Coordination of Paratransit with Conventional Transit

Revised Edition

A REPORT OF THE
TRANSPORTATION TASK FORCE
OF THE

URBAN CONSORTIUM
FOR TECHNOLOGY INITIATIVES

Supported by

U.S. DEPARTMENT OF TRANSPORTATION
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The Urban Consortium for Technology Initiatives was formed to pursue technological solutions to pressing urban problems. The Urban Consortium is a coalition of 37 major urban governments, 28 cities and 9 counties, with populations over 500,000. These 37 governments represent over 20% of the nation's population and have a combined purchasing power of over $25 billion.

Formed in 1974, the Urban Consortium represents a unified local government market for new technologies. The Consortium is organized to encourage public and private investment to develop new products or systems which will improve delivery of local public services and provide cost-effective solutions to urban problems. The Consortium also serves as a clearinghouse in the coordination and application of existing technology and information.

To achieve its goal, the Urban Consortium identifies the common needs of its members, establishes priorities, stimulates investment from Federal, private and other sources and then provides on-site technical assistance to assure that solutions will be applied. The work of the Consortium is focused through 10 task forces: Community and Economic Development; Criminal Justice; Environmental Services; Energy; Fire Safety and Disaster Preparedness; Health; Human Resources; Management, Finance and Personnel; Public Works and Public Utilities; and Transportation.

Public Technology, Inc. is a nonprofit, tax-exempt, public interest organization established in December 1971 as an institutional mechanism for applying available technologies to the problems of State and local governments. Sources of such technologies include Federal agencies, private industries, universities, and State and local jurisdictions themselves. PTI works in both the hardware and software fields.

Public Technology, Inc. was organized by several public interest groups representing State and local governments. Its present Board of Directors consists of Alan Beals, Executive Director, National League of Cities; Mark E. Keane, Executive Director, International City Management Association; Robert A. Kipp, City Manager, Kansas City, Missouri; and The Honorable Tom Moody, Mayor, City of Columbus, Ohio.

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January 1980

Prepared by

PUBLIC TECHNOLOGY, INC.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Secretariat
to the

URBAN CONSORTIUM FOR TECHNOLOGY INITIATIVES

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PREFACE

This is one of nine bulletins in the third series of Information Bulletins produced by the Transportation Task Force of the Urban Consortium for Technology Initiatives. Each bulletin in this series addresses a priority transportation need identified by member jurisdictions of the Urban Consortium. The bulletins are prepared for the Transportation Task Force by the staff of Public Technology, Inc.

Five newly-identified transportation needs are covered in the third series of Information Bulletins:

- Air Quality Regulation and Measurement
- Airport Access
- Mass Transportation Energy Conservation and Contingency Planning
- Non-Federal Street and Highway Financing.
- Pedestrian Movement

Four Information Bulletins covering needs identified in previous years, are being updated:

- Accelerated Implementation Procedures
- Coordination of Paratransit with Coventional Transit
- Neighborhood Traffic Controls
- Urban Goods Movement

The needs highlighted by Information Bulletins are selected in an annual process of needs identification used by the Urban Consortium. By focusing on the priority needs of member jurisdictions, the Consortium assures that resultant research and development efforts are responsive to local government problems.

Each bulletin provides a nontechnical overview, from the local government perspective, of issues and problems associated with each need. Current research efforts and approaches to the problem are identified. The bulletins are not an in-depth review of the state-of-the-art or the state-of-the-practice. Rather, they serve as an information base from which the Transportation Task Force selects topics that require a more substantial research effort.

The Information Bulletins are also useful to those, such as elected officials, for whom transportation is but one of many areas of concern.

The needs selection process used by the Urban Consortium is effective. Priority needs selections have been addressed by subsequent Transportation Task Force projects:

- A Manual for Planning and Implementing Priority Techniques for High Occupancy Vehicles (consisting of a Chief Executive's Report, Program Manager's Report, and Technical Guide) was developed to provide assistance to local governments in planning and implementing Preferential Treatment for buses and other high-occupancy vehicles.

- A National Conference on Transit Performance addressed the need for Transit System Productivity. The conference, held at Norfolk, Virginia, in September 1977, was attended by 200 government, industry, labor, and academic participants. As a follow-up to the Norfolk meeting, 5 Transit Actions regional meetings were held between January 1979 and May 1979. The product of these following meetings is a Transit Actions Workbook that features techniques currently being used to improve transit system performance and productivity.

- To facilitate the provision of Transportation for Elderly and Handicapped Persons, 6 documents were developed: one on local government approaches, a coordination guide, a planning checklist, an information sourcebook, a series of case studies, and a chief executive's summary.

- To help improve Center City Circulation two projects have been completed. A summary report on Center City Environment and Transportation: Local Government Solutions shows how seven cities used transportation and pedestrian improvements to help downtown revitalization. Another project, addressing the coordination of public transportation investments with real estate development, culminated in a national conference--The Joint

Development Marketplace, at Washington, D.C., in June 1978. The Marketplace was attended by over 600 persons, including exhibitors from 36 cities and counties and representatives of over 140 private development and financial organizations.

- Two documents relating to the need for Transportation Planning and Impact Forecasting Tools have been prepared: (1) A paper describing local transportation planning issues and concerns directed to the Urban Mass Transportation Administration and (2) A management-level document for local officials describing the tools available as a result of the Urban Mass Transportation research program and how these tools can be applied by local governments.

- To facilitate the dissemination of information on local experiences in Parking Management, a technical report describing the state-of-the-art is being prepared.

- A National Transit Pricing Forum was held at Virginia Beach, Virginia, in March 1979 to address the need for more information on Innovative Fares. Much of the Forum was directed to technical advances in areas of pricing research and practice. The proceedings of this conference are available.

Task Force information dissemination and technology sharing concerns are currently addressed by a series of SMD Briefs. These one-page reports provide up-to-date information about on-going UMTA Office of Service and Methods Demonstrations projects.

The support of the U.S. Department of Transportation's Technology Sharing Division in the Office of the Secretary, Federal Highway Administration, and Urban Mass Transportation Administration has been invaluable in the work of the Transportation Task Force of the Urban Consortium and the Public Technology, Inc. staff. The guidance offered by the Task Force members will continue to insure that the work of the staff will meet the urgent needs identified by members of the Urban Consortium for Technology Initiatives.

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Chapter 1

ISSUES AND PROBLEMS

The term paratransit has been defined broadly to include--...those forms of intra-urban passenger transportation which are available to the public, are distinct from conventional transit, and can operate over the highway and street system.[1]

For the purpose of this Information Bulletin, however, the term is used in a more restricted sense to refer to two particular categories of paratransit service:

- Shared-ride services in urban areas in lieu of or supplementary to regular transit services. These include shared-ride taxis, jitneys, vanpools, carpools, and subscription and demand-responsive services, and may be for general public use or for use by particular groups, such as elderly or handicapped persons.

- Client services in urban areas provided by or for public and quasi-public service agencies.

The problem addressed in this Information Bulletin, which replaces an Information Bulletin on Integration of Para-Transit with Conventional Transit Systems, October 1978, is how these kinds of urban paratransit services can be coordinated among themselves and with regular transit services to provide for

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[1]. Ronald Kirby, et. al. Para-Transit: Neglected Options for Urban Mobility. Washington, D.C.: The Urban Institute, 1974. This definition embraces daily and short-term rental cars, taxis, jitneys, vanpools, carpools and a variety of subscription and demand-responsive services. Kirby suggested recently that the term might also include organized hitchhiking, an idea reminiscent of the roadside shelters and "Give a Serviceman a Ride" signs that appeared near military and naval training camps during World War II.

the public transportation needs of a community.[2]

Coordination is treated under three headings:

- Planning
- Regulation
- Institutional Factors

PLANNING

Given an urban area in which size and the spatial arrangement of activities preclude reliance upon walking for the journey to work and other internal movements, transportation planning involves the identification of travel needs and the examination of the alternative means by which these needs can be met.

The objective is to tailor service to specific local situations, taking into account demand, the capabilities and costs of existing and potential transportation suppliers, and the reciprocal effects of each supplier upon all other suppliers. The resulting plan provides a gross kind of coordination that, although it is largely passive in nature, may well meet the local need.

The U.S. Department of Transportation planning requirements for urban areas foster the planning of area transportation activities as a system in which travel needs are met by a variety of means, each of which is the best response to a specific local situation.

Some of the obstacles to systemized transportation planning include:

- Planning at the regional level may not be fine-grained enough to fit the situations found at the community level -- situations to which paratransit services appear best-suited.

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2. It should be recognized that this is only one of the issues relating to paratransit services. This Information Bulletin is directed to a specific issue: coordination. It does not address questions relating to such things as the market for paratransit services, planning techiques, operating techniques and equipment, productivity and performance, maintenance, and financing. Neither does it address paratransit service coordination in rural areas.

- Techniques for identifying and measuring the full range of urban transportation costs and benefits are still rudimentary, especially with respect to social costs and benefits.

- Paratransit activities have only recently been recognized as an integral part of a planned urban transportation system, and many planners have not yet acquired the skills and experience needed to fit these activities into a planned system.

- Planning for public mass transportation at the community level, where most paratransit planning should be done, is frequently assigned to the transit agency that operates regular transit services in the area, and which may not be aware of or sympathetic to possible paratransit applications.

- Paratransit may involve the private sector; i.e. working with taxi companies, private citizens (carpools), and parking agencies, etc. This is an area not always familiar to planners of conventional transit systems.

These shortcomings in the planning process mean that paratransit options frequently may not be identified. Even if they are, the evaluation of costs and benefits may be even more difficult than it is in the case of more conventional transportation modes. Also, paratransit applications may be rejected because of such traditional antipathies as that of transit operators toward jitneys. Consequently paratransit options may be under-represented -- or not represented at all -- during the planning and planning review processes.

These shortcomings are particularly critical when dealing with the problems of large cities on a region wide basis. Paratransit has been applied mainly in small-and medium-size cities and rural areas, and considerable knowledge is evolving regarding these applications. But the planning of transportation functions generally, and of paratransit applications specifically, becomes much more complex, and may become unmanageable, as the size of the city increases. One barrier to paratransit applications in the largest cities may indeed be the inability of planning agencies, given the present state of knowledge and experience, to cope with the complexities of the services which must be provided.

REGULATION

Planning agencies, in the course of developing their plans, currently play a role in effecting coordination among paratransit operations and between these operations and those of the regular transit operator. However, except for periodic plan reviews, once the plan is developed the role of the planning agency is a passive one.

