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**Considerations in Planning and  
Operating Transportation Systems  
for Older Americans and Public  
Systems in Rural Areas**

By  
**Douglas J. McKelvey**  
May, 1975

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CONSIDERATIONS IN PLANNING AND OPERATING  
TRANSPORTATION SYSTEMS FOR OLDER AMERICANS  
AND PUBLIC SYSTEMS IN RURAL AREAS

by

Douglas J. McKelvey

May, 1975

Working Paper #15

Center for Urban Transportation Studies  
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CONSIDERATIONS IN PLANNING  
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SYSTEMS FOR OLDER AMERICANS  
AND PUBLIC SYSTEMS IN RURAL  
AREAS

by

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ABSTRACT

This paper identifies considerations in the planning and operating of transportation systems for older Americans and public systems in rural areas. It identifies an approach to transportation planning and number of elements related to the planning, implementation, and evaluation of that system. The paper draws upon dial-a-ride literature and experiences, the elderly and handicapped transportation literature, and experiences with special rural transportation systems in the mid-western states. The paper is intended to provide a basic set of considerations, questions, knowledge and expectations about elderly and rural transportation systems.



## PREFACE

The author has made presentations to a number of groups in Federal Regions V and VII, with respect to considerations in establishing rural and elderly transportation systems. This paper presents in normative form considerations that should be explored in undertaking new transit service. The style and referencing is informal, reflecting a format that was used in verbal presentations. Additional material is presented in the Appendix to provide examples of considerations posed by others and examples of how specific systems have responded to these considerations.



CONSIDERATIONS IN PLANNING AND OPERATING  
TRANSPORTATION SYSTEMS FOR OLDER AMERICANS AND  
PUBLIC SYSTEMS IN RURAL AREAS

This paper offers a perspective on and suggestions for planning and operating of transit systems which provide special service to such groups as the elderly and handicapped and in small urban or rural areas. Many of the statements are, in fact, questions which should be asked whether one is in the process of planning a new system or evaluating an existing system. In addition, there are recommendations.

In general, it is recommended that State Commissions on Aging and Area Agencies on Aging should do everything in their power to improve transportation services for the elderly. Where possible, this should be brought about through support of existing transportation systems and participation in existing transportation planning processes at the local, regional and state levels. The Area Agencies on Aging should not provide transportation services unless it is a necessity. If such agencies must directly provide the service, then the following points are relevant. Generally, the transportation service which is provided 1) should not be specialized, i.e., limited only to elderly, 2) should be regional (city and county or multi-county) and, 3) should have the approval of local, political, and social agencies as well as existing transportation operators. That approval should be prior to actual implementation, even before grant writing. Lastly, such systems should be planned with and by the systems users.

The remainder of the paper is divided into three major sections. Those sections are:

1. considerations in planning transportation services for the elderly,
2. operation, management, and promotion,
3. and funding.



## I. CONSIDERATIONS IN PLANNING TRANSPORTATION SERVICES FOR ELDERLY

The kinds of questions and considerations that are identified are applicable to both urban and rural systems. Some of the same considerations are included in the 'Proposed Rules for Elderly and Handicapped Transportation' which appeared in the Federal Register on February 26, 1975. These 'proposed rules' are relevant but not sufficient. The 'proposed rules' stress a standardized technical solution. In contrast this paper suggests that improved transportation for the elderly will result through a combination of local responsibility, state assistance, agency coordination, and appropriate services and discussion of the following points. These relevant steps and topics are summarized in Figure 1.

### A. Define the transportation problem.

For whom, where, why, how often is transportation a problem? The responses to these basic questions provide insight and suggest alternatives to eventual solutions to the problem. It is important to think very carefully about the types of transportation problems to be solved. Information that will provide some estimate of the magnitude of the problem is generally available from regional planning agencies or the U.S. Department of Transportation (if it is an urban area over 50,000). In those areas less than 50,000, little information other than that in the Census is available. Yet it is still important to estimate the number of people who may need transportation, their location and their ability to use existing transportation systems. Equally important is to estimate where people are going and how often and how many more times they wish to make various kinds of trips. This information usually must be obtained from local residents and local transportation systems. In some cases it is collected by survey and other cases by asking people from different locations with different life styles their existing travel behavior and their latent demand.

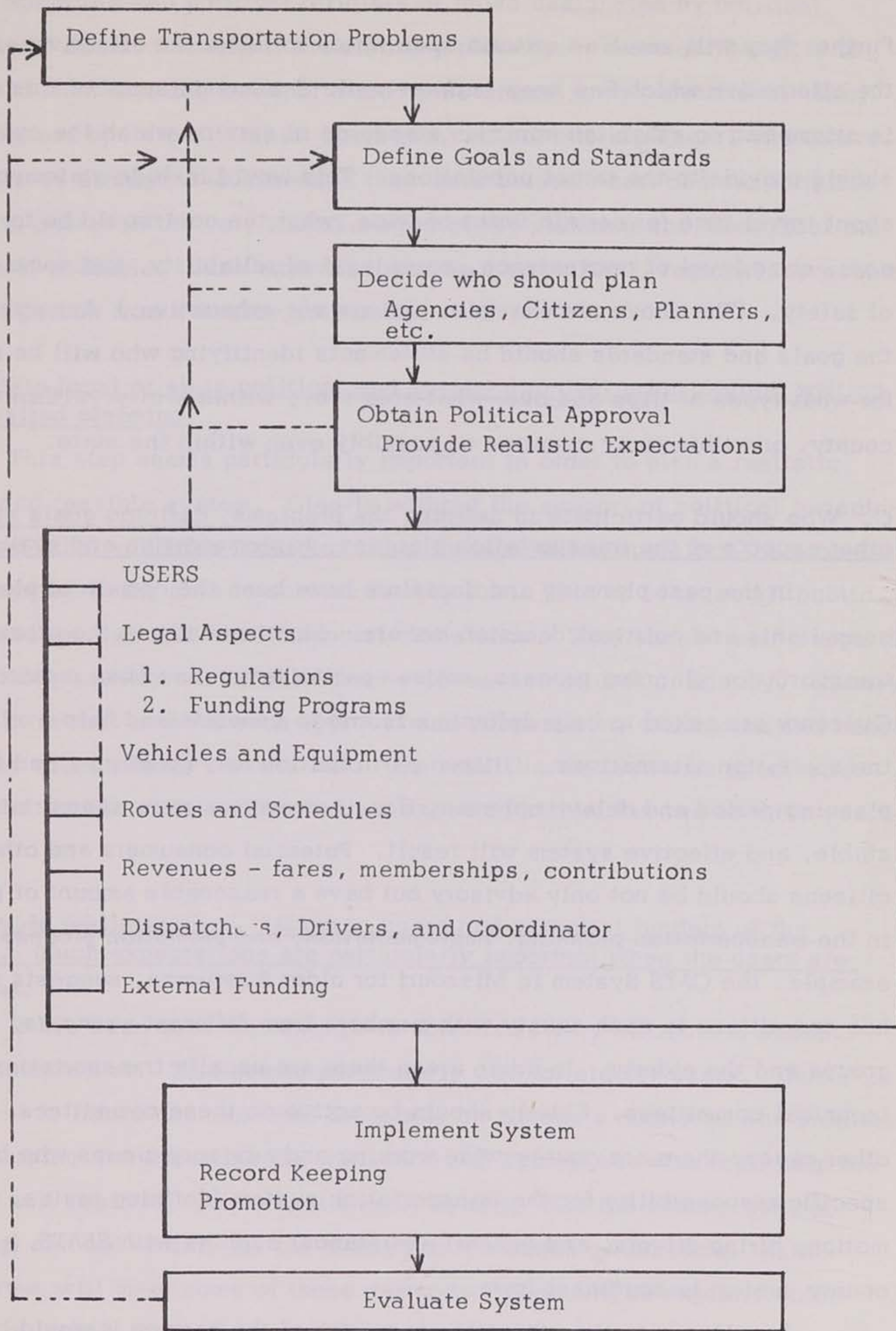
### B. Define transportation goals and/or minimum levels of transportation service which should be provided to all those you are trying to serve.

These goals will provide the direction for developing alternatives.



Figure 1

An Approach to Transportation Planning





Further they will serve as criteria upon which to judge the effectiveness of the alternative which has been implemented. A second aspect of this process is attempting to establish minimum standards of service which the system should provide to the target populations. This would include statements about travel time for certain types of trips, what the cost would be to the user, some level of convenience, some level of reliability, and some level of safety. (The above are examples and are not exhaustive.) Associated with the goals and standards should be statements identifying who will be served, for what types of trips and over what area i.e., within a city, within the county, or within many counties or possibly even within the state.

C. Who should participate in defining the problems, defining goals and in other aspects of the transportation planning, implementation and evaluation?

In the past planning and decisions have been the domain of planners, consultants and political decision makers. More recently in the urban transportation planning process, citizen participation has been required. Citizens are asked to help define goals and to generate and help evaluate transportation alternatives. Citizen participation may greatly extend the planning period and delay implementation, however, a more appropriate, stable, and effective system will result. Potential consumers and other citizens should be not only advisory but have a reasonable amount of power in the transportation planning, implementation, and promotion process. For example, the OATS System in Missouri for older Americans, suggests forming ad hoc committees in each county with members from different agencies, interested groups and the elderly. In urban areas there are usually transportation technical committees. Elderly should be active on these committees. In other cases, there are county-wide working and advisory groups who have specific responsibility for the transportation system (defining routes, promotion, hiring drivers, and general assistance) such as with SEATS, a seven county system in southeast Iowa.

In addition to the potential consumers of the service it would be very beneficial to have providers of elderly services, as well as local merchants,



transit operators and political officials or those designated by political officials to assist throughout the planning process. There are benefits to be gained from existing transportation operators on such committees. They could be taxi operators, transit operators, school bus managers, and others. Lastly, it is strongly recommended that there be some sort of transportation expert to assist in the very initial stages of the planning and throughout the process if possible. Such expertise may be a consultant, regional representative, or person from a nearby university.

D. Obtain local or state political and agency approval prior to grant writing and detailed planning.

This step seems particularly important in order to plan a realistic, stable and feasible system. Clearly without the support of political jurisdictions and other agencies including other transportation operators the probability of the system being able to survive is very low. This is because all public transportation systems need financial assistance. They are not self-supporting. The subsidy usually has to come from a governmental unit or agency. Equally important is that without such approval and cooperation, utilization and hence revenues will probably be very low. The result is that systems operate for even less time or at lower levels than expected and within two to three years terminate.

E. Provide realistic expectations to users and potential funders of the system. (Such expectations are particularly important when the users are elderly.)

It has been said that change is sometimes very difficult to accept and to understand. This seems particularly true for elderly users. Thus it is important to inform the user that there will be schedule changes, and problems in developing and operating the transportation system but with their help the system will improve. Further, it should be clear that the system (new or existing) can not satisfy all the transportation needs or demands. Rather the system will meet some of those demands. It should be explicit which those are, when, how often, and at what user cost.



It is also important to provide realistic expectations to the potential funders of the proposed or existing system. These include expectations in terms of the total system costs and required subsidy, ridership at any one time on the vehicle and total ridership over time. Experience suggests that realistic expectations were not known by local governments and agencies and hence at the end of the demonstration period the costs and subsidies were often much higher than expected. Hence many agencies and governments, regardless of the positive impact the system may have had, often felt that the system had "failed" and were unwilling to provide assistance.

It is also important to provide ridership expectations. For example, many specialized rural door-to-door systems often carry only between 5 and 15 people per day per vehicle. The cost is from \$3.50 to \$7.50 per passenger trip and each passenger travels between 7 to 10 miles each way. In urban areas the cost per vehicle mile is between 40 and 60 cents and the cost per passenger trip is between \$1.20 and \$1.40. (The previous figures are cost not subsidy estimates. The source of these particular figures is from the State-of-the-Art in Elderly Transportation by the Administration on Aging January 1975 pp. 40 and 41. Clearly the above figures verify that transportation for the elderly is expensive, but it is only a small proportion of what is spent on roads, bridges, and airports. In Iowa there is a 250 million dollar budget annually for road maintenance (Des Moines Register March 16, 1975.) One mile of rural interstate costs up to 3 million dollars (enough to run a 99 county SEATS like service for about one and one-half years).

In short it is important to provide realistic expectations to users and potential system funders and put the information in context (relative to similar systems and expenses for other transportation modes).

F. Determine the quantity, quality, and service of existing transportation resources.

This means determine the number of vehicles with different capacities that currently operate. This should include public vehicles such as buses, vans, taxis and inter-city buses as well as private or agency vehicles such



as those operated by Area Agencies on Aging, Headstart, O.E.O., churches, school districts and others. It should be determined if the vehicles could be used to carry other people at other times or if they could be purchased or managed by a single transportation authority in order to provide a more coordinated and efficient service. If not, the question is, 'could one of the existing systems be used to satisfy the identified needs?'

