Economic Efficiency in Transit Service Contracting: The Role of Contract Structure

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Abstract

This paper presents the results of a 1992 survey on US transit service contracting conducted by the authors. The survey was sent to a large sample of US public transport agencies; 135 agencies responded. The survey requested general information on the agency, including the types of transportation services offered directly and through a contractor and detailed contractual, financial, and performance information on each contracted service. The principal aims of this paper are to describe (1) the frequency and type of contracting used by responding agencies, (2) the types of contract structures and contracting processes, and (3) the implications of these processes and structure for the efficiency and effectiveness of the contracted service. Special attention is paid to compensation provisions, inclusion of contract incentives and penalties, and the enforcement of incentives and penalties. The paper concludes by presenting recommendations for improving the design of the contracting process and contract structure and also areas in need of further research.

Introduction

There has been increased attention to the role the private sector could play in helping to improve the performance of the US urban public transportation industry. This interest stems from disillusionment with the ability of the publicly owned transit monopolies to provide needed services efficiently and effectively. While a massive infusion of operating assistance over the past two decades has preserved transit as an alternative to the auto for many trips in medium and large metropolitan areas, there is now general acceptance that there are large efficiency losses in this approach, and that there is a need to think creatively about alternatives.

Many of the strategies being considered involve increasing private sector participation in the public transportation system, principally in terms of financing, service operation, and providing supporting functions (Teal, 1987). The avowed objectives of these strategies are to decrease the public cost of transit and/or to increase its effectiveness. While all these strategies may be valuable, depending on the local situation, those involving service operation (i.e. transit service contracting) are generally believed to have the greatest potential to improve, in a fundamental way, the condition of the transit industry. Service operation by the private sector is aimed at providing services similar to those operated by a public authority but at a lower cost or of a higher quality, or both. The services themselves may be of a conventional fixed route, fixed schedule type, or be innovative.

Although there is also potential for increase in unsubsidized private transit operations, subsidized, contracted service is likely to be the dominant form of private sector service involvement in the U.S., at least for the foreseeable future. There are several reasons for this:

- the "farebox" recovery ratio is approximately 40 percent (APTA, 1991); revenue at current fares would fall below costs even with a reduction in operating costs through private service provision;

- the significant fare increases necessary to sustain self-supporting transit would face both public and political opposition;

- the public, government, and transit industry recognize there are strong social, economic, efficiency, and equity arguments supporting some level of subsidization for transit services.

Consequently, an appropriate focus of attempts to increase the role of the private sector in direct transit service provision is subsidized contracted services. Realizing the potential of contracting, in 1984, UMTA enunciated a policy to encourage privatization of public transit to stabilize, and hopefully improve, the current situation. This policy, based on the premise that the present system of providing service through a public monopoly should be changed, and the private sector should be involved more directly in the operation of public transportation systems, has been adopted by several transit authorities, resulting in an increase in the number of contracted services nation-wide.

However, there is little inherent about private sector operation that guarantees greater efficiency; rather effective competition will spur any operator (public or private) to improve performance to preserve market position and increase profits. The key for transit agencies is to administer the contracting process and use a contract structure that takes advantage of the potential for competition in the private sector and allows the transit agency to capture the benefits of competition.

This paper addresses the role of contract structure in the efficient production of transit services. After a brief review of the role of service contracting in the US transit industry, the main issues of structuring a contract are discussed. This is followed by a presentation of the results of a 1992 survey of US transit agencies focussing on their use of contracted services and the form of the contract.

Transit Service Contracting in the US

Since 1983, the Federal Transit Administration (FTA) has enunciated a policy to encourage greater private sector participation in the provision of urban public transit. This policy, based on the premise that services should not be provided automatically through a public monopoly, has led to greater opportunities for the private sector. Table 1 shows the number of unlinked passenger trips that have been provided both directly and through transit service contracts in each year from 1987 to 1990.

