Possible Effects of Eliminating Federal Transit Operating Subsidies

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The Reagan Administration's proposal to phase out federal transit operating subsidies by 1985 has prompted a range of forecasts, some predicting that the transit industry will become more efficient and productive while others portend a much grimmer future. The ultimate effects of the federal cuts depend largely on the actions transit agencies take to make up lost dollars—fare increases, service cuts, increased local/state financing, or in-house efficiency improvements. Probable fare, service, and equity effects of the federal cuts among different types of transit operators are examined. A national survey of 99 transit agencies is used to develop a scenario of how federal cuts will affect transit operators. Overall, it is expected that fares will increase about 7 percent, service will decrease approximately 3 percent, and ridership will decline approximately 6 percent because of the federal cuts. Moreover, the poor will bear the brunt of fare increases, service cuts, and increased local and state taxes caused by the phaseout of federal operating assistance.

Shortly after the 1981 inaugural, the Reagan Administration included the gradual phaseout of federal transit operating subsidies in its first round of budget cuts. As part of the Administration's Program for Economic Recovery all operating assistance is to be eliminated by 1985.

By all accounts, the President's planned actions represent a major retrenchment in the federal commitment to transit. In 1980 federal operating assistance was $1.1 billion nationwide, an increase from $300 million 5 years earlier (1). The Carter Administration had actually planned to expand support for transit by increasing Section 5 appropriations by more than 30 percent. Reagan officials maintain that eliminating subsidies will force operators to become more efficient and will shift some of the financial responsibility for transit to state and local governments. In particular, the opinion of the present administration is that as subsidies decrease managers will be able to take a harder line in labor negotiations and will begin to run their systems more like private businesses.

Opinions differ as to the probable consequences of eliminating Section 5 funding. The Reagan Administration contends that the transit industry will eventually become more productive and that ridership will be only marginally affected. Transit lobbyists, such as the American Public Transit Association (APTA), envision a more gloomy scenario. Another perspective of the probable effects of federal cuts to transit is provided in this paper. A nationwide survey requested transit managers to identify the actions they plan to take to replace lost federal dollars. Their responses were used to explore the probable effects of the Section 5 phaseout on fares, services, ridership, and equity. Overall it is estimated that the federal cuts will cause nationwide fares to increase approximately 17 percent, service to decrease about 3 percent, and ridership to decline approximately 6 percent. These probable effects are discussed in greater detail in the sections that follow.

PAST RESEARCH ON THE IMPACT OF FEDERAL CUTS

Several studies to date have attempted to gauge the probable effects of eliminating federal operating subsidies. One study, conducted by the Regional Plan Association of New York (RPA) (2), assumed that all lost revenue would be recovered through higher fares. RPA estimated that, nationwide, fares would increase 46 percent, from an average of 38.4 cents to 56.2 cents, and ridership would fall by 900 million trips annually. From these figures RPA further estimated that use of the automobile would increase by 2.4 billion miles and fuel consumption would rise by 167 million gallons per annum.

The one shortcoming of the RPA study is that options other than fare increases were not considered for recovering lost federal revenues--e.g., service reductions or increased local aid. In an attempt to gain a more complete picture, APTA surveyed its membership in 1981. The survey results indicated that 90 percent of the nation's operators will raise fares, 80 percent will seek increased local and state aid, and 67 percent will reduce service (1). A significant number of operators actually indicated they may be forced to go out of business, particularly in urban areas with populations of 500,000 or less.

Based on these survey results, APTA predicted that by 1985 there would be a nationwide fare increase of 88 percent, an average fare of 94 cents, and a ridership loss of 2.1 billion trips, or 26 percent. Although the study's methodology is not disclosed, in view of the RPA findings and expected increases in state and local aid, the APTA figures seem inflated. Because APTA is a political lobbying organization, it is probable that APTA projections should be regarded as a worst-case scenario. In the light of the shortcomings of earlier studies, then, alternative predictions of the effects of federal transit cuts appear in order. The following analysis attempts to respond to this need.

