Radio License

If there is not a suitable existing license, then a new radio license must be obtained from the Federal Communications Commission. This is time-consuming and can easily get into procedural difficulties if it is not handled by experts.

Critical Paths

The 2 most common critical paths in DRT schedules are the vehicles (specification, bidding, procurement, checkout) and the radios (FCC license, radio manufacture, installation). Both of these paths need to be carefully monitored.

Service Mix

DRT includes a wide range of services (many-to-many, many-to-one, subscription, parcel delivery, shuttle, many-to-few, route deviation, and any mix of these). The mix of services should be chosen after careful consideration of the service objectives and economics. Often, choosing the right mix from the very large number of possible combinations is not immediately obvious, but the wrong mix will be costly and embarrassing to change after service has started.

REFERENCES

4. B. Arrillaga and D. M. Medville. A Demand, Supply, and Cost Modeling Framework for Demand Responsive Transportation Systems. Mitre Corp., Rept. M73-232, Dec. 1973.
5. N. H. M. Wilson et al. Scheduling Algorithms for a Dial-a-Ride System. Department of Civil Engineering, M.I.T., Cambridge, Research Rept. TR-70-13, March 1971.
6. G. J. Fielding and D. R. Shilling. Dial-a-Ride: Opportunity for Managerial Control. TRB Special Rept. 147, 1974, pp. 69-77.

George Gray, Division of Mass Transportation, California Department of Transportation

This paper discusses some aspects of implementing various DRT services, emphasizes funding at the state and federal levels, and reviews what several state transportation departments are doing with respect to DRT.

FUNDING

Identification of federal and state funds for DRT services is almost impossible for 2 reasons: Funding from state sources varies from state to state, and new federal legislation has not at this writing been signed and it is premature to estimate what programs the final legislation may affect.

In California, local funds are available through the state Transportation Development Act of 1971. In Michigan, funds from a special addition to the gasoline tax and some general funds are available for DRT services. Equally as important as having available funds is identifying the need for funds. At present, the tendency is to find a program to go with available funds, whether the program has high priority or not. What we really need to do is to establish the need for service and then work with state

administrations to obtain funds to meet that need.

In California, we are at work now on establishing those needs. The legislation that established the California Department of Transportation also called for development of a state transportation plan. The first part of this plan will identify our needs for public transportation. The plan is being developed with input from the local governments. Some of the areas, especially the smaller urban or rural areas, may be overly cautious in their needs for public transit, but the process for producing the plan is continual, and we already see an increased awareness of transit needs.

Federal funds through UTMA are mostly concentrated in the capital grants program. Since regular DRT service has gone beyond the demonstration phase, funds through that channel, I think, will be hard to justify. Funds for operating and capital expenses are available through other federal programs such as Title 3 of the Older Americans Act.

These various programs are quite detailed and complex. For instance, capital assistance funds from UMTA for nonprofit, private organizations are available on an 80-20 basis to provide service designed predominantly for the elderly and handicapped. This program (known as 16b2, after the Federal-Aid Highway Act of 1973 amendment to the Urban Mass Transportation Act of 1964) is an excellent example of the tendency to establish a program to fit the fund.

GROUPED SERVICES

I want to emphasize the importance of combining services. At present, we have programs to provide mobility to the elderly and to the handicapped, to provide hot meals, and to provide transportation services as part of a variety of subsidized social programs. Often these services operate in competition. One of the great advantages of DRT service is that it is flexible enough to meet the needs of almost all of these programs. Only when there are heavy volumes and common trip ends do fixed-route systems enter the competition. Grouping services can potentially reduce overall transportation expenses in many areas.

MARKETING

DRT can serve a variety of riders, but the market segments must be identified and then the service marketed to that segment. In doing so, community support can be increased. You can easily show the garage owner that DRT not only provides good transportation to those who leave their cars for repairs, but costs the garage owner less than having a garage employee transport them. This leads to the second point. Decision makers will back a system—even if it is costly—as long as it has community support. University student groups, PTAs, chambers of commerce, and social, service, and conservation groups are examples of potential supporters. Our goal should be to implement a service for which there is a waiting market for the product, not to create a service and then look for a market.

Successfully selling an operating system, especially a DRT, also depends largely on employees, especially the drivers. They are the best market developers. A happy, helpful, courteous driver can attract ridership, and the opposite can certainly lead to disaster.