Regulatory agencies, on the other hand, perform a more active -- though usually negative -- role.[3]

Regulatory functions developed sequentially over a period of years as the need arose to control the activities of a particular type of transportation supplier in the interests of the general public. The result of this is that, in the eyes of the regulatory agency, each mode may be a distinctly separate activity, serving different needs in different ways, and with different vehicles, from any other transportation activity. By their very nature, most regulatory agencies do not take a systems view of a community's transportation activities, and their decisions may erect barriers to paratransit applications that might compete with the services traditionally provided by transit agencies and taxicab operators. Proscriptions against jitney services are a leading example.

The difficulty, of course, is that paratransit franchises are valueless when costs exceed revenues, and where transit operations are publicly owned and supported. Many observers believe that it is only a matter of time until the same situation will exist with regard to taxicab operations unless public funds are made available to them through paratransit service contracts. They support paratransit not to prevent destructive competition, or to require the continuation of unprofitable but needed service, but to supply necessary and desirable community transportation demands at the least cost to the taxpayer.

In many States the emergence of paratransit as part of the transit system has been recognized by exempting publicly-owned carriers from regulation by an outside agency. In other cases, carpools and vanpools have been declared to be outside the purview of a regulatory agency. Regulations such as those prohibiting shared-ride taxi services have also been modified.

To summarize the current situation, some service providers are regulated, while the providers of other kinds of transportation services in the same community may not be regulated. In some cases, a transit agency may be self-regulating as to the service it provides, while at the same time it exercises regulatory functions over other transportation services. The regulatory function, however exercised, may erect barriers against, and will rarely facilitate, the introduction of new and unconventional urban transportation services.

INSTITUTIONAL FACTORS

The principal factors affecting the coordination of paratransit services lie in three areas:

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3. The term regulatory agency includes State and local public service commissions, a legislative body exercising regulatory functions, and a board which licenses and regulates particular types of operations, such as taxicabs.

- The organizational location of the coordinating function and the area of responsibility assigned to it.

- The pervasiveness of claims to the exclusive right to operate certain kinds of service, or in certain areas, or with respect to certain client groups.

- The application of labor protective requirements under Section 13(c) of the Urban Mass Transportation Act of 1964, as amended.

Coordination

It has been suggested earlier in this Information Bulletin that the coordinating role of a planning agency is essentially a passive one, and that the role of a regulatory agency, although active, is likely to be negative.

Assuming that the need for coordination goes beyond that provided by the transportation plan itself, some active coordinating mechanism must be provided. Most of the mechanisms with which there has been any experience to date fall into one of these categories:

- A single agency, responsible for providing all local transportation services, either directly or through various kinds of purchase-of-service contracts. This agency is ordinarily a city or county department or the agency that operates regular transit services. In Rochester, New York, the Regional Transit Authority is responsible for fixed route bus service, dial-a-ride bus service and dial-a-lift services for handicapped riders. Part of the dial-a-lift service is contracted to a private taxi operator.

- Two or more agencies responsible for providing particular local transportation services directly through various kinds of purchase-of-service contracts. The divisions of responsibility most commonly found are --

  -- Responsibility for regular transit services.

  -- Responsibility for paratransit services for the general public.

  -- Responsibility for paratransit services for the clients of particular agencies.

  For example, in Spokane, Washington, the Spokane Transit System provides conventional transportation service in the area. The Spokane YMCA has operated demand responsive transit service for the elderly and handicapped since 1975. In addition, the YMCA has contracted with various social service agencies to provide transporta-

tion for their clients.

- A transportation broker, responsible for identifying and matching transportation needs and resources. The role of the broker may be performed by the regional transit authority, the city or a private firm. In Knoxville, Tennessee, the city coordinates the travel demands of social service agency clients and other commuters with public and private transportation providers. In addition to the matching function, the transportation broker may, with respect to such paratransit modes as carpools and vanpools, be responsible for developing funding sources and contracting procedures, marketing and statistical reporting, operating or contracting for maintenance facilities, group purchasing of vehicles and suppliers, arranging for insurance, and establishing rules and standards for participation in the carpool or vanpool program.

Staking Out Turf

Transit operators often resist the provision of shared-ride services by other providers within their service areas. This attitude may reflect the period of private ownership and the concept of a valuable franchise which must be protected. The question arises as to what difference it makes if one publicly-owned and financed carrier operates with open doors along the route of another publicly-owned and financed carrier? Or why jitneys should be kept from taking on part of the job of providing that most costly of all conventional transit services -- service during peak periods?

Just as strongly, most social service agencies will resist the consolidation, or even the coordinated dispatching, of the fleets of vehicles which serve their clients. The plea is that they cannot carry out their programs effectively unless they directly control client transportation services. Also coordination would cause a compromise of service to their clients. The problem to be addressed is why a professional social or medical worker wants to be a transit operator, and why the taxpayer should support these individual vehicle fleets if it can be shown that consolidation or coordination can produce better service at the same or less cost.[4,5] A project being

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4. The same questions are asked about the fleets of yellow buses owned and operated by school districts. A study by the North Central Texas Council of Governments looked into this issue and concluded that several legal and institutional changes are needed to encourage more widespread nonpupil use of school buses.

5. One reason why local government officials do not push for the consolidation of all community transportation services, including those for the clients of social service agencies, within a single transportation department is their fear that the costs of providing client services will be shifted from social service agency budgets -- large shares of which are funded from Federal and State sources -- to the city or county budget.

conducted in Dade County, Florida, includes improved service for elderly and handicapped persons through the coordination of social service transportation.

Taxicab operators, who are in a different situation from transit operators and social service agencies because they ordinarily do not receive public financial support, resist shared-ride operations which may result in a smaller market for conventional taxi service. This resistance may change to cooperation and support if local transportation plans make a place for the taxicab operator in the provision of paratransit services.

Section 13(c)

Section 13(c) of the Urban Mass Transportation Act of 1964, as amended, requires protective arrangements for employees who might be adversely affected by a project assisted with Federal funds. This requirement poses a series of issues that must be considered in planning paratransit services. Extensive modifications in such plans may be required if the services are to be provided with financial assistance from the U.S. Department of Transportation.

Unions representing the employees of mass transportation carriers resist changes in function that adversely affect their members, and quite properly seek protection under Section 13(c) when there is Federal financial participation under the Urban Mass Transportation program. Observers who support the concept of protective provisions for adversely-affected employees may, however, look askance at 13(c) contract demands that appear to be made for the purpose of protecting jobs.

A much more bothersome problem arises out of the questions of just which employees are entitled to protection under section 13(c) and how that protection will be guaranteed.

Heretofore, the U.S. Department of Labor -- which by law administers section 13(c) -- has held that only the employees of mass transportation carriers are entitled to this protection. What happens, then, when taxicab operators provide shared-ride services under the paratransit concept?

Clearly, transit system employees who might be adversely affected are entitled to protection. Are taxicab drivers who might be adversely affected also entitled to protection? And, if taxicab drivers are entitled to protection in these circumstances, are they also entitled to protection against the extension of regular transit services by a carrier receiving section 5 operating assistance funds or against a Federally-assisted carpool project?

Finally, who signs the agreement with the union that defines the protective provisions, and who assumes the financial responsibility of guaranteeing this protection in the event that one or more employees are adversely affected?

In the Knoxville demonstration project the transit operator (a private management company) signed the agreement, and the City entered into a side-agreement with the union. In this case, the City had sufficient control over both the transit system and the City-owned vans to be able to enter into the side-agreement with substantial knowledge of the liability it was assuming. Will a transit agency or city council be willing to assume this liability in cases when it has limited or no control over the paratransit operation or the protected employees of a private company?

When social service agencies are involved, a major issue may be the extent to which personal services can continue to be provided by client agency employees, volunteers, part-time employees, and the clients themselves. Some of this is being looked at in the context of rural systems.

PARATRANSIT RESEARCH

Both the Urban Mass Transportation Administration and the Federal Highway Administration are encouraging and supporting paratransit research activities and the development of coordinated paratransit programs to supplement conventional transit services and to provide public transportation where conventional services are non-existent.

The Urban Mass Transportation Administration, through its Service and Methods Demonstration (SMD) Program, is supporting field demonstration of a wide variety of paratransit applications and techniques. Formal evaluation reports are already available on some of these projects. Several are being reported on in the SMD Briefs series, published by Public Technology, Inc. and available upon request.

The Urban Mass Transportation Administration is also supporting a substantial amount of research into all aspects of paratransit. This has already led to a body of research literature and the holding of two major workshops in Williamsburg, Virginia, in November 1975,[6] and February 1979,[7] by the Transportation Research Board.[8] The current level of interest and activity in paratransit topics is exemplified by the amount of attention given to them in sessions at recent Transportation Research Board meetings[9] and the Urban

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6. Transportation Research Board, Paratransit, Special Report 164, 1976.

7. Transportation Research Board, Paratransit: 1979, Special Report 186, 1979.

8. There is also a White House Inter-agency working group on Rural Transportation Coordination. The White House, Rural Development Initiatives, "Improving Transportation in Rural America," June 1979.

9. Transportation Research Board, "Paratransit Services", Transportation Research Record 650, 1978. "Current Paratransit and Ridesharing Activities", Transportation Research Record 724, 1979.

Mass Transportation Administration's annual research and development conferences.

With sponsorship by both UMTA and the Department of Health, Education and Welfare, there is considerable work going on in the area of social service agency coordination. Progress has been slow and there is considerable doubt that great economies will result from coordination. However the number of social service agencies that want to get out of transportation business is growing, and it appears that service to agency clients is improved by more professional management and better maintenance.

Some examples of recent and ongoing work on coordinated paratransit include:

- Ecosometrics, two volume report, Coordinating Transportation for the Elderly and Handicapped, that examines the legislative barriers and incentives for coordinated transportation services for the elderly and handicapped through interagency cooperative agreements.

- Public Technology, Inc.'s series on Elderly and Handicapped Transportation which includes the following six reports: Local Government Approaches, Eight Case Studies, Information Sourcebook, Chief Executive's Summary, Coordination Guide, and Planning Checklist.

- Region IV, of the Department of Health, Education, and Welfare and the Department of Transportation, in Atlanta has developed a Planning and Coordination Manual for specialized transportation systems such as for social service agencies and the elderly and handicapped.

- Multisystems' report, Modeling Demand - Responsive Feeder Systems in the UTPS Framework, which provides planning tools for integrated transit/paratransit service.

- Systan's models of supply characteristics of regional and local transit service alternatives which examine a variety of system components such as express bus and dial a ride, are now being tested in Kettering, Ohio and Portland, Oregon.