METHODOLOGY

A survey was conducted to gather information on how U.S. transit operators may respond to federal cuts (3). Questionnaires were mailed to 202 local transit operators and 99 were returned (about 50 percent), which is considered adequate for statistical analysis (4). The respondents included 17 of the 20 largest transit agencies. Because of the high response of large operators, about 70 percent of total U.S. ridership was represented in the survey. The typical respondent (82 percent) was an administrator, manager, or financial officer involved in determining the fiscal policy for his agency.

Each operator was asked to identify the actions its policy board plans to take in response to the Section 5 phaseout, including raising fares, reducing services, increasing local and state aid, obtaining federal block grants, increasing productivity (e.g., improving scheduling), and implementing cost-saving programs (e.g., securing work rule concessions). It should be noted that the questionnaire did not elicit when these actions might take place. Because federal subsidies are to be phased out between 1983 and 1985, it can be assumed that the planned actions will occur sometime during that period. Nevertheless, the survey results cannot be used to predict the actual fares or service levels that will exist at a particular time.

One potential problem, common to all attitudinal surveys, is that respondents may have deliberately distorted their responses to portray as gloomy a future as possible--i.e., fare increases and service

cutbacks. Some may have perceived it not to be in their best interest to suggest that federal funds could be easily replaced by increases in efficiency or increases in local aid. Comparison of those survey results with those of the APTA survey, however, shows a less pessimistic prediction of consequences. Thus, if the results are biased, they are at least less so than those of previous studies. It is possible, nevertheless, that this study overstates the impact of proposed federal cuts.

Elasticity Measures

This analysis allows the transformation of survey responses into predictions of changes in fares, service, and ridership and hinges on demand-elasticity estimates. Fare elasticity is defined as the percentage change in ridership resulting from a 1 percent change in service level. The typical formulas for estimating fare or service elasticity are

$$\eta_f = [(Q_2 - Q_1)/Q_1]/[(F_2 - F_1)/F_1]$$

and

$$\eta_s = [(Q_2 - Q_1)/Q_1]/[(S_2 - S_1)/S_1] \quad (1)$$

where

η_f = fare elasticity,
η_s = service elasticity,
Q_2 = ridership after,
Q_1 = ridership before,
F_2 = fare after,
F_1 = fare before,
S_2 = service after, and
S_1 = service before.

Curtin (5) found in his work on fare elasticities that on the average a 10 percent increase in transit fares will produce a 3 percent decrease in ridership--i.e., a fare elasticity of -0.3. Although this rule-of-thumb has proved to be remarkably reliable at the national level, elasticities can vary significantly among operators, user groups, and types of service. For example, rush-hour transit riders are known to be less sensitive to fare changes than midday or weekend patrons.

Ecosometrics, Inc. (6) recently summarized fare and service elasticity estimates from around the world. The estimates used in this analysis and given in Table 1 are based largely on the Ecosometrics compendium. These estimates show that operators in smaller urban areas usually experience greater ridership losses for a given increase in fares or decrease in service than those in larger urban areas. This is because the automobile is a stronger competitor to public transit in smaller, less dense settings.

Calculations of Fare, Service, and Ridership Changes

By merging the operating, financial, and elasticity information summarized in Table 1 with survey responses, it was possible to estimate fare, service, and ridership changes resulting from federal cuts. The estimation procedure basically relied on the line elasticity measures given in Equation 1. Each operator indicated how much lost federal revenue would be recovered by fare increases. This amount was added to the existing fare revenue to derive the total fare revenue the operator would need to generate. From this the average fare necessary to achieve the required revenue and the resulting ridership level was calculated using fare elasticity estimates.

Next, the ridership loss caused by cuts in service was deducted. Survey responses and information on current federal funding levels disclosed the amount of cost reductions that can be expected from cutting services. Using the average cost per vehicle hour of service, the service cuts necessary to achieve those cost reductions were calculated. Service elasticity estimates were then used to translate service cuts into ridership losses. These were then subtracted from the ridership remaining after fare increases to yield a total ridership loss.

Thus, this methodology amounts to a simple recursive procedure, first calculating the impact of fare increases, then the impact of service cuts, ignoring possible simultaneous influences. Equations used to estimate the effects on ridership are summarized in the next section.