INSTITUTIONAL CONSTRAINTS

Institutional constraints should be identified, understood, and dealt with before service is implemented, if at all possible. Artificial barriers such as city limits and county lines do not always coincide with logical service areas, but they can limit service. Users are not aware that and do not always understand why institutional constraints prevent the provision of reasonable service.

COST OF SERVICE

Often we fail to identify the real cost of transportation. The perceived cost of automobile transportation is low; the true cost is unknown. The cost to the responsible agency of public transit is easy to identify, but the hidden cost (usually a negative value, i.e., a cost of not having the service) is not easy to identify. Nationwide, at any one time, about half of the population cannot be served by the automobile. Among this 50 percent are people who cannot get employment, cannot get to the doctor, and so on. The point is that the lack of transit service may be the reason that some are on relief. What then is the cost of not having a transit system? Public transit seems to cost a lot of money, but in almost all cases the alternative may cost society a great deal more. We have reacted to the perceived cost and ignored the other costs. We are now beginning to credit transit for reduced pollution and congestion and increased energy efficiency, but we still are not looking at the total costs.

STATE TRANSPORTATION DEPARTMENT ACTIVITIES

Of the 26 existing state transportation departments, about half have major units that have public transit responsibilities. Few have active DRT programs. Many provide technical assistance to agencies within the state. In most cases, this includes feasibility studies of possible implementation sites.

Most state transportation departments are still defining their role in public transit. This role is made more difficult by the relations that already exist between local and federal governments. In the past, state governments generally have been hesitant to aid local governments in developing solutions to public transit problems. That void was filled by federal involvement and programs. Now, for the states to establish a role, the previous relation must be changed.

Public pressure to develop new policies in relation to clean air, urban sprawl, noise, mobility for those without it, and resource conservation is forcing changes in public transportation. To be responsive to these types of issues and carry out other responsibilities, states must develop equitable allocation of state and federal pass-through funds, coordinate public services, and provide technical assistance. In other words, the states must become more involved and more active.

In preparing this paper, I contacted staff members of 17 states that are most apt to be involved in DRT activities. I received information from 11; only a few are directly involved in DRT. Of those, the following 4 examples illustrate the range of activities that state-level organizations can be expected to be involved in.

Oregon

In 1973, Oregon established a cooperative program (known as the Special Transportation Program) to improve mobility for disadvantaged in 6 areas of the state. Funds from federal programs were combined with local and state funds. Three demonstration projects resulting from this program involve DRT service.

1. In Albany, a combined fixed route-route deviation service (by telephone request) has been established. The goals of this project are to use private enterprise such as taxi service to provide demand-responsive service, establish problems and solutions involved in intergovernmental multiple funding, and group social services to minimize costs.
2. In Columbia County, a system that serves senior citizens is operating (it was in existence before the state program but is continuing with state assistance). This service operates buses primarily in rural areas (only one city in the county has a population of more than 5,000). Highly personalized service is provided for the senior citizens, who represent almost 12 percent of the county's population. Use of the service is via reservations through senior citizen centers. Donations are collected and fund-raising

activities are used to augment the local share of costs (community support!). Funds from the state and Title 3 of the Older Americans Act provided for the costs of the program.

3. In the Portland area, about 12.7 percent of the population is in the elderly category. A project here attempts to coordinate several separate systems that already provide service for the elderly and handicapped. The object is to demonstrate the effectiveness of maximizing the use of these services. In 6 months of operation, the project has more than doubled its projected ridership. It now serves about 4,000 riders monthly, and agency participation has greatly increased.

Data on these 3 systems are given in Table 3. In addition, the state is quite active in marketing these services to maximize ridership and fare revenue.

Florida

Florida's Division of Mass Transit Operations is involved in a number of projects to improve systems in that state. It has a cost-sharing program in which 10 to 100 percent of costs are funded depending on the project (generally, it is one-half of the non-federal costs for local programs). At present, no DRT system exists in the state. A transportation of the elderly (TOTE) demonstration program is in operation in St. Petersburg. It is identified as a modified door-to-door, non-fixed-route, subscription, demand-responsive system. It began operation in September 1973, uses 13 special vehicles, and basically provides mobility for the elderly and handicapped. A full DRT system is being planned for St. Petersburg in an area not easily served by a fixed-route system.

