

Public Transportation in the 1980s: Responding to Pressures of Fiscal Austerity

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Fiscal austerity is a growing reality for an increasing number of public transportation agencies and may become the dominant factor shaping the evolution of the transit industry in the 1980s. The purpose of this paper is to look at how transit agencies are responding to these financial pressures and to examine the likely implications of these trends. An extensive telephone survey was conducted of general managers in 30 transit properties in order to assess the current financial state of the industry, to identify the financial pressures and options as viewed by top management, and to determine future directions that will be followed by local officials. The survey results showed a substantial number of agencies already financially constrained. These agencies have used five basic types of actions to respond to these financial pressures: (a) raising fares, (b) reducing levels of service, (c) reducing costs through labor negotiations or staff reductions, (d) seeking increased public funding, and (e) improving the efficiency of providing service. The survey raised questions as to the extent that fare increases can be used to respond to financial pressures, the role of states in the process, and the criteria used to reduce service. The study concludes that fiscal austerity is most likely a long-term trend for many agencies and would require a reevaluation of agency goals; a reassessment of various tasks, in particular marketing and service planning; and considerable thought to the issues of strategic planning and the improvement of efficiency.

Recent trends in the cost and finance characteristics of public transportation present some ominous signals of the difficulties that transit agencies might face in the 1980s. Capital and operating costs continue to rise at rates greater than inflation. Many local governments, constrained by the poor state of the economy, are having difficulty finding the resources needed to continue transit subsidies. In addition, the Reagan Administration has proposed serious cutbacks in federal assistance. How serious are these trends for transit? How would they affect various tasks involved in providing transit service? How can agencies respond to these fiscal pressures? And how do general managers view the constraints and options that affect possible agency response to these pressures? The purpose of this paper is to focus on these questions, gain insight into the current state of the industry as seen from the perspective of the general manager, and discuss some of the management implications of these trends and the way they are being handled.

RESEARCH METHODOLOGY

Answering the questions posed above required that personal contact be made with high-level management in a cross section of U.S. transit agencies. The most effective means of doing this was to undertake an extensive telephone survey of transit general managers. Such a survey was structured to allow a broad look at the transit industry and to determine its status prior to the possible implementation of cutbacks in Section 5 operating assistance. Clearly, the general manager's perspective on the constraints and options being faced was important, since in most cases the general manager was the key actor in responding to financial pressures. Also, from the view of this research, the manager was probably the best individual from whom to obtain information, given his or her knowledge of both the transit organization and the agency's institutional environment.

Telephone interviews were conducted with the general manager in 30 transit agencies, a sample that represented a broad spectrum of medium-sized agencies (100 to 1000 vehicles). The following transit agencies were surveyed:

1. California: San Francisco Municipal Railway, San Diego Transit Corporation, Santa Clara County Transportation Agency;
2. Colorado: Denver Regional Transportation District;
3. Connecticut: Connecticut Transit, Hartford Division;
4. Florida: Jacksonville Transportation Authority, Metropolitan Dade County Transportation Administration;
5. Georgia: Metropolitan Atlanta Rapid Transit;
6. Indiana: Indianapolis Public Transportation Corporation;
7. Maryland: Mass Transit Administration of Maryland;
8. Michigan: Southeastern Michigan Transportation Authority;
9. Minnesota: Metropolitan Transit Commission;
10. Missouri-Illinois: Bi-State Development Agency;
11. Missouri-Kansas: Kansas City Area Transportation Authority;
12. New York: Niagara Frontier Transportation Authority, Rochester Regional Transportation Authority;
13. Ohio: Cleveland Regional Transportation Authority, Queen City Metro, Central Ohio Transit Authority;
14. Oregon: Tri-County Metro;
15. Pennsylvania: Port Authority of Allegheny County;
16. Tennessee: Memphis Area Transit Authority;
17. Texas: Dallas Transit, Metropolitan Transit Authority (Houston), VIA Metropolitan Transit Authority;
18. Utah: Utah Transit Authority;
19. Virginia: Tidewater Transportation District Commission, Greater Richmond Transit Company;
20. Washington: Metro Seattle Transit; and
21. Wisconsin: Milwaukee County Transit System.

