Privatize Public Services?:
The Case of Urban Bus Transit
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ABSTRACT
This study assessed the costs and benefits of privatization in the context of urban bus transit. Five ownership-management structures were compared on a series of performance indicators. The analysis demonstrated that subsidized, privately-owned and managed systems exhibited greater operating efficiency than public providers, but they also were significantly less safe. Publicly-owned systems operated by management service companies had generally lower operating efficiency than publicly-owned systems managed by governmental entities.

INTRODUCTION
The search for appropriate structures for the delivery of public services has been a recurring theme within the literature of public administration. Early municipal reforms were motivated by concern for eliminating corruption associated with basic services such as police and sanitation. In the 1960s, decentralization was advocated as a means for improving the responsiveness and accessibility of governmental services.

The most recent search for organizational improvements has dwelled predominantly on the mechanisms of privatization as means for achieving greater efficiencies (Savas, 1982). Privatization usually means increasing the role of private firms in production and distribution, although it may also involve private sector planning and financing. Several strategies accomplish privatization. One is what Savas (1982) called load shedding, turning over a public service to the private sector. Another privatization strategy is to franchise or license producers to operate in a jurisdiction. Perhaps the most common form of privatization is to contract for the purchase of services. Contracting allows governments to establish service standards, but gives private contractors the choice of how to produce the service.

This paper tests the viability of particular privatization strategies in the context of urban bus transit. Using 1980 data reported under Section 15 of the Urban Mass Transportation Act, it compares five existing organizational forms on a variety of efficiency, effectiveness and utilization indicators.

Organization of Urban Transit Services
The evolution of organizational forms within the urban transit industry during this century is well documented (Barnum, 1977; Fielding, 1983). Privately-owned firms carried most transit riders at the turn of the century. The mortality rate for these organizations was quite high, especially after 1945, as transit riders shifted to the use of automobiles. However, most surviving transit agencies remained privately owned until 1964. Beginning in 1964, when Federal capital subsidies became available to local governments, increasing numbers of systems were acquired by public agencies. Today most urban bus systems are publicly owned.

Five different types of ownership and management arrangements exist in urban transit today: privately-owned and managed systems; systems owned and managed exclusively by either a general government or special authority and systems owned by general governments or special authorities and operated by a private management service company. In the latter two arrangements the contracts between the government agency and management service company normally provide: a resident team of professionals; technical support for the team from the firm's central office; and control of the day-to-day operations of the system (Boor-Allen & Hamilton, Dave Consulting, and Budd, Reilly and Wiley, 1983; Velenga, 1976). Financial terms and conditions of the contracts are usually on a fixed-fee basis, with provisions for inflation.

Although research provides some conflicting results, it strongly suggests the prospect of performance differences across organizational forms. In a majority of studies, private firms were found to be more efficient than government operators. While private firms have an efficiency edge, public systems appear to attract more riders. Among public-owned systems, general governments have been found to riders because of their efforts to hold down more efficient than special authorities. Furthermore, variations in operating environments appear to be important moderators of organizational performance relationships. Given these generalizations from prior research and theory, four hypotheses were proposed.

Hypothesis 1: Private firms and those public agencies that are operated by management service companies will be more efficient than publicly-owned and managed systems.

Hypothesis 2: General government systems will be more efficient than special authorities.

Hypothesis 3: Significant performance tradeoffs will be reflected across organizational types.

Hypothesis 4: Urban system characteristics will significantly affect performance.

Methods
It was not until recently that a nation-wide, uniform system of accounts and records became available for transit evaluation. All U.S. transit systems applying for federal operating assistance have been required to report detailed information concerning the status of the agency's financial and other environments. These data have permitted development of a set of performance indicators that is appropriate for cross-sectional comparisons (Fielding, Babitsky and Brenner, in press). Twenty-five performance indicators were initially selected for analysis. These variables represented three performance concepts—cost, efficiency, cost effectiveness, and service effectiveness (Fielding, Glauthier and Lave, 1978).

