Arizonans who visited one of the six multipurpose centers in Phoenix was taken. Although no attempt was made to obtain a random sample, the subjects did represent a group having an interest in, and a need for, transportation.

A questionnaire was constructed and administered during October 1979. Most of the questions required objective responses, and the questionnaire took approximately 35 to 40 minutes to complete. Of the approximately 150 questionnaires which were distributed at the multipurpose centers, only 34 usable returns were received.

Although the response rate was disappointing, several conclusions can be drawn from this study. For those elderly people who were mobile and handicapped, transportation was the most important problem which they faced. Most of the subjects reported using forms of public transportation rather than a private car. Dial-a-ride, the bus, and riding with a friend were the three most popular modes; taxi service was hardly ever used.

Cost, availability, and knowledge of the modes of transportation proved to be the three major transportation problems. Respondents had minimal knowledge about



the details of each of the forms of transportation. Most information about general problems and specifically on transportation was gained through television.

To be certain that the respondents were typical of other older Americans, the findings on how their time was spent were compared with the National Council on Aging study. The results were similar, except that the Phoenix sample spent more

time with media (television, radio, newspapers, magazines, and books) than the national sample. Television consumed most of the older persons' time.

The elderly rely on public forms of transportation more than private, and on television, officials at a center, and radio to inform them of transportation. However, they still feel they lack information about the availability of transportation. **END**

How Neighborhood Characteristics Affect Travel Patterns

Victor Regnier, Chief; Sherman Gordon, Research Assistant
Elaine Murakami, Administrative Coordinator
Environmental Studies Laboratory, Andrus Gerontology Center
University of Southern California, Los Angeles, CA

In a recently published book (1979), Wachs has suggested that designs for transportation systems for the elderly are often planned with the assumption that the transit needs of all older people are identical. In order to demonstrate that different groups of the elderly require substantially different transit services, he devised a factor analysis program which resulted in the identification of seven groups with differing "life-styles" related to specific neighborhood areas in metropolitan Los Angeles.

Data from respondents from four such Los Angeles neighborhoods — Westlake, Long Beach, Glendale, and Pasadena — were gathered in the study reported here. A sample of 400 older people, 100 from each area, was interviewed. In addition, information was also obtained from 30-day travel diaries of a subsample of the respondents in two of the neighborhoods. Analysis of the results shows substantially different transportation and service use patterns among the four areas.

Descriptions of the four target neighborhoods follow.

Westlake

The Westlake district is located adjacent to the western edge of the downtown Los Angeles area. Westlake was developed around the turn of the century. There are many small studio and one-bedroom apart-

ments. Westlake contains the highest residential density of any Los Angeles area, as well as the highest percentage of deteriorated or substandard housing. Because of the size of the units, older people and transients have traditionally been attracted to this district, whereas larger low-income families have not. Older hotels, many of which have been recycled for retirement living, are distributed throughout the district.

“... different groups of the elderly require substantially different transit services ...”

This district has the highest concentration of elderly people in the city. The neighborhood is convenient for older residents, containing a large urban park with senior citizen activities, numerous retail stores with moderate prices, and more public transit service than any other city area except for downtown.

Recently, undocumented aliens, and Mexican and Asian immigrants have moved into the area, and the influx has caused numerous conflicts. Rents, crime rates, and traffic accidents have all increased as the area has become more congested.

In addition, expansion pressures from downtown businesses have caused older residential buildings to be replaced with high-rise office structures or parking lots. This has resulted in a steady erosion of an already limited supply of low-cost housing units.

Long Beach

The Long Beach target neighborhood, located adjacent to the Pacific Ocean and including the older downtown portions of the city of Long Beach, has a developmental profile similar to Westlake. The area contains many wood frame, stucco apartment buildings from the 1905-1920 era.

During the 1930s and 1940s, larger homes were subdivided into smaller rental units. The social homogeneity of the population, combined with the more intimate physical scale of the city, has allowed a politically active and responsive relationship to grow between older people and the city government.

The target neighborhood includes the central business district and contains census tracts with the highest concentration of low-cost rental housing. Many residents of this district have lived in Long Beach most of their lives, in the areas surrounding the downtown business stores and offices. The older residents of this neighborhood share many of the same amenities and problems

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as Westlake residents. Social services, health services, public transportation, and convenience to downtown shopping are positive features of the neighborhood. However, increases in crime, deteriorated, poor-quality housing, and municipal plans for the redevelopment of downtown have discouraged reinvestment in housing and attracted transients, thereby reducing the quality of downtown living.

Glendale

Glendale is a city of 130,000 people located 10 miles north of downtown Los Angeles. Much of Glendale's development took place between 1930 and 1950. Prior to World War II, Glendale had been largely composed of single family homes, and had served as a "bedroom community" for Los Angeles. Since 1950, multifamily units have become increasingly more common and housing densities have increased rapidly in the last 20 years.

The minority population in Glendale is relatively low, although in recent years there has been an influx of younger Latino and Chicano families in the southern portion of the city. Glendale has traditionally been a city dominated by middle-aged adults. During the last 10 years an increase in the number of older people over 55 and younger people aged 18 to 34 has occurred.

The target area is ringed on three sides by commercial strip development which provides access to goods and services. Two features of the area attractive to older people include the convenient retail services and the abundance of multifamily units. Other factors include a low crime rate, and a certain "small-town" feeling of the community. Since 1975, higher rents and condominium conversions have restricted access to rental housing for older people. New high-rise commercial construction and expensive new condominium and townhouse developments have created upward pressures on land values, contributing to major increases in rent.

Pasadena

Pasadena is an incorporated municipality 12 miles northeast of downtown Los Angeles with a population of 120,000. It has a long tradition as a cultural and social center, e.g., the Parade of Roses, Rose Bowl football game, and classical music festivals.

The city has had a history of controversy attributed to the disparity between high- and low-income groups. These differences in race and income have stimulated the development of social services and volunteer organizations.

Pasadena has many neighborhoods with distinct identities. The target area was an older established residential neighbor-

hood, with homes dating back to the Victorian era. Single-family homes dominate; only a handful of multifamily units lie along the edges of the target area. Opportunities for shopping are limited to centrally-located Lake Avenue.

Lack of available rental units inhibits high concentrations of the elderly. The older people are generally long-term residents living in single-family homes. The target area included one apartment complex planned specifically for older people with about 175 tenants. Much of the area is dominated by younger people of diverse ethnic backgrounds. Lake Avenue splits the target area into two sections: the area to the east of Lake has a higher-income, Anglo population; the area to the west of Lake contains a mixture of older white and younger black families. Concentrations of publicly subsidized low-income family housing are located near the west edge of the target area. The mix of lower income, younger populations with an older, primarily Anglo, population has caused some problems.

Data Collection

Respondents were asked to report on the use of 32 common goods and services, and destinations, believed to be the most important for the support of older community residents. They also were asked what mode of transit, where, and how often on a

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monthly basis they visited the list of destinations. Diary data for a 30-day period were collected for a subsample of 53 subjects in two of the four neighborhoods.

The importance of various destinations can be evaluated by using several criteria, as follows:

1. The number of individuals who patronize a particular service.
2. The total number of trips taken to a particular service destination on a monthly basis. Trip totals by service increase the attention to services requiring frequent trips, such as a grocery or supermarket, and decrease the attention to trip destinations such as the doctor, which may be made infrequently.
3. The monthly frequency rate of trip-making. In this case, if a smaller sample of individuals uses a particular service intensively, it would be rated higher than a service which is important to a larger sample of individuals. For example, trips to a bar or to a church may be more frequent for a subsample of respondents.
4. The distance traveled to each type of service. This documents the most convenient and accessible destinations within each neighborhood. It also provides an indication of the types of services for which the

sample is willing to travel further to use.

Table 1 ranks services and facilities in each neighborhood according to the first criterion, the number of individuals who use these services. Fifteen services were identified as being used by an average of 50 percent or more of the respondents from all four neighborhoods.

Table 2 shows the rank ordering for each community of the total number of trips taken by respondents to the listed destinations. The top 15 services have an average trip rate of once a month or greater (score = 100). These 15 services account for 84.3 percent of all trips taken to the 32 destinations. Except for trips to a pharmacy, medical services account for only a small number of trips. On the other hand, all eating and food service establishments, except bars and health food stores, are included in the top 15 services. Services with little variation in the total number of trips per month in each of the four communities include trips to the beauty or barber shop, physician, eye doctor, and to some degree, the supermarket.

Although there is some consistency among communities with regard to particular destinations, each community differs with regard to the number of trips made each month. Table 3 rank orders the total number of trips made in each community

expressed as a percentage of the total trips made in Long Beach, the highest ranking city. A later analysis by mode will demonstrate a reversal of trip ranking by community, and a reduction in overall trip total differences, when pedestrian trips are eliminated.

Table 4 displays services ranked by the average number of monthly trips made within each community.

Table 5 rank orders the average distance to services in the four communities. The three communities classified as central city have 40 percent of the 32 services within five blocks. This figure does not hold for Pasadena, which was classified as more suburban. Only 11.8 percent of the Pasadena services were located an average distance of less than five blocks.

Trip Generation by Mode

The data in Table 6 include walking, and thus provide a more complete record of service access compared with traditional transportation data sets.

An examination of each community demonstrates the unique modal splits which occur. Respondents from Westlake and Long Beach walk frequently; however, distantly located services such as the supermarket or department store require the limited use of a bus or car. The higher incomes of Glendale respondents coupled with the

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**TABLE 1
NUMBER OF SAMPLE RESPONDENTS USING SELECTED SERVICE**

Number of Respondents	Westlake	Long Beach	Glendale	Pasadena	Average of Four Communities
90+					
80-90	Supermarket Bank	Supermarket Bank	Supermarket Bank	Supermarket	Supermarket
70-80	Pharmacy Physician Beauty/barber Variety store Small grocery	Department store Physician Restaurant Beauty/barber Pharmacy	Physician Department store Post office Restaurant Pharmacy	Bank Physician Post office	Bank Physician Department store Pharmacy Restaurant Beauty/barber
60-70	Department store Restaurant Dry cleaner Eye doctor	Variety store Dry cleaner	Dentist Beauty/barber	Department store Pharmacy Church Variety store Beauty/barber Dentist	Post office Variety store Eye doctor Savings and loan
50-60	Park	Hardware Eye doctor	Eye doctor Savings and loan Variety store Shoe repair	Restaurant Eye doctor Gas station Discount store Savings and loan	Dry cleaners Church Dentist Shoe repair
25-50	Shoe store Church Luncheonette Hardware Second hand store Clothing store Library Dentist Laundromat Liquor store	Library Church Dentist Post office Park Snack bar Bookstore Small grocery Second hand store Gas station Laundromat Bakery Gift shop	Small grocery Church Hardware Dry cleaner Library Shoe store Gas station Health foods Bakery Fast foods Discount store	Dry cleaner Shoe repair Hardware Bookstore Library Shoe store Fast foods Small grocery	Hardware Small grocery Library Shoe store Gas station Snack bar Park Bookstore Thrift shop Laundromat Bakery
<25	Bakery Bookstore Gas station Movies Tax service Foot doctor Gift shop Bar Craft shop Food coop	Shoe store Movies Tax service Liquor store Craft shop Foot doctor Bar	Laundromat Bookstore Movies Clothing store Foot doctor Thrift shop Gift shop Park Liquor store Chiropractor Bar	Laundromat Clothing store Thrift shop Bakery Park Health foods Foot doctor Movies Liquor store Gift shop Chiropractor Bar	Clothing store Tax service Movies Gift shop Liquor store Foot doctor Craft shop Bar Chiropractor

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TABLE 2
TOTAL NUMBER OF MONTHLY TRIPS TO SELECTED SERVICES

Number of Trips	Westlake	Long Beach	Glendale	Pasadena	Average Rank Ordered Type of Service
500+	Small grocery Supermarket Restaurant	Supermarket Restaurant Department store	Supermarket Restaurant	Supermarket	Supermarket
200-500	Park Luncheonette Liquor store Pharmacy	Small grocery Bank Snack bar Library Park Variety store Church Post office Pharmacy	Post office Department store Church Bank Library Pharmacy Gas station Small grocery Variety store Beauty/barber Bakery	Church Restaurant Post office Gas station Bank Small grocery Department store Beauty/barber Pharmacy	Restaurant Small grocery Department store Post office Church Luncheonette Bank Park
100-200	Variety store Church Bank Department store Bar Bakery Beauty/barber Hardware	Beauty/barber Liquor store Bakery	Fast foods Hardware Physician Laundromat	Fast foods Variety store Discount store Bakery Hardware Library Shoe repair Physician	Pharmacy Variety store Library Gas station Beauty/barber Bakery
50-100	Dry cleaner Library Laundromat Physician Gas station Second hand store Clothing store	Gas station Laundromat Second hand store Bookstore Dry Cleaner	Thrift shop Health foods Savings and loan Dry cleaner Park Clothing store Bar Discount store Foot doctor Gift shop Movies Bookstore Dentist	Park Laundromat Savings and loan Dry cleaner Bookstore Thrift shop Health foods Shoe store Dentist Clothing store	Liquor store Hardware Laundromat Dry cleaner Physician Second hand store Discount store
10-50	Movies Bookstore Tax service Dentist Movies Eye doctor Shoe store Gift shop	Clothing store Physician Hardware Gift shop Bar Movies Eye doctor Foot doctor	Shoe repair Eye doctor Shoe store Chiropractor	Eye doctor Movies Liquor store Foot doctor Gift shop Bar Chiropractor	Bar Savings and loan Clothing store Health foods Bookstore Shoe repair Movies Gift shop Dentist Shoe store Eye doctor Foot doctor Tax service
<10	Foot doctor Food coop Craft shop	Dentist Craft shop Tax service Shoe store			Chiropractor

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**TABLE 3
TOTAL MONTHLY TRIPS
FOR FOUR COMMUNITIES**

Community	Total Number of Monthly Trips	Percent of Long Beach Total
Long Beach	5460.5	100.0%
Westlake	5438.7	99.6
Glendale	4175.9	76.5
Pasadena	3220.0	59.0

convenience of the neighborhood provide for an almost equal split between the car (as either driver or passenger) and walking. The decentralized primarily single-family residential neighborhood in Pasadena shows a much stronger dependence on the automobile, essentially reversing the ratio of walking to riding in a car established in Long Beach. In Westlake and Long Beach, vehicular travel seems to be used for a number of services visited infrequently, but walking is the most popular form of access to frequently used services.

When walking trips are omitted from the analysis, the ranking of number of trips is completely reversed among the four communities. Pasadena residents make by far the greatest number of vehicle trips, and Long Beach the fewest. When walking is omitted, driving becomes the primary mode of travel for respondents in Long Beach,

**TABLE 4
AVERAGE FREQUENCY OF USE OF SELECTED SERVICES**

Trips (Person/month)	Westlake	Long Beach	Glendale	Pasadena
10+	Small grocery	Supermarket	Bar	Supermarket Small grocery
5-10	Luncheonette Liquor store Bar Supermarket Restaurant Park Bakery	Small grocery Restaurant Snack bar Liquor store Department store Park Library Church	Supermarket Restaurant Church Post office Department store Bakery Library Gas station Fast foods Laundromat Park	Church Bakery Restaurant Fast foods Gas station Park Laundromat Post office Bank Library Department store
1-5	Church Gas station Variety store Laundromat Pharmacy Food coop Hardware Library Department store Bank	Post office Bakery Variety store Bar Pharmacy Bank Clothing store Gas station Laundromat Second hand store	Bank Pharmacy Variety store Liquor store Chiropractor Beauty/barber Clothing store Health foods Foot doctor Discount store Hardware Gift shop	Beauty/barber Hardware Thrift shop Pharmacy Health foods Bar Discount food Variety store Shoe repair Liquor store Clothing store Gift shop
1-2	Movies Second hand store Clothing store Beauty/barber Dry cleaner Bookstore Tax service	Bookstore Beauty/barber Movies Gift shop Dry cleaner	Foot doctor Hardware Physician Craft shop Tax service Eye doctor Shoe store Dentist	Movies Bookstore Dry cleaner Savings and loan Shoe store Physician Foot doctor Chiropractor Dentist Eye doctor
<1	Physician Gift shop Craft shop Dentist Foot doctor Shoe store Eye doctor	Foot doctor Hardware Physician Craft shop Tax service Eye doctor Shoe store Dentist	Movies Bookstore Dry cleaner Physician Savings and loan Shoe repair Shoe store Dentist Eye doctor	Movies Bookstore Dry cleaner Savings and loan Shoe store Physician Foot doctor Chiropractor Dentist Eye doctor

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**TABLE 5
AVERAGE DISTANCE TO SELECTED SERVICES**

Blocks	Westlake	Long Beach	Glendale	Pasadena
0-5	Liquor store Laundromat Small grocery Dry cleaner Bar Tax service Hardware Gift shop Beauty/barber Food coop Luncheonette Park Variety store Bank Second hand store Gas station Restaurant	Small grocery Dry cleaner Second hand store Laundromat Post office Bookstore Bakery Variety store Library Pharmacy Snack bar Bank Hardware	Small grocery Gas station Laundromat Post office Gift shop Savings and loan Variety store Library Foot doctor Health foods Shoe repair Dry cleaner Thrift shop Department store Liquor store Hardware Bookstore Bank	Small grocery Variety store Liquor store Supermarket Fast foods Shoe repair Bakery Post office Health foods Laundromat Dry cleaner Gas station Library
	Pharmacy Supermarket Library Shoe store Foot doctor Movies Bookstore	Supermarket Restaurant Craft store Beauty/barber Park Gas station Department store Church Gift shop Liquor store	Supermarket Pharmacy Bakery Church Beauty/barber Dentist Fast foods Restaurant Clothing store Park	Savings and loan Bank Beauty/barber Chiropractor Pharmacy Gift shop Church Thrift shop Hardware Foot doctor Dentist
	Bakery Church Craft shop Department store Dentist Eye doctor Physician	Shoe store Foot doctor Movies Bar	Eye doctor Physician	Bookstore Restaurant Park Physician Department store
	Clothing store	Dentist Eye doctor	Movies	Clothing store Eye doctor
		Clothing store Physician	Shoe store Chiropractor	Discount store Shoe store Movies
		Tax service	Discount store	
50+				

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**TABLE 6
PERCENTAGE AND NUMBER OF TOTAL TRIPS BY TRANSIT MODE**

Mode	Westlake		Long Beach		Glendale		Pasadena	
	Percent Trips by Mode	Number Trips by Mode	Percent Trips by Mode	Number Trips by Mode	Percent Trips by Mode	Number Trips by Mode	Percent Trips by Mode	Number Trips by Mode
Car driver	9.86	520.66	9.39	495.71	37.49	1602.94	54.30	1714.88
Car passenger	4.18	220.86	3.61	190.59	9.13	390.48	19.57	617.96
Public transportation	11.49	606.81	3.59	189.79	1.88	80.26	7.74	244.54
Walk	69.77	3684.23	79.76	4210.93	51.07	2183.81	18.15	573.21
Taxi	.08	4.29	0.00	0.00	.10	4.09	.11	3.50
Other	.67	35.50	.29	15.50	.34	14.42	.13	4.00
Varies	3.96	208.49	3.35	176.82	0.00	0.00	0.00	0.00
Total ¹	100.00	5280.84	100.00	5279.34	100.00	4276.00	100.00	3158.09

¹Totals may vary from other counts because of the presence of missing data for number of mode choices.

Glendale, and Pasadena. In Westlake, the primary mode becomes the bus. The differences in total trips between neighborhoods are also reduced from a difference of 2,240 with walking trips included, to 1,196 with walking trips omitted.

Conclusions

Several conclusions regarding service use, activity pattern configuration, and perception of the value of different services can be drawn from this investigation.

1. Previous work suggesting the importance of walking as a means of transportation is verified in this investigation. Daily trip averages including walking are twice as high as rates which include only vehicle-assisted trips.
2. Comparisons of a subsample of monthly trip diaries with the 32 listed goods and services suggest that these destinations, in contrast with others which might be listed, account for the majority of trips made by the older respondents. In particular, the list accounts for a high percentage of shopping and social and entertainment trips.
3. Nine integral goods and services were found to be the most important of the 32 listed services. These included the market, bank, post office, department store, pharmacy, restaurant, beauty or barber shop, variety store, and church.

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4. Certain services are highly valued, although they are consistently located at some distance from the respondent's residence. For example, in the top 15 most frequently visited services, the department store, park, and church seem to be highly valued, although somewhat inconveniently located.

Implications for Planning

These conclusions have implications for the design of small-scale transit systems the delivery of supportive goods and services to older residents, the development of land-use policies for neighborhood improvement, and strategies for the placement of planned housing.

1. Walking seems a valuable and important transportation option for older people located in environments with mixed commercial and residential land uses, and should be considered when plans are developed for circulation systems in community areas.
2. Dial-a-ride and small-scale transit systems can profit from an understanding of the neighborhood as defined by older respondents. Often these boundaries are established quite arbitrarily, using political or jurisdictional criteria, rather than an

understanding of where older residents must travel to purchase supportive goods and services.

Planning for demand-response systems should focus on a list of critical destinations. Transit analysts have suggested that in order for cost-intensive transit services, such as dial-a-ride, to be most effectively provided, an understanding of their role in the provision of necessary services to the older community resident must be better established. For example, the cost of travel to distant destinations such as doctors' offices or discount food and variety stores which maintain the independence of the older community resident, may compensate for the cost of expensive systems by lowering the incidence of premature institutionalization.

3. Finally, these conclusions suggest that increased attention be spent on the examination of land-use solutions, such as constructing planned housing in convenient neighborhood locations, or increasing housing and commercial density in suburban neighborhood nodes.

