LYNDON B. JOHNSON SCHOOL OF PUBLIC AFFAIRS

ALTERNATE CARE FOR THE ELDERLY

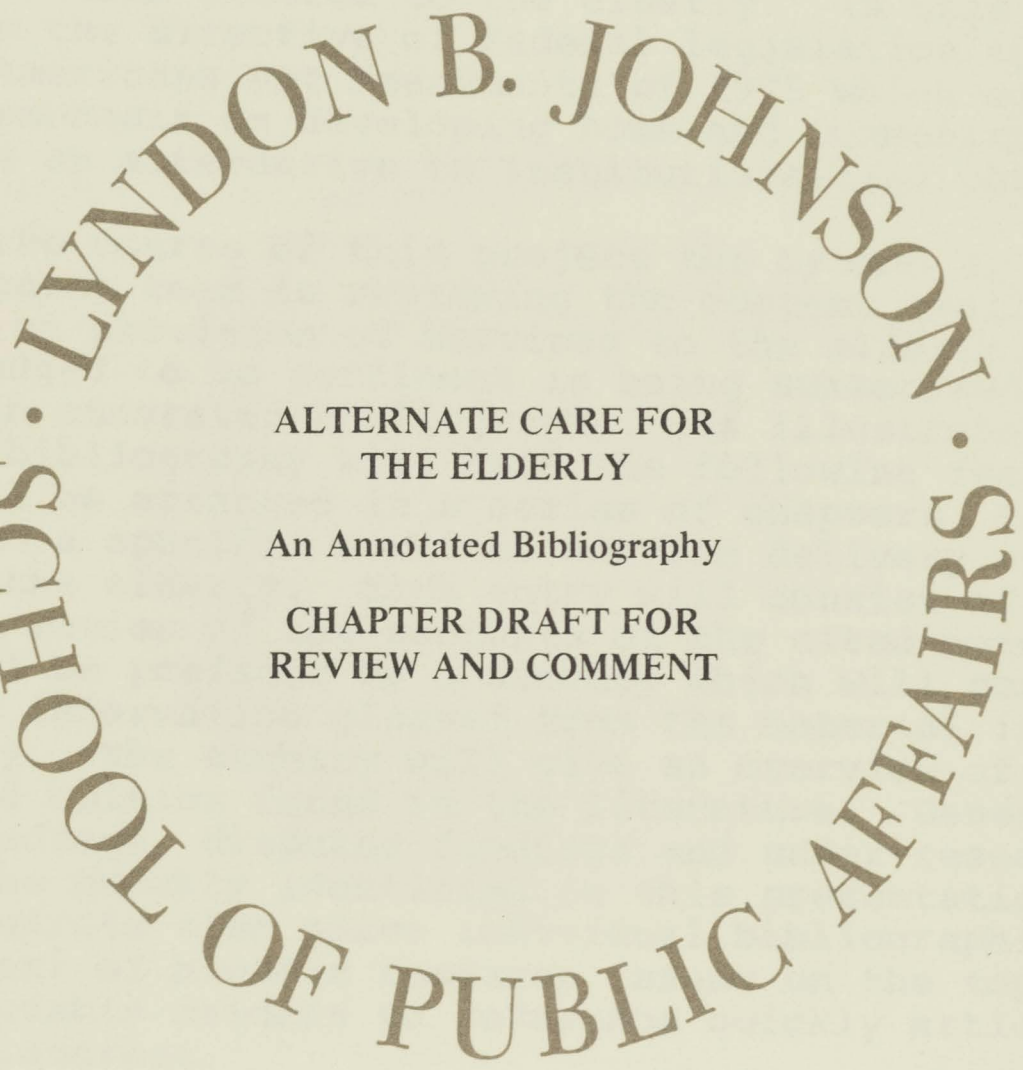
An Annotated Bibliography

CHAPTER DRAFT FOR REVIEW AND COMMENT

THE UNIVERSITY OF TEXAS AT AUSTIN

LYNDON B. JOHNSON SCHOOL OF PUBLIC AFFAIRS

POLICY RESEARCH PROPOSAL



ALTERNATE CARE FOR THE ELDERLY

An Annotated Bibliography

CHAPTER DRAFT FOR
REVIEW AND COMMENT

A Policy Research Proposal
prepared under faculty advisers
Professor Lodis Rhodes and John P. Hamilton
Lyndon B. Johnson School of Public Affairs
The University of Texas at Austin
1976

INTRODUCTION

This volume contains a draft of one chapter from an annotated bibliography being prepared by a faculty-student research team at the Lyndon B. Johnson School of Public Affairs under contract for the Texas Department of Public Welfare. This draft is being circulated for the purpose of inviting review and comment on the proposed format of the bibliography.

The contract executed between the Lyndon B. Johnson School and the Department of Public Welfare is an effort to provide the Department with new resources for expanding the range of services offered to the elderly. In this it is responsive to the directive of Federal legislation contained in the Older Americans Act Amendments of 1975 which mandate an increased emphasis on developing home and community based services as an alternative to institutionalized care.

In the course of this project the Lyndon B. Johnson School research team is reviewing the current available literature on provision of services to the elderly. The material judged to be pertinent is being summarized in the format of an annotated bibliography. As illustrated by this draft, the bibliography will have the following features. Entries will be arranged in a series of chapters, each dealing with a specific service, service delivery system, or problem of the elderly. Each entry will consist of a citation and a brief review of the contents of the cited material. Each chapter will be prefaced by a summary which will concisely present the information gleaned from the material in the bibliography. The summary will give an overview of research, practice and opinion found in the literature. Generally accepted findings, disputed findings and under-researched topics can be quickly identified in this presentation. The chapter summaries also place individual bibliographic entries in the context of broader research issues on the topic, and should enable readers to reference quickly articles of particular interest.

Chapter summaries are designed primarily to speed access to the bibliographic entries and secondarily to provide a commentary. An introductory chapter will be drafted at the conclusion of the literature review. This chapter will discuss the field of alternate care within the broader context of meeting the long-term care and service needs of the elderly; it may be useful to those newly entering the field of service to the elderly or concerned with design of comprehensive service programs rather than, or in addition to, specific services. Thus, the final product will provide information

at three levels of specificity: 1) overview of alternate care as a service option, 2) chapter summaries of the literature reviewed which cover a specific service, and 3) bibliographic citations with annotations. We hope that this format will meet the needs of the Department for a convenient and succinct research aid for use by administrators and planners at all levels.

The list of topics to be included in the bibliography is based upon our initial survey of the professional literature. Apart from the inclusion of a few general references to the topic of "problems of aging", we have decided not to review the literature on physiological effects of aging or medical treatment. It is our feeling that this literature is too specialized to be of use to most Department personnel and is removed from the area of services which Department personnel are called on to deliver or evaluate. The topics of "home health care" and "personal health maintenance" are included, however, and under these topics are found nursing and preventative medicine services. The list of topics is as follows:

Topics for Alternate Care Bibliography

Problems of aging
Physical rehabilitation services
Substance abuse programs
Community mental health services
Legal and advocacy services
Nursing homes
Homes for the aged
Mental institutions
Home health care
Personal health maintenance
Nutrition programs
Day care
Visitation programs
Foster homes
Homemaker services
Housing assistance
Transportation services
Income maintenance and employment services
Protective services
Multi-service community centers

Bibliographic entries are chosen from literature available through the University of Texas libraries or through the numerous public and private research institutes and service agencies which are being contacted in the course of this project. All bibliographic entries are based upon articles which have been read in full by members of the research team.

In order to reduce to a manageable size the volume of literature to be reviewed, we are excluding articles of a superficial nature and articles of description or advocacy not based upon research findings. In addition to academic research, we are seeking articles dealing with needs assessment, cost, administration and evaluation of services.

For each article selected an abstract of from one to three pages is prepared. These abstracts form the basis of our study of the service topics and are used in the preparation of the annotations and chapter summaries. In order to illustrate this process, the abstracts from which this chapter was prepared are included as an appendix.

The comments and suggestions of readers concerning this project are welcome. We are interested especially in response to (1) the format of the report, (2) the detail of the annotations, and (3) the list of topics to be covered. Comments should be addressed to:

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SUMMARY AND ANNOTATED BIBLIOGRAPHY OF TRANSPORTATION AND THE ELDERLY

TRANSPORTATION AND THE ELDERLY

Planning a transportation system for the elderly presents unique problems in terms of that population's specific needs. Toward this end, such planning often involves consideration of the elderly in the more broadly defined group of handicapped or disadvantaged (2, 16, 25). An understanding of the aging process as it determines life style is also essential to pinpointing transportation needs and options (19, 21, 22, 23, 38).

As a group, significant numbers of the elderly experience physical deterioration and impairment of sensory and motor functions (6, 8, 14, 22, 24, 25, 37). Many must also contend with economic limitations due to their fixed income (2, 6, 15). These aging process factors and economic limitations along with the accessibility or availability of various transportation services determine the mobility of the elderly individual (6, 10, 23, 28, 33). With mobility limited, the elderly individual's environment becomes smaller and isolation increases. One of the most drastic alterations in the elderly person's mobility occurs when he can no longer drive his own car due to physical or economic restrictions. This contraction of mobility results in a decrease in activity, self-concept, and life satisfaction (6, 9, 22).

In assessing the transportation needs and desires of the elderly, it is first necessary to identify current trip behavior. A number of studies are directed toward determining what need now exists by surveying trip patterns and modes of transportation available (1, 8, 26, 29). Whereas walking might appear a reasonable alternative to loss of automobile use, it is not always feasible for this population and is often viewed negatively as an option (8,11). Similarly, public

transit systems fall short of meeting the needs of the elderly for a variety of reasons: architectural design barriers (16, 20, 28, 31); physical problems of the elderly population (15, 28, 39); fear for personal safety while waiting for a bus and while riding (7, 28); and operational problems such as scheduling bus routes (16). Consequently, the literature attempts to out line prototypes of systems that would be more accessible to the elderly. Included in these prototypes are design modifications to make transit accessible to wheelchair users (14) and to provide better vehicle access in terms of horizontal and vertical gaps between the ground and the vehicle (3, 20, 33). Attention is also given to walkway and stairway modifications to remove pedestrian barriers (11, 18). In addition to suggesting design modifications to remove pedestrian barriers (11, 18). In addition to suggesting design modifications, several reports supply a description of innovative specialized transportation services such as reduced fare programs (15, 16, 40), minibus systems (16, 17, 29, 33, 35), and demand-activated service (12, 16, 34).

Much attention has been given to the problem of estimating latent demand, that is, the demand represented by the number of trips that would be taken if the appropriate means of transportation were both available and accessible (2, 24, 30, 31, 37, 41). Admittedly, latent demand is difficult to determine; nevertheless, some authors have attempted to relate the concept of latent demand to the potential costs to be incurred (27, 35, 36, 37). Relating benefits to costs is also attempted (3, 5). Such cost estimates may be inapplicable if it is true that mobility desires and habits change from generation to generation (19, 23, 27).

In conclusion, existing literature attempts to describe the elderly, identify their trip patterns, determine the accessibility and level of satisfaction with existing transportation systems, identify barriers to mobility and means to remove such barriers, suggest alternative modes of transit and their respective cost on the basis of latent demand. Needs and alternatives for the elderly are closely tied to health and income level. Needs of the rural elderly are largely unexplored (exception #5). An additional problem confronting planners is whether to modify existing systems or to introduce separate services for the elderly. The latter are generally considered more cost effective (17, 33, 35, 36). Planning handbooks, some based on existing systems, are offered as guides (4, 32, 41), as are equipment directories (13).

ANNOTATED BIBLIOGRAPHY

1. BELL, J. H. (1971) "Senior Citizen Mobile Service." Transportation and Aging: Selected Issues, U. S. Department of Health, Education, and Welfare. Pp. 138-150.

   This article is part I of a three part report on a demonstration project operated by the YMCA with HEW funding. This project served ambulatory elderly only, providing them with free transportation in passenger vans. It was concluded that the project brought many people out of their homes and helped involved participants with others. The article also deals with the practical tasks of such a service (e.g., communication systems for the vehicles).

2. BENSON, D. E. and M. J. MAHONEY, Jr. (1972) "Data Requirements in Transportation Planning for Urban Disadvantaged." Highway Research Record; 403, pp. 35-46.

   Transportation planning and services which have traditionally been geared to upper-middle and upper-income groups are moving toward the disadvantaged groups. To assess disadvantaged needs and to plan to fill those needs, the groups must be identified and characteristics determined. Actual and latent demand must be estimated, and then future demand. Recommendations to public transportation services should include assessment of present service, feasible operating strategies, pricing options, and possible reductions in welfare agency expenditures. A detailed engineering design and operation plan of the recommended system hardware and software must be produced. A pilot test should be utilized to assure the virtues of an innovative system.

3. BRONTSKY, L. (January 1976) "An Inflationary Impact Statement of a Program of Transportation Services to Elderly and Handicapped Persons." Cambridge, MA: Informal Staff Study by US Department of Transportation. 149 pages.

   This report is an inflationary impact statement and a proposed course of action to meet the transportation needs of the elderly and handicapped as is the intent of Senate Bill 662 and the proposed federal requirements concerning elderly and handicapped transportation services. Cost, competitiveness, and employment impact are analyzed. Included is quantitative analysis of the market for specialized services taking into account 1980 projections of population of the elderly, handicapped, and general population.

4. BRUNSO, J. M. (August 1975) "Transportation for the Elderly and Handicapped, A Prototype Case Study of New York State." Washington University, Urban Transportation Program. 102 pages.

   The focus of this article is on the administration at the state level of Section 16 (b) (2) of the Urban Mass Transportation Act. The author describes the difficulties in establishing priorities for acceptance of grant applications, and therefore recommends a first come, first serve basis for acceptance. Recommendations also include alterations of the Urban Mass Transportation Act so that the local level could remove some of the administrative load from the state.

5. BURKHARDT, J. E. (1971) "Transportation and the Rural Elderly." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 162-166.

   A free bus demonstration project in Raleigh County, West Virginia, 1967-1969, improved the transportation of the rural poor. Cost-benefit analysis of the project showed the eight-passenger carryalls provided transit for $1.80 per round trip per passenger. The program was beneficial by saving riders' transportation money, allowing riders to make more multi-purpose trips, and freeing riders from dependence on others for travel.

6. CARP, F. M. (1971) "The Mobility of Retired People." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 23-41.

   This study is based on a city-wide survey of retired persons in San Antonio concerning their mobility and transportation problems. A critical problem for elderly persons is the lack of car ownership and limited driver-ship, which results in dependency on buses and walking. These modes of travel are difficult due to sensory-motor deterioration.

7. CARP, F. M. (1971) "Public Transit and Retired People." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 82-92.

   Use of transit by 709 San Antonio retired persons reveals negative comments by those who use the buses most (central city residents, ethnic minorities), with most satisfaction coming from those who use the system less frequently. Those interviewed cited fears and anxieties of bus riding, including crowding, pushing, hurried feelings, and the fears about driver's ability, of falling while standing,

and of getting off at the wrong stop. Improvements suggested by the respondents were to have more frequent schedules, closer adherence to posted schedule, redesign of steps and doors, re-routing to avoid transfers, coordination of bus stops and pedestrian facilities, provision of shelters and change machines at bus stops, announcement of stops, and employment of bilingual drivers or aides and of transit aides to assist in entering and leaving bus. The author suggests an additional system of small vehicles to serve the residential clusters of elderly. Advantages of the present system are that it provides a means of transport to a population that has no other, a safe and inexpensive way to get around, and opportunity to be around other people.

8. CARP, F. M. (1971) "Walking as a Means of Transportation for Retired People." The Gerontologist, part I (summer). Pp. 104-111.

   Elderly persons make up 25 percent of the pedestrian deaths in the US, yet walking remains the predominant mode of travel for many of the elderly despite physical problems which make it difficult. This study took a sample survey of San Antonio elderly and found that 53 percent of those who walked felt it was an unsatisfactory way of getting around, yet most did recognize the exercise benefit of walking.

9. CARP, F. M. (1971) "Automobile and Public Transportation for Retired People." Highway Research Record, 348, pp. 182-191.

   This study, based on a survey of retired people in San Antonio and San Francisco, assesses problems that the elderly driver experiences and the extent to which driving an automobile facilitates personal satisfaction and social contribution. Descriptively, the study addresses itself to these questions: who are the older drivers; where do they go; what mobility impairment is present; why; who among the elderly do not drive?

10. CARP, F. M. (1975) "Correlates of Mobility among Retired Persons." San Francisco: University of California Medical Center. Pp. 171-181.

    This study of retired persons in San Antonio investigates factors that influence their mobility. Stepwise multiple regression analysis is employed between sets of person-situation variables and each mobility variable to determine frequency of travel and satisfaction with arrangement of

travel. Broadly speaking, health, socio-economic factors, and location of residence sharply determine a retired person's mobility.