Each general manager was asked questions in three topic areas:

1. Background information: Questions were asked concerning specific tasks, such as planning (size of planning staff, types of service standards used, organization of route evaluation); marketing (marketing tools, public participation process, existence of system map); and operations (last strike, use of part-time labor, management-labor communications). Other questions sought to give a picture of ridership and agency structure (institutional arrangements and organizational structure). All this information was to help supplement information collected from printed sources (1-4).

2. Financial issues: Questions concerning the existing financial condition and its likely evolution were asked. Questions were asked concerning current fares, recent fare increases, formal fare policy, breakdown of revenue sources, existence of dedicated taxes, prospects for new sources of funding, and future constraints.

3. Issues relating to operating under fiscal constraints: Areas examined were recent or future service changes, efforts to improve productivity, and actions taken to otherwise reduce costs.

In the rest of this paper, the survey concerning the sources of financial pressure and the types of responses being pursued by transit agencies will be presented and the issues they raise discussed.

SOURCES OF FINANCIAL PRESSURE

One of the underlying assumptions of this study was that transit agencies were facing significant financial pressures and that specific steps were being taken, or were at least being contemplated, by transit managers in response. In order to put a particular agency's response in perspective, a brief assessment had to be made of the specific financial pressures facing that agency. For this purpose, the assumption was made that costs were fixed in the short run and that the financial condition of an agency could be assessed by determining whether revenues were sufficient to meet the given level of expenditures and then by identifying the pressures on the various revenue sources.

The results of the survey show that the financial situation varies tremendously from agency to agency in terms of whether the system's financial situation is healthy, currently stable, dependent on outside events, or severely constrained. One-third (10) of the managers felt that their situation was currently stable and that they would not have financial problems in the short run. One of the following three reasons was usually given for the belief of stability: (a) large contributions from sales tax revenues (usually in areas experiencing high rates of growth), (b) exceptionally high operating ratios (i.e., that proportion of costs covered out of fare-box revenues), and (c) extremely diversified funding sources. However, only 4 of these 10 systems appeared capable of facing Section 5 cutbacks without some response to this funding loss.

Of those systems whose general manager expressed concern about their financial status, the most frequent cause was the shrinking revenues from a major dedicated tax (sales, property, earnings, gasoline). This was affecting 10 properties and ranged from situations in which sales tax revenues grew last year at a pace slower than anticipated, creating minor shortfalls, to one in which the growth rate of the dedicated tax has been consistently under the inflation rate for several years, causing any previously accumulated surplus trust funds to be at the point of exhaustion. Several managers felt that dedicated taxes were no longer a guarantee of financial stability. Sales and earnings tax revenues were being affected by the recession, and revenues from gasoline taxes were reduced because of gains in fuel conservation and automobile efficiency.

Other problems cited involved the poor financial condition of major financial contributors to a transit agency, e.g., states (two systems), counties (one system), and municipalities (four systems). Finally, in three cases, the financial condition of the system depended on outside events that would be resolved in the near future, e.g., suburban communities refusing to renew service contracts, current contract negotiations, or the expiration of a dedicated taxing authority.

The information gathered from the survey concerning major sources of revenues is outlined below:

1. Fares: average contribution, 41 percent (range 15-66 percent); less than 25 percent, 3 systems; more than 55 percent, 3 systems;
2. Section 5 funds: average contribution, 18 percent (range 4-30 percent); less than 12 percent, 4 systems;
3. State operating assistance (≥ 10 percent of agency revenues), 13 systems;

4. Dedicated local taxes: sales tax, 11 systems; property tax, 2 systems; earnings, payroll, license fee, 3 systems;

5. State aid and dedicated taxes, 5 systems; and

6. Only federal and local general revenues, 6 systems.

Fares are still the predominant source of revenue (on average covering 41 percent of costs), although there is a fairly wide variance concerning its exact contribution. Section 5 operating assistance is also an important source of funds, although its contribution is much smaller (18 percent) than that of fare collections. These findings are consistent with numbers available from the Section 15 reporting system for fiscal year 1979, which found an average fare contribution for the classes of systems surveyed of 38 percent and an average federal contribution of 18 percent (5).