- The Department of Health, Education, and Welfare and the Department of Transportation have joint demonstrations in five cities of coordinated transportation for social service clients.

Chapter 2

CONTACTS AND CURRENT PROGRAMS

CONTACTS

Responsibility for paratransit programs at the Federal level is shared by various offices in the U.S. Department of Transportation, Department of Energy, Department of Health, Education, and Welfare, and Environmental Protection Agency.

Department of Transportation

The address for all Department of Transportation offices is:

- Nassif Building (DOT)
  400 - 7th Street, S.W.
  Washington, D.C. 20590

Program activities and contacts are listed below. The code following each name is for identification and should be included in written correspondence.

Office of the Secretary

- Office of Environment and Safety.
  Sponsors coordination studies for elderly and handicapped.
  Contact: Ira Laster
  P-23
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 426-4380

Urban Mass Transportation Administration

- Operational Technology Development Program.
  Deals with systems analysis of paratransit (economic analysis, service integration, market characteristics) and refinement of technology.
  Contact: Edward Neigut
  UTD-22
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 426-8483

- Paratransit and Energy Conservation Development Program.
  Monitoring development of prototype small bus suitable for paratransit operations.
  Contact: Wilhelm Raithel
  UTD-23
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 426-4035

- Office of Service and Methods Demonstrations.
  Conducts service demonstration of paratransit techniques and applications.
  Contact: Ronald J. Fisher
  Director, UPM-30
  Office of Service and Methods Demonstration
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 426-4995

- Office of Planning Methods and Support.
  Develops planning methodology, including computer and non-computer based models.
  Contact: Robert B. Dial
  Director, UPM-20
  Office of Planning Methods and Support
  400 - 7th Street, S.W.
  Washington, D.C 20590
  (202) 426-9271

- Office of Planning Assistance.
  Coordination of social service transportation in cooperation with HEW.
  Contact: Richard Steinmann
  UPM-13
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 472-5140

- Office of the Chief Counsel.
  Deals with legal questions regarding development of paratransit.
  Contact: Theodore A. Munter
  UCC-30
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 426-1936

- Office of Grants Assistance.
  Administers capital and operating assistance programs.
  Contact: UMTA regional office shown below:

Region I Transportation Systems Center, Kendall Square, 55 Broadway, Cambridge, MA 02142; Tel: (617) 494-2055; FTS 837-2055.

Region II	Suite 1811, 26 Federal Plaza, New York, NY 10007; Tel: (212) 264-8162; FTS 264-8162
Region III	Suite 1010, 434 Walnut Street, Philadelphia, PA 19106; Tel: (215) 597-8098; FTS 597-8098.
Region IV	Suite 400, 1720 Peachtree Road, N.W., Atlanta, GA 30309; Tel: (404) 881-3948; FTS 257-3948.
Region V	Suite 1740, 300 S. Wacker Drive, Chicago, IL 60606; Tel: (312) 353-0100; FTS 353-0100.
Region VI	Suite 9A32, 819 Taylor Street, Fort Worth, TX 76102; Tel: (817) 334-3787; FTS 334-3787.
Region VII	Room 303, 6301 Rock Hill Road, Kansas City, MO 64131; Tel: (816) 926-5053; FTS 926-5053.
Region VIII	Suite 1822, Prudential Plaza, 1050 17th Street, Denver, CO 80202; Tel: (303) 837-3242; FTS 327-3242.
Region IX	Suite 620, Two Embarcadero Center, San Francisco, CA 94111; Tel: (415) 556-2884; FTS 556-2884.
Region X	Suite 3106, Federal Building, 915 Second Avenue, Seattle, WA 98174; Tel: (206) 442-4210; FTS 399-4210.

Federal Highway Administration

- Office of Highway Planning, Public Transportation Management Division. Concerned with carpooling, vanpooling, TSM, and non-urbanized public transportation. Publishes the Carpool and Buspool Matching Guide.
  Contact: Donald A. Morin
  Chief, Public Transportation
  Management Division HHP-30
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 426-0210

- National Highway Institute.
  Training courses on public transportation.
  Contact: Jim Robinson
  HHI-2
  400 - 7th Street, S.W.
  Washington, D.C. 20590
  (202) 426-9141

Department of Energy

- Office of Transportation Programs.
  Questions about vanpooling, particularly those related to marketing and insurance.
  Contact: Lew Pratsch
  20 Massachusetts Avenue, N.W.
  Washington, D.C. 20545
  (202) 376-4435

U.S. Environmental Protection Agency

- Office of Transportation and Land Use Policy.
  This office encourages the use of paratransit strategies as a method of reducing air pollution from mobile sources. Various publications have been developed toward this end.
  Contact: Chris Shaver
  AW-445
  Environmental Protection Agency
  4th and M Streets, S.W.
  Washington, D.C. 20460
  (202) 755-0603

Department of Health, Education, and Welfare

- Office of Human Services.
  Demonstration of coordination of social service agency transportation functions in cooperation with DOT.
  Contact: Mike Albarelli
  DSJ
  330 C Street, S.W.
  Room 2416
  Washington, D.C. 20201
  (202) 245-9202

CURRENT PROGRAMS

The UMTA Office of Service and Methods Demonstrations (SMD) is the focal point for paratransit service demonstration projects. The Office of Bus and Paratransit Technology, in coordination with SMD, sponsors technology development projects.

The SMD program, through service demonstrations in local areas, develops innovative techniques to make better use of existing forms of transit. Some SMD projects are familiar: buses on reserved lanes, fringe parking, dial-a-ride, fare variations, and special services for elderly and handicapped persons. The program is also conducting research into areas which are experimental, such as auto restricted zones, congestion pricing, and user-side subsidies.

The objectives of the SMD program are to reduce transit travel time, to increase transit reliability, to improve service for the transit dependent, to increase transit coverage, and to improve transit vehicle productivity. Most of these objectives have been addressed by a variety of service demonstrations, including the following:

- Knoxville, Tennessee - the City of Knoxville demonstrated the role of the transportation broker in coordinating public transit and private transportation resources (taxis, subscription van service) to form an integrated transportation system. This brokerage function is now performed by the University of Tennessee Transportation Center.

- Rochester, New York - The Rochester dial-a-ride demonstration involves the operation of a demand responsive small bus system in medium-density suburbs. The significant features of the project are comparison in public and private suppliers of dial-a-ride services, planning techniques for future funding, use of a mini computer in vehicle dispatching, and additional area coverage for elderly and handicapped persons.

- Naugatuck Valley, Connecticut - A multifaceted demonstration with special emphasis on the elderly and handicapped; operations began in January 1973. The system included limited fixed-route service, flexible route, demand-responsive service over a wider area, and contract bus service for social service agencies and other groups in the Valley. An automated fare collection system uses credit cards and monthly billings to eliminate the need for cash payment. Fare subsidization of agency-sponsored handicapped and elderly citizens is facilitated by a computerized billing system which bills sponsoring agencies according to use of the service by their clients during the previous billing period.

- Albuquerque, New Mexico - Albuquerque social service agency coordination will be promoted. There will be strong involvement by the local taxi operation and private operators serving trips by handicapped persons.

- Portland, Oregon - LIFT, a program to transfer the service model developed in Naugatuck Valley, Connecticut, to a medium size city of approximately 400,000 population. The project included the transit operator in the coordination of social service agency transportation.

- Cleveland, Ohio - In March 1975, the city of Cleveland inaugurated the Neighborhood Elderly Transportation (NET) demonstration project intended to coordinate transportation services to meet the needs of the elderly, those 60 years of age and over. Within three demonstration neighborhoods, small buses provide advanced reservation and demand-responsive service that is coordinated with regular public transit.

- Cranston, Rhode Island - TRANSVANS, a low-cost door-to-door system begun in April 1973 and extended through December 1974, when demonstration funds ceased. The city has continued to operate this successful service with local funds.

- Danville, Illinois - This project is testing the effectiveness of user-side subsidies and the use of a combination of regular and paratransit services, arrived at through a competitive bidding process, to supply the transportation needs of a small (pop. 43,000) city.

- Westport, Connecticut - Designed to integrate fixed route service provided by the district with new shared-ride taxi service provided by a private operator. The major features of the project include expanded fixed-route service, development of shared-ride taxi service, implementation of a special advance request, demand-responsive service for Westport elderly and handicapped citizens, and package delivery service for Westport businesses.

- Dade County, Florida - Detailed plans are being developed for a future demonstration of an integrated transit and paratransit system. Major features are expected to include a revision of taxi regulations in Dade County, integration of taxi and transit services, including taxi feeder to fixed-route service, and improved service for elderly and handicapped persons through coordination of social service transportation.

To find out more about the program,
<u>Contact:</u> Ronald J. Fisher
Director, Office of Service
and Methods Demonstrations, UPM-30
400 - 7th Street, S.W.
Washington, D.C. 20590
(202) 426-4995

Chapter 3

ANNOTATED BIBLIOGRAPHY

This bibliography was compiled primarily from sources included in the Transportation Research Information Service (TRIS) network of the U.S. Department of Transportation as edited and supplemented by the staff of Public Technology, Inc. This bibliography endeavors to give a sampling of the available literature rather than an exhaustive list of all sources of information on the topic.

GENERAL

American Public Transit Association. "Paratransit in the Family of Transit Services." Transit Journal, Vol. 2, No. 2, May 1976, p. 5-26.

The transportation service concepts generally referred to as paratransit have been receiving increasing attention as possible responses to changes in transportation demand. Increasingly dispersed development patterns, unfulfilled mobility needs of the transportation disadvantaged, and reduced predictability of petroleum availability all require the exploration of innovations in transport service.

Carnegie Mellon University, Transportation Research Institute. Productivity Improvement for Taxi/Paratransit Industry. Pittsburgh, PA: 1978.

Proceedings of a conference held at Carnegie-Mellon University on June 5-7, 1978. The papers presented cover shared rides, new technology, integrated services and operations, and financial, economic, and regulatory issues.

Cook, Allen R. Paratransit Resource Guide. Prepared for U.S. DOT by the University of Oklahoma, School of Civil and Environmental Science, July 1979. (NTIS PB 80-103237).

Provides the reader with sources of information including personal contacts on paratransit development at the Federal, State and local levels with emphasis on Federal sources and national information sources.

Institute of Public Administration. Demand - Actuated Road Transit (DART) - Performance and Demand Estimation. Washington, D.C.: Institute of Public Administration, 1969. (NTIS PB 189 330).

