

Critical Issues in Urban Transit Finance and Management

TRANSPORTATION RESEARCH BOARD
COMMISSION ON SOCIOTECHNICAL SYSTEMS
NATIONAL RESEARCH COUNCIL

NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C. 1980

Transportation Research Record 759

Price \$4.00

Edited for TRB by Susan Singer-Bart

mode

2 public transit

subject areas

11 administration

14 finance

Library of Congress Cataloging in Publication Data

National Research Council. Transportation Research Board.

Critical issues in urban transit finance and management.

(Transportation research record; 759)

Reports prepared for the 59th annual meeting of the Transportation Research Board.

1. Local transit—Finance—Addresses, essays, lectures.
2. Local transit—United States—Finance—Addresses, essays, lectures.
3. Local transit—Management—Addresses, essays, lectures.
4. Local transit—United States—Management—Addresses, essays, lectures.

I. Title. II. Series.

TE7.H5 no. 759 [HE305] 380.5s [388.4'068] 80-28689

ISBN 0-309-03074-9 ISSN 0361-1981

Sponsorship of the Papers in This Transportation Research Record

GROUP 1—TRANSPORTATION SYSTEMS PLANNING AND ADMINISTRATION

Leon M. Cole, Library of Congress, chairman

Management and Finance Section

Ira F. Doorn, Midlothian, Virginia, chairman

Task Force on Local Transportation Finance

*Alice E. Kidder, North Carolina A&T State University, chairman
Robert P. Aex, Rita J. Bamberger, Cynthia J. Burbank, William H. Crowell, Lawrence D. Dahms, Chris Hendrickson, Edward T. Herlihy, Arthur J. Holland, Marshall F. Reed, Jr., Arthur Rogers, Ruth Shack, Kumares C. Sinha, Marilyn Skolnick*

Task Force on Employee-Management Relations and the Quality of Working Life

Rhoda Pauley, Work in America Institute Inc., chairman

Kenneth E. Cook, Transportation Research Board staff

Sponsorship is indicated by a footnote at the end of each report. The organizational units, officers, and members are as of December 31, 1979.

Contents

LOCAL TRANSPORTATION GOALS AND FINANCING REALITIES: THE URBAN TRANSIT EXAMPLE	
William H. Crowell	1
TRANSIT FINANCING TRENDS IN LARGE U.S. METROPOLITAN AREAS: 1973-1978	
John Pucher	6
ALTERNATIVES ANALYSIS IN THE FINANCING OF MULTIJURISDICTIONAL PUBLIC TRANSPORTATION SERVICES	
Alice E. Kidder	12
JOB-RELATED EMPLOYEE ATTITUDES IN URBAN MASS TRANSIT	
Harold L. Angle and James L. Perry	20

Authors of the Papers in This Record

Angle, Harold L., College of Business Administration and Graduate School of Business Administration, University of Minnesota, 271 19th Avenue South, Minneapolis, MN 55455; teaching associate at Graduate School of Administration, University of California at Irvine, when this research was performed

Crowell, William H., Transportation Training and Research Center, Polytechnic Institute of New York, Brooklyn, NY 11201

Kidder, Alice E., Franklin Program in Transportation and Distribution, Syracuse University, 129 College Place, Syracuse, NY 13210

Perry, James L., Graduate School of Administration, University of California at Irvine, Irvine, CA 92717

Pucher, John, Department of Urban Planning, Rutgers—The State University, New Brunswick, NJ 08903

Local Transportation Goals and Financing Realities: The Urban Transit Example

WILLIAM H. CROWELL

The financing of urban public transit has always been a challenging and problematic subject, but particularly so since the late 1960s when the deficit payments for existing systems grew substantially and the demand for new systems in other areas increased. The expansion of transit services or changes in fare levels are typically instituted to try to meet a wide variety of local, state, and federal goals, and funds from each level of government are usually involved. However, the most serious transit financing problems in recent years have generally occurred on the local level, where relatively small differences in local matching costs under various federal subsidy schemes frequently can overwhelm the selection process among transportation options. The paper discusses the nature of local transportation goals and how this matches up with the fiscal methods available locally and offers basic criteria by which the suitability of a local taxation scheme may be judged. The issues involved in the choice between the use of earmarked transportation taxes versus general revenues are also discussed. It is concluded that (a) local transportation projects must be planned more carefully and selected to match the true nature of the travel markets involved and (b) financing schemes should be designed to match benefits and patterns of tax burden and to minimize disruption in other local economic markets.

The last 10 years have been particularly turbulent ones for the nation's transportation sector. Major social, economic, and environmental factors that came to the fore in the late 1960s caused a serious rethinking of the way in which transportation needs are met. The nation's increased energy-consciousness has strengthened these forces and further complicated the transportation planning process. A major highway building era has gradually wound down, and the modest federal support for mass transit in the mid-1960s has expanded in both amount and scope under various legislative actions. Although state and local governments have always been the principal source of revenues for transportation operations, the considerable fiscal leverage of federal funds (particularly for large projects) has given federal decision makers power to make or break many local transportation projects.

A classic example of how local transportation goals can be shaped (or at least strongly influenced) by financing mechanisms is the West Side Highway Project in New York City. The existing elevated highway along Manhattan's west side is poorly designed for current traffic needs and in such dilapidated condition that most of it was closed to traffic several years ago. After numerous years of analysis and millions of dollars spent on planning funds, the state put forward Westway as its favored option--a submerged Interstate highway that will cost roughly \$1.7 billion. Numerous transportation and nontransportation reasons have been given in favor of Westway as well as arguments in favor of trading in the funds for transit revenues under Section 103e of the Federal-Aid Highway Act of 1970. However, the arguments that appeared to have the most political appeal, especially for a fiscally pressed city like New York, are those that compare how much federal money would come into the region under these two options. Of particular import were the facts that (a) transit options required local matching funds versus the state's matching of federal highway dollars and (b) the federal share of transit projects is 80 percent versus 90 percent for highway costs (since then the Surface Transportation Act of 1978 raised the federal share for transit and non-Interstate highway projects via trade-in to 85 percent). While

involved in a brief review of the economic aspects of Westway and its possible alternative projects (1), I realized that the supposedly primary reason for building a major transportation facility--to effectively meet (and influence) future transportation needs--seemed to take a back seat to such issues as the funding share of local governments, the number of construction jobs to be created, and other aspects that are rather secondary from the perspective of long-range planning. The transportation goals of providing cost-effective mobility were somewhat overwhelmed by the financial realities of fiscally strapped municipalities and the often all-powerful influence of federal support.

THE RECENT CRISIS IN HIGHWAY FINANCE

The past 25 years have been a period of high growth for the highway transportation sector in the United States. The roughly \$70 billion in federal aid to the Interstate highway system during this period increased the amount of new highway construction considerably. However, although the federal share of highway expenditures was much higher than before, state and local governments were still the principal sources of overall highway funds, as the table below demonstrates (note that the total amounts do not include debt retirement) (2).

Highway Expenditures, 1955-1975		
Government Level	Amount (\$000 000s)	Percentage of Total
Federal	83 416	25
State	183 991	55
Local	65 111	20
Total	332 518	

The division of funding among the three levels of government has been fairly constant over the past 10-15 years. One factor, however, that has changed dramatically during this period is the cost of highway construction and maintenance; over the 1967-1977 period the nation's consumer price index rose roughly 85 percent, but the highway cost index increased by more than 133 percent (3). Many of the highways and bridges built during the post-World War II era are now in substantial need of repair--at a time when the costs of such maintenance are rapidly increasing and the available revenues are shrinking in constant dollar terms. The recent expansion in the amount of federal funding for bridge repairs was a partial response to the overall fiscal squeeze of state and local highway agencies. The highway user revenues (mainly from gasoline taxes) that were expected to increase with the steady expansion of highway travel could no longer be assumed to meet the necessary fiscal needs. Transit supporters who had long viewed the highway sector as both sumptuously financed and as a possible source of funds for transit also have had to realize that the highway system shares, to a great extent, the same fiscal plights that transit has experienced since the mid-1960s. The idea that state and local transportation financing were highway and transit modes in a fight over the same sources of revenues was clearly erroneous. The main point is that both

Table 1. Distribution of transit operating assistance by level of government.

Government	Amount (\$000 000s) ^a			Percentage of Total		
	1975	1976	1977	1975	1976	1977
Local	699.4	857.4	841.1	49.7	52.0	44.2
State	406.6	367.1	478.4	28.9	22.3	25.1
Federal	301.8	422.9	584.5	21.4	25.7	30.7
Total	1407.8	1647.3	1904.1			

^aDoes not include automated-guideway transit (AGT), commuter rail, or urban ferryboat operations.

sectors require additional funds if the specified needs of system maintenance and expansion are to be met.

THE LOCAL FINANCING SCENE

The changes in the transportation needs and goals caused by various social, environmental, and energy factors have created a number of serious challenges for local planners and decision makers. Public pressures to expand transit services, in response to higher gasoline prices, leaves transit authorities in a revenue bind because (a) service expansion is costly and (b) the claims that higher fuel costs will swell transit patronage will very likely fall short of covering such service expenditures. Several major articles in New York City newspapers, for example, recently decried the poor condition of many of the region's commuter rail operations (4) and implied that such low-grade services were ruining a golden opportunity to attract automobile travelers who had seen their monthly journey-to-work commutation costs increase by \$15-\$17 in less than two months [assuming a \$0.40/gal cost increase (common in the New York City area), daily commutation of 25-30 miles, and 15 miles/gal efficiency].

The real question here is, Why are these transit operations in such poor condition? After possible mismanagement, union work rules, and the like are accounted for, the simple lack of ample funding and overall public concern for these and other transit operations becomes the most realistic reason. In such a setting, the transportation goal of an efficient and (most importantly) well-patronized commuter rail network is clearly at odds with the financial reality of the public's willingness to pay for such services. In a similar vein, the same local transit agencies have strongly protested the requirements [under the U.S. Department of Housing and Urban Development (HUD) and Urban Mass Transportation Administration (UMTA) regulations] to convert transit systems to fully accessible operations. The goal of providing this type of mainstream services (versus separate paratransit service) to the elderly and the handicapped, although legally mandated, does not include public assurances that the necessary funding will be available (5).

Local transit operations have traditionally been supported primarily from local or regional funding sources, which make the frequent pressures for service improvement or fare protection much more of a local concern than highway improvements. The data in Table 1 (6) demonstrate that the local share of operating assistance remained relatively constant over the 1975-1977 period, and preliminary estimates from the American Public Transit Association (APTA) show that no significant changes occurred in 1978. Federal operating assistance (under Section 5 of the Urban Mass Transportation Act of 1974) is scheduled to increase slightly each year until 1984; however,

expected increases in operating expenses and deficits will require an equal or greater expansion in state and local assistance. Whether or not a recent study's claims that many municipal governments are in better fiscal shape than originally thought is true (7), cities will still be left with difficult decisions about which local goals (including transportation) should be supported.

NATURE OF LOCAL TRANSPORTATION GOALS

In many instances the definition of the transportation goals of a particular area will depend on which planner, agency, or public official is asked. The transportation sector is one of the most visible public services and so essential to the everyday operations of society that its continued existence and growth is almost taken for granted. The tremendous changes in America's life-style after World War II occurred hand-in-hand with similar adjustment in the ways persons and goods were moved. In larger urbanized areas, where the local (versus state) voice in transportation planning is greatest, transit service and patronage fell rapidly as automobile ownership and use increased at an even greater rate. The increased consciousness of the need for effective planning led to a much more structured view of the planning of transportation systems and culminated in the current (often overlapping) network of metropolitan planning organizations (MPOs), transit agencies, local planning commissions, highway departments, and related agencies. In such a setting, the exact nature of an area's transportation goals (i.e., what social, economic, environmental, or other impacts the system is expected to provide) is difficult to determine, whether one is a directly involved decision maker or an outside observer.

In a recent study that, like many over the past two to three years, focused on a "current emphasis...on a more comprehensive and open process..." in transportation and urban planning (8), the transportation planning process was broken down into three basic levels:

1. Policy planning--essentially a political arena that deals with broad social issues that set the overall context for more-specific planning;
2. Systems planning--analysis of entire transportation networks and the design, operation, and control of all their modes; and
3. Project planning--efforts associated with a particular portion of the overall system (e.g., the Westway situation in New York), including aspects of design, construction, and financing.

A crucial factor in the understanding of the linkages among these three planning areas is that only system and project planning deal specifically with transportation problems and solutions. They enter the sphere of overall policy planning as only one of many options to achieve various goals. The attainment of some social wants (e.g., cleaner air) by definition will have a major transportation element, as that sector's activities strongly affect local and regional air quality. A similar analogy could be made with petroleum conservation, as motor vehicles consume roughly 40 percent of the nation's petroleum. In other areas, however, the transportation mandate is often less clear or only has a meaningful, effective role if coordinated with other nontransportation investments or policies. A suburban area, for example, that wants (or at least is willing) to grow may support a major transportation link to the central city. However, without the related investments in other overhead social ser-

vices (e.g., sewer and water systems and schools), the growth that improved access might induce could be effectively stifled or redirected in an undesirable fashion.

An additional problem occurs when transportation planners, faced with overlapping or conflicting goals at the policy planning level, are hard pressed to create programs that do not violate one or more social goals. In a 1978 ruling by the Office of Civil Rights of the U.S. Department of Transportation (DOT), for example, the Connecticut Department of Transportation's arrangement of bus routes in the Hartford area was found to be in violation of the rights of that city's minority residents because the city-to-suburb service was poor, but much more extensive, higher-quality service was provided to commuters (mainly white) who travel from the suburbs to downtown Hartford (9). Although the requirements of a federal law (Title VI of the Civil Rights Act of 1964) were specifically in question here, it could just as easily have been argued on the grounds of conflicting local priorities.

Appropriate Local Transportation Goals

The real question to be asked in such a frequently confusing, highly political setting is twofold:

1. What social goals require specific transportation actions for their attainment, and which ones can be met by transportation or nontransportation policies?
2. Which of these actions is suitable for local transportation planning that depends, to a significant extent, on local financing?

Assuming, therefore, that one could ascertain the true nature and priority of a particular social goal, it still remains to be seen whether some action within the transportation sector can best meet that goal, assuming the fiscal means are available to follow that policy. In New York City, for example, the approval of the mobile source portion of the state implementation plan (SIP) to achieve federal air quality standards was based on New York State's promises of transit service improvements and fare stabilization policies. Such pledges (generally viewed to be beyond the financial capability of New York City) were based on a substantial increase in federal transit aid. When officials disclosed that these incremental revenues might not be forthcoming, the overall air quality plan was considered to be in jeopardy. In addition, the governor had used this pledge to win support for the Westway (10). Both the specific nature and actual realization of several local transportation goals were therefore strongly affected by a relatively minor change in the level of available local funds.

A state requirement (under a federal mandate) to reduce vehicular emissions, therefore, required local transportation decisions that were greatly affected and constrained by available local revenues. When plans for nonlocal revenues were threatened, the transportation policies developed to help achieve this goal became untenable. Referring to the three planning levels, this problem eventually provides those at the policy-planning level with a dilemma: Raise funds from alternative sources and carry out the planned transit scheme or develop some new transportation scenario that has a different local revenue burden yet still achieves the required air quality goals (e.g., toll charges on river crossings that are now free and the use of revenues generated to support transit).

The goal of cleaner air may have avid local support but its appropriateness as a local concern is mostly due to the existing federal mandates under the Clean Air Act of 1960. The appropriateness of reducing vehicular trips to meet these goals is also not necessarily in question, although the balance between reducing vehicle miles of travel versus the emission rate of vehicles themselves is a major policy dispute (11). However, whether it is appropriate for a city to reduce emissions by, say, raising local tax revenues in order to maintain or reduce transit fares rather than by following some alternative air quality schemes is clearly in question. The laudable local goal of a better, more heavily patronized transit system, which may help an area attain much more than cleaner air, faces very serious problems of both adequate funding and the cost-effectiveness of reducing emissions in that manner (i.e., how many persons will truly change modes due to such policies).