As for the other sources of revenue, there is a distinct pattern of income coming more frequently from dedicated taxes or state aid than from local governments. Only four systems received income from county general revenues, and nine received municipal operating assistance. Perhaps this ensures some stability since the six systems that received neither dedicated sources of income nor state aid appeared as a group with the most consistently difficult fiscal pressures on them.

RESPONSE TO FINANCIAL PRESSURES

There are five major types of actions that transit officials have used individually or in combination to respond to financial pressures: increased fares, reduced levels of service, reduced costs, increased public funding, and improved efficiency. Each of these five types of action will be analyzed by using the results of the general managers' survey.

Increased Fares

Increasing transit fares was suggested most often by the general managers as the first step in responding to financial pressures. This reflects a general change in perception about the role of fares that seems to be the result of several phenomena. First, there has been much discussion about fares and their direct influence on the industry's decreasing operating ratios. Several managers expressed interest in the concept of user charges and felt that fares should at least keep pace with inflation, and a few felt that transit patrons should be covering a larger percentage of the costs of using that service.

Second, several managers felt that during the last few years great strides had been made in improving the quality (comfort, reliability, and attractiveness) of the service offered, especially when compared with the condition of many private systems that were taken over publicly in the 1970s. These managers argued that in places where the public transit service compared favorably, not only to the previous state of the system but to competing modes, such as private suburban bus or even to the automobile, patrons must become convinced that a quality ride is worth a higher price.

Third, most managers stated that ridership is more sensitive to service cuts than it is to fare increases. Thus, in times of severe financial pressure it is preferable to increase fares rather than cut significant service.

Fourth, it was felt that the general economic picture has made fare increases easier to implement than previously. The recession has reduced the resistance to fare increases. The representatives of those constituencies who use transit heavily have

other issues to defend such as the maintenance of public services, i.e., police, fire, and education or employment. Furthermore, many managers argued that the mood of fiscal conservatism in the country has given more influence to opponents of public service and has created greater pressures for user charges to be increased.

In the first seven months of 1981, 17 of the 30 systems had already increased their fares. Of these 17, 11 had also raised fares in 1980. Eight more systems without fare increases in 1981 had their last fare increase in 1980. Thus, only 5 systems (out of 30) had not raised fares in the last 18 months. The distribution of fares (base fare + transfer) is shown below. The mean fare of the 30 systems was \$0.63.

Fare (\$)	No. of Systems	Fare (\$)	No. of Systems
0.40	4	0.70	4
0.50	5	0.75	0
0.55	2	0.80	2
0.60	6	0.85	2
0.65	3	1.00	2

Some managers suggested that a catching-up process was taking place. This was illustrated by the fact that the mean fare increase over the period January 1980 to July 1981 was 62 percent, implying a 39 percent increase per annum (three times the inflation rate). The average amount that fares increased over that 19-month period was \$0.21. More than half the systems have explicit fare policies where a specific amount of costs must be covered through fares. These dictate, in many cases, fare increases every year. Many managers felt that these fare policies would be shifted upward, increasing the operating ratio to be achieved in the years to come and thus shifting the burden increasingly onto transit riders. The distribution of fare increases over the 19-month period is as follows:

Percentage Increase	No. of Systems	Percentage Increase	No. of Systems
20	2	60	3
25	2	65	1
30	2	70	3
35	1	100	2
40	2	140	1
50	5	200	1

Finally, there appears to be a certain movement away from a flat-fare system. Two agencies (Columbus, Ohio, and Salt Lake City, Utah) adopted a peak/off-peak pricing scheme in 1981. Two other agencies (Denver and Cincinnati) already had such a system. In some cases such a pricing system was justified not only through the potential savings in costs by spreading the peak but through increases in ridership that would occur by tapping a latent market, thus producing a net gain in revenue.

Reduced Levels of Service

Although most transit managers felt that cutting service was much more harmful than increasing fares, it becomes the next option because other potential responses require a longer time to be implemented. It is not surprising, then, that a smaller number of systems cut service than increased fares. Nonetheless, 10 systems had to make significant cutbacks in service miles over the last year, and another 5 were involved in minor cutbacks. Only six systems claimed to be expanding their service, and some of these were in the last stages of a planned growth process. Eleven of the 30 systems did not foresee

cutbacks next year, but many of the others said that it depended on a series of factors whose outcome was uncertain (e.g., the phasing out of Section 5 funds, labor negotiations, and pending state legislation).