11. CARP, F. M. (1972) "The Older Pedestrian in San Francisco." Highway Research Record, 403, pp. 18-25.

    Most older people look with favor on walking when conditions are favorable. The negative reaction to walking is when one must depend on it as a means of getting places under existing conditions. This article, based on a survey of San Francisco elderly, examines attitudes about walking, impediments faced, and suggested solutions.

12. CURRY, J. P. (1972) "Providing Transportation for Persons with Limited Mobility in Suburban Areas." Highway Research Record; 403, pp. 47-52.

    Recent federal transportation policy has encouraged provision of public transportation to those who do not own or drive an automobile, including in particular, the elderly. This short article summarizes the results of a 1965 home interview survey conducted by the Bay Area Transportation Study Commission, concluding that dial-a-bus service is the best alternative for providing supplementary transportation service to mobility-limited groups.

13. DeBENEDICTIS, J. and E. Doherty (June 1975) A Directory of Vehicles and Related System Components for the Elderly and Handicapped. US Department of Commerce, National Technical Information Service. Prepared for Urban Mass Transportation Administration by Franklin Institute Research Laboratories. 146 pages.

    Information to guide the selection and purchase of equipment for transit systems catering to elderly and handicapped persons is catalogued in this publication. Emphasis is placed on wheelchair accessibility.

14. DOUGHERTY, E. J. (June 1975) "A Study of Making Transportation Facilities Accessible to the Handicapped and Elderly." Franklin Institute Research Labs. 101 pages.

    This project studies the accessibility to urban transportation of the handicapped and elderly by identifying elderly disfunctions and by catagorizing the physical barriers they face in urban transit systems. Various design ideas aimed primarily at wheelchair users are presented, as well as recommendations for areas of further study.

15. DOVE, D. A. (1971) "The Los Angeles Multi-Service Transportation (MUST) Program." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 151-152.

Special needs of the elderly cannot be met by an existing system because of costs, health problems, travel barriers, weather hazards, fear, desires for group travel. Service should be modified to accommodate elderly, including reduced cost charter service for groups. The Los Angeles program offers senior citizens a ten cent fare discount during non-peak hours.

16. FALCOCCHIO, J. C. and E. J. Cantilli (1974) Transportation and the Disadvantaged. Lexington, MA: Lexington Books, D. C. Heath and Co.

This book deals with the elderly along with others in a classification of disadvantaged citizens. It cites three projects aimed at improving the mobility of the elderly. The conclusion is that public subsidies are necessary to provide special services, which increase costs. However, the new services and the elimination of barriers benefit all of the citizens that utilize the transportation services.

17. FARMER, R. N. (1965) "Whatever Happened to the Jitney?" Traffic Quarterly (April). Pp. 263-279.

The trend of urban transportation toward more diffuse small-volume series of interlocked routes indicates that a revival of the jitney, circa 1914, might be in order. Jitneys, abandoned due to control regulations, were five- to eight-passenger private cars that operated along fixed or semi-fixed routes. Reinstating the jitney might make public transit in areas of low or diffused flow more compatible with what the traveling public wants.

18. FRUIN, J. J. (1970) "Designing for Pedestrians: A Level-of-Service Concept." Highway Research Record, 355, pp. 1-15.

This monograph develops a six level rating for walkways and stairs in an effort to establish a methodology using time lapse photography, whereby proposed or existing facilities can be evaluated concerning relative levels of convenience for the pedestrians.

19. GARRISON, E. L. (1971) "Limitations and Constraints of Existing Transportation Systems as Applied to the Elderly." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 100-106.

The process of planning a transportation system which will serve the elderly is complex. Attempts to tie demand, service, and utilization information variations to a class of elderly will not be accurate due to the heterogeneity of the class. The author suggests that instead of focusing on the elderly, the focus should be on individuals with certain physical or resource limitations.

20. GELICK, M. S. (August 1974) Design for the Handicapped in Elevated Transportation Systems. Chicago: University of Chicago, College of Engineering. 71 pages.

    A broad description of barriers to travel by the handicapped in mass transit settings leads to suggested remedies and establishes station design standards. A Chicago station is used as an example.

21. GELWICKS, L. E. (1971) "The Older Person's Relation with the Environment: The Influence of Transportation." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 19-22.

    An awareness of the process of aging--biological, psychological, or social aging--can be of great assistance in the development of an environment which will maximize the functional abilities of aging individuals. The author suggests certain approaches which should be taken in designing a transportation system for the older person, since transportation modes can play a major role in determining the quality of the older person's relation with his environment.

22. GIANTURCO, D. T., E. RAMM and C. W. ERWIN (1973) "The Elderly Driver and Ex-driver." Normal Aging II: Reports from the Duke Longitudinal Studies 1970-1973, edited by E. Palmore. Duke University Press. Pp. 173-179.

    A panel study concerned with the abilities of elderly drivers and the life satisfaction of ex-drivers is reported here. The panel concluded that driver capabilities should be judged on an individual basis and that becoming an ex-driver could be associated with a lower activity level and a lower level of life satisfaction.

23. GILIAN, J. S. (1975) Accessibility and Old Age in Los Angeles--A Study of Travel Patterns, Problems and Prospects. Thesis, University of California at Los Angeles. 61 pages.

The trip making behavior of the elderly was studied by obtaining data from the LA Regional Transportation Study, a cab company, and a senior citizen survey. The study concluded that mobility is affected by age, income, and location varaibles; that travel behavior changes after retirement; that modal choice and socio-economic status influence elderly attitudes and perceptions; and that certain segments of the elderly population have accessibility problems (women, non-drivers, and low income persons). Current life styles will probably change the transportation needs of the future elderly.

24. KINLEY, H. J. (1969) "Latent Travel Demand of the Aging and Handicapped and Barriers to Travel." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 52-54.

    This article introduces the concept of latent demand and its transference to effective demand. Specifically, this project designed a barrier-free system which removed architectural and movement oriented obstructions, then filmed the system for consumer response. Two priorities were established: assurance of access to the system and removal of architectural barriers.

25. LIBOW, L. S. (1971) "Older People's Medical and Physiological Characteristics: Some Implications for Transportation." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 14-18.

    This article identifies in a broad conceptual manner some of the universal characteristics of the elderly population which affect their physical capability, some of the principle problems which exist regarding their modes of transportation, and suggestions for improvement.

26. MARKOWITZ, J. K. (1971) "Transportation Needs of the Elderly." Traffic Quarterly, 25 (April). Pp. 237-253.

    Transportation among the elderly of New York, New Jersey, and Connecticut is examined on the basis of income and residential density. The key to elderly transport is said to be access to opportunities, not merely mobility. Though based on a 1963 survey, conceptual ideas are still valid.

27. MERGEL, J. J. and K. FREBJEK (March 10, 1975) "Working Paper: Potential Nationwide Applicability of Transportation Services for the Elderly and Handicapped." Cambridge, MA: US Department of Transportation, Transportation Systems Center. 22 pages.

This working paper attempts to specify the costs for a nationwide urban transportation system for the elderly and handicapped, based on 1970 census data and cost data from selected transportation projects. A two-year demonstration project is suggested, involving thirty-four cities chosen by a stratified random sampling, and expected to cost $36,800,000.

28. NATIONAL URBAN LEAGUE (July 1973) Transportation for the Elderly and Handicapped. US Department of Transportation, Urban Mass Transportation Administration, Grant # DOT-UT-5333. Written by Mark Battle Associates, Inc. Prepared by the National Technical Information Service, Springfield, VA. 187 pages.

    Random interviews of 867 elderly (over age 62) and 217 handicapped in four US cities explored usage of transit and identified major contraints. Elderly use mass transit for shopping and medical purposes, between 11 am and 4 pm, and would increase use if there were better service. Similarly, the handicapped use buses mostly for medical purposes, before 7 pm, and would use the service more if it were improved. Physical constraints included sight, movement impairment, difficulty in maintaining balance when standing, and problems with carrying packages. Psychological constraints included discomfort in crowds, fear of attack, attitudes of other riders.

29. NOTESS, C. B. and R. E. PAASWELL (1971) "Demand-Activated Transportation for the Elderly." Joint ASCE-ASME Transportation meeting July 26-30, 1971. Seattle, Washington. 30 pages.

    A case study of the 7,000 elderly (over 59 years) of the Buffalo, New York Model Neighborhood Area examined transportation behavior when a timely and convenient travel mode was available. Ridership on jetneys (small buses) increased over time, dropped in adverse weather, and consisted mostly of already active persons. The average rider used the service once a week, tended to be over 70 years old, would use buses if the jetney service were unavailable, travelled for personal needs (medical, shopping, personal service) rather than social needs, and used the jetney before 6 pm. There was continuous, heavy usage of the buses during morning hours, dropping off at midday, and increasing after 3:30 pm.

30. RRC INTERNATIONAL (January 1974) "Transportation for Seniors and Handicapped Persons in Rockland County." Prepared for Urban Mass Transportation Administration. 74 pages.

This study attempted to identify the transportation difficulties of elderly and handicapped citizens of Rockland County along with their latent demand for travel. This study also located the public and private resources available in the community. Recommendations were made concerning the establishment of county wide supervision of transportation activities and coordination of planning and servicing of the elderly on the part of private and public organizations.

31. REVIS, J. (January 1975) "Transportation for the Elderly: The State of the Art." Office of Human Development, Administration on Aging. 282 pages.

This report is designed to assist in the planning of elderly transportation services. It describes the transportation needs of the elderly along with discussion of their latent demand and preferences for service. Case studies contained within this report illuminate the problems of utilizing resources in the community which are unavailable due to legislation, e.g., school buses. Also included is information concerning various funding sources for elderly oriented transportation services.

32. REVIS, J. (November 1975) Planning Handbook: Transportation Services for the Elderly. Prepared for the Administration on Aging. 304 pages.

This handbook is designed to aid the planning and implementing of transportation services for a specified population-- the handicapped and elderly. The handbook is intended to furnish technical assistance to those who may be a part of establishing such a service but who may lack similar technical backgrounds. The discussion includes sections on organizing personnel, building a data base, designing the service, selecting equipment, budgeting, monitoring and evaluating the program and recognizing problem areas.

33. REVIS, J. (1971) "Transportation and the Aging: Some Directions." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare. Pp. 172-180.

The author examines constraints to aged mobility, suggests low cost improvements to existing transportation systems, and recommends testing of selected transit alternatives such as dial-a-bus. The ultimate suggestion here is to develop a retirement transportation package paid for through life earnings, somewhat like Social Security.

34. ROESS, R. "Existing Technology in Mass Transportation." Transportation and Aging: Selected Issues. US Department of Health, Education, and Welfare.

This is a broad survey of existing types of mass transit. Rapid transit is discussed in terms of capacity, physical systems, noise, operational problems and characteristics, stations, access, and fares. Local transit is discussed in terms of bus size, use of exclusive lanes, minibus, dial-a-bus, loading and unloading, fares. Conclusions were that planning for mass transit requires consideration of the populations to be served, magnitude and location of demand, physical performance of the system; and transit should be considered a public service which will not be self-supporting. Also included are criteria for planning dial-a-bus systems.

35. SCHNELL, J. B. (1974) "Public Transportation and Transportation Needs of the Elderly and Handicapped." Highway Research Record, 516, pp. 1-10.

Administrators of facilities and programs for the elderly and the handicapped were interviewed to discover and assess the best means of improving urban transit services. A centralized, publicly subsidized TRANSBUS or small bus system was recommended for the ambulatory and semi-ambulatory and invalids. Other improvements suggested include modification of present vehicle types to include lifts in at least some of the fleet; use of taxis; development of new vehicles like the TRANSBUS and other demand-responsive services.

36. SIMKOWITZ, H. (October 25, 1974) "A Theoretical Comparison of Various Transit Modes for the Handicapped and Elderly." US Department of Transportation, Transportation Systems Center, 43 pages.

The author examines types of transportation systems with the potential for serving the elderly: standard buses with special equipment, dial-a-ride, taxi service, rapid rail, and line haul rapid rail with DAR or taxi feeder and distributor at each end. Cost benefit analysis is employed based on a fixed demand schedule. The conclusion is that separate service for the elderly results in lower costs and a better quality of service for both the elderly and non-elderly.

37. TRANSPORTATION SYSTEMS CENTER (July 1973) The Handicapped and Elderly Market for Urban Mass Transit. Prepared for US Urban Mass Transportation Administration. 26 pages.

Travel barriers, needs, and latent travel demand of the elderly and physically handicapped who are unable to use existing transit systems without difficulty are assessed. The report concludes that there is no comprehensive barrier-free transit system presently existing; that there is utilization of reduced fares for elderly in some communities; that there is some coordination between social service agencies and transit systems. Alternative approaches suggested are to upgrade existing or planned systems to remove physical barriers; to expand door-to-door service (dial-a-ride); to expand fixed-route service; to use transit stamps to help overcome economic barriers; to implement a coupon taxi.

2-38. WACHS, M. and R. D. BLANCHARD (July 1975) "Life Styles and Transportation Needs of the Elderly in the Future." School of Architecture and Urban Planning, UCLA. Prepared for US Urban Mass Transportation Administration. 18 pages.

The authors stress the importance of considering present life styles when planning for the future transportation needs of the elderly. They disagree with the notion of continuing poverty, physical infirmity, and alienation of the elderly. Trends are toward improved health, more independent living arrangements, improved educational levels, and increased dispersions of the elderly in urban areas. Planning and studying with a thorough understanding of the aging process and relevant life styles, through time series analysis, is recommended.

39. WEAVER, V. C. and M. HERRIN (1974) "Transportation Needs and Desires of the Elderly Residing in a Medium Sized City." Highway Research Record, 516, Pp. 28-34

A telephone survey in a medium sized city brought the recommendation that cost reduction for the elderly be directed toward taxi service rather than buses due to the handicaps of the elderly limiting their access to a bus service. Further recommendations were made concerning installation of more benches and shelters, development of routes during off-peak hours, and display of maps and timetables in areas frequented by the elderly.

40. WEBBER, R. E. (1974) "Free Travel for the Elderly on London Transport's Services." Union Internationale des Transports Publiques (January) Pp. 31-32.

The evolution of free bus transportation for the elderly in several London boroughs is described. Elderly with permits can travel free during non-peak hours. The cost is paid by the Greater London Council.

41. YUKUBOUSKY, R. and A. POLITANO (August 1974) "Latent Travel Demand of the Elderly, Youth, and Low Income Populations." New York: State Department of Transportation, Preliminary Research Report #63.

Methodology of determining "latent demand" for mass transit is emphasized. The gap analysis approach matches two populations with the exception of transportation availability and infers from the behavior of one group what the behavior of the other would be if services were available. The rural and urban elderly, youth, and low income populations were observed through a 1965 Rochester Home Interview Survey and 1970 New York census data.

APPENDIX

Abstracts of articles included

in the bibliography

Transportation

Apfel, Kenneth
September 23, 1976

Bell, John H.
1970
"Senior Citizen Mobile Service"
Transportation and Aging

Abstract

Article was part I of a three part report on the Y.M.C.A. Senior Citizens Mobile Service demonstration project carried out in Chicago from September 1966 through November 1969. Funds were provided by Administration on Aging, H.E.W.

The project provided 1606 senior citizens with free transportation services within an unspecified area of Chicago. During the time period, 25,000 trips (for a total of 53,000 miles) were provided free of charge to any senior citizen who wanted services for a cost of approximately $37,000 (costs include operation expenses and salaries of drivers - not included - salary fringe benefits, salaries of group workers, and operating cost for the total project).

The project was equipped with one 7 passenger van (a second van was provided during the last few months of the third year of the project. Vans were not equipped to handle handicapped; participants had to be ambulatory to participate. The number of "requests filled" on specific types of trips over the three year period are summarized as follows:

Shopping	13,549
Medical	2,405
Library	2,462
Church	1,196
Special Meetings	1,603
Small Group Outings	975
Senior Club Meetings	1,110
Wakes and Funerals	724
Health Classes	389
Educational Classes	1,706
Other Services	219
Sports Events & Shows	366
Home Delivered Meals	723
Social Security & Other Agencies	171

Authors conclude that services brought many people out of their homes who were afraid of public transportation. The service helped involve participants with other people in recreational and social activities.

Comments

Possibly the other two parts of the study will answer many questions left unanswered such as total cost of program, the size of the area a senior citizen could ask to be driven to, what happens when more people call for a ride than can be taken on a day, ect.

Article was warm and friendly and I recommend it for developing community groups. Article dealt with nuts and bolts issues such as best communication system with vehicles, personal characteristics needed by dispatcher & recordkeeping.