In addition to estimating the utilization of the existing transportation supply, one should identify federal, state and local agency funds that could be used to support a higher level of service. Often each agency has limited funds which could be spent in restricted ways on their own clientele or programs in their own jurisdiction. With coordination and better bookkeeping procedures it should be possible to use these funds to yield more transportation service per dollar. Specific references on how to do this are: 'Social Service Agency Transportation Study' by Brown, Lund and Kidder and 'The Use of Existing Facilities in Rural Transportation Delivery' by Johnson of the Transportation Institute at North Carolina A & T University and the case study on Valley Transit Authority in Naugatuck, Connecticut in the State-of-the-Art in Elderly Transportation. This will mean coordinating existing resources including personnel, vehicles, telephones, radios, etc. to improve and provide transportation services to the elderly. This may include using volunteers, taxis, other agency vehicles, church or school buses and space in stores for waiting areas.

Other ways of improving service and decreasing costs is by obtaining experienced transit managers or sensitizing existing managers to the special needs and characteristics of elderly, obtaining insurance under existing group policies, and utilizing existing maintenance facilities of other governmental agencies or local commercial services (obtain other services such as washing, repairs or back-up vehicles from existing resources).

G. Identify laws and statutes which constrain the service and funding eligibility of the proposed or existing system.

It is important to identify federal, state or local laws which do or may



affect the operation system. This would include such things as whether chauffeurs licenses are required, registration with the commerce commission or public utilities or some other agency is required, whether certain equipment is necessary and what is the appropriate insurance. (The above are suggestive, but not exhaustive.) It is extremely important that these be identified and that interpretations of relevant laws as they relate to the proposed or existing system be given in writing to the sponsoring agency.

It is also important to make sure that the legal definition or status of the system is one which will provide the system with the greatest flexibility and ability to continue. For example, if the sponsoring agency or if the service is defined as private non-profit it would only be eligible for certain types of funding (e.g., 16.(b)2 of UMTA Act) and would have to offer service under certain conditions. Generally if the service is in the public interest or is operated by a public agency, then it is eligible for many more sources of funds and is subject to very little and in some cases no regulations. In other cases, special transit services have been part of a transit district or transportation authority. The latter often has the power to levy taxes and to bond and to operate beyond city boundaries.

Other legal issues concern licensing, ownership of vehicles and a rebate or exemption on fuel taxes. The resolution to each of the above issues varies by system and by state.

The major point of this legal questioning is to consider alternative types of service and sponsorship as well as identify those laws which relate to the operation of the system. These and other legal questions should be addressed in writing to local governments and the public utilities commission, commerce commissions and state attorney general at the state level. It is recommended that a lawyer be retained to assist with the details and each State Commission request an opinion on the most common questions. If a system does cross state borders these same questions should be addressed to the Office of the Legal Counsel in the U.S. Department of Transportation.



#### H. Vehicle selection.

The type of vehicle which is appropriate can only be determined by each local area. What is appropriate depends on the type and number of people to be carried, over what distances, and in what environment. This suggests the types of vehicles, routing, special equipment, etc., which would be most cost effective. In some cases it may be a four wheel drive vehicle, and in others a 20-30 passenger transit vehicle and others a van or car. Capacity and special equipment decisions are an integral part of vehicle selection.

Equipment may include such things as air conditioning (which has been found very important to drivers and passengers in the Midwest area), safety equipment including first aid, blankets, fire extinguishers, etc., special steps, hydraulic lifts, heavy equipment, high top roofs, and modified doors.

Other questions related to vehicles include whether the vehicle should be purchased or leased. Part of that decision rests upon the amount of money available and the source. Some sources require that the money only be spent for the purchase of vehicles. When this is not the case, leasing may be more appropriate because there is no large initial cost and it is possible to budget with certainty. This is because some leasing agreements include maintenance agreements and thus all costs except fuel and drivers are known. A disadvantage associated with leasing may be that the maintenance location is many miles away and hence if the vehicle would breakdown there would be considerable time lost in either providing a back-up vehicle or having the vehicle serviced. If extended repair is required it should be determined if a back-up vehicle will be supplied and who would assume the costs. Regardless, there should be a back-up vehicle for each 6-10 vehicles in service. These need not be purchased or owned by the transit company or sponsoring agency but at least available in case of long term maintenance and accident or another emergency service. In some cases back-up vehicles from Headstart, social service agencies or even churches



have been used. If these are not possibilities in your area, then possibly back-up vehicles should be purchased or available on a lease agreement.

In summary it is recommended that more money should be spent on basic transportation than on a fewer number of vehicles with special equipment such as lifts, unless there is a clearly identified need and advantage.

#### I. Supporting services and facilities.

Having a low cost reliable service with appropriate vehicles may not be sufficient. In some cases waiting facilities such as bus shelters or places within stores need to be defined to make the service viable. In other cases an escort or driver assistance may be needed for selected individuals to assist them from their home to the vehicle and from the vehicle to their destination. The location and nature of these facilities and the appropriate supporting services should not be neglected.

#### I. Who will be able to use the system?

This decision should have been made during the very early phases in defining the problem and stating the goals. After identifying the users, it is important to determine their location and travel patterns and consider the user's physical ability and perception of the proposed or existing systems as they relate to: 1) gaining access to the system and 2) riding the system. Using a map and plotting their residences and their frequent destinations is a simple but effective method for suggesting service areas and routes. Denoting the locations of routes of existing transit systems will identify those people and areas without transit service and suggest service priorities.

Next, reexamine previous decisions (such as vehicles) asking if the expected users can gain access to and use the existing or proposed system. Obvious examples include physical abilities, the need for assistance, or a specially designed vehicle. The above are why we now have high roof buses, special lifts, wide doors and a number of other features. Disabilities also are barriers to accessing transit services. Blind people cannot read schedules. Those with hearing problems may not be able to call dis-



patchers. Those with poor motor skills may have trouble dialing the extra four digits (1-800) on a WATS line.

In addition to recognizing physical disabilities it is important to consider the income levels and attitudes of the users. Clearly, if many users are low income people then high fares will directly influence trip frequency, especially for social and recreational trips which the latest AOA study finds just as important as trips to the doctor, social services and to the bank. Low incomes may mean that many users do not have their own phones and hence would be unable to call a dispatcher (7% of the households do not have phones nationally, and as many as 40% in selected area of southeastern United States).

Lastly, consider how the users of the system perceive the system. Do they think it is a welfare system? Is that because it only carries the old and poor? Is that because it is free? Is that because they use coupons and others pay cash? Is it because it is run by the social service agency? These are important questions and deserve explicit discussion.

Consider how to influence existing perceptions and how to educate users and non-users. Consider how to assure an elderly person that use of a toll free WATS line will not cost her 75 cents of her \$85 a month income; that the dispatcher will ask her questions and he/she need not worry, that the driver cares and will provide assistance, and that the system is safe and reliable (driver training, two-way radios, adequate insurance).

#### K. Route and Schedules.

In urban areas most transportation service is of the fixed route and schedule type. This means that buses are following certain routes at certain times of the day (like school buses). For some elderly this is not sufficient. They need a door-to-door service. Clearly the higher the level of service the more it is going to cost. Given limited resources one must realistically limit service. The key is to provide limited but appropriate service. Limited service could mean limiting the number of days per week that service would be available to a certain area or certain people and restricting destinations, limiting service only to those trips to a social service agency, medical facility or



economic trip, allowing only those clientele without private transportation or with a physical handicap etc., to use the system. Each of the examples have been tried by different areas, systems and agencies. These are listed as possibilities, not recommendations. More specific details about possible routes and scheduling in rural areas can be attained from Peter Schauer of OATS, Richard Brass of SEATS, or the author about other systems.

#### L. Radios and dispatching.

Radios and dispatching equipment for dial-a-ride systems and fixed route systems in rural and urban systems are serving important functions. This equipment increases the system's reliability, flexibility and saves time, miles and fuel. These represent significant benefits to operators and users in rural areas. The two-way radios provide immediate contact in case of emergency on the vehicle or emergencies sited along the way. The obvious disadvantage is the cost associated with the purchase of such equipment. The initial cost of such systems vary from two to thirty thousand dollars. However, operating cost is minimal (i.e., maintenance and tower rental). A technical description of a radio system is included in the Appendix. The licenses to operate such radio systems must be obtained from the Federal Communication Commission and may take as much as six months. Alternatives to radios or phone systems include mobile and digital communication and beeper.

#### M. Promotion.

Promotion is often an implicit consideration but should be an explicit one. It is recommended that at least \$500 be set aside for promoting an existing or proposed system. The promotion should utilize all types of media. Clearly an educational process is needed to inform all people of the service and to continually inform users about changes in the system. Some of the most visible types of promotion include the buses, names on the buses, the drivers, the dispatchers and the riders themselves. (Additional suggestions are found in the Appendix. Those are based upon ideas for promoting the DART System in Michigan.)



#### N. Record Keeping.

Record keeping is often overlooked until one actually implements the system. However, depending upon the type of evaluation criteria and the goals of the system it would be important to build into your record keeping procedures the information which would suggest the extent to which those goals are being achieved. In addition there is the traditional cost and performance information such as the number of miles, number of passengers, revenues, costs and others. It should be emphasized that a computer could save a great deal of time and tedious work and hence free individuals for more important tasks. The computerized bookkeeping possibly could be done by local universities, banks or other commercial establishments. One should also identify that information which is required for continuation of federal or state funds. In summary, what should be recorded and how often should be decided prior to implementation if possible. Improvement and success is related to records, goals, and evaluation.

#### O. Revenues.

There are a number of different sources of revenue that can be generated to help support the system. This section will concentrate on revenues which can be generated by the system itself. The most common examples of revenues include fares, membership, contributions, and promotional revenues.

There are many different fare structures that one might adopt. However it is important, regardless of which structure is adopted, to consider how that particular one will affect the use by those people for whom the system was designed. If most of the target population have low incomes, then low but not necessarily free fares would be appropriate. On the other hand if there are people from a variety of different income groups, then possibly a variety of different fare structures might be in order. Again, it is important to go back to the goals which were established and assess how the different fare structures would affect the achievement of those goals. Some of the different types of fare structures are listed below:

1. Cost per mile.
2. Zone to zone.



3. Flat fare.
4. Sliding fares (where the amount of money paid for service is a function of income where those who have lower incomes pay lower fares).

In addition to the above fare structures there are 'free' systems and reduced fare systems. Some of the methods of payment include cash, monthly passes, transportation trip coupons, or tokens. There is no right answer which fare structure and which type payment would be most appropriate. Thus, controlled experimentation would be useful.

Additional revenue can be generated from memberships. In some cases life or annual memberships are required for eligibility to ride. Such is the case for the current OATS system. This type of membership would be similar to a cooperative. However, memberships may also entitle people to reduced fares, or represent a contribution. The latter is often called a supporting membership. The amount of such a membership varies from a dollar to hundreds of dollars. Experience with the SEATS and other systems indicate that memberships are important. They tend to increase the identity of the user with the system and hence increase ridership. Secondly, the revenue from memberships is a stable source of funding. Thirdly, memberships provide a list of people who should always be contacted when there are system changes, as well as a list of people who should be contacted for reactions or responses to new changes. Further, memberships are practical gifts.

A third source of revenue can be from contributions. One type of contribution of course is the supportive membership just mentioned, but there are also trip coupons which can be purchased by users, relatives or local social service agencies and distributed to eligible or needy people. Further, there are other types of non-cash contributions which are as important as revenue. Examples of these are donations of equipment including vehicles or communications equipment, employment training grants for drivers and dispatchers, and donations of storage and maintenance services. (Some of the systems currently use Operation Mainstream and Manpower training programs to decrease these cash operating expenses.) A fourth type of local revenue can be obtained from a variety of promotional activities including having signs on the vehicles.



The above are examples of different types of system revenues. They are not exhaustive. The emphasis is upon identifying alternative sources of revenue as well as suggesting careful consideration of which fare structure is adopted in regard to identified goals. A realistic expectation is that the sum of all these revenues will generate between fifteen and forty percent of total operating costs. For those systems which are rural and which are door-to-door it is most likely that it will only amount to ten to thirty percent of total operating costs. Given this, external funding becomes a prerequisite.

Sufficient external funding is a vital element of a stable and successful transportation system. All public transit systems require subsidy. It is emphasized that every effort should be made to maximize the existing resources through coordination in management, funding service and promotion. At the moment it would seem that there will be some federal assistance available not only from social agencies but also from the Department of Transportation. Some states have allocated funds through their state DOT's for operating assistance such as Delaware, Nebraska, Pennsylvania, Michigan, Illinois and California. Many states in Federal Region VII are now in the process of considering and identifying methods for some supplemental funding for special transportation systems. Clearly Area Agencies and State Commissions on Aging should be involved in these decisions. Additional references concerning funds from the federal, state and local levels are identified in the Appendix.

#### P. Dispatchers, Drivers and Coordinators.

If the existing or proposed system does use dispatchers then the following comments are relevant. First, dispatchers are a key part of any transportation system. The dispatcher is the first person the user contacts. The dispatcher schedules vehicles and groups demand to satisfy travel requests. Clearly, a capable and friendly person is a prerequisite for an effective and efficient system. Often dispatchers will be asked to schedule trips and make appointments such as at a doctor's office. Therefore he frequently coordinates both service and transportation.