Effect of Fare Increases on Ridership

$$R_2 = (C \cdot J \cdot P_f) \quad (2)$$

where

R_2 = target fare revenue, after fare increase,
C = total operating cost, assumed equal to total existing fare revenue (R_1),
J = proportion of revenue received from the federal government,
P_f = proportion of federal cuts recovered by fare increases; thus,
$(C \cdot J \cdot P_f)$ = additional fare revenue that must be generated to make up revenue lost from federal cuts.

Table 1. Performance and financial data: elasticity estimates for U.S. transit operators (1, 6).

Parameter	Urban Area Population				
	Less than 100,000	100,000-250,000	250,000-1 Million	More than 1 Million	U.S. Total
Total operating expenses ($ millions)	39.5	153.4	443.8	4,225.3	4,862.0
Fare revenues ($ millions)	11.5	45.9	159.2	1,777.3	1,993.9
Linked passenger trips (millions)	43.0	126.9	447.6	5,451.4	6,068.9
Revenue vehicle-hours (millions)	2.1	6.9	17.6	78.7	105.3
Fare elasticity	-0.35	-0.35	-0.32	-0.24	—
Service elasticity	0.80	0.72	0.58	0.40	—
Federal share of total revenue (%)	33	33	31	18	—
Number of operators	57	91	71	105	324

Note: Figures are totals for all operators in the category.

$$(Q_2 - Q_1) = [(F_2 - F_1)/F_1] \cdot \eta_f \cdot Q_1 \quad (3)$$

where

Q_1 = ridership before fare change,
Q_2 = ridership after fare change,
$Q_2 - Q_1$ = absolute change in ridership due to fare increases,
F_1 = average fare before fare change,
F_2 = average fare after fare change, and
η_f = fare elasticity.

Both Q_2 and F_2 are unknown. But the identity $R_2 = F_2 \cdot Q_2$ allows Equation 3 to be solved, substituting R_2/F_2 for Q_2.

Effect of Service Cuts on Ridership

$$S_2 = [C - (C \cdot J \cdot P_s)]/C/S_1 \quad (4)$$

where

S_2 = reduced service level necessary to cut costs to make up lost federal assistance,
P_s = proportion of federal cuts recovered by service reductions, assuming increases in efficiency will offset the impact of service cuts by 50 percent,
S_1 = service level before service cutbacks,
C/S_1 = cost per vehicle hour of service; thus,
$(C \cdot J \cdot P_s)$ = absolute reduction in costs necessary as result of federal cuts.

$$(Q_3 - Q_2) = [(S_2 - S_1)/S_1] \cdot \eta_s \cdot R_1 \quad (5)$$

where

η_s = service elasticity, and
Q_3 = final absolute ridership after fare increases and service cuts; thus,
$(Q_3 - Q_2)$ = absolute change in ridership due to service cuts.

EFFECTS OF FEDERAL CUTBACKS ON ANTICIPATED FARE, SERVICE, AND RIDERSHIP

An Aggregate Picture

The 99 transit operators responding to the survey collectively indicated that lost federal revenue will be recovered predominantly by increasing fares and cutting service (see Table 1). In contrast, operators estimate that only a small amount of revenue can be recovered by improved efficiency, cost savings, or federal block grants. A summary of survey respondents indicated that the following percentages of lost federal revenue are expected to be recovered by various actions.

Action	Revenue Recovered (%)
Increase fares	22
Decrease service	18
Increase local support	17
Increase state support	17
Federal block grants	11
Increase efficiency and productivity	8
Cost saving measures	7

Table 2 shows that these actions can be expected to result in a 17 percent fare increase nationwide, from an average fare of 38.4 cents to 44.9 cents, in 1979 dollars. Service can be expected to decrease 3 percent, from 105 to 102 million vehicle hours. Although these changes appear to be minor, especially when spread over the 3-year span of the Section 5 phaseout, they could reduce nationwide ridership by more than 6 percent, approximately 370 million trips annually, provided all other factors (e.g., extreme gas shortages) remain constant.

