RIDERSHIP

In Rochester, ridership continued to increase before, during, and after the fuel shortage. Since the system started on August 6, 1973, its weekly ridership has increased from 714 to 3,900. Integrating DRT and the fixed-route systems indicates that as many as 30 percent of the former riders on a fixed-route line can be diverted to the demand-responsive system while a substantial number of new riders can be attracted who did not previously use the fixed-route system.

COST PER PASSENGER

Inflation during 1974 has increased costs of both DRT and fixed-route systems. Nevertheless, improved use of manpower and equipment has resulted in progressively decreased operating costs per passenger for the Rochester DRT system. The cost per passenger was $5.00 during the first month of operating in August 1973 and $2.54 during August 1974.

THE FUTURE

DRT systems in small communities have proved that they have a role in the total transportation system. I believe that small DRT systems will continue to be implemented in increasing number. Much remains to be learned of the role that larger systems in metropolitan areas can play. Automation will permit large systems to be integrated with fixed-route transit.

E. W. Ziegler, Urban Mass Transportation Administration

Most DRT systems have been small experimental projects to introduce the concept to a locality or to test techniques. These projects have provided an improved view of the role of DRT service in large transit systems. Operating and planned DRT systems indicate that those systems can substantially augment fixed-route service in suburban metropolitan areas. DRT systems provide better local transportation service and, as a feeder to express bus service, lead to increased transit ridership and lower operating costs. The use of DRT for feeder distribution service is likely its largest future role.

When DRT and line-haul services are mixed, each service is used at its best: DRT in areas where origins or destinations are scattered and fixed route in corriders where there are heavy volumes. The line-haul service can be provided by express buses or by rail rapid cars, depending on local factors such as passenger volume and funding availability. Interconnecting DRT service areas will provide accessibility via transit to all points in suburban areas.

Integrated DRT and fixed-route systems facilitate phased introduction and improvement of transit systems. DRT service can bring transit service into new areas quickly. As ridership and vehicle supply grow, buses can be moved to dedicated lanes to increase capacity and, later, dedicated lanes can be changed to dual mode where additional capacity is needed. Concurrently, planning and construction of rail lines and, as appropriate, personal rapid transit can take place for high-volume areas. This approach should be useful in widespread metropolitan areas such as Los Angeles.

Economically, a transit system with both DRT and fixed-route service should be stronger than one with either type of service alone. DRT feeder service facilitates access to fixed-route, line-haul service and allows more efficient operation by reducing the number of fixed-route vehicle stops. Integrating DRT service into a larger system provides management flexibility: Demand for DRT service peaks much less than demand for line-haul service, and line-haul drivers can be used in DRT vehicles during off-peak hours and thus reduce total costs significantly.

Passenger origins and destinations in suburban areas are not like those in corridors. In these areas, door-to-door service is attractive, particularly for senior citizens and the handicapped who depend on transit for mobility.

DRT service has been effective in raising local funds for transit operations. In Ann Arbor an increase in the property tax rate was approved by ballot, and in California local allocations of revenues from a gasoline tax are being used. DRT systems have been most successful in areas where fixed-route service has been least successful, i.e., the suburban areas in which about half the population lives. The improved efficiency of DRT service is most evident in Regina, Saskatchewan, and Batavia, New York, where its introduction increased transit ridership and decreased the operating subsidy of the systems. DRT and fixed-route systems cost about the same to operate on a vehicle per hour basis. The major operating costs of each are in drivers and vehicle-related factors such as maintenance, storage, and fuel. However, DRT requires fewer vehicles because passenger origins and destinations are known so that vehicles can be used more efficiently.

The operating costs of DRT service can be tailored to the services desired and the availability of funds in each area. Raising the fare or decreasing the size of the service area reduces the number of vehicles needed and the cost of system operation. Conversely, lowering the fare or serving a larger area increases the number of riders but also increases the operating subsidy.

In Orange County, California, the county transit district plans to offer each city a base-level DRT service. The base service will feature a medium to high fare, less than 24-hour service, and a specified service area. If a city wants better service or lower fares, the transit district will provide the improved service but the city must provide the incremental funding.