In comparison with fare increases, which were being pursued by the vast majority of agencies, changes in service levels illustrate the major differences between agencies. At one extreme, one agency cut vehicle miles by 25 percent in 1981. At the other extreme, one system was proposing to double service miles at the end of its five-year plan. However, more systems were cutting service than adding it, and most managers saw this trend continuing in the future.

One of the most interesting results of the survey in regard to service cutbacks was the process used to choose which services would be curtailed. Few systems had criteria or procedures for cutting service that would enable them to fully evaluate trade-offs. This was primarily explained by the fact that route planning had been geared either to expanding service to new areas or generators or to fine-tuning the service provided on a route to match the demand as it varied by month, by day, or by hour. Cutting service is a recent phenomenon and is a dramatic change from the growth that took place in the 1970s. Most systems seem not to have evolved any policy that makes choices clear, and although many agencies had formal service standards, most used them only as guidelines. A few systems were trying to develop indicators to identify costs of providing service by route but were hindered by the complexity of the data-management process involved. In most cases when cutting service, ridership as expressed by X passengers per hour seemed to be the main, and often exclusive, criterion for analysis. This was used to weed out unproductive routes on weekends or evenings and also served, as one manager pointed out, to eliminate "political" routes. Only a few managers explicitly mentioned trying to take into consideration the existence of alternative service so a minimum of passengers were left completely without service.

When more drastic cuts were needed, transit officials took the ridership-criterion approach a step further and evaluated overall ridership by weekly time periods. A similar pattern of service cuts emerged from systems going through massive cuts: first, owl service was eliminated, then Sunday service, and then night service; then major cuts were made in evenings, and then large reductions were made in Saturday service. When massive cuts had to be achieved and preserving ridership was the primary criterion, this cycle of cutting successive time blocks seemed to be the most convenient method, especially when planning-staff resources were limited.

Reduced Costs

A third option often pursued as a response to financial pressures was direct attempts by managers to reduce their operating costs. These actions, however, usually require a larger time to implement and are of two types: cost reductions through labor negotiations and reductions in staff.

The two principal cost-cutting measures sought during contract negotiations included the right to use part-time labor and the limitation of cost-of-living-adjustment (COLA) escalators. There is a significant move toward part-time labor; 15 systems had already negotiated this agreement with five of these in the last year alone (Muni, Santa Clara, Indianapolis, Southeastern Michigan Transit Authority, and Cincinnati). The usual limitation to the use of part-time labor was that it should not exceed

10 percent of the work force. Opinions varied considerably on how useful it was to the system, ranging from enthusiasm and strong results in systems where the ratio of peak to base ridership was very high to systems that rarely used part-time labor because of training and labor issues. However, all agreed that it did increase the manager's flexibility. Many managers also expressed concern about the cost increases and uncertainty caused by COLA payments. Seven systems had actively sought, in the last year, to cap the COLA escalator during negotiations.

Reductions in the level of service usually translated into reductions in the number of drivers. However, several managers also stated that their staff had been severely reduced, with one agency eliminating 170 staff positions. These staff reductions usually fell hardest on the departments of planning, marketing, and general administration in order to, as one manager put it, preserve "the productive service" of the agency, namely, operations and maintenance.

Increased Public Funding

A fourth option in responding to fiscal pressures is to modify the public sources of income to the system, either by increasing income from current sources or by seeking new sources of funding. During the 1970s this appears to have been the preferred method of dealing with fiscal pressures. This practice was based on the public's perception that after public takeover of private systems (usually financed by new sources of income themselves), there was an expectation that not only should service be improved but fares should also become stable.

However, this situation has changed dramatically, and the very pressures that affect transit also affect its ability to seek increased public funding and even the ability to exchange an inadequate taxing authority (such as property tax) for one that is more sensitive to inflation (sales tax). One-third of the agencies surveyed saw no prospects for changing their current mix or levels of revenue from public sources. Even though one system (Columbus) managed to obtain a new sales-taxing authority through a referendum, nine others lost referenda or legislative battles to change their sources of income. Managers suggested various reasons why their attempts at modifying or increasing sources of public funding failed--the recession, Proposition 13-type mood, the strength of rural or suburban constituencies, conflicts between highway and transit lobbies, etc.