END

Estimating the Demand for Specialized Transportation

Thomas L. Autrey, Transportation Planner

Gary H. Sokolow, Transportation Planner

Margie O'Farrell, Research Analyst

East Central Florida Regional Planning Council, Winter Park, FL

Before making major investments in specialized public transportation, the potential demand for such services should be assessed. Through questionnaires randomly mailed to some residents, and others distributed to members and clients of various social service agencies and advocate groups, the magnitude of the demand for special transportation services for the handicapped and elderly in metropolitan Orlando was estimated.

The Orlando urban area consists of Orange, Osceola, and Seminole counties in east central Florida, and has a current population of over 670,000. Orlando is the largest city, with over 120,000 people. The area is experiencing a high growth rate.

The basic goal of the study was to estimate the number and type of trips that might be demanded on two basic forms of specialized public transportation: Class I, door-to-door with lift; and Class II, door-to-door without lift (including taxis).

The transportation-handicapped were categorized in four major groups: 1) wheelchair users under age 55, 2) wheelchair users over age 55, 3) handicapped non-wheelchair users under age 55, and 4) handicapped non-wheelchair users over age 55. The last two groups consisted of those who had difficulty using public transportation, but were not wheelchair users; lift equipment was not necessary for their

transport. In addition, 50 percent of wheelchair users were viewed as not needing lift equipment.

“The Orlando area decided that 60 percent of the desired trips . . . could be used as a realistic goal for the special transportation system.”

To determine the characteristics and travel behavior of these groups, 12,000 questionnaires were randomly distributed by mail to households selected from a list which had a higher average age than the regional average. The list was purchased through a private mass mailing firm. Other potential sources for lists were eliminated due to bias other than age, e.g., voter registration, driver's license, tax records. Return postage was provided; approximately 1,100 questionnaires were received, resulting in a 9 percent return rate. Approximately 3,600 additional questionnaires were distributed to organizations serving the elderly and handicapped. Approximately 1,200 of them were returned, for a 33 percent return rate. Responses from both distributions were analyzed to identify the differences

between the two groups. The Statistical Package for the Social Sciences (SPSS) was used to analyze the data.

The *Summary Report of Data from the National Survey of Transportation Handicapped People* was used extensively to estimate the extent of the transportation-handicapped population. According to the national survey, in the southeastern United States approximately 7.5 percent of the total urban population can be considered transportation-handicapped. Table 1 shows the population estimates for the handicapped in the Orlando urban region.

**TABLE 1
POPULATION ESTIMATES FOR THE
TRANSPORTATION-HANDICAPPED
IN ORLANDO**

Transportation Handicap	Number of People
Wheelchair users under age 55	838
Wheelchair users age 55 and older	1,956
Handicapped non-wheelchair users under age 55	15,928
Handicapped non-wheelchair users aged 55 and older	32,083
Total	50,805

DEMAND ESTIMATION

Desired monthly trip rates were established from the responses to the questionnaire. It was then possible to make estimates of total demand for the various types of equipment available. The method of calculating the total demand for wheelchair users is illustrated in Table 2.

**TABLE 2
METHOD OF CALCULATING TOTAL
DEMAND FOR WHEELCHAIR USERS**

Age of Wheelchair User	Round Trip Rate	Population	Number of Round Trips/ Month
Under 55	2.3	838	1,927
55 and older	1.4	1,956	2,738
Total			4,665

Of the total estimated demand of 4,665 monthly round trips, it was assumed that approximately one-half could be accommodated by taxi and the remainder would have to use vehicles with lifts.

For the non-wheelchair users in the area, the number of desired monthly round trips was 62,455. These trips could be made by vehicles without lift equipment.

The total estimated demand, for the wheelchair users and non-wheelchair users, was 67,120 round trips or 134,240

one-way trips. The magnitude of these numbers presented a problem with respect to the fleet size required to meet this demand.

Other factors to be considered included:

1. The area's existing special transportation service reported that the average distance per trip was ten miles.
2. Each vehicle traveled an average of 2,300 miles per month.
3. The area system was currently providing .1 trips per vehicle mile.
4. In estimating the required fleet size, a rate of .3 trips per mile was used. It was assumed that a larger system would increase overall productivity.

Computation:

$$\begin{aligned}
 & 2300 \text{ miles per month per vehicle} \\
 & \times 0.3 \text{ passenger trips per vehicle mile} \\
 & = 690 \text{ passenger trips per vehicle.}
 \end{aligned}$$

Therefore, if 134,240 one-way trips were made at 690 trips per vehicle, 195 vehicles would be needed.

In the national survey, it was estimated that under an all-encompassing public transit system including accessible fixed-route and feeder service supplemented by door-to-door service, approximately 56

percent of the transportation-handicapped people would be served.

The data in the Orlando survey indicated that many of the trips included in the total demand figure of 67,120 round trips could be made by those who have only a little more difficulty using public transit than the general public. However, much of the demand could not be fulfilled under even the best of possible conditions. The Orlando area decided that 60 percent of the desired trips (40,272 round trips) could be used as a realistic goal for the special transportation system.

Transportation demand increases as the supply increases. As more services become available to the area's handicapped, the demand will no doubt increase. **END**

Statistical Survey Procedures to Determine Transportation Needs

Robert L. Martin, Vice President
 Kimley-Horn and Associates, Inc., Raleigh, NC
 M. Christine Doerflinger, Transportation Planner
 Kentuckiana Regional Planning and Development Agency, Louisville, KY

Statistically valid survey procedures were used to determine the transportation needs and problems of elderly and handicapped people living within the nine-county area in Kentucky and Indiana within the jurisdiction of the Kentuckiana Regional Planning and Development Agency (KIPDA). The survey methodology, including sample design, sample selection, and interview procedures, and the results of the survey are described below.

Two survey questionnaires were designed. The first collected data on the population of the nine-county region, i.e., a "census" of current socioeconomic data. Results of the first survey were used to determine the degree of mobility of handicapped samples for the second survey. The second survey collected data on travel behavior of the elderly and handicapped. The results were used to identify their transportation needs, travel modes, trip purposes, trip rates, travel demand, level of mobility, satisfaction with transportation service availability, travel problems, awareness of existing programs, and willingness to share rides.

The target populations to be surveyed were classified into four subgroups as follows:

1. Elderly nonhandicapped (Enh),
2. Elderly handicapped (Eh),
3. Nonelderly handicapped ambula-

tory (neHa), and

4. Nonelderly handicapped nonambulatory (neHa).

The target populations were also defined by three geographical subareas as follows:

1. Urban Kentucky (Uk), which included the city of Louisville and Jefferson County;
2. Rural Kentucky (Rk), which included six rural counties in Kentucky; and
3. Urban Indiana (Ui), which included two small urban and rural counties in Indiana.

This produced a four by three target group matrix, i.e., twelve cells or target groups to be sampled and surveyed.

Both surveys were performed by telephone interviews from a central location. Sampling procedures were used. The samples for the census survey were drawn on a systematically random geographical basis from city directories in urban areas, and from telephone directories in rural areas, employing random number tables. The resulting sample of elderly and handicapped people was therefore a random sample of each geographic subarea that was statistically valid.

The census survey was designed to produce results with a 95 percent confidence level with a bound on the error of es-

timate of ± 5 percent. This required completing approximately 380 household interviews for each of the three geographic subareas, amounting to a total of about 1,150 interviews.

Small sampling techniques were employed for the travel survey with the intention of completing 30 interviews per target group or cell, or a total of 360 interviews. Sampling for the census survey was completed as designed, and elderly and handicapped people willing to participate in the travel survey were found for all of the twelve cells, except that the three cells of the neHa category were not filled. Therefore, agency client lists were used in an attempt to fill these three cells. After all attempts had been exhausted, only 36 samples were found for this population subgroup (and only four for the rural Kentucky cell). This appears to indicate that there are fewer younger nonambulatory people within the region than originally expected.

Statistically valid results were achieved for the total census survey, and for at least nine of the twelve cells for the total travel survey. (Results of the neHa category as a whole within the region are sufficiently accurate that statements may be made regarding transportation needs and problems of people in this category, but only for the region as a whole.) The bounds on the error of estimation at a confidence level of 95

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percent for the census survey were ± 4.9 percent for Uk. ± 4.8 percent for Rk. and ± 5 percent for Ui. The bounds on the error of estimation for the travel survey at a 95 percent confidence level were totally acceptable for nine of the twelve cells, reasonably acceptable for two of the three neHna cells (Uk and Ui), but unacceptable for cell neHna — Rk. However, statistical reliability was achieved for each geographic subarea and each population subgroup.

The census survey results giving the proportions of elderly and handicapped people within the population of the entire nine-county KIPDA region are shown in Table 1.

**TABLE 1
PERCENTAGES OF ELDERLY AND
HANDICAPPED WITHIN KIPDA REGION**

Population Subgroup	Percent of Total Population
Enh	11.8
Eh	4.6
neHa	2.5
neHna	0.3
Total target population	19.2
Total nontarget population	80.8
Total	100.0

**TABLE 2
AVERAGE ROUND TRIPS PER PERSON
PER MONTH**

Population Subgroup	Actual (made)	Latent (desired)	Total Demand (actual and latent)
Ehn	21.4	0.5	21.9
Eh	15.3	1.9	17.2
neHa	24.3	5.1	29.4
neHna	17.0	6.6	23.6
Totals	19.9	2.9	22.8

Table 2 presents the results of the travel survey showing trip rates for elderly and handicapped people within the region.

The trip rate variation by geographic subarea was insignificant.

Results of the travel survey may be used to make certain statistically valid statements about the travel characteristics, needs, and problems of the elderly and handicapped in the KIPDA region, for example, statements about their trip rates.

A further check made on the statistical validity of samples selected from the census survey and from agency lists showed the average weekly trip rates of agency and nonagency samples to vary from the mean of the total by only +5 percent and -2 per-

cent, respectively, showing no significant difference between agency and nonagency samples. All elderly and handicapped people interviewed in the travel survey appeared to have similar transportation needs and problems.

“All elderly and handicapped people interviewed in the travel survey appeared to have similar transportation needs and problems.”

Results of the survey of transportation needs and problems of the elderly and handicapped in the KIPDA region were used by KIPDA staff to analyze needs, prepare alternatives, and recommend actions for improved transportation services. **END**

Transportation Needs of the Elderly in Kentucky

James M. Brockway, Director, Population Research Unit
Urban Studies Center, University of Louisville, Louisville, KY
Tanya K. Brockway

Transportation provides an important function to link people and community life. Research has shown that the availability of transportation is related to higher levels of participation in voluntary associations (Cutler, 1974), use of health and social services (Bell and Olsen, 1971), and the quality of later life (Cutler, 1972; Cutler, 1975). Moreover, problems with transportation are associated with frequent loneliness (Kivett, 1979); a recent study (Stirner, 1978) found that a significant number of older people need additional transportation.

Survey in Kentucky

A statewide needs assessment survey of older people in Kentucky was made in 1978, and the results confirm those of the studies mentioned above. A total of 570 noninstitutionalized people between 60 and 95 years of age were interviewed in their homes during a three-month period. The respondents were selected using a three-staged area probability sampling design stratified by three geographical regions. Each person selected was administered a questionnaire which took approximately 75 minutes to complete.

The median age of the sample was 69.4 years. Women comprised 57.9 percent of the sample and men 42.1 percent. The majority of respondents (92.1) were white.

The interview schedule covered several aspects of transportation: objective need; perceived need; barriers to use of transportation services; frequent modes of transportation used; program usage; and sociodemographic measures.

Sociodemographic variables included age, sex, total household income, length of residence, marital status, race, living arrangement (alone or with others), disability status, perceived health status, telephone in household, and the number of times in the average week spent talking with family, neighbors, and friends in person and on the telephone. Age was classified into four categories: 60-64, 65-69, 70-74, and 75 years and over. Income was categorized into low (\$3,999 and under), medium (\$4,000 — \$5,999) and high (\$6,000 and over). Length of residence was classified into one year or less, one to three years, four to six years, and seven or more years. Area of residence consisted of the following categories: on a farm; in the country (but not on a farm); in a town or small city (of less than 25,000 people); in a city (25,000 to 99,999 people); in a suburb of a large city; and in a large city (100,000 or more people). Life satisfaction was measured by the LSIZ scale (Wood, Wylie, and Sheafor, 1969).

Chi-square statistical analysis was applied to the data. Contingency coefficients

were used to examine the relative strengths of the relationships.

Results

The results of this study indicated that the majority of the elderly had use of vehicles owned by some member of the household (72.4 percent). People who were married, lived with others, had higher incomes, were younger, and lived in non-metropolitan areas were more likely to have vehicles in the household.

Although the incidence of household vehicle ownership was high, 33.7 percent of the elderly who lived in households which had a vehicle did not drive or were unlicensed. Older people who were more likely never to drive or be unlicensed included women, minorities, low-income elderly, disabled, those who perceived their health negatively, and those who were 70 years of age and older. However, the household vehicle was usually available when the respondent needed to go somewhere, thus suggesting that a household member provided the needed transportation.

Taxicab service was unavailable for a significant proportion of the elderly population (42.9 percent). This was particularly the case for older people living on farms and in the country.

Similarly, public transit was unavailable for a large number of the elderly (75.6 per-

cent). Of those who did have public bus service available in their areas, 53.8 percent lived less than one block from the nearest bus stop, while 33.1 percent lived more than three blocks from the nearest bus stop.

Bus service met the needs of the elderly to a certain extent; 53.9 percent of those people for whom bus service was available could take a bus to all or most of the places they wanted to go, although 21.1 percent could not use the bus to get to any of such places. However, public transit was less likely to meet the transportation needs of women, minorities, those who rated their health negatively, the disabled, and the older elderly population.

Respondents were asked if they felt safe using public transit during the day and at night. While the majority of people felt safe using the bus during the day (69.6 percent), a significant proportion of older people (59.6 percent) did not feel safe using public transit at night. The disabled, women, low-income elderly, people who rated their health negatively, and the older elderly population tended to be more likely to feel unsafe.

Riding with family members was mentioned by a significant number (69.6 percent) as a mode of transportation often used. The people who were more likely to ride with a member of the family were women, disabled, low-income elderly, resi-

dents of nonmetropolitan areas, and people who perceived their health negatively.

Nearly one-half of the respondents (47.2 percent) mentioned driving a car as a frequent mode of transportation. Men, the nondisabled, the married, the high-income elderly, the younger elderly population, people who perceived their health optimistically, those living with others, and residents of suburbs, towns or small cities, and the country were more likely to be drivers.

The findings show that 44.4 percent of the respondents rode with friends as a frequent mode of transportation. People who were unmarried, living alone, without vehicles and living in midsize cities, towns or small cities, and in the country were more likely to frequently ride with friends.

Walking was another means of transportation. More than one out of three older people (34.4 percent) frequently walked. Men, people without vehicles, and people living in midsize cities, large cities, and in towns or small cities were more likely to walk frequently.

One out of five older people (20.2 percent) frequently paid someone for transportation. Those who were more likely to pay someone as a frequent mode of transportation included people without vehicles, the unmarried, the disabled, those who rated their health negatively, the low- and middle-

income elderly, and residents living in the country, and in large and midsize cities.

Taxicab service was frequently used by more than one out of ten older people (12.6 percent). Taxi users included the unmarried, the low-income elderly, those without household vehicles, and those living alone in cities or towns.

Even fewer older people used public transit frequently (6.7 percent). Transit riders were more likely to be unmarried, live in households without vehicles, live alone, have no disability, belong to a minority, and live in large and midsize cities.

Only 1.8 percent of the elderly frequently called a government or social worker for transportation. In this small group were women, the disabled, the unmarried, people with low incomes, people living alone, and people without a vehicle.

The majority of respondents were not aware of special transportation programs in their area (64.4 percent), although these programs actually existed in the majority of counties in the state. People who had frequent contacts with family and friends, had telephones, had lived at their present address for more than one year, and who had no difficulty going places because of adequate transportation were more likely to be aware of special transportation programs for the elderly.

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The findings indicated that 62.7 percent of the people who were unaware of special transportation programs would have used the programs if they had been available. Potential users of the programs were more likely to have no household vehicle, be disabled, have low incomes, live in large cities and in the country, and to perceive their health negatively. However, several reasons were given for not using them; the major reasons were attributed to the lack of need.

Only a small number of people actually used the programs; just 12 percent of the people who were aware of the programs, actually made use of them. Users tended to have no household vehicle, to live alone, to have low incomes, and to be in the most elderly group. Although the programs were not widely used, they were well received by the elderly who did use them.

A significant proportion of the elderly (23 percent) expressed difficulty going places due to the lack of transportation. Moreover, not less than one-third of this group had difficulty going to the doctor, drugstore, clinics, government offices, church services, shops, the homes of friends and relatives, and nutrition sites.

The major barrier cited by these people was that there were not enough transportation services. The second most frequently mentioned barrier was cost. One-third of the

respondents who had difficulty going places stated they did not understand how to use the services. Other barriers cited were connected with the respondent's health.

The relationship between transportation and life satisfaction was examined. It was found that household vehicle ownership was related to life satisfaction. That is, people who lived in households with vehicles tended to have high life satisfaction.

In addition, perceived transportation needs were related to life satisfaction. People who had no difficulty going places because of adequate transportation were more likely to have high life satisfaction scores.

Implications

The results of this study point out an interesting paradox. While the majority of people were unaware of special transportation programs (64.4 percent), the data suggest that the people who were aware appeared to be those who needed the services less, and tended to be those who reported no difficulty going places because of adequate transportation.

The data also demonstrate that a significant proportion of the elderly need additional transportation. Nearly one out of four older people had difficulty going places due to the lack of transportation. Again, women,

the disabled, the unmarried, the low-income elderly, those in poor health, and the "old-old" were more likely to report transportation difficulties. While these same subgroups were also more likely to make use of alternate support networks and other modes of transportation, apparently these alternatives were inadequate. Moreover, those who had difficulty going places had difficulty going to both "essential" and "nonessential" services.

“ . . . the data suggest that the people who were aware [of special programs] appeared to be those who needed the services less . . . ”

Furthermore, the most frequent barriers mentioned were not enough transportation services and the high cost of existing services. Health problems and lack of understanding how to use the services were also significant barriers.

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The results of the study have implications for future planning.

1. A significant number of older people need additional transportation.
2. A large number of older people depend upon their families for transportation. However, there is a need to consider the influence of future demographic trends. The trends show that the size of families is decreasing, the size of the elderly population is increasing, and the older elderly population is increasing rapidly. Thus, the adult children of the older elderly are themselves entering the elderly category and must cope with problems similar to those their parents are experiencing, and there will be fewer children to seek assistance from in the future.
3. The elderly need flexible transportation which will pick them up at their door and take them to their destination.
4. Many older people are unaware of special transportation. Thus, it is important for providers of transportation to advertise their programs. However, such advertisement should not only be in writing, since 12.6 percent of the sample could not read.* Some form of outreach would help. Newcomers to the area

were less likely to be aware of the programs, and those who moved frequently were more likely to have low incomes, be disabled, and be unmarried.

Awareness of the programs were related to having a telephone. However, 14.4 percent of the elderly in this study did not own telephones, and those without phones tended to have low incomes, live alone, and reside either in the country or large cities.

5. Users were more likely to be those with high need. The small number of older people who were aware of, and actually used, the programs, evaluated them favorably. **END**

Assessing Ridership Eligibility

Carolyn DelGiudice, Executive Director
 Central Maryland Area Agency on Aging, Eldersburg, MD
 Annette J. Spear, District Director
 Annapolis Family and Children's Society, Annapolis, MD

The 1978 amendments to the Older Americans Act bar the administration of a means test based on income or other measurable status indicators as a criterion for receiving services funded under the Act. The Congressional intent was to assure service to older people who may have sufficient income or assets to pay, but who have various social or emotional needs associated with the aging process. The act places a great deal of responsibility on Area Agencies on Aging (AAA) to establish community service priorities. Therefore, implicitly, the AAA is charged with establishing client priorities. By federal mandate, the eligibility criteria must not be rigid or specifically measurable. On the other hand, professional experience indicates that unless service limitations are clearly defined and applied equitably, client preference patterns emerge, and agencies may be charged with discriminatory screening practices.

The Central Maryland AAA has developed an agency intake procedure of administering a worksheet which identifies a hierarchy of needs to be used to limit rural, call-demand transportation services without the use of traditional income-based eligibility criteria.

A simple Rider-Profile form to be administered to each new client calling to request minibus transportation in a rural

county was developed. This intake system is used in a countywide, multipurpose senior center located in an area with approximately 12,900 people 60 years of age and over. Many of these people are able to drive or have other means of transportation. The majority of the service users are affiliated with the senior center, comprising a small percentage of the total population over 60.

“... the transportation service may be the only contact an older person has with a helping agency.”

The form consists of 14 “rider need indicators” divided into three major categories: 1) destination, 2) social indicators, and 3) urgency. A numerical rating is assigned to each indicator; the sum of the indicators is a ranking score. The highest possible score is 65, indicating clients with the highest priorities.

The indicators are as follows:

Destination

1. Client requires medical or dental examination or treatment. **1 2 3 4 5**
2. Client requires transportation for household maintenance. **1 2 3 4**
3. Client requires transportation for personal care. **1 2 3 4 5**
4. Client requires transportation for recreational activities. **1 2 3**

Social Indicators

5. Client lives alone. **1 2 3 4**
6. Client indicates history of problems requiring agency intervention. **1 2 3 4 5**
7. Client expresses difficulty in community or family relationships. **1 2 3 4 5**
8. Client has mobility or physical difficulties. **1 2 3 4 5**
9. Client has difficulty orienting to time and place. **1 2 3 4 5**
10. Client is aged 60 or over. **5**

Urgency

11. Client does not operate personal vehicle. **5**
12. Client has limited access to community or family transportation resources. **1 2 3 4 5**
13. Client has emergency which cannot be met by other resources. **1 2 3 4 5**

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14. Client has ongoing need which cannot be met by other resources.