Transportation
Benson, Daniel E. and M. J. Mahoney Jr.
1972
"Data Requirements in Transportation Planning for Urban Disadvantaged"
Planning, Education and Transportation Department; North American Rockwell Information Systems Company, Chicago and Albany

Hauber, M. A.
9/ /76

Abstract

Traditionally, transportation planning and services have been geared to the upper-middle and upper-income persons. Some interest for transportation for disadvantaged groups has grown, however, new data is necessary in order to consider these groups in transportation designs.

First step, need to identify disadvantaged groups, locate them and determine characteristics. Levels of handicaps, disadvantages need to be established.

Two types of transportation disadvantage:
1) trip-maker constraints are the "inherent problems of the trip-maker in getting anywhere by an available mode of transportation. Will affect person no matter where he/she lives or what modes of transportation are available.
2) location constraints, are those"concerned with the transportation services available or known ... where he/she is or wants to go and the distribution of destination needs and opportunities". Changes in total transportation system can affect these constraints.

To determine data needs, a comprehensive study of social service needs and delivery system within Vermont was undertaken. The results are as follows:
1) Source of information on broad needs or trip purposes
2) Updated file of person characteristics and requests for services
3) Historical file reflecting changing needs of disadvantages
4) Sample approaching 100% of disadvantaged persons in area
5) Potential to sort data in sereral ways, for example, by addresses, incomes, handicaps.
6) Census data
7) Employment data

Second step is to determine actual and latent demand for the service by disadvantage and then to estimate future demand. Welfare data (obtained from social service agencies) will best be source of information here. Information to be provided would include coverage of nonwork related trips, histroical data or changing needs and income, and behavioral data for cause and effect research.

Some problems that may be encountered:
1) Confidentiality of welfare agencies records
2) Lack of uniform data base, often handwritten.
3) Unknown accuracy of data
4) Problem of estimating future demand always questionable.

2. Facilities - Construction of elevators and high level platforms in all new and existing stations and terminals, when structurally possible. (Alteration of existing facilities to accessibility standards over 10 - 20 year period.) Analysis is based on A.P.T.A. studies carried out by the Chicago Transit Authority. "Lacking both schedule and detailed designs only planning estimates could be made. Such estimates, <u>at best</u>, are only accurate ± 50%".

3. Vehicles - All new level entry and step entry vehicles will be built to specifications for use by E&H. Also, only one third of entire fleet of existing transportation systems would have to be adapted with a level change device and wheelchair stanchions for secure riding due to peak hour scheduling changes. A.P.T.A. estimates of costs are used for modifying vehicles.

Level change devices would necessarily enlarge dwell time. To meet existing standards of performance, existing fleets would necessarily be expanded by 20%. (Appendix I is a composite model of the 26 largest U.S. cities and the impact of level change devices on fleet requirements - highly technical 17 page appendix backs up conclusions presented in this section.)

4. Operation of Specialized Services - This program cost is the dominant cost factor in the proposed program. Three "Market Definitions" (M.D.) were developed in detail concerning eligibility requirements for specialized services.

a. <u>M.D. I</u> includes handicapped persons who can travel independently i.e. do not need the help of another person for mobility.
b. <u>M.D. II</u> includes M.D. I plus individuals that need the help of another person for mobility and require door to door service.
c. <u>M.D. III</u> includes M.D. I and II and extends to include non-handicapped elderly persons who do not live within accessable distances to existing transit.

Appendix II (32 pages) involves a quantitative analysis of the market for specialized services taking into account 1980 projections of population of the elderly, handicapped (and degrees of severity), general population. The number living within specified distances of public transportation and the market for specialized services are also analysed. Within these three Market Definitions, market size and average level of trip making is analyzed. Appendix III (12 pages) analyzes the effect of demand density, level of service and vehicle dwell time on type of service to be developed. The analysis concludes that with dwell time of 6 minutes or more, or sparse densities, service approaching a taxi service is the only appropriate alternative.

The third step is to make recommendations to public transportation services with respect to each category of disadvantaged persons. Information should include 1) who is served well by existing system and who is not, 2) what operating ~~shortag~~ strategies are feasible, 3) what pricing options are available, 4) what personal or welfare agencies' transportation expenditures are reduced.

Fourth step, is a detailed engineering design and operation plan of recommended system hardware and software. Hardware engineering studies are essential even when no heavy new capital investments are necessary. Detailed design of computer program requiremtnments are to be included.

Fifth, a pilot test should be utilized when implementing an innovative system. One to two years is recommended for a new system in order to get indication of how ridership level will react.

Various units of government will require varying combinations of the sources of data listed in this article. Specific data needs will depend on the government unity, the community and other factors uniauue to community and its needs.

Transportation

Apfel, Kenneth
September 16, 1976

Bronitsky, Leonard
January, 1976
An Inflationary Impact Statement of a Program of Transportation Services to Elderly and Handicapped Persons
Informal Staff Study by U.S. Department of Transportation, Cambridge, MA

Abstract

Special Definitions:

inflationary impact statement - measures fiscal impact of a program taking into consideration the effects of inflation on future spending. (This report considers inflation at 8% per year.)

dwell time - the time involved that a transit vehicle is stopped to pick up or discharge passengers.

demand density - number of passengers demanding services per square mile per day.

transfer impact - the transfer of payments that occurs when a person previously receiving government transfer payments is instead employed and is paying taxes.

This report is an inflationary impact statement and a proposed course of action to meet the transportation needs of the elderly and handicapped as is the intent of Senate Bill 662 and the proposed federal requirements (Federal Register Vol. 40, No. 39, Part 609 - February 26, 1975) concerning Elderly and Handicapped (E&H) Transportation Services. Factors, "analysed with as much quantitative precision as possible", measure impact on program cost, competition and employment. Large variances appear in much of the quantitative estimates due to major uncertainties in predicting future outcomes.

I. Planning Costs: Two phases are emphasized: 1) identification and location of E&H and 2) development of satisfactory service plans. (Planning must be carried out in all urban areas over 50,000 population to qualify for funds from U.M.T.A.). For analysis purposes, it was assumed that a professional labor year, with appropriate clerical and other support, costs about $50,000.00.

The study assumed that individual outlays for mass transit would be approximately $20 - $40 per H&E person using Dept. of Labor national averages for "retired couples".

Summarizing 8 systems currently in operation and analysing vehicle and operating costs per trip and adding planning, facility and vehicle costs, and generalizing these findings to the three Market Definitions in a national context and subtracting the estimated fare revenue collected, (whew) the following annual program costs for transportation services for the E&H were predicted:

	Annual cost (millions)
M.D.I.	202.5 - 852.2
M.D.II.	284.5 - 1,361.2
M.D.III.	541.5 - 3,153.2

II Competitve Impacts

No quantitative data was presented here except that a past study showed that 15% of trips by the urban elderly were with taxis. The question involved is whether judicial review would prohibit public transit authorities to compete with private enterprise in this area of transportation for the elderly and handicapped. Resolution of this issue of merit wants is beyond the scope of this study.

III Employment Impacts

The proposed course of action is considered to produce a substantial number of jobs for the handicapped. The potential to hire 16 - 130 thousand handicapped drivers is very possible. The primary employment impact is in the handicapped being able to get to jobs. This study, through a survey of unemployed handicapped adults, found that 15% (260,000) considered lack of transportation the reason they were not employed. This would be an enormous financial motivation for implementing the program. In addition, the researchers estimated that between 700 - 10,000 jobs would be created in manufacturing to implement the program (based upon which M.D. was instituted).

Cost benefit analysis.
The study concludes that the transfer impact for each Market Definition is substantial. For M.D. I, the transfer impact based on 1980 figures will range from $847 - $ 1,403 million dollars. For M.D.II, from $897 - $1,489 million and for M.D.III, from $285 - $1.361 annually. In other words, the transfer impact of M.D.I and II will pay for the public expenditures of the program. With M.D. III, transfer impact may not compensate for the public expenditures.

The researchers review the alternatives to proposed action and 8 scenarios based upon the quantitative analysis already reported. Dollar amounts are expressed in 1976 dollars and population totals are based on 1980 forecasts. Major analysis is in terms of total public expenditures, benefits in terms of number served and number employed and transfer impacts.

Comments

Data appears very solid except in the area of determining the number of jobs for the handicapped created by the increased transportation services. No data was presented to back up their survey that 15% of unemployed handicapped would be working if expanded transportation services were implemented. In addition, it was unclear whether inflation was considered in any areas outside of facility and vehicle costs.

TRANSPORTATION

RICHARD HARE
September 16, 1976

Brunso, Jo Anna M.
August 1975
"Transportation for the Elderly and Handicapped,
A Prototype Case Study of New York State"
Washington University, Urban Transportation Program
PB-249-105

The focus of this report is on the administration of Section 16 (b) (2) to the Urban Mass Transportation Act of 1964 which enables private non-profit agencies to receive funds to assist them in meeting the transportation needs of the elderly and the handicapped.

The author wrote this report prior to the actual distribution of federal funds in New York State, however, she successfully identifies and elaborates upon the initial problems of program administration.

Applications by private agencies varied in quality, completeness, and project justification which caused difficulties in assessing priorities for funding. It was recommended that a first come first serve policy be instituted to correct some of these difficulties and to upgrade the submitted applications.

Scaled values for acceptance criteria were developed but this was found to be operationally ineffective due to application reviewer subjectivity, therefore, a system utilizing multiple reviewers and then averaging values was instituted. It was still evident that political pressure could be applied to the reviewers and once again a first come first serve policy was seen as a solution.

The Urban Mass Transportation Act required state level purchasing of equipment which resulted in numerous problems. The administrative load was increased with the state responsible for negotiations with equipment suppliers, licensing of drivers, education of drivers, and handling insurance coverage. It was also necessary for local agencies to deposit their 20% share of the cost with the state prior to ordering or purchase. This caused delays in ordering and a heavy financial burden on the local agencies which resulted in some withdrawing.

In order to insure coordination of services in a locallity it was required that the local transit authorities write a letter of approval for the local appling agency. In many instances this allowed the state officials to recommend pooling of equipment by certain local agencies which cut-down on program expenditures. In other cases it was found that the services were already being provided by local transit authorities or that the agency was requesting less than what was required to fill the gap in services. An administrative problem with this procedure consisted of application approval prior to receipt of the local transit authorities' letter.

Evaluation phase of the program requires the agencies to submit quarterly reports which include ridership, overal costs, and operation times. It was also required that the agencies open their records to evaluation teams. This was resisted by many of the agencies.

Recommendations consisted of utilizing a first come first serve policy, waiting for the transit authority's letter of approval sothat coordination can be completed prior to acceptance and that more of the administrative load be taken by the local agencies in such areas as purchasing, and planning.

Conclusions are that the program is effective in chanelling funds to the local level to provide services to the elderly and handicapped. It is more effective in serving the urban population due to the concentration of that population near required services and it is costlier to serve the rural population due to the spread of that population,

Transportation

Carmichael, Mickey
September 23, 1976

Burkhardt, Jon E.
1971
"Transportation and the Rural Elderly" in
Transportation and Aging: Select Issues
Cantilli, E. J. and J. L. Shmelzer, ed.s
U. S. Department of Health, Education, and Welfare, Washington, D.C.

Abstract

Report is not "specifically focused on the elderly," but is "applicable because of the fact that so many of our elderly are poor." Rural poor nor rural elderly explicitly defined.

Report based on study of one free bus demonstration project in Wahleigh County, West Virginia, and included a cost-benefit analysis of the effects of the project on the county. Population of county dispersed in the hilly terrain, and were very dependent on the declining local coal industry. 30% of county population at the time of the study was classified as living in poverty. 30% of county population had no car; 50% of the poor had no car. Three bus lines existed, but they "generally did not serve the places where the poor were located." The demonstration project served people who had an average income of $150 per month for an average family of 4.3 persons. Before the project, an average trip cost 3% of monthly income.

Project began September 1967 and ran through February 1969. The project used 8-passenger carryalls, which on some routes ran daily and others weekly. Cost to project- $1.80 per round trip per passenger.

Travel patterns changed for riders of free bus system: "Trips for community-action, visiting, and other shopping increased substantially. Trips for church, food stamps, and medical purposes remained about the same." Poor made less walking trips and trips with neighbors. Free bus used for 91% of all travel by its riders. There were 22% more trips made to county seat through free bus system.

Overall annual net benefits to county computed to be $91,000, of which poor received 92%. Commercial buses in the area lost money; one of the lines went out of operation.

Report concludes that the system was beneficial because the riders 1) saved transportation money, 2) made more multi-purpose trips, and 3) felt more independent because they did not have to depend on others for travel. Report considers free bus system preferable to alternatives such as transportation stamps or moving services to the poor, because it did not rely on existing transportation and the costs of moving medical equipment and personnel, for example, over the "washboard roads" would be exorbinant.

Critique

Although author explains that the study examined transportation for the rural poor rather than the rural elderly, study does not apply to all rural elderly. No sample population figure, county population figures (i.e. number of poor), nor number of county population who actually used free bus system. Date of study assumed to be same as date of demonstration project.

Author at the time of report was a research analyst with the Research Management Corp., Bethesda, Md.

Carp, Frances M.
1971
"The Mobility of Retired People" in
Transportation and Aging: Select Issues
Cantilli, E. J. and J. L. Shmelzer, ed.s
U. S. Department of Health, Education, and Welfare, Washington, D.C.

Abstract

Report based on a city-wide survey of retired people in San Antonio, Texas, in 1968-69, to study how the retired person travels outside his home, how he feels about his mobility and transportation, and his use of various modes of transportation. Data collected from sample of 709 persons, approximately 1.3% of the city's retired population. All were self-identified as retired people or as wives of retired men. Sample drawn from zones drawn according to their distance from the city's center. Mean age - 67.5; 82% - 65 or over, 4% - under 50, and 4.5% - 85 or over. Sample comprised of 283 men and 426 women although sex ratio of people 65 and over is 3:4. Median income of group - $1,797. Most of those surveyed had held middle-level jobs; 9% had held professional or managerial positions and 7% had been unskilled laborers. Ethnicity - 57% white, 17% - black, and 26% - Mexican-American.

Mobility behavior determined from frequency of trips to 1) friends, 2) children, 3) other members of family, 4) doctors, 5) church, 6) grocery shopping, 7) other shopping, 8) meetings, 9) entertainment, 10) senior centers, 11) libraries, 12) sports events, and 13) "other" places - business errands, parks, and restaurants. Modes of transportation: automobile, bus, and walking.

Trip patterns: most frequent trips made to 1); median response between 'about once a month' and 'several times a year.' Median response to 2) and 3) - 'about once a year,' reason being that many had no children or no relatives living in the area. Median response to 4) and 7) - 'several times a year.' Median response to 5) and 6) - 'weekly' or '2-3 times per month.' Median value of "never" for 7), 8), 9), 10), 11), 12), and 13).

Modes of transportation: automobile most common means although one-third of respondents were drivers and two-thirds said they never drove. Less than 15% of drivers "were freely able to meet their needs" through driving. 40% of non-drivers were given rides at least upon occasion. Most drivers and non-drivers wanted more rides, but travel by car depended upon infrequent opportunity, problems of dependency, and inconvenience of tailoring plans to fit those of driver.

Bus: 40% of respondents 'never' took a bus and 20% used the bus more than once a week. Those who used bus "had a number of serious problems with it and used it rather infrequently."

Walking: 50% used walking as a means of transportation several times a week; 7% used walking for grocery shopping and visiting friends. Only 3% of group said walking was 'satisfactory' while more than 50% said walking met their needs 'very poorly' or 'not at all', reasons given that destinations needed and wanted were beyond walking range.

Summary: frequency and satisfaction were related positively for driving; relationship negative for bus and walking. Most of non-goer group "attributed their immobility to the lack of suitable transportation, although most people tended not to complain about means of transportation though they might prefer to go more often." Critical handicaps for retired people cited are lower incidence of car ownership and unlimited drivership, and enforced dependence on bus and walking, both of which "are more difficult because of sensory-motor changes and neither of which are ideally suited to providing access to leisure-time destinations."

Critique

Study used questionnaires and activity-diaries to test survey findings, and cites lengthy list of other studies of elderly for support and future reference. Establishes travel patterns by statistical analysis of trip frequency and use of existing transportation modes. Questionnaires used to gauge the sample's feelings on their transportation preferences. Retirement based on self-identification. Report based on study of retired people, not just on elderly.

TRANSPORTATION

Peggy Hamilton
September 23, 1976

Carp, Frances M.
Public Transit and Retired People

Transportation and Aging (HEW)

Abstract

This report seeks to examine the retired population's use of transit system and make suggestions for the improvement of existing system from the survey. Data is based on a study of the mobility of 709 retired persons in San Antonio in 1968-69.

20% of those interviewed rode a bus once a week, 80% rode a bus less than once a week (including 40% who never rode a bus). The public transit system served a minority of the population.

Use of the transit system depended on owning a car, place of residence, and proximity of the bus stop.