Patronage losses resulting from federal cuts could be much larger if local and state governments fail to increase their aid. Table 3 indicates that if operators are forced to rely solely on fare increases because of the failure of states and localities to bail them out, ridership losses could total 935 million trips annually, a reduction of about 15 percent. For some operators fare increases alone could not compensate for the federal cuts because too many riders would be priced off the system. Thus, the worst case given in Table 3 represents the maximum fare increases possible, and service reductions make up the remainder of the lost federal dollars.

The data in Table 3 further show that the exclusive reliance on service reductions to offset federal losses would have less effect on ridership than on fare increases. If operators receive the increases in state and local aid they expect, the use of these funds to compensate for withdrawn federal dollars, in combination with selective cuts in service, could be expected to result in a ridership loss of only 3 percent. This would represent the best possible scenario from the standpoint of minimizing ridership losses.

These findings suggest that the failure of states and localities to increase their support of local transit systems could cause nationwide ridership to decline significantly; however, this may be exaggerated somewhat. In particular, all fare increases and service reductions need not be across the board. Cervero, et al. (7) have shown that selective distance-based and time-of-day pricing could increase transit revenues by as much as 70 percent with as little as a 4 percent decline in ridership. Currently there appears to be a trend away from flat fares; and to the extent that federal cuts encourage this trend, ridership losses might be less than those indicated in Table 2.

Although it is uncertain what form fare increases will take, it is highly unlikely that service reduc-

Table 2. Expected responses at the national level to federal cuts.

Item	Average Fare (constant 1979 cents)	Service Level (million veh-hr)	Ridership (billion trips)
Existing	38.4	105.3	6.37
Future	44.9	102.1	5.99
Change (%)	+17	-3	-6

Table 3. Total expected ridership loss under different revenue recovery schemes.

Revenue Recovery Scheme	Ridership Loss (millions of trips)	Ridership Loss (%)
Expected actions: combined fare increases, service cuts, and increased state and local aid	371	6
Worst case: fare increases only	935	15
Next worst case: service cuts only	431	7
Best case: service cuts and state and local aid	204	3

tions will occur unilaterally (e.g., a simple increase in average headways). Hemily and Meyer (8) suggest that most operators will reduce service in such a way that ridership loss is minimized. They argue that operators will first eliminate night-owl service (midnight to 6 a.m.), followed by Sunday service, evening service, Saturday service, and so on. An even more prudent way to reduce costs might be to examine routes systematically, eliminating those found to be most unprofitable. In any event, by assuming across-the-board service cuts, the service-induced ridership losses given in Table 2 are probably exaqgerated somewhat.

A Disaggregate Picture

Considering only the nationwide impacts of federal transit cuts masks the hardships that will be experienced by certain groups of operators. For example, an operator receiving 50 percent of its revenue from the federal government will probably be severely hurt by the cuts, no matter what actions it takes.

Central to a more disaggregate analysis is the issue of how best to group operators that will be similarly affected by the cuts. Peer groups of operators are typically defined in terms of size, e.g., number of revenue vehicles. The amount of federal dollars received, as well as the actions contemplated, however, were not found to vary significantly among operators of different sizes. Federal subsidies were found, however, to vary significantly in terms of various operating characteristics of transit agencies as well as by metropolitan population and density. Regression Equation 6, computed using data from 65 of the agencies surveyed, indicates that the operators who rely on federal aid the least tend to be concentrated in large, densely populated cities. Moreover, the most productive (i.e., more hours of service per employee) and efficient (i.e., least costly service per hour of operation) transit agencies also rely on federal subsidies the least. These points are illustrated in the equation that follows where the coefficient of determination (R^2) equals 0.51 and the number of cases is 65.

$$\text{FEASSIST} = 42.5 - 0.00\,120\ \text{METROPOP}^{**} - 0.320\ \text{OUTPUT}^{**} - 2.07\ \text{DENSITY}^{**} - 0.338\ \text{LAPRO}^{*} \quad (6)$$