"DART" is a demand-responsive bus transportation system which provides direct point-to-point service in a variety of urban situations. A model that would compute cost per trip as a function of demand distribution, passenger boarding and unloading time, size and shape of the service area, average vehicle speed and hourly operating costs is described. The assumption that peak-hour demands tend to place diseconomies on transit operations by concentrating service requests at certain times was incorporated in the mode. It is concluded that carefully controlled manipulation of DART fares, schedules and services may facilitate a redistribution of demand to nearly uniform proportions between the hours of 7:00 a.m. and 10:00 p.m.

Kirby, R.F. et al. Paratransit: Neglected Options for Urban Mobility. Washington, D.C.: Urban Institute, 1974. (NTIS PB 234 320).

The study reviews the experience to date with paratransit services, assesses their potential for servicing urban transportation demand and proposes a research, development and demonstration program for the provision of paratransit services. Services studies were grouped into three categories: (1) "Hire and Drive" - daily car rentals and forms of short-term car rentals including mini-car and public automobile system; (2) "Hail or Phone" - taxi, dial-a-ride, jitney and related services; and (3) Pre-arranged ride-sharing - forms of carpool, vanpool, and subscription bus services. Chapters include comparative studies of paratransit modes, innovations in paratransit regulations and case studies. An extensive bibliography is furnished.

Medville, D. A Conceptual Overview of Demand Responsive Transportation Systems. McLean, VA: Mitre Corp., 1973. (NTIS PB 220 863).

Various issues related to the implementation of demand-responsive transportation systems are discussed in light of data obtained from systems that have been or are in operation. These issues involve system dynamics, potential market vehicle productivity, economic viability, and the utility of computer control.

Multisystems Inc. Paratransit Assessment and Directions for the Future. Vol. I, II and III. Draft final report prepared for UMTA, 1980.

Volume I explores the developments to date in paratransit - what has been attempted, the results and what we have learned. Volumes II and III examine potential future roles of paratransit given trends in energy availability, the State of the economy, settlement patterns and other factors. An attempt is made to identify promising service options and institutional structures. Recommendations of governmental and private sector actions and policies are presented.

Oram, Richard L., "Peak-Period Supplements: The Contemporary Economics of Public Transport." Progress in Planning. Elmsford, NY: Pergamon Press, 1979.

The report discusses how paratransit can significantly improve the economic viability of conventional transit, and expand total transit supply. The report integrates British and U.S. transport history and 1970s developments, arguing that dated industry attitudes and practices must be modernized to reflect fundamental changes of recent years. Findings from recent cost allocation studies, showing deficit primarily attributable to excessive peak-period orientation, and other prespectives underly the conclusion, that transit authorities should incrementally pursue transit coordination rather than remain sole (monopoly) suppliers.

Peirce, Neal R., and Jerry Hagotrom. "The Move to Para-transit is Starting to Pick Up." NATIONAL JOURNAL (August 6, 1977).

Corporations and the Federal government are showing greater interest in using shared riding -- especially vanpools -- as a means of saving energy and money. Many states and cities already are far ahead of the Federal government with their experiments.

SYSTAN. Paratransit Handbook. Washington, D.C.: U.S. DOT, 1979.

Developed to aid public officials, planners, and system operators in planning, designing, implementing, operating, and evaluating integrated paratransit systems.

SYSTAN, Inc. Paratransit Integration State-of-the-Art Report, Los Altos, California: 1978. (D 158-1).

Describes the operating environment and operating characteristics of over 100 dial-a-bus and shared-ride taxi paratransit systems focusing on systems that have coordinated dispatching systems. The operating characteristics data can be used by planners in determining how paratransit systems might serve their communities. The data can also aid researchers in constructing demand and supply models of paratransit services. For local policy makers, the report contains information on the potential roles of paratransit as well as some guidelines for selecting between conventional transit and paratransit. For regional and national policy makers, several significant institutional issues in paratransit are explored. A brief history of paratransit as well as a discussion of the future of paratransit are also included.

Transportation Research Board, National Research Council, National Academy of Sciences. Demand-Responsive Transportation Systems and Other Paratransit Services. (Transportation Research Record 608) Washington, D.C.: 1976.

Papers presented at the Sixth International Conference on Demand-Responsive Transportation Systems and Other Paratransit Services, held in Wash-

ington, D.C., March 15-17, 1976. The papers are organized under the following categories: Integrated transportation systems; demand-responsive transportation systems; services; dispatching and vehicles; relation of public and private agencies; and past accomplishments and future directions.

Transportation Research Board. Demand-Responsive Transportation Systems and Services. Special Report 154. Washington, D.C.: Transportation Research Board, 1974.

This reports the proceedings of the Fifth Annual International Conference on Demand-Responsive Transportation Systems conducted by the Transportation Research Board on November 11-13, 1974, in Oakland, California. The following issues concerning demand-responsive systems were addressed: state-of-the-art; planning, implementation, and operation; equipment and maintenance; taxis and other private services; research and development; marketing and promotion; evaluation; political and public policy issues; and several other concerns.

Transportation Research Board. Paratransit. Special Report 164. Washington, D.C.: Transportation Research Board, 1976.

This reports the proceedings of a conference on paratransit held in Williamsburg, Virginia, on November 9-12, 1975, conducted by the Transportation Research Board and sponsored by the Urban Mass Transportation Administration. The following six workshops provided the major areas of focus for the conference:

1. Role of Paratransit in an Integrated Urban Transportation System.

2. Effect of Governmental Capital and Operating Assistance on the Development of Paratransit.

3. Institutional Changes Needed to Foster the Development of Paratransit.

4. Paratransit in Small Communities and Nonurbanized Areas

5. Operation Issues for Paratransit: Productivity, Vehicles, Dispatching, Management.

6. Role of Paratransit in Serving the Needs of Special Groups.

Transportation Research Board. Paratransit: 1979. Special Report 186. Washington, D.C.: Transportation Research Board, 1979.

This reports the proceedings of a conference on paratransit held in Williamsburg, Virginia, in February 1979, conducted by the Transportation Research Board and sponsored by the Urban Mass Transportation Administration.

Transportation Research Board. Paratransit Services. Transportation Research Record 650. Washington, D.C.: Transportation Research Board, 1978.

A collection of 12 papers on various aspects of paratransit services reported at the 56th annual meeting of the Transportation Research Board.

U.S. Department of Transportation. A Discovery of Research Development and Demonstration Projects: Fiscal Year 1978. Washington, D.C.: US DOT, 1978.

This annual publication contains descriptions of current research, development and demonstration (RD&D) projects sponsored and funded by the U.S. Department of Transportation's Urban Mass Transportation Administration (UMTA). Many paratransit projects are included.

U.S. Department of Transportation. The Taxicab in Transportation: A Bibliography. Washington, D.C.: U.S. DOT, 1979.

An annotated bibliography including literature from 1960 through 1978 which specifically relates to the taxicab rather than general paratransit.

U.S. Department of Transportation, Office of the Secretary. Transportation and the Future. Washington, D.C.: G.P.O., 1979.

Outlines technologies that will be implemented over the next 10 to 20 years. Foresees paratransit to be a key component of future urban and rural transportation systems.

U.S. Department of Transportation, Technology Sharing Program Office, Transportation Systems Center. Demand-Responsive Transportation: State of the Art Overview. Washington, D.C.: U.S. DOT, 1974.

An overview of demand-responsive transportation. A summary of demand-responsive services in North America and selected characteristics of 80 different services are given. Decision-making, planning, and operating considerations for implementing demand-responsive transportation services are presented. The report also includes material on consulting and research organizations, governmental units, operating agencies and transit authorities, vehicle manufacturers, and a bibliography.

PLANNING

Cambridge Systematics, Inc. Development of a Method for Estimating Patronage of Demand-Responsive Transportation Systems. Transportation Systems Center. Washington, D.C.: U.S. DOT, 1977.

Objectives of this study were: (1) assess existing DRT systems and select areas for calibration and verification of calibrated models; (2) develop functional specifications for all required demand models and define meth- ods of calibration and application; (3) using data gathered through household interviews and/or acquired elsewhere, use mathematical tech- niques to produce an acceptable set for calibrated disaggregate models which have appropriate policy sensitivity, are logically structured, have reasonable coefficients, are based on commonly available data, and are statistically sound; and (4) test calibrated models in three selected DRT service areas and develop model.

Cooper, Lawrence C. The Use of School Buses for Public Transportation. Arlington, Texas: North Central Texas Council of Governments, 1978. (Reprinted by U.S. Department of Transportation.)

Examines the feasibility of using public school buses for nonpupil transportation purposes. Case studies and issues such as State laws, insurance, and safety are discussed. Concludes that several legal and institutional changes are needed to encourage more widespread nonpupil use of school buses.

Gurin, D. and J. Wofford. Implications of Dial-a-Ride for the Poor. Cambridge, MA: Massachusetts Institute of Technology, 1971. (NTIS PB 199 406).

Implications of dial-a-ride for the poor are examined ·ith respect to: (1) the extent to which dial-a-ride can overcome general problems of existing public transportation for the poor; (2) special problems which dial-a-ride may generate for the poor; (3) the potential for dial-a-ride to create employment opportunities for the poor; and (4) criteria by which the implications of dial-a-ride for the poor may be demonstrated.

Henderson, C. "Seminar on System Evaluation." Highway Research Board Special Report #124. Washington, D.C.: Highway Research Board, 1971.

In this seminar, an effort was made to consider the value of existing demand-actuated urban public transportation services (taxis, buses and jitneys) from the viewpoints of several other groups who must lend support if the system is to enjoy significant success. The following topics are considered: (1) Operators - alternative operating patterns, the national potential problems; (2) Owners - public versus private ownership and costs and fares; (3) Patrons - identification of the target ridership; and (4) Labor - potential labor-management problems.

Kirby, Ronald F. & Kiran U. Bhatt. Guidelines on the Operation of Subscription Bus Service. Report for US DOT, UMTA. Washington, D.C.: The Urban Institute, August 1974. (NTIS PB 237 076/AS).

This report provides guidelines on the planning, organization, and operation of specialized bus services, termed subscription, which are tailored to serve urban travelers who agree to patronize them on a regular basis. Based on ten detailed case studies of such services, the report develops guidelines on identifying and informing potential riders, obtaining vehicles and drivers, meeting regulatory requirements, setting routes, schedules, and fares, and obtaining special privileges such as the use of express lanes and close-in parking. The report concludes with a discussion of the potential impacts of those services on the congestion, pollution, and fuel consumption associated with urban travel.

Lerman, S. and N.H. Wilson. "Analytic Model for Predicting Dial-a-Ride System Performance." Transportation Research Board Special Report #147. Washington, D.C.: Transportation Research Board, 1974.

