

Significance of Specialized Transportation Services to the Elderly Urban Population: Case Study of Houston, Texas

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The role played by specialized public transportation services compared with other modes in transporting the elderly is investigated in this paper. The study ascertained the degree to which this type of service is used, service characteristics most preferred by the elderly population, and characteristics least acceptable to that population. The diverse ethnic characteristics of the urban elderly population were examined to determine their role in the demand for specialized transportation. Data on Houston, from both primary and secondary sources, were examined to determine the use of and demand for such service. In addition, the implications and implementation of the proposed changes on the existing specialized transportation services in Houston were evaluated by using information on existing ridership and service characteristics. The research findings should enable transit planners to better anticipate the future needs of the elderly and provide the services that are in demand. Because Houston is representative of the large urban environment, transportation planners in metropolitan areas should be interested in both its problems and solutions.

Specialized transportation for the elderly and handicapped has been in existence for more than a decade. It has gone through many transformations, which began with one to two bus operations run by volunteers and developed into larger operations run by a combination of paid and volunteer staff. Current systems can range from computerized scheduling of door-to-door services that are paid for by users and subsidized by public funds to the smaller operations that can include subcontracting to local taxi companies (1).

The urban elderly population was studied in this paper. That population is faced with many problems: social isolation, decreased purchasing power, increasing physical disability, and an increasing lack of transportation to access their service needs (2). While early research in this area has ranged from descriptive studies of systems and their service provisions to their financing mechanisms (3), more recent work has focused on issues of increased productivity, efficient management, and coordination of different types of public transit services (4). The push for coordination of services resulted from management concerns about decreased government subsidies, spiraling costs of special transportation, and the impact of various acts (e.g., Section 504), which reflect a growing demand by the handicapped for increased accessibility to public places by using public carriers (5).

The focus of this paper is on the role and significance of specialized transportation in a large urban area that exhibits many of the problems endemic to transportation for the el-

derly. Houston was selected as an appropriate city for this research. Here a substantial number of elderly individuals live within the city limits. They exhibit the typical characteristics of a growing elderly population: ethnic and cultural diversity, physical and social isolation, and decreasing purchasing power.

Houston's public transit service provisions including specialized transportation is examined. The findings are compared with data collected from a survey of the elderly in the city to evaluate their knowledge, use, and preferences for specialized and regular transit services.

EXISTING SPECIALIZED SERVICES

Several North American cities are retrofitting their entire fleet to provide access to all but the wheelchair-bound and physically handicapped individuals. Houston is an example of such a system. Its special services (Metrolift) are available only to handicapped individuals. The elderly must use regular bus transport, although with a discount fare. To qualify for Metrolift service, a certificate of eligibility must be completed and signed by a physician. Those eligible must be permanently wheelchair bound, use crutches or a walker, be legally blind, or have ailments or treatments that severely affect ambulation. Exclusions are clearly stated on the eligibility card and range from conditions that can be treated with medication to any conditions of a passenger that are harmful to other riders. As a result of these eligibility criteria for Metrolift, an elderly rider may not necessarily have access to the Metrolift special services. The Metrolift Subsidy Program (MSP) for transportation by taxi is available as a substitute transport when Metrolift is not available, when the demand is outside the Metrolift service area but within the Houston city limits, or when both of these conditions are met. The Metrolift service is a door-to-door service with vehicles equipped with wheelchair lifts, serving 375 square miles within Harris County. The service provided an average of 53,000 one-way trips per month to a registered clientele of 24,000 individuals between October 1989 and March 1990 (6). The demand for service is increasing: an average of 150 reduced-fare card holders are registered each month. Demand is high among younger disabled people for various trip purposes, especially for work trips.

Although the eligibility criteria appear to be constant, some major changes have occurred in the area of advanced scheduling. In 1985, 6-day advanced scheduling of rides was required with vans dispatched from dispersed points. From May 1988 the advance time required was reduced to 24 hours and

resulted in a 22 percent increase in ridership. Current services include a door-to-door Metrolift service that requires 24-hour advance notice, mixed with 25 to 26 fixed-route paratransit services using Metrolift vehicles to specific major destinations such as the Texas Medical Center. The rides requested and provided show a distinct morning and evening peak, during which 710 disabled workers and dialysis patients use the Metrolift service.