There are no well tested training procedures that the author is aware of. However, it is evident that the dispatcher must be capable, articulate, and



willing to help. Further it is clear that the dispatcher needs to be sensitive to many of the problems of the potential transportation users, not only those in transportation, but also in other areas. Frequently, the dispatcher is to some extent an information and referral person. He/she must be provided with on the job training as well as acquainted with emergency procedures. Lastly, the dispatchers must be trained in terms of record keeping and dispatcher logs. Karl Guenther of Ann Arbor, Michigan suggests that dispatchers and drivers rotate. Thereby both would become acquainted with the total transportation system, and hence become more effective.

Drivers are another key element in the transportation system. Regardless of whether it is an urban, rural, special or public transportation system, drivers will make or break it. Therefore, the process of choosing and training drivers is very important. Generally if it is an urban system and publicly owned, drivers are hired through the regular civil service process or as a city employee. For a rural system there is no established hiring process. However, some systems choose drivers based on driver records, physical exams, recommendations of local transportation committees, and eligibility for a chauffeur's license. After selection, drivers are sensitized to potential users, particularly if they serve the elderly or handicapped. In addition they are trained in preventive maintenance, how to assist, defensive driving, first aid, and emergency procedures. Lastly, they are taught how to complete trip records.

The above tries to identify different aspects of driver selection and training. More details are provided in the Appendix.

Additional considerations focus on driver wages and part-time versus full-time drivers. The experience of systems where drivers are paid only minimum wages indicates that it is difficult to keep good drivers. Thus higher wages should be considered in order to compete with other employment opportunities and existing union wages in order to keep good drivers. As for the issue of part versus full-time there are financial savings with part-time drivers. This is because one does not usually have to pay fringe or provide benefits. However, there are also benefits with full-time drivers. Full-time employees mean fewer drivers per vehicle. Generally, the fewer drivers per vehicle, the



longer the vehicles will last. Also full-time drivers may be more reliable than part-time drivers. Possibly some combination is appropriate such as a base of full-time drivers and a few part-time drivers for charter, peak hour service, or back-up.

A third key element is the transportation coordinator. His function potentially includes all aspects of the system. The specific functions vary depending upon system size and resources. The major point is that someone must have major responsibility and that someone indeed must coordinate. There must be coordination between the system components, the users, political decision makers, other agencies, other areas, and other transportation systems. It is not imperative that this person be a transportation expert but that he/she is extremely interested, fluent and hard working.

#### Q. Time and Timing.

Time is an element that is rarely considered as an important element in the transportation planning. However experience suggests that time and timing are critical. For example, it is recommended that not less than three months be allotted to identify problems and define alternatives (six months would be preferable). Implementation may be on-shot or staggered over a number of years. Realize that the system will not stabilize until two to three years after implementation. In short, prepare work plans that are flexible in order to plan effectively and to maintain credibility (when there are delays such as vehicle delivery, funding or guideline postponements, prolonged consideration of radio applications, etc.).

Timing is also important. Like everything else substance and expected benefits are not sufficient to achieve a successful outcome. In the case of transportation planning it is important to involve users, operators, funders and agencies from the very beginning. This means prior to writing grants and proposals and thereafter. Similarly, it means that elderly and Area Agencies need to be aware of and participate in the political (local and state) and transportation planning process to make their views known. This is critical for both rural and urban systems. This participation is time consuming but necessary



and thus it is recommended that a full time transportation coordinator at the state, metropolitan or multi-county level be funded.

In summary, be realistic about the amount of time required for planning and implementation of a transportation system. Also, attempt to sequence the different tasks to achieve the greatest impact or performance.

#### R. Additional Considerations.

Additional considerations are outlined in the two pages entitled "Suggestions and Comments Concerning Specialized Transportation Systems" by Peter Schauer as well as three pages by Brian E. Noble of Enterprise Unlimited which are included in the Appendix.

Further, it is important to ask: What are the potential negative impacts of increased mobility Will small shops go out of business if the transit systems are moving people exclusively from the rural to the urban areas? If so, alternatives to minimize this situation need to be implemented. This may include working with local shopkeepers during the planning and operation stages, instituting a policy requesting people to continue to shop locally for those goods which are available locally, establishing a package delivery service to assist local services and stores to maintain and possibly increase their sales.

Lastly, one should consider the impact of increasing fuel costs on all persons and the changing demand for alternatives to private transportation including variations on carpooling, jitney, and mass transit.

## II. OPERATIONS, MANAGEMENT, AND PROMOTION

This section of this paper focuses on operations, management and promotion. It does not attempt to summarize or augment the materials in the Appendix and the 'Mass Transit Management: A Handbook for Small Cities' by Indiana University for the Urban Mass Transit Administration. (The latter is available from the National Technical Information Service - PB - 222-386 or Nicholas Bade, Marketing Program Manager, Urban Mass Transit Administration, 2100 2nd Street, S.W., Washington, D.C. 20024.)



### III. FUNDING

The third part of the paper discusses funding and regulation. This discussion of Department of Transportation funds is by the Regional Representative of the Urban Mass Transportation Administration, Mr. Lee Waddleton and by Mr. Randolph Johnson of the Federal Highway Administration both from Federal Region VII. The comments relate primarily to the funding programs of their respective Administrations.

The Urban Mass Transportation Administration is concerned and recognizes elderly transportation problems. This is exemplified by the fact that identification of the transportation needs and implementation of programs benefiting the elderly and handicapped are mandatory for urban areas over 50,000 population receiving capital operating assistance from UMTA. Also the Transit Development Programs of these urban areas must seek to solve those transportation needs. Area Agencies on Aging and other interested individuals should determine what planning area or planning region they are in and participate in the existing urban transportation planning process to improve transportation services for elderly.

One of UMTA's most important programs for funding public transportation is the new transit bill, 1974 National Mass Transportation Assistance Act (Senate Bill S386). This new program includes a major change in UMTA funding programs. The first change is that funds for those urban areas greater than 200,000 will receive capital and operating assistance funds directly and the amount of Federal funds will be based on population and density formula. Also, part of these funds may be used for operating assistance. Further the funds will be available to both public and private transportation systems. (In the past, 1½% and now as much as 2% of all urban transportation funds can be used exclusively for elderly and handicapped transportation services). For those urban areas between 50,000 and 200,000 capital and operating funds will be disbursed by the governor or an agency recommended by him. Again such funds can be used for capital and operating expenses.

For those small urban areas (less than 50,000 and greater than 5,000)



and not part of an existing larger metropolitan areas, there will be transit funds available for capital investments from Section III of the UMTA Act. Currently, the bill says that those funds (\$500 million over the next five years) will be distributed at the discretion of the Secretary of Transportation and that they may only be used for capital assistance. Senator Williams of Delaware has introduced an amendment so that up to half of the funds could be used for operating assistance. The probability of this amendment passing is not known.

Currently there are planning and capital assistance funds on an 80-20 basis. In the case of capital grants the 20% match normally needs to be a hard match (or dollars). However, the value on contributed property can be used under certain conditions. In the case of planning assistance, the 20% match could be in soft or hard match.

In the case of local funds to match operating assistance grants for larger urban areas and possibly smaller areas, a soft or hard match can be used. The type and amount of soft match is subject to limitations. The match must be generally available at the time the grant is approved for a capital grant. However, funds to match operating assistance grants can be either eligible matching expenses already incurred since November 26, 1974 or it can be projected expenses reasonably expected to be incurred through the end of the fiscal year.

Another interesting possibility is that general revenue sharing funds may be used as matching funds if a certificate was obtained from the Treasury Department to this effect. It is generally not advisable to use them in computing the required maintenance of effort level.

Other funds are available from the Federal Highway Administration's Section 147, 'Rural Demonstration Transportation Program.' Section 147 is a rural public demonstration program and it is to encourage innovation, cooperation, and local commitment to insure continuation beyond the demonstration period. It is a program primarily for rural areas with trips that have their origin or their destination in towns or rural areas less than



5,000. During the first year there is approximately 9.6 million dollars available. This is the amount that has been appropriated even though 15 million has been authorized. Systems eligible to submit applications may be statewide, county wide, new or existing systems. The emphasis is upon demonstration of something new. This means something new in terms of service, coordination, funding, management or some other aspect. It cannot be a service restricted only to the elderly. It is a public demonstration program. Applications may request both capital funds and operating assistance. However, the operating assistance is limited to 30% of the total request. Requests should not include costs related to an existing system.

One of the major problems associated with this program has been the delay in issuing the final guidelines for it. Originally the guidelines were expected in July, 1974. Due to a number of constructive changes the final guidelines were not issued until April 11. The proposals are due June 10, 1975. After that, applications are judged at the state and regional levels and then finally at the federal level. Demonstrations chosen should be able to receive funding about November 1, 1975.

The above comments relate only to primary funding from the Federal Department of Transportation. In the Appendix other sources from other federal programs are identified. These and examples of state resources are from the State-of-the-Art in Elderly Transportation by the Administration on Aging.

In summary this paper has tried to provide or approach, questions and information related to the planning, operation, implementation, promotion and funding of transportation systems. The context and focus of the statements are on systems which serve elderly in rural areas. The paper is intended as one step toward a more comprehensive and effective process for planning such systems.

The Appendix, which follows, includes a list of selected references and materials on the above topics.



SELECTED GENERAL REFERENCES ON ELDERLY AND RURAL TRANSPORTATION

1. Hearings before the Special Committee on Aging, United States Senate, Parts 1-4 on "Transportation and the Elderly - Problems and Progress
2. Comments on Transportation and Human Needs in the 70's, 1972 NTIS, PB 224-925
3. Transportation and Aging, Selected Issues by Cantilli and Shmelzer
4. Transportation for the Elderly and Handicapped, 1973, by Mark Battle and Associates for the National Urban League and U.S. D.O.T.
5. The Handicapped and Elderly Market for Urban Mass Transit by the Transportation System Center, 1973, NTIS, PB 224-821
6. Accessibility of the Metropolitan Washington, D.C. Public Transportation System to the Handicapped and Elderly, 1974 by Hopkin Associates, U.S. DOT, Rural Transit Operations in Management, U.S. DOT, 1974
7. Developing Transportation Services for Older People by David Rachlis, for the Office of Economic Opportunity, by the National Council of Aging, 1970
8. The State of the Art in Elderly Transportation by the Institute of Public Administration for the Administration on Aging, February 1975
9. New Directions in Planning and Actions in Transit Programs for the Transportation Disadvantaged, from the Third Annual Transportation Conference sponsored by Florida State University, Tallahassee, Florida, edited by William Bell and William Olson
10. Towards a Working Partnership in Transit Programs for the Transportation Disadvantaged, Florida State University, edited by Bell and Olson
11. The Use of Existing Facilities for the Transportation Disadvantaged Residents of Rural Areas by Edwin Hauser of Research Triangle Research for the Federal Highway Administration
12. A Study of Bus Transit Planning in Small Urban Areas by Herman et al of Purdue University for the Joint Highway Research Project
13. Transportation and The Disadvantaged by John Falcocchio and Edmund Cantilli, Lexington Book, 1974



14. "Predicting Rural Public Transportation System Effectiveness," by Arthur Sartzman, Marion Blair, Joyce Johnson, Jon Burkhardt, North Carolina A&T State University
15. "Social Service Agency Transportation Study," by Raphael L. Brown, Judi Lund and Alice E. Kidder, North Carolina A&T State University
16. "Transit Planning for the Transportation Disadvantaged in a Small Town," by Arthur Sartzman and Alice E. Kidder - reprint from Highway Research Record, Number 473
17. "Transportation and the Rural Community," U.S. Department of Transportation Office of the Secretary
18. State-Of-The-Art Overview of Demand-Responsive Transportation, U.S. Department of Transportation, Transportation Systems Center, Cambridge, Massachusetts, August 1974
19. A Study of The Transportation Problems of the Rural Poor, Vol. I and II, by Jon Burkhardt, Bethesda, Maryland, Resource Management Corporation, RMC, UR 171 January, 1972
20. Dial-A-Bus Manual, Vol. II by Transport Canada, Montreal, Canada, March, 1974



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APPENDIX

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## APPENDIX

### CONTENTS

1. Summary of Findings on Transportation For The Elderly and Handicapped  
by Mark Battle and Associates
2. Suggestions and Comments Concerning Specialized Transportation Systems  
by Peter Schauer, General Manager of OATS
3. Design and Management of Rural Transportation by Brian Noble
4. Marketing DART: Function and Strategy, State Highway Department,  
Michigan, Mr. Gerald Geile
5. State Highway Commission of Kansas, Letter Discussing Section 147,  
Rural Demonstration Program of the 1973, Federal Aid Highway  
Act and state regulations in regarding drivers and vehicles
6. Typical Total Costs Per Seat Mile in a Rural Environment by Car, Van,  
Bus and other by The Governor's Task Force on Rural Transportation,  
Pennsylvania
7. Example of Budget Abstract by Line Item
8. Examples of a Vehicle Log and State Reporting Summary
9. An Example of Routes and Schedules in a Rural Environment
10. List of Legal Questions Concerning Operations, Regulation, Funding
11. Issues Concerning Insurance and Volunteer Drivers Federal and State
12. Funding Services for Transportation for the Elderly from the State-of-the-  
Art in Elderly Transportation
13. Radio Equipment Description and Specifications



TRANSPORTATION FOR THE ELDERLY AND HANDICAPPED  
SUMMARY OF FINDINGS BY  
MARK BATTLE AND ASSOCIATES

This summary is presented in six sections. Under each category are listed the major and discrete outcomes of this research. The reader is directed to the body of the report for more detail.