1 2 3 4

It is acknowledged that value judgments regarding the urgency of need for transportation are implicit in the ranking system. These value judgments are reflected in the instructions to the person administering the form.

For example, physician's appointments receive higher rating than dental, unless the situation is acute. Higher ratings are to be given for office treatment visits and lower ratings for general check-ups.

Highest ratings are to be given to shopping for food and other activities, which must be negotiated in person, as opposed to payment of bills or making bank deposits by mail.

The highest rating in the personal care category (Item 3) is for food at nutrition sites. If the meal site is attended mainly for socialization, the rating is lower. Higher ratings should be assigned to counseling or appointments with a social worker than for visits to a beauty or barber shop.

In recreation, highest ratings should be assigned to a client living in a socially isolated environment, for example, a remote rural area, or a new tenant in a large urban apartment complex.

For the category in which "client indicates history of problems requiring agency

intervention," the worker needs to ascertain general emotional state of the client for indication of highest rating. Similarly, when the "client expresses difficulty in community or family relationships," the worker needs to ascertain the client's anxiety level.

If the client indicates difficulty orienting to time and place, a rating should be assigned according to degree of impairment perceived by the worker during the telephone conversation.

When a client has limited access to community or family transportation resources, the highest rating denotes highest degree of limitation. If a client is able to take public transportation, or lives with family who have a car, the appropriate rating is **1**.

In emergency situations, the worker must assess the nature of the emergency, e.g., a medical emergency is rated **5**.

Higher scores are assigned for ongoing needs of a more critical nature, such as regular medical clinic appointments; lower scores are assigned to regular visits to a beauty shop or for recreational activities.

The Rider Profile data is collected by the dispatcher, who is instructed to follow the form as closely as possible, but to use general interviewing techniques and to avoid confronting the client with a specific item. The dispatcher is limited by the instruction and may not, for example, arbitrar-

ily decide that a routine dental check-up rates higher than a medical emergency. However, the dispatcher must exercise considerable judgment in ascertaining the degree of a client's disorientation.

When the Rider Profile form is completed, it is maintained in a file along with other information regarding that client, for example, directions to the home. Whenever possible, the dispatcher is trained to schedule transportation for the client, and not deny service unless vehicle limitations prohibit the trip at the time requested. The dispatcher is to deny service only when 1) there is a very low score, i.e., indication of minimal need, and 2) a vehicle is not available. In addition, the dispatcher must reschedule a vehicle if a client receives a very high score, e.g., in an emergency. The dispatcher uses the information obtained to deny repeated requests for inappropriate service, where documentation of the rationale for denying service is indicated.

It should be emphasized that the form is used as an intra-agency worksheet, and as a method of systematizing information and assuring consistency among transportation dispatchers within an organization. It is designed as an indicator of priorities for the dispatcher, not as a "pass — fail" scorecard for the client.

NEEDS ASSESSMENT

The Role of the Dispatcher

Meeting the needs of the older people calling for service is contingent upon the interviewing skill of the dispatcher. The requests do not come always from senior center members: the transportation service may be the only contact an older person has with a helping agency. The dispatch worker is, in fact, often performing general agency intake. Frequently clients request service for which they are not eligible. The worker must effectively interpret the program to the client and render a clinical judgment in diagnosing the client's unexpressed need. The worker then must, in some instances, alleviate the client's anxiety and make an appropriate intra- or interagency referral. Often the worker uncovers a problem beyond the need for transportation. The worker must be sufficiently professional to intervene and suggest services. It is most important that the worker have sufficient knowledge of community resources in order to help the client. In short, the dispatcher often must exercise a high degree of professional judgment in what would appear to be a routine administrative function; the worksheet is only a guide.

Agency Impact

To employ a dispatcher with sufficient social work skills to interview clients and effect differential diagnosis and proper

referral could be costly. The pilot work with the rider profile was done by a dispatcher who had had two years of college courses in the social sciences. More frequently, an agency dispatcher has less than a high school education. Frequently, the dispatcher may be a public service employee in the CETA program whose employment is terminated shortly after being trained.

There are also intra-agency organizational issues. Traditionally, dispatchers are supervised by administrative rather than social work personnel. Training in interviewing techniques, short-term casework, social gerontology, and management can be helpful but cannot substitute for qualified backup staff in the event of a crisis call. In addition, the dispatcher should have weekly case consultations with intra-agency social service staff, or an outside consultant. Proper professional support is critical to assure that all clients contacting the agency receive proper intake.

Service Network Impact

Neither the Older Americans Act nor UMTA programs were structured legislatively to be administered by established social service agencies. Transportation services for the aging are frequently administered by the staff of locally elected officials; UMTA programs are administered by a wide variety of host agencies with varying

degrees of transportation expertise. In effect, everyone is inexperienced in administering transportation for specialized populations.

The Central Maryland Area Agency on Aging had to recognize that what at first appeared to be a simple administrative task of ranking client requests created the need for a philosophical reorientation of the agency's perception of the dispatcher's function. The specialized role of this key staff person must be acknowledged in order to offer a more effective resource to the people served.

END

Evaluating Transportation Services for the Elderly and Handicapped

John C. Falcocchio, Associate Professor
Department of Transportation, Planning and Engineering
Polytechnic Institute of New York, Brooklyn, NY

A study to evaluate transportation services in Manhattan's lower East Side was conducted. The area contains a population of approximately 182,000 people, of whom 20,000 are above 65 years of age, and 5,000 are handicapped. For the purpose of the study, elderly people were defined as those 60 years of age and older, and physically handicapped people were categorized into three groups: 1) those who used wheelchairs, 2) those who were able to walk up or down steps only with severe difficulty or with the help of another person, and 3) those who could walk up or down steps unaided, although only with some difficulty. Blind people and people who were confined to the home because of ill health were excluded from the study.

In a personal interview, each person in a sample of 126 elderly and handicapped users (36 men and 90 women) was asked to evaluate the transportation services available in the lower East Side. The modes of transportation were EASYRIDE, a fully accessible service available to residents aged 65 and over and the handicapped; ambulettes, which are vans providing medically-related trips for the handicapped; the city transit services (buses and subways); and taxis.

The evaluations were made by rating variables having to do with convenience,

comfort, safety, and cost. The following variables were used:

1. waiting (seated or standing) time;
2. walking distance;
3. ease of vehicle entry or exit;
4. service reliability;
5. ride quality:
 - a. heating and ventilation,
 - b. noise,
 - c. sudden stops and turns,
 - d. shaking and vibration,
 - e. fear of falling,
 - f. fear of muggings; and
6. fare.

The respondents were asked to 1) rate the variables for each transportation service and 2) rank the variables in order of importance. This ranking was then converted into weights by linear transformation. Table 1 summarizes the importance (number of points out of 100 points) of each variable, as determined by each of six user subgroups based on age-handicap combinations. The abbreviations for these subgroups are as follows:

- EWC = Elderly and using wheelchairs (n=20),
ES = Elderly with severe difficulty in climbing stairs (n=31),
EM = Elderly with minor difficulty in climbing stairs (n=13),

NEWC = Nonelderly and using wheelchairs (n=25),

NES = Nonelderly with severe difficulty in climbing stairs (n=13), and

NEM = Nonelderly with minor difficulty in climbing stairs (n=11).

It was found that each subgroup rated the variables in a different way. The relative weight (importance) of each variable also differed from one subgroup to another (see Table 1). These findings led to the development of a methodology for the evaluation of services which takes into account the unique needs and preferences of each user subgroup.

Evaluation Methodology

The information about the users' perceptions of the variables of various transportation services can be used to develop measures of service usefulness. Overall service usefulness may be calculated by summing up the products of the rating and weight of each subattribute describing each of the transportation services available to the user. The ratings range from 1 to 5, with the higher number indicating greater satisfaction. The weight (Table 1) refers to the importance the user places on each subattribute.

**TABLE 1
WEIGHTING OF COMFORT, CONVENIENCE, SAFETY, AND COST VARIABLES**

Variable	Wheelchair Users		Severe Difficulty in Climbing Steps		Minor Difficulty in Climbing Steps	
	Elderly	Nonelderly	Elderly	Nonelderly	Elderly	Nonelderly
Heating and ventilation	8.2	7.6	4.6	6.5	6.6	5.4
Noise	8.3	6.8	6.8	6.4	6.5	8.9
Sudden stops, turns, etc.	10.2	10.9	6.8	4.7	8.0	6.5
Having a seat	N/A	N/A	14.9	11.9	13.4	14.2
Reliability	12.7	11.7	9.9	9.5	8.5	9.4
Waiting time	10.7	10.5	9.1	9.5	8.7	9.2
Transfers	6.3	6.6	4.9	6.3	5.4	1.4
Ease of getting on and off	13.5	9.9	10.8	10.6	7.0	9.9
Walking distance	3.4 ¹	5.1 ¹	13.2	13.7	11.2	11.7
Fear of falling	12.6	12.7	8.2	8.6	8.6	9.4
Fear of muggings	5.0	7.6	3.7	5.7	8.7	6.5
Fare	9.1	10.6	7.1	7.6	7.4	7.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

¹Distance covered by wheelchair

To allow comparisons among services requiring different activities and having an unequal number of activity requirements,

the overall service usefulness value must be divided by the number of activities required in the use of each service. Thus average

service usefulness is calculated as

$$\text{Equation 1: } U_s = \frac{1}{n} \sum_{i=1}^n r_{ij} \times w_{ij}$$

where: r_{ij} = rating given subattribute i by user group j ,
 w_{ij} = weight given subattribute i by user group j , and
 n = number of subattributes in the service.

To illustrate the application of Equation 1, the travel taking place between a senior citizens' housing facility (Baruch House) and a senior activity center (Educational Alliance Center) was assessed. These two points are served by bus, taxi, EASYRIDE, and ambulette if paid by the user.

Bus travel between these two points requires the following three physical activities:

1. A walking distance of 1200 feet from the Baruch Houses to the bus stop,
2. A transfer from one bus route to another, and
3. A walking distance of 800 feet from the bus stop to the Educational Alliance Center.

“...for any given age/handicap mix, the usefulness of service increased with the level of personal attention given the traveler.”

Taxi (hailed) travel requires:
A walking distance of 450 feet from the Baruch Houses to the street.

Taxi (phoned), EASYRIDE, and ambulette travel requires:

A walking distance of less than 50 feet.
Based on this information, the following allocations of people-to-service were made:

Bus service: could only be used by those in the EM and NEM categories.

Taxi service (hailed): could only be used by those in the EM and NEM categories.

Taxi (phoned), EASYRIDE, and ambulette services: could be used by those in the EWC, NEWC, ES, and NES categories.

**TABLE 2
USEFULNESS OF SERVICES CONNECTING BARUCH HOUSES TO
THE EDUCATIONAL ALLIANCE CENTER (ROUND TRIPS)**

Existing Services	Subgroup by Age-Handicap					
	EWC	NEWC	ES	NES	EM	NEM
Existing bus service (off-peak)	0	0	0	0	28.4	33.0
Taxi (hailed)	0	0	0	0	31.8	34.8
Taxi (phoned)	30.9	29.3	36.6	37.4	33.5	37.0
Ambulette	34.3	33.9	39.6	39.7	N/A	N/A
EASYRIDE	39.8	37.3	38.5	39.2	35.5	41.4

Using Equation 1, one could calculate the usefulness of each type of transportation service for each category of age/handicap mix. A summary of results is shown in Table 2. We can see that trip usefulness varied with the traveler’s characteristics and the characteristics of the service.

Bus service was of no use to those in a wheelchair or with severe mobility prob-

lems. The elderly with minor problems in climbing steps (EM) experienced a lower usefulness with the bus than those who were younger (NEM). The trend indicated that for any given age/handicap mix, the usefulness of service increased with the level of personal attention given the traveler. In this regard, ambulette and EASYRIDE yielded similar results. **END**

Impact of a Demand-Responsive Transportation System

Joan M. Walker, Transportation Systems Analyst
Multisystems, Inc., Cambridge, MA

UMTA's Service and Methods Demonstration (SMD) Program has sponsored a number of projects to test innovative approaches for improving the quality, quantity, and efficiency of mass transportation services. The goal of many of these demonstrations was to make public transportation accessible to the elderly and handicapped. A recent study by UMTA examined the impact of various SMD projects on travel behavior. Analysis of the results of three service concepts — demand-responsive specialized service, user-subsidized taxi service, and wheelchair-accessible bus — revealed that none of the transportation service improvements had an impact on the overall number of trips made by the elderly and handicapped. The findings of the study described below show that one particular demand-responsive system is having a substantial impact on the mobility of its users.

CRT Service

In the spring of 1979, survey research was carried out in the greater Cleveland, Ohio metropolitan area to assess the impact that the Community Responsive Transit (CRT) system, a demand-responsive service for elderly and handicapped people, was having on the mobility and life-style of its users. Two surveys, one of CRT users and one of eligible nonusers, were con-

ducted to collect data on the travel behavior, transportation handicaps, amount of transit dependency, choice of mode, and socioeconomic characteristics of the total eligible population numbering between 200,000 and 225,000 people.

In 1975, a joint SMD and HEW demonstration project offering door-to-door service for the elderly was implemented in three inner city neighborhoods of Cleveland. At the end of the one-year demonstration period, the Greater Cleveland Regional Transit Authority (RTA) decided to assume

“ . . . three-fourths of the users responded that they were enjoying life more as a result of being able to travel on CRT.”

the operation of the demand-responsive system, expand it, and offer the service to elderly and handicapped passengers as an alternative to fixed-route buses. Currently, CRT, with a fleet of over 70 vehicles, serves all of Cuyahoga County, an area which covers 456 square miles and includes over 1.7 million people. Ridership has grown

steadily over the three years that RTA has operated the system, and as of August 1979, CRT was providing over 33,000 passenger trips per month.

CRT offers 24-hour advance notice off-peak service six days a week. The service is free for all clients and no restrictions are imposed with regard to trip purposes. Although CRT service is offered throughout the county, clients may travel only within their own service zones, of which there are 18 ranging in size from six to over 100 square miles. A computer-aided reservation system is used to schedule each vehicle's route for the following day. A local taxi company provides about one-third of the service.

Methodology

To compare CRT users with eligible nonusers, 552 telephone interviews were conducted. A random-digit dialing technique was used to locate the nonusers. Each sample was stratified into two subgroups, the more able-bodied elderly, and the handicapped. A simplified set of functional criteria designed to measure the difficulty one experiences in riding a regular bus was established to identify people who were transportation-handicapped. A relatively narrow definition of the handicapped was used which equates this subgroup with “severely handicapped” people in other

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studies. Over 95 percent of people classified as transportation-handicapped had a substantial physical disability which caused them difficulty in riding the fixed-route bus. All other people interviewed, including those who experienced some difficulty in riding a regular bus, were placed in the elderly group. Using these arbitrary definitions, the screening process revealed that about 50 percent of the CRT users, and about 34 percent of the eligible nonusers, were transportation-handicapped.

Findings

Findings from previous studies have shown that only a small percentage of a target group will choose to use a new service or a service improvement which makes it possible for them to use public transit.

The CRT system is currently serving such a group. Even though CRT is making 33,000 passenger trips per month and offers free general purpose transportation, the number of users is estimated to be only between 3000 and 4000. This group comprises only one to two percent of the eligible population. Since both users and eligible nonusers were interviewed, the profile of the CRT users can be compared with the larger target group of all elderly and handicapped people, or nonusers. The differences between these two profiles are as great as the differences between all elderly and handi-

TABLE 1
COMPARISON OF SOCIOECONOMIC CHARACTERISTICS

Characteristics	General Urban Population (percent)	Eligible Population (CRT Nonusers) (percent)	CRT Users (percent)
Sex			
Male	48	42	12
Female	52	57	88
Age			
25	43	2	2
25-44	26	3	2
45-64	20	9	12
65-74 } 75 }	11	55	41
75 }		31	42
Income			
\$4000	15	21	51
\$4000-\$6000	11	19	19
\$6000-\$10,000	11	18	8
\$10,000	63	16	4
Refused		20	9
Don't know		6	9
Live alone	16	33	64
Licensed to drive	64	53	16
Autos in household			
None	16	37	87
One	48	47	10
Two or more	36	16	3

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capped people and the general population. Just as the elderly and handicapped population is distinguished from the general population by owning fewer automobiles, having lower incomes, being older and mostly female, having a higher incidence of physical disability, and having lower mobility rates, the CRT study found that the group of CRT users has characteristics in common which distinguishes it from the larger target group of which it is a subset.

Table 1 makes comparisons among the socioeconomic characteristics of the three groups: the general population, the elderly and handicapped, and the subset of elderly and handicapped people who preferred to use specialized transportation. The data revealed that, compared with the eligible nonuser population, the users were older, more dependent on transit, and had a lower income and a smaller household.

The subset of users, listed in the third column of Table 1, was divided into elderly users and transportation-handicapped users. The statistics for these groups are presented in Table 2.

These statistics demonstrate only part of the mobility problem experienced by CRT users. Only three percent of the users had access to a car to drive themselves. Forty-eight percent of them either could not perform, or had great difficulty performing, one or more of three tasks required to ride a

**TABLE 2
COMPARISON OF SOCIOECONOMIC
CHARACTERISTICS OF ELDERLY AND
TRANSPORTATION-HANDICAPPED USERS**

Characteristics	Elderly Users	Transportation- Handicapped Users
	(percent)	
Sex		
Male	8	16
Female	92	84
Age		
<25	N/A	3
25-44	N/A	5
45-64	2	22
65-74	54	28
>75	44	42
Income		
<\$4000	45	57
\$4000-\$6000	23	16
\$6000-\$10,000	9	6
>\$10,000	4	3
Refused	12	6
Don't know	7	12
Live alone	64	64
Licensed to drive	20	11
Autos in household		
None	91	83
One	8	13
Two or more	1	4

regular bus, i.e., walk two to three blocks, stand more than 10 minutes, get on or off a bus. Without CRT, many users would have had to depend on others for transportation; for some this was not a feasible alternative. About one-quarter of the users reported that they had no family or friends who ever drove them places.

A major finding of the study was that the CRT system had a substantial impact on the mobility of its users. Because they virtually lacked access to automobiles as drivers, and because travel on foot or bus was difficult for many of them, they chose CRT as their preferred mode. In the survey, a trip log was compiled for each user and each non-user which listed information about each trip the person had made over the past three days. The data revealed that nearly half of all trips made by users were made on CRT, and only two percent were made by driving. The transportation-handicapped subsample relied on CRT for an even higher percentage of its trips. In contrast, the nonusers made over half their trips by driving. A taxi was used for a surprisingly low number of trips for each sample.

The trip logs were used to compute the average mobility rates of the two groups. Even with the availability of a free door-to-door service, the average trip rate of the CRT users was found to be substantially lower than the trip rate of the nonusers, and

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substantially lower than the rate of transportation handicapped people nationwide. The nonusers' trip rate was four percent higher than the rate of CRT users.

To assess the impact CRT has had on the mobility of its users, an analysis was performed which combined data from the three-day trip log with data collected in a second log, one which recorded information on all trips taken on CRT over a two-week period. This second log was useful in revealing how, or if, users would make trips now made on CRT if the service were not available. The results of the analysis indicate that CRT has had a great impact on the mobility of the users. The trip rate of handicapped users was shown to have increased by 66 percent and the rate of the elderly, by 20 percent.

Since the methodology used to compute these impacts depended upon the users' perception of how they would have made each recent CRT trip if CRT were not available, some bias was introduced and the impacts reported are probably higher than the true increases. However, even if we assume a large margin of error, the increases are substantial. For example, if we assume that the users overstated their lack of alternatives by 50 percent, the percent increase for the handicapped group is 36 percent, and for the elderly group is 16 percent.

