

Overview of the Transportation Demand of Mentally Retarded Persons

JANE K. STARKS

Two remarkable and complementary trends have recently emerged in the treatment of mentally retarded persons: a marked increase in the quantity and availability of a great variety of services and a strong programmatic emphasis on the delivery of these services in community rather than institutional settings. The availability of multifarious services, the increasing decentralization of delivery of these services, and the propensity of mentally retarded persons to use these services extensively result in a demand for transportation that is particularly concentrated and exceeds that of elderly or physically disabled persons. Demographic factors that underlie the travel demand of mentally retarded persons are reviewed, and data that illustrate the distinctive travel patterns of these citizens are introduced. In the absence of adequate foresight or planning, these travel patterns inflate agency transportation costs and induce distortions in the demand-responsive ridership of special-efforts paratransit systems. Both social service agencies and special transit providers are more efficiently and equitably accommodating the travel demand of this segment of the transportation-handicapped population.

According to estimates based on the 1980 census, between 5.6 and 6.7 million persons are mentally retarded. The prevalence of mental retardation in this country is exceeded only by mental illness, cardiac disease, arthritis, and cancer (1). In this paper it is contended that the availability of a vast array of services for this population, the trend of increasing decentralization of delivery of these services, and the willingness of mentally retarded persons to extensively use these services have combined to produce a demand for transportation that is particularly concentrated and exceeds that of elderly or physically handicapped persons. Furthermore, the comparatively larger volume of trip making generated by this population imposes distinct, yet interrelated, problems of cost and efficiency for both human services agencies and special-efforts transportation services.

An overview of the travel demand of mentally retarded persons, who comprise a highly distinctive segment of the transportation-handicapped population, is presented. First, demographic factors that underlie the travel demand of mentally retarded persons are reviewed. Then, data that illustrate the travel patterns of these citizens are presented. Last, there is a description of how these travel patterns exert adverse impacts on social service agency costs and special-efforts system ridership, and the solutions that both types of provider have devised to more effectively accommodate the travel demand of mentally retarded persons are noted.

DEMOGRAPHICS OF RETARDATION

For an individual to be classified as mentally retarded two conditions—psychometric determination of low intelligence and manifestation of incompetence in some or many aspects of daily living—must both be present. To date, a completely precise, universally accepted definition of mental retardation has not been produced (2). Nonetheless, the most commonly cited definition is that of the American Association on Mental Deficiency: “Mental retardation refers to significantly sub-average general functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period” (3, p.11). This definition encompasses a vast range in the degree of disability imposed by retardation. At one extreme, a mildly retarded man or woman may be able to live a normal life—hold a job, marry, raise children—with little or no special assistance. At the other extreme, a profoundly retarded person is more likely to be unable to communicate or interact with others and may be physically incapacitated.

Population Characteristics

There has long been uncertainty about the total size of the mentally retarded population (1, 2). However, a number of reliable studies suggest that the prevalence rate of retardation ranges from 2.5 to 3 percent of the general population (1). Within the maximum total population of 6.7 million mentally retarded persons projected by the census there are two subgroups that are distinguished by differences in both the incidence and the severity of their mental retardation (4).

The much larger subgroup, 87 percent or 5.8 million persons, consists of people who are mildly retarded. Mild retardation is most often due to familial-genetic causes that are often rooted in the exigencies of poverty: poor prenatal and postnatal care, inadequate nutrition during childhood, emotional and physical abuse or neglect, and cultural deprivation (4). Consequently, the incidence of mild retardation in this group is closely linked with poverty. Mildly retarded individuals, whose IQ scores range from 55 to 70, can, with the provision of specialized educational and vocational services, expect to lead relatively independent lives. Some portion of this group may be identified as mildly retarded only during the years they attend school; when these individuals reach adulthood, and no longer require or are eligible for special services, they may simply “disappear” into the general population.