Ethnic minorities used buses more - but they lived in the neighborhoods with the poorest service. Bus users tended to live alone.

Reasons for not riding the bus were not systematically explored (this aspect was to be explored in a later study.)

People who seldom rode a bus rated it as a satisfactory means of transportation; those who rode the buses often rated them as unsatisfactory.

Women and central-city residents were likely to praise the bus system in that it took them where they wanted to go. Also, they were more likely to express dissatisfaction about crowding, difficulty of getting onto and off of the bus.

Anglo residents who used the bus least evaluated it rather favorably. Negative comments were more common from central city users, ethnic minority users - because of their greater use of the system.

Complaints most often heard were: buses too infrequent, necessity of transferring, schedules inconvenient, crowding during peak hours, difficulties in getting on and off the bus, buses not keeping to posted schedules, exact fare policy.

Advantages cited: transit system provided a means of transportation to a population that had none, it was safe and inexpensive and allowed the users to be around other people.

Interviewees were asked to envision a bus trip and evaluate it at each stage - all responses were negative. Respondents said when getting on the bus they were pushed, fearful; while riding they were crowded, fearful of driver's ability, of falling while standing; when getting off the bus they felt hurried, fearful of getting off at the wrong stop.

Suggestions for improvements in the system, given by the respondents: more frequent schedules, closer adherence to posted schedule, redesign of steps and doors, re-routing to avoid transfers, coordination of bus stops and pedestrian facilities, shelters at bus stops and change machines, transit aides to assist in getting on or off the bus, announcing stops, bilingual drivers or aides.

Due to costs of modifying the transit system, author suggests an auxiliary system of smaller vehicles, specially designed to serve the elderly. This would be feasible since theolder population is clustered in certain parts of the city or in age segregated facilities and have the need to go to certain common destinations.

Modification of the transit system as suggested would make it more attractive to all potential users - "older people should have special consideration because they comprise an important population subgroup with no significant lobby".

Comments:

While I am sure the author has sufficient data upon which to base conclusions, none of it is provided to the reader. I can agree with many of the findings and conclusions because they seem right intuitively and because they are essentially the same as in other studies of a similar nature, however, the lack of any quantitative detail makes this report less valuable.

Transportation

Griffis, Kathleen
September 17, 1976

Carp, Frances M.
Summer, 1971
"Walking as a Means of Transportation for Retired People"
The Gerontologist, Summer, 1971, Part 1, pp. 104-111.

Abstract

Older people may be "captive in pedestrianism," and greater study needs to be made of the patterns of pedestrianism among the elderly.

Most people consider the use of a car vital, but among the elderly, access to an automobile diminishes due to economic reasons. Other means of mobility include riding in automobiles as passengers, public transit, and walking.

There are inhibitions to pedestrian travel among the elderly due to visual-motor changes; reduction in muscular strength, coordination, agility and speed of movement; gait changes and tendencies to fall; and increasing bone fragility.

Pedestrian death in the U. S. in 1966 were 25% elderly.

This study seeks to answer five principle questions about the walking patterns of the elderly. To what extent was walking used as transportation? Which people walked? Where did they walk? How well did pedestrianism meet their needs? How was satisfaction related to the amount of walking?

The study surveyed the population of retired people in San Antonio, Texas. There were 709 interview respondents comprising 1.3% of the retired population of the city. There were 283 men and 426 women, racially distributed. Average age was 67.5 years, and median income closely parallelled the national average.

44% walked several times each week and one-fifth walked somewhere each day. The significant characteristics of those most likely to walk included location of residence, ethnicity of neighborhoods, and car ownership. The most common destination was to the grocery store, followed by visiting friends, family visits, religious services, general shopping, physicians offices, and entertainment; all in descending order of frequency. Only 3% said that walking was a satisfactory means of getting about, while 53% rated it very poorly. Problems relating to its lack of satisfaction included distance, fears, and health. Only the provision of necessary exercise stood out as a good reason for walking. The correlation of the amount satisfaction and the amount of walking was negative in categories related to sex, ethnicity, health, and location of residence. In visual representations of walking situations; respondents reacted with hostility to a picture of a crowded intersection with complex

signals, and demonstrated a measure of anxiety when presented with the task of crossing a busy street.

"While practically everyone pronounced walking - in the abstract - to be good, very few said that it met their own needs for getting about." Age was not related to frequency of walking; therefore, perhaps the low incidence of walking and satisfaction are functions of circumstances rather than age.

Transportation

Griffis, Kathleen
September 17, 1976

Carp, Frances M.
1971
"Automobile and Public Transportation for Retired People"
Highway Research Record, #348, pp. 198-191.

Abstract

Most previous research about driving and the elderly has dealt with the problems that the elderly create. This study examines the issues from a different perspective. It assesses problems that the elderly driver experiences and the extent to which driving an automobile facilitates personal satisfaction and social contribution. Five distinct factors may explain some of the problems: physical impairment and poor health, changes in sensory motor function, higher incidence of ailments, changes in the conditions surrounding driving, and inferiority of equipment. In examining the problems, the study sought to answer some significant questions. Who are the older drivers? Where do they go? What mobility impairment is present? What are the causes of problems? Who among them do not drive?

The study surveyed the population of retired people in San Antonio and San Francisco. The first phase of the study was a sample of 1.3% of the retired population of San Antonio. In that phase, the average age was 67.5 years, with only 5% being under 50 or over 85, respectively. 82% were 65 or older, and the median income of $1797.00 was only slightly higher than the national median for persons 65 and older. Most men and husbands of interviewed women had held middle income jobs. Nearly 90% of households under 65 have cars, while greater than one-half of those 65 and older do not. Two-thirds of the people interviewed did not drive at all. The possession and driving of an automobile played a key role in the transportation pattern of the population, and driving was the most common way of getting about. Riding as a passenger was second.

Factors studied in relationship to the question who drives were financial status, car ownership, health, ethnicity, sex, and location of residence. Characteristics of the non-driver were also briefly detailed. In examining the causes of problems experienced by the group, reasons for problems encompassed factors including changes in people and changes in driving conditions. Apparently significant aspects of driving conditions included speed, intersection complexity, potential collision situations, driving with a nervous passenger, and night driving.

Five statements may be made which are implications of the examination of who drives and of what his problems are:

"1. Drivers tend to be men who had a good education, income, and health and who retired in ethnic-majority meighborhoods.

"2. Drivers tend to perceive many problems for 'the older

driver' but not for themselves.

"3. The large majority were well aware of serious problems for the 'older driver,' and most acknowledged voluntary or compulsory limitations on their own driving.

"4. The private automobile does not provide adequate transportation for retired people at the present time.

"5. Most destinations are too far from home to walk, physical conditions for the pedestrian tend to be poor, and the social milieu is perceived as uncaring or even hostile."

In further examination, public transportation was little used. 40% of the respondents had never riden a bus, and only one-fifth rode as often as once a week. Bus riding was most characteristic for those in the heart of the central city, for those in ethnic-minority neighborhoods, and for those with lower socioeconomic status. Automobile drivers appraised bus service more highly than the bus riders, whose use of the bus was inversely related to their satisfaction with the service. Advantages and disadvantages of bus service were briefly outlined.

The principle conclusions of the study were that "the overall view of vehicular transport during retirement years is not encouraging," "most retired people do not have cars," "public transit does not provide very frequent or satisfactory access," and "the inability to drive an automobile in this country leaves one 'marooned' at home."

Transportation

Hall, John
September 16, 1976

Carp, Frances M.
Research conducted 1975
"Correlates of Mobility among Retired Persons"

Abstract

Mobility defined as one's ability to move about. Correlate defined as mutual relation among things.

Study of retired persons in an urban area investigating factors that influence their mobility. Individual interviews lasting about 2 1/2 hours were conducted on 709 San Antonio, Texas residents (3% of San Antonio retired population). Mean age of interviewees was 67.5. 82% of group were over 65. Men composed 40% of group and women 60%. Median yearly income was $1,797. Most had held middle level jobs, 9% having professional and managerial positions and 8% were unskilled laborers.

Sources of variance in mobility, transportation, and satisfaction studied in several areas. They were characteristics of individual, location of residence in the urban-suburban complex, neighborhoods, household composition and family, utilization of transportation facilities.

Stepwise multiple regression analysis was run between the set of 18 "person-situation" variables and each mobility variable to determine frequency of travel and satisfaction with arrangement of travel. Revelations follows: (a) One's assessment of health was most important variable regarding frequency of travel. Respondents also tend to be satisfied with means of transportation. (b) People in central city tended to move about more and expressed satisfaction with means of transportation. (c) Persons with cars travel more and express satisfaction. Outer city residents tended to be car owners more than central city dwellers. Nevertheless, the latter traveled more. (d) High-income groups travel more than lower socio-economic groups. The latter expressed dissatisfaction with income and means of transportation. (e) Minorities tended to be less mobile and dissatisfied with transportation. (f) Men tended to go less than women, as well as more dissatisfied with transportation. (g) Long time residents and persons having children or relatives tended to be more mobile.

There were various determinants of retired persons going to different distinctions: (a) Retired persons who had children or other relatives in area made frequent visits. Minorities tended to do so more often. (b) Persons living alone having easy access to transportation visit friends often. (c) Persons rated with good health, low-income groups, and substandard

housing made infrequent visits to doctor. (d) Non-drivers, persons living alone, and poor housing dwellers grocery shopped more frequently. (e) Inner city dwellers and suburbanites owning cars tended to do "other shopping" more. (f) Persons in poor housing and bad health hardly ever attended meetings. Long time residents and persons living alone were frequent attendants. (g) People who had children or relatives in area, those in poor health, short time residents, and substandard housing dwellers infrequently attended church. Men attended less than women. (h) Wealthier persons and car owners tended to visit entertainment functions, libraries, do traveling, and attend sporting events (mainly men). Regression analysis test of significance utilized.

Retired persons utilized various modes of transportation: (a) People who owned cars drove them daily. Tended to be high-income groups living in good houses. (b) Persons not having cars, those in poor health, bad housing, and low-income tended to be driven by others. (c) Non-owners of cars and central city dwellers utilized buses. Drivers were very satisfied with transportation. Persons driven by others were dissatisfied with transportation (unavailable drivers). Persons having no choice but bus as mode of moving very dissatisfied with travel. Regression analysis used as test of significance.

Health, socio-economic factors, and location of residence sharply determines retired person's mobility.

September 23, 1976

Carp, Frances M.
The Older Pedestrian in San Francisco

Highway Research Record, No. 403

Abstract

This is a follow-up study of a San Antonio sample that found walking to be a common form of transportation among the elderly, although their reactions to it were negative. The sample used in this survey was a group of 1.3% of the over-65 population in San Francisco. The ethnic composition of those interviewed was: Black (107), Chinese-American (138), Spanish (76), white (578).

60% of those interviewed walked to some destination every day; 40% walk to all or most of the places they go.

Most common trip purpose in San Antonio and San Francisco was social; for social visiting, 42-46% of the respondents respectively went on foot.

Most older people look with favor on walking when conditions are favorable; the negative reaction to walking is to dependence on it as a means of getting places under existing conditions.

Old people in both cities saw advantages to walking - good for health, inexpensive, allowed for independence, convenient, provided contact with other people.

Respondents listed impediments to walking as: destinations too far (83%), bad weather (78%), hills (72%), fears (63%), tired feet (55%), time involved (52%) health problems (37%), traffic confusing (36%)

Pedestrian problems were intensified when carrying packages (groceries, general shopping). Because of this, the nutritional adequacy of the older person's diet is inversely correlated with the slope of the street in front of his house.

Author suggests two types of actions:

Conditions for pedestrians must be improved:
- good walk ways that are safe from intrusion by vehicles
- time at crossings must be adequate for slower pedestrians to cross
- city planning should provide access by foot from residences to services

Vehicular transportation must be provided to drug and grocery stores or delivery service must be provided. Both would be better.

Transportation
Curry, J. P.
1972
"Providing Transportation for Persons with Limited Mobility in Suburban Areas"
De Leuw, Cather and Company. San Francisco, California

Hauber, M. A.
9/ /76

Abstract

Recent federal transportation policy has encouraged provision of public transportation to those who do not own or drive an automobile, including in particular the elderly, handicapped, poor, and other mobility-limited groups.

This short article summarizes the results of a 1965 home interview survey conducted by the Bay Area Transportation Study Commission. Results are as follows:
1) There are only a small number of low-income persons and in-commuters with a significant need for peak-hour service to employment centers.
2) The elderly, low-income, and zero-auto groups travel to a large extent during midday (9am to 5pm) for shopping, medical and personal business purposes.
3) More than half of all trips by persons under 16 years of age are to and from school, (which is served by school bus).

A dial-a-bus service appears to be the best alternative for providing supplementary transportation service to mobility-limited groups.

Transportation

Apfel, Kenneth
September 16, 1976

DeBenedictis, John & Doherty, Edmund
June, 1975
A Directory of Vehicles and Related System Components for the Elderly and Handicapped
Prepared for Urban Mass Transportation Administration by
Franklin Institute Research Labratories
U.S. Dept. of Commerce, National Technical Information Service
(Publisher)

Abstract

Special Definitions

Maximum Seating Capacity (M.S.C.) refers to capacity vehicle would have if it were fitted with standard seating for ambulatory, able bodied passengers. Actual seating will vary when accomodations for the Elderly and Handicapped are provided.

Transit Bus refers to a vehicle intended for mass transportation in urban areas.

This study is basically a catalogue of manufacturers that offer products for over-the-road mass transportation of elderly and handicapped (E&H) passengers. Emphasis is placed on wheelchair accessibility. The information contained is intended to be a guide for the selection of equipment for purchase.

Data were generated by compiling a list of potential manufacturers from registers and mass transit operators; catalogue information was augmented and substantiated by telephone contact with the manufacturers.

The Appendix consists of an alphabetical listing of manufacturers included in catalogue and categories of vehicle or devices they produce.

The categories listed in this catalogue and number of entries are as follows:

I Vehicles

0 large transit vehicles - (M.S.C. of 40 or more)
9 medium transit vehicles - (M.S.C. of 23 - 39)
14 small transit vehicles - (M.S.C. of 22 or less)
10 school vehicles - (variable M.S.C.)
23 other vehicles

Vehicles continued

23 other vehicles (commercial vans that are convertible in entryway, raised roof, reinforced support members, and/or width).

Note: Vehicles described by whether vehicle is designed for transit use, seating capacity, price, delivery time, units in operation, wheelchair accomodations (type of level change mechanism, cycle time, fail safe, user or operator control), life cycle, safety features, length and width, maximum riser and tread depth of steps.

II. Components

25 lifts
7 ramps
23 wheelchair securements (tie down devices)
2 retractable steps

Note: Components described by price, delivery time, units in operation, cycle time, length and width, whether component will lower below ground level or on uneven ground, and special requirements.

Comments

Researchers note that errors are possible in data and that rapid change is taking place in this area. Information is subject to change and may be obsolete at time of reading. Therefore, prospective buyers should notify manufacturers concerning updates in their products.

One limitation of study is that M.S.C. is in terms of able bodied persons. Manufacturers rarely mention that M.S.C. in terms of wheelchairs.

Dougherty, Edmond J.
Franklin Institute Research Labs (FIRL)
June, 1975

Elsa Flores
Sept. 17, 1976

A Study on Making Transportation Facilities Accessible to the Handicapped and Elderly

Project to study accessibility of urban transportation to the handicapped and elderly (HE).

Goals and ob jectives of project:
1) Examine and categorize all physical bar iers in nation's various urb an transit systems;
2) Identify and classify varying degrees of handicapped in terms of specific dysfunctions;
3) Propose and analyze cost of alternate solutions to each physical b arrier;
4) Str ucture a family of specifications identifying generic requirements for public facilities.

Barrier - anything which may impede HE rider use of rapid rail transportation, or reduce likelyhood of his/her regularly using public transportat ion.

Station - not defined; example most often used is that of a subway.

The study presents a classification scheme for vertical circulation devices, a classification scheme for fixed facilities, a station questionnaire for recording barriers, and a transit user scenario which considers psychological as well as phy sical barriers. It is recommended that these FIRL aids b e used to computer catalog all transportation fixed facility barriers and all potential solutions to these barriers as well as computer analyze the matching of barriers and specific solutions. Existing vertical circulation devices currently used in transportation facilities, their assets and shortcomings are detailed. A scheme is presented for comparing all devices against an idealized set of specifications. New concept s of vertical circulation are grouped into ramp, stair, escalator, and elevator devices. Conclusions center around applicability of existing circulation devices, the aspect of human engineering, problems related to various devices, and improvements concerning escalators and elevators. Recommendations for further study are:
1) The first devices to be evaluated should be the escalator and elevator since they are commonly used.
2) Not normally used but most promising are the shaftless elevator and the platform stairlift -- should also be evaluated.
3) A feasibility study should be made of new concepts (emphasis on modified wheelchair).
4) Device classification and survey should be made.
5) Further development and use of FIRL aids:
   --Classification system for Vertical Circulation Devices

--Classification system for Stations
--Idealized parameters for Rating Devices
--Station Questionn aire

Appendix A - Partial list of manufacturers and developers of shaftless elevators, wheelchair elevators, stairway platform lifts, and stairclimbing wheelchairs.
Appendix B - Bibliography
Appendix C - Specifications for selected devices (modified escalator,platform stairlift, and escalator-riding wheelchair).