Nonetheless, different types of options were being pursued with some prospects of success. Six agencies were hoping for increased state aid; three others were hopeful about changes in state gasoline taxes that would move from a volume base to a price base. Three others were counting on either new state operating assistance or a local option tax. Other prospects included increasing the local sales tax, creating a downtown transit district, or utilizing new federal legislation on charter operations and leasing vehicles.

In terms of the pressures on existing dedicated taxes and their relation to inflation, it would appear that no single tax is truly adequate. By most accounts, the most reliable tax is the sales tax. However, in many cases, managers stated that revenues produced by it have diminished as sales are affected by recession. Its revenue-producing capabilities were greatest in areas of sustained growth (although in one case this was inexplicably not true). As for revenues produced by gasoline taxes,

the managers noted that they consistently continue to fall as conservation and fuel economy increased. Basing gasoline taxes on a sales rather than volume base would help and has been sought by two agencies, but the revenues are usually shared by different modes and are thus subject to competition for their use (especially as the needs for highway maintenance soar).

Improved Efficiency in Providing Service

Much recent discussion in the transit field has focused on trying to improve the efficiency of service provision (6-8). Most of this discussion has focused on trying to pay more attention to the real costs of operations and the use of performance criteria, but it is sometimes difficult to see how the concern for efficiency is actually incorporated by operators into the agency's activities. Though not a quick strategy to an immediate problem, some managers did identify actions to increase efficiency as part of their response to financial problems. There seemed to be four levels at which action might be taken to improve efficiency:

1. Organizational efficiency, or the process of improving the efficiency of the overall organization by clarifying responsibilities, improving information, and strengthening control;
2. Network efficiency, or the process of improving the performance of the route structures and network in order to reduce system costs;
3. Operational efficiency, or the process of improving operational performance and ensuring a more efficient use of the various resources (labor, capital, information) needed to provide service; and
4. Individual efficiency, or the process of encouraging better individual performance from each employee.

Organizational Efficiency

One development in recent years that is significant for transit organizational efficiency is the rapidly increasing number of agencies with management-by-objective (MBO) processes. The survey showed that 20 of the 30 properties had formal MBO processes and 13 of these were less than three years old. The process was aimed at specifying goals for the system and objectives for each department, division, or unit, against which related performance could be compared; sometimes it was linked with employee evaluation.

Several managers felt that there was a definite trade-off between the level of detail of the process and the time and effort spent on it. Each agency appeared to be evaluating that trade-off through an adjustment period in the first years of the process' implementation. In two cases, the process had been rejected because the results did not warrant the effort and perceived complexity of the process. Though not directly related to dealing with financial pressures, the MBO process is relevant in that it provides a framework to identify priorities that can help in trading off alternative actions.

Network Efficiency

Actions aimed at network efficiency seek to improve the productivity of operations, thus resulting in reduced costs. Two types of actions that serve this purpose were mentioned by managers as part of the agency's response to financial pressures. The first concerned transportation system management (TSM) actions. Although responses from some managers indicated that TSM as a concept loses some of its

priority when immediate financial problems exist, two specific examples were provided where a TSM action was being pursued as a component of the agency's response to financial problems. One involved four bus priority lanes (Pittsburgh) and the other a bus-activated signal priority system (Jacksonville). In both cases, the reduction in travel time meant that fewer buses would be used to maintain the same headways. The priority system cost \$80 000 and was estimated to recover its cost in three years.

The second type of network efficiency action changes the overall structure of routes. In one transit agency, corridor planning was adopted to permit a planning process that would be more capable of identifying and eliminating duplicative service. In three other transit systems, the total route structure had been or was being modified from a radial orientation to a grid system. The intent of this change was again to eliminate duplicative service and provide a better market base for crosstown or circumferential routes.

Operational Efficiency

In seeking more efficient use of the various resources needed to provide service, a small number of properties were reevaluating their performance criteria to improve the cost-effectiveness of individual routes. However, most efforts in this area involved actions to improve utilization of labor and capital resources or actions to mechanize certain tasks.