The second, smaller subgroup consists of more severely disabled persons—those classified as moderately, severely, or

profoundly retarded and whose IQ scores range from 0 to 70—and is estimated to be 900,000 in size (1). Retardation in this population stems from organic causes, such as chromosomal anomalies or metabolic disorders (4). In addition, neurological and physiological impairments are more likely to be present, especially in individuals who express the lowest levels of mental competence. Because these individuals clearly manifest defined symptoms of organic retardation, they are often diagnosed at or shortly after birth. Therefore there is better information about this population. Furthermore, because organic rather than socioeconomic factors are the cause, the incidence of moderate, severe, and profound mental retardation is more evenly distributed among all segments of society. Nearly all organically impaired individuals require ongoing assistance and supervision; a few—those who are profoundly retarded—may need lifelong custodial care.

Trends in Service Delivery: Implications for Travel Demand

Since the 1960s this country has witnessed the advent of remarkable changes in the perception and treatment of mentally retarded persons. These include substantial increases in the amount and scope of research devoted to the identification, mitigation, and prevention of the many causes of retardation as well as the endowment of mentally retarded citizens with previously denied civil rights. These changes have produced two notable and complementary trends: a dramatic increase in the provision of a large array of services and a strong programmatic emphasis on delivering services in community rather than institutional settings. These trends have resulted in significantly increased travel demand on the part of mentally retarded persons.

Since 1962 the concept of “continuum of care” (i.e., the widespread availability of comprehensive primary and support services) has governed the delivery of services to the retarded (5). In the 1970s major federal legislative mandates, including the Developmentally Disabled Assistance and Bill of Rights Act (PL 94–103), the Education for all Handicapped Children Act (PL 94–142), and Section 504 of the Rehabilitation Act, as well as numerous federal and state programs, provided funding for a greatly expanded system for delivering service to the retarded (6). As a result, these citizens, particularly those who are moderately, severely, or profoundly retarded, are eligible for a stream of services that commences in infancy (or even earlier) and continues until death: fetal surgery, infant stimulation programs, occupational and physical therapy, special education, and corrective surgery are available during the early years; vocational, recreational, residential, medical, legal, and financial services are provided throughout adulthood.

A second, equally influential concept that has shaped the provision of services to the retarded is “normalization,” the notion that each retarded individual should be encouraged and helped to achieve his or her potential to live and work in the least restrictive setting (6). This concept has prompted a fundamental shift toward providing services in the community; this has been accompanied by an absolute decline in the number of

retarded persons who are institutionalized. Over a period of 20 years, beginning in 1955, the institutionalized population decreased 65 percent, from 559,000 to 193,000 (7).

More recently, the deconcentration of residential services for the remaining institutionalized population has emerged as a marked trend. In 1982 a national census was taken of all state-licensed residential facilities for the retarded (8). The census enumerated 243,669 mentally retarded persons who were living in 15,633 facilities, including foster homes, nursing homes, boarding homes, and group homes, that varied greatly in size and type. Large group residences remain the predominant type of facility: more than 58 percent of all residents of the surveyed facilities lived in group settings of 64 or more persons. However, although the population of retarded persons who lived in state-licensed facilities has remained at a relatively constant level of 250,000 during the last 15 years, in the 5 years immediately preceding the survey the number of facilities doubled.

The dispersion of residential placements for the retarded is predicted to accelerate due to changes in Medicaid law (9). Section 2176 of the Omnibus Budget Reconciliation Act of 1981 (PL 97–35) permits states that have met certain qualifications to provide a broad range of services to elderly, disabled, and retarded Medicaid recipients in non-Medicaid facilities. Provision of services in Medicaid-certified facilities, which must conform to stringent construction and operating requirements, is more costly. Under this new program, states have a strong cost incentive to deinstitutionalize their mentally retarded clients: 85 percent of all state institution beds have been certified for mentally retarded Medicaid recipients, and it has been estimated that approximately \$1,000 is saved annually for each mentally retarded client who is transferred to a non-Medicaid facility.

A similar combination of economic incentives and normalization principles has produced a trend toward placing mentally retarded clients in competitive jobs as an alternative to sheltered workshops or day activity programs. Since 1975 a number of competitive job-training programs have been created to train severely retarded persons for a variety of service sector jobs, including food, housekeeping, janitorial, and clerical services (10). In support of this trend, a number of legislative changes, which would allow mentally retarded persons to work full time and yet retain their eligibility for benefits provided by the Social Security and Supplemental Security Income programs (11), are being pursued.