The initial sample used for statistical analysis consisted of 269 transit agencies. These agencies were selected from the 321 agencies included in the 1979-80 UMTA Section 15 Report. The 72 agencies eliminated included 17 agencies with no fixed-route service, 54 agencies with a peak vehicle count of less than 10, and one agency whose data represented a combination of four transit operations with different ownership and management forms. This analysis excludes a few public agencies that did not appear in the 1979-80 Section 15 Report and
unsubsidized private bus lines that are not required to report under Section 15. However, the sample includes nearly all but the very smallest bus operations.

The performance indicators were analyzed using principal components analysis to determine the underlying conceptual structure in the data. Factor analysis reduces a large set of data to a smaller set of “components” or “factors” which portray the underlying relationships among the variables. From the twenty-five performance indicators that were entered into the analysis, eight factors were identified. These eight factors accounted for 85.9% of the variance in the original set of variables. (A Table showing the performance indicators and item loadings is available from the authors.)

Ownership-management structures were measured by category variables. The five categories were:

1. General government ownership, public management
2. Special authority ownership, public management
3. General government ownership, contract management
4. Special authority ownership, contract management
5. Private ownership, private management

Data on the ownership and management of target systems was gathered from UMTA, American Public Transit Association (APTA), and American Transit Association (ATA) reports and from telephone inquiries and letters to state departments of transportation and local transit agencies.

Results

To investigate the four research questions, three kinds of statistical analyses were used: analysis of variance (ANOVA), paired group means tests, and multiple linear regression with metric and dummy variables. The general effects of ownership-management form on performance were investigated through the ANOVA analysis. Different effects of any one type of organizational form were analyzed through the paired group means test. Results of both analyses are presented in Table 1.

Each of the eight performance dimensions identified in the factor analysis was analyzed across the five ownership-management forms. Group means were tested against the grand mean for each dimension and the significance levels for overall between groups differences are listed. There was no significant difference between groups on the service consumption and maintenance efficiency performance dimensions.

The differences between any pair of group means on each of the performance dimensions were tested using the least significant difference methods for calculating test limits. Results are noted in Table 1 in parentheses under each performance dimension. Private systems (5) are significantly different from the other four types on revenue generation, output per dollar, public assistance, and vehicle efficiency.

Multiple regression analysis was used to test the overall impact of organizational form, controlling for characteristics of the transit agency environment. Factor scores from each of the eight performance dimensions were predicted by metric and dummy variables representing system characteristics and organizational forms. Four system characteristics—total vehicle miles (TVM), number of peak vehicles (PVET), peak to base service ratio (PEAK/BASE) and average system speed (SPEED)—were the metric predictor variables. Four dummy variables represented the five ownership-management form categories. Private systems were used as the reference category. Standardized regression results are presented in Table 2.

Of the eight performance dimensions the greatest amount of variance (40%) was explained for output/dollar and

1. Eight factor score variables were calculated from the factors. Factor scores are composite scales calculated from the full rotated factor pattern matrix. Computer generated estimates for missing data were used for cases missing no more than 28 percent of the performance data.

<table>
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<tr>
<th>TABLE 1. ANOVA AND PAIRED GROUP MEANS TESTS FOR ASSOCIATIONS BETWEEN ORGANIZATIONAL FORMS AND THE EIGHT PERFORMANCE DIMENSIONS</th>
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<tr>
<td>ORGANIZATIONAL FORM GROUP MEANS</td>
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<tr>
<td>--------------------------------</td>
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<tr>
<td>(1) (N=57) (2) (N=82) (3) (N=46) (4) (N=34) (5) (N=32)</td>
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<td>PERFORMANCE DIMENSIONS</td>
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<tr>
<td>(5 vs 2,3,4,1)</td>
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<tr>
<td>Service Consumption</td>
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<td>Public Assistance</td>
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<td>Labor Efficiency (2 vs 3)</td>
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<td>Vehicle Efficiency (2 vs 4,3,1,2)</td>
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<td>Safety (4 vs 3,1,2) (2 vs 4,5)</td>
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<td>SIGNIFICANCE LEVEL (Overall Between Groups Differences)</td>
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<td>NOTE: The values in parentheses denote the significantly different groups on Paired Group Means Test (LSD&lt;.05)</td>
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safety, followed next by labor efficiency and revenue generation. Significant effects for both system characteristics and dummy categories are noted in Table 2. Four dimensions of performance-revenue generation, output per dollar, vehicle efficiency, and safety—were significantly associated with both organizational form and system characteristics. Service consumption and labor efficiency were more closely related to system characteristics than ownership-management form. Public assistance was more strongly related to organizational form than system variables, and maintenance efficiency was significantly related only to the average speed variable.