The clean air examples deal with the selection of policy options to meet an externally imposed goal. However, other transportation policies are more local in nature, although the financial leverage of federal and state policies cannot be ignored. Cities such as Atlanta, for example, that have begun to develop new fixed-guideway transit systems are making very expensive investments in networks that they hope will both shape and help meet future transportation needs. Atlanta, a city in which roughly 13 percent of the journey-to-work trips were made by transit in 1970 (12), made a clear local policy decision when it (a) took over the private Atlanta Transit System in 1972 and lowered fares from \$0.40 with \$0.05 transfers to \$0.15 and free transfers and (b) proceeded on an overall \$2.1 billion transit-development plan, the heart of which is that city's 14-mile subway system and a 1 percent sales tax earmarked for transit.

A recent study by the Urban Land Institute (13) supported the concept that a permanent transit structure will provide a city with the capability of sustaining and continuing growth in the future. It would not be constrained by the forces of expensive and often erratic petroleum supplies or steadily increasing congestion that might curtail and even reverse growth in more automobile-dependent cities.

Although other studies (14) might question the validity of assuming that a fixed-guideway system like the Metropolitan Atlanta Rapid Transit Authority (MARTA) could effectively operate in or substantially alter such automobile-based urban areas, the important point is that the city thought that (a) the low-fare policies and new heavy rail system were capable of achieving important local goals (15) and (b) it was willing to finance both the escalating construction costs and (more importantly) the operating deficits. Recent UMTA policy statements concerning new rail investments (16) have stressed that such systems cannot be expected to convert lower-density, automobile-dependent cities into Boston, Chicago, or New York City. In addition, it emphasized that local or regional governments must face (and plan for) the realities of substantial subsidy support and not assume that federal operating assistance will expand to fill these gaps. The experiences with San Francisco's Bay Area Rapid Transit (BART) system and the Washington, D.C., Metro have shown that optimistic expectations of break-even or modest deficit operations have been contrary to the realities of lower-than-projected patronage and rapidly escalating costs.

Local Goal Versus Local Financing

The essence of such financial limitations on possible transportation goals is the extent to which local funds are required to carry out the necessary steps to achieve such ends. The financing of transportation facilities has been widely viewed as local or regional in nature because the pattern of benefits are primarily limited to such areas. The basic reasoning behind the recently popularized value-capture concept (essentially following the long-supported idea of land-based taxes for transportation operations) follows this viewpoint as well (17). One might wonder why the federal government is even in the business of local transportation subsidization, especially when transit subsidies are concerned (18). However, those who advocate continued (or expanded) federal operating assistance would support their stance by pointing out the following facts:

1. Such aid is needed to counterbalance the modal effects of the long history of heavy federal aid for highway development;

2. Many social policy goals that greater federal transit support can supposedly help to attain, such as energy conservation and environmental improvement, are multistate or national in perspective and, therefore, deserve support from the national level; and

3. Other programs (e.g., welfare) that are probably most effectively handled on the federal level are still heavily financed at the state and local level; federal support of more locally focused transit operations could counterbalance inequities or inefficiencies in other areas (i.e., essentially an earmarked form of revenue sharing).

The social and political impact of the 1973-1974 energy crisis probably made it possible for Section 5 of the Urban Mass Transportation Act of 1974 to be passed and thus reversed a long-standing federal policy against operating versus capital assistance. Similar changes occurred on the state level, where even a major transit state like New York did not provide local transit operating assistance until 1974. A recent survey by state transportation and highway departments (19) confirmed that, although roughly half the states provided some form of transit operating assistance, there was a strong opinion that such expenditures were local in nature and should be financed as such.

Availability of Appropriate Local Tax Mechanisms

A crucial question in such considerations is whether the local governments involved have a suitable tax mechanism that is capable of effectively funding a particular local program. Whether an individual tax package is good for a specific situation will essentially depend on the following factors (18):

1. Will it avoid creating unwanted market effects (e.g., will a special payroll tax created to support transit development induce firms to locate outside the city)?

2. Will its overall incidence (the distribution of tax payments among various groups) be in keeping with local equity policies (e.g., is a property-tax-based method of transit support regressive in nature)?

3. Does it link tax payments to particular expenditures in a way that is conducive to collective decision making; do local citizens realize what benefits the tax revenues are to provide so they can make a rough net benefit decision on the overall

policy's merits; is there a reasonable correlation between payments made and benefits received?

4. Does it raise sufficient revenues while being sensitive to overall economic forces (e.g., how well will revenues keep pace with inflation)?

5. Is the tax easy and inexpensive to administer?

The answers to these questions are the financial realities against which the attainability of various transportation goals must be judged. One of the strongest political appeals of the Atlanta move to take over transit operations and cut fares by roughly two-thirds was that the overall policy effectively met so many of these criteria. The 1 percent increase in the sales tax was not particularly disruptive due to the low level of sales taxes in Atlanta at that time. The highly visible connection of the sales tax to the transit system also greatly enhanced the public's understanding of the program's overall worth. The tax generated a fairly substantial amount of revenues with moderate administrative ease, and its percentage-based nature allowed its revenues to rise with inflation (assuming retail sales were stable or grew in constant dollars). One could criticize the generally regressive nature of such excise taxes (20), although at least one analysis claims that the Atlanta program's overall incidence picture (taxes paid and benefits received) is more proportional-to-progressive in nature (8). However, the scale of local expenditures will increase substantially as the MARTA system is completed and made fully operational. In addition, the Atlanta voters recently rejected another 1 percent increase in sales taxes (not earmarked to transit services), and a recent comparative study of the fiscal health of numerous cities showed Atlanta to be worse off than originally expected (7). Apparently the fiscal realities of the situation have changed.

EARMARKED TAXATION AS A FISCAL SOLUTION

The transportation sector has a strong precedent of earmarked revenues. Most states dedicate the majority of their gasoline tax revenues to highway construction and maintenance, although two-thirds of the states return an average of one-third of these funds to counties and municipalities (19). On the federal level, the most significant example is the Highway Trust Fund, fed mainly by a \$0.04/gal gasoline tax; a similar fuel tax is used to support the Airport Trust Fund. Although a fair number of cities have some form of earmarked transit taxation (e.g., Atlanta's sales tax and Boston's property tax), the revenues generated are usually well below the needed levels, and the major source of revenues typically is general revenues. Transit advocates often feel that the main cause of their fiscal plight is the lack of this type of guaranteed revenue producer--one that is relatively insulated from annual legislative battles for funds and provides a stable base for long-range planning.

In terms of economic efficiency, the more earmarking the better. In fact, the best earmarking device of all is user charges (e.g., fares and tolls). The more they can be depended on as a revenue source (within other economic and social constraints), the greater the efficiency of the system. The gradual decline over the past 15 years in the operating ratios (passenger revenues per operating expenses) of the nation's transit systems shows that the reverse has held true, although the decline has generally leveled off since 1975. However, any financing scheme that promotes the use of various taxes over fares must be compared with other options (including higher fares) by using the

five financial criteria outlined above. A citizens advisory committee to the Metropolitan Transit Authority (MTA) in New York City, for example, recently suggested a plan to cut all subway and bus fares by 50 percent and commuter rail fares by 20 percent by using \$130 million from a payroll tax surcharge and \$420 million in new automobile taxes and bridge tolls (21). The overall scheme would certainly have some difficulties in the area of unwanted market effects because it would further increase labor-based taxation in the most heavily taxed city in the country. Most of the levies would be easy to collect, although the retrofitting of bridges with toll systems would seem costly (not considering the continuously intense political opposition to this scheme). The connection between benefits received and taxes paid is certainly tenuous, mainly due to its heavy dependence on a transfer of funds from automobile travelers to transit passengers. Equity issues are somewhat muddled here, although I think that the net impact would be fairly regressive (22).

The main point, however, is that the sharp reduction in fares greatly reduces the affected agency's control over the system's capacity, further separates the individual passenger's decision making from the realities of service costs (especially in the peak periods), and avoids the overall transportation problem of how all modes' services are sold to the public. From my perspective, such plans can eventually worsen the overall fiscal situation in urban areas because they lower fares (although numerous studies show fares are secondary to service quality in most transit markets) and very likely disrupt other markets that are being inefficiently taxed for often unnecessary revenues. However, this does not mean that transportation agencies and decision makers should not necessarily push for earmarked taxation schemes or that such plans could not resolve fiscal constraints to local transportation developments. What it means to emphasize are the following earmarking concepts:

1. Markets that are taxed should benefit from the associated transportation improvements;
2. New tax should not be placed in an already heavily taxed area;
3. Taxing of the automobile to support transit may be an effective and economically efficient means of earmarked support in some settings; however, there is no universal rationale for such revenue transfers (also, it implies a them-versus-us modal competition that is destructive to rational transportation operation); and
4. All modes need to be priced efficiently before truly appropriate subsidy schemes are developed (the underpricing of automobile trips is the most widely mentioned claim here, but there should certainly be no financial carte blanche to lowering transit fares in current or constant dollars).

FUTURE PROSPECTS FOR LOCAL TRANSPORTATION FINANCE

At the recently held American Society of Civil Engineers (ASCE) conference on urban transportation finance, the financial doldrums of operators, transportation agencies, and planners were painfully clear. The basic problems of moving goods and people continue, but they have now been complicated by the pressures of the recent energy crisis and challenges of those to come. Transit forces had some signs that their time had finally come, but the entrance of new gasoline supplies brought the exit of most new patrons and the usual financial squeeze remained. The highway sector was feeling the financial weight of maintaining deteriorating

facilities and has gradually become aware that the steady growth of gasoline tax revenues was a thing of the past. It was clear that there are no simple solutions to local transportation financing problems. The promises of expanded federal transit assistance for capital project development for the 1980-1989 period by drawing revenues from the Energy Security Fund (i.e., the so-called excess profits tax on petroleum firms) provided some hope for financial relief in some areas. These funds, however, are still only tentative at best and would (a) only add an additional \$1.2 billion nationwide in annual revenues and (b) require an increase in state and local matching funds. The changeover has also begun from an age of highway construction to one that concentrates on maintenance and improved management of existing systems. The exact impact of such policy adjustments on the amount of funds available at the regional and local level is difficult to determine.

The main points when transportation goals are contrasted with available local financing, assuming an area's overall social goals as given (e.g., revive the downtown areas, reduce air pollution, and control suburban growth), are as follows:

1. Are the transportation solutions offered to help achieve these goals cost effective and politically implementable?
2. Can a financing method be found that is also in line with these and related goals and meets the types of good tax criteria outlined earlier in this paper?

Federal and state revenues will continue to be available and will frequently be the deciding factor in local transportation decisions (especially on major projects). Local revenues, however, will still be a major force, particularly in the consideration of current or future transit deficits. Regional transportation improvement programs, developed by MPOs in cooperation with state and local governments, include lists of needed highway and transit projects, with revenue needs (and shortfalls) listed next to them. Does the lack of funds to fully support such wish lists constitute a perplexing financing problem?

Clearly, the question, in the familiar terms of economics, has both supply and demand elements. Although it is hard to define, there is a limit to available local revenues. In addition, other local social services are crying poverty with equal vigor, including the politically sensitive areas of education and police expenditures. The financial realities of local government, especially in larger, older cities that have recently lost numerous residents and jobs to other areas, presents financial and transportation planners with a double challenge:

1. Carefully select programs and projects that are closely matched with the realities of transportation demand in the travel markets in question, and
2. Give equal attention to the identification of financing schemes that are correlated with the patterns of benefits provided by the services local government funds and minimize disruptions to other economic markets. Effective, rational pricing of the services involved is crucial to such considerations, from both operational and financial perspectives.

Some local areas will be more hard-pressed than others to find and politically implement the solutions to these two problems and, I hope, federal

and state assistance will, to some extent, reflect these differences. Relatively minor differences in the local cost of particular programs should not dominate decision making, and seemingly artificial differences in incentives from federal and state sources should be removed (e.g., the gradual closing of the gap between transit and highway matching shares). In summary, the only solution to local revenue shortfalls must include (a) program prioritization, (b) greater stress on cost-effective program selection, and (c) the careful development of financial schemes that follow some of the general guidelines that this paper has briefly reviewed.

REFERENCES

1. The Economic Impact of Westway: A Report to Region II. U.S. Environmental Protection Agency; Fred C. Hart Associates, New York, Nov. 1977.
2. The Status of the Nation's Highways: Conditions and Performance (Report of the Secretary of Transportation to the U.S. Congress). 95th Congress, 1st Session, Sept. 1977, U.S. Government Printing Office, 1977.
3. Construction Contracts for the Fourth Quarter of 1977. DOT News, No. 12-78, Feb. 17, 1978.
4. Commuter Lines to Worsen Without Aid, a Panel Says. New York Times, Oct. 1, 1979.
5. J. Falcocchio and others. Mobility of People and Goods in the Urban Environment: Mobility of the Handicapped and Elderly. U.S. Department of Transportation, Rept. DOT-TST-77-43, April 1977.
6. Transit Fact Book: 1977-1978 Edition. American Public Transit Association, Washington, DC, May 1978.
7. J. Herbers. Study Turns up Surprises on Fiscal Shape of Cities. New York Times, March 21, 1979.
8. R. G. Rice. Evaluation of Road and Transit System Requirements for Alternative Urban Forms. TRB, Transportation Research Record 677, 1978, pp. 15-22.
9. Hartford Bus System Violates Minority Rights, DOT Rules. DOT News, DOT-11078, Aug. 15, 1978.
10. L. Maitland. Carey Never Sought Transit Aid Pledge, U.S. Officials Assert. New York Times, Sept. 24, 1979.
11. E. Bentz and others. Car pools, Van pools, and High-Occupancy Preferential Lanes: Cost-Effectiveness and Implementation and Inspection-Maintenance Cost-Effectiveness and Feasibility of Implementation. U.S. Environmental Protection Agency, 1977.
12. Journey to Work. Bureau of the Census, U.S. Department of Commerce, PC 2-60, 1973.
13. Central City Office Development. Urban Land Institute, Washington, DC, Interim Rept., March 1979.
14. A. Wiener and others. Future Directions for Public Transportation: A Basis for Decision. Research and Education Division, Urban Mass Transportation Administration, Dec. 1978.
15. P. E. Potter. Urban Restructuring: One Goal of the New Atlanta Transit System. Traffic Quarterly, Vol. 33, No. 1, Jan. 1979.
16. U.S. Department of Transportation. UMTA Policy Toward Rail Transit. Federal Register, Vol. 43, No. 45, March 7, 1978.
17. C. Sharpe and others. A Value Capture Policy. Rice Center for Community Design and Research. Houston, TX, Nov. 1974.
18. W. Crowell. The Basic Economics of Transit Taxation. In Workshop Report: Financing Public Transit in New York State. Polytechnic Institute of New York, Brooklyn, NY, Feb. 1977.
19. W. Crowell. The Feasibility of State-Level Multi-Modal Transportation Trust Funds. Research and Education Division, Urban Mass Transportation Administration, Nov. 1978. NTIS: PB 292-396.
20. J. Pechman and B. Okner. Who Bears the Tax Burden? Brookings Institution, Washington, DC, 1974.
21. D. Stetson. Tax Surcharge to Cut Fares Urged. New York Times, Feb. 19, 1978.
22. W. Crowell. An Analysis of Transit Pricing and Finance Options. New York Univ., New York, Ph.D. dissertation, 1976.
23. Transportation Energy Initiative Program. DOT News, No. 95-79, Aug. 22, 1979.

Publication of this paper sponsored by Task Force on Local Transportation Finance.