Until 20 years ago, institutions were the primary providers of residential care, and community-based services for noninstitutionalized retarded persons were scarce. Changing concepts of service delivery—the shift to community- or home-based residential care and the expansion of habilitation, vocational, and job-placement services—have resulted in trip origins and destinations that are more numerous and increasingly dispersed. As a consequence, human service planners and administrators have, during the last 15 years, begun to cite transportation as a critical factor in enabling retarded persons to participate in services and programs based in the community (12–18). In 1977 the President’s Committee on Mental Retardation reported that 35 states had identified the lack of transportation as the principal barrier to the use of such services by these citizens (19).

EVIDENT TRAVEL DEMAND OF MENTALLY RETARDED PERSONS

Sources of Data

Although the demand of mentally retarded persons for transportation is undeniably significant, there are few data to document the nature, extent, or impacts of this demand. A chronic deficiency of data pervades nearly all elements of delivery of service to the mentally retarded. In 1977 the President's Committee on Mental Retardation observed that large amounts of federal money had been distributed without any requirement that recipients assemble, analyze, or distribute quantitative data (19). The continued lack of a uniform data-reporting system means that, with the exception of the data on residential placement trends reviewed previously, it is still not known how many retarded persons are receiving services, how effective or efficient those services are, and in which areas services are needed but not provided (20).

Federal transportation policy makers also failed to analyze the travel needs of the retarded when policies for both accessible and specialized transit services were implemented (5, 21, 22). Furthermore, special-efforts providers are not required to compile ridership statistics, disaggregated by user type, trip frequency, or trip purpose, which would help clarify the idiosyncratic travel behavior manifested by various dysfunction groups within the larger population of elderly and handicapped users (23).

Despite the general paucity of information, ridership and cost data related to the provision of transportation for the retarded have recently become available. Probably the best source to date is the California Department of Developmental Services (CDDS). The CDDS was created in 1973 and administers a massive, statewide program of 21 regional centers. Each regional center purchases (but cannot directly provide) a comprehensive range of services, including transportation, for an approximate total caseload of 58,000 retarded persons who live in the community. In 1982 the CDDS began a yearlong study, funded by the California Department of Transportation, to identify who among its clients received purchased transportation services and to evaluate how costly, efficient, and effective those services were. This study was noteworthy because of its scope: fairly reliable preliminary information was compiled about the travel consumption patterns of 12,719 regional center clients (21 percent of the statewide caseload) for whom transportation was purchased in 1982 (16). Subsequently several regional centers have undertaken more sophisticated and more complete analyses of their clients' demand patterns.

These data, supplemented with ridership data from several special-efforts providers, are the sources for the analysis that follows. It is important to note that these data are only suggestive: the travel behavior of regional center clients cannot be generalized to the much larger populations of either all mentally retarded clients of social service agencies or mentally retarded persons outside the social service network. Nonetheless, this writer maintains that those ridership and cost data that are available support with great consistency the inference that mentally retarded persons comprise a separate and distinctive

segment of the market of elderly and handicapped users of specialized transit services.

Travel Patterns of Elderly and Physically Handicapped Persons

The elderly and the physically handicapped differ from the retarded in ways that lead to a divergent demand for special transportation services. According to the U.S. Department of Transportation, nearly half of the persons identified as transportation handicapped are elderly, and a large proportion of them are wheelchair users and persons who rely on other mechanical aids (24). Consequently, the transportation-handicapped population is less likely to work and travels less frequently than the non-transportation-handicapped population. For example, elderly persons who are transportation handicapped travel at a rate of 18.5 trips per month compared with an average monthly trip rate of 65.1 for all non-transportation-handicapped persons over the age of five (24).

Users of specialized services exhibit basically the characteristics just described. A high percentage of users are elderly or wheelchair users, or both (25, 26); the monthly rate of travel on special-efforts systems is less than five trips per registrant (27). Elderly and physically disabled persons use special-efforts services primarily for social and recreational travel; the second most common trip purpose is medical care (23). Furthermore, the travel of the elderly and the physically handicapped tends to be demand responsive whereas the spatial distribution of travel is many to many.