There were significant system performance differences across organizational forms. Revenue generation and output/dollar were particularly sensitive to organizational form, while public assistance, vehicle efficiency and safety were also significantly related. These effects hold across both the ANOVA results and the regression results. Although it appeared from the ANOVA analysis that ownership-management form was significantly related to labor efficiency, when system characteristics were controlled in the regression, this relationship disappeared. Ownership-management form does not appear to affect service consumption; system size as measured by peak vehicles and total vehicle miles was the only significant predictor of this performance dimension.

Private systems appear to be quite different from the other four types. They generated more revenue, produced more output per dollar, used less public assistance, and had better vehicle efficiency. The paired group means test found that private systems were clearly different from public systems. Publicly-managed special authorities were also different in some ways from other public systems. They produced more output per dollar, were safer than contract-managed special authorities, and were less labor efficient than contract-managed general governments. Finally, contract-managed special authorities were significantly less safe than all other ownership-management types, except private systems.

Do system characteristics wash out performance differences across organizational forms? The general answer to this question is "no". For five performance dimensions in the regression analysis, organizational form exerted a significant influence on performance even when controlling for system variables. Revenue generation, output per dollar, public assistance, vehicle efficiency and safety were all significantly affected by ownership-management form after accounting for external system characteristics. Organizational form was not significantly related to either service consumption or maintenance efficiency at even the first stage of investigation. Thus, the lack of significance of ownership-management variables in the regression equation was expected. Further although maintenance efficiency was significantly related in general to differences in organizational form, only two groups were significantly different on the paired group means test. Thus, the insignificance of ownership-management variables in the regression model is understandable.

Discussion

The empirical analysis provided mixed support for the hypotheses. Hypothesis 1 was partially supported. Private systems were positively and significantly related to operating efficiency, i.e., output per dollar. However, publicly-managed special authorities achieved better operating efficiencies than contract-managed systems. When vehicle efficiency is considered, private systems again perform more positively than publicly-owned systems, but contract-managed systems perform no better than publicly-managed systems. Thus, private systems appear to be more efficient than other organizational forms, but contract-managed systems are not.

This was the first test of the relative efficiency of general government and special authority ownership using uniform accounts as specified by Section 15 reporting requirements. Our results appear to confirm what others have argued: that past research findings overstated the efficiency of general government because of unaccounted costs. General governments performed relatively poorly on output per dollar and vehicle
efficiency. Thus, Hypothesis 2, which posited that
general governments would be more efficient than
special districts, was not supported.

Hypothesis 3 was partially supported. For general
government ownership, there were consistent patterns of
trade-offs across the performance dimensions, no matter
what the management type. Negative associations with
revenue generation, output per dollar and vehicle ef-
ciency are counterbalanced by positive relationships
with the other five performance dimensions. Private
systems also showed trade-offs across performance cri-
teria. Negative associations with public assistance, labor
efficiency, safety and maintenance efficiency were
balanced by positive associations with the other four
dimensions. The type of agency management seems
to make a difference in the performance profiles for
special authorities. Contract and publicly-managed
special districts reflect differing performance pro-
files.

Urban system characteristics were significant deter-
minants of performance and, therefore, hypothesis 4
was strongly supported. Of the eight performance dimen-
sions, seven were significantly associated with at
least one of four system characteristics. Five per-
formance dimensions were significantly related to three
or more system characteristics. However, for the six
performance dimensions to which organizational form
was significantly related, system characteristics washed
out only the relationship with labor efficiency.