Transit Financing Trends in Large U.S. Metropolitan Areas: 1973-1978

JOHN PUCHER

From 1970 to 1978, total government subsidization of transit in the United States increased almost tenfold, from only \$540 million to \$5264 million. This burgeoning aid program has prompted significant changes in the nature of government assistance. There has been a marked shift among government levels in the responsibility for transit financing, and new tax mechanisms have been adopted, particularly at the local and regional levels, to raise additional transit funds. This paper documents these transit financing trends in detail and explores briefly the potentially significant impact of these trends on the overall equity, efficiency, and political feasibility of transit financing. On the basis of operating subsidy data collected from transit agencies in each of the 26 largest U.S. metropolitan areas and capital subsidy data for all urban

areas provided by the U.S. Department of Transportation, two main conclusions were reached. First, the responsibility for transit financing has shifted to higher levels of government so that, in 1978, the federal government contributed 52 percent of the total subsidy. Second, there has been a very strong trend toward the use of uniform-rate regional taxes specifically earmarked for transit subsidization.

Government financial assistance to mass transit in the United States has increased dramatically since 1970, when capital and operating subsidies combined

amounted to only \$540 million. By 1978 the total subsidy had grown to \$5264 million, an almost tenfold increase in only eight years (see Table 1). This burgeoning of transit subsidization has prompted significant changes in the nature of government assistance. There has been a marked shift among government levels in the responsibility for transit financing, and new tax mechanisms have been adopted (particularly at the local and regional levels) to raise additional transit funds.

These shifts in financing arrangements have had important consequences for both the efficiency and the equity of the transit financing process. The incidence of tax burdens, for example, varies substantially by type of tax and by the level of government at which the tax is levied. Thus, shifts in these two variables may have considerably altered the distribution of the overall burden of transit taxation among socioeconomic groups and geographic regions. Moreover, shifts in funding responsibilities and tax mechanisms may have affected incentives for cost control by local transit agencies and thereby the efficiency of transit operations and overall subsidy requirements. Another efficiency impact may arise from the effect of funding arrangements on the feasibility of comprehensive, long-range transit planning. The possibility of such planning, for example, is certainly enhanced by the earmarking of dependable and growing revenue sources specifically for transit subsidization. Finally, the nature of transit funding can substantially influence the

political feasibility of raising any given amount of transit subsidy and, as a consequence, may significantly affect the magnitude of the subsidy program as a whole.

These considerations of equity, efficiency, and political acceptability of transit financing arrangements are of primary importance. Before such impacts can be analyzed, however, it is necessary to establish quantitatively the actual patterns of financing and how these have changed over time. Such are the purposes of this paper: first, to document recent trends in the division of government responsibility for transit financing and shifts in the types of funding mechanisms employed and, second, to examine variations in transit financing arrangements among U.S. metropolitan areas and different regions of the country.

Because detailed data could not be obtained from all U.S. transit agencies, this report focuses on the financing of transit operations in the 26 largest metropolitan areas. These account for about 75 percent of all transit riders in the United States and for almost 90 percent of the total nationwide transit subsidy. Transit funding arrangements may be considerably different in smaller metropolitan areas, but clearly the national impact of these is overwhelmed by the far greater magnitude of subsidization in the very large urban areas to be examined here.

OPERATING SUBSIDIES

As shown in Table 2, transit operating subsidies in the largest U.S. metropolitan areas increased dramatically from 1973 to 1978. In 1973, the aggregate subsidy in the 26 largest areas was \$829 million, compared with \$2389 in 1978, which represents almost a threefold increase during the period and an average annual rate of growth of 24 percent.

Funding increased at every level of government to help cover the burgeoning transit deficit, but the extent of subsidy growth varied considerably. Federal funding, for example, increased by \$567 million above the 1973 level, and the proportion of the total deficit covered by federal assistance increased from 0 to 24 percent. Regional funding also grew rapidly, although not quite as dramatically. The absolute amount of the increase

Table 1. The growth of transit capital subsidies relative to the growth in transit operating subsidies.

Year	Subsidy (\$000 000s)		Subsidy (\$000 000s)			
	Capital	Operating	Year	Capital	Operating	
1965	76	12	1972	765	605	
1966	159	44	1973	1611	871	
1967	181	79	1974	1607	1533	
1968	183	190	1975	1735	2028	
1969	223	260	1976	1940	2183	
1970	200	341	1977	2290	2238	
1971	427	485	1978	2609	2655	

Note: Subsidy figures include commuter rail.

Table 2. Sources of transit operating subsidies for 26 large metropolitan areas, aggregate 1973-1978 data.

Type of Funding	1973 ^a		1974		1975		1976		1977		1978	
	Amount (\$000 000s)	%										
Federal	0	0	42.2	3.5	282.3	16.7	422.5	21.5	477.0	22.8	566.8	23.7
State	186.7	22.5	357.2	29.2	435.9	25.7	419.6	21.4	391.1	18.7	432.7	18.1
Regional ^b	224.2	27.0	310.5	25.4	476.3	28.1	565.7	28.8	639.0	30.5	732.5	30.7
Local	283.4	34.2	394.0	32.2	372.0	21.9	397.8	20.2	406.9	19.4	472.3	19.8
Total government aid	694.3	83.7	1103.9	90.3	1563.5	92.4	1805.8	91.9	1914.1	91.4	2204.5	92.3
Bridge and tunnel tolls and cross-subsidies from airport and marine operations	120.0	14.5	99.2	8.1	106.6	6.3	133.2	6.8	160.5	7.7	168.5	7.1
Cross-subsidies from utility operations	10.6	1.3	13.9	1.1	10.9	0.6	11.2	0.6	11.8	0.6	7.1	0.3
Cross-subsidies from freight operations	4.5	0.5	5.7	0.5	11.2	0.7	15.2	0.8	8.8	0.4	9.3	0.4
Total from other sources	135.1	16.3	118.8	9.7	128.6	7.6	159.6	8.1	181.1	8.6	184.9	7.7
Total transit subsidy	829.4		1222.7		1694.9		1965.3		2095.1		2389.4	

^aThe data for 1973 exclude San Francisco, Washington, and Denver because it was not possible to obtain consistent 1973 financing statistics for these areas.

^bFunding was classified as regional if an explicit (or nearly so) metropolitanwide financing mechanism existed. Uniform county taxes were also classified as regional, provided the county was large enough to include most of the metropolitan area.

Table 3. Sources of transit operating subsidies for 26 large metropolitan areas, 1978 data aggregated by region.

Type of Funding	Region		Northeast ^a		Great Lakes ^b		Interior River ^c		South ^d		West ^e	
	Amount (\$000 000s)		Percent		Amount (\$000 000s)		Percent		Amount (\$000 000s)		Percent	
	Federal	294.3	22.4	102.8	26.7	47.7	33.6	27.8	25.6	94.2	21.4	
State	355.7	27.1	37.8	9.8	37.1	26.1	1.6	1.5	1.0	0.1		
Regional ^f	148.3	11.3	238.0	61.9	43.3	30.5	44.2	40.7	259.0	58.8		
Local	356.7	27.1	5.7	1.5	13.8	9.7	27.9	25.7	68.2	15.5		
Total government aid	1155.0	87.9	384.2	100	141.9	100	101.5	93.4	421.9	95.8		
Bridge and tunnel tolls and cross-subsidies from airport and marine operations	159.4	12.1	0		0		0		9.1	2.1		
Cross-subsidies from utility operations	0		0		0		7.1	6.5	0			
Freight cross-subsidies	0		0		0		0		9.3	2.1		
Total other sources	159.4	12.1	0		0		7.1	6.5	18.4	4.2		
Total	1314.4		384.2		141.9		108.7		440.3			

^aIncludes Boston, New York, Philadelphia, Baltimore, and Washington.^bIncludes Buffalo, Cleveland, Detroit, Chicago, and Milwaukee.^cIncludes Kansas City, St. Louis, Pittsburgh, Cincinnati, and Minneapolis-St. Paul.^dIncludes Miami, Houston, Dallas, Atlanta, and New Orleans.^eIncludes Los Angeles, San Diego, San Francisco, Denver, Seattle, and Portland.^fFunding was classified as regional if an explicit (or nearly so) metropolitanwide financing mechanism existed.

Table 4. State and federal assistance as a percentage of total operating subsidy in each urban area, 1978 data.

City	Assistance (%)		
	Federal	State	Total
Baltimore	50.0	50.0	100.0
Milwaukee	56.6 ^a	28.9	85.5
Pittsburgh	32.4	51.6	84.0
Philadelphia	37.7	44.0	81.7
Buffalo	58.5 ^a	20.8	79.3
Detroit	48.5	24.0	72.5
Minneapolis	25.2	40.3	65.5
Boston	13.4	49.4	62.8
New Orleans	53.5 ^a	8.3	61.8
Cincinnati	37.8	17.1	54.9
Dallas	45.5	0	45.5
Kansas City	44.3	0	44.3
Los Angeles	42.9	0.2	43.1
New York	21.7	21.3	43.0
Miami	39.5	0	39.5
St. Louis	37.1	0	37.0
San Diego	31.2	0	31.2
Chicago	20.1	8.4	28.5
Washington	17.4	6.0	23.4
Cleveland	18.6	1.0	19.6
Portland, OR	19.5	0	19.5
San Francisco	14.5	0	14.5
Atlanta	13.8	0	13.8
Seattle	7.9	0.6	8.5
Denver	8.3	0	8.3
Houston	0	0	0

^aIndicated percentages exceed the statutory maximum of 50 percent federal operating assistance due to the peculiar timing of Section 5 grants in these areas and the accounting procedures used by individual transit agencies.

in regional funding was only slightly less than the federal increase (\$508 million), and this raised the regionally funded proportion of the total deficit from 27 to 31 percent. In contrast, the state and local portions of the total operating subsidy in these 26 areas actually decreased. The local contribution, for example, fell from 34 percent of the total in 1973 to only 20 percent in 1978 although the local subsidy grew by \$189 million. The state proportion of funding fell from 23 to 18 percent despite a more than doubling in the amount

of that subsidy, from \$187 million in 1973 to \$433 million in 1978.

By 1978, regional funding had become the single most important source of operating subsidies (31 percent of the total), federal funding the next most important (24 percent), followed by local funding (20 percent) and state funding (18 percent). This situation represents a striking contrast to the 1973 financing arrangement, where federal assistance was nonexistent and local aid was the most important. Thus, as the overall burden of operating subsidization has grown in the United States, the responsibility for financing transit has shifted to higher levels of government.

Table 2 also documents the decline in nongovernmental funding sources (such as the proceeds from bridge and tunnel tolls), which accounted for most of these funds. Overall, nongovernmental funding increased by \$50 million, but its proportion of total operating subsidy funding fell from 16 to only 8 percent.

Disaggregation of the nationwide totals of Table 2 reveals substantial variation in funding arrangements by region of the country. Regional funding, for example, is much more important in the West and the Great Lakes regions, where it accounts for about 60 percent of the total operating subsidy, than elsewhere (see Table 3). Regional funding is least significant in the Northeast, where it accounts for only 11 percent of the total. The relative importance of state funding also varies substantially. State aid was extensive in the Great Lakes region and the Northeast but insignificant in the South and the West. Local operating assistance was most substantial in the Northeast and the South and least substantial in the Great Lakes area.

The differential regional reliance on nongovernmental funding is also noteworthy. Roughly 86 percent of these funds were found in the Northeast in the form of proceeds from bridge and tunnel tolls. Other regions either did not rely on such funding sources or only covered a very small percentage of their operating deficits in this manner.

Of course, there is also significant variation in transit financing arrangements among individual

cities. Table 4 documents the striking differences among urban areas in the percentage of their transit operating subsidies that are derived from federal and state sources. At one extreme is Baltimore, which receives all of its funding from either the state of Maryland or the federal government. At the other extreme is Houston, which in 1978 received no federal or state operating funds at all. Some cities that receive very generous state funding (such as Boston) suffer from proportions of federal funding that are far below average. Conversely, some cities that receive very generous federal funding (such as New Orleans, Dallas, and Kansas City) receive little or no state assistance. On the basis of Table 4, one may conclude that urban areas differ greatly in the extent to which they have been able to shift the burden of transit subsidization from the local and regional levels to the state and federal levels. Such differences may have had important consequences for the equity and efficiency of the transit financing arrangements in each area. Whatever the precise impacts may have been, the tremendous variation in funding responsibility among government levels suggests correspondingly significant variation among cities in the ultimate equity and efficiency impacts.

This intercity variation that arises from differential governmental division of funding responsibility is compounded by variations among cities in the specific types of tax mechanisms employed, the geographic scope of their coverage, and particular provisions with respect to the definition of the tax base. Regionwide, uniform sales taxes, for example, are the primary means of financing in Chicago, Cleveland, St. Louis, Los Angeles, Atlanta, Denver, and San Diego, where regional transportation agencies are responsible for coordinating transit services in their areas and have been delegated the authority to levy a percentage of the general sales tax specifically for transit funding. Regional transit agencies have also been important in coordinating the operations and financing of transit services in Boston, Philadelphia, Minneapolis, Milwaukee, Buffalo, and Miami, although uniform regional taxes have not been specifically earmarked for the subsidization of transit in these metropolitan areas. Except in Minneapolis, which has a general-purpose regional property tax, the transit authority assigns to each locality a percentage of the total regional transit deficit.

Other differences in specific subsidy mechanisms are also considerable. New Orleans, for example, is unique among large U.S. cities in that a large proportion of its transit deficit is financed from the profits of the utility company that runs the city's transit service. In the New York area, more than \$130 million/year is transferred from the surplus toll revenues of bridge and tunnel authorities to offset transit deficits. (New York accounts for more than 95 percent of nationwide toll revenues used for this purpose.) Much of the Massachusetts subsidy to Boston-area transit is derived from the cigarette tax, and gasoline and motor vehicle excise taxes are a significant source of regional subsidy funds in Chicago, Seattle, and Detroit and the sole source of state subsidy to transit in the Miami area. Cincinnati relies heavily on a citywide employee payroll tax (or earnings tax); Portland also uses a payroll tax, but it is regionwide and is paid by the employer rather than the employee. Reduced fares for senior citizens in Philadelphia are subsidized by the proceeds of the state lottery. The Metropolitan Transportation Authority (MTA) of New York finances part of its commuter rail operations from the

proceeds of a mortgage-recording tax levied in counties served by its lines.

A perusal of Table 5 will reveal more examples of differences among urban areas in the types of tax mechanisms employed. Clearly, however, even on the basis of the few examples cited above, there is considerable variation in the types of mechanisms used to raise funds specifically for transit subsidies. Moreover, even the subsidy funds derived from general revenues at either the state or local level are indirectly supported by tax mixes that differ greatly from one state to another and among cities as well (1, Table 47; 2, Table 12).

The aggregate distribution of operating subsidy funds by level of government and by tax type for the 26 largest U.S. metropolitan areas is displayed in Table 6 (1, Table 47). The figures indicate that 34 percent of the total government operating subsidy is derived from sales taxes, 27 percent from individual income or payroll taxes, 22 percent from property taxes, 6 percent from corporation profits taxes, and 6 percent from excise taxes on gasoline and motor vehicles. Roughly 6 percent of the total government operating subsidy funds could not be identified by specific tax type.

CAPITAL SUBSIDIES

Detailed statistics were not collected on the financing of capital subsidies in each of the 26 largest metropolitan areas. There are two reasons for this:

1. It is difficult to ensure consistent amortization of capital subsidy funding statistics across different urban areas, and variations may significantly alter the patterns of variation in financing indicated by the reported data; and
2. The state and local portion of capital funding is so small relative to the federal contribution that differences in state and local financing arrangements are far less consequential in aggregate than is the case for operating subsidies.

The steadily increasing federal contribution to operating subsidization has been preceded by a corresponding (albeit discontinuous) increase in the federal share of capital funding. Initiated in 1964, federal capital assistance grew from only \$51 million in that year to \$133 million in 1970 and \$956 million in 1974, the first year in which federal operating subsidies were granted. Since 1974, federal capital funding has more than doubled to reach \$2100 million in 1978. In addition to the increased total amount of federal contribution, various legislation has set the federal matching percentage at successively higher statutory levels. From 1964 until 1974, the federal share of capital projects was discretionary but could not exceed two-thirds. Since then, most project grants have entailed 80 percent federal funding, so that state, local, and regional governments pay only one-fifth of transit capital costs, in contrast to the three-quarters share of operating subsidy costs they bear.