USER EVALUATION OF METROLIFT SERVICES

An evaluation of Metrolift services included an internal telephone survey of a sample of registered riders conducted during July and August 1987 (7). Survey results indicated an average of 2.2 rides per person per month. This was a decrease from the previous year, which may have resulted from a decrease in the number of persons who had purchased advance tickets.

Of the riders interviewed and carried by Metrolift, 21 percent were under age 55 and the remaining 79 percent were older. Thirty-five percent of the participants older than 55 were over age 75. Among the respondents, 23 percent had severe mobility problems and 38 percent had limited walking ability. Problems faced by Metrolift users were revealed in the survey results. Two examples are having to (a) make at least three telephone calls to connect with Metrolift telephone lines and (b) wait an average of 6 to 7 minutes before a telephone operator serviced calls. In addition, 50 percent of the riders were denied their first preference in ride schedule time. A lack of timeliness of pickups, late arrivals for appointments, and "no shows" of Metrolift vehicles appear to be recurring problem areas.

Of those who were interviewed, 43 percent were MSP riders, and the majority of them (86 percent) were satisfied with the service.

The findings indicated that a significant majority of handicapped workers use this service. The remaining capacity was being used by elderly handicapped persons primarily for medical trips, with some trips for recreation and shopping.

Although this review provided information on the registered riders, it did not provide any information on those who do not use or are not eligible for the Metrolift or MSP services. To complete the evaluation on specialized services available to the elderly in Houston, data on use, needs, and transportation preferences among the elderly that attend senior activity centers around the city were collected and analyzed.

TRAVEL BEHAVIOR OF THE ELDERLY

A survey was undertaken in fall 1988 using a structured questionnaire. It included questions on current mode or modes of transport, users' perceptions and attitudes about alternative public transport modes, and service areas that need to be improved. A self-selected cluster sample of 224 individuals completed the questionnaire. The elderly individuals involved in the survey included the dominant minority ethnic groups represented in this city.

There were 97 male and 137 female respondents age 60 years or older (Table 1). Of the 224 total respondents, only 23 percent were handicapped (Table 2). Excluding physical disabilities, a majority of the handicapped respondents suffered from heart problems or high blood pressure, which alone would not make them eligible for Metrolift or MSP services. On the basis of eligibility requirements for Metrolift and MSP services, only about 50 percent of these individuals would qualify for special services.

Among the respondents, 79 percent lived inside the city limits and could access the special services if they qualified. In the sample, 37 percent had driver's licenses, 25 percent owned cars, and 17 percent had access to a car. Clearly, more than 60 percent of the sample were dependent on some form of public transportation. What is perhaps a significant problem affecting their need for travel is their occupational status. Only 15 percent worked full or part time and an even smaller percentage depended on the job for financial support (9 percent). Living arrangements and income level also help to explain their primary mode of travel apart from their occupational status. The majority of the sample have annual incomes below \$5,000 (58 percent) and 75 percent lived with someone. These two factors together help to explain why 45 percent used rides provided by others as the primary mode of transport (Table 3).

Although only a minority of the sample used any form of public transport, most were aware of the public transit systems. Hence responses to questions on levels of satisfaction with these services and on the service areas that need to be improved were surprising.

EVALUATION OF EXISTING TRANSIT SERVICES BY THE ELDERLY

The most surprising response was to the question on the level of satisfaction to the existing transit services (Table 4). Of those responding to this question, only a small percentage

TABLE 1 DISTRIBUTION OF RESPONDENTS BY AGE AND SEX

Sex	Age (years)			No Reply*	Total
	60-69	70-79	80+		
Male	56	31	8	2	97
Female	72	43	12	0	137
Total	128	74	20	2	224

*Two individuals did not respond to the question on age.

TABLE 2 TYPE OF HANDICAP BY SEX

Type of Handicap	Sex		Total
	Male	Female	
Heart/blood pressure	11	15	26
Hearing impairment	0	2	2
Physical disability	9	11	20
Eyes	0	0	0
Mental	0	1	1
Total	20	29	49

TABLE 3 PRIMARY MODE OF TRANSPORT

	Percent
Own Car	27
Taxi	1
Driven by others	45
Regular Transit	19
Metrolift	4
Walking and others	4
Total	100

expressed dissatisfaction. A detailed series of questions on which areas of service needed improvement produced strong responses in 30 to 40 percent of the sample. The areas believed to need improvement were door-to-door service, expansion of the neighborhoods covered, cheaper fares, and more frequent service. What is significant is the apparently low level of concern about security and safety on the buses and at the bus stops. Issues of language barriers and assistance to embark and disembark from buses appear to be even less important. Perhaps these results are biased because of the low use of existing transit services and hence are reflected by the relatively mild responses to questions on areas requiring improvements. Perhaps more meaningful are responses to the question on whether the existing transportation services restricted their mobility. Twenty-five percent of the respondents indicated that their mobility was restricted and 20 percent of these indicated a very strong restriction (Table 5).