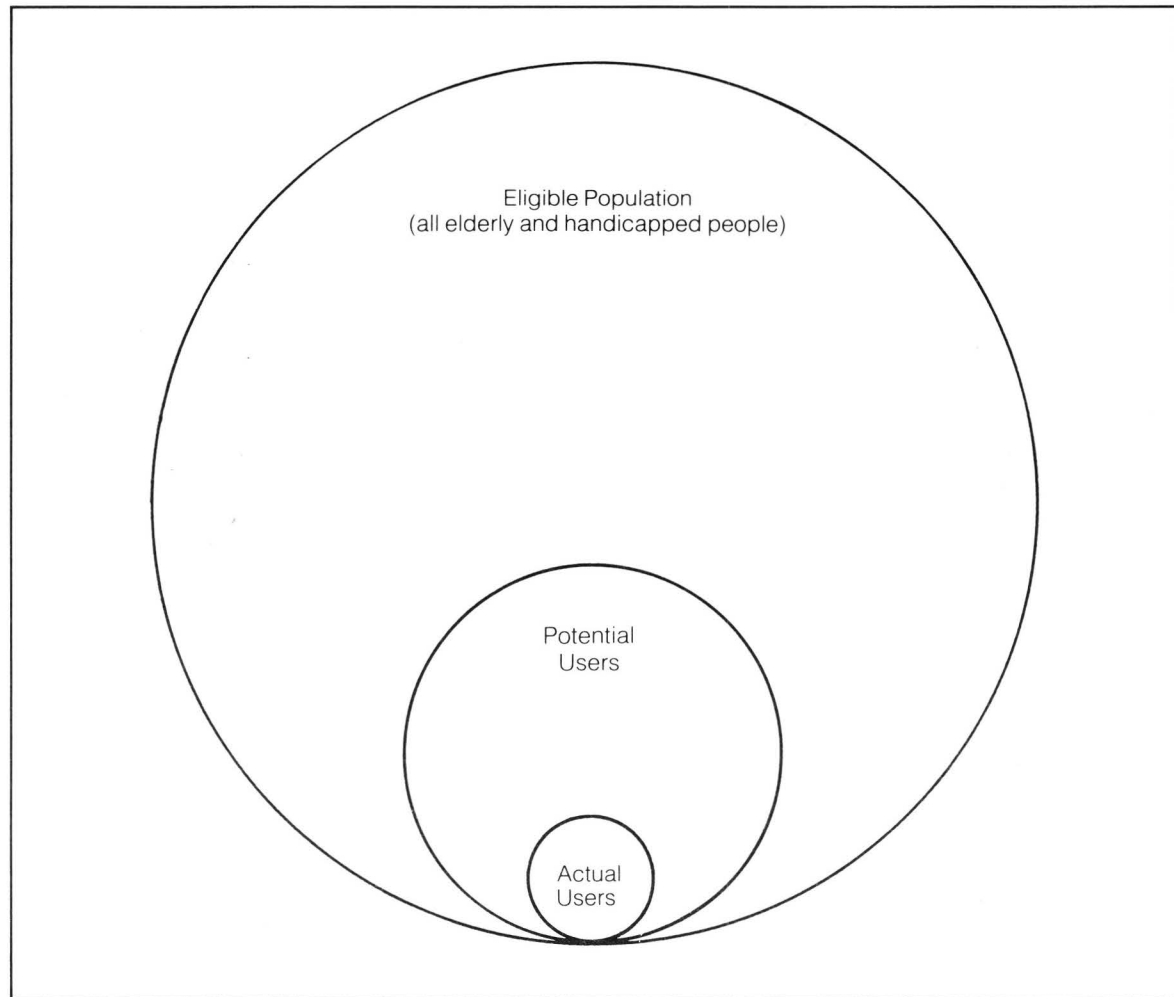


Figure 1. Actual and Potential Users Compared with Total Eligible Population

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Although the absolute increase in the daily trip rate was small, the impact of this small change, and other benefits of the system on the lives of the users, was great. The availability of a reliable source of transportation enabled CRT clients to feel less dependent on others, to enjoy greater flexibility, and to experience less physical difficulty when traveling. These benefits, however, were not the features of the system which were most highly rated. The courtesy and helpfulness of the drivers received the highest rating in the users' evaluations. One possible explanation for this is that CRT offers more than a means of transportation; the personal aspect of the service has an impact on the social lives of the users. The importance of this impact can be appreciated by noting other results of the study which relate to social interaction. Sixty-four percent of the users lived alone. Fifty-four percent reported that they did not go on social or recreational trips, although some of them went to senior centers. Twenty-three percent neither had a car nor had any friends or relatives who ever drove them places. Another forty-one percent were driven places only once a month or less.

It appears then that the availability of transportation is crucial to social interaction. The importance of the role played by CRT in providing this basic ingredient was summed up when three-fourths of the users re-

sponded that they were enjoying life more as a result of being able to travel on CRT.

The approach taken in this study was to measure the impact of the CRT system on the mobility of the users rather than on the mobility of the aggregate target population. The users characterized the true transit-dependents, a group which comprised only a small subset of the total elderly and handicapped population. (See Figure 1.) The survey revealed that only 15 to 25 percent of the eligible population had need for, and were interested in, using a door-to-door service. The majority had their needs satisfied by car or bus and expressed no unmet demand. In spite of a continuous marketing campaign, to date only about 10 percent of this potential market has been penetrated.

END

Evaluation of an Urban Transportation System

Jolinda Lee, Transportation Analyst, Austin, TX

Existing transportation services available to handicapped people in the Austin, Texas metropolitan area recently were evaluated in order to support further development of a transportation system that can be used effectively by all people, including those with mobility impairments. The implementation of such a system depends upon the fulfillment of the following objectives:

1. developing additional information on the composition and needs of people with mobility problems;
2. considering this group in all planning and construction phases;
3. including citizen participation in project planning and evaluation;
4. coordinating transportation services for the mobility impaired;
5. improving basic mobility for all members of this group;
6. providing accessibility to public transit services within the economic constraints of public resources; and
7. increasing the security of all transportation facilities and their users through educational programs and appropriate facility design.

The Population

A higher percentage of people with mobility problems reside in Texas (about 9.4 percent of the state population) than in the

nation as a whole (5 percent). Within the corporate limits of Austin, 7.5 percent of the noninstitutionalized population three years and older have mobility impairments. People living in dormitories and special homes not included in these census figures increase the percentage to 9 percent.

The elderly, age 65 and over, comprised 7.4 percent of the total population. From the total elderly population, one-third was assumed also to have mobility problems. The total number of people in this population subgroup has been increasing within all age groups, even though the percentage of this population compared to the total population has been decreasing. (See Table 1.)

TABLE 1
TOTAL MOBILITY-IMPAIRED
POPULATION IN AUSTIN
(Noninstitutionalized)

Age Group	1978	1980
3 - 15	1,729	1,941
16 - 64	14,611	15,003
65+	8,054	8,682
Total mobility impaired population	24,394	25,626

Mobility Limitations and Travel Needs

Over 4,200 people responded to a card survey mailed in January 1979. The survey

respondents indicated the basic disability characteristics shown in Figure 1. Just over one-fifth of them were employed, and one third of this group had part-time employment.

Most people surveyed indicated a minimal use of normal public transportation vehicles. Most trips were made by people traveling as a passenger in an automobile, with the next highest number of people driving an automobile themselves. The second choice of most who participated in the survey was travel by bus, including the public special transit vehicles. Taxicabs were also used frequently as a second travel alternative.

The quality of transportation is important for disabled people, since physical limitations may determine whether or not a type of transportation can be used. Barriers exist beyond the physical impasses caused by high steps, curbs, steep grades, and distances. There are also operational, psychological, and economic barriers. Many people in this group are not experienced in dealing with problems encountered in regular transit and are apprehensive. Examples of psychological barriers are fear of crowds, embarrassment, getting lost, asking strangers for assistance, and fear of personal safety.

Walking, or wheeling for those in wheelchairs, is an integral component of urban life

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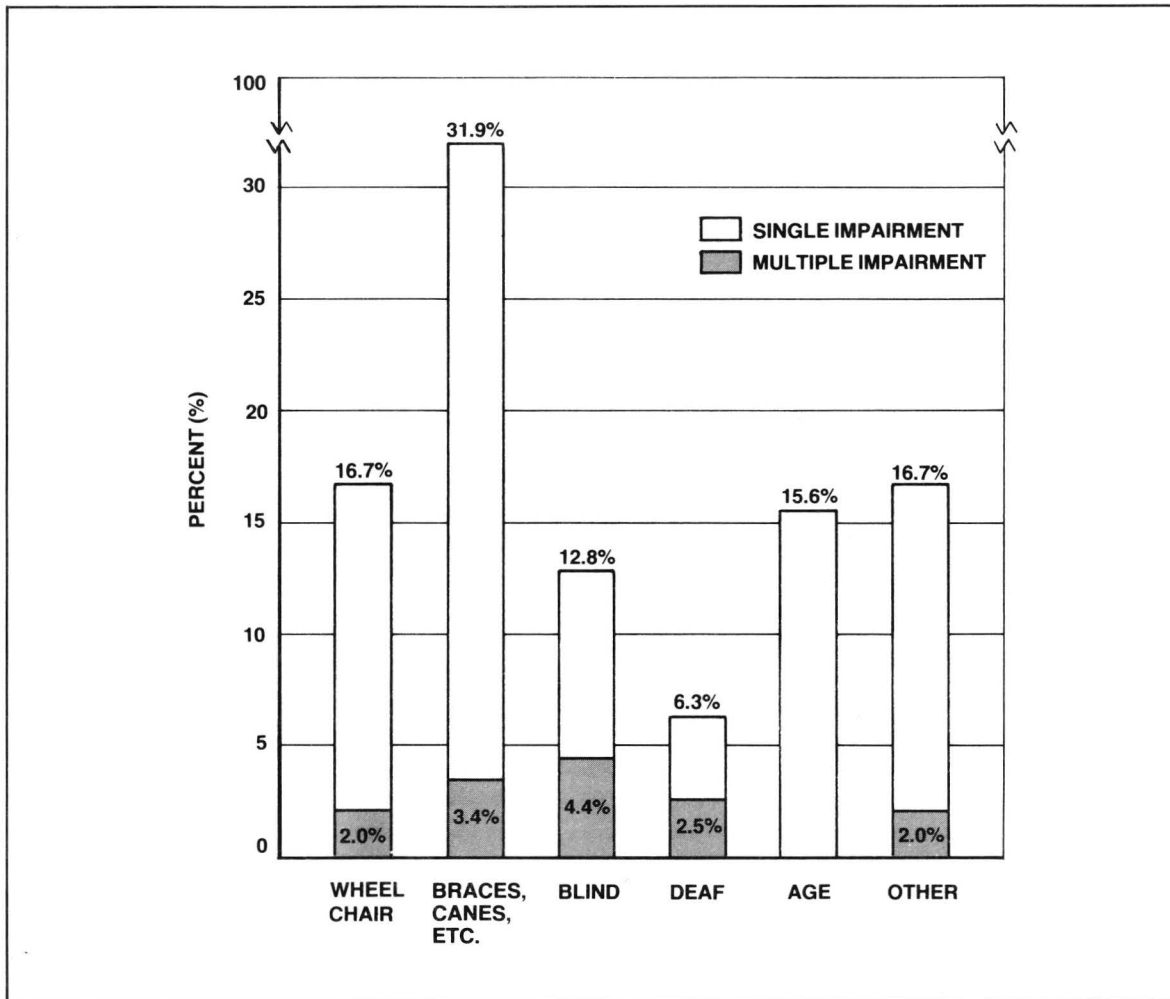


Figure 1. Incidence of Disabilities Among the Mobility-Impaired Population, Austin, Texas

and remains a primary means of travel. Curbs, steps, and other obstructions within the pedestrian space, along with inadequate or unprotected crosswalks, present serious problems to handicapped people utilizing pedestrian facilities. Curb ramps are used in the pedestrian system to provide smooth transition between walkway surfaces with different elevations. Crosswalks exist by state law between adjacent corners at all street intersections. Pavement markings are provided at certain intersections which are regulated by some type of traffic control device, and at intersections or other roadway locations where there are significant numbers of pedestrians. Special pedestrian protection is provided by "Walk-Wait" signal indications at 215 street intersections and pedestrian signals at three additional locations. These signals do not stop traffic unless they are activated by pedestrians. Motorists are also warned by graphic signs on approaches to crossings used extensively by handicapped people.

The private automobile is the main means of travel for the handicapped, either as a passenger or as a driver. The availability of an automobile can influence an individual's use of public transit. Almost 53 percent of the persons using the city Special Transit Service (STS) have no automobile available to them. Reserved handicapped parking is provided as identified needs

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arise. State law provides that the State Department of Highways and Public Transportation shall "...issue specially designed symbols, tags, or other devices to be attached to the license plates of motor vehicles regularly operated by or for the transportation of permanently disabled persons." This act has been recently amended to include disabled veteran (DAV) licenses.

Taxicabs provide the closest alternative to the private automobile. In general, a high percentage of taxicab users do not own or have access to an automobile. Although taxicabs provide quick response and dependable service, current vehicles cannot be used conveniently by those confined to a wheelchair. One taxicab company is procuring several lift-equipped vans to supplement the fleet.

In order to supply service to low income users, the Department of Human Resources has a verbal agreement with the Yellow Checker Cab Co. for reimbursement to the company for carrying clients. A contract between the City of Austin and this taxicab company also provides support services to the city's STS system.

The Austin Transit System is owned by the City of Austin and operated under a management contract between the city and American Transit Corporation. All transit services provided by the management company are subject to supervision and

AUSTIN METROPOLITAN TRANSPORTATION SYSTEM FOR THE MOBILITY IMPAIRED



NOTICE OF PUBLIC HEARING

THE URBAN TRANSPORTATION COMMISSION WILL HOLD A PUBLIC HEARING ON WEDNESDAY, MAY 16, 1979, AT 7:30 PM IN THE CITY COUNCIL CHAMBERS AT 303 WEST 2ND STREET TO DISCUSS THE AUSTIN METROPOLITAN TRANSPORTATION SYSTEM FOR THE MOBILITY IMPAIRED.

FOR MORE INFORMATION, YOU CAN CALL THE URBAN TRANSPORTATION DEPARTMENT AT 477-6511, EXTENSION 2280.

control of the city and the city council approves routes, fares, budgets, and other policy matters. Annual ridership is currently estimated at 6,500,000 people.

In addition to regular fixed-route service, other types of service are offered by the transit system, including the STS provided for the handicapped population. STS provides demand-responsive, door-through-door service, and is limited to those residing within the city limits of Austin. Reservations must be made at least 24 hours in advance, and can be scheduled up to eight days in advance. Service begins at 6:00 a.m. Monday through Fridays for work trips. Regular service hours are from 7:00 a.m. to 10:00 p.m. on Mondays through Fridays, from 10:00 a.m. to 10:00 p.m. on Saturdays, and 9:00 a.m. to 9:00 p.m. on Sundays. All reservations must be made between the hours of 8:00 a.m. and 3:00 p.m., Mondays through Fridays. The service is used by those individuals who are characterized as transit-restricted (nonambulatory) or transit-limited (semiambulatory). Visitors to the city can use the service by obtaining a visitor's pass by telephone or letter.

STS has approved more than 2,500 applications, approximately 700 of which are on an active monthly basis. The program provides a centralized transit effort and an alternative for many human resources

agencies who are currently providing special transportation services. Daily service consists of about 280 to 300 trips. One attendant is allowed to ride with a disabled patron at no charge. Other people may travel on a "space available" basis. Seeing Eye dogs are allowed, but must be muzzled.

Drivers are specially trained to assist the passengers. Training includes instructions in using wheelchair lifts, tiedowns, and step stools; loading, securing, and unload-

“Walking, or wheeling for those in wheelchairs, is an integral component of urban life and remains a primary means of travel.”

ing wheelchairs; driving with wheelchairs attached; and assisting people with mobility impairments. Operators are also enrolled in the National Safety Council Defensive Driving Course, and instructed in basic first aid.

Provisions in current state laws require that all public and some privately owned

buildings be constructed to insure accessibility. Buildings undergoing modifications must also accommodate the handicapped. During this study, an inventory of Austin's publicly owned or leased buildings in respect to their accessibility to the handicapped population was conducted.

Suggested Service Improvements

The handicapped population was identified and evaluated according to their ability to utilize different transportation options, both as a percentage of an entire group and by individual characteristics of disability, age, and geographical location. Each mode of travel was inventoried and analyzed to determine each system's accessibility. Current systems, both public and private, were evaluated to identify problems of accessibility with existing facilities and equipment, and to project longer range improvements in barrier-free travel. Recommended solutions to the shortcomings identified in this study are listed below; implementation of many of these may require amendments to the current City Code.

- Pedestrian.**
1. More sidewalks with adequately designed curb ramps should be installed.
 2. High curbs, particularly adjacent to major activity centers, should be replaced. Where sidewalk and curb

ramps cannot be reconstructed, alternative access should be provided.

3. Damaged or poorly maintained sidewalks should be repaired or replaced.
4. A minimum of four (4) feet of level sidewalk should be provided at the top of curb ramps before sloping begins. All sidewalks should be constructed with a minimum effective width of four (4) feet clear of signs, utility poles, down guys, and other obstructions.
5. Uniformity of curb ramp design should be developed. Adequate provisions also should be made to prevent vehicular traffic from encroaching on curb ramps.
6. Crosswalks should be marked in conjunction with the installation of curb ramps.
7. Pedestrian "Walk-Wait" lights should be installed at intersections carrying a significantly high level of pedestrian traffic. Adequate time should be provided for disabled people to cross the street
8. Where a divided street provides pedestrians with two separate opportunities to cross the full width, pedestrian areas should be provided in the median at a level com-

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mon to the street.

- Automobiles.** 1. Spaces identified as reserved handicapped parking should be a minimum of 12' 6" wide. Parallel parking spaces that cannot be widened should be located to assure maximum safety.
2. Reserved parking spaces should be closely coordinated with curb ramps.
 3. A minimum requirement of one percent of the total number of parking spaces should be set aside for reserved handicapped parking in public facilities.

- Taxicabs.** 1. Taxi companies should be encouraged to include barrier-free vehicles in their fleet.
2. Taxi companies could initiate a program that allows an assisting companion to ride free.

- Transit Service.** 1. Shelters and benches should be installed at all major shopping and employment centers. Armrests or handholds should be provided on at least one side of the benches.
2. Buses should only stop at designated points.
 3. Bus stop signs should be distinguishable from either direction along the street. Signs should be

clearly defined in colors visible to partially blind people.

4. Public information displays, including those located on the buses, should be monitored more frequently so that route maps and schedules are available and current.
5. Pocket-size route maps and schedule cards should be considered. Cassette tapes could be used to provide information to the visually impaired, along with route maps currently being developed in Braille for blind patrons.
6. Information that vehicles are equipped with interior handrails, illuminated steps, nonslip flooring, and priority seating should be promoted.
7. A totally accessible system should be developed by combining demand-responsive and fixed-route service.

END

Travel Patterns of Users and Nonusers of Special Transportation Services

Sandra Rosenbloom
Carole Schlessinger

Center for Transportation Research
University of Texas, Austin, TX

There are two assumptions underlying most of the current legislation aimed at increasing transportation services for the elderly and handicapped. Social service programs emanating from the U.S. Department of Health, Education and Welfare (HEW) share the following common, if not always explicit, assumptions with the more specific transportation assistance programs of the U.S. Department of Transportation (DOT):

1. The lack of transportation is a barrier to the use of human and medical services seen as necessary for the well-being of the elderly and handicapped; and
2. Increasing the availability and affordability of transportation services to the elderly and handicapped will increase the use of needed human and medical services.

A study was conducted to test these assumptions, i.e., to determine to what extent transportation programs actually increase the mobility of the elderly and handicapped and their use of essential services.

Existing conventional transportation providers, notably taxi companies and transit operators, have argued that elderly and handicapped people were already making the trips in question before special transportation services were available; they have switched to special services simply

because they offer cheaper fares. They also argue that service provided by a social service agency has a much higher public cost. This argument is of some concern to DOT because of its interest in maintaining the viability of local transit systems.

The impact of transportation provided by agencies on clients' travel patterns, including frequency of medical trips, was

“Some . . . elderly [clients] . . . switch back and forth, using the subsidized services for some . . . trips, and not others within the same week.”

examined in Austin, Texas. The Texas Department of Human Resources (DHR, the state “welfare” agency) has been under federal court order since 1975 to provide transportation for medical purposes to all Medicare and Medicaid clients. Region 6 of DHR asked the University of Texas to help determine the impact of the transportation services provided in that region on both users and nonusers of various forms of subsidized transportation. The Center for Transportation Research at the University of

Texas assisted DHR in designing a questionnaire to identify the travel patterns of handicapped and elderly DHR clients, both for medical and nonmedical reasons, and the impact that transportation services subsidized by DHR had on those patterns.

DHR must, under its federal court mandate, provide transportation services to able-bodied clients (largely those covered under the Medicaid program) as well as to handicapped clients. Because of the national interest in the travel patterns of the handicapped, only those users who had physical difficulties with fixed-route conventional transit were interviewed. Region 6 is a ten-county area of which only the center city, Austin, can be considered urban, and only the clients living in the city of Austin were interviewed.

DHR itself does not provide transportation; rather, it directly or indirectly subsidizes the client's use of existing transportation services. Moreover, whenever possible, DHR does so in a way that minimizes its own cost. For example, the department will give clients regular fare coupons to use on the services provided by the city of Austin, both the conventional fixed-route services and the accessible demand-responsive system for the elderly and handicapped, STS. Both of these services are, of course, heavily subsidized by the City of Austin and indirectly by UMTA.

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DHR subsidizes its clients' transportation in three basic ways. Able-bodied clients are given a number of coupons for use on the city transit fixed-route system; these coupons may be used only for medical travel, although users rarely are checked. Those clients unable to use fixed-route services are given coupons to use the city STS, a 24-hour advance notice system designed for the handicapped and handicapped elderly. Some DHR clients cannot use either the fixed-route transit or the STS service because of disability; therefore, as a last resort, DHR contracts with the largest local taxi company to provide medical trips for their clients. DHR pays the regular city fare, 25¢ each, for the fixed-route coupons, 50¢ for the STS coupons, and pays the cab company a flat rate of \$6.25 per passenger trip. The client pays nothing for any of the three options.

Because DHR clients are, by definition, eligible to use the STS for all nonmedical as well as medical trips, it is interesting to note any differences between the number of medical trips made by users of limited-trip free transportation, and the number of trips made by users of the fairly unlimited 50¢ mode.

Survey Methodology

DHR interviewed a total of 229 users, comprised of clients receiving subsidies to

use the STS service and clients being provided regularly with taxi service. Forty-three nonusers were also interviewed.

It became apparent that although the eligibility criteria of DHR and the city transit system indicated that STS users would be a discrete group from DHR taxi users, in fact, DHR taxi users were sometimes using both STS service and the DHR taxi. For purposes of analysis, the two data sets were combined wherever respondents were asked identical questions.

DHR was interested in the full impact of its subsidized medical transportation services and wished to interview all clients receiving transportation assistance. An attempt was made to get a 100 percent sample, but due to refusals to be interviewed, deaths, and the institutionalization of some clients, a response rate of only 80 percent was achieved.

Interviews took place either in person or by telephone, and lasted approximately 20 minutes each. Clients were asked to indicate their age and sex, whether or not they or anyone in their household had a driver's license, the number of people living in their household, and whether or not they had access to a working automobile. Respondents were asked to describe all of the trips they had made over the seven days previous to the interview, the purpose of each trip, and how they had traveled going and returning.

For each trip made using one of the DHR options for medical transportation, the client was asked if the same type of trip had been made prior to the availability of DHR transportation, and if not, why not. If the trip had been made previously, clients were asked what the mode of transportation had been.