Station questionnaire used in Philadelphia, New York, Boston, and Chicago. Details of sampling techniques under separate cover -- not included in this report.

Conclusions:
1) The most difficult barrier to remove in renovating or designing rapid rail stations is the vertical circulation barrier (level change).
2) Most devices on the market today are for home use.
3) The wide variety of problems dictatesthat a variety of solutions is essential -- no one device is likely to serve all.
4) Transit operators have little incentive to undertake the investment renovation would require (problem: initial cost, maintenance, security, fare collection). If laws were passed requiring all existing stations or public buildings to be modified for accessibility, many manufactrures and developers would invest their own funds. Until then, federal funding is the only means of developing new and better devices.

The majority of the design ideas in the report concern making a transit system accessible to the wheelchair user.

Available under separate cover from FIRL:
--FIRL Specifications for Making Mass Transit Accessible to the HE
--Station Questionnaire for Recording Barriers on Fixed Facilities
--User, Operator, and Manufacturer Opinion Assessment Regarding Mass Transit for the HE.

TRANSPORTATION

Peggy Hamilton
September 30, 1976

Dove, Donald A.
The Los Angeles Multi-Service Transportation (MUST) Program (2 pgs.)

Transportation and Aging - Selected Issued

Abstract

In Los Angeles, senior citizens receive a 10¢ discount off the regular fare during non-peak hours.

Special needs of the elderly cannot be met by an existing system because:
1) too costly
2) health precludes walking to stops, boarding and alighting difficult or impossible
3) inclimate weather presents health hazard
4) fear of waiting alone at steps, especially at night
5) desire to travel in groups

Recommendations
1) whenever possible modify service to meet needs of older citizens
2) use charter service for group trips but with reduced cost

Perry, Henry
The Kansas City Multi-Service Transportation (MUST) System

Transportation and Aging - Selected Issues

Short article, contains absolutely no specifics on anything, possibly because they are only 35 days into their program at time of writing.
JUNK

Transportation

Mickey Carmichael
September 16, 1976

Falcocchio, John C. and Cantilli, Edmund J.
1974
Transportation and the Disadvantaged
Lexington Books, D. C. Heath and Company, Lexington, Mass.

Abstract

Disadvantaged defined as those who are "transit-dependent," i.e. those who do not have freedom of mobility or freedom of choice among transportation modes--- the poor, the young, the handicapped, and the elderly. Elderly defined as those over 65 with restricted physical ability and/or limited financial means. No concrete numbers listed for all disadvantaged elderly, but authors cite the Department of Transportation's 1970 estimate of the elderly handicapped of 7,030,000.

Problem seen in transportation for the disadvantaged is that the usual modes of transportation, auto, bus, train, and airplane, are not available because of cost, design inadequacies, and/or operational problems. Cost affects the poor. Design inadequacies affect those who cannot get on or off public conveyance easily or are uncomfortable once on board. Operational problems affect those ignorant of system; those with difficulty in reaching the system; and those who find that motion of conveyance make it difficult to use.

Factors seen as necessary in determining how transportation can be used and what types of services are needed are measures of "community cohesion"---1) extent of pedestrianism 2) location and accessibility of community facilities 3) amount of neighbor exchange and mutual help 4) knowledge of others in a given area and 5) recognition of geography of area. Disadvantaged must have high cohesion for mobility; "average" can afford conditions of poor or low cohesion.

Drawbacks in in use of public transportation by elderly 1) psychological factors such as knowledge of schedules, sufficient time to board, crowds, and trip distance 2) cost of fares 3) structural problems such as high steps, overcrowding, braces or handles for maintaining balance, fare collection, and tendency of new passengers to enter through exit doors or enter before unloading completed. Mass transit curtailment means difficulty in elderly's use of services during "off-peak" hours--- crowds, longer waiting periods in hostile environments, and decline in improvements which aid the elderly. Mass transit defined as buses and subways.

Three projects aimed at improving mobility of elderly: reduced fares, minibuses, and "demand-actuated" service. When instituted, ridership increased but all programs suffered high or higher operating costs. Conclusions drawn from surveys and descriptions of "best known" examples of projects.

Effects of reduced fare projects drawn from M. H. Cantor's "The Reduced Fare Program for New Yorkers" (1969) and description of Chicago Transit Authority's reduced fare project. In New York, 50% fare reduction resulted in 15-20% ridership net increase. 800,000 elderly New Yorkers reached by system; $35,000,000 or

$25 per person per year cost to City after 2½ years of project. Level of reduced fare registration higher in white rather than in nonwhite poverty areas. Elderly reached through banks, senior centers, and "Little City Halls." In Chicago, fare reductions of about 40% resulted in 15% average ridership increase. 66% increase in number of trips made by elderly. Elderly reached through group services, public housing, and community centers. Net loss to Chicago Transit Authority but no costs listed. Unclear when study was made, who did study, and how figures were obtained.

Effects of minibus servicedrawn from Chicago YMCA Senior Citizens Moble Service which ran from September 1966 through November 1969, based on J.V. Bell's "Senior Citizen Mobile Service" study. Service employed 2 7-passenger vans, carried a total of 1,606 senior citizens on more than 30,403 trips, at cost of about $32,000 over 3-year period. Schedule based on calls to dispatcher and on first-call-first-served basis. Service used for trips to health centers, welfare agencies, shopping centers, and social outings. Ohter examples of minibus operations; Prince Georges County, Maryland; Cape May, New Jersey; and Menlo Park, California.

Conclusions on "demand-actuated" projects were drawn from reports, primarily the ones concerning the East Orange, New Jersey Mobility Project and the Bronx, New York Dial-A-Ride. "Demand-actuated" projects refer to those based on calls to dispatcher. They may "include minibuses and may offer reduced fares" also. The East Orange Project used hired escorts. According to A. T. Rinaldi's report in Escort Service- A Final Report (E. J. Cantilli, ed., 1973), during year 1970, 5 escorted bus trips made in the city with an aged population of 13,000. The Bronx project used cars and offered reduced rates for the elderly. During first 6 months of project, 65 person-trips per week were made although projections of 1190 person-trips had been made. Fares pegged at 50¢ per person for groups of 3 or more; individuals at 75¢. Figures cited from "Final Report, Bronx, N.Y., Dial-A-Ride" (1974, unpublished). Other examples of "demand-actuated" service: Haddonfield, New Jersey; Cranston, Rhode Island; Valley Transit Dist.-Connecticut; and Tuscon, Arizona projects.

Book relies on descriptions of surveys made by others to draw conclusions on special transportation projects for the elderly. Concludes that public subsidies necessary to provide special services and that "improvement of personal mobility as more than a desirable quality; it is a necessity fo full development and quality of life to all citizens." Book stresses that costs of special services run secondary to the value of services to all societal groups; new services and elimination of physical barriers for the elderly benefit not only the handicapped and the young, but the average citizen as well.

Critique

Book is a general overview of transportation problems and aids for the diadvantaged, and thus does not contain much specific information on the elderly. Relies on incomplete figures from other sources, almost all of which are studies of programs in the Northeastern U. S. Conclusions drawn from information not given to reader.

Transportation

Lisa Flores
Sept. 23, 1976

Farmer, Richard N.
Traffic Quarterly, April/1965
"Whatever Happened to the Jitney?"

Jitney - five-to eight-passenger private car (or station wagon) operated along fixed or semi-fixed routes; cross between specialized, individual-service taxi operations and scheduled common-carrier bus operations. First appeared in the U.S. in 1914.

Thesis: Jitney service has been arbitrarily choked off in the U.S. for many years, thus closing a potentially profitable solution to some traffic problems in cities of all sizes.

The development of the jitney was not popular with franchised rail-transit operators. By 1918 most American cities had strict entry control over such operations -- jitneys were soon forgotten.

According to the author , the traffic problems facing many American cities today suggest a general shift away from concentrated, mass transpor tation facilities, to a more diffuse small-volume series of interlocked routes. Jitneys seem ideally suited f or many of the types of transportation demand now present in American cities.

Pub lic transit systems are focused, concentrated flow systems, while city development in the past two decades has been, according to the authors, in exactly the opposite direction -- toward diffusion of both population and flows. Results: bus systems are abandoned in smaller cities; routes are cut back in larger ones; rail systems lose money and traffic; and highways get more congested. The author suggests that the use of the jitney might be a method of making public transit in many areas of low or diffused flow more compatible with what the traveling public clearly wants.

Comment: "The constant stream of letters to newspapers complaining about lack of transit facilities by persons unable to drive (typically the very old)" is the only mention of the elderly when the author discusses the "suggestive implications about demand" for jitney transportation.

Transportation

Lisa Flores
Sept. 23, 1976

Fruin, John J.
Extract from doctoral dissertation, 1970
Highway Research Record, No. 355
"Designing for Pedestrians:
A Level-of-Service Concept"

This is a series of ratings for walkways and stairways. The author hopes the six levels of service will provide a qualitative method of designing new or evaluating existing pedestrian environments. The pedestrian level-of-service standards (ranging from A to F) are based on the freedom to select desired walking speed, the ability to bypass slower moving pedestrians, the ease of crossing , and the presence of reverse flows at various traffic concentrations. The data required to define relative levels of convenience of pedestrians was collected through the use of time-larse photography instead of normal field survey prodedures.
E.g.
Level of Service A for Walkways - equivalent to an average pedestrian area occupancy of 35 sq. ft. per person or greater. Design volumes would be approx. 7 pedestrians per minute per ft. width of walkway or less.
Level of Service F for Walkways- equiv. to an avg. pedestrian area occupancy of 5 sq. ft. or less per person. Not recommended for walkway design.

Level of Service A for Stairways - equivalent to an avg. pedestrian area occupancy of 20 or more sq. ft. per person and a volume of approx. 5 or fewer pedestrians per minute per ft. width of stairway.
Level of Service F for Stairways - equiv. to an avg. area occupancy of 4 sq. ft. per person or less.

TRANSPORTATION

Peggy Hamilton
September 30, 1976

Garrison, W.L.
Limitations and Constraints of Existing Transportation Systems as Applied to the Elderly (7 pgs.)

Transportation and Aging - Selected Issues

Abstract

The idea of transportation and the elderly is "ill-defined and ill-definable". Attempts to tie demand, service and utilization information variations to a class of elderly will not be accurate due to the heterogeneity of the class.

Issues of social action that might change the mobility characteristics of the elderly overlap significantly in other areas.

Reduced fare programs as existing, do not really help those who are unskilled at utilizing mass transit.

Transportation planners have a mobility bias that may not be shared by the elderly population. Additionally, each generation of elderly have different mobility patterns and expectations;must be considered when planning a transportation system.

Instead of focusing on the elderly, the focus should be on individuals with certain physical or resource limitations.

Implementation of an effective program to serve the elderly will take decades.

Comments:

Perhaps this is a realistic account of the situation, certainly it is a pessimistic one. The idea of the inability of planners to plan for the elderly due to mindset may be overstated, but the idea that different generations of elderly have different mobility patterns is an interesting one - a system planned for the elderly of today may not be the best system for the elderly of the next generation due to differing mobility patterns when they were younger.

September 16, 1976

Gelick, Michael S.
August 1974
Design for the Handicapped in Elevated Transportation Systems (microfiche)
UNIVERSITY OF CHICAGO, COLLEGE OF ENGINEERING

Abstract

This report identifies architectural barriers to travel by handicapped in mass transit settings, establishes design standards and shows how to incorporate them into new or existing stations, using a Chicago station as the example.

Emphasis is on broad description of barriers and remedies.

handicapped includes: wheelchair disabled, orthopedically impaired, cardiac patients, elderly, seriously or short-term injured, sight/hearing disabled, proambulatory disabilities, parcel carrying disabilities, small children, and groups of people (the last in terms of their size and relative inflexibility)

Barriers encountered:

doors (not wide enough, too heave to oper easily, improper direction of swing)
curbs
stairs
turnstyles
ticket booths
long walking distances
crowds
structural member spacing (pillars spaced to narrowly)
station furniture
horizontal/vertical gaps between platform and vehicle
seating arrangement
narrow aisles
entry/exit time too shor
rapid acceleration/deceleration
station announcements unclear
(though the scope of the report only addresses itself to the archetectural features of a station that present a barrier, many other non-archetectural barriers are included ir the discussion of what barriers exist)

offers solutions and suggestions in terms of ideal door size, turnstyle design, passageway size, stairway height, ramp gradients, handrail placement, use of chairlifts, restriction of escalators, dimensions of elevators, levels of lighting, posting of signs, position of phones, recommended colors and textures, patterns of furniture arrangement, criteria for lavatories

Prototypical station design: center platform, glass elevator with doors on either side for entry and exit only, supplemental stairway, new gate-type turnstyles with trough money receivers, texture and lighting used to indicate primary circulation areas and warning areas

Comments:
Simplistic presentation, goes well beyond the scope of needs of the elderly alone leaves some of the barriers still barriers (acceleration/deceleration)

Transportation

Sept. 23, 1976

Gelwicks, Louis E.
Transportation and Aging
"The Older Person's Relation with the Environment:
The Influence of Transportation"

According to the author an awareness of the process of aging (biological, psychological, or social aging) can be of great assistance in the development of an environment which will maximize the functional abilities of aging individuals.

Life Space - sum total of man's past, present, and future experience which is relevant to his general well-being.

The zones of life space are:

Man - always at the center of his total life space.
Personal Space - space which man customarily places between himself and other humans; boundaries are invisible but distinct.
Living Space and Secondary Living Space - space in which man spends the majority of his time; boundaries are not necessarily fixed by property lines.
Territory - permanent or transitory portion of an individual's life space which when encroached upon by either objects or living things will precipitate resentment or defense.
Home Range - series of behavior settings, oriented towards a predominant locus of activity; traversed and occupied by the individual in his normal activites. Physical mobility and transportation play a major role in determining the boundaries of the home range. Transportation is a channel penetrating all zones of the life space.
Physical World - space which man believes he is capable of occupying either at present, or in the future, and may occasionally visit.
Psychological World - inner as well as the outer world; boundaries expanded by all media of communication.

The life space of the older person undergoes several changes as he continues to age. The principal character of his life space many be described as follows: the quality and size diminishes; static relationships replace dynamic ones; there is less differentiation within the life space, particularly within the home range; boundaries become less flexible and less permeable; and the number and quality of channels are reduced.

In view of such concepts the author suggests the following approaches should be taken in designing a transportation system for the older person:
1) Transit systems should be made comprehensible and predictable, i.e., transportation modes can be made to run on time, stop at identifiable stations, display recognizable cues, and above all establish general patterns of operation which facilitate the development of a "cognitive map" by the individual.

2) Convert transportation links to behavior settings. Take a few steps toward making the transportation experience and enjoyable social experience.

3) View the transportation system as a total mobility system, e.g. what use is there in bringing an elderly person, via public transportation, to the corner of a shopping center if there is no internal transportation system to assist the elderly in traversing several acres of parked cars.

Transportation modes can play a major role in determining the quality of the older person's relation with his environment. Thus, the author outlines the critical need for further research in this area.

Gianturco, Daniel T., Ramm, Dietolf, and Erwin, C.W.
1973
"The Elderly Driver and Ex-driver"
Normal Aging II: Reports from the Duke Longitudinal Studies 1970-1973, ed. E. Palmore

ABSTRACT

OBJECTIVES This report is a panel study which numbered 100 survivors in 1970 after mortality and attrition reduced the original number. This study was oriented toward answering the following questions:

1. What is the physical condition of the elderly subjects?
2. Do they, in fact, give up driving voluntarily when their physical problems makes it dangerous?
3. If they do continue to drive is their driving conducted with an appreciation of their limitations?
4. If they do give up driving what effect has it had on their activity level and attitude toward life satisfaction?

METHODOLOGY The 100 subjects were interviewed by a social worker for six series of observations. During the sixth observation they were asked the following questions:

1. Have you ever learned to drive?
2. Are you continuing to drive?
3. What limitations are placed on your driving, voluntarily or otherwise?
4. Why have you stopped driving?

Data concerning attitudes and activities was obtained by the social worker by administration of the Havinghurst Scale during the social history interview. There were five areas of activities on the scale: (1) health, (2) leisure, (3) security, (4) family and friends, and (5) religious activity. The subjects were also examined by a physician and given a Physical Function Rating (PFR).