If frequency of trips outside the home is analyzed, the elderly who live with someone appear to be more active outside the home; similarly, those with lower incomes make more trips. In general, the elderly as a whole make few trips and the greatest percentage get rides (Table 6). A possible explanation for this is the presence of a higher percentage of ethnic minority elderly individuals in the sample who live with their children. From the data in Table 6, it is clear that as the number of trips increases, a greater proportion of those trips are made by cars owned or driven by friends or relatives. When the data are grouped by trip number, taxi use shows up in a high frequency category because of either the use of illegal jitneys in the Hispanic neighborhoods or the presence of high income elderly individuals who can afford taxis. An anomaly is the limited use of Metrolift by this sample. This may result from the limited capacity available in Metrolift as well as the need for 24-hour advanced scheduling.

Information on use of existing transit did not yield much data in part because of the way the questions were formulated and in part because of a lack of information on these services.

The Metrolift service was known to 47 percent of this sample, and out of this group only 38 percent knew that it served only handicapped individuals. Other details such as the fare or the advanced booking requirement were known to just 20 percent of the respondents. Information on the MSP service was even more obscure, known by only 23 percent of the sample.

LATENT DEMAND

A more useful response was to a question about how frequently and for what trips a door-to-door service would be used, if such a service was made available to all the elderly.

Most of the latent demand is for shopping, medical, and social trips. (See Table 7.) The most frequent latent demand is for medical trips up to 4 times a month. If this response is representative of the elderly in Houston, then clearly even if a door-to-door service were to be open and available to all the elderly, the demand per person would not very high and hence any fears of very high levels of government subsidies for this type of service may be exaggerated.

Latent trip demand for door-to-door services might be related to questions about dissatisfaction with the existing services. The responses showed that a significant minority avoided transit services because of infrequent service, too far a distance to walk to the bus stop, a lack of information on service, unsuitable routes, the long travel time, and the option of getting rides from someone or driving. Perhaps it is significant that the greatest demand for door-to-door trips occurs amongst the younger groups of the elderly, as expected, since they are likely to be physically more active and hence have the greatest desire to go out.

If the type of living arrangements of the elderly is evaluated against latent trip demand, it appears that those living with someone appear to generate the highest demand for door-to-door service. Single elderly people do have the next highest demand for this type of service, followed by a very small

TABLE 4 LEVEL OF SATISFACTION WITH TRANSIT SERVICES

	Percent
Very Satisfied	14.3
Satisfied	21.0
All right	21.2
Dissatisfied	13.4
Very Dissatisfied	1.8
No Response	22.3
Total	100.0

TABLE 5 PERCEIVED RESTRICTION OF MOBILITY

	Percent
Very Much	19.6
Somewhat	24.6
Not at all	4.0
No Response	51.8
Total	100.0

TABLE 6 TYPE OF MODE BY NUMBER OF TRIPS

Trips	Mode					
	Own Car	Rides	Taxi	Reg. Tran.	Metro-lift	Walk and Others
0-24	15.2	33.9	0	8.9	2.7	1.8
25-74	9.4	8.9	0	8.9	1.3	1.8
75-149	1.3	1.8	4	0	0	0
150+	1.3	0.4	0	1.3	0	0

TABLE 7 FUTURE DEMAND FOR TRIP TYPE BY DOOR-TO-DOOR SERVICE

Expected Frequency of Trips/ Months	Type					
	Shopping	Medical	Recreation	Social	Work	N/A
0-4	13.4	22.3	3.6	6.7	1.3	3.6
5-14	3.6	6.7	4.0	11.2	3.6	1.8
15-29	2.7	2.2	0.9	2.2	0.9	0
30-44	3.6	1.3	0	0.4	1.3	0
45+	0.4	0	1.3	0.4	0	0.4

TABLE 8 TRIP DEMAND BY OCCUPATIONAL STATUS

Number of Latent Trips	Occupational Status				
	Full Time	Retired	Part Time	Work at Home	No Response ^a
0-4	2.7	32.6	3.1	12.5	0
5-14	0.9	14.3	3.1	11.2	1.3
15-29	1.8	4.9	0	1.8	0.4
30-44	0.4	4.0	1.3	0.9	0
45+	0.9	0.9	0.4	0.4	0

^aThe percentage who did not respond to the question on occupation.

demand by the elderly who live in old age homes. A reason for the latter is the existence of other transport from these homes and a reduced need to go outside. For among the elderly, a significant percentage have alternative modes.