Some clients used the DHR transportation services for some but not all of their medical trips during the week in question. For each medical trip a user took by another mode, he or she was asked the reason for not using the DHR service.

All users were asked for their reactions, both positive and negative, to the service provided, and for an indication of the mode of transportation they would use if the DHR system were discontinued. Because DHR clients who are registered for city STS service are allowed to make nonmedical trips on STS at their own expense, STS users were asked if they made additional trips, and if so, what type. For the purposes of the survey, it was assumed that each round trip had only one purpose. For multipurpose trips, clients were asked to identify the main purpose of the trip.

The survey was designed to bring out important information often lost in aggregate statistics. For example, many clients pay to be driven to a doctor or other appointments. These data are lost in the description

**TABLE 1
GENERAL DEMOGRAPHIC
CHARACTERISTICS OF DHR/STS
TRANSPORTATION USERS**

Characteristics	Percent
Age	
< 16	2.9
16-64	36.3
65+	60.7
Sex	
Male	20.4
Female	79.6
DHR client classification	
Elderly	56.8
AFDC	4.4
Blind	5.3
Disabled	33.5
People in household	
1	42.8
2	27.9
3 to 5	24.4
6 to 10	4.9
Auto availability	
At least one car in household	32.5
Client has driver's license	8.7
Household has one or more driver's license	33.5

“car passenger.” Therefore, not only were car passengers distinguished from car drivers, but passengers who paid to be driven were distinguished from those who rode free. In all, eleven categories of travel modes were considered.

Findings

Table 1 presents the general personal characteristics of the population surveyed. Table 2 compares the basic characteristics of the users with those of the nonusers. Neither users nor nonusers made many trips, but users made slightly more trips per week (2.9 percent) than did nonusers (2.6 percent). Eligible nonusers were more likely

**TABLE 2
COMPARISON OF CHARACTERISTICS OF
USERS AND ELIGIBLE NONUSERS OF
DHR TRANSPORTATION SERVICES**

Characteristics	User (percent)	Nonuser (percent)
65 + years	60.7	67.4
Female	79.6	95.4
Lives alone	42.8	53.5
Driver's license	8.7	16.3
Disabled	33.5	11.6
Average number of trips per week	2.9	2.6

to be women over 65, and living alone. They also were more likely to have a driver's license and less likely to be classified as disabled.

**TABLE 3
COMPARISON OF PURPOSES OF TOTAL
TRIPS TAKEN IN A SEVEN-DAY PERIOD BY
USERS AND ELIGIBLE NONUSERS**

Trip Purpose	User (percent)	Nonuser (percent)
Medical/dental	17.36	6.2
Shopping/personal	26.88	37.1
Work	2.84	17.7
Social/recreation	50.42	38.1
Other	2.50	0.9
Total trips/week	602	113

Table 3 shows how the total number of trips made by users and non-users was distributed over five major trip purposes. Over 30 percent of the trips taken by users in a one-week period were for social and recreational purposes; shopping and personal business trips constituted the next most frequent trip purposes (27 percent). Medical, therapy, and dental trips accounted for slightly over 17 percent of all trips taken by users during the week in question. Not surprisingly, given the strict income criteria for DHR eligibility, few users took work trips.

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Nonusers showed different trip patterns, although their first and second most frequent trip purposes were the same. Nonusers were more likely to take more social and recreational trips and more work trips than users; they also were more likely to take shopping and personal business trips than users, and they took these more frequently than they took medical trips. Trips for medical purposes accounted for only 6.2 percent of all trips taken by eligible nonusers. These data suggest that nonusers may be less likely to use DHR subsidized transportation services because they are simply less likely to take medical trips. Moreover, the fact that the nonusers take more work and shopping trips may mean that they are relatively more active and better off economically and so have other options available.

Table 4 shows the modes of travel used by both groups for all trips taken in the seven-day period. The largest percentage of all trips made by users was by car, with the client as a free passenger; the next most common method was walking. The DHR taxi (only to be used for medical trips) and social service agency vehicles were of roughly equal importance, each accounting for between six and seven percent of the total trips taken by users. Note that the city bus accounted for eight percent of all trips taken; technically, this response indicates

an "illegal" use of the bus, because if clients can use fixed-route transit they are not eligible for either the DHR service or the STS.

**TABLE 4
COMPARISON OF TRAVEL MODES FOR
ALL TRIP PURPOSES DURING A
SEVEN-DAY PERIOD FOR USERS AND
ELIGIBLE NONUSERS**

Travel Mode	User (percent)	Nonuser (percent)
DHR taxi	6.2	0
Car (driver)	3.5	10.6
Car (free)	40.7	46.0
Car (paying)	1.5	9.7
Taxi (50¢)	1.5	0
Taxi (full fare)	1.0	1.8
City bus	8.0	14.2
Social service agency bus	6.3	1.8
City STS	6.3	0
Walking	19.7	15.9
Other	4.1	0
Total trips/week	602	113

The modal choice patterns of nonusers was different from that of users. They most frequently chose to travel by car, which accounts for more than two thirds of all trips

taken compared with approximately 42 percent for users. Nonusers were far more likely to drive themselves or ride as a free passenger than were the users. The data presented in this table suggest that nonusers have more convenient and generally cheaper transportation available to them than do users. Nonusers took fixed-route transit for 14.2 percent of their trips, an indication that they did not perceive themselves as unable to use fixed-route transit, regardless of their classification by DHR. No one in this group eligible for DHR-subsidized medical transportation used the STS for any other trips.

It is clear from Table 5 that data from the Austin sample of handicapped people are very different from the national data developed for UMTA by the Grey Advertising Company. Work and school trips account for 27 percent of all trips of the full national sample but only a little over five percent of the total trips of the Austin group. The national sample makes more shopping trips (34 percent) than do the Austin respondents (26.9 percent), and almost half the number of social and recreational trips. These differences are probably an indication of the effect of the very low income level of the Austin group. Since these people are receiving public assistance, it is unlikely that they would make many work (or school) trips; moreover, as they have little money,

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they do not make many shopping trips.

There are marked differences between users and nonusers in all three client groups. The data suggest that those eligible clients who are the most mobile or least handicapped are the least likely to use either DHR or city STS services.

Implications

There is no evidence that either DHR services or the unlimited city STS have led to more frequent medical trips or to more trips of any kind for the respondents as a whole.

Clients appear simply to substitute one kind of travel for another. Some clients, particularly the elderly, appear to switch back and forth, using the subsidized services for some of their medical and other trips, and not for others within the same week. There was a small but significant amount of diversion from the more expensive modes such as full fare taxi or paying to be driven. However, in Austin, the taxi operator actually increased his business because of the two separate contracts with DHR and the Austin transit system. This operator makes more

trips with elderly and handicapped clients than before, but there is no guarantee that this pattern will continue.

This paper set out to determine the validity of two popular assumptions that underlie most programs providing transportation assistance to the elderly and handicapped. Analysis of the data, as presented here, refutes the second assumption, that providing available and accessible transportation increases the use of medical services. If this assumption is not true, it is extremely difficult to prove the validity of the first assumption, that the lack of transportation is a barrier to the use of necessary medical services by the elderly and handicapped.

END

**TABLE 5
COMPARISON OF RESPONDENTS' TRIP PURPOSES WITH NATIONAL FIGURES**

Trip Purpose	Austin			Grey National Data		
	Total	Elderly (percent)	Nonelderly	Total	Elderly (percent)	Nonelderly
Medical/dental	17.4	13	22	11	12	11
Shopping/personal business	26.9	22	29	34	42	31
Work	2.8	1	1	18	11	21
Social/recreation	50.4	64	46	28	34	25
School	2.5	0	2	9	1	12
Totals	100	100	100	100	100	100
Grey national study data is based on monthly trip rates. Austin data is based on total trips taken in a seven-day period.						

II RELATED ISSUES

4. Citizen Participation
5. Insurance
6. Labor
7. Training
8. Vehicles

Controlled Planning Games: A Public Involvement Technique

Walter J. Diewald, George A. Watkins
Battelle Columbus Laboratories, Columbus, OH

UMTA's Automated Guideway Transit (AGT) program represents a major thrust by the federal government in the development and deployment of new transit technology in the United States. Questions regarding public reaction to, and acceptance of, new technology are of great interest to the public agencies contemplating the implementation of such systems. The public attitude and reaction to a new transportation system cannot, in most cases, be based upon existing experience. Therefore, it is extremely difficult to determine if society as a whole, as well as individual social groups, will accept this new technology.

The Controlled Planning Games (CPG) technique was used to assist decision-makers in Erlangen, in the Federal Republic of Germany, to decide whether to implement a new AGT system. The technique may have some application to the implementation of new services for the elderly and handicapped.

CPG is based upon the same principles as military planning games which simulate some strategic activity. The technique now has evolved to the point that it is used for the dissemination of information and learning in many spheres of activity. The planning games approach attempts to portray or simulate actual situations as much as possible, to stimulate group interaction and conflict behavior, and to provide a learning

environment. The "controlled" aspect of the technique refers to the fact that the planning game action is subjected to external control in the form of tape and video recordings. The recordings are used by the researchers, who also act as moderators to summarize the discussions, prepare for subsequent meetings, and interpret the arguments presented as objectively as possible.

“...even though in Erlangen the citizens rejected the new system, application of the CPG was successful because it enabled the public that would be affected by the new system to assist in the decision-making process.”

Typically, the CPG technique has consisted of the following components:

1. preparation of the local governing council and local administration;
2. presentation of an exhibit to inform planning game participants and the general public about the new transit technology;

3. a survey of local attitudes regarding public participation in transportation planning and alternatives analysis; and
4. conduct of a controlled planning game centering around a fundamental decision to be made regarding a new transit technology.

The preparation for the CPG technique in Erlangen consisted of conducting an intensive campaign to gather information regarding local attitudes, power structures, and the local transportation planning and facility environment, as well as dissemination of information to local politicians and administrators designed to enlist and ensure their cooperation.

The second activity was a public exhibition regarding the new transit technology; the exhibit included photographs, drawings, printed materials, a brief movie, and a full-scale model of a prototype vehicle. In a third and concurrent activity, a press campaign to generate interest in the proposed system, the exhibition, and the CPG method was conducted. In conjunction with the exhibition and press campaign, a survey of exhibit visitors was made to obtain their impressions of the exhibition and the system presented, and to determine their reaction to the material presented in the press. In addition, local attitudes toward

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public involvement in transportation planning were surveyed.

The fourth activity in preparation for the CPG involved the selection of the participants. In general, approximately one-half of the participants were local opinion leaders identified as follows:

1. by status, i.e., people who were leaders of local organized groups;
2. by function, i.e., people who were recognized as being influential members within local organized groups; and
3. by image, i.e., people who were identified by others as being local opinion leaders.

The remaining participants were representatives of the general public randomly chosen from the local public records. Thirty-eight people participated in the initial planning game in Erlangen, 25 opinion leaders and 13 randomly chosen citizens. The participants were not selected on the basis of a representative sample because it was felt that the main objective of the CPG discussions was not the achievement of statistical representation, but the careful selection of a group of participants who should be able to offer valuable opinions on the particular topic.

In addition to the citizens, representatives of the system supplier and representatives of the City Planning Office participated

in the CPG as resource experts. They provided the planning game participants with first-hand information about the local traffic planning situation and the new transit system. In turn, the experts were able to learn the reasons for citizens' reactions to the proposed plans.

Researchers from Battelle-Frankfurt conducted the CPG sessions and acted as moderators for the discussions. The researchers were required to maintain a firm but unbiased position throughout the planning games in order to sustain and reinforce the participants' belief that the outcome of the games was not being manipulated.

Typically, the CPG technique consists of a number of sequential sessions or rounds conducted during consecutive weeks. The objective of the first CPG round was to familiarize the participants with the objectives and components of the CPG technique. Additionally, they were informed about the new urban transit system under consideration; this information served as a basis for subsequent discussions. At the conclusion of the first round, the participants were asked to indicate their initial opinion regarding the new transit system.

In preparation for the second round, the participants were provided with written material about DPM systems planning and were asked to discuss the system and the questions that were raised at the meeting

with their friends and acquaintances. The intention was that the participants would be able to represent the interests of other citizens as much as possible.

Where possible, prior to the second CPG round, the participants were given an opportunity to visit an experimental installation of the system. The visit provided an opportunity to clarify any unanswered technical questions and enabled the participants to actually experience the system in operation. In West Germany, the site visit diminished most misconceptions about the system and helped to avoid overemphasis on explanations of unfamiliar technical details in subsequent discussions.

At the beginning of the second round, the participants were asked for their evaluation of the information gained during the visit to the test site. The response at this stage indicated that questions of technical detail were no longer considered as important as questions regarding impacts upon the city structure.

During the second round, three subgroups were formed which represented the various opinions regarding the installation of the system as follows:

1. Pro Group. This group felt that the new transit technology was a good solution to the local traffic problems and that difficulties in adapting the system to the city structure in the

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historical inner city area could be solved by more thorough planning.

2. **Contra Group.** This group felt that the proposed new transit system would create problems (e.g., noise, aesthetics, and route selection), the solutions to which were irreconcilable. The impacts on residents living near the routes were expected to be intolerable.
3. **Neutral Group.** This group argued that the information available was not yet adequate to resolve two key issues, i.e., other solutions to the local traffic problems, and other solutions to the problems of adapting the proposed transit system to the city structure. Doubts were also expressed about the ability of the city to absorb the necessary investment and about the reliability of the traffic forecasts which indicated that the system was necessary.

All three groups indicated that more information was necessary about the selection of the route.

At the end of this and subsequent rounds, representatives of the opinion groups were asked to make a summary of their arguments. These summaries were videotaped and played as an introduction to the next round.

During the third planning game round, a film of selected portions of the proposed network was shown to the participants. The film had been prepared in response to questions regarding route selection and was made from two perspectives, that of a pedestrian observing the system and that of a passenger. In addition, local planners and system engineers were questioned further, and the working groups met together for additional discussions regarding their positions.

The purpose of the last planning game round was to present to local city officials the arguments and positions of the pro, con, and neutral groups, which had crystallized during the preceding rounds. During this round, there was a thorough exchange of information, and a general discussion between the members of the town council and the participants. By this time, participants appeared to assume the role of experts because of their knowledge about the system. All groups were encouraged to make constructive arguments in the deliberations.

At the conclusion of the last round, the participants indicated they felt that their level of information had improved significantly and that their attitude toward the system had been modified through their participation in the planning game.

The CPG technique is useful because it provides a basis for an assessment directly

involving the various affected parties. Thus, even though in Erlangen the citizens rejected the new system, application of the CPG was successful because it enabled the public that would be affected by the new system to assist in the decision-making process.

This technique may be useful in any effort to insure the involvement of the elderly and handicapped in planning new transportation systems. There can be no question that efforts toward the provision of transportation services for this group must be matched by efforts to obtain informed opinions from the members of the group. The CPG technique has the following features:

1. It helps to alleviate fear of the new technology through the presentation of comprehensive information;
2. It helps to reduce or eliminate design and operating deficiencies which might have been overlooked by planners; and
3. It helps to reduce planning errors through the articulation of local opinions, perceptions, and sensitivities within the forum.

END

A Mechanism for Consumer Participation

M. Christine Doerflinger, Transportation Planner
Kentuckiana Regional Planning and Development Agency
Donna Strauss, STEHP, Inc., Louisville, KY

During late 1975 and early 1976, the Kentuckiana Regional Planning and Development Agency (KIPDA), the public transit authority (TARC), and the major provider of transportation service to the aging and disabled in the Louisville area (WHEELS) began to need information from consumers on a variety of transportation issues. Within the KIPDA region there were many organizations for the elderly and handicapped as well as social service agencies with a large elderly and handicapped clientele. While all

“They have worked with traffic engineers, the board of aldermen, and the court on establishment of local parking policy for the handicapped, and methods of enforcement.”

of these organizations were concerned, to some extent, with transportation, no single group represented the elderly and handicapped on transportation issues. KIPDA, TARC, and WHEELS representatives initiated steps to form such an organization.

Federal regulations issued jointly by UMTA and the Federal Highway Administration (FHWA) in April 1976 required that elderly and handicapped people be involved in the transportation planning process. As a direct result of this requirement, a group calling themselves the Specialized Transportation Council met in June 1976. Four committees were formed: Organization, Nominations, Membership, and Operations. A constitution and by-laws were drafted. In order to maintain independence, the organization incorporated in August 1977 as the Specialized Transportation for Elderly and Handicapped Persons (STEHP), Inc.

The membership of STEHP, Inc. consists of elderly and handicapped people; representatives from social service, advocacy, and rehabilitation agencies; private for-profit, private nonprofit, and public providers of transportation service; and transportation planners. It is an independent organization that serves in an advisory capacity to the Metropolitan Planning Organization (MPO) regarding matters related to transportation planning for the elderly and handicapped. It is the responsibility of the KIPDA staff, the Transportation Technical Coordinating Committee (TTCC), the Transportation Advisory Committee (TAC), the Transportation Policy Committee (TPC) and the KIPDA Board of Directors to review and

consider, and then to either accept, reject, or modify any recommendation made by STEHP, Inc. These actions must then be documented for UMTA.

Members of STEHP, Inc. actively participate in the transportation committees of KIPDA. Members serve on the Transportation Advisory Committee, the Center City Study Subcommittee, the Public Transit Subcommittee, and the Mobility Curriculum Committee. Through this involvement, they contribute to all phases of the transportation planning processes.

STEHP, Inc. reviews the study design of work efforts addressing transportation planning for the elderly and handicapped. Members have an opportunity to recommend revisions in the study design prior to initiation of the major work effort. Members hear all status reports on planning efforts specifically related to transportation of the elderly and handicapped. Members are encouraged to make suggestions that would contribute to the success of the work effort at any time.

STEHP, Inc. then reviews the outcome of these major work efforts and either recommends revisions to KIPDA staff, or adoption to the Transportation Advisory Committee, the Transportation Technical Coordinating Committee, the Transportation Policy Committee, and finally, to the KIPDA Board of Directors.

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In addition to participating in the review process, KIPDA staff works closely with members of the Operations and Planning Committee of STEHP, Inc., a working group comprising transportation planners, transportation operators from Kentucky and Indiana, a representative from the Kentucky DOT, a social service agency representative, and elderly and handicapped consumers. Members play an active role in transportation planning for the elderly and handicapped. For example, members of the committee participated in the consultant selection process and the survey design for the KIPDA Elderly and Handicapped Transportation Needs Study. Members of the committee were instrumental in the development of alternative plans for meeting the transportation needs of aging and disabled people, an outgrowth of the study. The committee assisted KIPDA staff in the development and weighing of the objectives and criteria by which alternative plans were evaluated.

STEHP, Inc. provides an effective forum for addressing complex issues. The MPO retains all transportation planning responsibilities, but relies heavily on STEHP, Inc. for information about what services or improvements in existing services consumers most need and desire.

STEHP, Inc. has been active in solving some of the more immediate transportation

problems. For example, the requirement for a double authorization for trips made for medical purposes and reimbursed by Medicaid was eliminated. The group was also instrumental in the extension of a route which now provides service to an area with a high concentration of elderly and handicapped consumers. Although the public transit authority, TARC, provides accessible door-to-door service to handicapped people, as a result of STEHP, Inc. efforts, service is now available to people with temporary disabilities.

Members have participated in several workshops for the purpose of identifying travel barriers and making recommendations on service improvements which could directly benefit the aging and handicapped residing in the area. They have made suggestions to the transit authority for the placement of newly acquired bus shelters which are large enough to house wheelchair users. They have worked with traffic engineers, the board of aldermen, and the court on establishment of local parking policy for the handicapped, and methods of enforcement. A local ordinance mandating the use of a handicapped identification card was instituted due, in part, to their efforts. Local merchants were contacted and encouraged to sign spaces reserved for the handicapped. In addition, the hours of operation of the major paratransit provider in the

area have been extended, due to STEHP, Inc.

A biannual newsletter, *In-STEHP*, is published to give elderly and handicapped consumers current information on transportation improvements. The organization has also distributed a directory of transportation services available to elderly and handicapped people in each county of the KIPDA region.

This effort to educate consumers has played an important role in facilitating coordination. Over the past three years the membership has acquired a working knowledge of issues affecting transportation of the aging and disabled. As a result of this education process, STEHP members have in turn been educating the elderly and handicapped community and social service agency personnel on available transportation services and their best possible uses, and an audio-visual presentation was developed for this purpose. STEHP, Inc. members are continually making referrals to the appropriate transportation providers, and encouraging consumers to voice their concerns through the organization.

In response to Section 504 regulations, STEHP, Inc. has been working closely with providers of nonemergency specialized transportation in the development of a resource file which will be used to identify the locations of wheelchair users who depend

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on forms of transportation other than the private automobile. This information will facilitate the public transit authority's placement of accessible vehicles along the existing routes with the greatest number of wheelchair users, thus assuring optimum use of these vehicles.

A study conducted by KIPDA indicated that over 50 percent of the aging and disabled population were unaware of transportation services or programs available for their use. In addition, over 60,000 reported a willingness to share rides in private and other vehicles; however, no services exist which are geared to the mode of transportation preferred by the aging and disabled — the automobile. STEHP, Inc. prepared a proposal requesting two Vista Volunteers to staff a Transportation Resource Center, to answer and document requests for transportation information and referrals, and to initiate implementation of a computerized ridesharing program for the aging and disabled. This project was funded and was scheduled to begin in December 1979.

STEHP, Inc. has provided a favorable climate and mechanism to allow consumers and providers the opportunity to discuss transportation concerns, to help shape future plans, and to advocate solutions to improve the mobility of the elderly and handicapped by proposing changes in policy or through design of innovative projects.

END



These members of STEHP, Inc. told the Louisville Board of Aldermen about the need for more clearly marked pedestrian crosswalks and more time for elderly and handicapped people to cross the street.