CONCLUSION

The rapid growth in the nation's transit subsidy program has had profound impacts on the nature and composition of transit financing. Two trends have been most prominent:

1. A marked shift toward the use of regional taxes dedicated to transit subsidization and

Table 5. Transit-operating-subsidy funding sources for 26 large U.S. metropolitan areas.

Area	Funding Source	Amount (\$000s)					
		1973	1974	1975	1976	1977	1978
New York	Federal—UMTA	0	25 000	185 563	174 129	161 887	184 695
	New York State	0	123 500	149 200	114 700	91 370	91 608
	New Jersey	22 249	38 834	55 220	55 695	65 147	76 430
	Connecticut	2 971	7 612	9 075	9 559	9 303	12 859
	New York City ^a	173 000	247 470	234 355	241 407	245 582	275 997
	MTA assessments to local governments						
	Mortgage-recording tax	13 311	11 047	7 208	8 257	10 042	12 519
	Station assessments	19 690	17 767	21 848	36 133	27 998	23 303
	Local share of commuter rail operating assistance program	0	20 000	15 000	20 000	20 300	20 000
	Bridge and tunnel tolls—Triborough and Port Authority ^b	120 036	95 254	101 728	129 787	146 236	152 251
	Total	352 257	586 484	779 197	789 667	777 865	849 932
Boston	Federal—UMTA	0	6 241	11 173	16 869	22 200	26 628
	Massachusetts ^c	54 925	58 920	73 474	77 938	84 765	98 243
	Local cities and towns—property tax	52 342	64 220	64 703	68 920	78 975	74 049
	Total	107 267	129 381	149 350	163 727	185 940	198 920
Philadelphia	Federal—UMTA	0	2 293	15 959	33 403	38 884	52 043
	Pennsylvania	46 568	56 043	56 317	61 282	61 315	60 761
	Local counties including Philadelphia	11 668	16 008	19 305	22 775	21 902	18 385
	Bridge tolls—Port Authority ^d	0	3	701	566	7 097	6 901
	Total	58 236	74 347	92 282	118 026	129 198	138 090
Baltimore	Federal—UMTA	0	0	4 254	7 338	10 349	12 539
	Maryland—primarily gasoline tax, motor vehicle fees, and excise taxes	2 789	6 723	9 027	9 310	10 349	12 539
	Total	2 789	6 723	13 281	16 648	20 698	25 078
Washington, DC	Federal—UMTA	0	0	6 893	11 489	15 612	18 404
	District of Columbia and counties in Virginia and Maryland						
	Virginia	17 312	35 089	45 846	57 614	80 708	
	Maryland	400	0	0	0	0	0
	Total	17 712	44 982	61 335	78 663	105 491	
Buffalo	Federal—UMTA	0	0	370	2 532	3 348	4 989
	New York State	0	1 180	1 770	1 770	1 770	1 770
	Erie and Niagara Counties	0	1 180	1 770	1 770	1 770	1 770
	Total	0	2 360	3 910	6 072	6 888	8 529
Cleveland	Federal—UMTA	0	600	3 439	6 903	11 647	11 233
	Ohio	0	130	151	615	577	600
	Cuyahoga County—sales tax	0	0	5 857	37 759	44 044	48 531
	Cleveland	0	730	0	0	0	0
	Total	0	1 460	9 447	45 277	56 268	60 364
Detroit	Federal—UMTA	0	6 470	10 715	18 530	25 623	29 999
	Michigan—gasoline tax	5 958	5 504	7 655	6 937	8 996	14 830
	Regional tax on vehicle registrations and title transfers	0	0	0	0	2 057	13 553
	Detroit	9 387	10 056	7 723	8 110	0	2 700
	Total	15 345	22 030	26 093	33 577	37 521	61 842
Chicago	Federal—UMTA	0	0	0	49 358	49 598	49 290
	Illinois						
	Operating assistance—gasoline tax	24 600	27 536	0	0	0	0
	Reduced-fare reimbursement ^e	10 877	19 188	21 023	20 324	20 001	20 556
	Regional transportation sales tax	0	34 228	89 186	89 305	98 838	110 595
	Regional motor vehicle registration fee	0		24 049	15 714	15 602	16 162
	Public transportation tax—regional 5 percent tax on motor fuels	0	0	0	0	0	43 536
	Cook County—gasoline tax	5 000	1 000	1 000	1 000	2 000	2 000
	Chicago—gasoline tax	.7 300	700	700	1 500	3 000	3 000
	Suburban towns	92	302	227	80		
	Rail freight cross-subsidy ^f			3 145	6 057		
	Total	47 869	82 954	139 330	183 338	189 039	245 139
Milwaukee	Federal—UMTA	0	0	1 454	3 624	5 457	7 240
	Wisconsin	0	0	1 255	1 979	2 198	3 703
	Milwaukee County—property tax	0	0	577	1 476	1 832	1 852
	Total	0	0	3 286	7 078	9 487	12 795
Pittsburgh	Federal—UMTA	0	0	7 168	7 335	9 200	13 000
	Pennsylvania	13 290	15 113	22 118	18 012	19 800	20 700
	Allegheny County	4 932	3 635	5 946	5 700	6 400	6 400
	Total	18 222	18 748	34 425	31 047	35 400	40 100
Cincinnati	Federal—UMTA ^g	1 186	1 616	2 750	4 356	4 936	5 611
	Ohio	0	0	0	0	0	3 546
	Hamilton County	60	72	72	72	72	72
	Cincinnati—earnings tax	1 803	5 449	5 790	7 397	8 082	6 632
	Total	3 049	7 137	8 612	11 825	13 090	14 861
St. Louis	Federal—UMTA	0	0	0	7 876	6 828	14 782
	Illinois	627	15	0	0	0	0
	Illinois Downstate Transportation Fund (sales tax)	0	0	3 332	2 832	3 989	4 913
	Regional transportation sales tax	0	11 785	14 723	13 050	19 681	20 102
	St. Louis City and County	1 976	0	0	0	0	0
	Total	2 603	11 801	18 065	23 758	30 498	39 797

Table 5. Continued.

Area	Funding Source	Amount (\$000s)					
		1973	1974	1975	1976	1977	1978
Minneapolis-St. Paul	Federal—UMTA	0	0	8 907	0	8 628	8 628
	Minnesota	0	3 980	3 211	16 309	10 841	13 816
	Regional property tax	6 713	7 641	6 548	9 019	11 202	11 829
	Total	6 713	11 621	18 666	25 328	30 671	34 273
Kansas City	Federal—UMTA	0	0	1 536	2 801	4 991	5 692
	Kansas City—sales tax	3 515	5 727	7 403	8 869	5 893	6 296
	Other local governments	149	592	770	1 245	804	859
	Total	3 664	6 317	9 709	12 915	11 688	12 847
Atlanta	Federal—UMTA	0	0	2 419	3 346	4 098	4 977
	Regional transit district—sales tax ^h	17 572	20 971	23 142	26 014	28 594	30 971
	Total	17 572	20 971	25 561	29 360	32 692	35 948
	Federal—UMTA	0	0	3 932	6 000	8 074	8 641
Miami	Florida—gasoline tax	0	0	0	84	26	0
	Dade County—property tax	3 688	5 425	4 600	7 957	11 046	13 220
	Total	3 688	5 425	8 532	14 142	19 146	21 861
	Federal—UMTA	0	0	0	0	3 192	10 265
New Orleans	Louisiana	0	0	0	0	0	1 592
	Local—New Orleans and Jefferson Parish	0	0	366	653		340
	Cross-subsidy from utility operations ^j	10 596	13 877	10 858	11 192	11 803	7 106
	Total	10 596	13 877	11 224	11 845	14 995	19 263
Houston	Houston ⁱ	0	1 044	4 561	8 993	14 066	23 247
	Federal—UMTA	0	0	1 500	2 191	3 197	3 579
	Dallas	0	1 704	2 728	3 968	3 566	4 294
	Total	0	1 704	4 228	5 159	6 763	7 873
Denver	Regional sales tax						
	Federal	0	0	0	0	0	3 050
	Local governments—property tax						0
	Total			5 429	12 329	18 216	32 967
San Diego	Federal—UMTA	0	0	0	5 076	6 891	5 965
	Regional sales tax—local transportation fund (LTF) ^k						
	San Diego	4 654	6 507	3 654	1 548	2 122	2 969
	Other cities			21	21	17	21
Los Angeles	Total	4 654	6 507	8 628	13 932	17 062	19 136
	Federal—UMTA	0	0	16 500	28 506	44 524	49 458
	Los Angeles County	727	6 380	13 639	21 772	4 536	5 200
	Regional sales tax—LTF ^k	32 027	41 172	51 919	59 904	65 619	60 373
San Francisco	California	0	0	0	0	1 171	235
	Total	32 754	47 552	82 058	110 182	115 850	115 266
	Federal—UMTA			0	4 629	11 815	22 763
	Regional transportation sales tax—LTF ^k ^l			9 916	11 361	13 823	27 593
Portland, OR	San Francisco ^l			36 133	31 680	38 156	47 280
	Oakland and suburban counties ^m			20 098	17 461	20 807	18 919
	Bay Area Rapid Transit (BART)						
	District property tax				4 410	5 029	5 170
Seattle	District sales tax ⁿ				4 000	21 021	28 700
	Sales-tax revenue bonds ^o				20 000	5 195	19 548
	Bridge tolls ^p			2 962	4 125	2 799	7 142
	Cross-subsidy from rail freight profits—Southern Pacific			4 503	5 702	8 021	8 800
Seattle	Total ^q			75 811	105 687	127 832	166 367
	Federal—UMTA	0	0	1 660	2 767	5 063	4 833
	Regional employer payroll tax	8 395	7 334	9 009	12 418	16 084	19 985
	Total	8 395	7 334	10 669	15 185	21 147	24 818
Seattle	Federal—UMTA	0	21	111	5 990	0	4 038
	Regional motor vehicle excise tax ^r	3 000	4 512	5 121	12 044	21 809	18 529
	Regional sales tax—King County	12 530	15 077	16 620	18 410	22 133	27 909
	State business tax exemption	188	195	240	254	273	300
Seattle	Seattle and other local governments	91	134	113	114	253	367
	Total	15 809	19 939	22 205	36 812	44 468	51 143

Note: The amounts in the table represent the total subsidy for all transit modes, including commuter rail.

^aThe figures for New York City include compensation for transit police service (about \$120 million annually) and support for reduced fares for school children, elderly, and handicapped (about \$80 million annually). They do not incorporate the city's expenses in repaying the transit debt (about \$170 million each year).

^bAbout \$38 million in operating subsidy is provided by the bridge and tunnel tolls of the Port Authority of New York and New Jersey to support the Port Authority Trans-Hudson rail rapid transit lines. About \$115 million/year of the proceeds of the tolls of the Triborough Bridge and Tunnel Authority is transferred directly to the New York City Transit Authority and the MTA to cover operating losses.

^cAbout \$17 million of each year's state contribution is derived from cigarette taxes; the remainder comes from general revenues.

^dThe Port Authority uses its toll revenues to support the operations of the Lindenwald High-Speed rail rapid transit line between Philadelphia and its New Jersey suburbs.

^eThis subsidy covers the cost of reduced fares for the elderly, the handicapped, and school children on the Chicago Transit Authority.

^fThis amount is equal to the difference between the operating loss attributable to provision of commuter rail service and the payments received.

^gThe federal subsidy figures for 1973 and 1974 almost certainly include capital subsidies.

^hThe total proceeds of the regional transit sales tax far exceed the amounts shown, but a considerable portion is used for capital improvements. The operating portion, that shown, was set equal to the difference between the total operating deficit and the federal operating assistance.

ⁱThe Public Service Company of New Orleans (the gas and electric firm for the region) provides transit service and covers the loss from its profits on utility operations.

^jThese are federal revenue-sharing funds but are classified as a local subsidy because, unlike UMTA Section 5 subsidies, the use of these for support of transit precludes their use for nontransit city expenditures, which in effect thus requires that this amount be raised from other city taxes.

^kThe regional transportation sales tax is collected by California in the particular city's metropolitan region and returned to the region for transportation uses.

^lFor support of the San Francisco Municipal Railway (Muni).

^mFor support of AC Transit and Golden Gate Transit.

ⁿThis is a transaction and use tax originally intended for capital subsidy only but currently used for operations.

^oThe amounts shown were spent exclusively for operations.

^pThe figures only include Golden Gate Bridge toll proceeds used to subsidize bus and ferry transit to Marin and Sonoma Counties.

^qThe 1973 total does not include BART sales or property taxes.

^rNot all of the proceeds of this tax are used for operating purposes.

Table 6. Tax revenue sources for government operating subsidies to transit, aggregate 1978 data for 26 largest U.S. metropolitan areas.

Level of Government	Type of Tax ^a	Amount (\$000 000s)	Percent
Federal ^b	Individual income tax	364.5	64.3
	Corporation profits tax	127.5	22.5
	Sales tax	53.3	9.4
	Other	21.0	3.7
State	Total	566.3	
	Income tax	130.5	30.2
	Sales tax	188.1	43.5
	Gasoline tax and motor vehicle excise tax	27.4	6.3
	Property tax	3.7	0.9
	Other	83.0	19.2
Local and regional	Total	432.7	
	Income tax	109.0	9.0
	Sales tax	507.6	42.1
	Gasoline tax and motor vehicle excise tax	96.8	8.0
	Property tax	475.6	39.5
	Other	16.2	1.3
Total government subsidy ^c	Total	1205.2	
	Income tax	604.0	27.4
	Corporation profits tax	127.5	5.8
	Sales tax	749.0	34.0
	Gasoline tax and motor vehicle excise tax	124.2	5.6
	Property tax	479.3	21.7
	Other	120.2	5.5
	Total	2204.2	

^aWhere taxes were not specifically earmarked for transit subsidization, the operating subsidy in each metropolitan area was distributed according to the composition of local general revenues in each specific area. The same procedure was followed at the state level. The state and local figures do not indicate any allowance for the federal contribution to general fund coffers via revenue-sharing grants. These accounted for about 4 percent of state and local revenues. Ultimately, therefore, federal taxes accounted for an even higher proportion of total operating subsidies than shown in the table, and state and local taxes accounted for a lower percentage than indicated.

^bNo federal taxes are specifically earmarked for transit; therefore, amounts of specific taxes under this category reflect the composition of general revenues only.

^cThis total excludes about \$400 million in operating subsidies to transit in smaller urban areas and also excludes about \$185 million in nongovernment operating subsidies (such as bridge and tunnel tolls) in the larger areas.

2. A dramatic increase in the federal role in transit financing.

Prior to 1965, there was no federal role, and even as late as 1970, the federal contribution was overwhelmed by state, regional, and local contributions. By 1978, however, the federal government actually funded a greater percentage of the total operating and capital subsidy in the United States than all other government levels combined (52 percent). It is somewhat ironic that in the United States, with its strong tradition of decentralized government, the federal role in transit financing is significantly greater than the corresponding role of national governments in most Western European countries, even with their long traditions of very centralized government structures (3).

REFERENCES

1. Government Finances. In 1977 Census of Governments, Bureau of the Census, U.S. Department of Commerce, Vol. 4, No. 5, 1977.
2. Local Government in Metropolitan Areas. In 1977 Census of Governments, Bureau of the Census, U.S. Department of Commerce, Vol. 5, 1977.
3. H. Wolman and G. Riegeluth. Financing Urban Public Transportation in the U.S. and Europe. Urban Institute, Washington, DC, Sept. 1979.

Publication of this paper sponsored by Task Force on Local Transportation Finance.