This trend is repeated and reflected in the data relating potential trips by a door-to-door service with occupational status (Table 8). The demand for door-to-door service by occupational status is not high in general. Among those who make use of such service, the greatest demand is from retired individuals or housewives or those who work at home and make only social or recreational trips. If income level is compared with latent trip demand, it can be seen that the lower the income, the greater the demand for a door-to-door service. The correlation is similar among the higher income elderly, who show the lowest demand for a door-to-door service. They are able to afford alternative modes such as taxis or to have goods delivered (Table 9).

A final evaluation of latent demand was made by comparing the primary transportation mode used by the elderly with their latent demand for a door-to-door service. Table 10 shows that the highest latent demand for door-to-door service comes from those who are driven, followed by a lower level of demand from those who drive or ride the transit service. This

demand may be for essential trip purposes, like medical appointments, for which a long bus ride or problems of parking a car may be a problem.

SUMMARY AND CONCLUSIONS

Results from the Metrolift internal survey and the general survey of the elderly cannot be directly compared because of different methodologies for data collection and different sample populations. The internal survey combines responses from the elderly and those from young handicapped individuals. The Houston survey of the elderly conducted by the authors selected a different sample of elderly individuals. However, some of the findings can be combined to provide an overall assessment of the existing specialized services in Houston.

The existing Metrolift and MSP services do play a valuable role in providing transport for some of the elderly. However, because of the eligibility criteria, many elderly who would like to use this type service are unable to do so.

Regular transit services appear to be used by a very small percentage of the elderly because of several factors, including a lack of information, the distance to the bus stop, and frequency of service (i.e., long waits at bus stops).

TABLE 9 TRIP DEMAND BY INCOME CATEGORY

Number of Latent Trips	Income Category (\$1,000s)							N/A*
	<5	5-<10	10-<15	15-<20	20-<25	25-<30	30+	
0-4	28.6	11.6	4.5	2.2	0.4	1.3	0.9	1.3
5-14	20.5	5.4	1.8	0.9	0.9	0	0.9	0.4
15-29	3.6	2.2	1.3	1.8	0	0	0	0
30-44	4.0	1.8	0.4	0.4	0	0	0	0
45+	1.3	0	0.9	0.4	0	0	0	0

*No response to the question on income category.

TABLE 10 TRIP DEMAND BY PRIMARY MODE OF TRANSPORT

Number of Latent Trips	Transport Mode						
	Own Car	Driver	Taxi	Reg. Bus	Metro- lift	Walk Other	No Response*
0-4	15.6	19.6	0	12.1	1.8	1.3	0.4
5-14	6.3	18.8	0.4	2.7	0.9	1.8	0
15-29	2.7	2.7	0	2.2	1.3	0	0
30-45	1.3	2.7	0	2.2	0	0.4	0
45+	1.3	1.3	0	0	0	0	0

*No response to the question on primary mode used.

In general the demand for a door-to-door service exists primarily for essential trips by the lower income elderly, who are either retired, work at home, or are housewives.

As a result of the findings of both surveys, several recommendations can be made about the special services available in Houston, Texas. They are as follows:

- Alter eligibility criteria to include elderly, especially low-income elderly;
- Expand service area;
- Increase marketing of the service and provide detailed information targeted for the elderly;
- Improve telephone-ride reservation system; and
- Decrease "no shows" or delays of Metrolift vehicles.

These recommendations also have some direct bearing on the other public transport modes:

- **Retrofitting of buses may not lead to higher use of regular buses by the elderly and hence may not be justified.**
- The added cost of more open eligibility criteria for Metrolift and MSP services could be offset by savings from not retrofitting the regular buses.
- Contract use of taxis may be a cost-effective method of expanding the specialized transport services both in the number of people served and the area covered, especially in an expansive low-density city such as Houston.

In general the findings of this study clearly point to a need to evaluate the restrictive criteria for special services and the tradeoffs between retrofitting regular buses and expanding services to the elderly and handicapped urban population.

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