A variety of actions were taken to improve resource utilization: use of transit line coordinator; driver utilization program; reduced number of job bids to avoid job-hopping; use of articulated buses; modernization of maintenance facilities; bus quality control program; and driver suggestion program. Actions to mechanize certain tasks were as follows: improvement of management information system (MIS) (major activity in six systems, ongoing in eight, starting in three); mechanized public information system; mechanical vehicle identification and information systems; computerized recording of inspections, attendance, job descriptions; audiovisual driver and management training classes. Mechanization and computerization to increase the performance of some tedious manual tasks was an on-going process in many agencies, and in a longer-term perspective of improving management performance, MIS were continuously being expended to increase their role for accounting, reporting, inventorying parts, and cutting runs.

Individual Efficiency

Finally, a few properties recently implemented procedures to increase the efficiency of individual employees. This involved three different types of actions: actions to increase employee involvement in the agency's activities in order to improve labor relations, actions to improve employee morale or to create positive incentives for better individual performance, and actions to avoid costly undesirable behavior such as absenteeism or misconduct. Examples of actions used in different agencies are given below:

1. Actions to increase employee involvement:
 - a. Driver suggestion program (four systems)
 - b. Development production groups (three systems)
 - c. Passenger service committee
2. Actions to improve employee morale or to create positive incentives:
 - a. Driver-of-the-month program

- b. Employee of the year
 - c. Employee newsletter, produced by employees
 - d. Comprehensive employee assistance program
 - e. Monetary rewards for performance (four systems)
3. Actions to avoid undesirable behavior:
 - a. Strengthened performance code or program (seven systems)
 - b. Citations for safety violations
 - c. Attendance recording
 - d. Probationary contracts with code offender

Many agencies expressed particular concern about absenteeism, and eight systems had recently strengthened performance codes and were increasing enforcement through disciplinary actions. Interestingly, there was also an emphasis on increased monetary rewards (four systems), sometimes in the same agencies that had taken tough stands on discipline.

The pursuit of efficiency, whether organizational, network, operational, or individual, as a response strategy to fiscal pressures may not produce significant short-term cost savings. Rather, its importance lies in providing the manager with sufficient flexibility to address longer-term financial issues. Successful management in an era of service cutbacks means maintaining employee morale and discipline as much as possible and especially not losing sight of the agency's goals as the need for cuts becomes more pressing.

CONCLUSIONS

The survey results provide a good picture of the current status of the transit industry as it begins responding to several political and financial challenges. The survey showed the diversity of the various agencies' positions but also indicated some trends that have important policy implications. There are several issues that these results raise, some related to the actions taken and others related to the sustained nature of these financial pressures.

Issues Related to Actions Taken

Diversified Funding Sources

Fare increases have been the first action taken in response to financial problems. All the systems that were financially constrained had increased their fares recently, often by large amounts. This raises the question of how high fares should be and how fast they should increase. Should we anticipate, as one manager did, that fares in three years will be 150 percent of what they are now? There is a limit to the extent such a response can be pursued. It is clear that fares cannot at the same time cover the increases due to inflation, replace public funding sources that are not growing fast enough (property tax, gasoline tax, and even sales taxes in many cases), and substitute for phased-out Section 5 operating assistance.

With respect to public funding, it appears that the existence of dedicated taxes and/or state aid, even if they are not always keeping pace with inflation, still offers the agency some flexibility in dealing with fiscal pressures. This flexibility also seems to increase if the agency is able to diversify its funding sources. In comparison, the single group of agencies with the most consistent pattern of financial problems received neither state aid nor revenues from a dedicated tax. These systems relied on only three revenue sources (fares, Section 5, and municipal or county general revenues). They were particularly threatened by economic forces affecting local finances or by the

elimination of Section 5 funding.

However, the existence of a sales tax is not in itself a guarantee of a healthy financial situation, since these sources can be affected by economic recession. An agency should thus resist relying too much on current revenues from the tax and resist using large tax revenues to maintain extremely low fares. Any excess revenues could rather be used to create a trust fund that can permit reliable five-year planning. In the absence of large revenue-creating taxes, diversity of funding sources could be sought. Though it may complicate political interactions, it allows for more flexible responses.