TRANSIT USAGE BY ELDERLY AND HANDICAPPED

Elderly

Over sixty percent of the elderly sample use bus services on certain occasions.

Most of the elderly users ride the bus no more than two days per week.

About one-sixth of the elderly are prevented from using mass transit facilities by such factors as inaccessibility, costs, physical handicaps or various fears connected to bus use.

Buses are used more for shopping and visits to doctors or dentists than for any other trip purposes.

With improved services, the elderly would take more trips for non-essential purposes such as for entertainment or to visit family or friends.

Largely to avoid having to stand, the majority of bus trips taken by the elderly occur between 11:00 a.m. and 4:00 p.m.

Handicapped

Forty-three percent of the handicapped use the bus, and forty-seven percent do not.

Thirty-eight percent of the handicapped use automobiles and taxis.

Approximately forty percent of the handicapped find buses difficult or impossible to use.



Buses are used more frequently for health-related trips than for any other type of trip.

Improved transit services would enable the handicapped to visit family and friends more often and would allow for travel to places of entertainment.

The sample indicates a very limited need for bus services after 7:00 p.m. by the handicapped.

## PHYSICAL LIMITATIONS AND PSYCHOLOGICAL CONSTRAINTS AMONG THE ELDERLY AND HANDICAPPED

### Physical Limitations to the Use of Mass Transit

#### Elderly

Approximately one-third of the elderly have vision or movement problems which make riding the bus difficult for them.

It is difficult for more than one-third of the elderly to move quickly enough to get on and off buses without problems.

Over one-third of the elderly are unable to maintain balance if required to stand while riding.

#### Handicapped

Sixty-two percent of the handicapped experience some form of functional difficulty relating to riding the bus. Slightly more than one-half are unable to move quickly enough to get on or off the bus without experiencing problems.

Approximately one-half have difficulty carrying packages while riding the bus and therefore have difficulty using buses for shopping.

### Psychological Barriers to Use of Mass Transit

#### Elderly

Of the total elderly sample, more than one-fifth dislike functioning in crowded conditions.

Fear of being physically attacked while riding the bus is a concern of sixteen percent of the sample.



### Handicapped

Fear of physical assault is the leading psychological barrier to mass transit usage for handicapped persons.

More than one-fourth of the handicapped find impatience of other riders and fear of embarrassment a concern.

One-fourth of the handicapped dislike having to function in crowds while using the bus.

## TRANSPORTATION COSTS FOR ELDERLY AND HANDICAPPED

### Elderly

Almost fifty percent of the elderly in the sample spend less than three dollars per week for transportation.

Almost thirty percent of those who do not use the bus also spend under three dollars per week for transportation.

Thirty-six percent of the elderly think the cost of transportation is too much, whereas fifty percent do not.

Exact fare regulations do not cause problems for most of the elderly.

Sixty-three percent do not think that mass transit should be free.

### Handicapped

Approximately one-third of the handicapped spend between one and three dollars per week on transportation.

Three times as many handicapped as elderly spend more than seven dollars per week on transportation.

Forty-seven percent of the handicapped think the cost of transportation is too high; forty-two percent do not.

Almost fifty percent of the handicapped report having problems with exact fare requirements.

## RESPONSIVENESS OF THE TRANSIT SYSTEM TO TRAVEL NEEDS

### Elderly

More than eighty percent of the elderly sampled live within two blocks of a bus stop.



Over half of the elderly feel that buses get them to their destinations on time; only ten percent do not.

Almost three-fourths of the elderly consider buses a good way to travel.

Forty percent prefer better service over better buses or lower fares.

### Handicapped

Seventy percent of the handicapped sampled live within two blocks of a bus stop.

Over half of the handicapped think of buses as a good way to travel.

## PREFERRED AND MOST USED INFORMATION SOURCES

### Elderly

Printed route schedules are considered the easiest information sources to use, but are generally difficult for elderly people to obtain.

The driver is viewed by the elderly as an important source of information.

Most elderly are adequately informed about service to their destination points because they maintain fixed travel patterns.

### Handicapped

The bus driver and the telephone information service are important sources of information for the handicapped.

Less than one-half of the handicapped are knowledgeable about services provided by their local transit systems.

## SERVICE AND SYSTEM IMPROVEMENTS

### Recommended Service and System Improvements

#### Elderly

Forty-five percent of the elderly indicated that shelters at the bus stop would encourage more use of buses.

Door-to-door service would encourage fifty percent of the elderly to use buses more often.



Better services and lower fares were the most frequently mentioned improvements needed by local transit systems.

### Handicapped

Over half of the handicapped say that shelters would encourage them to use buses more frequently.

Sixty percent of the handicapped would use buses more if door-to-door services were available.

Better service was the most frequently cited improvement needed by local transit systems.



SUGGESTIONS AND COMMENTS CONCERNING  
SPECIALIZED TRANSPORTATION SYSTEMS

Peter M. Schauer, General Manager OATS  
Older Adults Transportation Service, Inc.,  
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909 University Avenue  
Columbia, Missouri 65201

1. Organizing a transportation program is an extremely complex undertaking. Of primary concern are the legal base, the financial plan, the system, private transportation firms, and political realities. All of these factors are interrelated.
  2. "It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by the preservation of the old institutions and merely lukewarm defenders in those who should gain by the new ones."<sup>1</sup>
- <sup>1</sup>From The Prince, by Niccolo Machiavelli, trans, and edited by Thomas G. Bergin; copyright 1947, Crofts Classics, page 15.
3. Develop an ad hoc committee which includes all agencies and interested groups.
  4. Contact your state agency on aging. They will be most helpful.
  5. Secure a lawyer. Preferably someone who knows about corporate and transportation law.
  6. Ask your state university for a transportation consultant to help you. Ask them to develop a management program for you.
  7. Under what statute should you organize?--Cooperative?--Non-profit? In Missouri we started as a cooperative, but we are now a not-for-profit corporation. Consult your secretary of state. Pay special attention to your tax requirements.
  8. Check with your state Public Service Commission to determine if your system is legal. In Missouri there is no major problem as only members are transported.
  9. Approach transportation from a business standpoint. Develop a budget which includes salaries, vehicles, gas, oil, etc., rent, telephone, etc.
  10. Incorporate to protect all individuals concerned. This also helps to secure funding.
  11. Transportation is expensive. Start up costs may range well above 75¢ per mile. Are you certain you or your organization can afford these kind of costs? Could another agency or private firm meet your transportation needs?



SPECIALIZED TRANSPORTATION SYSTEMS

Page: 2

12. If you determine that your own transportation system is the only way, then allow yourself enough funds to operate at least two years with little financial strain.
13. Transportation is highly visible. Can your organization afford the scrutiny? Will you have enough funds not to cut corners?
14. Be sure you have a sufficient geographic and population base to support your program, it seems 400 to 600 members per bus is a good base to aim for.
15. Develop a financial plan which gives you a solid dependable base.
16. Ask yourself what would happen if your buses were iced in from November 15 to February 28? Could you survive?
17. To help insure a steady flow of income you can sell memberships in your program at a nominal fee. Be sure to charge enough to cover your cost of postage and processing. In the OATS program the basic membership costs \$6.00 with a \$5.00 annual membership contribution.
18. Develop a contribution per mile. Ours is 4.5¢ per mile per passenger with lower rates for group excursions.
19. If possible plan to be self-sustaining in a given time period. But remember it is very difficult for mass transportation programs to break-even. In all likelihood you will always need some level of subsidy.
20. Contact your state agency regulating insurance. They will help you in securing the necessary insurance.
21. We are using 14-passenger vans with air-conditioning, 10 ply tires, heavy springs and tinted glass. Buy them all the same color and identically equipped to save on maintenance. Set up a maintenance schedule.
22. Don't worry about the route before you have users. Get the people involved and then let them tell you where and when they want to travel. OATS is door-to-door, but sometimes the customers have to adjust their schedules to coincide with the buses. Let the people help design the system as much as possible.
23. Plan. Involve many people in the planning from the beginning. Write down your goals and objectives.
24. Regularly evaluate your system. Could someone else provide transportation in your place at less cost or faster? Cost per mile? Tire efficiency? Scheduling?



## ISSUES: INSURANCE & VOLUNTEER DRIVERS

N.I.C.A.A. Senior Citizens' Services, like many other Title VII programs, uses volunteer drivers, who are reimbursed at a set rate per mile, to transport the elderly to the lunch sites. In most cases with this nutrition project, the drivers themselves are elderly.

The questions are those of both liability and responsibility.

### Liability

It is generally agreed that a driver who transports others for no fee would be covered by his own personal auto insurance policy, even though he is reimbursed for his mileage.

### Questions:

If an accident occurs, under what circumstances can he and his company be sued for a personal injury or wrongful death by other third parties and by passenger guests? What is the difference between liability of a driver to his passengers for negligence as opposed to his liability in case of an accident with a non-insured negligent third party? Is there liability in an accident occurring as a person enters or leaves the auto or is helped to or from a building by the driver? How much liability should he carry? Should it be increased once he begins to transport others on a regular (volunteer) basis? I assume the extent of necessary liability insurance relates to the extent of his own property (his solvency). Is this correct? Are there limits on a suit of this type?

The project has purchased an auto liability insurance policy. This is to cover the project as an entity in case it were named as a party defendant in a personal injury suit or wrongful death action and to cover staff members if involved in an accident while transporting elderly program participants (which they occasionally do). This was purchased on the advice of an insurance representative.

### Questions:

Can a Title VII program as a federal agency be sued by a private citizen? How extensive should the liability coverage be? Is it while riding or from door to door?

### Responsibility:

Although the liability of the agency and its staff may be minimal under the law, I feel the agency's responsibility in this kind of a system is great. The agency has solicited the services of these citizens and in many cases provided the link between the drivers and the riders.

### Questions:

Is there some way the agency can protect its elderly drivers from a suit? Can passengers be requested to sign some sort of release that would be binding in case of an accident? Could there be any kind of an agreement so that the program would assume liability rather than the driver? Is this desirable? What are the



insurance facts of which each volunteer driver should be apprised by the agency before he begins to drive? What standards should be developed in selection of volunteer drivers?

Of all the above is there a difference between law and policy, i.e., mandate or desirability?



## HEADINGS AND CHAPTER CONTENT

### THE DESIGN AND MANAGEMENT OF RURAL TRANSPORTATION

#### Chapter I: Introduction

The primary content of the text presents solution oriented system techniques and methodologies for the purpose of assisting developing programs and providing a tool for educational purposes. The introduction contains:

- A. A brief description of the need for rural transportation as it has emerged in American society.
- B. The implications of rural transportation and its techniques for suburban as well as rural areas.
- C. The environmental implications.
- D. Special interest group requirements for rural transportation.

#### Chapter II: Research and Survey Techniques That Directly Contribute to Design and Operation

- A. Research that establishes preliminary routes and schedules.
- B. Research that utilizes existing data and information (not necessarily census.)
- C. Research which eliminates the usually meaningless house-to-house or other public survey methods that are subject to a wide range of leading questions, opinion error, and misinterpretation by non-professionals.
- D. Research which leads to efficient record keeping and management procedures.
- E. Research that is quick, effective, and system or solution development oriented, eliminating costly and often unusable complicated documents that are too detailed for local comprehension.

#### Chapter III: Legal Options

This chapter includes the advantages and disadvantages of legal structures that can be considered by any group, organization, state, or municipal authority, as viable alternatives for the ownership and operation of a rural transportation system. The alternatives include:

- A. Municipal and multi-political jurisdictional authorities;
- B. Consumer owned and professionally operated cooperative structures;
- C. Privately owned and publically supported systems;
- D. Regulated and unregulated public utilities;
- E. Other corporate organizational structures; and
- F. Promising combinations of structures encountered.

For each legal structure, a complete set of bylaws, a formal charter and resolution package is available for each option as supplements to the basic text. It is the intent of the text to insure clear understanding, in non-legal terms, of the options available, and suggest that with brief technical assistance to research specific state laws, any organization or group could then pursue its selected choice.



Chapter IV: Routing and Scheduling Techniques  
(And the infinite variety of combinations possible)

This chapter discusses the many new approaches toward achieving effective and efficient routing and scheduling. Flexibility and innovation in routing and scheduling is emphasized. Highly stylized, modern and futuristic equipment as a solution is discouraged. A basic opinion of this book is that the effective utilization of any equipment regardless of its design is predicated upon efficient and successful routing and scheduling. Every effort is made to reduce each technique and methodology to concise explanation, and a variety of technique combinations are suggested.

Chapter V: Promotion, Communications and Advertising

Effective communications between the ridership and the management is vital to the development of a successful system. This chapter contains:

- A. Communications through the media.
- B. Direct communications.
- C. Communications through agencies and industry.
- D. Special Promotions.
- E. Advertising the system.
- F. The sale of advertising.