Travel Pattern of Mentally Retarded Persons

The travel demand of mentally retarded users of special services is much more concentrated in its spatial and temporal distribution. However, as is the case with the elderly and the physically handicapped, the travel patterns of the retarded are especially linked to availability of services as well as to demographic characteristics. It has been suggested that the generally low levels of trip making by the elderly users of special transit systems are due to the lack or insufficiency of community services for the elderly (23). It has been observed that community-based services for mentally retarded persons are currently much more extensive than are services for elderly or disabled persons (9). That those few special-efforts systems that can estimate or provide information on user types report that their mentally retarded users are nearly always affiliated with social service agencies appears to confirm this observation.

For the most part, trip purpose appears to be governed by agency affiliation. The CDDS found that travel to a day program or sheltered workshop was, by far, the most frequent trip purpose of the 12,719 clients who used door-to-door transportation purchased by the regional centers (16). This pattern is further illustrated by data from a special-efforts generic mobility training program in Sacramento (1985 operating statistics of Paratransit, Inc.). Table 1 gives mobility-training destinations according to user type for 407 elderly and handicapped persons

TABLE 1 MOBILITY TRAINING DESTINATIONS OF 407 ELDERLY AND HANDICAPPED PERSONS

Trip Purpose	114 Elderly Persons (%)	218 Mentally Disabled Persons (%)	40 Physically Disabled Persons (%)	35 Mentally Retarded Persons (%)
Medical	24	37	28	11
Shopping	59	34	53	26
Social visits	8	7	5	9
Subtotal	67	41	58	35
Programs	4	2	5	14
School	NA	5	5	20
Employment	NA	2	2	17
Subtotal	4	9	12	51
Other	5	13	2	3
Total	100	100	100	100

Note: NA = not applicable.

Source: Paratransit, Inc., Sacramento, California.

(training to use fixed-route service is provided as an alternative to paratransit service) for 1985. For example, 55 percent of all elderly, physically disabled, and mentally handicapped persons were successfully trained to reach shopping or recreational destinations compared with 35 percent of the mentally retarded trainees. Medical destinations were the second most frequent travel purpose for the elderly, physically disabled, and mentally handicapped trainees, but only 11 percent of retarded persons were trained to reach this type of destination. Programs, school, or employment were the training destinations for 51 percent of the retarded candidates but for only 4 to 12 percent of the elderly and disabled candidates. The preponderance of social service (i.e., program) destinations is especially pronounced for the mentally retarded clients of three regional centers in the Los Angeles area. Ninety-four percent of the 1,370 clients for whom transportation was purchased in 1985 traveled to educational and occupational programs; the remaining 6 percent were transported to recreational or after-school care sites (28).

In addition, demographic factors promote the ability of mentally retarded persons to participate in programs. Transportation analysts have suggested that, for the elderly, barriers of poor health, low income, and an indifferent attitude may limit participation in available community services (23). However, these barriers are generally lacking for mentally retarded persons. Mentally retarded clients tend to be under the age of 65 (severely retarded persons in particular have a shortened life expectancy) and are usually ambulatory. To illustrate, 78 percent of 1,370 regional center clients, mentioned in the previous paragraph, for whom transportation was purchased were ambulatory adults (28). Only 12 percent of adult clients were in wheelchairs, and 10 percent of clients were infants.

However, in addition to the possession of youth and physical ability, mentally retarded clients have a complaisant attitude that ultimately leads to frequent travel. Retarded persons who are recipients of social services are captive clients; they willingly undertake a regimen of programs and activities arranged by caseworkers or parents and comply with whatever

travel arrangements are necessary to ensure attendance. Thus the availability of services for the retarded, combined with their propensity to use them, results in a travel demand that has temporal and spatial characteristics that are atypical of the general population of elderly and handicapped users of specialized transportation services.