RESULTS Three quarters of the subjects drive and most of the drivers were from ex-white collar occupations. The average PFR for drivers was 1.2 with an average age of 78. This indicated good physical condition dispite age. Perceptual impairment (requiring glasses) was indicated for half of the

drivers. Hearing difficulties were evident (in severe category) for only four of the drivers. Reaction time was longer for the elderly drivers as a whole when compared to the whole of a group of younger drivers, but some of the elderly drivers had comparable times to the younger group. The authors did state that the drivers were fast enough for ordinary conditions of driving. Attitudes of elderly drivers as a whole reflected a desire to drive as long as possible, but a recognition of limitations due to physical problems was also expressed. Elderly drivers had a higher activities and life satisfaction rating that elderly ex-drivers. The ex-drivers on the average had a 20% loss of physical function.

CONCLUSION States' decisions on revoking driving privileges should be made individually. Elderly drivers tend to avoid high-risk driving situations and drive fewer miles per year and collisions involving the elderly are usually minor in nature and at low speeds. Becoming an ex-driver can be associated with lower activity level and a lower level of life satisfaction as defined on the Havinghurst Scale.

Gillan, Jacqueline Stephany
Thesis, UCLA/1975
Accessibility and Old Age in Los Angeles County
A Study of Travel Patterns, Problems and Prospects

Elsa Flores

Sept. 17, 1976

Traditionally, transportation planning and research have attempted to forecast mobility needs by examining aggregate travel data and socioeconomic characteristics. However, several studies have shown that variations in trip-making behavior occur upon reaching retirement age. Recognizing influence of age and situational variables on travel, the author conducted a study of mobility among the elderly population of Los Angeles County.

The data for this research was obtained from: 1)Los Angeles Regional Transportation Study (LARTS), 2) Yellow Cab Survey, and 3) a senior citizens survey in the city of Beverly Hills. The behavior of the elderly was examined from two perspectives. The LARTS and taxicab survey were origin and destination studies and provided information about observed trip patterns of the elderly. The Beverly Hills survey was designed to solicit opinions and attitudes from senior population about transportation opportunities and services within the city.

Although the elderly are uniquely different from the general population in their travel patterns, they are also pursuing individual lifestyles which also influence their mobility. Summary of research findings: 1) mobility among the elderly is affected by age, income, and locational variables, 2) there are changes in travel behavior before and after retirement, 3) modal choice and socioeconomic status influence elderly perceptions and attitudes about accessibility, and 4) certain segments of the elderly population, specifically women, non-drivers, and low income persons have accessibility problems.

While the elderly today are found to be living in higher densities, having lower incomes and traveling less often, it is not expected that elderly of the future will be similar. According to the author, current trends toward a more dispersed and auto-dependent elderly population challenge basic assumptions of transportation planning models. This study develops a travel profile of various subgroups of the elderly population which the author hopes will assist agencies in planning for the present and future generation of retirees.

LARTS survey (1967 by the California Division of Highways) -- a two-part study. One protion consisted of home-interview questionnaire administered to a 1% sample. Only this segment used. Observations were drawn from interviews of 38,671 respondents, 4,225 (or 11%) of whom were over 65 yrs of age. The data base was reduced to 16 areas. Some represented whole

cities while others were aggregations of census tracts. A criterion for selection was that each community have an elderly population greater than the county average of 9.3% of the total population.

Yellow Cab Survey -- 1973 investigation of taxi use throughout Los Angeles county. With the cooperation of the Yellow Cab Co., information was collected on characteristics of taxe passengers as well as trip types. 2,400 passengers were sampled of which 28% were classified ad elderly.

Beverly Hills survey --(1973) 208 senior citizens were surveyed by the city's recreation department out of an estimated 13,316 persons over 55yrs (or 38% of the population).

Transportation

Griffis, Kathleen
September 23, 1976

Kinley, Holly J.
1969
"Latent Travel Demands of the Aging and Handicapped and Barriers to Travel"
Transportation and Aging - Selected Issues, DHEW, pp. 52-54. Available from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, Doc. No. PB 187327.

Abstract

An underlying assumption in this work is that the elderly and the handicapped should have the same opportunities to travel as anyone else.

The concept of latent demand is introduced and is defined as that demand represented by "the number of trips that a given population needs or would like to take, but which are not taken because the service is not available or accessible. Two additional assumptions are that latent demand would become effective demand, if service was available; and that the population is willing to pay for the service.

Admittedly, costs will have to be met by sources other than the elderly and the handicapped, singularly; therefore, latent demand is not as significant as addressing the issues of unmet needs and the elimination of travel barriers.

The specific project designed a barrier-free system, filmed the system and showed it to an undefined handicapped population to determine their response.

Major barriers were observed to be of two types: architectural or design, and movement oriented. Movement barriers were determined to be the most critical and included four specific varieties: acceleration/deceleration, crowding, long walking distances at and to terminals, and the complexity or difficulty using safety devices.

To remove barriers in a system two priorities were proposed. First, insure access to the system with special attention given to movement criteria; and second, remove architectural barriers.

Critique

The study and its population are not fully described, nor is documentary data provided in this excerpt. Assumptions may be valid, but this cannot be demonstrated in the text of this article.

Transportation

Griffis, Kathleen
September 23, 1976

Libow, Leslie S.
Circa 1970
"Older People's Medical and Physiological Characteristics:
Some Implications for Transportation"
Transportation and Aging - Selected Issues, pp. 14-18.

Abstract

This article identifies some of the universal characteristics of the elderly population, some of the principle problems which exist regarding their modes of transportation, and suggestions for improvement. There is no specifically defined study population, with the exception that elderly are defined as being over 65 years of age.

Observed characteristics of the elderly are broken into categories effecting physical capability, including: vision, hearing, central nervous system, locomotor system, cardiovascular system, medication, and general health. Significant stastistics are as follows:

3-5% are permanently institutionalized
80% have some measure of chronic illness
Loss of peripheral vision and farsightedness are characteristic, with 10% of the elderly being vision-impaired
4% use hearing aids and 20% claim some hearing difficulty
Reaction times are reduced and there is coordination loss
40% have some cardiovascular disease, and CV disease causes 50% of the deaths
Of the twenty medications taken most frequently, twelve have some sedating effects
Only twenty percent remain in the labor force.

Transportation difficulties are categorized according to mode: pedestrian, automobile, buses and subways, and airplanes.

25% of pedestrian accidents are elderly people
14% are licensed drivers
Mass transit poses problems of access to and within vehicles, crowding, and information systems
Air transit has special problems of baggage handling, rushing, and [illegible]ation at 8,000 feet (rarified oxygen).

General suggestions for improvement for pedestrian travel include better directional systems, heightened cross-way recognition, low curbing, segregation of pedestrian traffic, and rest/waiting areas. For automobile travel: medical clearance for all drivers over 60 years of age. For buses and trains: Adjustment of door sizes and opening speeds, better information systems, special buses with special fares for more specific trips (taxi-bus service). For airplane travel: registered nurse in-flight for long trips, better Red Cap service at lower cost, early arrival to avoid rush, advise airplane personnel of potential

medical problems, avoid heavy meals and drinking of alcohol.

Critique

For the new student to the study of transportation and the elderly, this article is a fairly complete, albeit elementary, discussion of some of the issues surrounding this area. It does not represent an in-depth study of any single population, and apart from providing general concepts, is of little value.

Transportation

DuBose, Diane
9/16/76

Markowitz, Joni K.
April, 1971
"Transportation Needs of the Elderly"
Traffic Quarterly, 25, pp. 237-253

Statistics of the elderly (65 years and older) were extracted from a 1963 survey for this study of transportation habits and needs in the most intensely developed portions of New York, New Jersey, and Connecticut. No total n of aged is given.

Transportation is examined on the basis of income and residential density. Trip purpose is primarily "to home" (44%), followed by shopping (14%), personal business (13%), and social-recreation (10%). Since 86% of the elderly have total leisure time, the lack of social-recreational trips was analyzed by breaking down the population by income. Still, there was no upward trend in social trips for the wealthier elderly, whereas there is an upward trend with increased income in the total population.

Trip rates decrease as density increases, regardless of income group, although higher incomes show higher trip rates. Excluding trips home or to work, rate has a positive relation with income, negative relation with density. It might be expected that trip rate for higher income groups would not decline in dense areas with the availability of taxis, but this is not the case. The lower income groups do not make use of mass transit in dense areas. The author suggests that these statistics mean that the elderly do not want to or cannot make as many trips as others. Possibly trip rate doesn't increase even with income in dense areas because the elderly cannot afford to take advantage of the destination (e.g., pay for the theater).

Although only 25% of the elderly are drivers, 55% of all elderly trips are in autos. Drivers average four times as many trips as non-drivers. Their trips decrease with density and increase with income, following the overall pattern. Non-drivers have the same number of trips, regardless of density, although low income non-drivers have a lower rate than high income non-drivers. High income non-drivers have a significantly lower trip rate (no significance figures) than high income drivers, who make 68% more trips than low income drivers.

The key to elderly transport is said to be access to opportunities, not merely mobility. Considering the loss of facilities as a limit to transport usage, an outline is given for a high density housing area near necessary services as an alternative to reduced fare plans or increased or new service which may not be used by incapacited elderly.

Transportation

Fisher, Bonnie
September 17, 1976

Mergel, Joseph J., and Frenkel, Lothar
March 10, 1975
"Working Paper: Potential Nationwide Applicability of Transportation Services for the Elderly and Handicapped"
U.S. Department of Transportation - Transportation Systems Center, Kendall Square, Cambridge, Ma. 02142

Abstract

(Note: pp. 1, 2, and 4, apparently missing from this copy)

Based on 1970 census data coupled with cost data from selected transportation projects for the elderly and handicapped, this working paper, prepared under DOT auspice, attempts to specify the costs for a nationwide urban transportation system for this population.

Key definitions and acronyms include the following:
UMTA = Urban Mass Transportation Administration
DOT = U.S. Department of Transportation
ParaTransit = an umbrella category for non-traditional transportation systems. Traditional systems include car, bus, taxi, rail. Paratransit systems include Dial-a-Ride, and other related methods for getting persons to main transportation forms, or themselves substitute for traditional means.
Mode Split =number of trips on the particular system divided by the population under study (in this case elderly and handicapped trips).

A series of assumptions are made by the authors to arrive at their nationwide cost estimates. Most notable is that current trip trends (in number as well as distance) will presumably remain constant. Another key assumption is that the only off-line method for transit worth considering is dial-a-ride. No other para-transit method is costed out. A third assumption is that average person cost per ride would not increase above the 20¢ stated and that UMTA would bear 100% of the operating costs ($23.5 million) for the first two years of this demonstration project. (None of these assumptions appear justifiable.)

The study estimates potential ridership to be 150 million trips per year (on dial-a-ride systems), on the following basis: (1) 1970 Census figures purportedly indicate 27 million elderly and handicapped persons; (2) 16 million live in urban areas, with 3.5 million in urban non-metropolitan areas; (3) of this 19.5 million population, one study cited estimates that each person makes .5 trips/day, or a total of 10 million trips/day; (4) taking an average modal split of 2.5% from the six dial-a-ride programs cited, and assumming that this figure could be doubled to 5% by "a widespread, well publicized and carefully planned

application of such systems," the potential daily trip-making was calculated at 500,000 trips/day for the non-rural elderly and handicapped throughout the nation; and finally (5) assuming 300 days of system operation/year, yields a figure of 150 million trips/year.

Costs, meanwhile, are figured at an average vehicle cost of $15,000/ vehicle, $2/ trip, $90,000/ demonstration project (based on costs for currently operating Dial-a-Ride systems), and $2,500/ square mile of service area for support facilities.

The authors recommend an initial two year demonstration project which would involve thirty four cities. The cities would be chosen on a stratified random sample basis, the stratification being based on population size with the number of same being determined by its representation within the country as a whole (eg. 10 cities of 50,000 - 500,000, 5 cities of 500,000 - 750,000, etc.). This two year project would cost an estimated $36,800,000.

Critique

This report is of genuine interest to those concerned with the development of a national transportation program for the urban elderly and handicapped. Although of interest, however, the report lacks credibility. Far greater detail is necessary if the varied assumptions made are to be upheld, or even to be fully refuted. The reader would have benefitted from a fuller presentation of data. For instance, the reliance on six Dial-a-Ride efforts (of unknown size) is a highly questionable sample to project a nationwide strategy. More importantly, only Dial-a-Ride programs are relied on, as opposed to a potentially more useful comparison of this strategy with other alternatives. In sum, the figures presented, as impressive as they seem, have little validity within the information presented.

Transportation

Griffis, Kathleen
September 17, 1976

National Urban League
July, 1973
Transportation for the Elderly and Handicapped
Written under Grant No. DOT-UT-533, U. S. Department of Transportation, Urban Mass Transportation Administration by Mark Battle Associates, Inc.
Prepared by the National Technical Information Service, Springfield, Virginia

Abstract

Two principle purposes of the study were to explore the usage of transit by the elderly and the handicapped, and to identify the major constraints to their use of mass transit systems including physical and psychological limitations, transportation costs, travel needs, and information needs.

The two primary methods of research were a search of the literature relating to transportation needs and case studies of four cities: Albany, Knoxville, Sacremento, and South Bend. Each city had a percentage of elderly above the national average, and all were served by a bus system. Geographical distribution nationally is obvious.

One observation was that the handicapped encounter more transit problems than the elderly, spend more money, and use mass transit less.

The study was conducted over a ten month period and included 867 elderly and 217 handicapped, for a total of 1084 respondents.

Principle conclusions were reported in six categories: transit usage, physical and psychological constraints, transportation costs, responsiveness of the transit system to travel needs, preferred and most used information sources, and service/system improvements. Questioning conducted by personal interview, though allowing for the possibility of an element of interviewer bias, was exhaustive and seemed conclusive.

The sample included 1% of the elderly population (based on the 1970 census) of persons over the age of 62. A census track map was prepared to identify city bolcks at least one-half of whose residents were elderly. Interviews were then conducted at random. Interviews with handicapped were conducted randomly at rehabilitation centers. Profiles of both groups reveal that, of the elderly: 72% are on a fixed income, 69% were 62 and older, 79% were male, 30% female, 19% had visual problems, 14% had hearing loss, and 38% expressed some walking difficulty; of the handicapped: the age range was 16-61 years with 36% being 51-61, 24.9% had vision impairment, 9.2% hearing loss, 60.8% experienced walking difficulty, and 15.6% used mechanical aids.

Interesting conclusions involving mass transit are outlined as follows:

1. Transit Usage - Elderly:
   60% use bus occasionally, most no more than twice weekly
   One-sixth do not have access
   Buses were used mostly for shopping and visits to the doctor or dentist
   Usage was usually from 11:00 a.m. to 4:00 p.m.
   Better service would increase use

   Handicapped:
   43% use buses
   38% use taxis
   Buses used mostly for health and medical visits
   No real need exists after 7:00 p.m.
   Improved service would increase visits to entertainment and family

2. Physical and Psychological Constraints
   Physical:
   Sight, movement impairment, difficulty maintaining balance if standing, and difficulty carrying packages
   Psychological:
   Discomfort in crowds, fear of attack, impatient of other rider is embarassing

3. Transportation Costs
   Opinions were generally split evenly between those who thought that expense was too high or too low.

4. Responsiveness of the Transit System to Travel Needs
   Both groups said that responsiveness seemed adequate.

5. Preferred and Most Used Information Sources
   Elderly:
   Printed route schedules, driver, most elderly said that they felt adequately informed
   Handicapped:
   Bus driver, telephone information, but they were generally poorly informed as a group

6. Service and System Improvements
   Shelters, door-to-door service, better services, and lower fares were predominent improvements mentioned.

Final reccommendations were to remove barriers for the elderly and the handicapped to mass transit in each of the six preceeding categories. Though reccommendations seemed admirable, no specific processes for the removal of those barriers were proposed in this study.

Critique

This study was well-constructed and seemed to be objectively conducted. Numerous tables and graphic representations of data in the report are easy to read and reflect information accurately.

Though a portion of the study deals directly with the handicapped, the information is relevant to the elderly population as well, and there are many similarities in the two groups. The references to the handicapped do not detract from the information about the elderly, but rather, probably enhance it.

Notess, C.B., and Paaswell, R.E.
1971
"Demand-Activated Transportation for the Elderly"
Published by the American Society of Civil Engineers and the American Society of Mechanical Engineers.

Abstract

Elderly defined as above 59 years. Jetneys defined as small bus designed to carry passengers over regular route according to a flexible schedule.