Chapter VI: Bookkeeping, Record Keeping and Cash Flow

This chapter has been subdivided into two basic sections. The first deals with purely financial cash flow control mechanisms for security as well as rapid route performance analysis practices. Computer bookkeeping is described with a supplemental computer bookkeeping guide available upon request.

A second and equally important record keeping section deals with operating cost analysis including the importance of careful records on tire mileage, equipment dead heading, fuel consumption, depreciation, management costs, and economically acceptable ratios between these costs. The importance of keeping these records in order to operate an efficient system points the way toward self-support.

Chapter VII: The Economies and Diseconomies of Public Systems and Subsidies Vs. Self-support and Public Purchase of Service

This chapter describes how effective flexible routing and scheduling combined with rates based upon cost of operation, can emerge into an efficient self-supporting system. At the same time, care is taken to point out that net surplus or profit (depending upon type of organizational structure) may in fact be small, and is often held down by a variety of public pressures. This chapter also describes why private financial support and private investors are difficult, if not impossible to find, not because systems must operate at a loss, but rather, that there are many other lucrative quick profit and greater profit opportunity combinations available for investors.



The text also suggests that public funds might be invested into research and development costs for the establishment of systems, and follow this initial grant investment with low cost, long term loan funds. Such an approach recognizes that private financing cannot be enticed into a business that, at least for the present, has low profit potential, a long lag time, and high initial capital investments.

Finally, this chapter describes contracting techniques that can be used by a variety of public service agencies and governmental entities that encourage the system to deliver service, develop routes, and serve the public and private sector effectively and efficiently.

#### Chapter VIII: Progress Monitoring Criteria

In order to successfully establish an ongoing operational transit service, each route and vehicle usage pattern must be continually evaluated for its contribution to the total system. This evaluation is even more important during the route by route and unit by unit build up of service. This chapter contains some of the basic materials and guidance and procedures for daily monitoring controls that assist the management to quickly correct deficiencies and identify problems while at the same time develop the internal performance records that can be used for monthly, quarterly and annual progress evaluation in terms of cost, cost benefit and social impact. This material is also discussed for its usefulness when reporting to supporting agencies and organizations on the results from their investment. The progress monitoring criteria includes the following list of subjects and, equally important, the step by step internal procedures for monitoring, assembling and presenting the data at a minimum cost in time.

- A. Cost per vehicle mile.
- B. Cost per passenger.
- C. Administrative overhead as a percent of total cost.
- D. Progress toward cost recovery.
- E. Total ridership growth.
- F. Ridership characteristics.
- G. Cost recovery growth as a percent of total expenditures.
- H. A brief assessment of the supporting agency(s) return on grant monies expended in terms of:
  - 1. Cost to the agency for each person transported.
  - 2. Legal, operational and technical problems solved.



MARKETING DART: FUNCTION AND STRATEGY

I. General Considerations

Marketing of DART service should not be an attempt to "sell" the service. Simple, accurate public information and maintenance of high quality service is much more important than covering the area with colorful leaflets exhorting the public to use the service. The basic approach of a marketing strategy should be:

1. Continuous visibility, provided by the buses.
2. Use of the fact that DART service initiation, modification, expansion, or progress is genuine news in any community, deserving and likely to get extensive print and broadcast news coverage.
3. Simple, readily available information on how to use the service -- placed so that potential users have it available when they are making travel decisions, if at all possible.
4. An organized program of information availability via telephone, with follow-up.
5. Maximum use of work-of-mouth information, by initiating direct presentations to identifiable groups and encouraging people to talk to others they know. Leave them with brief printed material to spread around.
6. Selective use of pricing and "specials" if necessary.
7. Above all, continuous attention to the quality of service. If riders' experiences with the system are good, they will spread the word.

Why these recommendations against the traditional promotional campaign of flyers, posters, advertisement, bumper stickers, and the like? The basic reason is that experience shows that people do not have to be prodded to try Dial-A-Ride service; they try it in substantial numbers without special encouragement. Unlike the latest "new, improved" detergent, Dial-A-Ride is a genuinely new service, about which people are naturally curious. If they can find out how to use the service, they will try it out, if only to see what it's like. The job of marketing then becomes simpler, but deeper -- to provide appropriate information at the proper time, and to provide a service good enough that people will use it frequently, including it in their daily lives.

What if these recommendations, based on experience in other areas, turn out to be incorrect for DART cities? Then one can turn to the traditional methods of publicity, advertising, and promotion. The key variable in the decision is not simple ridership level, but penetration. If only a few households have in fact used the service after some reasonable starting period, then a campaign to increase public awareness is in order. On the



other hand, if a large number of households show some usage, but only once or twice, then methods must be used which identify the reasons for such a pattern. In that case, a different approach is needed, including examination of the service initially offered to see if it is properly aimed at community needs.

With substantial community concern about public transportation evident -- a prerequisite for initiation of DART service in any case -- it could be disastrous to implement an "all-out" publicity campaign at service initiation. The system should be given some time to "iron out" its operations, without being heavily stressed from the first day to operate at high ridership.

## II. Recommended Marketing Mechanisms

1. Visibility of the system is provided automatically by the buses. A small number of vehicles in service can seem like many more to casual passers-by, appearing nearly ubiquitous. The bright color aids identification, and the planned distinctive passenger signaling horn adds to the impression. About one-quarter of all passengers in the Grand Rapids system became aware of the service simply by seeing the buses on the street.
2. Local editorial news coverage is extremely important. Announcement of the initial service, coverage of the first day, interview features on system personnel, progress reports, service changes, expansion, visits by assorted dignitaries, etc. are all genuine news items for which press releases and preferably pictures should be sent to local media. Releases should be brief, to the point, and written in good journalistic style, so that little or no editing of the copy needs to be done, except to fit in the available space.

Print media will generally be less cooperative if the project is obviously trying to use editorial space as free advertising, so it is important that press releases be genuinely newsworthy, timely, and soberly written. Frequent, trivial reports such as weekly ridership or other routine information will not get printed and will cause hard feelings. Broadcast media, on the other hand, are typically hungry for almost any scrap of information, and may even broadcast routine information and announcements of somewhat less news value than will be accepted by newspapers.

Another aspect of broadcast media is talk or call-in shows. Any such call-in "talk of the town" or "community comment" host should be provided with full information on the service and its progress.

It is conceivable that local media will be reluctant to carry much news about the system unless advertising space or time is bought. A moderate level of such expenditure would be justified to obtain good news coverage.

3. Information brochures or flyers remain an important element of marketing, and attention to clear and attractive design is manda-



tory. The first printing, explaining the initial service, should be equal to the number of households to be served -- no more.

Door-to-door distribution or wholesale mailing of these brochures to every household in the city is not recommended. Rather, they should be made available in public places and mailed in response to specific inquiries. (See below for further explanation of these mechanisms.)

Brochures should be small, including the system number and a brief description of service and how the system operates. A singly folded format with appropriate space for addressing and stamping is recommended, so that brochures can be mailed without envelopes.

A natural and effective distribution mechanism is with a pocket holding a number of brochures, which can be placed at key points of high pedestrian traffic in the city, such as foyers or counters of stores, hospital and office lobbies, etc. Distribution to these locations should be done by project personnel or volunteers during training and start-up, and a regular restocking program must be planned.

Remember that the service is expected to and should change -- the information brochures should not contain material likely to be rapidly outdated, and revised editions on different color paper stock should be used when major changes occur -- effective date and expiration date, with new editions planned to be distributed just before the previous expires. The poster holders should be very basic so that they need not be changed.

For riders and other persons more deeply interested in the system's operations, funding, and significance, a more elaborate description could be printed separately, available on the vehicles and by request. Such a second-level information source could contain a clip-out space for comments and suggestions. This material should be aimed at the "why, who, how" questions about the service in some depth; the basic brochure addresses only the basic "what" and how to use it. In the same manner as the basic brochure, this supplementary information bulletin should be updated as needed to reflect project changes and progress.

4. The telephone will almost certainly be a primary means of providing public information. Callers who ask very simple questions will nearly swamp the dispatch center as soon as the number is widely known, and adequate personnel to answer the questions must be available. Answering repetitive questions can be tiring and annoying, so people who are performing this function should be rotated frequently, thoroughly briefed, and provided with standard responses to common questions.



- 4 -

The labor cost of additional telephone-answering personnel can and should be paid out of the marketing budget.

All serious calls for information should result in the caller's name and address being taken -- written directly on the address portion of a brochure to eliminate copying -- so that the basic brochure and/or the in-depth information handout can be mailed out in response to the call, as well as the information given verbally. A ticket good for one free ride might also be included -- and charged at full fare against the marketing budget, if desired.

At the next directory printing, a bold-type listing for the DART phone number and a large advertisement in the Yellow Pages are strongly recommended.

5. Word-of-mouth recommendations and information are known -- for all products and services -- to be the most effective of all marketing tools. When it begins, DART is a natural topic of conversation in any town, but often with a lack of accurate information. The direct and immediate "conversational chains" that are characteristic of smaller communities are a tremendous advantage. The key to the process is to inject accurate information into these chains so that people's natural curiosity and tendency to gossip can spread system information. To do this, one needs 1) personal contact, and 2) something to give people to take away with them, for reference and further distribution.

The project director and perhaps other system personnel should go to meetings of all sorts, armed with many brochures, and answer questions about the system. An extremely brief presentation followed by many questions is much more effective than a long speech, even if illustrated. A map and single special explanatory poster are sufficient as props. Encourage people contacted at such sessions to take 2 or 3 brochures and give extras to their friends.

This process is time-consuming but essential. It also gives important direct feedback to the project director about public expectations and desires -- critical information in refining the system.

6. One possible method of special pricing was mentioned above: inclusion of a ticket for one free ride in project information sent out upon request. A number of other similar schemes are obvious:
  - a) Day or week of free rides for everybody.
  - b) Introductory reduced-rate passes, etc.
  - c) Discount or free tickets or tokens distributed by stores or other institutions.

A period of free rides is potentially quite costly in terms of system performance. It seems useless, if the goal is to intro-



duce the public to the service, to do the introduction under conditions of virtual chaos caused by overloading. A better approach would be to give residents of a small compact area free service for a day -- perhaps one-way only -- and move the "free zone" daily to different areas to give all residents a chance. This has important operational advantages over city-wide free service, and can probably be instituted with virtually no degradation of service.

A limited introductory rate -- of which the one free ride ticket is an example -- has considerable merit in getting people used to the service, and is recommended in a form that meets local desires. The moving "free zone" could serve the same purpose.

Promotion through merchants via tickets or tokens supplied with a purchase is an excellent idea, but is suggested for a later time in the project than service initiation. Such efforts have proved to require a substantial amount of staff time which is urgently needed for other tasks early in the project. Initiation of such a program would be a useful "second wave" technique, also generating news coverage.

7. In general, the use of promotional giveaways such as bumper stickers, buttons, and such is discouraged. A small sticker for the telephone, serving to remind household members of the system telephone number, is probably the most useful of the possible giveaway devices, since it actually helps people to use the system. One could be included with the basic brochure.

### III. Timing

1. No marketing effort should be carried out until approximately one week before service starts, other than press releases and news coverage of the progress of system planning.
2. Initial marketing should be concentrated in the last 2-3 days before service actually begins, toward the end of personnel training.
3. A high level of marketing effort should continue through the first two weeks or so after startup.
4. Any extensive free-ride program should occur only after a few weeks of operation to shake the system down.
5. Major events, such as merchants' token programs, service changes, or expansion should be done one-by-one with separate and full news coverage and coordinated revisions of project brochures, if necessary.
6. The continuing marketing budget is intended to cover revisions and reprinting of brochures, introductory free rides if used, photography for press releases, and all miscellaneous customer information expenses, such as suggestion/complaint forms and mailing.



#### IV. Summary of Recommended Activities

##### Pre-service activities

- Press releases written by project director and/or local newspaper staff.
- Design and order literature.
- Talk with community groups if urgently requested.

##### Immediately before service, during training week

- Buses on street for training practice.
- System telephone manned for information calls, personnel fully briefed.
- Drivers and volunteers distribute posters with brochures in pockets.
- Information calls result in brochure mailed out to caller.
- Second-level information bulletin ready.
- News coverage arranged for announcement and first day's activities.

##### During first few weeks of service

- Intensive talking at community meetings, possibly arrange special meetings.
- Continue above program elements.

##### After first few weeks of service

- Taper off talks at meetings.
- Institute moving area free ride program if judged necessary, with news coverage.
- Continuing brochure availability and mailings in response to suggestions.

##### Following first month of service

- Possible merchants' token, etc. program.
- Probable service revisions and announcement.
- Continuing moderate to low level marketing expenditures.



V. Sample Marketing Budget Breakdown

This budget is based on marketing expenses for a city of 25,000-30,000 as outlined in the DART program at \$2000 for initial marketing and an average of \$200 per month thereafter. It can be scaled roughly up or down to fit other size cities and therefore marketing volume efforts. The project director's time spent in marketing is assumed to be paid out of the regular budget item for project director. Similarly, distribution labor for posters, etc., is assumed to be covered under training or volunteer work.