Local Planning for Rural Transportation

Robert L. Martin, Vice President
Kimley-Horn and Associates, Inc., Raleigh, NC

Before transportation services can be implemented, or existing services improved, there must be extensive planning. Representatives of the political jurisdictions affected, as well as the appropriate bureaucratic and administrative units, must be satisfied that the program is needed, and is cost effective.

In the rural areas of Virginia, it is required that this planning results in the development of a Transportation Service Improvement Program (TSIP) for each planning district. It is clear that the implementation of a TSIP will be enhanced if it has been well researched, and has wide support among such diverse groups as potential consumers, providers, and local public officials who may be called upon to sponsor funding measures through local tax revenues.

One would expect, therefore, that the most successful plans would be developed by these groups with the help of professional technical assistance when necessary. Unfortunately, the failure of many transportation programs can be attributed to planning from the "top down," or by the inappropriate use of technical consultants who, in spite of their expertise, are unfamiliar with the specifics of the local communities.

The TSIP for the Northern Neck and Middle Peninsula Virginia Planning Districts,

a ten-county rural area in eastern Virginia, was developed by a Technical Advisory Committee (TAC) that was established for each planning district at the outset of the planning activity. The TACs were established through the combined efforts of the planning district commissions, the Virginia Department of Highways and Transportation (VDH&T) and the consultant, Kimley-Horn and Associates, Inc.

Membership on the TACs included representatives from the following groups: 1) public officials, e.g., planning district commissioners, county administrators and supervisors, and law enforcement and community college officers; 2) public and private agency staff, e.g., from the planning district commission staffs, VDH&T, private nonprofit agencies, and taxi and intercity bus service operators; and 3) private citizens, including the chiefs of two Indian reservations, and representatives of transportation-handicapped groups such as the elderly, the disabled, and the poor.

The principal functions of the TACs were to provide assistance in seeking accurate information on existing conditions, serve as liaison with the community-at-large, review and comment on products of the various parts of the study, and in general, to facilitate acceptance of the findings, including the TSIP. The TACs were working committees. They assisted in accomplish-

ing the overall goal of the federally required technical study which was to determine the transportation service needs of the citizens in each planning district, and to develop a safe, economical, and efficient TSIP to meet some of the transportation demands of those citizens, particularly the elderly and handicapped.

The planning activity began by helping the TACs to understand the tasks which had to be accomplished. The schedule, nature, and scope of the required technical study were discussed, and goals and objectives were developed for the role of public transportation within the planning districts.

“ . . . the failure of many transportation programs can be attributed to planning from the ‘top down,’ or by the inappropriate use of technical consultants . . . ”

With the assistance of TAC members, inventories which assessed the characteristics of the population, location of activity centers, transportation resources, and

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other items were made. The other technical representatives who served on the TACs provided important assistance to the consultant. Analyses of the data obtained through the inventories were then made. Estimates of travel demand, the extent of existing transportation, and the need for expanded services were developed in meeting with the entire TAC. The TACs first reviewed a technical memorandum on the findings and implications of the inventory and analysis, and then met in a working session with the consultant to share more informal information relevant to the development of a final plan. Based upon this information, revisions were made in order to facilitate the acceptance by the planning district commissions of the study results and recommendations.

Alternative service concepts were developed and evaluated in regard to continuation and coordination of transportation services. Again, TAC members first reviewed a technical memorandum on these alternatives and then met in a working session with the consultant to evaluate them. These discussions led to the identification and selection, by the TACs, of the most appropriate alternatives to be included in the preparation of the TSIP. A summary of the alternatives and the TAC recommendations were then presented to the planning district commissions.

The final TSIP, developed with the crucial assistance of the TACs, was then prepared and submitted to the planning district commissions for their review. A draft of a final report on the total planning effort was also presented to the commissions by the consultant and TAC representatives.

The first steps toward implementation of the TSIP, i.e., acceptance and approval by the planning district commissions, were accomplished within eight months after the first orientation sessions with the TACs were held. The commissions have adopted the TSIP in concept and called for the support of the individual counties within the districts. The County Board(s) of Supervisors have since given their support to the TSIP.

The development of a realistic TSIP and its approval by the local authorities, as well as progress towards timely implementation, are directly attributable to the active participation of local decision-makers, technical personnel, and citizens in the planning process.

END

Efforts to Consolidate Insurance for Special Transportation

Ronald W. Beane, Operations Manager
Iowa Commission of the Aging, Des Moines, IA
Pam Hunt, Manager
Integrated Transit Service, Ottumwa, IA

In 1978, the Iowa Commission on the Aging in its State Aging Plan recognized that insurance problems were causing major barriers to reaching state transportation objectives. As in most state agencies on aging, there were no experts in transportation insurance on the staff, nor were there any funds available to acquire this expertise. There were at least two major concerns regarding transportation insurance: 1) consistent coverage with comparable premiums for paid drivers, and 2) insurance problems encountered by volunteers driving their own cars.

The commission's first step was to see if volunteers could be interpreted as state employees for insurance purposes, since they were conducting activities for the state. However, the Attorney General ruled that volunteers providing services under programs run by an Area Agency on Aging (AAA) receiving state or federal funds were not state employees for purposes of the Tort Claims Act.

The Iowa Commission on the Aging then sought advice from other state agencies who used volunteers as well as paid drivers. Since they were unable to help, the Commission considered obtaining statewide group insurance coverage, as had been done in other states. However, the Attorney General and the state Insurance Commission determined that the state could

not directly form a statewide group for insurance purposes.

At about the same time, insurance for its members was also becoming a problem for the Iowa Public Transportation Association (IPTA). IPTA had been formed in 1976 as an outgrowth of an earlier state transit association. IPTA's broad goals were to represent the common interests of transit operators, provide information exchange, aid members in dealing with special issues, encourage cooperation, collectively promote legislation, and to collect and compile data. The association has three divisions: 1) transit operators from urban areas, 2) taxi operators, and 3) operators of special services, which are generally multicounty regional systems providing over one-half of the rides to the elderly and handicapped.

In 1978, the IPTA membership voted to explore jointly with the Iowa Commission on the Aging transportation insurance problems, and authorized the vice-president of the IPTA Special Services Division to work with the commission. The Oregon Standards Manual was one of the specific items that IPTA wanted to review closely. An ad hoc insurance committee was formed with the following membership: one transit operator and representative from IPTA, one AAA representative, one volunteer transportation representative, one university representative, one representative from the Independ-

ent Insurance Agents of Iowa, one representative from the state Insurance Commissioner's office, one representative from the Iowa Commission on the Aging, and one representative from the Professional Insurance Agents of Iowa. The stated purpose of the committee was to examine and resolve insurance problems of transit providers in Iowa. The goal agreed upon by the committee was to develop a standard manual that would address insurance-related problems.

The AAA representative designed and conducted a survey based on discussions in the committee which was sent to the sixteen regional transit agencies. Included in the questions were number and type of vehicles, insurance carrier, coverage and categories of comprehensive, liability, medical, collision, and property damage liability. The survey also asked for figures on the cost per insured vehicle.

The committee members also went through the first section of the Oregon manual, recommending changes to make the standards more appropriate for the situation in Iowa. The results of a survey by the University of Tennessee, which had gathered information from eleven transit operators in Iowa, were also discussed.

Of the more than half of the sixteen regional transit agencies which responded, most were mainly providing transportation

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for older Iowans. The results indicated that there was a great disparity in premium rates. These differences were not necessarily related to the differences in coverage purchased, although it became clear that transit operators did not have an adequate understanding of insurance needs.

The disparity in premiums appeared to be partly the result of differences in loss experienced by the transit operators and different assessments of risk. Other premium differences appeared to be the result of the way the insurance companies classified the transit operations for insurance purposes. These differences indicated to the committee that transit operators needed information regarding the amount and types of coverage to purchase, and needed to be made aware of premiums paid by other operators in similar circumstances. The findings also indicated that the insurance industry needed information on system activities in order to facilitate classification.

After the first meetings, the reluctance of the representatives of the insurance industry to interact with the other committee members was overcome and the representatives presented invaluable expertise to the committee.

One of the biggest problems that volunteers were encountering, was the confusion by volunteers and insurance agents about coverage under the volunteers' private

automobile insurance. The state Insurance Commissioner's representative on the committee agreed to work with an AAA which had a large number of volunteers in order to determine the extent of the volunteers' regular coverage. In many cases it was found that because volunteers were not operating their vehicles for hire, their existing insurance would cover their liability as volunteers. The Insurance Commissioner's office agreed to follow up with individual agents, if volunteers would present them with the names of agents who threatened either to cancel the policies or raise the premiums of those volunteers who were providing transportation to their neighbors.

The committee also reviewed the final draft of the Iowa Standards Manual developed from the Oregon Standards Manual and presented it to the full membership meeting of IPTA in December 1978. The draft manual contained required standards, recommendations, and procedures for the following items: driver selection and screening, driver training, loss control policy and program, vehicle maintenance and safety, accident reporting, and insurance coverage. The draft was approved and one of the representatives of the insurance industry agreed to survey a number of insurance underwriters regarding industry interest in a statewide insurance policy using the manual.

These activities took many months, and there was a general loss of momentum during this period. By May 1979, it was clear that the insurance industry as a whole was not interested in a single policy covering statewide liability questions. Only one un-

“There is a need to educate insurance representatives as well as transit providers.”

derwriter was interested in exploring the question of statewide coverage with the committee. However, the industry was interested in the manual policies in regard to loss control on individual agency coverage.

It was agreed that the classification for insurance would be separated, with one division for volunteers and another division for paid drivers and that the insurance industry needed specific information from regional transit providers before it could explore the possibility of providing coverage. This information was provided through a phone survey which was conducted among almost half of the transit providers. Detailed information was obtained on each vehicle, including the make, year of manufacture,

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capacity, mileage, radius of service, and the drivers.

The one potential statewide underwriter decided that the statewide coverage would not be possible, and it was agreed that the representative of the insurance industry on the committee would contact other underwriters. It appeared that a driver's age was a factor among some of the underwriters, regardless of the driver's accident record. Since many of the transportation providers were highly involved with programs for the aging, there was a strong feeling that drivers should not be discriminated against on the basis of age alone.

It became obvious that there were no underwriters willing to write a single statewide policy. However, because of the manual, and the organizations that the committee represented, interest did develop in providing coverage for an individual agency without reference to the age of the drivers. This was a significant breakthrough for the committee and for a number of transportation agencies which used older drivers. Another even more detailed survey of the regional transit agencies was made but the responses were few. The transportation agencies were becoming disenchanted by requests for more and more detailed information by the insurance industry. It appeared that communication once again would break down.

In addition, a new barrier to communication was developing due to the high turnover among transit operators and planners in the state. New staff members were not aware of IPTA's role in the insurance matter. To counteract this problem, the committee held a meeting for reviewing the manual and related insurance concerns with new transit personnel.

Sections of the manual were revised to establish a new classification for social service vehicles, which specifically included vehicles to transport senior citizens to congregate meal centers, medical facilities, social functions, and shopping centers. The new sections also established a program to provide excess coverage for volunteers.

Four conclusions can be drawn from the work of the ad hoc insurance committee:

1. The committee met its original goals and purposes. Many problems relating to insurance were brought to light; alternative solutions were developed and evaluated for feasibility; and a draft of the Iowa Standards Manual was prepared for public inspection.
2. After surveying the market, it was not feasible to develop uniform statewide policy coverage for special service transit operators in Iowa.
3. There is a need to educate insur-

ance representatives as well as transit providers. Among other things, the insurance industry must have a working knowledge of the transit system's design, the ridership, and the risks associated with the riders who use the service. The transit operators need to know exactly what types and levels of coverage to purchase for adequate protection.

4. The committee achieved a certain level of success in bringing insurance providers and consumers together. A greater awareness and enthusiasm for working on this complex problem were generated through the committee's efforts.

Finally, two recommendations are made to other states interested in pursuing the insurance problem:

1. A balance must be achieved between committee size and a good cross section of the insurance industry and transit operators, otherwise there is a high risk of developing a plan or process in a vacuum.
2. State insurance statutes and rules, as well as the state's responsibility as it relates to program operations, should be investigated at the outset.

END

Labor Protection Requirements and Rural Transportation

Robert P. Schmitt, Community Assistance Coordinator
David J. Cyra, Director
Office of Statewide Transportation Programs
University of Wisconsin-Extension, Milwaukee, WI

Federal legislation in Section 13(c) of the Urban Mass Transportation Act of 1964 and Section 18 of the Urban Mass Transportation Act of 1964, as amended in 1978, mandates regulations to protect transit labor in urban and rural areas. The complexity of these requirements, coupled with a widespread misunderstanding of their application, has concerned rural transportation advocates for some time. Because rural transportation is so vital to the elderly and handicapped, it is important to examine the impact of this legislation upon the delivery of rural transit services.

Labor issues resulting from situations involving Section 18 have not yet been studied extensively by the Department of Labor (DOL) because the program is relatively recent. However, the requirements derive from the labor protection provisions in Section 13(c). Whenever federal assistance is given by the Department of Transportation (DOT) to state or other public bodies in financing mass transportation, the Secretary of Labor is responsible for assuring that employees involved must be given fair and equitable treatment.

Section 313 of the Surface Transportation Assistance Act of 1978 added a new program of "Public Transportation for Non-urbanized Areas" (Section 18) to the Urban Mass Transportation Act of 1964, as amended. Section 18 provided \$75 million

"It would indeed be a tragedy to allow misconceptions and fears concerning Section 13(c) to interfere with the development of rural transportation projects."

to be distributed to states, by formula, for capital and operating assistance for Fiscal Year 1979. This four-year program, administered by an agency designated by the state, is intended to provide financial assistance to rural and small urban public transportation projects. Eligible recipients include state agencies, local public bodies, nonprofit organizations, and operators of public transportation services. Transportation systems supported with these funds must be open to the public and their vehicles must be clearly marked for public use. Therefore, systems now serving a particular client group, such as the elderly or the handicapped or both, would have to make their service available to the public to be eligible for Section 18 funding.

Before Section 18 funds are approved, certain labor protection assurances must be made. The origin of these labor protection provisions are found in Sections 3(e), 4, and 13(c) of the original Urban Mass Transportation Act of 1964. Section 18(f) extends the provisions of 13(c) to assistance authorized under the new Section 18 program. Section 13(c) of the Act states that:

It shall be a condition of any assistance. . . that fair and equitable arrangements are made, as determined by the Secretary of Labor, to protect the interests of employees affected by such assistance. Such protective arrangements shall include, without being limited to, such provisions as may be necessary for (1) the preservation of rights, privileges, and benefits under existing collective bargaining agreements or otherwise; (2) the continuation of collective bargaining rights; (3) the protection of individual employees against a worsening of their employment; (4) assurances of employment to employees of acquired mass transportation systems and priority of re-employment of employees terminated or laid off; and (5) paid training and retraining programs.

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The evolution of the labor protection provision of 13(c) has been a long, complex, and arduous process. Heretofore, the impacts of 13(c) controversies and the subsequent rulings have been confined largely to commuter rail transportation and urban transit systems. When Section 18 was being debated in Congress and elsewhere, rural transportation advocates argued that the disposition of 13(c) should be a quick and relatively simple matter since many rural areas did not have transportation-related employees who could be adversely affected. Partly because of this, DOL and DOT worked for many months on a special 13(c) Warranty for application to the new nonurbanized program. The Warranty provides that the state administrative agency agrees that

“...the terms and conditions of the Warranty shall apply for the protection of the transportation-related employees of any other surface public transportation providers in the transportation service area of the Project.”

The Warranty also provides for a waiver of the provisions in cases where no transportation-related employees are present in the service area of the project and where no employees could potentially be affected.

Case Study

Fears about adverse effects of 13(c) provisions in rural areas have existed for some time. The case study described below is an example in which such fears led, unnecessarily, to the abandonment of a single-route transit service in a predominantly rural area.

The situation involved a bus service from a predominantly rural county to the central business district of the City of Milwaukee. Ozaukee County lies directly north of Milwaukee and for many years communities in the county had bus service available to downtown Milwaukee. The 20-mile route extended from the City of Port Washington to Milwaukee, and service was provided by Wisconsin Coach Lines, a local intercity carrier operating for profit. During 1975, the service consisted of 10 round-trips per day serving approximately 200 passengers. However, Wisconsin Coach petitioned the Wisconsin Public Service Commission (PSC) to abandon its service along this route in Ozaukee County, and the PSC authorized abandonment effective January 1, 1976.

The county board, on petition from transit users, felt that the service was necessary and agreed to subsidize part of it for six months. The board directed the county highway commissioner to investigate the possibility of state and federal fund-

ing to help subsidize the service. After receiving assurances that state aid was available, the board extended the service contract with Wisconsin Coach to maintain service through 1976. In the meantime, efforts were made to secure UMTA Section 5 funding, for which it was thought that the county was eligible. The board then entered into an agreement with Wisconsin Coach for service during 1977.

An application for Section 5 funds was prepared, and therefore the labor protection requirements of 13(c) had to be addressed. Prior to this, Wisconsin Coach had entered into a 13(c) agreement with the Amalgamated Transit Union (ATU). This agreement was noted in the application, and county officials thought this treatment of the 13(c) requirements was sufficient. After submission of the funding application, the county highway commissioner received word from the ATU that the county's acknowledgement of the previous 13(c) agreement was not adequate, and that the union would require a letter from the county addressed to the Secretary of Labor making additional assurances concerning other potential private operators or potential county operations in the event the operational characteristics of the transit service might change at some future time. When the highway commissioner brought ATU's request for additional assurances before the county

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board it promptly voted to discontinue any subsidy. In June 1978, the transit service was discontinued. Board members did not want to get involved in what they perceived as a potentially complex labor issue. While there was a distinct possibility that the labor issue would be complex, there was absolutely no sound reason for terminating the subsidy since the county board could have reserved this as a later option. Elimination of a transportation service due to a lack of local funds would void almost all conceivable labor protection provisions. In this particular situation, the county board's perceptions of 13(c) affected employees and service users; approximately 20 percent of the riders were elderly rural residents.

Questions Concerning 13(c) and Section 18

It is imperative that the confusion concerning Section 13(c) regulations be cleared up so that situations such as the one reported do not occur with increasing frequency.

Many questions have arisen concerning how DOL interprets the application of 13(c) to the Section 18 program. Because this is a new program, DOL has had little actual experience in handling 13(c) provisions as they apply to rural transportation. Until this experience is gained, DOL has

taken the position that issues will be dealt with on a case-by-case basis.

The following questions are somewhat representative of those received by DOL.

1. Suppose a project in a small town with a population of 12,000 is funded through Section 18. As a result of this project, a small taxi company consisting of two cabs goes out of business due to an unanticipated shift of riders to the new public transportation system. Would the employees of the taxi firm be entitled to protection under 13(c), even though they are not unionized and no collective bargaining agreements were previously in effect?

If the taxi employees provide exclusive-ride service, they are not considered public transportation employees by definition, and therefore, would not be eligible for 13(c) protection. The absence of a drivers' labor union in the area is irrelevant, since under 13(c) protection is afforded to affected employees whether or not they are represented by labor organizations. Had the taxi company operated a shared-ride service, whereby the taxi driver could pick up additional passengers without the consent of the first passenger, the drivers would be considered public transportation employees and, hence, covered by 13(c). Still, for a valid claim, the driver would have to dem-

onstrate that the Section 18 project led to a shift in consumer demand which, in turn, produced an adverse impact.

2. A users' subsidy program for the elderly and handicapped funded by the County Commission on Aging is in operation in a rural county. The service is provided by the local taxi operator who also offers shared-ride service to the public. A public transportation project consisting of transit service in the same service area is funded with the county as recipient of federal funds from Section 18. Many riders shift to the transit system, resulting in the layoff and reduced employment of three taxi drivers. Are these employees covered under 13(c)?

Since an adverse impact did occur, and if the three affected drivers spent a substantial portion of their time providing user-subsidized service, they would be eligible for protection under 13(c). Generally, in situations such as this it is advisable to consider the following questions: 1) Did an adverse impact occur? 2) Did the adverse impact(s) result from project activities? 3) What percentage of time was spent by drivers in the subsidy program? 4) What was the percentage of revenue gained by drivers in the subsidy program compared

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with all other revenue generated by shared-ride services?

3. In the previous question, what array of protection is possible for the three adversely affected taxi drivers?

Each case involving a potential work protection infringement is unique and must be dealt with by DOL on an individual basis. However, several options are listed:

- a) If it is determined that the driver is placed in a worse position with respect to employment in that he suffered a wage or fringe benefit reduction as a result of the Section 18 project, he could be considered a "displaced employee" and be paid a monthly "displacement allowance." The amount depends upon compensation received during the most recent 12 months of his previous employment. The amount could be determined by considering the difference in compensation before and after the introduction of the Section 18 project. The period during which a "displaced employee" is entitled to protection is called a "protective period." It is generally defined as being equal to the employee's length of service prior to the adverse effect up to a maximum

period of 6 years. The money used to pay the "displaced employee" can come, in part, from monies received through the Section 18 project since up to 50 percent of the operating deficit can be funded by Section 18.

- b) If the employee is laid off or otherwise deprived of employment as a result of the Section 18 project, the employee could be considered a "dismissed employee" and could be paid a monthly dismissal allowance which again generally depends upon compensation received during his former employment. The protective period is the same as previously described.
- c) An employee receiving a dismissal allowance is required to accept reasonably comparable employment for which he or she is, or can become, qualified after a reasonable training or retraining period, as long as this does not require a change in residence or infringe upon the employment rights of others.
- d) The Section 18 recipient is financially responsible for complying with the *"Provision of the National (Model) Agreement for*

Incorporation in the Special Warranty" promulgated by DOL. The recipient makes the necessary arrangements so that any public transportation employee affected by the Section 18 Project may file a claim through a proper representative, or by himself if he is not represented by a labor union.