What should be made of the finding that private systems
are more cost efficient than publicly-owned systems?
One interpretation reflects a deterministic view:
forces in the environments of private organizations en-
courage efficiency and analogous forces for public or-
izations discourage efficiency. The private systems
in this investigation were predominantly located in the
Northeast within the New York-New Jersey urbanized
area. These subsidized firms successfully negotiated
financing arrangements with local public agencies that
required only partial dependence on the fare box and
provided some financial stability. They also benefi-
ted from a favorable mix of local, commuter, and inter-
city bus service which may have affected their effi-
ciency. Teal and Giuliano (1983, pp. 175-6) paint a pic-
ture of the special characteristics of these systems:

Two of the most striking characteristics of ex-
isting private commuter bus services are that
they have been in operation for many years...and
that they predominantly serve specialized markets.
The commuter bus operations serve areas with
strong CBD's (central business districts) charac-
terized by heavily congested highway access and
very high parking costs. Workers commute long
distances, usually 25-30 miles or more, or are
very price conscious and thus willing to accept
equipment with fewer amenities—notably the use
of school buses or other old vehicles—in return
for cost savings.

Whether or not the superior efficiencies of private
firms can be generalized, however, our results do con-
tradict a recent assertion about the inefficiencies of
subsidized, private systems: "...the private operators
have traditional monopolistic operations and a guaran-
teed city subsidy to cover their deficits. The end
result is little incentive toward low cost, efficient
operation (Morlock and Vaton, in press). On the con-
test, competitive privatization subsidies have
apparently an important objective for the private oper-
ators in this sample. And, as suggested by Teal and
Giuliano, costs are held down by private systems by
running older, possibly more accident prone buses for
longer periods of time. This explanation accounts for
the significantly poorer safety records of private
firms. Thus, although the analysis confirms the ef-
ciency advantage of private firms, it is unclear whe-
ther such results can be duplicated on a large scale
given the specialized circumstances surrounding these
operators.

The history of conversion of transit systems from pri-
ivate to public suggests another interpretation for the
higher efficiency of private firms, one linked to the
purposive nature of organizations. As Holoff and
Knighton (1977, p. 19) have argued: "It is not because
operations are public that they are unprofitable, but
the reverse: unproductive operations tend to become
public." Therefore, comparisons simply confirm
what some observers argued should be taken into
account: how we often ignore in policy debates—that public
organizations are inherently less efficient than private
because of their unique social roles.

This line of reasoning—that the performance of the
different types of organizations is a product of social
purposes rather than environmental determinism—can be
extended to interpretation of the overall performance
profiles. Different organizational types might be
conceptualized as reflections of their constitutions,
i.e., "conceptions of legitimate purpose or goals,
and conceptions of legitimate authority wielded in pur-
suit of them" (Wamsley and Zaid, 1972). Employing this
perspective, the performance profiles can be viewed as
the result of initial decisions about problems of
organizational purpose rather than outputs from day-to-
day decisions (Levine, Backhoff, Cahoon, Siffin, 1975).

Another interesting result was that contract-managed
systems had lower output per dollar than publicly-
managed districts. The surprising cost-efficiency re-
results for contract-managed systems may have resulted from
the contracting environment. The fixed-cost contracts
common in transit provide few incentives for efficiency
and cost-cutting. In addition, competitive
vironments may be weakened by the edge of "first hand
experience." Once a firm has provided contracted ser-
vice, there is inertia in the environment which in-
hibits switching to another contractor (Booz-Allen &

In the on-going debate about the merits of contract
management, our results come down strongly on the side
of those who have argued that management service
panies have no financial risk at stake and, therefore,
perform no better than public management. Because
contract-managed agencies remain public monopolies they
are unable to capture the competitive nature of the
private market. Furthermore, since the professional
management team is usually only a small portion of an
agency's staff, the incentives for most employees are
such like the civil service arrangements in public
bureaucracies.