Alternatives Analysis in the Financing of Multijurisdictional Public Transportation Services

ALICE E. KIDDER

The challenge of welding several independent and geographically distinct political jurisdictions into a single transportation service has been beyond the grasp of many U.S. cities. The rewards of such a feat are tempting—a widespread regional network of coordinated transportation service, an end to misaligned bus routes based on town boundaries rather than travel needs, and the economic advantage of spreading overhead costs such as the outlays for trans-

sit management and vehicle maintenance. Additional advantages include increased ability to attract federal dollars and a broader base for marketing of transportation services. Private bankrupt transit properties can be rescued and rationalized when several jurisdictions pool their financial resources. These benefits are offset, however, by the inherent problem of the public systems' requirement for public funding, and the subsidy must somehow be apportioned

to the residents of separate and frequently competing political jurisdictions. Sharing the cost of the deficit is required but, in the nature of multijurisdictional areas, the units of government are independent and cannot commit one another to future action without recurring appropriations by the individual jurisdictions. The determination of a basis for distributing the subsidy requirements is a difficult and politically sensitive task. This report explores the manner in which eight cities addressed the problem of sharing costs.

Areas were selected for study based on (a) their history of multijurisdictional financing arrangements, (b) their successful and unsuccessful experiences with alternative financing mechanisms for cost sharing, (c) the presence of innovative financing arrangements, and (d) lessons to be shared with other cities of comparable population size and density. The cities vary in fiscal capacity and geographic region. The research team surveyed patterns of transit deficit sharing in the 50 states through telephone interviews with local transportation financing officials. All systems that were located in the 100 largest metropolitan areas were contacted to determine whether one or more political jurisdictions contributed jointly to the financing of the public transportation services in the area. By using the results of the telephone interviews, the researchers selected judgmentally the case study sites.

The case studies are used in this paper to assess several questions:

1. Which criteria appear to be paramount in the choice among financing alternatives?
2. What conclusions can be drawn from the experiences of these disparate systems? and
3. Are there lessons for other areas that contemplate the formation of multijurisdictional financing arrangements?

CRITERIA BY WHICH MULTIJURISDICTIONAL TRANSIT FINANCING ALTERNATIVES ARE EVALUATED

In making the choice among financing alternatives, a jurisdiction must choose among several objectives to be achieved. Often one goal competes with another, and the final decision is inherently a political one. Since there is little consensus on the relative importance of the various criteria, each dimension along which the financing can be judged is discussed separately.

Efficiency

Tax revenues should be raised in a manner that minimizes interference with the economic decisions that would have been made in otherwise efficient markets. For example, it may be efficient to have persons buy in stores close to their home or work to reduce fuel consumption. The imposition of a sales tax in one jurisdiction but not in a neighboring one may, however, induce consumers to drive extra distances to purchase where the tax is lower. The extra resource cost of the fuel and time consumed is a violation of the principle of efficiency (1). The criterion of efficiency may influence several aspects of economic choice.

Consumption Decisions

If consumers have two or more competing markets in which to buy, and if one imposes a tax and the other does not, consumption decisions are distorted.

Production Decisions

If two jurisdictions are competing for the same factors of production (e.g., skilled workers), a pay-

roll tax in one jurisdiction but not in the other will distort employee decisions about where to work and ultimately may affect the relative economic activity of the two jurisdictions.

Mode-Choice Decisions

If two or more transportation modes compete with one another for customers, the subsidy of one mode more than another may cause a distortion in the decisions of which mode is used. Many observers feel that it is socially advantageous to push consumers in the direction of energy-saving public transportation alternatives and would question whether distortions of this nature are adverse. Nevertheless, one can question the economic efficiency inherent in a practice that subsidizes inefficient transportation suppliers at the expense of competing, and more-efficient, alternative suppliers. This issue has been raised in connection with suburban bus services, as for example in Montgomery County, Maryland. Federal subsidies support the higher-cost system of buses that emanate from the Washington Metropolitan Area Transportation Authority, but a lower-cost system, Ride-On, operates without federal assistance.

Equity

Equity is a measure of fairness of the taxing and spending arrangements. Different individuals measure fairness by different standards; what is at stake is the question of how material goods and services are to be distributed. A review of the literature reveals several concepts of equity.

Income Distribution Equity

Persons who have higher income or greater assets should pay a proportionately higher share of the costs of a public service such as transportation.

Benefit Equity

Persons who use the service should pay in proportion to the amount of service they have received. This second principle comes in conflict to some extent with the first, in the case of public transit, whenever the users are more likely to be lower-income persons.

Jurisdictional Equity

Each jurisdiction should contribute toward the support of a regional public transportation program according to a common standard, formula, or rule. This principle is violated when, for example, one state legislature fails to pass financing support comparable to that contributed by neighboring states in a case where both states benefit from the availability of a regional service.

Political Acceptability

In practice, this criterion is of overriding importance in decisions about which financing mechanism to use. Frequent violations of the efficiency or equity principles are justified by local elected officials on the grounds that it is important to get new transportation service instituted; selection of taxing procedures that are viewed as politically salable has higher priority than theoretically sound economic principles that, if followed, might prevent imposition of the tax at all.

Administrative Simplicity

One criticism of complex formula-allocation procedures for sharing the operating costs of a transit system among jurisdictions is that the administration of the financing allocation may be costly and time consuming. Local elected officials may have difficulty in predicting the tax effects in a situation where very complex financing rules prevail. Voters may not grasp the incidence of transit financing where complicated cost allocation occurs.

Openness to Public Scrutiny

Related to the concept of simplicity is the criterion that the financing mechanisms should be available and understandable to taxpayers and the voting public. In some of the cities visited, the financing sources and the allocation among jurisdictions was well documented in newspaper articles that had preceded crucial votes. In other cities, even the local elected officials were not entirely clear on the manner in which funds were allocated among jurisdictions.

Economy in Implementation

In the case of the allocation formula used in Washington, D.C., its complexity requires the annual expenditure of over \$1 million for data collection alone. Precision in information can at times be very costly. The introduction of regionwide financing arrangements that do not require such a wealth of detail of disaggregated information may be cost effective. Another aspect of economy in operations is the cost saving from the use of an existing tax source, rather than the creation of new tax collection mechanisms, special taxes, or the like. Systems that collect funds through statewide sources, such as the motor-vehicle excise tax in the state of Washington, are using previously established taxes that do not add to the administrative cost, except as the accounting of funds to the jurisdictions is concerned.

Sensitivity to Variations in the Fiscal Capacity of Component Jurisdictions

Through historical accident or by fundamental differences in economic base or political orientation, neighboring jurisdictions frequently exhibit very diverse fiscal capacities. Tax bases differ. Assessment rates and practices differ. If a transportation region includes two or more states, tax laws, constitutional limits on debt, and statewide tax levies may differ considerably between the component jurisdictions. Financing arrangements must be ingenious enough to take into account these differences and permit an amicable distribution of financial responsibility. In cases like Albany, New York, where wide variations occur in the ability to pay (from the wealthy suburbs to the much less densely populated rural areas and the inner city), much use is made of statewide financing. This practice reduces the need to confront the fiscal-capacity issue at the local level.

Inflation-Proof Revenue Sources

One problem that has been handled with varying degrees of success by the various metropolitan areas is the issue of deriving a funding source whose receipts keep pace with the region's increases in the cost of living. Transit costs are particularly vulnerable to inflationary pressure. A very high percentage of operating costs are labor costs. The

typical system usually has labor costs that amount to at least 70 percent or more of total operating costs. Since most of the major city transit systems engage in collective bargaining with organized labor, the practice of including cost-of-living escalators into labor contracts is widespread. The cost-of-living clauses generally include a cap, and thus do not advance to the full extent of the consumer price index (CPI) adjustments. Nevertheless, many clauses build in sizeable cost increases for the transit operation. Even a cost-of-living adjustment based on 0.6 of changes in the CPI is significant when the wage bill is 70-80 percent of total costs.

The escalation in transit costs can be met if the revenue sources also expand with inflationary pressure. There are several ways in which such tax escalation may occur:

1. Revenue sources such as sales taxes automatically increase receipts as the scale of economic transactions in the area increases,
2. Rules can be built into the tax structure to allow for expansion of rates automatically, and
3. The local governing bodies may be called on for renewed appropriations for transit support based on evidence of cost increases.

This final method leaves the discretion in the hands of the elected officials and is the most common practice. The disadvantage is that the planning horizon is foreshortened because one cannot predict with certainty the outcome of crucial local votes. For systems that are unable to build in revenue sources that escalate with the pace of costs, the alternative is retrenchment of service or, in some cases, the development of alternative subsidies. In the case of the Washington, D.C., metropolitan transportation region, cost escalations in building the new subway system have forced the development of alternative financing arrangements. To date, the principal source of relief has been special legislation passed by Congress to augment the basic federal assistance available from the Urban Mass Transportation Administration (UMTA) (legislation that includes debt guarantees, for example). Again, cities have frequently been compelled to turn to higher levels of government to solve problems based on the inability or unwillingness of local services to pay for the growing transit deficits.

Stability and Predictability

When multibillion-dollar capital investment programs are undertaken by regional transportation authorities, they have created an important fiscal partnership between federal, state, and local agencies. Financing of this large block of capital can be done through conventional money markets only if the revenue source that will retire the debt is demonstrable and predictable. The vagaries of decisions about authorization legislation weigh substantially in the minds of would-be lenders. Hence, it is financially advantageous to have developed stable and predictable sources of financing. The advantages are obvious: lower lending rates, less dependency on municipal corporate ratings (which have suffered in recent years), and the ability to raise money to solve initial cash-flow problems that frequently arise in waiting for federal or state financing.

In some cases, the issue of stability and predictability is couched in terms of a test of the political will of a region to finance the operations of a system on a long-term basis. The amortization of capital costs is based on commitments made at a single point in time, whereas the decisions about

the scale of operations can be adjusted incrementally based on the political judgment at various points in time. Where this issue arises is in cases such as the Washington, D.C., Metro subway system, where skeptics have raised the issue of whether the electorate wants to support a system with as large implied capital and operating costs as was originally designed. To some extent, the two issues are intertwined. The larger the scale, measured in capital terms, the higher the operating funds needed to sustain the system. The fear is that the system may be designed on too large a scale, and segments yet to be built will be abandoned; or, worse still, service will be abandoned even after a line is installed. One may point to cases where high capital investment was not sustained by operating funds, and the project was terminated. In the case of Bradley International Airport, for example, capital facilities for commuting are not used because of a lack of operating funds.

Sensitivity to Variations in Demand for Transportation Services

Several of the systems noted problems in adjusting financing arrangements to changes in demand for public transportation. For example, sudden modal shifts sparked by the energy crisis have strained existing peak-hour capacity. The scale of system operations cannot be increased without causing important increases in the deficit for operation. A capital constraint may also exist, but the staggering of commuter runs can bring about more-effective or better-balanced use of equipment if operating costs are covered. The problem lies in the fact that city and state budgets are technically locked in by collective bargaining provisions. The use of part-time drivers, for example, is not possible in some cases. Cities such as Seattle and Washington, which have been successful in negotiating provisions for a flexible labor supply, with part-time staffs permissible, find it easier to cope with unexpected variations in ridership.

Financing formulas that gear funding of the deficit to demand-related variables (such as ridership, vehicles hours of service, or fare-box revenue) are better able to cope with this problem. Some systems have built-in guidelines that suggest that the fare-box revenue should be maintained at a constant or increasing fraction of operating costs. The state of Maryland, for example, proposes to reimburse the Washington Metropolitan Area Transportation Authority based on an assumed fare-box recovery of 50 percent.

Compatibility with UMTA and Other Federal Guidelines

In order to comply with federal financing guidelines, local jurisdictions must be able to raise 50 percent or more of the operating cost toward which UMTA is also contributing. Where some systems have found this a difficult chore in the context of multijurisdictional financing, use has been made of federal revenue-sharing funds (Northern Indiana Commuter District), of diverted highway funds under the Federal Aid to Urban Systems (FAUS) options (as in the case of Washington), and of private-public joint-venture financing (as in the case of subscription service purchased by condominiums in Melbourne, Florida). These less-usual forms of local financing are the exception rather than the rule, however. For the most part, jurisdictions solve the problem by raising funds from general revenues. In some cases, the funds are from earmarked sources that are dedicated for transportation purposes. Any interruptions, therefore, in the flow of local funds

threaten the continuity of federal support. In the case of Norfolk, for example, threats of possible loss of potential funding induced the city, somewhat unwillingly, to join a very large, farflung regional transportation system.

Special federal regulations, such as required expenditures for facilities for the elderly and handicapped, add new strains to the need for local funding. Since the use of facilities for the elderly and handicapped may not follow the same pattern by subjurisdiction as does the overall system ridership, new allocation formulas are sometimes called for to apportion this extra cost equitably. New federal concerns have occasioned unexpected costs, and local requirements must adjust accordingly. Officials of Montgomery County noted that it was cheaper to forgo federal operating or capital assistance for the locally run Ride-On system, pay nonunion drivers considerably less than would be required by federal financing, and run the system in a more economical fashion.

To comply with UMTA stipulations, multijurisdictional systems that receive federal assistance have in the past had to pledge "maintenance of effort" such that federal funds do not simply replace previously contributed local funds. Some financial specialists for the systems interviewed expressed concern that maintenance-of-effort requirements would be placed in jeopardy if a major jurisdiction were to break away from a consolidated, multijurisdictional financing arrangement. Examples of smaller systems that have broken away from previous multijurisdictional arrangements are the case of Fairfax City, Virginia, which withdrew rail capital contributions from Metro when changes occurred in the allocation of subway stations; the case of Melbourne, Florida, where a jurisdiction left the regional transit configuration; and the case of Peabody, Massachusetts, which also opted out of the commuter system. South Bend, Indiana, expressed concern that one of its lessees, Mishawaka, might withdraw its support from Section 5 of the National Mass Transportation Assistance Act of 1974, as well as its local share, and thus throw into question the compliance with maintenance of effort. Thus, the ability to raise revenues through the taxing power of a consolidated government, as in the case of Dade County, or through earmarked, statewide taxes (as is true in California) eases the problem of securing a maintainable level of effort.

Congressional initiatives now call for stable and predictable local funding sources as a prerequisite for continued federal funding. One of the concerns to be addressed is whether tax sources must be earmarked specifically for transit if they are to constitute a stable and predictable basis of support.

In most of the systems studied, little prior thought was given to the relationship between the financing mechanism and the subsequent impact on future decisions regarding fare levels, cost control, or marketing to increase patronage. The experience of the various systems suggests that there will indeed be some causal relationship between the type of financing available and these management decisions.

Fare-Box Policy

Many of the systems interviewed had an implicit subsidize-as-you-go policy. No firm policy set fares to rise as deficits increased. As deficits mount, fare-box increases were not expected to absorb any given fraction (much less the total) of cost increases. Given the escalation of costs and fairly constant yields from fare-box and other operating revenue, the result is a sharp upward trend in local

and federal subsidies required to sustain transit operations.

Several systems reported, however, that they were under pressure to increase fares and had done so without injuring ridership rates. In only one system interviewed (Washington) was there any policy to keep revenues from fares and other operations at some set percentage of the operating costs (or deficits). In two systems (Washington and Norfolk) fares were credited to the jurisdiction that generated the fares. Higher fares would automatically result in lower subsidies required from the jurisdiction.

Several financing specialists in the transit authorities interviewed felt that UMTA had influenced the authority to keep fares low. They felt that this policy was in response to the concerns of the transportation-disadvantaged ridership and was a partial justification for continued federal support of operating assistance. Clearly, the specialists felt no responsibility to maintain fares at a given percentage of costs simply based on federal requirements.

Cost Control

In most cases the link between financing arrangements and cost control was direct. The financing must be agreed on annually by the regional body or by the component jurisdictions, and budgets set by the board of directors of the authority had the effect of providing the general limits on spending for the transit operations. In most cases the board of directors was composed of local elected officials, who would in another capacity have to vote for subsidies to the transit company if necessary; therefore, on the surface it appeared that the decision-making process provided considerable incentive for cost control. In Seattle, for example, the newspapers carried articles that condemned the local transit (and implicitly the local officials who served on the board) for unexpected cost overruns in the rebuilding of the street-level electrified bus system.