The most striking aspect of this demand pattern is the frequency of travel. In 1982 the CDDS was able to determine that nearly 95 percent of 12,719 clients who used door-to-door services made a minimum of three round trips per week; only 656 clients traveled less frequently (16). However, three regional centers in Los Angeles have been able to provide more recent and more complete information. In 1985, 1,370 clients for whom transportation was purchased made an average of 454 trips per year, which resulted in an annual total of 623,000 one-way trips. It must be emphasized that this volume of ridership is dramatically larger than that produced by any transit or city provider of specialized paratransit. For example, Houston Metro's special-efforts program, one of this country's largest, provides 370,000 trips per year (29).

Furthermore, this twice-daily travel is concentrated during peak travel periods. This is confirmed by two special-efforts providers, Getabout, in the east San Gabriel Valley, and Omnitrans, in neighboring San Bernardino County, who reported that the ridership of regional center clients comprised nearly 90 percent of the total peak ridership on both systems. Similar core riderships, which are comprised of mentally retarded persons traveling to social service programs during peak periods, have been reported by special-efforts transit services in Barnstable County, Massachusetts (30), and Rochester, New York (31).

Additional data from the three regional centers in Los Angeles suggest that the spatial distribution of travel is comparatively concentrated as well. Commercial providers provide many-to-few service to 115 program destinations on a total of 204 morning and afternoon routes; the ratio of clients to destinations is 12 to 1 (28). In an earlier assessment of the clients of these regional centers it was found that fewer than 3 percent of all clients traveled one-to-one (32). There is also some clustering of clients' origins. A regional center in Orange County reports that 30 percent of its clients are transported from shared origins (better data are not available). The travel of the 1,370 regional center clients is mostly within fairly localized ranges. Table 2 gives the distribution of ridership according to different ranges of trip length. For example, more than two-thirds of the 12,726 trips provided weekly were less than 7 mi long; only 9

TABLE 2 PERCENTAGE DISTRIBUTION OF RIDERSHIP ACCORDING TO TRIP DISTANCES FOR 1,370 MENTALLY RETARDED CLIENTS (28)

Range of Miles	Total Weekly Trips	Percentage of All Trips
0-3.25	4,327	34
3.26-6.25	4,200	33
6.26-10.00	3,054	24
10.00 +	1,145	9
Total	12,726	100

percent of commercially provided client travel exceeded a distance of 10 mi.

Transit analysts have determined that the travel variables described previously—high ridership, many-to-few route configuration, and a fairly confined geographic service area—contribute to higher vehicle productivities (29). Only one of the three Los Angeles regional centers, Harbor, has computed productivity (28). During FY 1984–1985 the productivity of door-to-door transportation purchased for 583 clients was 6.4 passenger trips per vehicle hour. This figure considerably exceeds the 2.94 passenger trip productivity value that is more typical of specialized transportation services located in urban areas with a population in excess of 1 million persons (29).

In summary, the demand pattern of mentally retarded clients contrasts sharply with that of elderly or physically handicapped users of specialized services. Mentally retarded persons travel with much greater frequency and therefore generate seven to eight times more ridership than do either elderly or physically disabled users. Similarly, mentally retarded persons require services that are prescheduled rather than demand responsive, and their distribution of travel is many-to-few rather than many-to-many. The greater demand densities that are associated with the provision of transportation to this population have significant impacts on the costs to social service agencies and on the ability of special-efforts systems to equitably meet the transportation demands of a broad range of elderly and handicapped patrons.

FINANCIAL AND RIDERSHIP IMPACTS OF THE TRAVEL DEMAND OF THE MENTALLY RETARDED

Impacts on Social Service Agencies

The high costs associated with the travel demand of mentally retarded persons reduce the capability of human service agencies to purchase or provide primary services. However, until recently, the magnitude and complexity of transportation costs were simply unknown. In 1972 the President's Committee on Mental Retardation surveyed 17 states to obtain statewide agency expenditures for the transportation of mentally retarded clients. Only six states were able to respond, and all reported that they were unable to disaggregate the costs of services for the retarded from expenditures for other handicapped populations or to identify transportation expenditures (14). Ten years later the state of California, one of the six states that had earlier been unable to provide cost data to the President's Committee, was able to obtain this information through a study performed by the CDDS (16).