Though much work has been done on the supply side of dial-a-ride systems, little has been done which allows for prediction of the demand aspects of such a system. In this paper, a model is presented which includes both supply and demand, and allows transit planners to explore a variety of design and policy options.

Menhard, et. al. Modeling Demand-Responsive Feeder Systems in the UTPS Framework. Report for US DOT, UMTA, Washington, D.C.: Multisystems Inc., July 1978.

A general methodology for analyzing DRT feeder systems within the UTPS framework is discussed. A set of previously developed DRT supply models has been adopted and refined. A series of nomographs based on model results have been developed to enable the analyst to predict the service levels under a range of conditions without actually exercising the models themselves.

Miller, Gerald K. & Melinda A. Green. An Analysis of Commuter Van Experience. Report for US DOT, UMTA. Washington, D.C.: The Urban Institute, February 1976.

This report analyzes the planning, organization and operation of commuter van programs (often called vanpools) in the U.S. and Canada. More than 30 existing operations have been examined and classified by considering the major organizational arrangements for providing the service. The potential benefits van commuting generates for the users, employers, and community are discussed, and the paper presents guidelines on the demand environment and indicates the service characteristics that are likely to be important in attracting riders. Major legal issues including public regulation, competition with bus transit, liability and insurance, and implications of driver compensation are also reviewed. The potential for widespread van programs and the proposals for large-scale, areawide van service are also discussed.

Miller. Gerald K. & Melinda A. Green. Guidelines for the Organization of Commuter Van Programs. Report for US DOT, UMTA. Washington, D.C.: The Urban Institute, February 1976.

This is the follow-up report to An Analysis of Commuter Van Experience. This document describes the major stages in the development of a company sponsored van program including: the investigation of program feasibility, the promotion and organization of the service, and the operation and administration of an on-going operation. These guidelines are based on the experience of several successful programs, and potential sponsors should find them useful for their particular situations. Seven detailed case studies which are representative of the major types of commuter van services are also presented in the Appendix.

Mitre Corporation. Demand-Responsive Transportation System Planning Guidelines. Report for US DOT. McLean, VA: Mitre Corp., 1974. (NTIS PB 232 970/7). An update will be available.

Based on the limited empirical information of 12 demand-responsive transportation systems, preliminary planning guidelines have been developed to aid in the design of new demand-responsive systems. These guidelines facilitate the estimation of ridership, fleet size, staff requirements and costs. A summary is also presented of the major characteristics of these 12 demand-responsive systems that are operating in the United States and Canada.

Vitt, J.E., et. al. "Determining the Importance of User Related Attributes for a Demand-Responsive Transportation System." Highway Research Record #318. Washington, D.C.: Highway Research Board, 1970.

A demand-responsive transit system must be based on a discriminating analysis of the needs of potential patrons and other interest groups. A method is discussed for quantifying this analysis and making it pertinent to system design. A questionnaire is devised that provides a continuum from patron responses to system characteristics and design variables. Analytic techniques and survey applications are described. Nine steps involved in the integration of this method with design and marketing for civil systems are discussed as parts of a process of modelling, evaluation and decision-making.

REGULATION

International Taxicab Association. A Compendium of Provisions for a Model Ordinance for the Regulation of Public Paratransit. Report for US DOT, UMTA. Chicago, IL: International Taxicab Association, February 1976.

This publication comprises a complete set of provisions for the regulation of various types of public paratransit transportation. The preparation was undertaken by the International Taxicab Association under the supervision of special counsel and consisted of five stages: the collection and analysis of the statues of every state, the ordinances of some

600 municipalities and several multi-state contracts; the compilation, comparison and the organization and drafting of the sections; consideration of varying attitudes concerning several philosophies of regulation as revealed by the existing regulations, research into the needs which would appear from the implementation of new forms of public paratransit transportation; and the assembly of the Compendium.

Hines, J.M. and D.W. Sloan. Legal Analysis of Transportation Regulation and Innovation - The Dial-a-Ride. Cambridge, MA: Massachusetts Institute of Technology, 1971.

State and Federal motor carrier regulations are examined as they may impinge on a new concept of transportation, the dial-a-ride. An experimental exemption from regulation is proposed to encourage the testing and implementation of new technological and service concepts. The problem of acquiring permission to operate is explored under the assumption that dial-a-ride would not qualify for an exemption from regulation. Part of the report is essentially advocacy, anticipating some of the obstacles a dial-a-ride application would meet in state law and marshalling arguments and authorities to overcome them. A second section considers developing Federal law as it would affect dial-a-ride.

Lax, J. "Dial-a-ride Project in Ann Arbor - Legality." Highway Research Board Special Report #136. Washington, D.C.: Highway Research Board, 1973.

A lawsuit was commenced by Ann Arbor's two major taxicab companies requesting an injunction against the operation of the dial-a-ride service. The reasons advanced for the illegality of the operation were: (1) dial-a-ride vehicles must obtain licenses under the taxicab ordinance; (2) issuance of licenses to existing taxicab companies constituted an agreement not to engage in competing activity; and (3) the Ford Motor Company was being greatly enriched without giving adequately in return. The city, joined by the Ford Motor Company, filed a motion for summary judgment. The motion answering the contentions is detailed. The Circuit Court decision affirming the legality of the dial-a-ride system was upheld by the Court of Appeals and the transcripts of the proceedings are included in the appendix. The taxicab companies have decided not to appeal this decision, thus establishing the legal basis for the dial-a-ride service in Ann Arbor, Michigan.

Gilbert, Gorman et. al. Establishing Innovative Taxicab Services: A Guidebook. Prepared for UMTA by University of North Carolina's Department of City and Regional Planning. Washington, D.C.: U.S. DOT, August 1977.

This report serves as a guidebook to local planners and public officials who are interested in establishing innovative taxi-operated paratransit services.

OPERATIONS

Bevans, P. Computer Configurations for a Dial-a-Ride System. Cambridge, MA: Massachusetts Institute of Technology, 1971. (NTIS PB 205 190).

The design philosophy for the computer configuration is discussed with reference to several variables, including type of system (experimental, demonstration, or operational), size (number of vehicles, passenger demand, and service area), and performance. Typical dial-a-ride computer systems are cited with reference to programming and scheduling operations. Criteria for selection of computer hardware are outlined for both medium and small-sized units. The report concludes with detailed time and cost estimates for development of all hardware and software components of the dial-a-ride computer subsystems. Appended material outlines the proposed dial-a-ride software organization with reference to assumptions, programs and files, security, core list specifications, drum file specifications, and programming operations. In addition, an implementation and user's guide is provided for the computer-aided routing system (CARS).

Dallas, Texas. Dallas Carpool/Buspool Program Evaluation. FHWA Contract No. DOT-FH-8313, Mid 1977, Contact: H.G. Gale, DOT-Room 4404, HEP-1, FHWA, (202) 755-9370 for more information.

The research evaluated the methods used, and their effectiveness, in initiating and maintaining a carpool/buspool matching program in the City of Dallas using the FHWA computer program.

Davidson, J. "Use of Data Processing in Taxicab Control." Highway Research Board Special Report #136. Washington, D.C.: Highway Research Board, 1973.

Dispatching is recognized as the most critical problem facing operators of demand-responsive vehicles. Three technically and economically feasible improvements in the field are suggested: (1) data processing for receipt, assignment, retention and matching of requests for service and units available for service; (2) digital communications equipment for transmission of messages between mobile units and base; and (3) automatic vehicle monitoring. Experiences of the taxicab company in implementation of the first improvement are described, and it is concluded to be technically and economically feasible.

Davis, F.W. Jr., et. al. Increased Transportation Efficiency Through Ridesharing: The Brokerage Approach Vol. 1. Report for UMTA, U.S. DOT Knoxville, TN: University of Tennessee Transportation Center, 1977.

This report defines the brokerage concept, describes benefits, assesses market potential, describes mechanisms for determining needs, outlines methodology for comparing costs of alternative types of service, identifies institutional barriers to program implementation, and develops strategies for increasing ridesharing.

Davis, F.W. Jr., and K. Oen. Solving Public Passenger Transportation Problems: A Need for Policy Reorientation Vol. II. Prepared for UMTA, U.S. DOT. Knoxville, TN: University of Tennessee Transportation Center, 1977.

This report argues that if public transportation is to become an efficient method of satsifying the transportation needs of a community, a brokerage or consumer-oriented approach should be adopted.

International Taxicab Association. An Analysis of Taxicab Operating Characteristics. Report for UMTA, U.S. DOT. Chicago, IL: International Taxicab Association, August 1975.

This report presents the results of a survey of taxicab company operating characteristics conducted by the International Taxicab Association during the fall of 1974. A mail questionnaire was sent to 6,467 active operators. Of these, 696 (10.8%) responded. In spite of this rather low response rate, the sample provides broad geographic coverage and covers all sizes of operations (1 to over 2,000 cabs). The sample appears to be representative of the industry, although it falls short of being a true scientific (random) sample. It is believed that the sample statistics can be accepted as being reasonably close to their corresponding universe values and that projections based on these statistics will be useful as preliminary estimates. Information on characteristics, services provided, types of operations, vehicles in operation, operating characteristics and fare structure is provided.

Kendall, Donald C. Carpooling: Status and Potential, US DOT Report No. DOT-TSC-OST-75-23. Cambridge, MA: Transportation Systems Center, US DOT, June 1975.

This report contains the findings of studies conducted to analyze the status and potential of work-trip carpooling as a means of achieving more efficient use of the automobile. Current and estimated maximum potential levels of carpooling are presented, together with analyses revealing characteristics of carpool trips, incentives, impacts of increased carpooling, and issues related to carpool matching services. A model was developed to predict the maximum potential level of carpooling in an urban area. Results from applying the model to the Boston region were extrapolated to estimate a maximum nationwide potential between 47 and 71% of peak period auto commuters. Maximum benefits of increased carpooling include up to 10% savings in auto fuel consumption. A technique was developed for estimating the number of participants required in a carpool matching service to achieve a chosen level of matching among respondents, providing insight into tradeoffs between employer and regional or centralized matching services.

Knapp, Elaine S. "Vanpool Phenomena." State Government News (November 1977).

Discussed in this article is vanpooling--the latest approach to commuter ridesharing--an analysis of its success in Tennessee, California, Louisiana, and Maryland. Vanpoolers in California have conserved nine million gallons of fuel and prevented 6,000 tons of pollutants from fouling the air. Aside from the energy-saving aspects, vanpoolers do not have to hunt for a parking space, can ride in comfort, and take advantage of not being in the driver's seat by reading, sleeping, or socializing with fellow passengers.