One of the results of the research and development program of DRT systems is a better understanding of the diversity of scheduling methods. These methods include the following:

1. Shuttle service in which vehicles move back and forth between a few points and are coordinated by radio communication;
2. Zonal service in which fixed schedules are maintained at a transfer point, often a line-haul interconnection, and each bus stays within a fixed zone until returning to the transfer point;
3. Subscription gather service in which passengers are picked up at the same time each weekday and brought to a line-haul transfer point;
4. Scatter service in which passengers at a high-volume inbound point, such as a rail rapid station in the evening, are taken to diverse destinations; and
5. Many-to-many service in which a passenger can be picked up at any point and delivered to any point without a transfer.

Any one of the scheduling methods can be the best under particular circumstances. The factors that affect the choice of scheduling methods include demand levels, demand patterns, and local priorities. For example, zonal scheduling provides efficient service when relatively heavy demand is focused on a major trip generator. Some factors, such as the demand pattern, are subject to management control. In Haddonfield, New Jersey, service was improved by instituting a shuttle service between 2 major trip generators, a rail rapid station and a large shopping center. This allowed the system to operate as a feeder distribution service focused on one point, the rail rapid station; the shuttle provided service to the shopping center.

The optimal scheduling method is likely to involve a combination of the various methods, and the combination will change with circumstances. On Sunday in Haddonfield demand is relatively light and has little focus, so many-to-many scheduling is used throughout the day. On weekday evenings a large number of trips originate at the Cherry Hill Mall shopping center and at the rail rapid station. During this period shuttle service brings passengers from Cherry Hill Mall to the rail station, scatter service takes those passengers and incoming rail passengers to their destinations, and many-to-many service carries passengers with origins other than the rail rapid station. Throughout the evening individual vehicles shift among shuttle, scatter, and many-to-many services as needed.

The research and development program is identifying improved techniques for determining the most appropriate mixture of scheduling methods under various operating circumstances. These techniques can be expected to result in further improvements in the operation of DRT services. Quantification of the techniques will enable decisions to be incorporated into the computer system. These decisions will improve the ability of the computer system to support the operations manager, either by providing data needed by the manager to select the scheduling methods or by selecting the scheduling methods for review by the manager.

In summary, DRT fills a gap in current transit systems by providing effective and efficient suburban service. These services should be an integral part of a metropolitan transit system and should be closely coordinated with fixed-route, line-haul service. Such a coordinated system can provide comprehensive transit service between various suburban areas as well as between suburban areas and the central business district. Operating economies can be realized by combining DRT and fixed-route services. DRT provides better suburban service. Fixed-route drivers can be used on DRT vehicles in off-peak hours to reduce total system costs. Origin-destination data collected as a by-product of DRT operations, particularly computer-based operations, can contribute to a better use of vehicles and drivers in both types of services. Also, those data are useful in transit planning. The origin-destination data can replace information now collected in surveys, a major expense in transit planning studies.

A diversity of DRT scheduling methods have been identified. Research and development is in progress to determine the best combination of scheduling methods under a variety of operating circumstances. Identification and quantification of formal techniques to select scheduling methods will further improve the operating of transit systems.

Charles Boynton, Salt Lake City Taxicab Association

The International Taxicab Association is an association of taxicab owners and operators in the United States, Canada, and Mexico. During 1974 I was president of that association and gave to its members the message that is in this paper.

During the past few years, the taxicab industry has come a long way. A few first-order problems involving our industry, government, and consumers at all levels remain and must be resolved before we can make further progress.

The major issue facing the taxi industry today is clarifying its overall role in the urban passenger transportation system. If that were done, intelligent goals could be identified and more coherent policies developed. The issue is not just a taxi industry issue. We would be naive to assume that we could make this decision by ourselves. Urban planners, local governments, and federal agencies make decisions every day that affect what we do. They do not deliberately try to influence our future; as they carry out their legal and administrative duties, we are affected. Certainly the EPA clean air standards will have a major effect on us.

Clarifying the taxi industry's role is important because it has financial consequences to us and the communities we serve. It is also important because service standards are included, and thus the quality of transportation is affected. The future urban transportation system may have no taxis, nothing but taxis, or a certain number of taxis; each plan will create a different kind of situation.

I should like to discuss the urban public passenger transportation system, make a proposal, and ask for the help of others involved in solving urban transportation problems. Our industry has a duty to provide input to the solution of these problems, and we are trying to do just that.