A case study of Buffalo, New York Model Neighborhood Area (MNA) to access elderly persons frequency of travel and travel distinction provided timely and convenient means of travel made available. 7,000 elderly lived in MNA. Jetney service provides free transportation for elderly to points anywhere within four miles of the MNA. Shopping centers and medical facilities located in the area. Jetney service personnel very experienced in various modes of transportation. Four jetney operated from 8:00 a.m. to 12:00 p.m. Jetney realistic capacity is 400 persons daily. Study conducted four months (January-April). Publicity regarding this service took the form of limited media coverage and the distribution of flyers in MNA churches, recreation centers, and other places where elderly congregated.

Findings in study follow: (a) 75% of all trips taken before 6:00 p.m. (b) Continuous, heavy usage of bus during morning hours (8-12) with some drop off between 12:30-3:00 p.m., and then increase between 3:30-5:00 p.m. (c) 90% of all jetney riders return home via jetney, and (d) Jetney services used by riders to reach services in their own heighborhoods.

Daily logs enabled researchers to analyze trip purposes. Demand for travel is greatest for trips to satisfy personal needs (medical, shopping, personal services). Only a small portion of trips are taken for social needs. No test of significance reported.

An analysis of frequency of travel reveals that average passenger utilizes service once a week. In survey of 61 elderly persons in May, 1971, it was revealed that most of jetney users (65%) would utilize buses if present service was unavailable. Also, jetney tended to be used more by older persons than younger ones (50% of users 70 years and over).

Final conclusion in regard to jetney services follows: (a) Ridership increased from 500 per week (70 per day) for the first week to over 1,100 per week (150 per day). (b) Adverse weather conditions caused ridership to drop to 75% of normal daily volume. (c) Persons who were active before the free service utilized it more than those with physical handicaps and failing health.

Transportation

Hall, John
September 16, 1976

PRC International
1974
"Transportation for Seniors and Handicapped Persons in Rockland County"
National Technical Information Service
(U.S. Department of Commerce)

Abstract

Latent demand defined as difference between the number of trips handicapped and elderly persons take, and number they would take were a barrier-free system available.

The objective of study is to obtain a precise description of transportation problems of elderly and handicapped in Rockland County, and to formulate operational solution. Data collected from surveys and analysis of social service agencies, comparing of Census block data with transity system route to determine number of persons who are inaccessible to bus lines, survey of bus routes to determine number of seniors riding, their purposes, cost, and perceived problems, public meetings to obtain public opinion and relevant data, and review of national literature regarding transportation studies.

Synthesis of data related to three areas of concern: demand analysis, supply analysis, and cost impact.

16,087 persons in Rockland County over 65 years. 14,000 received Social Security. 40% were below poverty line. 86% did not work. 50% do not drive automobiles. 6,500 subjects in Rockland County classified as "ambulatory handicapped" (those who could potentially use special transportation services).

Demand analysis revelations follow: (a) 15,000-16,000 of target group used transportation services if accessible. Only 45% of elderly lived in walking distance of present transit system lines. (b) Both elderly (55%) and ambulatory handicapped (71%) used the automobile as a mode of travel most. (c) Inclusive of problems in using transit were physical problems (shelter, waiting for bus, comfort), informational (schedule confusion, stops not marked), routing (more convenient routes), schedule problems (no night service, more frequent service, service too infrequent), and cost (too much). Agency survey results correlates closely to those of target group.

The supply analysis provided the following information: (a) Private and public agencies had 71 vehicles (2 full buses, 37 mini-buses, 32 station wagon/sedans). (b) Provided 15,000-18,000 trips daily for target group, expending $800,000 annually.

20% of demand not being met. A latent demand trend suggests that 5,200 trips daily needed for target groups, provided barrier-free system available. (c) Health/social welfare agencies provide transportation to clientele.

In formulating operational solution to target group problem a project of limited size was implemented that was given extensive treatment. Recommendations were made that reflected the geo-political environment. More accessible routes, transportation for weekly meetings, shopping, and recreation events, reduction of fares, linking of present transit system, and changes in schedules to increase punctuality were recommended with regard to demand/supply factors. With regard to organizational arrangements to achieve maximum efficiency, recommendations were several. They are listed as follows: (a) Establishment of county office responsible for all transportation activities. (b) Development Council of Agencies to coordinate agency needs, including transportation. (c) Appointment of Policy Advisory Committee to evaluate transportation agency servicing of its clientele. (d) Pooling of existing health/social welfare agencies' hardware to form a centralized vehicle capacity and capability. (e) "Purchase service" agreements between health/social welfare agencies and centralized transit operation to provide target group services. (f) Federal funding for future demonstrations, reduce fares for low-income persons, and comprehensive studies regarding transportation that are futuristic in nature.

Transportation

DuBose, Diane
9/16/76

Revis, Joseph, et al
April, 1975
Transportation for Older Americans: A State of the Art Report
Institute of Public Administration (microfiche, PB-243-441)

An extensive accounting of elderly transportation needs and availability of services acts as background for planning, design, and funding information. The elderly (65 years and older) are restricted in traveling by their capacity to move around and the extent that mobility is restrained by physical and emotional difficulties. Travel barriers are delineated as mechanical problems with public transportation, auto dependence, unavailability of public transportation, low income, and isolation in rural areas. Differentiation is made between demand (reflected in actual trips made) and latent demand expressed through need (reflected in some minumum level of transportation services related to necessities) and desire (what might be used if available and unconstrained). Latent demand is difficult to measure.

Synopses of twelve case studies of bus service are given to show how latent demand has been met in some communities. Extensive reports can be found in the appendix. The cases describe services, equipment, fares, costs, funding, staff (often volunteer drivers), advantages-disadvantages, overall problems and successes. As alternatives to special service and reduced fare mass transit, cases are also shown for reduced fare taxi service and use of school buses, and information about elderly driving and walking is outlined.

Funding information is discussed, including available sources through HEW, DOT, Department of Agriculture, Department of Labor, Veterans Administration, ACTION, state and local sources, and future prospects. Design and planning is a theme throughout.

Transportation

M. A. Hauber
9/17/76

Revis, Joseph
November 1975
Planning Handbook: Transportation Services for the Elderly
Prepared for the Administration on Aging

Abstract:

Chassis, motor vehicles defined as "basic operative motor vehicle, including engine, frame, cab and other essential structures and mechanical parts, but excludes body and all accessories and auxiliary equipment".

Component, engine "refers to a complete replacement unit rather than an individual repair part that may be used to repair the unit".

Downtime defined as "the total time when a piece of equipment is not available for use during normal operating hours because it is out of service for needed repairs".

Gross vehicle weight (GVW) defined as "the total weight of a vehicle including body, payload, fuel, driver and any other equipment attached to the vehicle".

Lifts defined as "platform level change mechanisms adaptable to mass transportation vehicles and capable of boarding and deboarding a wheelchair user".

Ramps defined as "inclined passageway adaptable to mass transportation vehicles and capable of boarding and deboarding a wheelchair user".

School bus defined as "vehicle intended for transportation of school children. Typical school buses utilize a bus chassis and usually have a front mounted engine."

Securement defined as "devices designed to secure a wheelchair on board a vehicle".

Transit bus defined as "vehicle intended for mass transportation in urban areas. Typical transit buses use a cab-over-engine or rear mounted engine chassis".

Wheelbase defined as "distance from the center line of the front axle to the center line of the rear axle".

A handbook designed to aid the planning and implementing of transportation services for the specified population: the handicapped and the elderly. The handbook is intended to furnish technical assistance to those who may be a part of establishing such a service but who may lack similar technical backgrounds.

Those organizations for which the handbook may prove useful would include area agencies on aging, state agencies on aging and other organizations concerned with the transportation needs of the handicapped and elderly. Because of the general design of the handbook, it may also prove helpful to others interested in similar issues.

The handbook consists of nine sections and annexes. The nine sections are: 1) Getting Started, 2) Building a Sound Data Base, 3) Designing Service 4) Selecting the Right Equipment 5) Running the Project, 6) Putting the Budget Together, 7) Monitoring and Evaluation, 8) Paying for the Project, 9) Problems to Watch For.

Section I, Getting Started, specifies how to choose and organize personnel to be involved. A pert chart is included to organize and schedule activities to be completed. Guidelines are provided for soliciting participation from the target group, community, transit systems, government, planning agencies, and social services. Additional miscellaneous tips are offered.

Section II, Building a Sound Data Base, outlines sources of existing data and specifies what information is necessary. Guidelines are suggested for collecting data which does not exist but is necessary.

Section III, Designing the Service, is divided into three subsections. The first explains how to analyze the results of survey efforts. The second describes how to develop routes and schedules for the proposed transportation system. The third lists some service concepts to be considered including taxi, advanced reservation dial-a-ride, advanced reservation subscription service, modified fixed route schedule and special services.

Section IV, Selecting the Right Equipment, provides information to 1) assist in selection of hardware, 2) insure a match between the service and client needs, 3) to assure cost-effectiveness of service, especially by predicting possible maintenance costs. Guidelines are outlined to achieve each of these objectives.

Section V, Running the Project, explains the role of the sponsor and various funding related considerations. Coordination with existing systems is urged. The structure of the organization necessary to run the system is outlined and each function explained. Promotion is emphasized as a must to insure success of the program. How to promote the system is included. Evaluation of the project is recommended to be an ongoing activity for the duration of the system.

Section VI, Putting the Budget Together, explains the two types of budgets necessary and how to complete the budgets. A capital budget is necessary to determine costs for beginning the project. An operational budget documents door-to-door expenditures which estimates costs and sources of financing.

Section VII, Monitoring and Evaluation, explains the significance of continuous monitoring and evaluating a system and the ultimate purposes to be achieved by these activities. A system may be evaluated in terms of performance and of the actual impact of the service on the community. Specific information required are listed. Methods for collecting and analyzing that data are specified.

Section VIII, Paying for the Project, includes recognition of legislation providing for and possibly funding for service systems for the target population. Governmental departments to contact are suggested. Also other sources of funds are included, such as private agencies.

Section IX, Problems to Watch For, lists possible barriers which may be encountered in the implementation of a transportation system for the handicapped and elderly. These include: 1) conflicts with existing transportation providers, 2) labor union arrangements,

3) insurance rating systems, 4) vehicle registration and safety requirements, and 5) restrictions on the use of school buses.

Each section contains examples of forms to assist the various phases. To illustrate, questionnaires are furnished to be used for monitoring the system.

Critique: An excellant guide if you are in the business of planning and implementing a transportation system to reach a target population. Helpful to researchers because of the thorough listing of issues and problems to be considered with respect to such a system.

DuBose, Diane
9/23/76

Revis, Joseph S.
"Transportation and the Aging: Some Directions"

Transportation and Aging, pp. 172-180

Abstract

A case is made for future efforts to fill the transportation needs of the aged (over age 65), those who are "relegated to the economic junk pile, by a society that ignores and neglects its citizens who have contributed 40 to 50 years of their efforts to the economy." By neglecting these needs now, the author says, we are assuring our own addition to the junkpile. The ultimate suggestion here is to develop a retirement transportation package paid for through life earnings, somewhat like Social Security.

Constraints to aged mobility are medical, income (no funds for travel, no funds for enjoyment of destination), and institutional (e.g., driver's licensing problems, inadequate safety regualtions, social habits and practices like bus drivers who drive away before the aged passenger is stabilized). Such problems further alienate and isolate the elderly, whose latent demand for transportation may be more than that of the younger persons, shown through tolerance and patience for bus transfers and poor schedules.

The author proposes that no specialized transportation should be planned for the elderly, since it is not economically viable. Rather, elderly needs should be considered with those of other "captive riders"--the very young, housewives, part-time workers, and physically handicapped. All have the same time demands (off peak) and the same origin-destination demand patterns.

Low cost improvements to existing systems include changes, providing hand holds and special step heights. Special gates could make peak-time entry fast and safe. Low cost bus shelters, improved signs (color, letter size, frequency), improved information access, more off-peak services (low fares, special schedules and routes), and pricing experiments would help not only the elderly, but others who use mass transit.

Needs of the aged should be considered when new systems are designed. This is less expensive than making adjustments later. Types of new systems should be tested, such as Dial-a-Bus, mini-vehicles, personalized rapid transit (DART), and lease-a-car. Jitney use could be increased. Rent-a-car with volunteer drivers might be utilized for group movement.

Research of the aged's needs and aspirations should be done. Problems in public administration could be alleviated by reviewing driver's licensing practices to avoid discimination and by ending schedules which do not adapt to old people. The attitudes of transit employees could be improved through educational training programs teaching sensitivity to the aged.

Elderly transport could be financed by raising peak fares to compensate lowered non-peak fares; private sector contributions; a permanent pass paid for by lifetime earnings payments.

TRANSPORTATION

Peggy Hamilton
September 30, 1976

Roess, Roger
Existing Technology in Mass Transportation (7 pages)

Transportation and Aging - Selected Issues

This is a broad survey of existing types of mass transit.

Rapid transit is discussed in terms of capacity, physical systems, noise levels, operational problems and characteristics, stations, access, and fares.

Local transit is discussed in terms of bus size, use of exclusive lanes, minibus, dial-a-bus, loading and unloading, fares.

Conclusion is that planning for mass transit requires consideration of the population to be served, magnitude and location of demand, physical performance of the system. Transit should be considered a public service which will probably not be self supporting.

Comments:

This is a general survey of transit systems addressed at a general sort of evaluation. However, in one respect it was interesting - it lists criteria for the feasibility of a dial-a-bus service as follows:

1) at least 100 demands per hour per square mile
2) 10 square mile service area, maximum
3) 60 fleet vehicles
4) seated capacity greater than 10
5) 1000 feet maximum distance between pick-ups
6) minimum 15 mph average speed

I wonder where he got these criteria and why they were settled on.

Transportation

Fisher, Bonnie
September 24, 1976

Schnell, John B.
1974
"Public Transportation and Transportation Needs of the Elderly and Handicapped"
Highway Research Record
American Public Transit Association

Abstract

"Handicapped person," according to Section 16(d) of the Urban Mass Transportation Act of 1964, means any individual who .....is unable without special facilities or special planning or design to utilize mass transportation facilities as effectively as persons who are not so affected.

Elderly person, in this study is an individual 65 years or older.

"Effective use" of transportation, according to 16(a) of the Act states that "transportation shall be available to the elderly and handicapped and shall be of such a type that this population can use it.

Two groups are defined in the Act: (1) those elderly who can effectively use the transportation abailable, and (2) those that cannot use it without special facilities, planning, or design.

Handicapped persons, in this paper are defined in the following way:

(1) invalids - persons who are disabled for active service or movement and are virtually confined to bed;
(2) non-ambulatory - persons who, for all practical purposes, are confined to wheel chairs;
(3) semi-ambulatory - persons who, though handicapped to some extent, can walk with difficulty and generally use crutches or canes;
(4) ambulatory - persons who, although handicapped by age or infirmity, can walk without serious difficulty; and
(5) able-bodied.

This study is primarily concerned with the supply side of transportation needs of the elderly and handicapped, or those services directed at compensating for physical disabilities. The study is concerned with urban transportation needs (from 1970 census figures) for the 8.7 million elderly and handicapped who cannot provide their own transportation, the 1.7 million who must occasionally be taken to a medical facility, and some of the 4.4 million who can drive themselves but might prefer other options.

The methodology was to interview administrators of facilities and programs for the elderly and handicapped. Reporting method is descriptive in nature. Methods discussed for imporving services to this population include modification of the types of vehicles currently in service (such as building a lift into some or all of a public bus fleet), use of taxis (great difficulties noted), development of new vehicles in the TRANSBUS (UMTA's prototype bus program) and Small Bus Programs, and demand-responsive service (for instance, Door-Through-Door services, where the attendant would respond to the call and come into the home to pick up the individual.). In the opinion of those interviewed the most efficient and economical means of providing transportation that the elderly and handicapped can effectively use is to centralize, and support by public subsidy, TRANSBUS and small buses for the ambulatory and semi-ambulatory. For invalids and non-ambulatory, it is recommended that demand-responsive vehicles with attendents who would operate on a Door-Through-Door basis would be optimum. Extensive public information and education are considered by interviewees to be essential.

Critique

The authors note at the outset of the article that they had intended to interview consumers. Because of various problems, they had to settle instead for interviews with experts. With both types of interviewees, this study would have been strengthened. Although the authors go into detail in terms of description of each alternative transportation mode, they do not provide any capital expenditure or trip-cost data. Cost-effectiveness assertions by the authors are thus purely subjective and therefore suspect. The study should be read, however, by anyone interested in but unknowledgable about any of these transportation modes for this well-defined population.

September 16, 1976

Simkowitz, Howard
October 25, 1974
A Theoretical Comparison of Various Transit Modes for the Handicapped and Elderly
US DEPT. OF TRANSPORTATION, TRANSPORTATION SYSTEMS CENTER

Abstract

Research question: Can public transit systems be modified for use by the handicapped and elderly or should separate systems be provided? Determination to be made by cost benefit analysis.