In 1972 the President's Committee on Mental Retardation found that, for some agencies, more than 50 percent of the total expenditure for services for some clients was dedicated to transportation (14). The CDDS was able to confirm this pattern and document the magnitude of transportation costs. In 1982 transportation had, for some regional centers, replaced residential services as the single most costly service provided (14). Transportation costs represented from 50 to 70 percent of the total cost of services for some regional center clients. Furthermore, transportation costs were increasing at an alarming rate.

In 1982 the regional centers spent \$19 million for the purchase of transportation services (14). By 1985 total transportation costs had risen 50 percent to nearly \$29 million (33).

Certainly a significant portion of this increase is the result of the continued decentralization and expansion of community-based services described earlier in this paper. However, the regional centers were mostly ignorant about their clients' travel patterns, deficient in their accounting methods, and inept at procuring transportation services. These deficiencies are, according to several transportation analysts, fairly typical of human service agencies (34, 35). For the regional centers, these problems resulted from the way the delivery of services was organized. All decision making was highly decentralized: case managers in each of 21 regional centers arranged a variety of residential, vocational, and transportation services for their clients. However, the costs of these services were billed to the CDDS rather than the caseworker. Because transportation costs were aggregated with other service costs, the CDDS remained unaware of the extent of spending for transportation.

As a consequence, caseworkers, who were insensitive to costs and ignorant of cheaper alternatives, most often chose the most expensive mode of transportation: nearly 80 percent of the 12,719 regional center clients for whom transportation was purchased in 1982 traveled on door-to-door services provided by commercial vendors (16). Furthermore, service contracts with private, nonprofit providers (only a small percentage of regional center clients were able to use special-efforts services) were not competitively bid, even though the regional center system, in total, purchased from 5 to 6 million trips in 1982 and some regional centers were the sole source of revenue for their contract providers. In addition, contract rates were based on mileage and thus provided an incentive for vendors to inefficiently route regional center clients to increase profits.

Caseworkers also contributed to the provision of inefficient, and sometimes duplicate, services. For example, 8 percent of all trips purchased for 1,373 clients in Los Angeles were for clients who were transported from the same origin to the same destination but were nonetheless taken individually by different vendors (32). Also, clients' program placements were sometimes made without consideration of the distances to be traveled. This resulted in unnecessary burdens on both client and agency budgets. Some clients were spending from 3 to 4 hr per day in transit (16). The regional center that serves the East Bay determined that long ride times have a degrading effect on their clients' behavior, as well as reduce the amount of time that can be spent more effectively in a program (36). Also, longer travel distances resulted in higher fares and more single rides. In the most egregious case, \$112 per day—\$28,000 per year—was spent to transport a single client 70 mi each way between home and workshop (16).

Impacts on Special-Efforts Providers

For social service agencies, the costs of serving the high-volume travel demand of clients may encroach on the ability of the agency to provide primary services or may reduce the number of clients who can be accepted for services. However, for some special-efforts transportation providers, mentally retarded users may, through their concentrated demand for

travel, create additional costs and command a disproportionate share of door-to-door capacity.

Few special-efforts providers compile ridership data that distinguish users according to their disability. However, a consistent demand pattern does emerge for several providers in quite diverse locations. In 1982 special-efforts providers in Detroit, Fort Worth, and Houston estimated that approximately one-third of their ridership consisted of mentally retarded persons who traveled to programs (37). This ridership pattern has also been observed for special-efforts systems in Kansas City, Missouri, and Cleveland, Ohio.

More recent and detailed information about users of two special-efforts systems indicates that mentally retarded users generate disproportionately higher volumes of ridership than do elderly or physically handicapped users. For example, in 1984 Paratransit, Inc., the special-efforts provider in Sacramento, was able to identify 250 mentally retarded users. These individuals represented fewer than 14 percent of all active users but took 59 percent of the 230,000 paratransit trips provided. Similarly, in 1982 Getabout, which serves the east San Gabriel Valley, determined that 65 percent of its ridership was 125 regional center clients who represented fewer than 3 percent of all registered users.