Michigan, Department of State Highway and Transportation. Michigan Small Bus Program Management Handbook. Washington, D.C.: U.S. Department of Transportation, 1978.

Handbook designed to be a day-to-day guide on personnel relations, operations, management, marketing, and funding. Based on experience in Michigan.

Pratsch, L. Carpool and Buspool Matching Guide. Washington, D.C.: Public Transportation Branch, Federal Highway Admimistration, 1973. (NTIS PB 22 017 015).

The report summarizes available information on the results of different programs that encouraged the use of carpools and buspools to decrease the use of individually occupied automobiles for commuting purposes, and thus provide more efficient use of urban highway facilities. In addition to the important public relations and incentives aspects, the use of commuter matching techniques to provide commuters with information to enable them to share rides with others is discussed.

Rebibo, K.K., et. al. Summary of an Automated Scheduling System for Demand Responsive Public Transportation. McLean, VA: Mitre Corp., 1974. (NTIS PB 232 419/2).

The dial-a-ride automated scheduling system is a package of computer programs developed on a Westinghouse 2500 minicomputer by the Mitre Corporation under sponsorship of the Urban Mass Transportation Administration. The system contains an automated scheduler that dynamically assigns customer requests for trips to vehicle tours and dispatches the vehicles through their stops; data analysis programs that produce statistical reports on system performance; and programs to generate and maintain the data files required by the scheduler, such as the file of related street names.

Remak, Roberta. Potential for Flexicab Services: Innovative Uses of Taxis and Jitneys for Public Transportation. Report No. DOT-TSC-OST-75-52 for U.S. DOT. Santa Barbara, CA: INTERPLAN Corp., December 1975.

The term flexicab has been coined to refer to the range of demand-responsive and fixed-route services that can be offered as extensions of existing taxi/jitney operations. The taxi industry, with its experience in small vehicles, dispatching, and flexible routing is particularly

suited to flexicab operations. Opportunities for profit exist, particularly when several types of flexicab services are offered by the same operator, permitting him to make maximum use of his labor force and equipment. Three examples of multi-service, flexicab systems are presented in the form of scenarios set in hypothetical urban areas (small, medium, and large). The examples include the calculation of revenues, operating costs, and net earnings.

The report also reviews the present status of the taxi and jitney industry and makes policy and research recommendations. A bibliography and a list of contacts are included in appendices.

Roos, D. "Operational Experiences with Demand-Responsive Transportation Systems". Highway Research Record #397. Washington, D.C.: Highway Research Board, 1972.

Demand-responsive transportation systems have been implemented in Ann Arbor, Michigan; Batavia, New York; Mansfield, Ohio; Columbia, Maryland; Columbus, Ohio; Bay Ridges, Ontario; Emmen, The Netherlands; and Regina, Saskatchewan. These new systems are examined with respect to vehicle dispatching, ridership, economic feasibility, type of service and overall impact. Future directions in demand-responsive transportation based on observed system performance are discussed.

Shackson, R.H. "Automation in Dispatching Demand-Responsive Vehicles." Transportation Research Board Special Report #147. Washington, D.C.: Transportation Research Board, 1974.

This is contained in the proceedings of the Fourth Annual International Conference on Demand-Responsive Transportation Systems conducted by the Highway Research Board on October 3-5, 1973, Rochester, New York.

The role of automation in dispatching demand-responsive transportation vehicles is discussed. Panelists discussed the justification for, and performance of the system. A computerized system alleviated two problem areas of the taxicab industry: piracy and favoritism. Costs are considered in terms of time and money saved. Future plans such as dial-a-ride application for cabs, computer digital systems and data communications between cab and dispatch center are discussed.

Taylor, W.C. and T.K. Datta. "Techniques for Selecting Operating Characteristics of Demand-Actuated Bus System." Transportation Research Board Special Report #147. Washington, D.C.: Transportation Research Board, 1974.

As the number of applications of demand-actuated public transit systems increases, careful consideration must be given to the selection of operating policies. The effect of several variables including scheduling dynamics and routing dynamics on the economic and service characteristics of demand-actuated systems are explored. Comparative tables and charts describe a process for selecting the "best" system for prescribed service

area and potential demand. The selection of a system will necessitate a tradeoff between service and operating costs. Techniques for formalizing these decisions and results of applying those techniques are presented.

Transportation Systems Center. Small City Transit Characteristics: An Overview. Washington, D.C.: U.S. DOT, March 1976.

This report is based on information and operating data from thirteen small community transit systems which were studied as part of a larger project on small community transit and its potential. It summarizes organizational, institutional, and operational aspects of the case studies, and contains an analysis of some of the relationships among service, cost and community response. Hypotheses are offered regarding the types of trips which are served, the cost and service tradeoffs which are relevant when choosing between fixed-route and demand-responsive modes of operation, the critical variables such as labor agreements and maintenance arrangements which affect operating costs, the level of subsidy which may be anticipated and the tradeoffs between single-ride fares and transit passes as a means of fare collection. Individual case study reports on each of the following thirteen cities are also available:

- Amherst, MA
- Ann Arbor, MI
- Bremerton, WA
- Chapel Hill, NC
- East Chicago, IL
- El Cajon, CA
- Eugene, OR
- Evansville, IN
- Merced, CA
- Merrill, WI
- Sudbury, MA
- Westport, CT
- Xenia, OH

U.S. Department of Energy, New Approaches to Successful Vanpooling. Five Case Studies. Washington, D.C.: U.S. Government Printing Office, 1979. (061-000-00332-1).

Provides a summary of five vanpool programs in New Jersey, Michigan, Knoxville, the San Francisco Bay Area, and at Silas Mason Company. Each summary contains a program description, contact name, and phone number.

U.S. Department of Energy. Vanpool Implementation Handbook. Washington, D.C.: April 1979.

Provides a guide for employees describing the steps in putting into operation a successful vanpool.

U.S. Department of Transportation. Guidelines for the Organization of Commuter Van Programs. Washington, D.C.: U.S. DOT, 1979.

Describes development of a company sponsored commuter van program from feasibility to administration of the ongoing operations.

U.S. Department of Transportation. How Ridesharing Can Help Your Company (A Manual for Employers). Washington, D.C: U.S. DOT, May 1979.

Provides guidelines for employers as to how and why they should start a ridesharing program in their organization.

U.S. Department of Transportation. Rideshare and Save - A Cost Comparison. Washington, D.C.: U.S. DOT, 1979.

A pamphlet for the individual to use in calculating the costs of commuting to work alone, in a carpool, or in a vanpool.

University of Tennessee. An Analysis of Two Privately Owned Shared-Ride Taxi Systems: Executive Summary. Report for UMTA, US DOT. Knoxville, Tennessee: University of Tennessee, Transportation Center, April 1975.

A comprehensive study of the markets, economic characteristics, and operation of two privately owned demand-responsive transportation systems in operation in Davenport, Iowa and Hicksville, New York. Except for the movement of masses of commuters during rush hours, the shared-ride taxi systems performed most of the functions of their scheduled bus competitors; moreover, the composition of the markets for the bus and shared-ride taxi systems was found to be remarkably similar. With the adoption of a vehicle leasing arrangement with the drivers, the economic structure of each of the economically viable shared-ride cab systems was considerably more flexible than that of the fixed-route, fixed-schedule bus systems. The success of the private demand-responsive transportation systems was attributable to the innovativeness of the management and the high level of competency of the dispatching personnel and the drivers. A major conclusion was that a taxi company under the direction of a skilled manager and entrepeneur can be an effective public transportation service.

Voorhees (Alan M.) and Assoc., Inc. Transportation Pooling. McLean, VA: Alan M. Voorhees and Assoc., Inc., 1974 (NTIS PB 236 157).

With the advent of impending energy shortages in the winter of 1973-74, the U.S. Department of Transportation embarked on an accelerated program to promote increased use of high-occupancy vehicles--transit and carpools. As part of this program a series of reports was prepared that should be considered as a guide to the development of a sound program in a metropolitan area. The individual reports contained in this volume are: review of carpool activities, organization for carpooling, approaches to matching, legal and instututional issues, incentives to carpooling, transit/taxi coordination, vanpools, buspools, pooling for

the disadvantaged, and carpool backup systems.

Wilson, N.H. et al. "Simulation of a Computer Aided Routing System (CARS)", Highway Research Record #318. Washington, D.C.: Highway Research Board, 1970.

A simulation model that contains such inputs as number, capacity and velocity; time distribution of demands; spatial distribution of origins, destinations and intermediate points; and output options has been exercised on an IBM 360/67 to evaluate the effectiveness of a real-time routing alogorithm for a demand-response taxi service named CARS (Computer-Aided Routing System). The alogorithm is heueristic because of the inapplicability of existing optimization techniques. The Fortran model was designed to evaluate various heuristics based on time-versus-cost tradeoffs. The operating variables and interactive characteristics of the model are described and illustrated. Further investigation is planned to simulate the system instead of merely the alogrithm.

LABOR ISSUES

Aeschuler, David M. Labor Protection, Labor Standards, and the Future of Paratransit. (Prepared for the 58th Annual meeting of the Transportation Research Board and the Second Williamsburg Workshop on paratransit). Cambridge, MA: Multisystems Inc., 1979.

An excellent discussion of the protective provisions of sections 3 (e) and 13 (c) of the Urban Mass Transportation Act of 1964, as amended, and of the issues involved in applying these provisions and other labor standards legislation to paratransit operations.

Brandon, Carter. Paratransit Labor Issues. Washington, D.C.: Urban Mass Transportation Administration, 1978. NTIS PB-280-206.

This report looks into paratransit labor as it relates to type of service, union affiliation, management strategies, and characteristics of the system location. Labor costs are analyzed in terms of wage scales, benefits, incentive payments, work rules, scheduling practices, and job definitions. The transit labor costs are analyzed separately from paratransit labor costs, and the relationship between the two is explored.

This report concludes that real growth in paratransit over the coming years could affect the establishment of dual union wage standards for paratransit and conventional operators. Although the future of paratransit in small rural communities appears secure, the uncertainty and the high labor costs found in the larger cities make its future there more tentative.

Carnegie-Mellon University. Transportation Research Institute. Productivity Improvement for Taxi/Paratransit Industry. Proceedings of a conference held at Carnegie-Mellon University, June 5-7, 1978. Pittsburgh, PA: Carnegie Press, 1978.