This breakdown is intended to be illustrative, rather than restrictive of the actual amounts to be spent.

Initial Marketing Expenses

Preparation of literature and graphics 20 hrs. @ \$5/hr.	\$100
Printing: 10,000 brochures	120
10,000 telephone stickers	100
5,000 "second-level" bulletins	60
100 posters	90
5,000 free ride tickets	30
Telephone answering/brochure addressing Temporary help, 20 days @ \$25/day	500
Postage, 3000 mailings @ \$.10	300
Telephone book advertising	50
Free rides, 1000 @ \$.50 used	500*
Additional for paid advertising and misc.	<u>150</u>
	\$2,000

\*Note that this ends up essentially as a budget transfer from marketing to revenue.

Continuing Marketing Expenses (Per Month)

Printing (as needed)	\$ 50
Postage, 500 mailings @ \$.10	50
Telephone book advertising	40
Free rides, 100 @ \$.50 used	50
Miscellaneous	<u>10</u>
	\$200



# State Highway Commission of Kansas

ROBERT F. BENNETT  
~~ROBERT F. BENNETT~~ Governor

L. W. Newcomer, Acting  
~~ROBERT F. BENNETT~~, Director of Highways  
JOHN IVAN, Assistant State Highway Director  
JOHN D. McNEAL, State Highway Engineer

STATE OFFICE BUILDING  
TOPEKA, KANSAS 66612

February 19, 1975

## STATE HIGHWAY COMMISSIONERS

KEN PHELPS, Manhattan  
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RICHARD M. DRISCOLL, Russell  
KARL A. BRUECK, Paola  
NESTOR R. WEIGAND, JR., Wichita  
LOUIS KAMPSCHROEDER, Garden City



Section 1-C  
Transportation for the  
Elderly and Handicapped

Mr. Douglas J. McKelvey  
Center for Urban Transportation Studies  
Institute for Urban and Regional Research  
102 Church Street  
Iowa City, Iowa 52240

Dear Mr. McKelvey:

In reference to your phone conversation with Tom McCormick on February 12, 1975, the State Highway Commission of Kansas administers Section 16(b)(2) of the Urban Mass Transportation Act of 1964, as amended. This program is applicable to urban areas of over 5,000 population. The purpose of this program is to make available capital assistance for the purchase of equipment, to private nonprofit organizations providing transportation services to the elderly and handicapped at the county and local levels. In addition, Section 5 of the Urban Mass Transportation Act of 1964, as amended, makes funds available to the three metropolitan areas of Kansas, for public transportation. These funds will be used, probably, for subsidy of operational expenses as well as for capital grant purchases.

There are no programs, as yet, which are directed at providing transportation assistance to rural areas. Section 147 of the Federal-Aid Highway Act of 1973 could be of some benefit to this area, if a Kansas demonstration project is selected.

To the best of our knowledge, laws which affect the implementation of such transportation services as administered by Section 16(b)(2) can be separated by whether or not the implementing agency is incorporated as private for profit or not-for-profit versus public not-for-profit. There appears to be few laws, if any, on the books or pending, which shape the implementation of transportation services by private nonprofit organizations. They need not have drivers with chauffeur's licenses. They need not file with the Kansas Corporation Commission (KCC). There are no passenger safety regulations other than those applicable to the transport of school children. On the other hand, if the agency is private for profit or public nonprofit, it must comply with such regulatory restrictions. Of the numerous individual transportation operations in Kansas providing services directed at the



Mr. Douglas J. McKelvey

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February 19, 1975

elderly and handicapped, most are private not-for-profit, with only the public transit systems in the larger metropolitan areas being public non-profit. There are a number of taxi services in various Kansas communities which are not included as part of the above mentioned services.

We realize that this is but a quick overview, and that the information conveyed is only as reliable as our limited research has revealed. Further research into these concerns is in process with the output hopefully being in the form of more concrete, definitive expressions of reality.

Tom McCormick will be unable to attend the Regional AoA Conference on February 26 due to obligations beyond his control. He sends his regards.

Yours truly,

VERNE L. CRAIG, P.E.  
ENGINEER OF PLANNING AND DEVELOPMENT

*E. D. Landman*

E. D. Landman, P.E.  
Assistant Engineer of Planning  
and Development - Systems Planning

EDL:HTM:dv



TABLE II-10  
**TYPICAL TOTAL COSTS**  
**PER SEAT-MILE IN A RURAL ENVIRONMENT**

	<u>Car</u>	<u>Van</u>	<u>Small Transit Bus</u>	<u>Medium Transit Bus</u>	<u>Large Transit Bus</u>	<u>School Bus</u>
Capacity (Seats)	5	10	20	30	50	44*
Speed (MPH)	30	25	18	18	15	15
Fuel Consumption (mi./gal.)	13	10	7	6	5	7
Fuel Type Cost	Gas \$.50/g	Gas .50/g	Gas .50/g	Diesel .38/g	Diesel .38/g	Gas .50/g
Fuel	.039	.050	.072	.064	.076	.072
Maintenance Rolling Stock	.045	.090	.125	.125	.150	.140
Injury & Damages	.025	.030	.042	.042	.050	.050
General & Misc.	.050	.060	.083	.083	.100	.100
Admin.	.035	.042	.058	.058	.070	.070
Wage \$3/hr.	.100	.120	.167	.167	.200	.200
Total Operating Cost	.294	.392	.547	.539	.646	.632
Capital Cost	.037	.069	.125	.115	.167	.054
Total Cost/ Veh. Mile	.331	.461	.672	.654	.761	.686
Total Cost/ Seat Mile	.066	.046	.034	.022	.015	.016

\*Adult Seating Configuration

SOURCE: Governor's Task Force on Rural Transportation, Rural Transportation in Pennsylvania, Problems and Prospects, Volume II, Harrisburg, May 31, 1974, p. 127.



BUDGET ABSTRACT

Comprehensive Transportation Services

Estimated Federal Request by line item and year

Central Office Personnel  
Dispatch Personnel  
Drivers Wages and Fringe  
Site Supervisor Salaries  
Legal and Consultant Services  
Travel - Central Office and  
    Advisory Committees  
Office Equipment  
Office Space  
Telephone  
Office Supplies, Printing, Postage  
Visual Aids  
Two way Radio Systems  
Vehicles/Vehicle Equipment  
Gas, Oil, Maintenance and Repair  
Vehicle Related Expenses  
    (Tires, Storage, Washing)  
Driver Training  
Evaluation and Research

TOTAL DIRECT COST

    Indirect Cost

TOTAL

    Revenue

Total Request



NUMBER OF TRIPS BY PURPOSE OF TRIP

Purpose	M.	E	G	CM	R	V	A	C	O
County									
Area Total									

Trip Purposes

- M - medical
- E - economic
- G - group
- CM - congregate meal
- R - ride
- V - visit
- A - agency
- C - church
- O - other











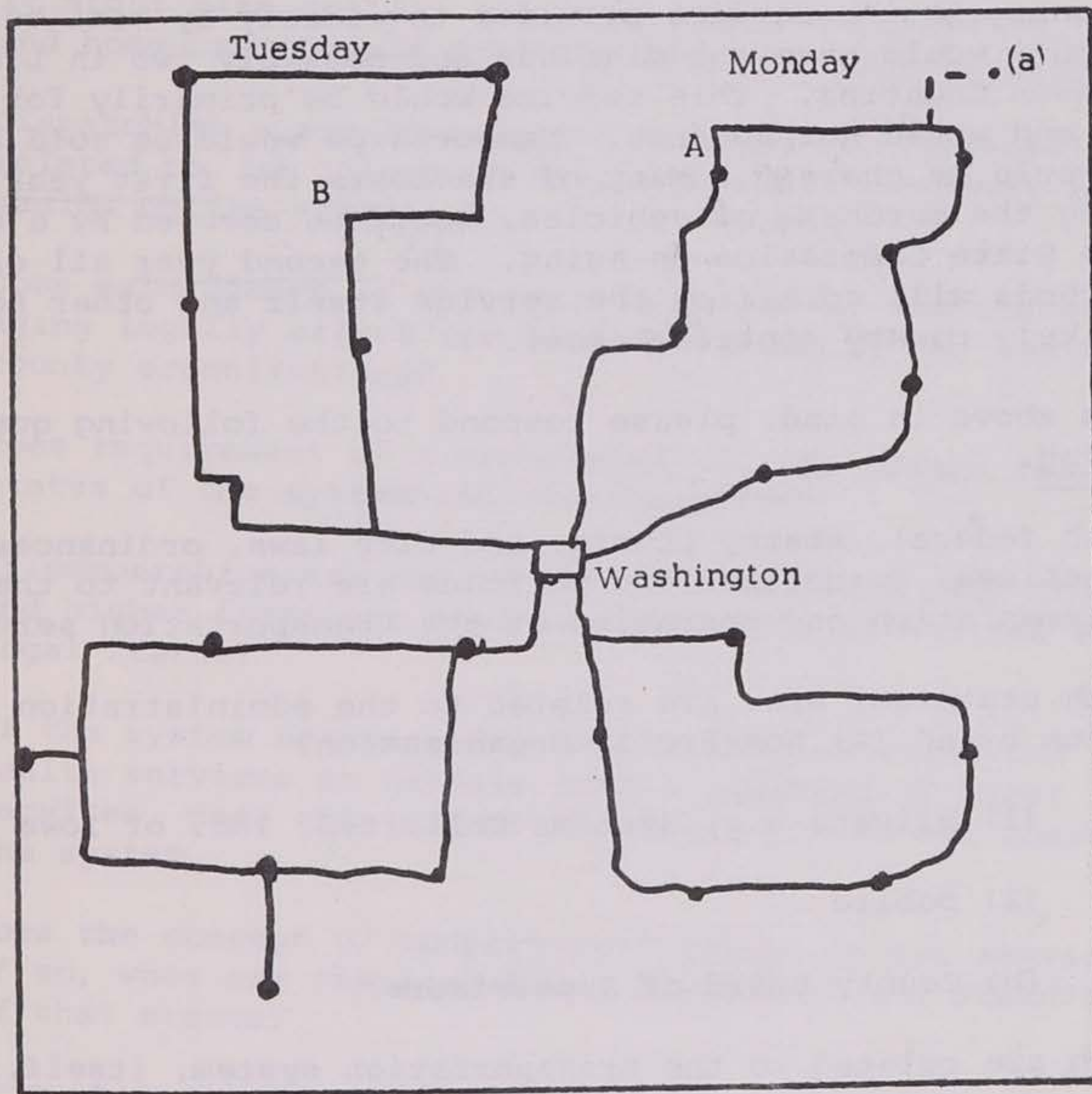
## Routes and Schedules Proposed for the SEATS Program in Southeast Iowa

Fixed-flexible routes be established by county transportation committees who knew the general location of elderly concentrations and their general travel patterns. Reliance on the committee to plan routes became imperative because of lack of data on rural populations and their respective travel behavior. (The budget and the target implementation date in the grant precluded any formal surveying.) The fixed-flexible routes provide door-to-door service but potential origins and destinations are restricted spatially and temporarily (see Figure 2). For example, the minibus would follow the fixed route "A" between small towns and to the county seat, Washington, two or four times on Mondays. The minibus would follow Route A but would deviate from it to pick up the user at his door (a) and deliver him at the door of his destination. The result is that service is available to everybody at least once a week and then on a fifth or sixth day service is provided anywhere in the county or to some place outside the county (often a large urban area) on a first come first served basis. The day/days that specific parts of the country would receive intra-county service was decided by the County Transportation Committee. Generally their decision was based on the timing of public programs, medical services, and transportation service in contiguous counties. Transportation in contiguous counties was considered to facilitate transfers between counties. Service outside the county was provided once or twice a week; the frequency was a decision of each county committee. The committees had previously identified cities outside their own county as potential destinations. For example, Fridays have been designated as out-of-county days in Washington County. On the first and third Fridays of each month a bus goes to Iowa City in Johnson County. On the second and fourth Fridays the destinations are open to ridership demands.



Figure 2

Fixed-Flexible Routes for Washington County





## SUGGESTED OUTLINE FOR LEGAL QUESTIONS

The following questions relate to the implementation, operation and administration of mini-buses in the seven counties of Area X. This project is undertaken through Area X's Area Agency on Aging under the direction of Dr. Feller. Envisioned is a transportation service provided to elderly by mini-buses. Each county would have one mini-bus and possibly two in Linn and Johnson Counties. This service would be primarily for elderly and would not be free. Memberships would be sold and a fare would be charged. Many of the costs the first year, including the purchase of vehicles, would be covered by a grant from the State Commission on Aging. The second year all or most of the funds will come from the service itself and other sources (most likely county contributions).

With the above in mind, please respond to the following questions in writing.

1. Which federal, state, county, and city laws, ordinances, franchises, guidelines and policies are relevant to the implementation and operation of the transportation service?
2. Which statutes, etc. are related to the administration of the system by an (a) Non-Profit Organization?
  - (1) private e.g. Systems Unlimited, Inc. of Iowa City
  - (2) public
  - (b) County Board of Supervisors?
3. Which are related to the transportation system, itself, i.e.
  - Drivers - training, special license, etc.
  - Vehicles - equipment, licensing, full tax, liability
  - Routes - schedules\*
  - Level of Service - capacity, safety
  - Users - may handicapped ride the system? If so, are there additional guidelines that must be met?