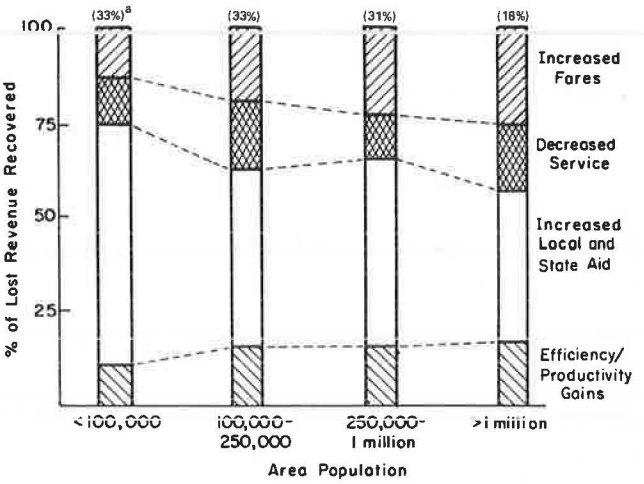
where

FEASSIST = federal share of operating revenue (expressed as a percentage),
METROPOP = metropolitan area population (in thousands),
OUTPUT = operating expense per vehicle hour (in dollars),
DENSITY = metropolitan area population density (coded 1 through 5, low to high), and
LAPRO = revenue vehicle hours per employee.
**significant at the 0.01 level
*significant at the 0.05 level

From Equation 6, METROPOP was found to have more explanatory power than any other variable. METROPOP alone explains more than 30 percent of the variance in FEASSIST suggesting that the best way of exploring how federal cuts might affect different peer groups of operators is to break data down by metropolitan population size. Four groups of transit operators, therefore, are used in the following analysis: those located in metropolitan areas with populations more than 1 million; 250,000 to 1 million; 100,000 to 250,000; and less than 100,000.

Figure 1 shows how operators in metropolitan areas of different sizes are planning to respond to federal cuts, as well as the percentage of total revenue they will lose from the Section 5 phaseout. Although the anticipated actions do not vary significantly by metropolitan area size, a pattern does emerge.

Figure 1. Percentage of revenue recovered, grouped by operator response to eliminating Section 5.



[a](%) = Percentage of operating revenue received from federal sources.

Operators in small metropolitan areas will probably rely more on increases in state and local aid, whereas those in large cities can be expected to increase fares and cut service. These results are not surprising because operators in small metropolitan areas usually receive a relatively large share of their revenue from the federal government. Operators in small cities would be hard pressed to recover lost revenue solely through fare and service changes even though the total federal dollars received by these operators nationwide is fairly small.

In contrast, operators in large metropolitan areas stand to lose only 18 percent of their total revenue because of federal cuts; however, the absolute amount of dollars involved is substantial (i.e., operators in areas with populations of more than 1 million received a total of $760 million in federal operating aid in 1979). In general, transit operators in big cities can recover lost revenue more easily with fare increases or service cuts than by seeking large increases in state and local aid. Operators in small cities, on the other hand, will be at the mercy of local and state treasuries.

Effects in Large Urban Areas

For the most part, whatever happens to operators in large urban areas happens to the U.S. transit industry as a whole. This is because America's transit services and ridership are concentrated in large urban areas. Although there are more transit operators in smaller urban areas, 85 percent of the nation's ridership is in areas with populations greater than 1 million.

Transit agencies in large cities generally receive a relatively small proportion of their total income from federal grants. Of the ten largest operators, all but two (those located in Los Angeles and Detroit) receive less than 20 percent of their operating revenue from federal sources. Operators in New York City, alone accounting for nearly 35 percent of U.S. ridership, receive only 6 percent of their revenue from the federal government.

Because large operators stand to lose a relatively small proportion of their revenue, the impact of federal cuts should be minimal. The data in Table 4 show that fares are expected to increase about 15 percent, from an average of 32.6 cents to 37.5 cents; and service levels can be expected to fall by only about 3 percent in areas with populations more than 1 million. The result will be an estimated 5 percent decline in ridership, a loss of 250 million riders annually in the largest cities. Thus, with few other travel options, residents of big cities will probably continue to patronize transit even when fares rise sharply.

Although large urban areas will be the least affected by federal cuts, in absolute terms the ridership losses could be significant. More important, these operators are also counting on a $280 million increase in state and local aid. If this aid is not forthcoming, the loss in transit ridership could run as high as 14 percent (see Table 5).