4. Are transportation-related social service employees covered by 13(c)?

DOL considers transportation services to a nonrestricted elderly and handicapped clientele eligible for funding under the Act as "public transportation." If such employees were adversely affected by the project, they would be entitled to 13(c) protection. While DOT may not include such employees within the "public transportation" category, DOL has jurisdiction over labor matters.

5. What if a bus route is implemented using Section 18 funds and ridership is so low that the service is abandoned. Are the employees of this system entitled to 13(c) coverage?

The DOL guidebook states that "... the Warranty is not intended to apply to any employee whose dismissal, displacement or worsened position results solely from the termination of the Project or its funding."

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Therefore such employees are not entitled to coverage.

6. Are employees of intercity bus carriers covered under Section 13(c)?

Generally, if such employees are in the project service area and are affected, they are entitled to Section 13(c) protection. The following statement in the guidebook is relevant here:

The term "transportation service area of the Project" is intended to include the geographic area over which the Project is operated and the area whose population is served by the Project, including adjacent areas affected by the Project . . .

7. Are CETA employees covered by Section 13(c)?

If CETA employees are engaged in public transit services they would be entitled to the same protections as other employees. However, if CETA employees are terminated solely as a result of the expiration of their CETA contract, Section 13(c) protections would also end at this time.

Implications

The Section 18 program for nonurbanized areas is not large by urban standards but it can have an important influence on rural public transportation in the future. It is

well known that the elderly and, to a lesser extent, the handicapped, constitute a significant proportion of the ridership of many existing public transportation systems in rural areas. It would indeed be a tragedy to allow misconceptions and fears concerning Section 13(c) to interfere with the development of rural transportation projects.

Those who are planning rural transportation programs should learn as much about Section 13(c) as is necessary for the orderly and systematic preparation and processing of applications for Section 18 funds. They should write DOL for a copy of the guidebook and contact officials at DOL whenever questions or problems relating to Section 13(c) arise. **END**

Training Programs For Using Lift-Equipped and Kneeling Buses

Anne-Marie O'Hanlon Barry, Coordinator of Training, Transportation Project
 Rehabilitation Research and Training Center
 The George Washington University, Washington, DC

In May 1978, the Washington Metropolitan Area Transit Authority (WMATA) purchased 130 lift-equipped and kneeling buses. In order to facilitate their implementation, the George Washington University Rehabilitation Research and Training Center was awarded a two-year grant from UMTA and the Rehabilitation Services Administration of HEW to develop a "training and evaluation program in the utilization of the lift-equipped and kneeling buses in the Washington metropolitan area." The center has traditionally been involved in commun-

“The importance of mechanical skills training [for drivers] cannot be stressed enough.”

ity issues which concern the rehabilitation of the disabled.

The project was organized into five components. These were to:

1. develop and implement training programs for bus operators and bus operator/instructors to increase awareness of and sensitivity to the transportation needs of people who are disabled or elderly;

2. develop and implement training programs for rehabilitation professionals, elderly people, and people who are disabled, in the use of the accessible buses;
3. evaluate the impact of the training programs and the utilization of the buses;
4. evaluate the buses for overall accessibility, reliability, and safety; and
5. disseminate the project findings and materials nationally.

The training programs were developed on a "train the trainer" model. A three-day comprehensive training program on "Disability Awareness" was developed for 18 WMATA bus operator/instructors, who in turn were to train WMATA's 2,800 bus operators. The program was designed to allow instructors to: examine their attitudes relating to the disabled and elderly; communicate with consumers who have transportation handicaps; experience the feelings of a "transportation-handicapped" individual through simulation; obtain information regarding disabilities; and lastly, to learn how to properly assist disabled and elderly passengers. The training was conducted by the project staff and assisted by disabled and elderly patrons in two, two and one-half-day sessions, each with nine randomly assigned bus operator/instructors.

In order to evaluate the training, a pre- and post-test design was used. The instruments used for evaluation included an adaptation of the 30-item, form B, Attitudes Toward Disabled Persons (ATDP) Scale (Yuker, Block and Young, 1966) and the Disability Awareness Inventory (DAI) (Linkowski and Schaier, 1979), which was developed for this project. The DAI is a true-false, 70-item objective test which assesses disability awareness and bus operation in relation to passengers with transportation handicaps with a number of items related to attitudinal barriers. The random division of the two groups permitted Group 2 to be pre-tested twice prior to training, thus serving as a control for the first phase of training. Group 1 was pre- and post-tested immediately following the first phase of training. All the instruments were tested a third time after the instructors conducted their first seminar for bus operators. A fourth testing will be conducted to evaluate whether the gains are sustained over time.

The results of the post-testing of Group 1 showed a significant increase in disability awareness ($p < .01$) over Group 2, who were pre-tested a second time and served as a control group. The results of the third administration of the instruments showed that gains made by Group 1 were sustained, and that the results in Group 2 were not significantly different ($p < .05$) from those of

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Group 1 in their gains in knowledge and attitudes as a result of the total training program. These results demonstrate that disability awareness training does have a measurable impact on both knowledge about how disabled passengers interact with the accessible bus, and attitudes toward these passengers.

The second phase of training was to have the 18 WMATA bus operator/instructors conduct seminars with the 2,800

bus operators. To do this, the transportation project staff, assisted by personnel from WMATA and consumers, evaluated the three-day activity and condensed this information into a three-hour comprehensive program. The instructors were provided with an instructor's manual as well as audio-visual aids, which included a set of thirteen charts, a booklet entitled, *Accessible Bus Transportation, A Guide to Assisting the Disabled or Elderly Passenger*, and two

thirty-minute videotapes. One of the tapes, entitled "Getting to Know You," provides bus operators with an opportunity to hear patrons discussing transportation issues with bus operators. The other tape, "The Accessible Bus: Guidelines for the Operator," illustrates the procedures involved in riding the bus. The approach was to have two instructors co-teach their first three-hour program with assistance from the project staff. Prior to the three-hour seminar, the project staff met with the instructors to review the training materials. Immediately after the program, the instructors were evaluated on their presentation. To date, all the bus operator/instructors have been trained and are familiar with the training materials. In addition, 2,000 of WMATA's bus operators have participated in the three-hour disability awareness seminar. Evaluation data of operator training is being collected.

The bus operator training program begins in the classroom.



Another component of the project is to train rehabilitation professionals such as physical and occupational therapists, nurses, and rehabilitation counselors in order to increase their awareness of public transportation, and to identify the mobility skills needed by the disabled or elderly passenger to use the accessible bus. After training, the professional can then incorporate those skills into rehabilitation programs. This training is also complemented by direct training of users in which a lift-

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equipped and kneeling bus is brought to a location and they experience firsthand the procedures necessary to board, pay fares, secure wheelchairs, and get off the bus.

The implementation of a training program of this scope has its difficulties, as one might expect. For example:

1. One concern is that operators who have been trained may not, in effect, be scheduled on an accessible route for some time. Therefore, the initial impact of the disability awareness training may not continue.
2. Prior to attending the three-hour seminar, operators were to have received one hour of training in mechanical skills related to the accessible features. Occasionally this did not occur. Therefore, some operators attended the seminar with little or no knowledge of the equipment.
3. The training programs focused on bus operator/instructors and operators. The exclusion of road supervisors has been a limitation.
4. The importance of mechanical skills training cannot be stressed enough. Occasionally a consumer has been denied service because of either mechanical problems with the lift, or lack of operational knowledge on the part of the bus operator. **END**

Training Programs For Vehicle Operators in Texas

David D. Thomas
William H. Henderson

Transportation Management Associates, Fort Worth, TX

In October 1977, as part of its ongoing survey of transportation providers, the Texas Department of Highways and Public Transportation (DHT) distributed approximately 700 letters and questionnaires throughout the state to organizations identified as providing transportation services to either elderly or handicapped people. Over 250 transportation providers responded that they would participate in "sensitivity training" workshops to be sponsored by the DHT, and indicated that they intended to send slightly more than a total of 1,000 people. This response was considerably in excess of that which had been anticipated by the DHT.

A description of the Passenger Assistance Techniques (PAT) course and a companion course for instructors (TPAT) developed by Transportation Management Associates (TMA) appeared in *Transportation for the Elderly and Handicapped: Programs and Problems*, issued by the U.S. DOT Technology Sharing Office in December 1978. Since then, PAT has been given to several hundred people, but never on a statewide basis as in Texas.

Transportation Management Associates agreed to conduct the Passenger Assistance Techniques training program under a contract with the DHT. The logistics of conducting the training on a district by district basis required coordination with not

only the 25 district offices but also with the state office in Austin, as well as over 200 independent organizations from over a 250,000 square mile area.

A registration fee of \$15 was charged for each person attending the class to cover the state and local match to be combined with federal funding to finance the overall training project. TMA also agreed to conduct the TPAT course, following the basic PAT course, in selected metropolitan areas.

District personnel in charge of public transportation assistance were the contacts for the training program, and in each case were familiar with the local transportation providers and their unique characteristics.

“...the need for training as perceived on the local level was much greater than anyone had anticipated...”

As a major teaching tool, TMA operates a Mobile Training Unit, which is a specially designed and equipped vehicle that transports all of the audio-visual materials, including videotape equipment, other teach-

ing devices such as wheelchairs, and is equipped with lifts and ramps for practice in entry and exit procedures.

The training activities began in November 1978. During the first year, over 600 people, representing approximately 260 organizations, in 21 of the 25 district offices, were trained. In the same period, instructor training sessions were conducted for 44 people in Dallas, Fort Worth, Houston, Austin, San Antonio, Amarillo, and Lubbock.

Profile of PAT and TPAT Students

During the course of the first year of training, the students represented some 47 different types of organizations, including drivers of urban transit systems as well as drivers for rural transportation demonstration projects. However, a significant number of people attending the courses did not drive as part of their job function, but were Medicaid transportation officers, dispatchers, transportation planners, personnel from the staff of Area Agencies on Aging, driver training and safety instructors, and public transportation officers with the DHT. Training for these people was intended to give them insight into the type of tasks performed by drivers and into the state of the art of transportation services for the elderly and handicapped.

The drivers represented various cultural, racial, and ethnic backgrounds; their

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Learning safety precautions is a major part of the training for bus operators. Here, the instructor shows that the driver's arm must be straightened with the elbow "locked", to insure that the driver will not accidentally place his feet under the lift platform when loading a passenger in a wheelchair.

ages ranged from 18 to 78 years of age; the number of men and women was approximately the same. Several students with Ph.D.'s completed the course, as well as a number of individuals who were functionally illiterate. (it should be noted that academic training is not, in this case, a predictor of how well an individual will do in learning

passenger assistance techniques.) Experience levels ranged from people who had been providing transportation services to the elderly and handicapped for as many as twenty years to those whose first day on the job was spent in the PAT training course. Previous experience in providing transportation services to elderly and handicapped

Drivers are instructed in various techniques for assisting passengers in wheelchairs.



TRAINING

people was not a factor in predicting the benefits an individual received from the course.

Evaluation

All students evaluated the class and the instructors at the conclusion of each

A student learns the proper technique for tilting a wheelchair.



training session. The students rated the course and the instructors on a scale of 1 to 10 (low to high) on seven items. For each class an average of the ratings for each of the seven items was taken in order to obtain a composite score for that training session. The weighted average for all sessions con-

The instructor supervises a student learning how to take a wheelchair up a curb.



ducted during the first year, on a scale of 1 to 10, was 9.51.

Each individual who becomes a PAT instructor is required to have each of his or her students complete the PAT evaluation forms and then mail them to TMA as part of established certification procedures. The evaluations are tabulated, recorded, and results are sent back to the instructors. This process allows TMA to monitor the instructors' performances and to assist them in areas which might be giving them trouble, as indicated by the evaluations. Having filled out the same questionnaire themselves during their training, instructors are better able to interpret the scores and comment on the evaluations of classes which they have conducted. To date, the sessions conducted by non-TMA staff instructors have received a weighted average of 9.48 on a scale of 1 to 10.

A number of things were learned during the first year's experience. First, it is possible to coordinate several hundred different transportation organizations to provide training on a statewide basis. This coordination depends upon knowledge of the particular needs of each of these organizations, and the close cooperation of state personnel at both the local and the state levels.

One of the major difficulties encountered in scheduling and conducting the classes was that a number of organizations

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Drivers who transport passengers in sedans or stationwagons must learn the proper way to load a wheelchair in the back seat or trunk of a car.

did not allow their personnel time off during normal weekday work hours to attend the training. TMA usually adjusts training hours to fit a given organization's needs, but under the DHT contract, the training facilities were available only from 8:00 to 5:00 p.m., Monday through Friday. In some cases, it was possible to arrange for alternative training facilities and the course was given outside of normal work hours. Other organizations designated a person from their organization to be trained as an instructor; this person could then teach the course to the drivers in their operation.

Finally, the need for training as perceived on the local level was much greater than anyone had anticipated prior to the commencement of training activities. Therefore, while it is feasible to teach large numbers of individuals the techniques of transporting elderly and handicapped individuals in a relatively short period of time, the emphasis in the long term must lie in the teaching of instructors, who in turn become a community training resource. In the summer of 1979, TMA conducted TPAT sessions for instructors for the entire state of Washington. These instructors in turn conduct training sessions throughout the local Washington communities. This system has, in fact, become the major thrust of teaching activities of TMA. **END**

Selection of Vehicles for Elderly and Handicapped Services

James D. Brogan, Francis X. McKelvey,
James M. Witkowski, Mark Dublin
Department of Civil Engineering
Michigan State University, East Lansing, MI

Section 16(b)(2) of the Urban Mass Transportation Act of 1964, as amended, makes available to private, nonprofit organizations 80 percent of the capital costs of vehicles for use in providing transportation services to elderly and handicapped clients. To date, millions of dollars per year have been allocated to the program, with thousands of organizations purchasing vehicles of various types.

The relative inexperience of the participating agencies in the provision of transportation services has resulted in an unusual number of problems. These problems have related primarily to vehicle selection, the inspection upon delivery of vehicles, vehicle operation and durability, and vehicle maintenance. Vehicle performance expectations often have been overstated, particularly in the case of relatively inexpensive vans, modified vans, and "body-on-chassis" small bus vehicles used in relatively heavy transit-related operations. The frequent stopping and starting, heavy passenger loads, and the use of inexperienced drivers have also contributed to the problems. The frequency of breakdowns has been particularly disturbing; since each operation has a small fleet, a breakdown means a reduction in service. It is therefore important to help local nonprofit agencies understand how to select vehicles for use in 16(b)(2) programs.

Operators of transportation services for the elderly and handicapped under the 16(b)(2) program generally select vans, modified vans, or small buses for the provision of service since these vehicles offer the seating capacity, maneuverability, and wheelchair lift or ramp options desired.

Vans

Standard vans available are limited to such models as the Dodge B-300 Maxivan or the Ford E-350 Supervan. As standard production models, however, these vehicles are usually considered too small to accommodate more than six to eight passengers comfortably. A particular problem with the standard production van is that the limited interior headroom does not allow passengers to stand erect when boarding or leaving the vehicle. This can be especially troublesome for elderly passengers with limited mobility, or for anyone helping a passenger using a wheelchair to board.

“Even a well-secured wheelchair, however, provides very little protection for the passenger in the event of an accident.”

Modified Vans

To increase the interior space beyond that provided by a standard production van, modified vans have been introduced. As the name implies, these vehicles are standard production vans which have been altered, either to increase the headroom or to widen the body. Modifications are made by companies other than the original manufacturer.

Modified vans can generally seat nine to twelve passengers depending on the seating arrangement. The addition of a wheelchair lift and accommodations for two wheelchairs in the vehicle generally restrict seating to six to eight passengers.

The most common modification made to a van is the addition of a raised roof to increase interior headroom. This is usually accomplished by removing the standard roof at or below the roof line and replacing it with a steel, aluminum, or fiberglass raised roof. Other common modifications include the addition of wheelchair lifts, transit-type seats, rubber-covered floors, and sliding passenger windows.

Modifications to standard vans alter the structural integrity of the vehicle; it is therefore important that materials of high quality and good workmanship be used in producing these modifications. The purchaser should develop written specifications which discuss the integrity of the structural body prior to selecting a vehicle.

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**TABLE 1
STANDARD AND OPTIONAL EQUIPMENT FOR MODIFIED VANS**

Standard Equipment ¹	Options
Power steering Power front disc brakes 350 or 360 V-8 gasoline engine 3-speed automatic transmission Heavy-duty shock absorbers 20 to 30 gallon fuel tank Heavy-duty battery and alternator Sliding transit-type tinted windows Transit-type neoprene seats Rubber covered floor Front and rear heaters Insulation in walls and roof Windshield defrosting and defogging system Exterior lighting Passenger entrance and emergency exit Interior and exterior rear-view mirrors Driver-controlled passenger lighting	Air conditioning, front and rear Wheelchair lift or ramp Wheelchair securement devices Folding passenger seats Brake retarders Roof vents Heavy-duty cooling systems Heavy-duty passenger heaters Rustproofing AM/FM radio Communications equipment Destination signs

¹Standard equipment varies with each manufacturer. A complete list of standard and available options should be obtained prior to ordering a vehicle.

Typical standard and optional equipment on a modified van are shown in Table 1.

Small Buses

Small buses are vehicles built on a chassis designed for light trucks. These

vehicles are often referred to as “body-on-chassis” vehicles using a truck chassis produced by such manufacturers as Chevrolet, Dodge, and Ford. The add-on body of these vehicles is typically constructed around a steel frame added to the chassis. Small buses are larger than modified vans. The

seating capacity of these vehicles ranges from 12 or 13 passengers up to 20 or 21 passengers. Because these vehicles are so much larger than modified vans, they can more easily accommodate wheelchair passengers, or a mix of wheelchair and seated passengers. The larger size of the small bus, however, does tend to limit maneuverability, although this is not a serious problem.

A comparison of the relative sizes of modified vans and small buses is given in Table 2.

Choosing the Right Vehicle

Selecting the right vehicle for each type of service offered by 16(b)(2) operators can be difficult. Matching the proper vehicle with the type of service, however, can increase the efficiency of the operation considerably. Experience in Michigan indicates that, in the case of operators of rural public transportation programs, the type of service provided is sometimes inadequate because the wrong size vehicle is purchased. Larger vehicles appear best for longer trips, while small vehicles seem best suited for shorter dial-a-ride, door-to-door service. Using one size of vehicle for all forms of service can be a serious mistake. It is important to plan service needs carefully prior to the purchase of a vehicle.

VEHICLES

**TABLE 2
SIZE COMPARISON OF MODIFIED VANS AND SMALL BUSES**

	Modified Vans	Small Buses
Overall		
Length	220 - 226"	233 - 280"
Width	80 - 94.5"	80 - 96"
Height	101 - 115"	93.5 - 117"
Interior		
Width	71.5 - 82"	79 - 90"
Headroom	72 - 74"	63 - 78"
Wheelbase	127 - 138"	125 - 167"
Gross vehicle weight	9,000 lbs	10,250 - 18,000 lbs
Typical seating capacity	9 - 16	16 - 22

Some guidelines for matching vehicle size and type of service were developed by the Michigan Department of Transportation for operators of rural public transportation. These guidelines are shown in Table 3 and may be appropriate when determining which type of vehicle to select for 16(b)(2) use.

The optional items selected for a 16(b)(2) vehicle will greatly influence the quality of service offered. These features, however, may also contribute to additional maintenance or other problems. Examples of experience with optional equipment in Michigan include:

1. Air conditioning. Fewest maintenance problems resulted from the use of manufacturer-installed (original) equipment. These, however, only cooled areas near the driver. Add-on units capable of cooling the entire vehicle had continual maintenance problems usually due to improper installation. Particularly troublesome were improperly mounted hoses and electrical wiring. Service for add-on units was also difficult to find.
2. Auxiliary rear heaters. These are effective in the larger vehicles for

heating the passenger compartment; improper installation is the primary maintenance problem.

3. Cruise control. This is ineffective for short, stop-and-go trips, but may save fuel on long highway trips. Maintenance is a problem.
4. Tinted glass. This is necessary for effective air conditioning.
5. Heavy-duty electrical system. This is effective in preventing overloading when additional electrical equipment is added to the vehicle.
6. Heavy-duty suspension system. This provides increased durability and adds to vehicle life.
7. Engine block heater. This is useful in colder climates, particularly where no indoor vehicle storage is available.
8. Power steering and brakes. These systems are helpful to operators.
9. Two-way radio. This is used for dispatching and scheduling, and also for emergencies such as breakdowns, accidents, or passenger problems.

Wheelchair Lifts

The technology needed to accommodate wheelchair users on public transit vehicles is still in an early stage of development. All of the wheelchair lift and secure-

VEHICLES

**TABLE 3
VEHICLE SELECTION GUIDELINES**

Demand - Responsive Operating Patterns	Vehicle Size
1. Pure demand: same day door-to-door service within a small service area	8-12 passenger
2. Advance reservation: planned trip service, usually scheduled 24 hours in advance	8-12 passenger or larger depending on trip length and terrain
Fixed-Route Service Patterns	
1. Fixed schedule: vehicle follows a prescribed path with defined pick-up points	16-19 passenger or larger depending on trip length
2. Route deviation: vehicle leaves fixed route to pick up or drop off passengers	12-16 passenger 16-19 passenger depending on terrain
Special Service Transportation	
1. Group service: single point-to-point service	Size determined by number of passengers
2. Agency client: frequent trips to and from human service agency locations	12-16 passenger 16-19 passenger depending on terrain
3. Subscription service: work trips and other orders for regular service	8-12 passenger 12-16 passenger depending on trip length

Source: *Rural Public Transportation Vehicles: A Section 147 Demonstration Program Technical Manual*, Number 4 of 5, Jack Hayes, U.S. Department of Transportation, Technology Sharing Program.

ment equipment currently on the market represents an attempt to make existing vehicles accessible to wheelchair users. A great deal of further research and development is needed.