Role of State

The role and attitude of the state will also be an increasingly important factor to consider in analyzing financial options. Eleven of the 22 states covered in the survey provided operating assistance; several others had passed legislation enabling local-option taxes. However, the managers surveyed were generally pessimistic about the prospects of increased aid in states that did not already have aid programs, given the mood of fiscal conservatism. Given the new federal policies of returning funds and program authority to the states, this perceived reluctance for increased state aid could be a serious indication of even more financial difficulty in the future.

Criteria for Service Reduction

The survey showed that the predominant criterion used by managers in reducing service was to minimize total ridership affected, sometimes taking into consideration the existence of alternative service. This often led to a cycle of cutting service from whole successive time periods. The use of this criterion has a hidden implication that should be recognized; it implies that the fundamental purpose of transit is to serve commuters (these are the single group of users who are protected the longest during such a cycle of cuts). This may be in fact what is desirable, but then it should be recognized that alternative social goals may not be served.

Reevaluation of Service Planning

Service planning is usually one of the first staff functions to be severely reduced in times of staff cutbacks. This occurs because increased emphasis is placed on preserving the productive service and because service planning is viewed essentially as a tool for serving growth (i.e., planning for expanded service). Several managers felt that once the system is operating at the necessary level and no service expansions are projected, service planning becomes less essential since minor changes are assumed to be handled by the scheduling and operations staff.

However, it is important to realize that periods of severe cutbacks entail major (if negative) service changes to the system, and if such a trend is to continue, it becomes critical to preserve the agency's means of analysis in order to minimize as much as possible the disruptive nature of these changes on both users and personnel.

Another aspect of this issue is that service planning may have to be reevaluated in light of this new trend. Goals, criteria, and procedures should be rethought in order to take into consideration increased emphasis on costs, explicit analysis of existing alternative services, and the need to trade off different potential options for responding to financial pressures.

Issues Related to Sustained Problems

Curtailment Cycle

Although many managers felt that fiscal pressures were more than just current imbalances in budgets, only in a few cases did an analysis of the implications, or of the actions to be taken, extend beyond the current year. Such a short-term perspective usually leads to a crisis-management attitude when problems occur. To the extent that an agency's financial problems are not simple imbalances in the budget but a signal of a longer-term change in the agency's financial and institutional environment, the response should perhaps be thought of as part of a curtailment cycle with goals and processes different than when service is being expanded during a growth cycle and that might have implications for goals to serve, the organization of various tasks, and network structure.

Importance of Strategic Planning

Given the long-term nature of the financial situation of many transit agencies and its implication on the goals, objectives, and planning procedures the agency uses, strategic planning may become an important tool for agencies trying to deal with this financial uncertainty. Strategic planning provides an analysis framework that helps to define goals and objectives, analyze trends, evaluate options, and merge various actions into a strategy whose outcome a few years hence is understood and desirable.

The identification of goals is a particularly difficult problem during a curtailment cycle. It is easy to serve a variety of goals during growth periods just by expanding service; to serve new geographic areas or new user groups, one can expand the network; and to attract nonusers, one can increase frequency or purchase better vehicles. During a curtailment cycle, one must constantly trade off one goal for another, and there is always the danger of collapsing all goals into one.

Goals have to be specified and the linkages between the transit service provided and the well-being of the community must be made explicit. The manager must know what components of the service are important and why, so that it can be determined how best to protect the achievement of these goals. This is important for top management in its efforts to organize the production of transit service during a curtailment cycle, but it is also important for them in their dealings with outside actors. Defining goals explicitly in a way that links the long-term well-being of the community with that of the agency and that can be translated into clear objectives might help improve transit's image and ease discussions in times of financial problems. The problem is, of course, how to make goals explicit and how to make them operational. In this respect, the trend observed in the survey toward the development of MBO processes in many agencies might provide a good preliminary base since it establishes a coherent procedure for determining priorities.