The Conference on Productivity Improvement for Taxi/Paratransit Industry was organized to bring together taxi operators, transit operators, regulators, regional transportation planning agencies, social service agencies, and Federal officials for the discussion of various paratransit issues and problems. Although this volume of proceedings follows closely the program of the conference, some slight changes have been made in the format to improve the organization of the contents. Topics covered by the papers are shared rides, new technology, service integration, and regulatory issues.

Elliott, J.M. "Demand-Responsive Transportation as seen by the Transit Worker." Highway Research Board Special Report #136. Washington, D.C.: Highway Research Board, 1973.

Concerned as the transit worker is with the economic difficulties and declining productivity of the fixed route transit system and the failure of government and the industry to respond adequately, the dial-a-bus is reviewed as an alternative improvement, offering jobs and economic progress both to the worker and the industry. The system is seen to offer opportunity for new markets in the low density areas and other areas where conventional line-haul is not feasible. It is also seen to stabilize the number of jobs and reduce the need for split-shift schedules. The improved convenience, reliability and speed of transit of the dial-a-bus would increase its patronage, thus enabling the transit system to function more productively.

FINANCIAL

Golob, T.F. and R.L. Gustafson. "Economic Analysis of a Demand-Responsive Public Transportation System." Highway Research Record #367. Washington, D.C.: Highway Research Board, 1971.

This paper discusses the methodology and results of a case study analysis of the economic feasibility of a many-to-many, demand-responsive transportation system in a chosen U.S. City. Ridership was estimated by means of market research tools, in-depth group surveys, and home interviews. A flexible cost model was developed to evaluate the cost of serving various hourly distributions of demand. The estimated demands for each of a series of alternative levels of service and fare were then applied to this cost model and the profit or loss was calculated for each level of service and fare. The sensitivity of the profit or loss to changes in demand distributions and to changes in various cost parameters was also investigated.

Stafford, J. Economic Considerations for Dial-a-Ride. Cambridge, MA: Massachusetts Institute of Technology, 1971. (NTIS PB 204 054).

An analysis of the market environment concludes that dial-a-ride would effectively supplement bus and taxi services by providing transportation to 8-15 passengers per hour at rates of less than one dollar. Alternative methods for computing probable market demand are discussed. A

detailed cost summary is provided with reference to: average estimated costs per trip (approximately 51 cents); total operating costs (vehicles, labor, maintenance and overhead); communications and control (the costs of receiving service requests; computer processing and dispatching vehicles); computer operation costs; and general management costs. The economic attractiveness of dial-a-ride as compared with private transportation is discussed according to a variety of assumptions. The report concludes with an analysis of pricing policies for dial-a-ride based on time of day and trip length and location or trip time. The probable value of commuting time to riders in different income categories is also computed. Appendices document methods of driver costing and the results of an attitude survey conducted among users of different commuter modes.

MAINTENANCE

Flusberg, Martin, et al. Small Transit Vehicle Survey. Cambridge, MA: ECI Systems, Inc. and Transportation Systems Center, US DOT, December, 1975.

Small transit vehicles, defined as those vehicles seating 7-25 passengers and intended for public transportation use, are available in a variety of makes and models, with markedly different characteristics, affecting both operators and users. This report documents the specifications and operating experience of small transit vehicles available in the United States. Vehicles are divided into three main categories: vans and van conversions, small buses, and converted motor homes. Operating experience was obtained by sampling from manufacturer-provided user lists. Vehicle specifications were obtained directly from the manufacturer.

No vehicle has been completely free of problems; no one vehicle is clearly superior to all others; nor is any one category of vehicle clearly superior to any other. A vehicle operator must weigh a number of variables before determining which vehicle is best for a particular application.

Hoyes, Jack. Rural Public Transportation Vehicles: A Section 147 Demonstration Program Technical Manual. Prepared for U.S. DOT by Michigan DOT, 1979.

This manual looks at vehicle considerations, vehicle specifications, vehicle maintenance, communication equipment, and driver training.

Suomala, J.B. Dial-a-Ride Vehicle Specifications. Cambridge, MA: Massachusetts Institute of Technology, 1971. (NTIS PB 202 027).

The purpose of this report is to provide a set of specifications which would enable early procurement of vehicles for a dial-a-ride (DAR) experiment. Conformance to the following specifications is mandatory: (1) all applicable Federal motor vehicle safety standards; (2) static test code for school bus body structure, Truck Body and Equipment Association, Washington, D.C.; and (3) Society of Automotive Engineers Handbook Supplement 19. The minimum standards represent a practical point of

departure for specification of the DAR vehicle since they describe a passenger-carrying vehicle designed around reasonable safety criteria. Detailed specifications are provided for vehicles in terms of: The interior configuration, exterior configuration, construction, safety, braking, steering, heating, ventilating and air conditioning, performance, propulsion, running gear, and electrical systems.

INTEGRATION OF SERVICES

Multisystems, Inc. Operational Implications of a Major Modal Diversion to Transit, a Macro-Analysis. Report No. DOT-TST-76-72 for U.S. Department of Transportation, Washington, D.C., U.S. Department of Transportation, April 1976.

This study examined the implications of a dramatic increase in transit patronage on system structure and performance for a medium-sized urban area (800,000 population). Models were developed to examine the cost and service attributes of a variety of system components, including express bus, exclusive land operation, subscription service, dial-a-ride, and several route-based feeder options. These models were applied in a regional context over a range of patronage assumptions to evaluate both the individual components and synergisms resulting from various service combinations. The analysis provided insights into the structure of integrated transit systems and the expansion of these systems to serve increasing shares of urban travel.

Multisystems, Inc. The Evolution of Integrated Transit, Three Parables. Report for U.S. Department of Transportation, Contract No. DOT-TST-76T-4. Washington, D.C.: U.S. Department of Transportation, June 1976.

This study examines the implications of embarking on a ten-year strategy to implement a comprehensive, regional transit system integrated operationally, physically, and institutionally for medium-sized urban areas (800,000 population). Three levels of ridership response are assumed which affect system scale and operating policy decisions at biennial intervals. The operating cost and deficit implications of these three response parables are then traced to yield insight into the feasibility of an evolutionary strategy.

Rancer, Michael D. "Transit in Smaller Cities: Ride-Sharing Brokerage." Municipal Innovations (July 1977).

Knoxville, Tennessee is developing a means of improving local public transportation services at little additional cost to the community. In the role of "ride-sharing broker," the city aggressively seeks out available transit and paratransit service sources (buspools, vanpools, taxis, charter bus operators, etc.) and potential riders (social service clients and employees in large firms or concentrated activity areas), then matches them to provide an alternative to automobile dependency. The concept is still developing but appears promising. It is unique in its emphasis on institutional change in the traditional approach to transit

and in its use of a wide range of transport services in an integrated manner.

SYSTAN, Inc. Deployment Scenarios for Integrated Regional Transportation Networks. Report for U.S. Department of Transportation, Report No. DOT-TST-76T-7. Washington, D.C.: U.S. Department of Transportation, August 1976.

This report describes the cost and service implications of four alternative scenarios for the deployment of an integrated regional transportation system in a hypothetical, large urban city. The impacts of various levels of user acceptance on the cost and service characteristics of integrated systems are investigated parametrically. Although the results obtained are heavily dependent on the size and population density of the study region, sensitivity analyses indicate the likely effect of varying certain key assumptions. For the selected study area, a limited incremental expansion of integrated transit service to certain suburbs currently unserved by transit appears possible, and the improvement of off-peak suburban service through the use of flexible-route systems appears desirable. Limited incremental expansion of integrated service holds the promise of reducing system deficits if guided by judicious planning and accompanied by service-related fare increases. In view of the large areas and low suburban population densities characterizing the study region, full coverage of the entire suburbs appears to be economically feasible only at reduced service frequencies.

SYSTAN, Inc. Macroanalysis of the Implications of Major Modal Shifts in Integrated Regional Transportation Networks. Report No. DOT-TST-76-65 for the U.S. Department of Transportation. Washington, D.C.: U.S. Department of Transportation, April 1976.

This report describes a macroanalytic approach to the problem of analyzing changing travel patterns in an integrated regionwide transportation network for large urban areas. Separate models of residential areas, transportation corridors, and central business districts are combined in a modular representation of urban structure suitable for use in policy analysis and transportation planning. This analytic approach treats demand parametrically, has minimal data requirements and provides rapid insights into the impacts of alternative patterns of transit and automobile usage. Such impacts as travel time, user costs, congestion and energy consumption are examined explicitly. Application examples discuss the potential economies of scale available from major shifts in current transit usage patterns tradeoffs between flexible-route and fixed-route systems and the potential benefits available from policies to reduce the effects of demand peaking.

U.S. General Accounting Office. Report of the Comptroller General of the United States: Hindrances to Coordinating Transportation of People Participating in Federally Funded Grant Programs. Vol. I. Washington, D.C.: October 17, 1977.

Cites hindrances to coordination of transportation services, the most significant being the confusion at all government levels about the extent of coordination federally funded projects may engage in. Lists 114 federal programs that provide financial assistance for the transportation of people.

SOCIAL SERVICES

American Public Transit Association . Summary of Elderly and Handicapped Transportation Services. Washington, D.C.: APTA, 1976.

Reports the results of a survey of APTA members concerning special services for elderly and handicapped persons. Description of the services, the operators, costs, subsidies, and fares and other pertinent information are given.

Barker, William G. et al. An Analysis of Transit and Paratransit Options for the Elderly and Handicapped. Arlington, TX: North Central Texas Council of Governments, January 1978.

The paper summarizes an analysis of transit and paratransit options for the elderly and handicapped undertaken as part of a larger study of transportation options for the disadvantaged groups. Six mass transit options defined by service area and equipment modifications are compared with one option (minor hardware changes and existing service) found to be the most cost-effective.

Four major paratransit alternatives are examined to provide lower taxicab fares: equipment subsidy, fare increase subsidy, direct subsidy, and shared-ride subsidy.

Carter - Goble - Roberts, Inc. Planning and Coordination Manual. Prepared for HEW and DOT, Washington, D.C.: Government Printing Office, January 1979.

This is a "how to" manual that is intended for use by persons repsonsible for planning and/or operating specialized transportation systems. Paratransit, elderly and handicapped transportation, social services transportation, and rural transportation are addressed by this manual.

Ecosometrics Inc. Coordinating Transportation Services for the Elderly and Handicapped - Executive Summary. Prepared for U.S. DOT. Bethesda, MD: 1979.