There recently has been some recognition of these in-
adequacies. "Incentive contracts are now being con-
sidered as possible substitutes for standard fixed-fee
contracts. The idea behind incentive contracts is
quite simple: "Profit is the basic motive of business. This is
the fundamental principle behind the incentive
contract" (Booz-Allen Hamilton, et al., 1983). While
such reasoning is appealing, the successful implemen-
tation of complex incentive contracts in the public sec-
tor has not been documented. Incentive contracts also
fail to address potentially critical problems inherent
in existing arrangements: (1) the absence of alterna-
tive service providers; and (2) constraints on managers
and incentives for employees in any governmental set-
ing.

As a final point in considering the generally negative
results for contract management, system idiosyncrasies
rather than the performance characteristics analyzed
hence may determine the exact goals noted in the contract. Transit authorities have sometimes turned to management firms in order to solve “insoluble problems.” Contract target goals have included “increased frequency,” “increased reliability,” “lower labor costs,” and “increased ridership.” With idiosyncratic and system-specific goals in a contract with a management firm, the goals of management service companies may not be congruent with the performance dimensions used in this study. Thus an understanding of the real effects of contract management—both positive and negative—may have escaped the analytic approach used in this research.

CONCLUSIONS

The conventional wisdom about organizational form and performance has, in part, been borne out by this research. Purely private organizations generally are perceived as efficient producers of goods and services. Our empirical results support this viewpoint in that privately-owned and managed transit systems were found to be significantly more efficient than four other types of organizations. The most important qualification is that the private organizations in our sample were subsidized systems located predominantly in the New York-New Jersey area, and, therefore, may not be representative of all private systems.

As significant as the support we found for the relative efficiency of private systems, however, was evidence of the relative inefficiencies of contract managed systems. Contrary to our expectations, contract-managed systems were no more efficient than publicly-managed systems. This finding was replicated across several indicators, including output/dollar, and vehicle maintenance efficiency. Publicly-managed special districts were significantly more efficient than either special districts or general government systems managed by contract.

We indicated that it may not be appropriate to evaluate contract systems according to a generalized set of performance dimensions. Their goals may differ quite radically from publicly-owned and managed systems and from private systems. Future research might include case studies that assess the objectives of contract-managed public systems to ascertain whether their goals differ in any significant ways from other systems. Such case studies might be useful for identifying constraints upon efficient operation of contract systems and for explaining precisely why contracting has become so popular in recent years.

There also would be some advantage if future research expanded the range of criteria used to assess the performance of different organizational forms. Because Section 15 contains no census-type data, we were unable to investigate the service allocation attributes of different organizational forms. Without such data, important questions cannot be addressed: What are the redistributive effects of alternative forms? Does each organizational form allocate services similarly to socio-economic groups? These social welfare issues have not been addressed directly because of limitations in our data. However, they are central to the issue of tradeoffs involved in choices between organizational forms that we have raised in this research.

A third area in which further research would be helpful is the interaction between organizational form and system characteristics. An implicit assumption of much structure-performance research is that an appropriate organizational structure is the subject of a conscious choice by an organization’s leadership. However, seldom are managers and politicians able to make such rational choices. Are particular organizational forms better adapted than others for certain environments? Is there an established pattern associated with the evaluation of transit organizations that is determined primarily by external factors? With respect to the latter question, there is prior research that suggests organizational form reflects an increasing specialization of a city’s upper and middle management with respect to transportation (Robey, Bakr and Miller, 1977).

Given the special nature of successful privately-owned systems, the “load shedding” privatization strategy may not have general application throughout the country. However, it may be appropriate in large urban areas that account for a substantial portion of public transit expenditures in the U.S. The research suggests that some safety reductions might be associated with such a shift, but the cost savings could be substantial.

REFERENCES

Barnum, D.T. From Public to Private: Labor Relations in Urban Mass Transit (Lubbock, TX: College of Business Administration, Texas Tech University, 1977).


Savas, E.S. Privatizing the Public Sector: How to Shrink Government (Chatham, NJ: Chatham House, 1982).