Effects in Smaller Urban Areas

Most small-city operators rely as heavily on federal subsidies as on the farebox; some receive as much as one-half of their income from federal funds. Figure 1 shows that operators in smaller urban areas (i.e., populations less than 1 million) are counting heavily on replacing federal grants with increased state and local aid. Nonetheless, some fare increases and service cuts will occur. The data in Table 4 show that fares can be expected to increase 31 to 48 percent in areas with less than 1 million population with concurrent service cuts of 3 to 6 percent. The total ridership loss in small urban areas is expected to reach 93 million passengers annually, and the largest impact is expected to be in areas with populations of 100,000 to 250,000.

Unlike operators in large urban areas, many transit agencies in smaller cities will be wholly dependent on increased state and local aid to keep their systems solvent. The data in Table 5 show that, without the increased state and local aid, many will suffer substantial ridership losses as a result of drastic fare increases and service cuts.

It appears likely that a large number of operators in areas with less than 100,000 population would be forced to cease operations as services begin to fall below the threshold necessary to maintain political support. Consequently, operators that can afford to run buses only a few hours a day, or only on hour-and-a-half headways, may eventually be forced out of business as policymakers find other ways to meet the travel needs of their constituents. It may be, however, that such an outcome could prove beneficial over the long run as taxi companies and various other private service providers fill the void left by discontinued public transit services.

Table 4. Expected response of urban areas to federal cuts (by population area).

Parameter	Urban Area Population			
	Less than 100,000	100,000-250,000	250,000-1 Million	More than 1 Million
Percentage of total U.S. transit ridership	1	2	7	90
Fare increase (%)	31	48	35	15
Service decrease (%)	3	6	3	3
Existing ridership (millions of trips)	43	127	448	5,450
Ridership loss (millions of trips)	6	27	60	252
Ridership loss (%)	13	21	13	5

Table 5. Expected ridership loss in urban areas under different revenue recovery schemes (by population area).

Revenue Recovery Scheme	Ridership Loss by Urban Area Population (%)			
	Less than 100,000	100,000-250,000	250,000-1 Million	More than 1 Million
Expected actions: fare increase, service cuts, and local and state aid	13	21	13	5
Worst case: fare increase only[a]	48	39	28	14
Next worst case: service cuts only	24	20	15	6
Best case: service cuts and local and state aid	6	9	6	3

[a]Ridership loss resulting from maximum possible fare increase. Some service cuts would still be necessary because withdrawn federal funds could not be recovered with fare increases alone.

Summary

These results indicate that federal cuts will probably have only a minor impact in large metropolitan areas but could be devastating in smaller cities. Large cities would be relatively unaffected because they receive only a small share of their revenue from federal funds. Agencies in small cities, on the other hand, are highly dependent on federal assistance. Because many already have marginal service levels, there are fewer opportunities for raising fares and reducing service. Thus, if compensatory state and local aid is not forthcoming, the elimination of operating subsidies could force many small-city transit agencies into bankruptcy.

OTHER EXPECTED IMPACTS OF FEDERAL CUTBACKS

Environmental and Energy

Because transit accounts for only 3 percent of urban passenger trips, the effect on environment and energy as a result of ridership losses will be imperceptible on a national scale. Assuming a net reduction of 343 million transit trips annually, the Section 5 phaseout could increase automobile travel by 1.3 billion miles (0.13 percent) and fuel consumption by 93 million gallons (0.13 percent).

Equity

Federal cuts will affect some income groups more than others. Clearly, fare increases induced by federal cuts will be a greater strain for the poor than for the wealthy. The impact on the poor could prove pervasive because they rely much more on transit than the wealthy. In 1970, for example, Americans with incomes below $5,000 used transit for 13.7 percent of their trips, whereas those with incomes above $15,000 relied on transit for only 5.8 percent of their trips (9).

Service cuts will probably also hurt the poor the most, particularly those living in smaller cities. Because they own fewer cars than other income groups, the poor will more likely be forced to forego trips because of federal cuts. The loss of travel opportunities to the poor will be particularly burdensome if service reductions focus on night-owl, Sunday, and other off-peak services. Nationally, a high percentage of off-peak patronage

is made up of lower-income persons; wealthier riders tend to ride during peak periods (10).