Wisconsin

The current budget for the Wisconsin Department of Transportation includes funding for 2 state transit-aid programs. The first of these provides $5 million for operating assistance and $2 million for planning and demonstration projects. Under the second program the first demonstration project is to be a DRT system in Merrill. The city will provide 10 percent of the funds and will be eligible for operating assistance at the end of the 1-year demonstration.

One of the objects is to study the feasibility of consolidating the transportation services currently provided in that city. Estimated cost for 1 year is $170,000. In the October 1974 issue of Wisconsin Urban Transit Trends, the project is discussed as follows: In addition to providing benefits to Merrill, this project will give department staff first-hand experience in the design and operation of a demand-responsive transit system. This will enable DOT staff to respond to requests by other systems throughout the state for assistance in analyzing the feasibility of similar systems. Although there are demand-responsive transportation services being provided to the elderly and handicapped in other parts of the state, the Merrill project will represent the first demand-responsive system open to the general public in Wisconsin.

Table 3. Demand-responsive transportation projects in Oregon.

Item	Project 1	Project 2	Project 3
Funding, dollars			
State	18,279	34,638	45,000
Local	31,862	14,831	22,609
Federal	22,976	11,356	36,578
Total	73,117	60,825	104,186
Miles operated/month	2,600	55,523	–
Riders/month	1,687	–	–
Operating costs/mile, dollars		0.196	
Cost/passenger, dollars		2.50	

Michigan

In 1972, Michigan established an assistance program to provide support, improvement, expansion, and establishment of public transportation systems in that state.

Included are 3 types of projects: operating assistance, demonstration, and capital. Under this program, 100 percent funding can be provided by the state from gasoline tax sources.

The revenue source provides about $20 million per year in a state General Transportation Fund. Fifty percent of this amount goes directly to metropolitan areas with public transportation services. Most of the rest of the funds are for state-established demonstration projects. Of the programs thus funded, the one of particular interest is the Dial-A-Ride Transportation (DART) Program. This program is designed to provide basic transportation services in nonmetropolitan areas of the state. Door-to-door, shuttle-bus service between major traffic generators, charter service, and package delivery or combinations of these are allowed.

The first Michigan DRT service was established in September 1971 in Ann Arbor, before the DART Program began. Since the DART Program, DRT service has expanded considerably. For instance, in the first year, service was implemented in 8 cities with populations ranging from 9,000 to 35,000. At the end of 1974, 9 cities had DRT, and 9 others expected to have it by the middle of 1975.

During the first year of operation, the state pays all the capital and operating costs except for a local $1,000 commitment. After the first year, the state continues to provide about 30 percent of the operating cost of the systems. The estimated costs for the first year for the typical installation is $175,000, which provides for four 12-passenger vehicles with radios operating 60 hours per week each. The typical fare is 50 cents; senior citizen fare is 25 cents. Each of the DART cities will soon be equipped with a vehicle designed for providing service to wheelchair users.

Another Michigan program is the Small Vehicle Acquisition and Operating Assistance Program. This program is intended specifically to provide for obtaining equipment and operating assistance for both new and expanded existing systems for cities and rural areas where small vehicles are appropriate. Under it, programs to continue the original DART projects to complete the 12-month demonstration program are eligible for funding.

An experimental bus project in connection with DART is under development. A variety of small buses will be placed in service and tested.

California

In California, the transportation department has no direct involvement in DRT services. It does act as a clearinghouse for information and provides technical information on such services. The California Transportation Development Act of 1971 provides funds to local agencies to provide for public transportation or, if there are no unmet transit needs that can reasonably be provided, to be used for road and street projects. In a few instances, these funds are being used or planned for use to provide DRT service. But this is a local program, and the state is only involved in administration of the funds.

We are currently involved in identification of transit needs—both in the planning effort associated with the state transportation plan and in separate studies. With information from these sources, we will work to develop other fund sources.

ACKNOWLEDGMENTS

My thanks to those who provided information for this presentation, especially, Dennis Moore, Oregon Department of Transportation; Bill Fowler, Florida Department of Transportation; and Governor Grimes and Gerald Geile, Michigan Department of State Highways and Transportation.