\*Basically, the system will follow a different fixed route each day deviating from it to provide door-to-door service when necessary. Also, the vehicles will operate basically within county boundaries with some exceptions such as all-county days.



May other than elderly use the bus, if so, what are legal implications of that? May other organizations, such as schools, churches, etc. rent the vehicle for excursions? If so, what legal foundations are relevant?

May the vehicle be used by non-elderly?

It might also deliver groceries, medical supplies, etc. and home-care people from the Regional Medical Program?

Dispatching - are there legal precedents, licenses, etc. related to (a) telephone dispatching, (b) two-way multi-band radios on the vehicles?

4. Does maintenance of the vehicle titles by the State Agency on Aging legally effect the administration of the system by county organizations?
5. Does requirement of a membership to ride effect the legal status of the system and its operation?

If memberships are not required in order to ride the system, and higher fares are charged, does this effect the system's legal status?

If the system serves a few people who are using the family health services at Oakdale or Williamsburg or other social services, does this effect the legal status and operation of the system.

6. Does the concept of 'cooperative' relate to the service? If so, what are the associated advantages and disadvantages of that status?
7. From what people and agencies is it necessary to obtain permission (or a license) in order to operate the proposed service?
8. May revenue sharing funds be spent on this proposed system by City and/or County authorities?
9. Who may set up sub-contracts between the Area X Agency on Aging and county organizations and what should be the tenents of that contract?



10. (a) May the system, which is county-wide, provide services within cities where there are transportation alternatives such as transit, taxi, other? If so, may memberships be sold to those people?  
  
(b) May the system cross county lines? May it serve people in cities already served by Greyhound or Missouri Transit?
11. What should be known about liability and accidents, both inside the vehicle and between the vehicle and other property, vehicles, or persons?
12. If this mini-bus <sup>competes</sup> interes with existing transportations, are there legal implications which should be considered? if so, which ones?
13. What other recommendations do you have regarding such a system?
14. What agencies and people represent a sufficient list that should be contacted to proceed in a legal and rational manner with the implementation and operation of the proposed system?
15. How may county and city systems legally interface?
16. How may sheriff and minibus dispatching operation legally be coordinated?

If you are unable to respond to some of the above questions, please suggest which agencies and people they should be addressed to.

If at all possible, we would appreciate the written responses to the above by September 20, 1973, since the people in the counties are anxious to make the system operational by December, 1973. If this date is not reasonable, please notify us accordingly.



FROM THE STATE OF THE ART IN ELDERLY TRANSPORTATION BY THE ADMINISTRATION ON AGING

Table III-2 (Continued)

MAJOR FEDERAL FUNDING SOURCES PROVIDING TRANSPORTATION FOR OLDER AMERICANS AS OF OCTOBER 1974

1. Plus spouse of any age.
2. The following symbols are used:
  - "DOC" - Department of Commerce poverty guidelines, based on Census Bureau Statistics
  - "OMB" - Office of Management and Budget poverty guidelines
  - "OEO" - Office of Economic Opportunity poverty guidelines
  - "SSI" - Supplemental Security Income levels
3. May be statewide or community-wide. Regulations specify that project areas must have "large number" of elderly
4. Regulations allow the elderly to qualify on any or all of four grounds:
  - (1) cannot afford to eat "adequately"
  - (2) lacks skills to prepare well-balanced meals
  - (3) has "limited mobility"
  - (4) feels lonely and rejected
5. At least 50% of projects must be in States predominantly rural
6. AoA policy is to encourage capital purchase for demonstrations through joint DOT participation.
7. Both must have high proportion of elderly poor
8. Since these projects originated in the Office of Economic Opportunity, most are located in areas of low-income population
9. State services vary, and transportation is optional
10. An estimated 2.5% of those rehabilitated are age 65+
11. Emphasis on urban and suburban areas
12. Has not completed high school; has limited English skills, lives in area with a culture different from his own
13. Water and waste funded separately
14. This was a seven-month appropriation
15. Survey of existing resources must first be taken. Equipment costing \$500 or more must have regional approval
16. Focus is on elderly and children, although program also includes families and individuals generally
17. But only if vehicles extend the coverage of existing service programs. Emphasis is on better use of existing vehicles
18. For general services. For employment and volunteer services, the age requirement drops to 55+
19. This figure represents 20% of OEO "local initiative money" appropriated for a seven-month period and available for Community Action Programs. Thus, it represents not additional money, but part of the funds listed above for Title II, Sections 212 and 221
20. Of this amount, \$29.2 million was budgeted for travel
21. As of June 30, 1974 there were 29,265,000 veterans, of whom 2,125,000 (7.3%) were 65 years of age or older
22. State and local governments are allowed broad use of available funds. Two of eight suggested priority categories are "Public Transportation" and "Social Services for the Poor or Aged." These two categories accounted, respectively, for 15% and 3% of funds expended in the only period thus far reported, January 1, 1972 - June 30, 1973
23. Categorically needy; no upper income limit when deducting incurred medical expenses (medically needy)
24. Includes potentials, and former recipients at State option, and those having State supplemental payments. Aged potential recipients are eligible at age 60 or older
25. Flexibly interpreted on a project basis but when was below 2500, not generally considered



SOURCE: STATE OF THE ART IN ELDERLY TRANSPORTATION BY THE ADMINISTRATION ON AGING

Table III-2

MAJOR FEDERAL FUNDING SOURCES PROVIDING TRANSPORTATION FOR OLDER AMERICANS AS OF OCTOBER 1974

Department Statute Title & Section	Description	Appropriated Funding Level FY 74 (millions of \$)	Provides Transport For	Elderly Share	User Eligibility Restrictions			Area Coverage	Capital Purchase
					Age	Income Work Status	Health/ Educ./Other		
<b>A. DEPARTMENT OF HEALTH, EDUCATION &amp; WELFARE</b>									
1. Older Americans Act of 1965 as Amended Title III, All Section except 308	State & Community Programs on Aging	\$ 96	Broad Sec. Services	Exclusive	None	Priority:DOC		Planning & Service Areas	Prohibited
Title III, Section 308	Model Projects	\$ 5.7	Model Projects	Exclusive	None	None		Varies <sup>3</sup>	Prohibited
Title IV, Section 412	Transportation Study & Demon- stration Projects	None	Demonstra- tions & Studies	Exclusive	None	None		Rural Emphasis <sup>5</sup>	Possible <sup>6</sup>
Title VII	Elderly Nutrition	\$99.6	Nutrition Sites	Exclusive	60+ <sup>1</sup>	One <sup>4</sup> criterion DOC		Urban <sup>7</sup> or Rural	Possible
Title IX	Elderly Community Service	\$10	Project Activities	Exclusive	55+	OMB/Unemployed		Community	Possible
2. Public Health Service Act of 1944 as Amended Title III, Section 314(d)	Comprehensive Health Services	\$90	Broad Health Services	Moderate	None	None		Community	Allowable
Title III, Section 314(e)	Community Health Centers	\$209.1	Health Sites	Moderate	None	None <sup>8</sup>		Community <sup>8</sup>	with
Title XII,	Emergency Medical Services	\$27	Emergencies	Moderate	None	None	Critical Condition	Established Service Area	Approval
3. Social Security Act of 1935 as Amended Title VI	Services for Aged, Blind and Disabled	\$365 (FY 73)	Approved Services <sup>9</sup>	Predominant ly	at least 60+	SSI Recipient or Applicant <sup>24</sup>		State	Prohibited
Title XIX	Medicaid	\$5,255	Medical	Aged, Blind, Disabled, AFDC		SSI eligibility criteria or more restric- tive criteria at State op- tion <sup>25</sup>		State	Prohibited







Table III-2 (Continued)  
 MAJOR FEDERAL FUNDING SOURCES PROVIDING TRANSPORTATION FOR OLDER AMERICANS AS OF OCTOBER 1974

Department Statute Title & Section	Description	Appropriated Funding Level FY 74 (millions of \$)	Provides Transport For	Elderly Share	User Eligibility Restrictions			Area Coverage	Capital Purchase
					Age	Income Work Status	Health/ Educ./Other		
<b>C. DEPARTMENT OF AGRICULTURE</b>									
1. Consolidated Farm and Rural Development Act of 1972 Title III, Section 360(a)	Loans for essential community facilities	13 \$ 50		Moderate				Rural up to 10,000	Allowable
<b>D. DEPARTMENT OF LABOR</b>									
1. Comprehensive Employment and Training Act of 1973: Title III	National Older Workers Program	\$ 24	Work Duties	Exclusive	55+	OEO/"Chronically unemployed"	None	Varies: primarily city- or county-wide	Prohibited
<b>E. OFFICE OF ECONOMIC OPPORTUNITY</b>									
1. Economic Opportunity Act of 1964 as Amended Title II, Sections 212 and 221	Community Action Programs (CAP)	\$358.8 <sup>14</sup>	Broad Social Services	Moderate	None	OEO, but broad	None	Urban or Rural	Allowable WITH approval <sup>15</sup>
Title II, Section 222(a)(5)	Emergency Food & Medical Services	\$ 22.4	Broad nutrition & medical services	Substantial <sup>16</sup>	None	None	Suffering from hunger	Most are run by CAPs	Allowable <sup>1</sup>
Title II, Section 222(a)(7)	Senior Opportunities & services	\$ 10.2	Broad Social services	Exclusive	61+ <sup>18</sup>	OEO, but flexible	None	Urban or Rural	Possible; 221 notes
Title II, Sections 232(a) & (e)	Research & Pilot Programs	\$ 35.6 <sup>19</sup>	Special Needs	Moderate	61+	OEO	None	Rural Focus	Allowable v approval;



Table III-2 (Continued)

## MAJOR FEDERAL FUNDING SOURCES PROVIDING TRANSPORTATION FOR OLDER AMERICANS AS OF OCTOBER 1974

Department Statute Title & Section	Description	Appropriated Funding Level FY 74 (millions of \$)	Provides Transport For	Elderly Share	USER ELIGIBILITY RESTRICTIONS			Area- Coverage	Capital Purchase
					Age	Income Work Status	Health/ Educ./Other		
<b>F. VETERANS ADMINISTRATION</b>									
1. <u>Veteran Health Care and Expansion Act of 1973: Title I, Section 101(b)</u>	Expanded Medical Care	\$2,800 <sup>20</sup>	VA medical facilities	Substantial number <sup>21</sup>	None	None	Veteran	Nearest Appropriate Medical Facility	Leased Vehicles Allowed
<b>G. ACTION</b>									
1. <u>Domestic Volunteer Service Act of 1973</u> Title II, Section 201	Retired Senior Volunteer Program	\$ 15	Volunteer Stations	Exclusive	60+	None/Retired	Able to Work	Community	Allowable with prior approval
Title II, Section 211(a)	Foster grand-parents program	\$ 25	Program Duties	Exclusive	60+	OEO/retired	Able to help children	One or more communities	Allowable with prior approval
<b>H. REVENUE SHARING</b>									
1. <u>State and Local Fiscal Assistance Act of 1972</u>	Revenue Sharing	45,970	Funds can be used for any purpose <sup>22</sup>	Varies by State and Locality				States, local jurisdictions	Allowable

Source: Much of the data and material for this table was initially collected by Suanne Brooks of the Atlanta Regional Office of the Department of Health, Education & Welfare. This material was expanded to include a number of Acts not included in that compilation.



ILLUSTRATIVE EXAMPLES OF STATE LOCAL AND PRIVATE FUNDING  
SOURCES AS OF  
OCTOBER 1974

**A. STATE**

<u>Type of Funding</u>	<u>State Providing It (Example)</u>	<u>Description</u>
1. Direct Budget Allocation	All states	Funds for social services as part of general funding - state and local levels
2. Special Funds	Illinois	In 1972 state authorized grants for mass transit facilities. One of three designated purposes: to aid movement of persons unable to drive.
3. Bond Issues	Massachusetts	State pays 90% of yearly debt service on bonds authorized to finance mass transit equipment.
4. Special Taxation	Michigan	In 1972 state made available part of a motor fuel increase for public transit as advances or loans for a period of 2-1/2 years. (Referendum will decide further use of the funds.)
	Massachusetts	4¢ of tax on cigarettes pays for extra-revenue expenses of the Massachusetts Bay Transportation Authority, and other authorities.
5. Sales Taxes	Florida	2¢ of the 8¢ state gasoline tax may go for establishment and operation of a transportation system. <sup>2/</sup>
	California	In 1972, gasoline added to sales tax base 0.25% of sales tax revenues (est. \$142-150 million annually) are set aside in a Local Transportation Fund. Monies can be used for development and operation of a public transportation system, but amounts for operating expenses are limited.
6. Utility Taxes	N.A.	
7. Tax Relief <sup>3/</sup>	16 States	Motor fuel exemptions or refunds.
	27 States	Property, Income and/or Bond Exemptions.
8. Lottery	Pennsylvania <sup>4/</sup> New Jersey	Free statewide transit provided elderly under statutory guidelines to aid elderly and individuals. 25% of net revenue goes to program to aid the elderly.