Finally, the replacement of the more progressive federal income taxes by the more regressive state and local sales and property taxes could place an increasing tax burden on the poor. If some localities chose more progressive taxes, such as a stock transfer tax (11), to help pay their transit bill, wealthier residents of those areas would be effectively making up the loss in federal assistance.

In summary, federal cuts may hurt the nation's poor in multiple ways. They will probably suffer the most from higher fares and reduced service and can also be expected to bear the brunt of tax increases to support transit. User-side subsidies, perhaps administered through various human services programs, should therefore be considered for lessening the impact of federal cuts on the poor.

Political

Federal transit cuts are likely to spark some major political confrontations. Battles will surely be fought between managers seeking selective service cutbacks and fare increases on the one hand, and boards trying to maintain their political support via low fares and extensive routing, on the other. Efforts to introduce zonal and peak-period fares, for instance, can be expected to be opposed by users, labor, and politicians. Similarly, confrontations over service cuts will heighten, perhaps pitting suburban taxpayers who lose their services against those in areas where service levels are maintained.

Labor

Federal cuts may also hurt transit labor. Most fundamentally, as services are scaled down, some transit workers may be furloughed. In areas where unemployment is already high, such as the industrial Northeast, this could impose significant hardships on workers that have been laid off.

SUMMARY AND CONCLUSIONS

This research suggests that the wholesale withdrawal of all federal operating assistance could have a significant effect on the American transit industry. Nationwide, federal cuts can be expected to cause fares to increase on the order of 17 percent, service to decrease about 3 percent, and ridership to decline approximately 6 percent. The impact of cuts will be most severe in smaller urban areas because of their relatively heavy reliance on federal aid. Ridership losses will probably average about 15 to 20 percent in these areas, and a number of agencies, perhaps as many as 50 nationwide, may be forced to cease operations.

Should massive federal cuts occur, ridership losses can be minimized by reducing service instead of increasing fares. The selective elimination of unprofitable routes coupled with the introduction of distance and time-of-day pricing offer the best opportunities for meeting costs while also minimizing ridership losses. Most operators are also counting on substantial increases in local and state aid to lessen the impact of federal cuts. Should this assistance fail to materialize, nationwide ridership could decline as much as 15 percent. In general, the poor will bear the brunt of the future fare hikes, service cuts, and state and local tax increases that will result from federal cuts.

The findings of this research appear to provide ammunition for both sides of the argument. Federal officials expect the Section 5 phaseout to prod operators into becoming more efficient and to shift some of the transit cost burden to state and local governments. Operators will, indeed, strive to become more efficient as they cut unprofitable routes, raise fares, and generally tighten their belts. The result will be an estimated 15 percent increase in the nationwide farebox recovery ratio from the existing 0.41 to an expected 0.47.

However, the script written for the future by opponents of the federal cuts probably also holds some truth. The cuts will be devastating to some areas. If localities and states fail to make up some of the lost federal revenues, many operators in smaller urban areas will have no option other than to scale down services radically or completely cease operations. The danger of shifting the transit financial burden to states and localities is that they, too, may reexamine their programs and eventually cut back. It is doubtful that even the largest transit systems could survive on passenger fares alone. A trend away from operating subsidies could easily plunge transit into a period of gradual attrition similar to that before the 1970s, which brought the industry to the brink of financial collapse.

Given some of the possible deleterious effects of eliminating all federal operating assistance to transit, several alternative courses of actions are recommended. First, all governments should rely increasingly on user-side subsidies that allocate aid specifically to the disadvantaged. A well-designed subsidy program providing travel vouchers to the poor, elderly, and handicapped could also stimulate greater competition among various service providers and encourage more innovative paratransit modes to emerge. Second, efficiency objectives can probably be better achieved through subsidy allocation strategies rather than the complete withdrawal of public support. Governments can encourage the types of efficiency improvements desired and bring escalating costs under control through various incentive programs and the adoption of performance standards. Tying subsidies to improvements in cost recovery or labor productivity could offer greater hope for strengthening the industry than simply eliminating operating assistance.