The propensity of mentally retarded registrants to use door-to-door services can significantly improve the overall performance of the special-efforts provider. As noted in the previous section, mentally retarded users comprise a core ridership whose daily travel to congregate destinations during peak travel periods is a key factor in achieving high vehicle productivity (29, 38). Because programs have fixed stop and start times, which are separated by several hours, both legs of round-trip service are prescheduled: many-to-few in the morning and few-to-many in the afternoon. Furthermore, because most mentally retarded persons are ambulatory, specialized vehicles seldom need to be dedicated to their service.

The divergent ridership patterns of mentally retarded persons and of elderly and physically handicapped persons can be successfully coordinated by providing demand-responsive and subscription services exclusively during dedicated times. However, both services cannot be provided using the same vehicles during the same hours of service; subscription trips inevitably preempt demand-responsive service, particularly during peak travel periods.

Getabout's operating experience illustrates how passenger productivity is improved and that inequitable shifts in ridership occur when subscription trips are added to existing demand-responsive travel on door-to-door services. Before 1981 Getabout's users were predominantly elderly persons, and there were a smaller number of orthopedically crippled users. However, attracted by flexible eligibility criteria and a donation-only fare policy, a nearby regional center, within a few months, inundated the peak periods of paratransit service with mentally retarded clients. Overall passenger productivity increased from 3.5 to 5.1 trips per vehicle hour—a 31 percent net increase in efficiency. However, this improved system performance masked distortions in the provision of demand-responsive travel. Mentally retarded subscription riders were provided 9 trips per vehicle hour. However, because demand-responsive services were discontinued during those hours, ser-

vice effectiveness to the elderly and the physically handicapped declined 37 percent, from 3.5 to 2.2 trips per vehicle hour.

Moreover, a considerable inequity in the distribution of per capita transportation subsidies accompanied the distortion of capacity allocation among different user groups. In 1982, \$19 million was allocated from the California Transit Development Act (TDA) Section 4.5 fund to provide special transportation services to approximately 604,931 citizens identified as mobility impaired by the 1980 Census of Population and Housing. In this same year Getabout received \$540,715, 71 percent of its total annual budget, from TDA Section 4.5 funds. However, 65 percent of Getabout's service was provided to 125 regional center clients. These clients benefitted from an annual net transit subsidy of \$2,811, which greatly exceeded the average per capita amount of \$31.40 provided by TDA funds to meet the needs of all transit-handicapped Californians.

Finally, despite the advantages of greater load factors, service to this user group can entail difficulties, and hence costs, that may be obscured in gross operating costs and statistics. Some problems are caused by social service agencies. Caseworkers may take advantage of inexpensively priced special-efforts services by adding more programs to a client's itinerary; vehicles must be dispatched four times a day for clients who attend different morning and afternoon programs. In addition, programs that do not closely observe established starting and closing times impose schedule delays on drivers who must wait for clients.

Other problems for special-efforts providers arise from the personal limitations of some mentally retarded patrons. For example, some regional center clients who were users of Getabout could not tolerate a change in drivers. Thus Getabout had to deploy the drivers of these clients for 12-hr shifts as well as absorb the cost of overtime wages. Client behavior problems also produce schedule delays. An additional 10 min of dwell time was added to a taxi schedule to accommodate a client who sometimes soiled her clothing when the vehicle arrived. In this case the regional center paid the extra costs (28). Some clients, particularly those who are severely retarded, engage in behavior that should only be indulged in in privacy and must therefore be transported separately from elderly and physically handicapped users even when combined services are possible. Finally, some drivers refuse to carry regional center clients. One taxi driver was followed and physically threatened by angry drivers because his passenger, a young mentally retarded and physically disabled man, had repeatedly, and with great facility, made a well-known obscene gesture out the rear window of the cab.

Only a small percentage of mentally retarded users create problems. Nonetheless, special-efforts transit operators and drivers sometimes devote much time and effort to solving clients' problems, which are really the responsibility of the care provider or caseworker.

SOLUTIONS

The problems that attend the concentrated travel demand of mentally retarded persons who are affiliated with social service agencies—high transportation costs and disruptions in the equi-

table distribution of scarce paratransit services to elderly and handicapped users—have prompted some social service agencies and special-efforts providers to implement a number of solutions.