Several factors tend to weaken the link between financing decisions and cost control. In most of the systems studied, recent collective bargaining agreements build in cost-of-living adjustments that automatically increase compensation to the work force whenever there are upward movements in the CPI. The ready availability of federal assistance for capital expansion, coupled with the maintenance-of-effort requirement, sets in motion a likely expansion of the scale of the system. Such growth (in vehicles, route miles, and hours of service) calls forth significant increases in operating costs as the new elements in the system must be maintained, staffed, and repaired. The result of system growth without concomitant revenue growth has been noticeable increases in deficits.

Nevertheless, the complex nature of organizational decisions has the effect of separating, in place and time, those decisions that affect cost increases (e.g., labor dispute settlements, selection of neighborhoods to be served by transit, and choices of capital stock) from the decisions about needed subsidy. Local elected officials are frequently told after the fact that they must cover major cost overruns or face immediate loss of service. Local elected officials complained of being misled at times by hopes that federal assistance would materialize or that costs would not escalate as rapidly as they did. Political jurisdictions have found numerous ways to cover the deficit retroactively, and there are important political reasons why they should do so. Transit companies create a

lot of jobs. Termination of service would imply loss of jobs--an unpalatable alternative in an election year. Many low-income persons depend on public transportation to get to their place of work; disruption of service could have important side effects in reducing the productivity of the labor force when companies have large numbers of transit-dependent workers. Many elected officials have polled the voting public sufficiently to become convinced that positive votes for growth of the transit system will be beneficial to gaining reelection. It is a later administration that may have to raise the funds to pay for increased operating costs. The short time horizon of the local elected official may induce positive votes on expansion of transportation infrastructure, since the increased maintenance and upkeep will not fall due for some time. In all case studies, deficits have grown sharply over the last five years. Rather than imposing expenditure ceilings, elected officials have found methods to subsidize the growth.

UNIQUENESS AND COMMONALITY IN FINANCING ISSUES

Most of the multijurisdictional financing arrangements described in this report took shape in the early 1970s or mid-1970s. Therefore, too little time has elapsed to discern trends or find common outcomes. The unique fiscal and topological aspects of each metropolitan area played an important role in determining the choice of revenue source and the basis for agreement among the jurisdictions. It is difficult to transfer one system to another. Table 1 presents background information on multijurisdictional public transportation financial arrangements in the eight cities studied.

As can be seen in Table 2, deficits have grown in all systems studied. Public takeover of previously bankrupt or near-bankrupt private companies has been accompanied by service expansions, and unit cost increases are associated with inflation of transit costs at rates higher than cost-of-living increases.

Again from Table 2, one notes that the deficit increase is more pronounced in the early 1970s and, in many cases, doubled or trebled between 1973 and 1977. Later increases between 1977 and 1979 show constrained growth, particularly in systems that did not have dedicated revenue sources.

Several levels of government have shared in making up the operating deficit. Increased availability of federal and state funding is shown in Table 3. The role of local jurisdictions has tended to diminish as states and the federal government have offered more support for operating deficits.

If one tendency appears to be a common pattern, it is that each jurisdiction is likely to overspend local resources and to look to the next-higher level of government to contribute disproportionately to further growth of the system. Two or more adjoining cities wholly within a state are likely to propose confederated financing linked to the carrot of state subsidy. Multijurisdictional systems that cross state boundaries are likely to require special federal support, as in the case of the Washington metropolitan area.

Transit officials interviewed perceived strong economic incentives for developing multijurisdictional regional financing arrangements that permit the growth of a metropolitanwide transit system. Each of the multijurisdictional arrangements discussed offered a considerably larger and more comprehensive set of transit services, as compared with an earlier period when separate systems operated as individual private companies or as individual city-owned systems. None of the systems were eager

Table 1. Nature of multijurisdictional public transportation financial arrangements for eight study sites, 1979.

Location	Revenue Source for Nonfederal Share of Operating Deficits	Funds Earmarked for Transit	Formula for Cost Allocation	Jurisdictions Buy Levels of Service
Albany, NY	General revenues, state operating assistance	No	Specified shares of individual counties are spelled out in the state legislation	No
Dade County, FL	General revenues	No	No	No
Norfolk, VA	General revenues	No	Yes	Yes
Northern Indiana	State tax on leased freight cars, revenue sharing funds of counties	Yes	State legislation prescribes amounts for each jurisdiction	No
Sacramento, CA	Sales and fuel taxes, general revenues	Yes	Formula allocated by state	Yes
Seattle, WA	Motor vehicle excise tax, sales tax	Yes	No	No
St. Louis, MO ^a	Sales tax	Yes	No	No
Washington, DC	General revenues, highway fund transfers	No	Yes	No

^aData were given for the Bi-State Development Agency, which serves St. Louis, MO, and East St. Louis, IL.

Table 2. Index of growth of transit operating deficits for eight study sites.

Location	1973	1974	1975	1976	1977	1978	1979
Systems without dedicated revenue sources							
Albany	NA	38.8	39.4	73.2	100.0	113.4	NA
Northern Indiana ^a	NA	NA	58.8	76.5	100.0	93.8	NA
Dade County	28.9	47.8	71.3	86.2	100.0	126.4	NA
Norfolk	NA	NA	NA	NA	100.0	105.1	107.6
Washington	NA	NA	NA	NA	100.0	110.5	133.7
Systems with dedicated revenue sources							
Sacramento	NA	NA	76.9	88.3	100.0	123.9	118.2
St. Louis	NA	34.3	58.5	76.8	100.0	130.1	154.9
Seattle	36.9	54.2	75.1	89.9	100.0	120.1	129.9

^aData were supplied only by Gary, IN.

Table 3. Sources of support for deficit in selected study sites by jurisdiction.

Location	Local (%)		State (%)		Federal (%)	
	1974	1978	1974	1978	1974	1978
Dade County	62.3	39.2			37.7	60.8
St. Louis	100.0	56.1	0.0	10.9	0.0	33.0
Northern Indiana ^a	49.9	37.9	5.4	14.7	44.6	47.3
Albany	16.7		24.4			58.9
Seattle	94.5		0.1			5.4
Norfolk	42.8		5.0			52.2

^aData were supplied only by South Bend, IN.

to split again into the smaller units they had once served. The economies of regionalized solutions were perceived to be considerable.

The following advantages of the regional basis for service were illustrated in the case studies:

1. Sharing of management costs (all systems),
2. Sharing of maintenance costs (all systems),
3. Improved planning capability (all systems),
4. Improvement of route alignments (in Albany, for example, routes of the individual cities did not end at the terminus of the next city's routes, so intercity travel had been difficult),
5. Opportunity to integrate bus and light rail systems (Washington and Miami),
6. Opportunity to share the tax burden to sustain major capital improvements that one city could not afford alone (all systems),
7. Increased ability to attract federal funds (Norfolk), and

8. Increased visibility of the transit system, improved marketing capability, and ridership growth (all systems).

The largest systems, whose very size, complexity, and frequently interstate nature compounded problems of management, had the most difficulty in taking advantage of these economies. In the case of Washington, for example, one county had found it less costly to set up its own independent bus service, despite the fact it was already a contributor to the regional system. The latter proved to be advantageous principally for long-haul commuting traffic rather than for internal circulation within the county.

Dedicated Revenue Sources and Centralized Transit Authorities

Dedicated revenue sources and centralized transit authorities result in improved ability to plan and achieve capital acquisition. Spokesmen for transit agencies that enjoyed dedicated funding sources (either through an earmarked tax or through passage of revenue bonds) thought that they had achieved a considerable advantage in negotiation with banks for interest rates, in maintaining the proper cash flow, and in ability to demonstrate local commitment as matching money on gaining federal capital assistance. This point was made in Dade County, where bonds passed in the early 1970s provided needed funds; in Seattle, where a series of dedicated taxes financed capital acquisitions; and in Sacramento, where considerable improvement of service to outlying areas has come from the state-collected earmarked sales tax revenues.

The advantages of having a dedicated revenue source are that leading agencies can predict appropriate amortization schedules and can increase the credit rating of the transit authority and thus charge lower interest rates.

Dedicated financing sources and centralized regional authorities run greater risk of high-cost operations. Systems such as that in Norfolk, which depend on annual appropriations by the five participating jurisdictions and where there is no dedicated financing, exhibited the highest ratio of fare-box receipts to total operating costs. Cities such as Seattle and Sacramento, which have tax funds earmarked for transit, had the highest deficits. Such a comparison should be qualified by the fact that passage of a dedicated tax may be evidence of higher demands for transit; the larger deficits may be simply a reflection of the political judgment to have a higher cost and more extensive system.

Cost-control issues are closely tied to the pat-

tern of interjurisdictional decision making: Where the formulas build in an incentive for cutting back service to non-revenue-producing areas, cost per passenger mile can be minimized but at the expense of service to less-dense areas and suburbs. Where there is regional financing and service allocations are made on the basis of systemwide criteria (as in the case of Seattle), cost may be allowed to climb in an effort to develop higher levels of service and eventually generate high patronage. In the short run, costs per passenger mile are higher.

Deficits have been growing faster than the CPI in all the cities studied, but cities that have put transit financing on a "buy what you can afford" basis have succeeded in limiting the growth of the deficit by comparison with cities that have dedicated revenue sources. Deficits grew by an average of 34 percent in the period 1977-1979 in cities that have dedicated revenue sources but only grew by an average of 14 percent in cities that have subsidy support from annual appropriations.

Few cities attempt to match cost increases with fare increases, and the inevitable result in an inflationary era is the growth of deficits as a fraction of total operating costs. Several cities reported that UMTA had urged them to refrain from major fare increases. In most cities, fare increases were considered politically unwise. However, some cities (Miami, Washington, and Seattle) had experienced fare increases with no accompanying decline in ridership. As the fiscal crisis deepens, more cities appeared to turn to this method of covering costs, but fare increases were modest by comparison with the rise in cost. In cities such as St. Louis and Seattle, where the earmarked sources generated more revenue than was currently used, incentives for cost control appeared to be less.

Dedicated revenue sources for supporting transit are an outgrowth of higher levels of political support for transit and higher ridership as well as a reflection of per capita income of an area. Cities such as Seattle, Portland, Houston, and Sacramento reflect a protransit orientation of voters and local elected officials; they have consequently been able to pass dedicated taxes (locally or at the state level). Cities such as the Virginia communities that have rejected transit financing bills are more likely to be automobile oriented or less likely to have the journey to work end in the central business district.

Cities where sentiment for transit improvements is mixed (e.g., Miami) have either had close votes that narrowly passed transit financing bills or have been unable to pass dedicated financing arrangements at the local level (northern Indiana). The degree of popular support for transit may explain the presence of dedicated, or at least stable, financing arrangements.

Dedicated transit revenues do not in and of themselves ensure a stable and predictable revenue source. Contrary to popular belief, the availability of a dedicated source of transit revenue (such as an earmarked sales tax) does not guarantee the availability of funds to cover operating deficits. In the case of St. Louis, for example, the earmarked tax may be used for a number of alternative transportation purposes and must be signed over by the component jurisdictions. Their failure to do so has caused several cash-flow problems for the transit authority. Further, earmarked revenue sources may be subject to cyclical fluctuations (such as variations in tax receipts from a statewide freight car leasing tax in northern Indiana). Earmarked revenue sources must be responsive to inflation to be adequate and stable revenue producers.

On the other side of the issue, stable and pre-

dictable revenue sources may come out of an annual appropriation process where the political disposition is in favor of transit. The Capital District Transit Authority in Albany, New York, receives considerable state assistance and has been able to acquire needed buses, expand service to suburban and rural areas, and conclude labor negotiations in an atmosphere of ensured financing, because the legislature has been supportive of transit improvements both in the Albany area and elsewhere in the metropolitan centers of the state. The stabilizing element is the political necessity of raising large nonfederal contributions from the state legislature to match the federal assistance that goes to New York City. To collect enough up-state votes, the bills also include sizeable sums for cities outside the New York City area.

Finally, no earmarked tax is perpetually useful for supporting transit in the absence of political opposition. The Washington state legislature has the power to eliminate the dedicated motor-vehicle excise tax if it so chooses. Voters in Miami came close to reversing a bond issue vote in favor of transit.

Alternatives to the Dedicated Transit Tax

Alternatives to the dedicated transit tax are the allocation of subsidy among component jurisdictions by formula (Washington, Boston, and Norfolk) or by legislative fiat (Albany). The use of a prescribed formula to allocate costs among component jurisdictions has been a frequent method of handling the cost-allocation problem. In one city (South Bend) costs were shared with a neighboring city on the basis of the ratio of assessed property values. Such a formula has little relationship to demand or supply conditions that relate to transit and will probably change over time. More common is a formula that links relative costs or system inputs with the relative contributions made by the component jurisdictions. For example, local shares for the capital costs of the Washington Metro subway system are built around a formula that involves station stops and other input variables.

A more economically defensible basis for the formula is the netting out of fares collected within a jurisdiction against the cost of service given to a jurisdiction. Thus, a marginal cost-of-service pricing policy makes sense from an efficiency standpoint. However, even in this case it is difficult to settle certain knotty problems:

1. How is service that is provided simultaneously to several cities (as on a long-haul commuter run) to be divided among the cities?

2. How are joint costs (e.g., maintenance and planning) to be allocated to the component jurisdictions, particularly in cases where the relative amounts of service vary widely among jurisdictions? Norfolk started by dividing these costs equally among the jurisdictions, found this unworkable, and eventually allocated on the basis of the number of peak-hour vehicles operated within a jurisdiction. Here again, it is difficult to attribute vehicular use to particular areas where there is a lot of cross-commuting.

3. Which is more important in defining the recipient area: residence of passenger, workplace of passenger, or current location of passenger?

4. How are fares to be credited when transfers are purchased?

5. How are discounts to senior citizens or school children to be apportioned among jurisdictions?

The final determination of the appropriate formula is a political issue that, for the most part, is settled by compromise among the representatives of the participating jurisdictions in the forum of the transit financing debate. There are no right formulas, only more-durable and less-durable formulas. Formulas that rely on indicators that are independent of supply or demand for transit (e.g., relative population, relative property values, or relative taxing capacity) are more likely to become anachronistic and require renegotiation. Formulas that allow for changes in service levels to be reflected in the cost-allocation formula will be acceptable for long-run arrangements (as in the cases of Washington or Norfolk).

It would appear that earmarked, regional transit taxes are difficult to pass. Repeated defeats in Indiana, rejection of the local-option sales tax by the Virginia legislature, and the delays in gaining Illinois support for the St. Louis financing arrangement are evidences of the problems to be anticipated. In many states new legislation limits the growth of local taxing (such as property tax freezes in California, constitutional debt ceilings in many states, and even the limitation of tax receipts in Prince George's County, Maryland). These restrictions place artificial barriers in the way of raising local tax money in support of bus lines or rail systems.

Formula-allocated deficits are less visible to the voter and have been instituted in a number of cities. They are likely to be the principal vehicle for allocation of costs in multijurisdictional systems in the future. The formulas allow for yearly political votes on the level of service desired and leave considerable control in the hands of local elected officials.

Local Autonomy

Local autonomy sometimes conflicts with the goal of a rational, regional system, and different areas choose financing plans based on the relative importance of these criteria. There is a conflict in permitting local decision making regarding service levels and the degree of financial support with the ideal of a regional system. Areas that are totally regionalized and permit no financing decisions on the part of the component jurisdictions gain the advantage of being able to plan for a sensible regional system without the necessity of responding to local issues. However, the relative independence of the transit district from the local units of government removes decision making from the hands of local elected officials, who are likely to lose interest in the transit operations unless sufficiently consulted. The degree of coordination with other groups (land use planning, local elected officials, and school systems, for example) is a matter for management discretion rather than financial necessity. Independent agencies (such as Seattle's Metro) came under pressure of takeover by political units, as exemplified by King County's interest in taking over responsibility for public transportation in the area.