Basically, there are two types of wheelchair lift machinery presently available. The first type is a small electric or electro-hydraulic elevator consisting of a platform which unfolds from the side of the vehicle

through doors separate from the main passenger door. An electric motor usually moves the platform from a vertical to horizontal position, and hydraulic pistons lower and raise the platform from the vehicle floor to the ground and back.

In the second type of lift, the main passenger steps of the vehicle are repositioned to make a flat platform which then is lowered and raised hydraulically. No separate door is needed with this type of lift since the basic stairwell serves as the lift area. The in-step lift may be operated by the driver; the side lift requires that the operator either ride the lift platform along with the passenger or stand alongside the vehicle to work the controls.

It is extremely important that a wheelchair lift meet several minimum requirements for safety as well as prolonged operation. Detailed specifications describing minimum requirements for lifts have been developed by several agencies including the California Highway Patrol (CHP), Michigan Department of Transportation (MDOT), North Central Texas Council of Governments (NCTCOG). Several minimum requirements for lifts are summarized in Table 4.

In addition, the platform must have a nonskid surface; the platform must have front and side anti-rolloff barriers; and the lift

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**TABLE 4
SUMMARY OF MINIMUM REQUIREMENTS
FOR LIFTS**

Lift capacity (pounds)	Agency
600	UMTA
600	CHP
750	MDOT
1,000	NCTCOG
Usable platform dimensions (minimum length times width)	
42x32"	UMTA
42½x32½"	MDOT
45x32"	NCTCOG

must be capable of manual operation in case of power failure.

Lifts may be equipped with an automatic shutoff mechanism which is activated when the lift contacts the ground or some obstruction such as a curb, rock, or tree branch. This is a useful option and can help prevent damage to equipment.

It is important that the lift controls be located so that either the driver or the lift user can operate the equipment. When the lift is operated by the drivers, they should be either on the lift platform or next to it outside the vehicle. The driver should be in a position to have a clear view of the lift and wheelchair, and be able to aid the user in case of an emergency.

The basic problem with lift equipment is that light machinery must be made to do heavy-duty work while exposed to destructive elements, especially temperature extremes, water, dirt, mud, gravel, and salt-induced corrosion. A piece of equipment that works well under laboratory conditions may be unable to stand up under continuous use in rural areas or in the climate of the northern states. Lift maintenance is of prime importance from both a safety and an operational viewpoint. Proper maintenance will prolong the operational life of a lift and decrease safety hazards.

Wheelchair and Passenger Restraints

Wheelchair restraint or securement equipment is presently quite primitive. The problem is to secure a passenger who *must* remain seated in a lightweight, semi- or fully collapsible chair throughout the ride. Most restraints now in use secure the rear wheels of the chair and hold a wheelchair in place during the course of a normal, accident-free passenger trip. Even a well-secured wheelchair, however, provides very little protection for the passenger in the event of an accident. Tests have shown that when secured in an aisle-facing position on the vehicle, a standard wheelchair gives very poor lateral support and tends to collapse during a front-end collision. When facing front, the wheelchair will pitch forward dur-

ing an emergency stop, or in a front-end collision. If the passenger is properly secured in the wheelchair, the front-facing position is relatively safe provided there is nothing located in front of the wheelchair which a passenger might strike. A wheelchair facing the rear of the vehicle must be supported from behind by a bulkhead, railing, or other structure which will completely prevent the chair from rotating backwards on its own rear axle. This is extremely important because, left free, the chair will rotate over the rear axle and cause serious injury to the passenger.

At least one manufacturer produces a wheelchair restraint device that secures the frame of the wheelchair as opposed to the rear wheels. This arrangement may reduce the pitch of a forward-facing wheelchair during an emergency stop. These units, however, will not increase the structural integrity of the wheelchair in a side-facing position.

Variations in chair and wheel size among existing wheelchairs may make it necessary to readjust the securement setting for each passenger. This can be a clumsy and time-consuming process; restraints, however, must be capable of accommodating various users.

In summary, vehicle selection is a key element in the success of any 16(b)(2) operation. **END**

Factors in Vehicle Design

David D. Thomas
William H. Henderson
Transportation Management Associates, Fort Worth, TX

The current state of the art in design and production of vehicles to meet the transportation needs of the elderly and handicapped has not advanced as far as it could have. To accelerate the advance, steps must be taken to develop a much broader perspective.

Anyone who has worked closely with systems transporting the elderly and handicapped realizes that the equipment used is often mechanically unreliable, poorly designed and, in some cases, presents an actual safety hazard to both the passengers and the vehicle operators. It would seem reasonable to ask why it is so difficult to obtain appropriate vehicles, and why it is that vehicle operators so often feel compelled to overcome mechanical and design deficiencies by improvising solutions.

In extensive experience with this problem, we have found that most accidents that occur in transporting elderly and handicapped individuals are a result of a combination of 1) a lack of training on the part of the drivers, and 2) the use of equipment which is not adequate to serve the transportation needs of this group.

Lack of Equipment Standards

This equipment deficiency is not due to lack of diligence, effort, or sincere desire on the behalf of the manufacturers to provide safe and reliable equipment. Clear and

concise federal or state standards for the functional requirements of vehicles designed to transport the elderly and handicapped have not been made available to manufacturers. A set of standards, such as the American National Standard ANSI A117.1-1961 *Specifications for Making Buildings and Facilities Accessible to, and Usable By, the Physically Handicapped*, has not been promulgated. The ANSI standards are not fully adequate, but the architectural and building professions have at least some basic guidelines from which to proceed. The manufacturers of vehicles, and devices such as lifts, have to date no such guidelines.

Without accepted national guidelines, the burden of developing specifications or standards often has fallen to state officials. In many cases, the person given the task of designing specifications for the acquisition of accessible vehicles for a state has had no previous experience in the field of elderly and handicapped transportation, and much less with the intricacies of equipment designed to transport people with a wide range of disabling conditions. All too often, this results in a vehicle that may be adequate in some respects, grossly inadequate in other respects, and may incorporate features at sometimes great expense that are not at all necessary for the safety or efficient transport of disabled individuals.

Fragmentation within the Industry

The second fundamental inhibiting factor in the development of safe and adequate specialized vehicles comes from the fragmentation of the sources of supply. There are at least three distinct industry segments involved in providing such vehicles:

1. Manufacturers of vehicles such as vans, school buses, and transit buses. These vehicle producers have a primary market other than that of providing vehicles for the elderly and handicapped.
2. Manufacturers of personal vehicle aids, such as lifts, ramps, and hand controls. Most of these manufacturers began by designing and producing such adaptive devices for use in private vehicles. This group often has a difficult time distinguishing between what is appropriate for a personal car and what is appropriate and necessary for a vehicle designed for public transportation.
3. Companies involved in customizing vehicles to meet private or public transportation needs of the elderly or handicapped. This group comprises companies whose major function is the installation of assistive devices such as wheelchair lifts, and which have expanded into the area of extensive customization of

VEHICLES

vehicles, primarily recreational vehicles.

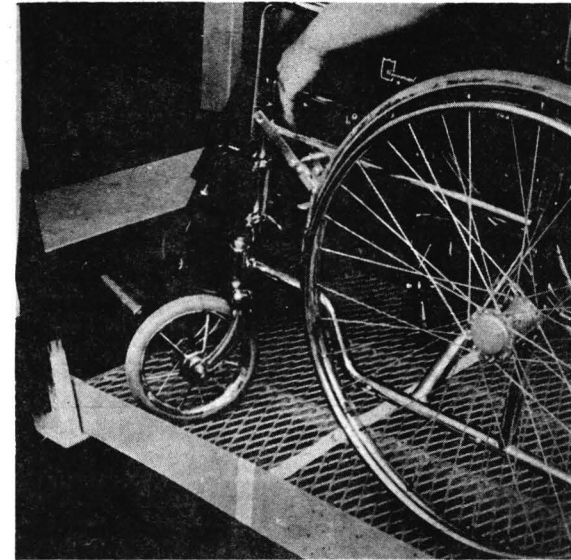
Over the past several years, the interaction of these distinct industry segments in solving design problems has been limited. In addition, the manufacturers of personal assistive devices, such as wheelchairs, also should be involved in the design problems. There has been a proliferation of assistive devices in the past few years. Only a short time ago, there were approximately four primary manufacturers of electric wheel chairs. Today, there are at least fourteen such companies with distinctly different products. While a considerable amount of attention has been focused on the design and production of such personal assistive devices, almost no thought has been given to the necessity of establishing common standards so that they might interface with the rapidly growing number of vehicles designed to carry elderly and handicapped people.

It appears that while designers and engineers are well trained and have extensive experience in the production of safe and effective vehicles, the needs of the elderly and handicapped demand performance in an area outside their typical training and experience. An extensive background in biomechanics, human factors engineering, and the design and construction of personal assistive devices is



In designing or specifying vehicles to transport the elderly and handicapped certain tolerances and spatial relationships have to be known by the designer or the one responsible for establishing specifications for vehicles. In this illustration a lift has been installed on a vehicle without a raised roof and raised doors. Drivers must in turn execute difficult maneuvers to overcome the vehicle's shortcomings. The minimum floor to ceiling height for adult males seated in wheelchairs is 57". The standard floor to ceiling height for most vans is 42"-44".

needed, as well as formal training and experience in vehicle design. Experience in how people actually use personal assistive devices is also necessary.



There are a number of safety aspects to be considered in designing or specifying a vehicle to transport the handicapped. In this case a hinged safety plate between the vehicle floor and the lift platform will keep the passenger's foot from being severely injured or severed. A number of lifts available today do not have a hinged bridge between the vehicle floor and the lift platform.

Design Problems

To illustrate the interrelationships among the designers of vehicles and adaptive devices, vehicle operators, and the elderly and handicapped users, four examples are listed here.

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In this example, the automatic backstop on the lift platform is hinged to close inwards. Since this lift has a powered downstroke, the backstop can crush the foot of a person in a wheelchair who does not use footrests.

1. Never tie a wheelchair down by one wheel. A wheelchair is designed to pivot freely on one wheel even though the other may be firmly fixed. Thus, tying a wheelchair down by one wheel leaves the chair free to pivot about that point, and presents a hazard to both the wheelchair user and others inside the vehicle.

2. A wheelchair wheel is made to function in compression and not in expansion, i.e., the opposing spokes on the wheel of a wheelchair are made to bear weight and to provide integrity to the structure only when they are under compression. If wheelchair tiedowns pull on the rim of a wheelchair wheel and put the wheel in expansion, this negates the structural integrity of the wheels.
3. The combination of colors and their contrast, both within and outside a vehicle, are of great significance to the visually impaired. Of the approximately 1.5 million people in the United States who are legally blind, more than two-thirds have some perception of light and color. This is also true of the 4.5 to 5 million individuals who are functionally but not legally blind. These people are able to see within the blue, green-gray, or white spectrums of color. The contrast of light and dark within the vehicle, i.e., the surfaces which reflect light and those which absorb it, can be just as important as the actual colors used.
4. Audio clues are very important to individuals with visual impairment. The standard horn of a wide variety of special vehicles is virtually indis-

tinguishable from the other vehicles operating in the visually impaired person's environment. It is recommended that specialized vehicles for the elderly and handicapped be equipped with a distinctive horn or chime.

It is necessary that a forum be established in which representatives of all industry segments, along with federal and state officials, can meet to discuss the role each

“Never tie a wheelchair down by one wheel.”

has to play in the development and production of accessible vehicles. This forum also should provide the opportunity for industry representatives to exchange information and discuss their own inherent design and manufacturing limitations. For example, a successful solution to the wheelchair tie-down problem can only be achieved when manufacturers of personal assistive devices and vehicle manufacturers work together to solve the design and engineering problems inherent in the interface between the device and the vehicle. Such solutions may involve compromises and standardization.

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Because the federal government has established, through both legislation and regulation, that the elderly and handicapped have a right to equal access to public transportation, it should assume the primary responsibility for the sponsorship of these cooperative relationships through the suggested forum. One of the prime objectives of such a forum should be the identification of areas that need additional research. The outgrowth of such an information exchange and research program should be the development of a set of standards similar to the ANSI architectural standards for making buildings accessible to handicapped individuals. While it is unlikely that such standards will provide the ultimate solution to all the design problems, they would certainly provide a much better basis for solving these problems than we currently have today. **END**



LIST OF AUTHORS

William E. Arnold
Chairman, Department of
Communication
Arizona State University
Tempe, AZ 85281

Tung Au
Professor of Engineering and
Public Policy, Civil
Engineering Department
Carnegie-Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213

Tom Autrey
Transportation Planner, East
Central Florida Regional
Planning Council
1011 Wymore Road
Winter Park, FL 32789

Anne-Marie O'Hanlon Barry
Coordinator of Allied Health
and Consumer Training
Transportation Project
Rehabilitation Research and
Training Center
The George Washington University
1828 "L" Street, N.W., Suite 704
Washington, DC 20036

Dwight M.B. Baumann
Professor of Engineering Design
Civil Engineering Department
Carnegie-Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213

Ronald W. Beane
Operations Manager, Iowa
Commission on Aging
415 10th Street
Des Moines, IA 50319

Mario Biaggi
Member of the House of
Representatives from the
State of New York
Chairperson, Subcommittee
on Human Services
House Select Committee on Aging
U.S. House of Representatives
2428 Rayburn Building
Washington, DC 20515

James Bley
Research Associate, Depart-
ment of Communication
Arizona State University
Tempe, AZ 85281

James M. Brockway
Director, Population Research
Unit

Urban Studies Center
University of Louisville
Gardencourt Campus, Alta
Vista Road
Louisville, KY 40205

Tanya K. Brockway
Transportation Planner, Southwest
Regional Planning Agency

James D. Brogan
Assistant Professor, Depart-
ment of Civil Engineering
Michigan State University
East Lansing, MI 48824

Don M. Coleman
Director, Urban Systems
Engineering
School of Engineering
Howard University
2300 6th Street, N.W.
Washington, DC 20059

David J. Cyra
Director, Office of Statewide
Transportation Programs
University of Wisconsin-
Extension
Johnson Hall, Box 413
Milwaukee, WI 53201

Carolyn DelGuidice
Executive Director, Central
Maryland Area Agency on
Aging
5745 Bartholow Road
Eldersburg, MD 21784

John W. Dickey
Professor, Center for Public
Administration and Policy
Virginia Polytechnic Institute
and State University
Blacksburg, VA 24061

Walter Diewald
Principal Research Engineer
Battelle - Columbus Laboratories
505 King Ave.
Columbus, OH 43201

M. Christine Doerflinger
Transportation Planner
Kentuckiana Regional Planning
and Development Agency
505 W. Ormsby Ave.
Louisville, KY 40203

Mark Dublin
Specialist, Department of Civil
Engineering
Michigan State University
East Lansing, MI 48824

Mary Ellen Early
Ulrich Ernst
Transportation Studies Program
The Urban Institute
2100 "M" Street, N.W.
Washington, DC 20037

John C. Falcocchio
Associate Professor, Poly-
technic Institute of New York
333 Jay Street
Brooklyn, NY 11201

Dale Fitschen
Director, Paratransit
Planning and Development
Regional Transit Authority
300 N. State Street
Chicago, IL 60610

Viktoria W. Fox
Special Services
Administrator, EASYRIDE
Peninsula Transportation District
Commission
3400 Victoria Blvd.
Hampton, VA 23661

Judith Frank
Occupational Therapist
Rehabilitation Research and
Training Center
The George Washington
University
2300 Eye Street, N.W.
Washington, DC 20037

Kathryn French
Research Associate, Depart-
ment of Communication
Arizona State University
Tempe, AZ 85281

Sherman Gordon
Research Assistant, Environ-
mental Studies Laboratory
Andrus Gerontology Center
University of Southern
California
Los Angeles, CA 90007

Eric S. Graye
Research Associate Engineer
Urban Systems Engineering
School of Engineering
Howard University
2300 6th Street, N.W.
Washington, DC 20059

Lawrence J. Harman
President, Call-A-Ride of
Barnstable County, Inc.
P.O. Box 7
Hyannis, MA 021601

Amin B. Hassam
Consultant, Peat, Marwick,
Mitchell and Company
1190 K Street, N.W.
Washington, DC 20006

LIST OF AUTHORS

William H. Henderson
Associate, Transportation
Management Associates
2 Arthur Drive
Fort Worth, TX 76134

Jackie Hunt
Director, Coordinated
Transportation Project
Executive Office of Trans-
portation and Construction
Commonwealth of Massachusetts
One Ashburton Place
Boston, MA 02108

Pam Hunt
Manager, Integrated Transit
Service
SIEDA, Building 17
Ottumwa Industrial Airport
Ottumwa, IA 52501

Ronald Kirby
Director, Transportation
Studies Program
The Urban Institute
2100 "M" Street, N.W.
Washington, DC 20037

Jolinda Lee
Transportation Analyst, Urban
Transportation Department
City of Austin
P.O. Box 1088
Austin, TX 78767

Thomas V. Letky
Manager, Elderly and Handi-
capped Services
Port Authority of Allegheny
County
Beaver and Island Avenues
Pittsburgh, PA 15233

David Lewis
Associate Analyst, Congressional
Budget Office
2nd and "D" Streets, S.W.
Washington, DC 20515

Hal S. Maggied
Maggied and Associates
3114 Kingscliff Way, N.E.
Atlanta, GA 30345
K. Mallik
Associate Research Professor
of Medicine, Rehabilitation
Research and Training Center
The George Washington University
2300 Eye Street, N.W., Suite 420
Washington, DC 20037

Robert L. Martin
Vice President, Kimley-Horn and
Associates, Inc.
P.O. Box 33037
Raleigh, NC 27606

Francis X. McKelvey
Associate Professor, Department
of Civil Engineering
Michigan State University
East Lansing, MI 48824

William W. Millar
Special Assistant to the
Executive Director, Port
Authority of Allegheny County
Beaver and Island Avenues
Pittsburgh, PA 15233

David P. Middendorf
Senior Consultant, Peat,
Marwick, Mitchell and Company
1990 K Street, N.W.
Washington, DC 20006

James H. Miller
Director, Public Transportation
Program
The Pennsylvania Transportation
Institute
The Pennsylvania State
University
Research Building B
University Park, PA 16802

Elaine Murakami
Research Assistant, Environ-
mental Studies Laboratory
Andrus Gerontology Center
University of Southern
California
Los Angeles, CA 90007

Margie O'Farrell
Research Analyst, East
Central Florida Regional
Planning Council
1011 Wymore Road
Winter Park, FL 32789

Michael Osborne
Research Assistant, Rehabilitation
Research and Training Center
The George Washington
University
2300 Eye Street, N.W.
Washington, DC 20037

Kelly Parrish
Assistant Project Director
Project on Section 504
National Governors Association
Hall of the States
444 North Capitol Street
Washington, DC 20001

Robert B. Patterson
Director of Special Transit
Department of Transportation
City of Kansas City
414 E. 12th Street
Kansas City, MO 64106

David J. Pearl
Deputy Administrator, Brockton
Area Transit Authority
232 Main Street
Brockton, MA 02401

Billy Pelham
Administrator, Special Program
Section
Bureau of Surface Transportation
605 Suwannee
Tallahassee, FL 32304

Victor Regnier
Laboratory Chief, Environmental
Studies Laboratory
Andrus Gerontology Center
University of Southern
California
Los Angeles, CA 90007

Joseph S. Revis
Senior Associate, Institute
of Public Administration
1717 Massachusetts Avenue N.W.
Washington, DC 20016

Sandra Rosenbloom
Center for Transportation
Research
The University of Texas at
Austin

U.T. Station
P.O. Box 8059
Austin, TX 78712

Ervin S. Roszner
Manager, ACCESS Project
Office
ACCESS Transportation Systems,
Inc.
701 Smithfield Street
Pittsburgh, PA 15222

L. André Roy
Senior Transportation Planner
and Supervisor
Short-Range Planning Section
KIPDA, Inc.
914 East Broadway
Louisville, KY 40204

Arthur Saltzman
Director, Transportation
Institute
North Carolina A&T State
University
Greensboro, NC 27411

Carole Schlesinger
Center for Transportation
Research
University of Texas at Austin
Austin, TX 78712

LIST OF AUTHORS

Robert Schmitt
Community Assistance
Coordinator, Office of
Statewide Transportation
Programs
University of Wisconsin-
Extension
Johnson Hall, Box 413
Milwaukee, WI 53201
Gary Sokolow
Transportation Planner, East
Central Florida Regional
Planning Council
1011 Wymore Road, Suite 105
Winter Park, FL 32789
Annette Spear
District Director, Annapolis
Family and Children's
Society
934 West Street
Annapolis, MD 21404
Barri J. Standish
Director, Urban Rural
Transportation Alliance
5829 Banneker Road
Columbia, MD 21044
Donna Strauss
STEHP, Inc.
505 West Ormsby Avenue
Louisville, KY 40203
David Thomas
President, Transportation
Management Associates
2 Arthur Drive
Fort Worth, TX 76134
Thomas Urbanik II
Assistant Research Engineer
Texas Transportation Institute
Texas A&M University
College Station, TX 77843

Joan M. Walker
Transportation Systems Analyst,
Multisystems, Inc.
1050 Massachusetts Ave.
Cambridge, MA 02138
David Warren
Paratransit Program Manager
Metropolitan Transit Authority
P.O. Box 61429
Houston, TX 77208
George A. Watkins
Battelle - Columbus Laboratories
505 King Avenue
Columbus, OH 43201
James M. Witkowski
Research Assistant, Department
of Civil Engineering
Michigan State University
East Lansing, MI 48824

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Mr. Bud Giangrande
Chief, Technology Sharing Office
U.S. Department of Transportation
Research and Special Programs Administration
Transportation Systems Center
Kendall Square—Code 151
Cambridge, MA 02142
(617)494-2486