Relatively few social service agencies have access to a special-efforts provider. The demand of the clients of those that do will likely exceed the capacity of a special-efforts service. Therefore social service workers must understand the costs and complexity of providing or purchasing transportation services for their mentally retarded clients. To this end, the three regional centers that serve clients in the Los Angeles area have undertaken several actions to enhance their performance as major public contractors of a range of transportation services.

First, the purchase of transportation and the monitoring of performance and efficiency are performed by a full-time transportation coordinator rather than left to the whim of the individual caseworker. Second, competitive bidding is used to secure contracts that require that transportation services be efficiently routed and that levels of service related to punctuality and the length of clients' ride times be maintained. Third, the regional centers have established a comprehensive data base using both Commuter Computer [donated by the Los Angeles Rapid Transportation District (LARTD)] and a computerized routing and billing program that collects and analyzes the following data: client origins and destinations, scheduled versus actual pickup and drop-off times, average ride time, longest ride time, service hours and miles consumed, cost per client, and cost per trip (28). Fourth, mobility training has been provided as an alternative to expensive door-to-door services. Harbor regional center achieved a net savings of \$48,000 in FY 1984–1985 by training an average of 12 regional center clients a month to use fixed-route bus services (28). Fifth, the regional centers are promoting services contracted with commercial providers because better service is obtained at lower cost. Correspondingly, the provision of transportation services by social service agencies has been demonstrated to be more costly and less efficient and to detract from the ability of programs to provide primary services.

As a result of these measures these three regional centers were able to report a 13 to 16 percent decrease in unit transportation costs in FY 1983–1984 (32). It is estimated that these management and policy changes saved the regional centers well over \$300,000 in the purchase of transportation services in FY 1984–1985 (28).

Special-efforts providers have also contrived several responses to the challenges posed by the demand of mentally retarded persons for door-to-door services. Some special-efforts providers, such as the one in Pittsburgh, impose strict eligibility requirements that exclude any person who is ambulatory, including persons who are retarded, from door-to-door services. However, proposed changes in federal law regarding nondiscrimination in the provision of specialized services to the handicapped will likely eliminate this option (39). An alternative measure is to restrict the amount of door-to-door service. For example, the paratransit service provided by the city of San Diego allows only eight trips per month, which is much closer to the actual demand of elderly and handicapped users. This policy avoids the discrimination that is inherent in the categorical exclusion of individuals from specialized ser-

vices on the basis of their disability and yet is an effective way to screen frequent users, particularly those who are agency clients.

However, there are effective ways to capture the productivities of frequent users of door-to-door services. Some special-efforts providers have recognized that mobility training is a specialized service that diverts moderately transportation-handicapped persons, especially the retarded, to fixed-route transit, thus reserving scarce paratransit services for severely transportation-handicapped individuals. Mobility training for the retarded was implemented by the special-efforts provider in Sacramento (40). Recently, that program and a similar program administered by the Genessee Transportation Council in Rochester, New York, have evolved into generic training programs for elderly persons and people with a broad range of physical and mental disabilities (41).

A second option is the provision of hybrid services, which require little if any mobility training and efficiently capture the passenger productivities of subscription travelers. For example, Sacramento Regional Transit provides closed-route subscription bus service to 350 mentally retarded clients who attend sheltered workshops and vocational training programs. Eight routes are served by suburban buses; the programs adjusted their start and stop times so that off-peak buses could be used (40). In Sacramento 40 mentally retarded clients were taught to ride a hybrid bus route that provides closed-route subscription service in one direction and reverts to regular route service on return trips (42).

The final option, but the least likely, is to enlarge door-to-door services to restore or maintain demand-responsive services for the elderly and the handicapped while providing subscription services for agency clients. However, if such expansions in service cannot be financed, either by increased public funding or by cross subsidies obtained by contract rates charged for subscription services, inequitable shifts in ridership result. Although overall systems cost will likely remain constant and unit costs will decrease, a large share of trips will be supplied to a comparatively small number of mentally retarded users, and this will be accompanied by an inescapable reduction in demand-responsive services to a much larger number of elderly and physically handicapped patrons.

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