Improving Efficiency

A longer-term perspective of the financial trend facing transit justified considering improvements to efficiency as another option in responding to financial pressures. However, efficiency improvements are not only difficult to achieve but also difficult to understand and trade off with other managerial options. More analysis should be made of their role within a coherent strategy involving other actions. It was clear for the survey that managers are more

prepared to take strikes to achieve gains in efficiency. But it should not be forgotten that unions also have a stake in preserving service for purposes of employment. To the extent that this can be communicated and fair exchanges negotiated, labor relations need not deteriorate.

1980s as Period of Change

The 1980s will bring considerable change and thus strain those transit agencies subject to a curtailment cycle. However, the change, by its very nature, will provide certain opportunities for reorganization. To the extent that this entails reassessment of goals and practices, this might be an occasion for renewal. The challenge to transit management lies not only in preserving a vital service to the public but in seizing the opportunities provided by these changes to rethink and reorganize the provision of a service that will better serve the interests of the public. Thought must be given to how the crisis might be used and not only survived.

ACKNOWLEDGMENT

This research was sponsored by a grant from the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation (DOT). The opinions expressed are ours and do not reflect the policies or procedures of UMTA or DOT.

REFERENCES

1. Operating Statistics Report. American Public

Transit Association, Washington, DC, 1980.

2. Catalog of Management Information System Applications. American Public Transit Association, Washington, DC, 1980.
3. Transit Actions: Techniques for Improving Productivity and Performance. Public Technology, Inc., Washington, DC, Oct. 1979.
4. A Directory of Regularly Scheduled, Fixed Route, Local Public Transportation Service in Urbanized Areas over 50 000 Population. U.S. Department of Transportation, Aug. 1980.
5. National Urban Mass Transportation Statistics: First Annual Report of Section 15 Reporting System. U.S. Department of Transportation, May 1981.
6. J.R. Meyer and J.A. Gomez-Ibanez. Improving Urban Mass Transit Productivity. Harvard Univ., Cambridge, MA, Feb. 1977.
7. J.L. Perry, H.L. Angle, and M.E. Pittel. The Impact of Labor-Management Relations on Productivity and Efficiency in Urban Mass Transit. Univ. of California, Irvine, March 1979. NTIS: PB294-721.
8. G. Smerk, S. Dodge, H. Gil, and C. Lee. Handbook for Management Performance Audits. Institute for Urban Transportation, Bloomington, IN, Oct. 1979.

Publication of this paper sponsored by Committee on Transit Management and Performance.

Design of Bus Transit Monitoring Programs

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A method is described for the design of a comprehensive, statistically based data-collection program that can support bus route planning and operations. A two-stage approach used in the design of the collection program is advocated. In the baseline phase, a detailed profile of each bus route is developed. This is followed by a monitoring phase in which limited data are collected to verify that the route profile developed in the baseline phase is still accurate. Both the desired accuracy and the inherent variability of the data items are considered in the design of the data-collection program. To reduce the overall cost of the data-collection program, consideration is given to the use of simple linear relationships between data items. The methodology discussed in this paper was developed under contract to the Urban Mass Transportation Administration and has been approved as meeting the Section 15 reporting requirements for passenger-related data.

In recent years, there has been a growing awareness of the need to use public transportation resources more efficiently (1). It has become more important to evaluate carefully all services, both current and planned. In response, many transit agencies, large and small, have developed on-going programs that use performance measures and standards to evaluate their transit services (2,3). Often, however, these evaluation programs have not been supported by adequate data-collection programs. Cost-effective programs are needed to provide the passenger-related performance data that are required for good service evaluation.

This paper describes a methodology for the design of a comprehensive, statistically based data-collection program that can support the service-evaluation process. This methodology was developed under contract to the Urban Mass Transportation Administration (UMTA). By using this methodology, most transit agencies will be able to develop and maintain comprehensive profiles on all their bus routes at a reasonable cost. Although the focus of the approach is route-level data collection, the approach also provides systemwide performance data (such as UMTA-required Section 15 data) through the aggregation of individual route data.

In this paper the overall approach to performance monitoring is described first, followed by a description of the data needed by transit agencies for short-range operations planning. The next two sections describe the available data-collection techniques and how they can be combined into a sampling plan. In the final section the costs of implementing such a program are discussed.

PROPOSED APPROACH TO DATA COLLECTION

The proposed approach consists of two distinct data-collection phases. In the first phase, or the baseline data-collection phase, the base conditions are