Handicapped and elderly (H&E) are those persons in the population with a transportation disfunction, who can go out but cannot use public transit. (No age is given for the definition of elderly)

Analysis of 5 services:
1) standard buses with special equipment
2) Dial - a - Ride (DAR) small specially equipped buses without fixed schedules on variable routes
3) taxi service
4) rapid rail (CBD - Central Business District) with special facilities
5) line haul rapid rail with DAR or taxi feeder and distributor at each end.

Assumptions:
H&E are 1.33% of total population
H&E travel probable less than 1% of total demand
H&E make 1 one-way trip per day on the average

Considerations:

BUS
bus routes must be only 2 blocks apart for access
cost for fully equipped (modified) buses is $900,000 additional per year (8 sq. mile area, 2000 trips/sq.mile/day
longer loading time slows trips for non-H&E
all buses must be specially equipped or longer waiting time between specially equipped buses for the H&E
this system only feasible for those who can get to a bus stop
total cost per trip - $2.79 (figured on 1.5 H&E trips/day)

TAXI
existing fleet
total cost $2.20 - 2.30 (1.5 H&E trips/day) but allowing for longer load and unload times, cost raised to $4.30-4.40 per trip (load/unload time figured to reduce trips to one per hour; cost includes administrative costs of $30,000 per year for an 8 sq. mile area and $15,000 a year for a 4.5 sq. mile area)

DAR
cost per trip dependent on wait time (lower cost for longer wait)
shared ride effect lowers cost of DAR below taxi cost and makes it competitive with specially equipped buses
cost per year $100,000 - 500,000 per year

CBD RAPID RAIL

costs for altering existing stations almost prohibitive

LINE HAUL WITH FEEDER DISTRIBUTOR

combines costs of CBD rapid rail with taxi or DAR costs

Comparison of 5 systems:

problems: each system provides different type and quality of service
size of service areas compared varies
length of average trip differs
H&E population assumed evenly distributed

3 least costly alternatives:

BUS	$ .80-2.40	2000 trips/sq. mile/day cost per trip
	1.60-3.20	4000 trips/sq.mile/day cost per trip
TAXI	2.40-3.00	1 trip per sq. mile/hour
DAR	2.00-3.20	with 15 minute wait
	1.00-2.40	with 45 minute wait

Conclusions: (assuming access to type of transportation within 2 blocks of residence and equal acceptability of each system)

Taxi is the least costly for small demands and in conditions of uncertainty

DAR is less costly than taxi when demand exceeds 1.5 trips/sq.mile/hr this system allows for shared rides to lower the cost

When H&E demand is "a reasonable percent of total demand" bus is competitive (cost-wise) with DAR but does not provide same level of service

Conclusion of report:

"in most instances, separate service results in lower costs and provides a higher level of service to both H&E and non-H&E"

COMMENTS:

The age group which is being discussed is not defined. Also the report admits that the extent and form of H&E demand is not known and has not been researched. The age of the group being considered would effect the demand level.
Their conclusion is biased toward recommending the lease capital-intensive system since the demand is so uncertain.

see also problems under Comparison section.

TOPIC: Transportation

ABSTRACTOR'S NAME: M. A. Hauber
ABSTRACT DATE: 9/17/76

AUTHOR: Transportation Systems Center

PUBLICATION DATE: July 1973

TITLE: The Handicapped and Elderly Market for Urban Mass Transit

REMAINDER OF CITATION: Prepared for United States Urban Mass Transportation Administration

ABSTRACT:

Physically handicapped defined as those persons "who by reason of illness, injury, age, congenital malfunction, or other permanent or temporary incapacity or disability is unable to utilize mass transit facilities and services as effectively as persons who are not so affected".

Elderly defined as 65 years of age and above.

Travel barriers defined as "those factors of a transit system that inhibits the use of that system by certain people". Travel barriers are usually physical or operational characteristics of the system. There may also be economic or psychological barriers to a transit system.

Latent travel demand is defined as the difference between the number of trips the handicapped and elderly would take if a barrier-free transit system were available as compared to those number of rides currently being taken by that population. Can only be estimated by indirect methods in reality.

This report is an assessment of urban mass transit needs of the handicapped and elderly. The report which is limited to existing data and information exclusively considers the transit problems of the target group residing in urban areas.

The methodology utilized included five specific tasks:

1) Literature survey and data synthesis
2) Determination of the transit demand of the physically handicapped
    a) Identification and categorization of the predominant functional disabilities

4) Transit Stamps; would help to overcome the economic barrier of transit services.
5) Coupon Taxi; would provide a high level of service, door-to-door, as well as assisting financially a selective target group.

The impact of these alternatives are portrayed in Table 1. Those factors considered are: service coverage, number and types of fobs created, spatial distribution of jobs created.

Chart 2 summarizes the cost of alternative improvements as compared to the extra market served.

Specific recommendations include the following:
1) Consideration of the elderly and handicapped should be encouraged by providing federal monies to be directed at this purpose.
2) Further research, development and demonstrations for the alternatives discussed -- transit stamps and coupon taxi.
3) A list of suggested topics for further research is included.

Critique:

A clear introductory level report of the handicapped and elderly population, some of their transportation needs and suggestions for meeting those needs. Perhaps less discussion of how they completed the report and more of the nitty-gritty would have expanded the usefulness of this document.

b) Identification of the persons of all ages within each category established

c) Determination of current utilization and potential demand for urban mass transit by the target population

3) Determination of transit demand of the elderly including estimation of the latent travel demand for this group

4) A local level analysis of three representative communities is a part of the larger study undertaken, however the details of these alayses are not included in this report--only referred to briefly.

5) Data implications, considerations of viable alternatives to serve the target population, possible impact for those persons, and suggested topics ofr futher research.

The report is limited to the assessment of the transportation needs of the handicapped and/or elderly who are unable to use existing transit systems without difficulty. The target population is characterized in terms of number, living distributions, status in the labor force, income levels. The two groups, handicapped and elderly are not mutually exclusive.

The report concludes that no comprehensive barrier-free transit system presently exists in any community. However, reduced fares for the elderly are frequently utilized in communities. Also some coordination between social service agencies and transit systems has also been implemented in some communities.

Five specific alternative approaches are discussed. These are:

1) Upgrading existing or planned systems; especially be removing physical barriers. Some special adaptations can be made to the vehicle and facility, including lifts, wider doors, elevators.

2) Dial-A-Ride Feeder-Distributor; would expand the service area by providing a door-to-door service dimension to existing fixed-route systems.

3) Expand fixed-route service; by doubling the existing system, all users would benefit. However, physical barriers would remain.

Chart 1

~~Figure 6.1~~

PROBABLE IMPACTS OF ALTERNATIVE ACTIONS

ALTERNATIVE ACTION	SERVICE COVERAGE	NUMBER AND TYPES OF JOBS CREATED	SPATIAL DISTRIBUITON OF JOBS CREATED
1. Fix physical plant Bus modification	43 urban areas (38% of H&E)	2,500 manufacturing	1 or 2 places
Rail modification	7 - 8 urban areas (about 20% of H&E)	7,400 construction	7 - 8 large cities
2. Dial-A-Ride Feeder-Distributor	239 urban areas (56% of H&E)	200,000 service and manufacturing	239 urban areas
3. Ubiquitous fixed route	239 urban areas	200,000 service	239 urban areas
4. Transit stamps	43 urban areas	--	--
5. Coupon taxi	All SMSA's	30,000 drivers	239 urban areas

Chart 2

~~Figure 5.2.~~: COST OF ALTERNATIVE IMPROVEMENTS VS. EXTRA MARKET SERVED[1]

	TRANSIT				OTHER
	Physical	Operational		Economic	
	Fix Physical Plant	Dial-A-Ride Feeder-Distributor	Ubiquitous Fixed Route	Transit Stamps	Coupon Taxi
Extra users served	0.7M*[2]	4.2M[3]	4.2M[3]	1.5M[5]	1.2M[6]
Extra Cost	Bus $250M Rail Exist. $640M New $100M $990M	$2.2B/yr*[4]	$2.2B/yr[4]	$260M/yr	$300M/yr
Extra cost/ Extra user	$1400	$525/yr	$525/yr	$175/yr	$250/yr

*M = million; B = billion

[1]There is an additional market of an undetermined number of the 4.4M H&E drivers who would use transit if transit were improved.

[2].7M = Urban H&E within two blocks of transit who can go out, but can't use transit.

[3]4.2M = 3.M currently not covered + 1.2M who can go out but can't use transit (.7M with transit available + .5M with no transit currently available).

[4]$2.2B is an estimated operating plus capital cost of such a service and for the operators would be reduced to some extent by fares charged.

[5]1.5M = Urban elderly below poverty level with transit available.

[6]1.2M = handicapped who can go out, but can't use transit.

Transportation

Fisher, Bonnie
September 17, 1976

Wachs, Martin, and Blanchard, Robert D.
July 1975
"Life Styles and Transportation Needs of the Elderly in the Future"
School of Architecture and Urban Planning, University of California at Los Angeles, prepared for Urban Mass Transportation Administration, NTIS.

Abstract

Elderly defined, as in common usage, as over 65 years, though later in paper subdivided into "young-old" (60-75 years) and "old-old" (75 years and up) categories (Neutgarten).

Method employed involves use of 1970 census-tract data, specifically concerning population size, independent living arrangements, educational level, population density, car ownership and associated drivers license possession, to review commonly held views of elderly transportation requirements and speculate about future patterns of living and travel.

In studying censes data an initial assumption is made that the elderly of the future will not necessarily have the same needs as those now, nor will the aging process itself necessarily create "transit dependency" or particular locational patterns. The life style one brings into old age is identified as a major determinant of subsequent behavior. Thus, the elderly of the 1990's (who are in their 40's and 50's now) would be bringing in a totally different life style than did the current generation of elderly. This premise is in opposition to the idea found in literature today that the elderly will always be relatively poor, immobile, and dependent."

Anticipated demographic changes show a growth in elderly population from 8.9 million men and 12.8 million women in 1970, to 10.2 million men and 16.3 million women in the year 2000, an increase of approximately 22% in actual numbers. However, authors point out that this growth will represent little actual change in proportion of elderly to total population (10% to 11-12%). (This statement does not appear to be justified on the basis of other census data or the discussion.) Current trends toward: (1) improved health and associated increased life span; (2) increased independent living arrangements (currently among persons 75 and over, 80% of all women and 90% of all men live independently); (3) improved educational level (1970 census shows ½ elderly with only elementary education while ½ of those under 65, had at least a high school education); and (4) increased dispersement of elderly within metropolitan areas leading to lower population densities, are expounded upon for the presumed purpose of predicting an increasingly heterogeneous, affluent, and dispersed elderly

population of the year 2000.

For the purposes of the study, the elderly were distinguished from non-elderly in: (1) number of cars owned, and (2) number and sex of individuals possessing drivers licenses. Using descriptive analysis of the period of time and life styles of the elderly's youth, statistics indicating the low number of cars owned by individuals over the age of 65, in comparison with lower age groups, and the far lower percentage of drivers licenses, are taken to indicate that many of today's old never did own a car or posses a drivers license, particularly the women. (The inferences are logical but not necessarily limiting.)

The authors finally point out the while consideration of life style (that the elderly brings into old age) can provide a new and essential dimension in the analysis of travel requirements of the elderly, it is insufficient for a full explanation or understanding of locational patterns and travel demands of all elderly of the future. They distinguish "young-old" having a wide range of choices regarding living arrangementsaand travel patterns, and the "old-old" who by virtue of earlier moves to less densely populated areas, may become more dependent upon public transit yet in less of a position to receive it (geographically).

Recommendations for studying and planning for the transportation needs of both groups involve both a thorough understanding of the aging process and relevant life styles, through time-series analyses of population groups in place of the more traditional cross-sectional analyses of today's population of elderly. Taking life style as opposed to age, as a primary independent variable, they expect to find a significant degree of stability over time, therefore aiding in the planning of transportation services in the future.

Critique

It's an interesting study, though with the exception of census tract data on population movement and car and drivers license ownership, the premises are essentially without quantitative support. The authors are currently testing this paper's hypotheses, however, in Los Angeles county, and I think the results would be worth consideration. There is certainly enough thought provoking material in the paper to indicate the importance of life styles in the planning for future needs of the elderly population, in transportation as well as other areas.

Transportation

Fisher, Bonnie
September 24, 1976

Weaver, V. Clayton, and Herrin, Moreland
"Transportation Needs and Desires of the Elderly Residing in a Medium Sized City"
Highway Research Record, No. 516 (1974), pp. 28-34.

Abstract

Although numerous studies have traced the transportation needs of the elderly in general, few have dealt with the mobility constraints of this population in a medium-sized city (50,000 - 250,000 population). This study conducted in Urbana-Champaign, a city of 125,000 persons, was meant to answer:

(1) determination of transportation mode choice;
(2) what role does the bus system play; and
(3) what changes in available transportation modes are needed to better serve the elderly?

This study utilized telephone interviews with 3% (207) elderly in this area. Urbana-Champaign is typical of mid-sized cities, where the sole form of public transportation is the bus, which is infrequently used and has limited route coverage.

The authors discovered that bus usage declined as income increased. However, ridership increased as income exceeded $15,000 per year. Retired persons were also found to take twice as many bus trips as working persons. Females were found to be twice as likely to use the bus as males. In terms of the taxi mode, middle income persons were found to be the most frequent users.

Cost appeared to play a minor role in the decision to use or not to use the bus, and physical problems significantly limited bus ridership. It was recommended that cost reduction schemes for the elderly be directed toward taxi use, rather than buses, in that it is a more viable mode for the handicapped. Other recommendations were made, such as elderly awareness programs, maps and timetables to be displayed in areas used by this population, installations of benches and shelters, and development of bus routes during off-peak hours.

Critique

An excellent article. Reliance on the taxi mode as the sole source of serving the handicapped, however, is unrealistic. Door-Through-Door, Dial-a-Ride, and other demand-responsive modes are not noted.

Transportation

DuBose, Diane
9/16/76

Webber, Roger E.
1974
"Free Travel for the Elderly on London Transport's Services"
UITP Revue, January, 1974, pp. 31-32

Free bus transportation for the elderly has been provided in several London boroughs. This study tells the story of the changing and increasing benefits of the program.

No definition of "elderly" is given. No specific geographic dimensions are defined.

In the ultimate form of the program, free transportation was allowed for permit holders during nonpeak hours. The entire cost is paid by the Greater London Council. Three-fourths of the entitled elderly have permits.

The original plan provided a child's fare rate to permit holders during restricted hours. The elderly had to pay for the permits. As interest increased and more boroughs adopted the practice, hours were extended to 09.30 to 16.00 and 19.00 to midnight, Monday through Friday, and all day Saturday and Sunday. The Greater London Council began paying permit costs in September, 1973. The free service takes advantage of spare capacity during nonpeak hours.

Problems include the question of identification (no photos on permits) and the slight worsening of service to regular passengers. There is general acceptance of the program, even by those regular fare-payers "who ultimately pay for it." London Transport has the additional problem of maintaining adequate records. Formerly, cash receipts were used, but his is no longer reliable. The company needs new record-keeping methods in order to plan routes.

The permit price as paid by the Greater London Council to London Transport is £ 9.63. It is not stated whether this is a one time payment or repeatable after a period of time.

Yukubousky, Richard and Politano, Arthur
August 1974
"Latent Travel Demand of the Elderly, Youth, and Low Income Populations"
New York State Department of Transportation, Preliminary Research Report #63

This report utilized statistics collected in the Rochester Home Interview Survey, which was conducted eleven years earlier, along with the 1970 census statistics for New York to describe and illustrate the application of a methodology whereby "latent demand" as opposed to the "need for" travel can be determined for rural and urban elderly, youth, and low income populations.

Latent demand is defined as a measure of new trips that would be made by a population if transportation services were provided or as "the collective behavioral response measured in actual riders to a new transportation system."

The "gap analysis" approach is utilized to determine latent demand. It consists of matching two populations with the exception of transportation availability and inferring from ones transportation behavior to what the others transportation behavior would be if services were available. This form of analysis requires large samples in order to develop cells which are large enough for statistical comparison.

The parameters for levels of service computation included dollar and time costs, degree of privacy, convenience, frequency, and reliability of the service.

Alternative approaches of opinion surveys, demonstration projects, and average travel behavior are discussed within the report concering their strengths and weaknesses. Overall, the authors lent most of their energies to support of the gap analysis procedure over these other methods.

Applications of latent demand computations are illustrated within the report. At one point they described the procedures for determining the potential ridership and costs to the State to establish transit service in a middle size city that had never had any form of transit service. They failed to include the cost of manpower within their cost computations and thereby minimized the actual impact upon the State.

COMMENT This article was oriented toward the discription of a methodology and illustration of its uses within transportation planning. Throughout the article the authors gave certain explanations for various transportation behavior patterns, however, these explanations were not verifiable by any of the information contained within this report.