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An Analysis of Local Taxpayers' Willingness to Finance Transit

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A strong commitment of local tax dollars will be necessary to sustain transit service in many U.S. cities in the 1980s. Limited research has been completed on willingness to pay local taxes for transit. Factors that influenced support for a proposed special property tax millage in Council Bluffs, Iowa, are examined. Council Bluffs is a moderately low income, blue collar community within a metropolitan area of half a million people. An analytic technique known as the Automatic Interaction Detector (AID3) is applied to survey data collected through telephone interviews of 770 households in Council Bluffs. AID3 sequentially partitions a data set on the basis of maximum differences in the means of the resultant groups. Each respondent is assigned to one and only one subgroup. Results of the analysis indicate that home ownership is a major factor in the willingness to pay a local transit tax; home owners are distinctly less willing to pay than renters. Older persons are also less supportive of an additional property tax. Among homeowners, personal transit use or use by another household member is an important factor in support. The attitudes that business within the city is stimulated by transit, that low income persons are enabled to get or keep jobs, and that local government is generally performing well are highly related to willingness to pay a transit tax. The conclusion is drawn that it is important to provide transit service that conforms to the objectives of local taxpayers as well as to demand by users of the service. If these taxpayers believe that transit is making a useful contribution, they are much more likely to support a local property tax to help finance it, even if they are not making personal use of transit.

Recent policy shifts in the federal government are gradually transferring the burden for financing transit operations to the local level. With the phaseout of UMTA Section 5 operating assistance, the entire cost of operating transit must be defrayed by fares, state assistance, and local funds. Fares have been increasing quite rapidly in the early 1980s (an average of 18 percent from 1980 to 1981) and probably will continue to do so (1). Concern exists, however, that too rapid an increase in fares could bring about significant ridership losses and, in some instances, reductions in total revenue. State transit operating assistance is provided by only about half of the states, and the level of this assistance is rarely high (2,3). A strong commitment of local tax dollars to subsidize transit operations may often be the only alternative to major reductions in or even termination of service.

Limited research has been conducted in the area of local transit financing. A growing literature is emerging on the efficiency and equity implications of alternative financing strategies; Pucher (4), for example, and the probable responses to fare changes (5). Few studies have addressed the issue of local willingness to pay local taxes for transit (6-8). An earlier analysis by Forkenbrock (9) examined the relationship of various user and nonuser benefits to transit support, but the case study city of Ann Arbor must be regarded as somewhat atypical.

This analysis is an attempt to extend what is known about factors influencing willingness to pay a local tax earmarked for transit. The data used in the analysis were collected as part of a study of citizen preferences regarding transit financing. The fundamental questions explored in this paper are the relationships between (a) personal transit use, situational attributes, and individual attitudes; and (b) willingness to pay a local property tax for transit.

CASE STUDY AND RESEARCH METHODOLOGY

The Case Study City: Council Bluffs, Iowa

Council Bluffs, Iowa, purchases transit service from Metro Area Transit (MAT) which serves the greater Omaha region (570,399 population). Costs are assigned to Council Bluffs on the basis of service hours provided on a monthly basis. As the hourly charge by MAT increased and the amount of federal Section 5 operating assistance began to diminish, the concern of city decision makers heightened. Alternatives ranged from terminating service to levying a local tax to help defray the burgeoning deficit.

Iowa law enables a local government to institute a special property tax assessment of not greater than 2 mills to provide for transit. In Council Bluffs a 2 mill assessment would generate approximately $350,000 annually. Although state law does not require a referendum to establish a new tax, the mayor and city council decided that a large-scale household survey would be prudent. Such a survey would enable them to determine whether the citizenry would favor an increase in property taxes to help pay for transit.

The city council's concern over public support for a transit tax stemmed in part from the difficult economic circumstances of the city. At the time the increase was being contemplated, the city had a 9 percent unemployment rate. Most of the labor force is blue collar, and the average household income of $17,870 is well below the national average of more than $21,000. The median educational level is 11.8 years. In short, Council Bluffs is a lower middle income, blue collar community whose economy is not particularly strong.