Systems that go to the other extreme and allow each component city to buy the level of service it feels it can afford (e.g., Norfolk) lose some of the advantages of regionalism. Buses may run half full but with closed doors through some neighborhoods, so that the city is not forced to share some of the cost of the commuter run. Planners may be unable to experiment with the development of new routes and service options if the local governments do not feel willing to finance the experiment.

Trade-Offs Involved

A trade-off is involved in the decision whether to have close voter control over the major transit financing decisions or to have an ensured continuity in financing arrangements by locking in a dedicated revenue source. There appears to be a perceived conflict in the minds of transit planners over whether to have close voter control, which may result in transit financing setbacks or a financing arrangement that is obscure to most of the general public. Frustrated by several failures to enact dedicated transit taxes in Indiana, the Northern Indiana Commuter Transit District succeeded in passing the dedication of a little-known existing ad valorem tax on the leasing of freight cars. In some cities (e.g., Albany, Norfolk, and St. Louis) voters had no opportunity to vote on capital financing issues because the funding sources from the state were sufficient to provide needed funds.

In some cities, transit votes have received wide press coverage and have been major political issues. This was true in Seattle at the time of the enactment of the regional sales tax and also in Miami, where voters narrowly affirmed the desire to go ahead with completion of the subway system.

Experiences of Cities That Have Multijurisdictional Financing Programs

The experiences of the cities that have a history of multijurisdictional financing offer some important lessons to cities that are considering implementation of such a financing program. Once initiated, it is difficult to alter the financing arrangements or the basis for formula allocation. These agreements, when put into practice, will benefit some jurisdictions and work to the detriment of others. For example, if population of the jurisdiction is put into the formula, cities that experience growth will pay a larger share of the operating deficit as time goes on. To change the basis of the formula is, consequently, a zero-sum game, where one side benefits only at the expense of another jurisdiction. Improvement for one jurisdiction hurts another, and the potentially losing jurisdiction will try hard to block any change. The process of negotiating is itself destabilizing, as it introduces possible delays in payments and cash-flow problems.

Another lesson to be learned is that political consensus in favor of transit development is a necessary precursor to any workable financing scheme, however hidden from voter scrutiny. More important than an earmarked revenue source for the stability and predictability of financing is a strong political stance in favor of the transit system currently in operation or proposed. Loss of that political consensus in Dade County threatened a capital building program that had "locked-in funds" from a bond issue that had gained voter approval several years earlier. The political consensus in the New York legislature in favor of high levels of transit service for the principal cities and suburbs in the state has produced a stable and feasible source of nonfederal matching funds. The fact that the funds must be approved annually has not caused any particular difficulty to the transit authority, which has come to count on the availability of funds from the state operating-assistance program.

Finally, the experience of the regional transit systems studied indicates that increased attention should be given to ensuring that revenue sources, of whatever origin, have the following characteristics:

1. Expand with inflation,

2. Expand with increases in the demand for transit,
3. Provide built-in incentives for cost control and restriction of service to nonproductive routes, and
4. Restrict the number of decision makers who must approve the pass through of funds from one agency to another.

In the cities that have experienced the most serious threats of service interruption because of financing difficulties (Washington and St. Louis), recurring violations of these principles have caused difficulties. Capital-contribution agreements in the case of the Washington Metro have been for fixed sums; with the onset of inflation these capital-contribution agreements have had to be renegotiated. This process has proved time consuming and holds open the possibility that one party or another will drop out of the next round of financing. In both these cities, decisions to fund must be made simultaneously by two state legislatures and by the local governments involved. The multiplicity of decision points can cause cash-flow problems, since the budget cycles of the various groups differ. Political differences among the jurisdictions can cause local politicians to use the transit subsidy as a club to extract policy concessions in its favor from the board of directors of the transit authority.

CONCLUSION

Multijurisdictional transit financing has been approached from many directions. Some jurisdictions

act as independent units that buy services at a predetermined rate by using general revenues. Other cities have adopted regionwide taxation, either directly through local levies or by the earmarking of state taxes collected in the areas. Some allocate service on the basis of financial contribution; others use a regional planning framework that does not allocate specific amounts of service to jurisdictions as such.

There is an increasing tendency to overspend all local resources and to look to the next-higher level of government to contribute disproportionately to further growth of the system. New fiscal imperatives may require the jurisdictions to reevaluate the low-fares policy inherent in their programs or to renegotiate local arrangements to accommodate the higher costs of public transportation.

ACKNOWLEDGMENT

This paper is based on research sponsored by the Office of Policy Research, Urban Mass Transportation Administration. The results and views expressed represent my position and not necessarily that of the U.S. Department of Transportation.

REFERENCE

1. R.A. Musgrave and P.B. Musgrave. *Public Finance in Theory and Practice*. McGraw-Hill, New York, 1973.

Publication of this paper sponsored by Task Force on Local Transportation Finance.

Job-Related Employee Attitudes in Urban Mass Transit

HAROLD L. ANGLE AND JAMES L. PERRY

Early efforts of behavioral scientists interested in finding attitude-behavior linkages on the job centered largely on job satisfaction. More recently, organizational commitment has joined job satisfaction as a focal variable and, indeed, shows greater promise as a predictor of both employee participation and worker productivity. Nonetheless, job satisfaction continues to interest organizational scholars, partly due to current societal concern about the quality of working life. Neither concept, however, seems to have found a wide audience within the transit industry. This research attempts to fill that void by assessing the degree of organizational commitment as well as patterns of job satisfaction in a sample of 1244 lower-level employees in 24 public mass transit organizations. Cross-industry comparisons are facilitated by the use of standard measures for which normative data are available. Contrary to the belief of some scholars, lower-level transit employees do become committed to their organizations. On the other hand, overall satisfaction levels were lower for transit employees than for those employed in most comparative occupations. The specific job aspects responsible for dissatisfaction tended to be those related to the rewards and employee treatment that are under control of the organization rather than the nature of the work itself. In general, the unique pattern of job concerns found among transit employees indicates that attitudinal research based on other occupations should be applied in the transit industry only with due caution.

The attempt to establish reliable and meaningful linkages between employee attitudes and on-the-job behavior has been a long-term quest of behavioral scientists. Early research in organizations tended to concentrate on linkages between job satisfaction and relevant job behaviors (i.e., productivity, attendance, and continuation of organizational

membership). More recent emphasis has centered on a global, psychological attachment to the organization, usually called organizational commitment. Despite potentially significant payoffs for the management of transportation organizations, little systematic analysis of these employee attitudes has been evident in the transit industry. This study extends the analysis of job satisfaction and organizational commitment to public mass transit organizations, with particular focus on the transit operator.

PRIOR RESEARCH

Early efforts to relate worker attitudes to work behavior focused on the concept of job satisfaction. The intuitive notion that a satisfied worker should also be a productive worker can be traced back at least as far as the famous Hawthorne studies, which were conducted by Elton Mayo and his associates in the late 1920s and early 1930s (1). Whether the Hawthorne studies were actually responsible, or they occurred at the right moment in history, they appeared concurrently with a dramatic shift of managerial mood—from an emphasis on worker motivation by manipulation of wage incentives and environmental conditions to a new approach centered on human relations.

Since the Hawthorne studies, a growing body of research has demonstrated little empirical support for the wave of a priori optimism regarding improvement of workers' performance through morale enhancement. Brayfield and Crockett (2), in a review of more than 50 carefully screened studies, questioned the assumptions that

1. Satisfied workers will demonstrate their gratitude by increased output,
2. Increased satisfaction frees creative energies in the worker, or
3. Satisfied employees internalize management's goals.

Although satisfaction and performance were often seen to covary, there was little reason, based on available evidence, to assume any simple causal link.

Vroom (3) reviewed 20 studies that showed a median correlation of only 0.14 between satisfaction and performance, both for individual and group levels of analysis. Although the relationship reported by Vroom between satisfaction and employee participation was also less than perfect, research findings were more consistent than for studies that attempt to relate satisfaction to productivity. Vroom's review indicated a consistent negative relation between job satisfaction and voluntary turnover along with a somewhat less consistent negative relation between job satisfaction and absences. These observations were consistent with those of Herzberg and others (4), who summarized then-current research by concluding that positive job attitudes seemed more reliably related to the worker's tendency to stay with the job than to productivity.

Subsequent to Vroom's review, and particularly during the past decade, the concept of organizational commitment has joined job satisfaction as a key construct in the search for linkages between employee attitudes and work behavior. There are at least three reasons for the current popularity of this concept. Theoretically, commitment should be a reliable predictor of certain employee behaviors, particularly turnover (5). The concept also makes intuitive sense and stems from a persistent historical concern with employee loyalty. Finally, behavioral scientists are interested in commitment in its own right because exploration of this concept holds the promise of lending important insights into the way people make sense out of their relationship to their environment (6). Commitment may be a more stable employee attribute than job satisfaction, and this is a basis for assuming its closer relationship to actual behaviors (7).

The definition of organizational commitment offered by Porter and others (7) contains three major components:

1. Strong belief in and acceptance of the organization's goals,
2. Willingness to exert considerable effort on behalf of the organization, and
3. Definite desire to maintain organizational membership.

Buchanan (8, p. 533) has defined commitment as a "partisan, affective attachment to the goals and values of the organization, to one's role in relation to goals and values, and to the organization for its own sake, apart from its purely instrumental worth." The psychological bond between individuals and their organizations was conceived by Buchanan as having three components:

1. Identification--adoption as one's own of the goals and values of the organization,
2. Involvement--psychological immersion in one's work role, and
3. Loyalty--a feeling of affection for and attachment to the organization.

Recent research has indicated that commitment is not only a predictor of employee retention (5,7), but that it may also predict employee effort and performance (6,9,10). This makes good, intuitive sense. By combining the elements of Porter's (7) and Buchanan's (8) definitions of commitment, a general set of behavioral expectations, for a committed employee, can be derived. The "definite desire to maintain organizational membership" would lead, in the aggregate, to reduced turnover. Furthermore, identification with the organization and acceptance of perceived organizational goals, as well as a "willingness to exert considerable effort on behalf of the organization," would make it reasonable to expect that commitment can lead, ultimately, to higher productivity as well.

Although commitment appears to be somewhat superior to job satisfaction as a predictor of employee behavior, organizational scholars continue to express an interest in both concepts. Although inducements for research into job satisfaction may be less powerful in terms of direct payoff to the organization, there is, nevertheless, a growing concern in contemporary society over the quality of working life (11-13). Above and beyond any potential benefits to the organization, in terms of participation and performance, there appears to be a widely shared belief that improving employees' job satisfaction has value in its own right; that a part of corporate social responsibility is a responsibility toward the employee. Part of that responsibility would be to attempt to provide work that is satisfying (or at least not aversive).

The present research is concerned, therefore, with both job satisfaction and organizational commitment among lower-level transit employees. Through the use of standard survey instruments, for which normative data on a number of occupations are available, the research is able to put the level of commitment and patterns of job satisfaction and dissatisfaction of transit employees into meaningful perspective.

METHOD

Sample and Research Sites

The research was conducted as part of a larger study that investigated the impact of labor-management relations on organizational effectiveness in urban mass transit (14). A total of 28 transit organizations (fixed-route bus systems) in the western United States participated in the study. The extent of data collection differed among participant organizations depending, among other things, on each associated labor organization's concurrence in having its members surveyed. Questionnaires were administered to employees at 24 of these organizations. Archival and manager interview data were collected at all participating organizations.

The sample-pool criterion was membership in the bus operators' bargaining unit. At some of the participating transit organizations, mechanics and clerical personnel were included in the operators' bargaining unit. In those instances, they were sampled along with the operators. In the aggregate, a majority (91 percent) of respondents were bus operators.

Eighty-seven percent of the respondents had at least a high school education and 7 percent were college graduates. Eighty-six percent had worked at their present organization for longer than one year.

Measures

Organizational Commitment

Employee commitment to the transit organization was measured by Porter's organizational commitment questionnaire (OCQ) (7). Respondents are asked to express the extent of their agreement or disagreement with each of 15 items, such as, "I am proud to tell others that I am part of this organization," or "I am willing to put in a great deal of effort beyond that normally expected, in order to help this organization to be successful." The OCQ has demonstrated good psychometric properties, with internal consistency coefficients that range from 0.82 to 0.93, with a median of 0.90. In our study, Cronbach's alpha (15) was 0.90.

Job Satisfaction

The short form of the Minnesota satisfaction questionnaire (MSQ) (16) was used to measure satisfaction with 20 job aspects (i.e., factors). In the short form, each factor is measured by a single question. In addition, the MSQ provides intrinsic, extrinsic, and general satisfaction scores. Responses to each item were elicited on a seven-point Likert scale, with verbal anchors that ranged from very dissatisfied to very satisfied. Reliability coefficients reported for seven occupations range from 0.87 to 0.92 (17). Scale reliability in our study (Cronbach's alpha) was 0.91.

Personal Characteristics

Measures of personal characteristics included sex, education level, marital status, organizational and job tenure, breadwinner status, age, and race. Self-report measures were also obtained on absenteeism, intent to remain in the organization, perceived job opportunities in other organizations, and perceived usefulness of personal skills to other organizations.

Data Collection Procedures

Archival data were collected, on-site, at each participating transit organization during the latter half of 1977. Site visits normally lasted two days. The questionnaires were administered during the site visits.

All sampling was by personal presentation of questionnaires to employees by a member of the research team. The majority of the completed questionnaires were handed back to the researchers at the transit site; respondents who were unable to complete the questionnaires during the site visit were provided preaddressed and stamped envelopes for mail return. The cumulative response rate was 64 percent--71 percent from on-site returns and 32 percent via mail return, for a total sample of 1244.

Probability questionnaire sampling targets were established separately for each transit organization based on organization size. At the smallest organizations (less than 30 eligible employees) the target was 100 percent. This target declined, on a percentage basis, as organization size increased, so that the target was only 10 percent at organizations that have more than 1000 eligible employees. Little difficulty was encountered in meeting sampling quotas at most organizations, except for those in

the 100 percent category, and sampling was close to quota in those cases as well.

Since participation was voluntary, true random sampling was infeasible. Researchers attempted, judgmentally, to stratify samples by age, race, sex, and tenure in the process of contacting employees at work sites. However, there were clear discrepancies in proportional representation of certain groups. Blacks were underrepresented (14 percent in sample but 31 percent in population), and whites were overrepresented. Women were overrepresented (18 percent in sample but 11 percent in population), as were employees over 50 years of age (18 percent in sample but 6 percent in population). Employees that had more than five years' tenure in the organization were underrepresented (30 percent in sample but 38 percent in population). Other groups matched sampling targets reasonably well. Although an effort was made to administer questionnaires during all work shifts, the site visits, and therefore all questionnaire administration, took place on weekdays. This may have been partly responsible for the racial, age, and tenure imbalances. The overrepresented groups were probably present in greater numbers during these more desirable workdays because of the seniority system in route bidding. It is also likely that females were available for questionnaire response in disproportionate numbers because of a high percentage of females on "extra boards" (i.e., operators who are brought on duty to fill in for absentees on bus routes). The large amount of time spent in operators' ready rooms by extra-board drivers may have increased the probability of their being asked to participate.

RESULTS

Occupational Comparisons

Mowday and others (6) reported OCQ means and standard deviations for nine separate occupational groupings. Table 1 provides comparison data between those occupational groupings and the public transit employees who participated in the study. Intrinsic, extrinsic, and general satisfaction scores for transit employees and for six comparative occupations (17) are shown in Table 2.

Table 2 indicates that transit employees are generally less satisfied with their jobs than are employees in the comparative occupations. The only exception to this general rule is the electrical assemblers. For transit and nontransit employees alike, the trend is for intrinsic satisfaction to be higher than extrinsic satisfaction; that is, satisfaction with such aspects as the work itself is higher than with such job aspects as the way the organization rewards good performance. In addition, variability in satisfaction, as indicated by the standard deviations in Table 2, is generally higher for transit personnel than for the comparative employees. It appears that transit employees are not particularly homogeneous with respect to job attitudes and show, instead, a fairly wide range of satisfaction levels.

