

to accommodate those needs.

2. After the requirements of a system have been identified, determine a financial plan. Modifications of desires to fit available funding may be necessary in terms of not only capital acquisition needs but also operating costs. In all but a few unique instances, systems touted to pay for themselves from the fare box have been a fiscal disappointment. Be prepared to subsidize the operation.

3. Understand that time and money invested in a marketing and advertising program will be returned, with dividends, in terms of patronage, revenues, and public support.

4. Develop a sound personnel recruitment, training, and management program. This will ensure an efficient operation, satisfied employees, and a good image with the community.

5. Select equipment and plan maintenance carefully. Unless vehicles, radios, and other equipment are adequate and reliable, the operation will suffer.

6. Develop sound accounting and reporting procedures to prevent losses and to monitor system efficiency.

7. Do not go to computer control unless it is needed. If a manual system provides fast and efficient delivery of customers from point A to point B, then the goal is achieved. But if a computer is needed, evolve the manual system to computer control over time.

8. Do not expand too fast. The initial success of a small system may lead to service being overextended. As a result, costs can increase beyond budget limitations and level of service will fall. The system will be less attractive and therefore less used. Be realistic, identify needs and inventory various opportunities to provide service, take time to identify the system that best serves the needs, develop surveys and preservice information to determine potential levels of use by various market groups, evaluate funding capabilities, seek financial sources, and perhaps contract operators to operate the system.

9. Seek professional help if you are uncertain about your abilities to achieve these things. There is nothing more embarrassing than to move forward with a visible public program only to see it fall because of inadequate planning or inept management. A realistic program, well thought out, funded, and instituted will in the long run better serve your needs and reflect well on your planning wisdom.

## REFERENCES

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The first step in implementating a DRT system is to establish goals and objectives.

Why is that important? If your goal is simply to run buses, then the system planner and designer will produce a much different system than if the goal is to improve the environment or to reduce the number of cars per household or to transport senior citizens at low fares. Goals should be specific, and objectives should be set to measure goal achievement. As consultants, we insist that transit districts or communities have goals; otherwise, we cannot design systems for them. Goals affect the number of vehicles, the way people are trained, and every aspect of the operation.

Program management is also extremely important. A single person should be accountable and responsible for the planning and design of the DRT system. That person will of course be supported by a number of people. The job of program management should not be given to an assistant clerk because he or she is the only one who has the time to do it. The program manager should be at a high level in the organization and be able to make decisions (because there will be a lot of decisions to make) and to report directly to the transit agency or the community or the city council or the mayor. The program manager must understand the goals and objectives and ensure that they are met in the planning and designing of the DRT system.

Planning can be thought of as part of system design, but system design also includes determining hours of service, fare collection methods (credit card, cash, or tickets sold on the outside), type of control system, location of the control center (in La Habra and La Mirada, the control center is in the city administrative building, where it is highly visible), and areas of high ridership potential. Signs, benches, shelters, and curb painting must be considered during system design.

Point-to-point travel times must be determined. Typically a demand-responsive vehicle will move at about 12 mph (19 km/h) while making pickups and deliveries, depending on the type of area. La Habra has a grid street pattern and many through streets, both north and south and east and west, and is ringed vertically by 4-lane, 40-mph (64-km/h) arterials. Buses can move quickly in this city. La Mirada, on the other hand, was designed as a city of cul-de-sacs to keep traffic out of the neighborhoods. Vehicles have more difficulty moving in that city.

Hills, a freeway splitting the city, and railroad tracks bear on the design of the system and the number of vehicles. If there are 2 cities of equal size but one of them has hills, dead-end streets, and a railroad track through its center and another has a perfect grid street pattern, more vehicles will be required in the hilly, less accessible city for the same level of service.

The most difficult time for sustaining public support is during the lapse between the time the decision is made to institute a DRT system and the time the buses start running. That lapse can be 3 to 6 or even 9 months, particularly if buses must be purchased. Newspaper coverage is important during this period to keep the public informed and interested.

Local business managers, taxicab operators, and private transit system operators should be included in discussions of the DRT system from the outset. The taxi operator has expertise in this kind of service, and business managers may help support the system with money or buying tickets.

The capital costs of most DRT systems are covered by matching grants. A serious question then becomes, Where is the money to operate the system to come from? Only about a third to a half will come from the fare box. There are a number of sources of funds for system operation, but they should be explored before service is started.

During the implementation phase, marketing and sales promotion are important. The project manager should talk to all of the service clubs, schools, and other groups about the system, how it works, and how it will affect the community.

Also during the implementation phase control procedures will be carried out and control personnel selected and trained. Spatial perception tests are useful in the selection of these employees, for they must make judgments based on different points in space. They have to visualize where the bus is, where it is going, and what stops it will make en route. Simple clerical tests that are nondiscriminatory in both language and intent are also useful in hiring control personnel.

Depending on the size of the system and the complexity of the area, demand-responsive transit can become an excellent planning tool for other modes of transit

because data from the demand-responsive transit will reveal when and where people move. In large and dense areas, demand-responsive transit can help in determining where corridors should be for fixed-rail routes.

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I want to discuss how to obtain federal money for use in implementing a demand-responsive transportation system. The principal program is the Capital Grants Program of the Urban Mass Transportation Administration. Under that program eligible communities can obtain 80 percent of the funds for all capital equipment and facilities necessary for demand-responsive transit systems. That includes buses, maintenance facilities, the land for the maintenance facilities, control room equipment, radios, shelters, and signs. The other 20 percent must come from local sources.

Funds are also available from the Federal Highway Administration. The Federal-Aid Highway Act of 1970 made some changes with regard to the Highway Trust Fund. Money is set aside in that fund for the Interstate Highway System. If the community decides it no longer wants the Interstate Highway, it can seek to get those funds for transit use. The procedures for doing that are not yet clear, but the intent of the law is that the funds can be used to procure capital equipment.

The Mass Transit Assistance Act of 1974 sets aside approximately \$12 billion for public transit. Of that amount, some \$8 billion is for capital equipment and \$4 billion is for operating subsidies. Communities may borrow capital funds for use as operating funds if they choose.

The guidelines for applying to the Federal Highway Administration have not been promulgated as of this writing, but they will likely be similar to those of the Urban Mass Transportation Administration. In general they involve the submission of a preapplication that briefly describes the program and the amount of money needed. UMTA judges the preapplication and checks to see that the planning requirements have been met not only at the city level but also at the county or the regional level.

If the judgment is favorable, the application is submitted that describes in some detail the equipment and facilities, the expected cost, and the benefits to the community, the users, and the operators. In addition, the application must describe in some detail the system, the kind of operation, and its relation to other modes of transportation in the community.

UMTA must also be given a 5-year financial plan that includes a 5-year capital improvement program indicating how the system will be supported, how it will be expanded, and how equipment will be replaced.

An environmental impact statement must also accompany the grant application.

Before the application is submitted, a public hearing must be held, which requires that notice be posted 30 days before the hearing is held. The proceedings of the hearing and the notice of the hearing must be incorporated in the application.

Section 13-C of the Urban Mass Transportation Act provides that UMTA cannot grant money to any community in which those funds would adversely affect labor. A copy of the preapplication, therefore, goes to the U.S. Department of Labor, which makes an assessment of whether labor will be adversely affected. I suspect that what is most often done is that the local transit union is asked, "Do you think that this is going to adversely affect you?" If the answer is "yes," the application is likely to be in trouble. Communities would do well to clear their DRT plans with the local transit union and with the Department of Labor.

These requirements are all outlined in an UMTA manual, External Operating Manual, which is available from the Office of Public Affairs.