An overview of a two-volume report on legislative barriers to and incentives for coordinated transportation services for the elderly and handicapped through interagency cooperative agreements. Eight Federal statutes are analyzed with regard to funding, planning, and service requirements. Incentives for State and local agency participation as well as regulatory reform are recommended for further consideration. Establishment of human service transportation authorities within the

States, and offices for coordinated transportation in HEW and DOT are proposed

Ecosometrics, Inc. Coordinating Transportation Services for the Elderly and Handicapped - Volume I: Statutory and Regulatory Analysis of Incentives and Barriers to Coordinating Transportation Services for the Elderly and Handicapped. Prepared for U.S. DOT. Bethesda, MD: 1979.

Federal statutes and regulations are analyzed with regard to incentives or barriers to coordination found in requirements which are related to funding, planning, and the provision of transportation services.

Ecosometrics, Inc. Coordinating Transportation Services for the Elderly and Handicapped - Volume II: A Model Uniform Billing and Accounting System for Coordinated Transportation Systems. Prepared for U.S. DOT. Bethesda, MD: 1979.

Contains a model billing and accounting system for local agencies and organizations attempting to coordinate their transportation services. In addition, an analysis of the Federal regulations pertaining to fiscal management procedures is provided.

Institute of Public Administration. Coordinating Transportation for the Elderly and Handicapped - A State of the Art Report. Washington, D.C.: IPA, 1976. (DC-06-0106) (PB 265-079/AS).

Explores the state of the art in the coordination of transportation projects serving elderly and handicapped persons. Primary emphasis is on the identification and examination of on-going transportation projects in which coordination or consolidation of funds or services has been undertaken. The report consists of four major sections: 1) an overview of the nature of the problem and the results of an examination of 26 transportation projects, of which 20 on-going social service projects have been developed as case studies; 2) preliminary findings and conclusions based on a telephone survey of the 20 projects; 3) preliminary recommendations for future effort and programs; and 4) an appendix containing the survey form and detailed case studies of the 20 special transportation service projects.

Institute of Public Administration. Planning Handbook - Transportation Services for the Elderly. Washington, D.C.: IPA, 1975.

A comprehensive manual of transportation planning methods and techniques applicable to the development of special transportation services. The handbook is organized by the major tasks which are needed to bring a transportation project into operation from the beginning of planning to the start-up phase.

Institute of Public Administration. Transportation for the Elderly - An Information Dissemination Program. Washington, DC.: IPA, 1979.

A supplement to IPA's Planning Handbook. Provides information and training materials. Contains technical memoranda, 11 case studies, visual aids, resources lists, and an annotated bibliography.

Institute of Public Administration. Transportation for Older Americans: A State-of-the-Art Report. Washington, D.C.: IPA, 1975.

A comprehensive survey of the transportation problems of older Americans, describes the present urban and rural transport delivery system, examines driving and walking as they relate to older Americans, examines present program funding and discusses future funding prospects, discusses institutional problems and constraints, describes innovative solutions, and outlines future directions for programs and research. A set of technical appendices presents detailed information developed for the study and includes case studies, a bibliography, State school bus and driver licensing laws, and a summary of the characteristics of 24 transportation projects serving the elderly.

Loughborough University of Technology. Mobility for the Elderly and the Handicapped. Loughborough, England: 1978.

The proceedings of the International Conference on Transport for the Elderly and Handicapped at Cambridge, April 4-7, 1978, organized by Loughborough University of Technology in conjunction with Florida State University. Papers cover the following topics: An overview of the problem; infrastructure; vehicle and equipment design and modification; mobility and lifestyle considerations; community and voluntary transport; air and rail transport; physical abilities; rural transport and planning considerations; transportation and movement in urban areas; and policy considerations.

Pshyk, Fred U. Elderly and Handicapped Study Volume II Public Transportation Funding Catalogue. Prepared for the Greater Bridgeport Regional Planning Agency and the Greater Bridgeport Transit District. Bridgeport, CT: 1978.

This catalogue covers public transportation funding sources. The sources cited, with the exception of the U.S. Department of Transportation and Connecticut Department of Transportation, finance social or educational programs and provide transportation funding only to allow clientele access to program services.

Public Technology, Inc. Elderly and Handicapped Transportation: Eight Case Studies. Washington, D.C.: U.S. Department of Transportation, September 1979.

Presents case studies of eight transportation services for elderly and handicapped persons in Austin, TX; Pomona Valley, CA; Akron, OH; Chattanooga, TN; Bridgeport, CT; Spokane, WA; Brockton, MA; and San Mateo, CA.

Public Technology, Inc. Elderly and Handicapped Transportation: Information Sourcebook. Washington, D.C.: U.S. Department of Transportation, September 1979.

Contains Federal and interest group contacts, a list of vehicle manufacturers, a brief description of 10 local approaches to providing transportation for elderly and handicapped, and an annotated bibliography.

Public Technology, Inc. Elderly and Handicapped Transportation: Local Government Approaches. Washington, D.C.: U.S. Department of Transportation, 1977.

Describes a variety of innovative programs implemented by local governments to provide better transportation for elderly and handicapped persons.

Public Technology, Inc. Transportation for Elderly and Handicapped Persons. Washington, D.C.: 1976.

An Information Bulletin developed by the Transportation Task Force of the Urban Consortium for Technology Initiatives. Provides an overview of the issues involved in providing transportation for elderly and handicapped persons and a description of Federally-sponsored programs. Thirty research studies are cited and annotated as a sampling of available literature.

Transportation Research Board. Improving Transportation Services for the Elderly, the Handi- capped, and the Disadvantaged. (Transportation Research Record 660) Washington, D.C.: TRB, 1977.

Papers on life-styles and transportation patterns of the elderly in Los Angeles, an evaluation of Pennsylvania's free transit program for senior citizens, improving the mobility of the elderly and handicapped through user-side subsidies, the San Diego study of transportation for the elderly and handicapped, coordination and integration of special transportation services, cost of alternative transportation systems in small urban areas, and estimation of demand for transit service among the transportation-disadvantaged.

Transportation Research Board. Transportation Issues: The Disadvantaged, the Elderly and Citizen Involvement (Research Record 618) Washington, D.C.: TRB, 1976.

Contains 11 papers covering demand for special transit systems for the rural elderly, life styles, travel patterns, and latent travel demands of the elderly and handicapped, travel behavior and mobility patterns of low-income residents, analysis of taxi-operated transportation service for the handicapped, duplication between demand-responsive and fixed-route systems, and citizen participation in transportation planning.

U.S. Department of Health, Education and Welfare, Office of Human Development, Administration on Aging. Transportation for the Elderly: The State of the Art. Washington, D.C.: U.S. DHEW, 1976. (DHEW Pub. No. (ORD) 75-20081).

Provides (1) a general overview of the state-of-the-art of transportation projects serving older Americans, including public transit, reduced fare programs, special transportation sub-systems, and school bus and taxi use and (2) a detailed examination of specific projects representative of types of special service found in rural and urban areas.

U.S. Department of Transportation, Urban Mass Transportation Administration. Transportation Problems of the Transportation Handicapped Volume II: The Roles of Government and the Private Sector in the Provision of Mobility Systems for the Transportation Handicapped. Prepared by Crain and Associates. Washington, D.C.: U.S. DOT, 1978. (PB 258-580/AS).

This report examines the conflicting perspectives and attitudes of participants involved in improving mobility for the transportation-handicapped. These participants are the handicapped and their advocates, the transit industry, the Congress and Federal agencies, State and local governments, the public at large, private providers of taxi and paratransit services, and equipment manufacturers. Issues which emerge from their conflicting perspectives are discussed, including the need for coordination of services and funding sources; the role of the courts; provision of services by public or private means; and problems with labor standards, insurance, safety, and administration of services. Federal and State legislation and regulations dealing with transportation for the handicapped are discussed in detail. A section on the policy-making process examines the role of user groups and Federal, State, and local governments in policy determination, administration, planning, implementation, operation, financing, and evaluation. Specific changes and actions needed in the roles of the relevant actors are presented.

U.S. Department of Transportation, Urban Mass Transportation Administration. Transportation Problems of the Transportation Handicapped Volume III: Alternative Planning Methodologies. Prepared by Crain and Associates. Washington, D.C.: U.S. DOT, 1976. (PB 258-581/AS).

This report proposes a general structure for the planning process in dealing with the problems of the transportation-handicapped. Flexibility of procedures and the avoidance of unnecessary standardization are emphasized. Planning for the needs of the transportation-handicapped may be incorporated into conventional transit planning or emerge as an independent process. Effective participation by the transportation-handicapped, transit and taxi operators, union representatives, and local health and social service agencies is discussed in detail. Use of census data, the National Health Survey, and general population surveys; assessment of current transportation resources and existing constraints that affect the options for serving the needs of the transportation-handicapped; jurisdictional problems and labor issues; implementation planning, including

organizational structure, funding mechanisms and consolidation; time phasing, plan revision, and system monitoring are discussed.

U.S. Department of Transportation, Urban Mass Transportation Administration. Transportation Problems of the Transportation Handicapped Volume IV: Transportation Solutions for the Handicapped. Prepared by Crain and Associates. Washington, D.C.: US DOT, 1976. (CA-06-0092) (PB 258-582/AS).

Examines transportation solutions for the transportation-handicapped through public transit, alternative special services, and private transportation. The first section presents 51 physical and operational solutions for existing systems. The use of personal vehicles by disabled persons who can drive is described in section two. Four problems with which the disabled driver must contend are presented along with summary data on automotive adaptive controls and their cost. The third section describes six aspects of specialized transportation services: Service characteristics (door-to-door, personalized assistance, request time, etc.), the four principal vehicle types used, provider characteristics, eligibility restrictions, operational issues, and costs. Twelve possible systems based on different combinations of service characteristics and provider type are described in detail. Two comprehensive systems both currently in operation, one in Sweden, the other in Delaware, are discussed.

U.S. Department of Transportation, Technology Sharing Program Office, Transportation Systems Center. Transportation and the Elderly and Handicapped: A Literature Capsule. Washington, D.C.: U.S. DOT, 1977.

Includes highlights of the scope of current research and planning, five selected summaries based on excerpts from detailed studies which cover a wide range of topics being considered in current transportation research and planning for elderly and handicapped persons, and an annotated bibliography covering literature from 1970.

U.S. Department of Transportation, Technology Sharing Program Office, Transportation Systems Center. Transportation for the Elderly and Handicapped: Programs and Problems. Washington, D.C.: U.S. DOT, 1978.

Abridged versions of papers presented at the Florida State University annual elderly and handicapped transportation conference in December, 1977. The report includes presentations from a national perspective, a brief history of the major Federal legislation affecting transportation programs for the elderly and handicapped, discussions of planning and implementation methods, examples of State and local urban and rural programs, and discussions of two specific problems--driver training and equipment selection.

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