Comparisons of the Job Satisfaction Factors

Each question on the MSQ (short form) represents one job factor, as derived from factor analysis of the long form (17). Table 3 lists the 20 factors and shows levels of transit employee satisfaction (seven-point scale) for each factor.

As was indicated in Table 2, the overall trend is for satisfaction levels to be lower for transit operators than for other nonsupervisory transit employees. As Table 3 indicates, however, there are

Table 1. Occupational comparison: organizational commitment (OCQ).

Occupation	No.	Mean	SD
Public employees	569	4.5	0.90
University employees	243	4.6	0.90
Hospital employees	382	5.1	1.18
Bank employees	411	5.2	1.07
Telephone company employees	605	4.7	1.20
Scientists and engineers	119	4.4	0.98
Automobile company managers	115	5.3	1.05
Psychiatric technicians	60		
Remain in organization		4.2	1.04
Quit organization		3.3	0.94
Retail management trainees	59	6.1	0.64
Public transit employees	1214	4.50	1.36
Bus operators	1087	4.48	1.13
Supervisors	15	4.91	1.16
Maintenance personnel	58	4.34	1.11
Nonoperators, first level	104	4.57	1.10

Table 2. Occupational comparison: job satisfaction (MSQ).

Occupation	No.	Intrinsic		Extrinsic		General	
		Mean	SD	Mean	SD	Mean	SD
Transit							
Operator	1093	5.22	1.04	4.15	1.34	4.79	1.06
Supervisor	15	5.59	1.47	4.53	1.90	5.16	1.56
Maintenance	58	5.48	1.01	4.30	1.45	5.01	1.08
Nonoperator, nonsupervisory	106	5.39	1.09	4.47	1.44	5.02	1.13
Total	1272	5.24	1.05	4.19	1.36	4.82	1.08
Comparative occupations							
Engineer	290	5.66	0.88	4.97	1.02	5.45	0.84
Office clerk	227	5.52	0.90	4.52	1.16	5.21	0.87
Salesperson	195	5.87	0.88	4.99	1.11	5.59	0.83
Janitor and mainte- nance	240	5.73	0.81	4.90	1.13	5.46	0.81
Machinist	248	5.63	0.81	4.59	1.18	5.31	0.81
Electrical assembler	353	4.94	0.91	4.21	1.13	4.72	0.85

Table 3. Transit employees' satisfaction with 20 job factors.

Factor	Transit Operators		Non- operators	
	Mean	SD	Mean	SD
Activity	5.56	1.33	5.82	1.20
Independence	6.15	1.15	5.47	1.61
Variety	5.40	1.63	5.45	1.71
Social status	4.70	1.75	4.92	1.67
Supervision				
Human relations	3.90	2.12	4.37	2.14
Technical	3.97	1.94	4.69	2.03
Moral values	5.31	1.68	5.48	1.58
Security	6.18	1.19	6.17	1.20
Social service	5.84	1.23	5.44	1.53
Authority	4.70	1.46	4.95	1.54
Ability utilization	4.99	1.91	5.36	1.89
Company policies and practices	3.23	1.85	3.73	1.90
Compensation	4.88	1.89	4.79	1.95
Advancement	3.89	1.96	4.24	2.02
Responsibility	4.69	2.01	5.01	1.83
Creativity	4.12	1.89	5.15	1.80
Working conditions	4.30	1.91	4.58	2.00
Co-workers	5.24	1.64	5.02	1.84
Recognition	3.78	1.99	4.33	2.03
Achievement	4.92	1.80	5.38	1.69

reversals of this trend in specific job factors such as independence, social service, compensation, and co-workers. For operators and nonoperators alike, company policies and practices stood out as the source of greatest dissatisfaction. Job factors with which operators were dissatisfied but

nonoperators seemed satisfied included supervision, advancement, and recognition.

Job factors that appeared generally to be strong sources of transit employee satisfaction included independence, variety, security, social service, ability utilization, co-workers, and achievement. Satisfaction with compensation was nearly as high--a finding somewhat at variance with the general body of research literature on job satisfaction (4).

Individual Correlates of Job Satisfaction and Commitment

Differences in levels of job satisfaction were found to be related to age, sex, education level, and type of environment in which the employee grew up. The more satisfied employee subgroups were females ($p < 0.05$), older employees ($p < 0.001$), those who had less formal education ($p < 0.001$), and those who grew up in rural surroundings ($p < 0.05$). Differences between single and married employees, breadwinners and nonbreadwinners, and various racial and ethnic groups did not reach conventional levels of statistical significance.

Statistically significant differences in the level of commitment to their work organization were found for age, sex, and education subgroups. Older employees showed higher levels of organizational commitment ($p < 0.001$) as did females ($p < 0.001$), and the less well educated ($p < 0.0001$). Length of service, marital status, breadwinner status, race, and community background were not significantly related to employee commitment.

Self-report measures of absenteeism and intent to quit the organization were obtained, as were self-estimates of usefulness of one's job skills to other organizations and availability of equivalent jobs in other organizations. These measures enable comparisons of job satisfaction and commitment levels with some of the attitudes, beliefs, and behaviors that have frequently been associated with satisfaction and commitment in other research.

In agreement with the general body of literature on turnover, both commitment and job satisfaction were significantly related to intent to quit the organization. Commitment correlated -0.51 ($p < 0.001$) with intent to quit, and job satisfaction correlated -0.45 ($p < 0.001$). The difference between these two correlations was statistically significant ($p < 0.001$).

JOB SATISFACTION IN PUBLIC MASS TRANSIT

The use of a standard job satisfaction instrument (MSQ) provided an opportunity not only to assess overall levels of satisfaction and satisfaction with several specific job factors but also to compare those levels with measured satisfaction in other industries. Several points merit discussion.

As Table 2 indicates, overall levels of job satisfaction are lower for transit employees than for those employed in five of the six comparative occupations. Furthermore, within the transit industry, transit operators tend to be less satisfied than other nonsupervisory transit personnel. In Table 3, the differences between operator and nonoperator job satisfaction are largely attributable to a small set of job factors. To a great extent, the pattern in Table 3 verifies the subjective impressions that had been gained by the researchers during the site visits.

Transit operators seem to be relatively satisfied with the built-in aspects of their jobs (i.e., job factors resident in the nature of the work itself). Unless extraordinary measures were to be taken by management to modify the way bus transit operations

are conducted, the transit operator's job will characteristically be high in those job aspects.

On the other hand, several of the job factors about which employees are less satisfied are the type that can be subject to considerable variability from job to job, depending on the way the transit organization treats its employees. For the most part, these controllable job aspects relate to supervision (both technical and interpersonal), company policies and practices, working conditions, promotion practices, and wages and benefits. Wages and benefits represent the only one of these factors for which this study's transit employees appear relatively well satisfied. The other five factors are among the seven lowest job satisfaction scores for transit operators (Table 3). Clearly, there is room for improvement in several areas that are well within management's capability to improve.

Informal conversations with many bus operators repeatedly highlighted the quality of supervision as a frequent irritant. This was manifest in two ways:

1. The tendency for supervisors to cut themselves off from informal communication with drivers (a situation sometimes aggravated by physical barriers such as glass partitions) and

2. A perceived tendency for some road supervisors to interpret their role as that of a disciplinarian rather than a helper.

The factor "company policies and practices" was represented by a single question worded in such a way that we suspect that it too reflects this general syndrome (i.e., the way organizational policies are put into practice).

Another general irritant that had been detected during field visits was a perceived lack of receptivity to drivers' suggestions for procedural improvements or recognizing driver contributions whenever driver suggestions had been implemented. The driver-nondriver disparity, for the factor "recognition," seems wholly consistent with our earlier subjective impression.

EMPLOYEE COMMITMENT IN PUBLIC TRANSIT ORGANIZATIONS

Lower-level employees in public transit organizations develop psychological bonds to their transit organizations, and these individual-organization linkages appear to have important implications for the effectiveness of a transit organization. Mayntz (18) had been explicit in denying the likelihood of commitment to (or identification with) formal organizations, on the part of lower-ranking organizational members. Two basic reasons were cited. First, because subordinate roles in organizations are highly specific and programmed, they offer little basis for a positive self-image. This was said to lead to work roles' being seen as intrinsically unattractive and, therefore, pursued mainly for their instrumental payoffs.

Second, the individual in the subordinate role is seldom afforded the opportunity to make personal decisions about either the organizational purposes toward which he or she contributes or the means used to attain those goals. The choice is only whether to comply or to refuse compliance. Thus, the employee feels little ownership or responsibility for his or her actions in terms of organizational outcomes.

In a comparison of public- and private-sector managers, Buchanan (10,19,20) isolated personal significance reinforcement as a prime determinant of managers' commitment to their organizations. In effect, "managers who feel the work they do makes

real contributions to organizational success are more likely to develop commitment than those who lack this feeling" (19, p. 341). Buchanan (20) cited "goal crispness" as one factor that leads to higher commitment in private, goal-oriented organizations than in public agencies, where individual contributions to ultimate goals were less visible.

One possible reconciliation of such views as those of Mayntz and Buchanan with our finding that many transit employees seem to be committed to their organizations may lie in the basic nature of lower-level work in public transit. Although other categories of transit employee were included, the principal focus of the study was on the transit operator. More than 90 percent of the nonsupervisory participants were transit operators.

By contrast to the routinized, oversupervised nature of lower-level organizational work, as characterized by Mayntz (18), the transit operator performs, within general limits, as a relatively autonomous agent of the organization. He or she is what Adams (21) called an organizational boundary-role person. To the individual passenger, the operator is the transit organization, and the operator seems aware of this. The specific job-factor satisfaction pattern in Table 3 indicates that such job aspects as independence, variety, authority, and responsibility are relatively well satisfied among transit operators. Furthermore, except for responsibility, there is less variability in satisfaction with these factors than with the great majority of other factors (Table 3).

Sex of the employee related significantly to commitment; women were more committed to the organization than their male counterparts. This finding is at variance with conventional wisdom. Historically, women have been considered less involved than men in their work (11,22). A frequent argument encountered in the literature cited above is that it is the essentially menial nature of the jobs that women hold that underlies their lack of work involvement. The job satisfaction findings of our study, however, clearly suggest that women (as well as men) do not perceive transit jobs to be menial.

Rapid social change may also partly explain the reversal of past findings with respect to women and work encountered in the present study. The job of transit operator has been dominated in the past (though certainly not exclusively) by male employees. During the site visits, managers of several transit organizations noted a rapid increase in the number of female transit operators, both recent and projected. It may be that the arena of public transit, at the time in history in which the study occurred, represents an aspect of a social revolution in which the relationships between women and work organizations are changing.

CONCLUSION

Employees can and do become committed to their transit organizations. Levels of commitment are generally comparable to those found in other industries. However, transit employees are generally less satisfied with their jobs than are employees in comparative occupations. Furthermore, there is an overall trend for job satisfaction levels to be lower for transit operators than for other nonsupervisory transit employees. For operators and nonoperators alike, company policies and practices stood out as the source of greatest dissatisfaction. Job factors that appeared generally as strong sources of transit employee

satisfaction included independence, variety, security, social service, ability utilization, co-workers, and achievement.

Several aspects of these findings single out the transit operator as an employee with unique job-related concerns. The pattern of specific job-facet satisfactions and dissatisfactions is not duplicated in any other blue-collar occupation of which we are aware. Fortunately, the problem areas disclosed by this research fall well within the range of management's capability for improvement. It now appears incumbent on the transit industry to take the next logical steps.

ACKNOWLEDGMENT

Support for this research was provided by the Office of University Research, U.S. Department of Transportation, the Graduate School of Administration, and the Institute of Transportation Studies, University of California, Irvine.

REFERENCES

1. F.J. Roethlisberger and W. Dickson. *Management and Morale*. Harvard Univ. Press, Cambridge, MA, 1939.
2. A.H. Brayfield and W.H. Crockett. *Employee Attitudes and Employee Performance*. *Psychological Bull.*, Vol. 52, 1955, pp. 396-424.
3. V.H. Vroom. *Work and Motivation*. Wiley, New York, 1964.
4. F. Herzberg, B. Mausner, R.O. Peterson, and D.F. Capwell. *Job Attitudes: Review of Research and Opinion*. Psychological Services of Pittsburgh, Pittsburgh, 1957.
5. J.L. Koch and R.M. Steers. *Job Attachment, Satisfaction, and Turnover Among Public Sector Employees*. *Journal of Vocational Behavior*, Vol. 12, 1978, pp. 119-128.
6. R.T. Mowday, R.M. Steers, and L.W. Porter. *The Measurement of Organizational Commitment*. *Journal of Vocational Behavior*, Vol. 14, 1979, pp. 224-247.
7. L.W. Porter, R.M. Steers, R.T. Mowday, and P.V. Boulian. *Organizational Commitment, Job Satisfaction, and Turnover Among Psychiatric Technicians*. *Journal of Applied Psychology*, Vol. 59, 1974, pp. 603-609.
8. B. Buchanan II. *Building Organizational Commitment: The Socialization of Managers in Work Organizations*. *Administrative Science Quarterly*, Vol. 19, 1974, pp. 533-546.
9. R.T. Mowday, L.W. Porter, and R. Dubin. *Unit Performance, Situational Factors, and Employee Attitudes in Spatially Separated Work Units*. *Organizational Behavior and Human Performance*, Vol. 12, 1974, pp. 231-248.
10. Y. Wiener and A.S. Gechman. *Commitment: A Behavioral Approach to Job Involvement*. *Journal of Vocational Behavior*, 1977, Vol. 10, pp. 47-52.
11. U.S. Department of Health, Education and Welfare. *Work in America*. MIT Press, Cambridge, MA, 1973.
12. R.A. Katzell and D. Yankelovich. *Work, Productivity, and Job Satisfaction: An Evaluation of Policy-Related Research*. Psychological Corporation, New York, 1975.
13. R.P. Quinn and G.L. Staines. *The 1977 Quality of Employment Survey*. Institute for Social Research, Ann Arbor, MI, 1979.
14. J.L. Perry, H.L. Angle, and M.E. Pittel. *The Impact of Labor-Management Relations on Productivity and Efficiency in Urban Mass Transit*. Office of University Research, U.S. Department of Transportation, Final Rept., March 1979.
15. L.J. Cronbach. *Coefficient Alpha and the Internal Structure of Tests*. *Psychometrika*, Vol. 16, 1951, pp. 297-334.
16. L.H. Lofquist and R.V. Davis. *Adjustment to Work: A Psychological View of Man's Problems in a Work-Oriented Society*. Appleton-Century-Crofts, Century Psychology Series, New York, 1969.
17. D.J. Weiss, R.V. Davis, G.W. England, and L.H. Lofquist. *Manual for the Minnesota Satisfaction Questionnaire: Minnesota Studies in Vocational Rehabilitation*, XXII. Industrial Relations Center, Univ. of Minnesota, Minneapolis, 1967.
18. R. Mayntz. *Role Distance, Role Identification, and Amoral Behavior*. *Archives Europeenes de Sociologie*, Vol. 11, 1970, pp. 368-378.
19. B. Buchanan II. *Government Managers, Business Executives, and Organizational Commitment*. *Public Administration Review*, July-Aug. 1974, pp. 339-347.
20. B. Buchanan II. *To Walk an Extra Mile: The Whats, Whens, and Whys of Organizational Commitment*. *Organizational Dynamics*, Vol. 3, No. 4, 1978, pp. 67-80.
21. J.S. Adams. *The Structure and Dynamics of Behavior in Organizational Boundary Roles*. In *Handbook of Industrial-Organizational Psychology* (M.D. Dunnette, ed.), Rand McNally, Chicago, 1976.
22. T.C. Taveggia and T. Ziemba. *Linkages to Work: A Study of the "Central Life Interests" and "Work Attachments" of Male and Female Workers*. *Journal of Vocational Behavior*, Vol. 12, 1978, pp. 305-320.

Publication of this paper sponsored by Task Force on Employee-Management Relations and the Quality of Working Life.