Source: State of the Art in Elderly Transportation by the Administration on Aging



# DIAL-A-BUS COMMUNICATION EQUIPMENT

## TELEPHONE EQUIPMENT

Source: Dial-A-Bus Manual Volume II

Leased equipment which can effectively handle almost any volume of anticipated calls, is generally available from telephone companies. In some cases the type of equipment available at the local telephone company may restrict the number of options for the dispatching control centre. The discussion here is limited to automatic or dial telephone exchange systems.

### Types of Telephone Line

There are two types of line. The facilities available through the public "switched network", such as those found in most homes and offices, are called "private lines". The other type of line commonly used is the "automatic private line", "direct" or "hot-line". In this case, whenever either station lifts its receiver, the bell rings automatically in the other station with no dialing. Such lines are mainly used for quick, toll-free communication between dispatching control centre and customers in the lobbies of major activity centres such as shopping centres, hospitals, senior citizen residences and rapid transit stations.

It is recommended that more than one telephone line should be acquired and that the "distribution hunting in both directions" feature should be included so that incoming calls are answered in approximately the same sequence, to provide equal distribution to all telephone users.

### Types of Telephone Equipment

The particular type of telephone used by the telephone operator will vary according to individual preference. Ordinary desk telephones are often used, but headsets instead of the hand-held receiver are more convenient, because they leave the operator's hands free to take records.

Apart from the standard dial telephone, there are various modifications in dialing procedures presently available. When more than one telephone line is installed, push-button or "key" telephones can be used. Features available include automatic pick-up and holding, intercommunication between lines, visual and audible signals, automatic cut-off and exclusion. An illuminated push-button on the telephone set gives a visual indication of incoming calls, held lines, or busy lines. The "hold" key enables the user to hold any line picked up, if necessary. The automatic cut-off and exclusion features enable the dispatcher to disconnect other extension telephones from the line.

At night, or when nobody is present in the dispatching control centre, an "automatic telephone answering device" connected with a magnetic tape recorder permits users to make reservations for the next morning. This has proved popular in Regina and its inclusion in the design of future control centres is highly desirable.

### Mobile Telephones and "Telephone-Patching"

When D.A.B. demand is low, there is no need to operate a full scale dispatching control centre. A direct link between the user and the driver via a "mobile telephone service" can be installed instead. If this is not offered in the locality to be served by the D.A.B. system, a base station and a coupling unit, called the "telephone-patch", can be purchased which permit the customer to talk directly to the driver. Before ordering this equipment, the telephone company must be consulted about their policy towards such inter-connections. Some companies have not yet set a tariff for this service. Normally, the telephone company supplies a protective voice coupler to electrically isolate their system from the radio unit. Section 6, subsections 4 to 6, Bill C-104 passed by the Canadian House of Commons on the 29th February 1968, permits this type of inter-connection in Canada.

### Automatic Number Identification

In this system, the number of the customer's telephone can be automatically identified and recorded. A computer is required to reconcile telephone numbers and addresses. This can be useful in centralized automatic billing operations. Eventually, this may be extended to include dialing directly into the computer to request service.



## RADIO EQUIPMENT

### Base Station Two-Way Radio

A base station includes a radio transmitter and one or more radio receivers.<sup>1</sup> These are permanently installed at a fixed location. See Figures 1 and 2. The primary purpose of the base station is to provide the dispatcher with a means of sending information and receiving it from the mobile units. Both voice and data messages may be handled by the base station. Digital messages occur in systems which employ equipment such as teletypes, teleprinters and computer terminals.

Base station radio equipment varies widely in physical appearance. The transmitter and receiver may be mounted in the same housing or may be completely separate. Receivers tend to be smaller and more uniform in size than transmitters; they are usually about the size of a typewriter. The size of a transmitter mainly depends on its power rating. Low-powered base station transmitters and most receivers are often small enough for desk-top operation. High-powered transmitters, however, generally stand on the floor or are mounted on a wall or a pole.

### Mobile Radio Units

In planning the installation of a mobile unit, proper space for later removal of all units

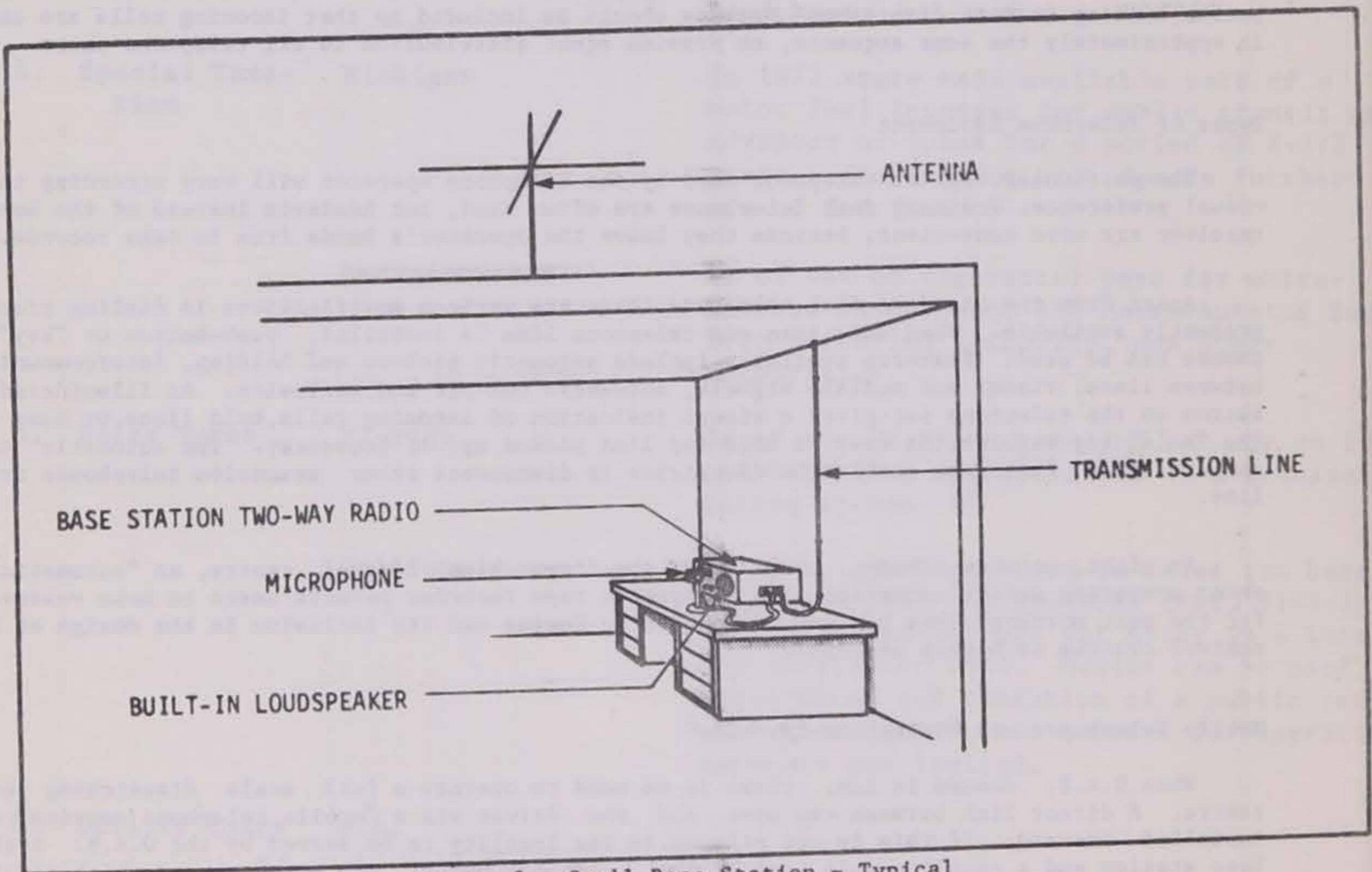


Figure 2 - Small Base Station - Typical

for servicing is important, and the driver should be able to reach the necessary controls without difficulty. The transmitter, receiver and decoder are usually housed in a rugged cabinet that can be put under the driver's seat. The speaker may be mounted on the dashboard or on the steering column. The control head, which contains the loudspeaker, the pilot light and switches, is small enough to be mounted under the dash or close to the driver. A good ground connection is important, which should be to the battery ground busbar if possible. (See Figure 3.)



## Base Antenna

In any communication system, the effective range of operation depends on the transmitter power output (RF amplifier power in watts), the type of modulation (AM or FM), the operating frequency, the sensitivity of the receivers, the antenna elevation and the terrain at the base station. Good terrain and an antenna elevation well above any nearby intervening obstructions will produce clear communications between the dispatcher and the vehicles within a radius of ten to thirty miles with ordinary equipment. This is suitable for a D.A.B. system, where the range of operation is restricted to a small service area.

Since the range of a radio system is limited by the "radio-horizon" as seen from the antenna, the performance of a communication system will depend partly on the antenna elevation at the base station. The antenna may be located:

- (a) On the roof of the base station and dispatching centre. This is satisfactory for a relatively small service area.
- (b) On a specially constructed communications tower. This is expensive but frequently employed.
- (c) On the roof of an elevated building. In this case a lease must be signed with the building's owner.
- (d) On a suitably located hill.

The location of the antenna is also important. Areas close to sources of interference should be avoided. Sources of electrical noise, such as high voltage transmission lines, industrial induction heating, neon signs, electric motors, X-ray equipment and other nearby radio systems, may be picked up by the receivers. Special shielding may be needed for the D.A.B. antennae when it is located with police, fire or highway maintenance antennae on the top of the municipal reservoir.

Locally-controlled transmitters which are less than 100 feet from the dispatching control centre, are the most economical. Remote-controlled transmitters are connected by telephone lines, leased from the local telephone company, to a control panel in the dispatching control centre.

## Selective Calling System

A selective calling system allows the dispatcher to communicate with a single mobile unit or all the units simultaneously. Thus operators do not have to be distracted by conversations in which they are not concerned.

This equipment permits the dispatcher to transmit a coded signal by means of push-buttons or a telephone dial. Each receiver has its own code and, when it is called, the decoder circuit triggers a bell and/or flashes a lamp. Leading manufacturers of vehicular communication equipment offer such selective calling devices as accessories for their own radio equipment.

The two commonly used techniques in selective calling are tone signalling and digital signalling.

Tone signalling consists of transmitting a continuous audio frequency or "tone", superimposed on the transmitted carrier wave for a specific period of time, in order to activate a one receiver system. A system activated by a sequential two-tone code reduces errors. Operation experience with tone signalling in Ann Arbor and Haddonfield has proved unsatisfactory, because it is not responsive enough for the dispatcher, as the time lag is too great. It was abandoned in both cases.

Digital signalling involves the sending of a train of pulses coded for the particular receiving unit desired. In the past, tone signalling was considered more reliable but, with the development of better computer communication methods, digital signalling is gaining in popularity. This has not yet been tested for D.A.B. applications; however, new lower cost hardware is currently available which seems worth testing.



## Noise Squelch

In the absence of a selective calling system, a noise squelch feature facilitates communications. A noise squelch is a circuit in the receiver which increases the audio amplifier gain when a signal is received, and which decreases the gain when no signal is present, thus lowering the noise level.

A tone squelch keeps the gain low until the carrier radio frequency, modified by a sub-audio tone, is received. The Sub-audio-tone activates the tone squelch in a receiver, providing remote control by the transmitter of each mobile unit's receiver.

## ITEMS TO BE COVERED IN SPECIFICATION OF A TWO-WAY RADIO SYSTEM

### 1 BASIC SYSTEM CONFIGURATION

- Modulation (usually FM)
- Radio Link (simplex/duplex)
- Frequency band (usually VHF/UHF)
- Frequency in MHz (allocated by Ministry of Communications)
- Type of Selective calling
- System capacity
- Components of base and mobile units

### 2 BASIC RADIO SYSTEM SPECIFICATION

#### PRIMARY BASE STATION COMBINATION

- Type of mounting
- Type of control (local/remote)
- Type of squelch system
- Cabinet - construction characteristics
- Electrical supplies and voltage variation
- Carrier frequency (stability/adjustment)
- Antenna relay
- Instruments (test set/clock etc.)
- Transmitter power

#### SECONDARY BASE STATION COMBINATION

Same as primary base

### SELECTIVE CALLING SPECIFICATIONS

- Type of signalling
- Adaptation to primary/secondary base capacity
- Actuating device (push button/dial)

### ANTENNA & SUPPORTING STRUCTURE SPECIFICATIONS

- Radiation pattern and gain
- Band width
- Transmission line characteristics
- Responsibility for construction
- Lightning protection

### MOBILE RADIO SPECIFICATIONS

- No. of units
- Type of control heads (handset/microphone/headset)
- Frequency in MHz
- Physical characteristics of radio unit
- Security arrangements
- Hardware installation
- Electrical supply (voltage, amperes)
- Transmitter power
- Turn-on time (milliseconds)
- Carrier frequency stability (amount of drift permissible)
- Signalling decoders, type and physical characteristics