This table shows that, while there has been substantial growth in the use of contracted transit service, it still represents only a small portion of all passenger trips in all modes except Demand Responsive. When measured on the basis of total operating expenses, the role of purchased transportation increased from four percent (in 1987) to six percent (in 1990). This reflects the high cost - low productivity nature of paratransit service, where purchased transportation is dominant.

Contract Structure

Transit service contracts can be applied to different types of services and structured in a variety of ways, but the basic provisions cover compensation, performance standards, and vehicle provision and maintenance. Contracts also generally include provisions related to contract enforcement such as the amount of notice needed for a breach of contract prior to contract termination or whether the courts or arbitration will be used to resolve disputes. (These topics are not addressed in this paper).

Types of Contracted Services

Contracted transit services can be divided into two types: fixed route and demand responsive. Fixed route services operate on a schedule over a predefined route with boardings and alightings occurring at specific, predetermined locations.

Table 1

Unlinked Passenger Trips - Directly Provided and Purchased				
	1987	1988	1989	1990
All Modes				
-Direct	7,787	7,729	8,004	7,853
-Purchased	79	83	95	112
Motor Bus				
-Direct	4,748	4,747	4,780	4,813
-Purchased	48	47	58	74
Commuter Rail				
-Direct	302	314	319	319
-Purchased	9	11	10	9
Demand Response				
-Direct	10	11	13	14
-Purchased	20	23	24	26
Table abstracted from the UMTA Section 15 summary reports for 1987, 1988, 1989, and 1990.				

Demand responsive ("Paratransit") services operate in response to passenger demand, generally picking up passengers at any point within the service area, and dropping them off at any other point (i.e. there are no restrictions on boarding or alighting locations within the service area). Passengers must generally request service in advance to allow vehicles to be scheduled. Demand responsive services are often designed for, and limited to, the elderly and/or disabled. There are two basic varieties of demand responsive services:

a) dedicated services, which involve the operation of vehicles that are exclusively committed to the demand responsive services.

b) market based services, which involve transportation of passengers on services that already exist in the marketplace serving other market segments, and therefore are not exclusive. (For example, a transit authority might contract with a taxicab company to provide service to passengers under certain circumstances, paying part or all of the passengers' fares.)

It is much easier to structure and monitor a contract for fixed route services than for demand responsive services, since the service to be supplied can be defined more clearly. Monitoring is also easier, since the service is confined to specific routes and a specific schedule (Halvorsen, 1992).

Methods of Compensation

There are two basic ways that a contract can be structured with respect to contractor compensation, cost-plus and fixed-price. In cost-plus contracts, which have traditionally been the most commonly used contracting arrangement for government services, the contractor is awarded a set fee to cover overhead and profit and reimbursed for all authorized costs incurred, often regardless of service outcome. These contracts may also be structured so that the contractor is reimbursed for all costs and then paid an additional percentage of costs in place of the fixed fee. Frequently, such contracts include a cost ceiling

limiting the total amount that will be paid to the contractor. In some cases, the contractor is not required to continue to provide service once the cost ceiling has been reached. The key elements of cost-plus contracts are (1) that the contractor cannot suffer a loss from the contract except under exceptional circumstances and (2) that the transit agency can control the cost of the contracted service only through a cost ceiling.

Fixed-price contracts involve the quotation of a certain price for providing a given amount of service over a specific contract length. The contractor's profit is one element of this fixed price. If the contractor can trim costs, the resultant savings represent additional profit; however, if costs rise, the contractor cannot receive additional funds and may suffer a loss. There are two basic types of fixed price contracts: those based on the service supplied and those based on the service consumed.

Contracts based on the service supplied involve fixing a price for a given amount of service or per vehicle hour, vehicle mile, etc. The public agency generally specifies an expected scope of service that permits the bidders to estimate the amount of service required. This type of contract is used in the great majority of demand responsive services and involves little risk for either the public agency or the contractor. The private contractor can safely assume a certain revenue stream based upon a certain service level, while the public agency can readily budget for, and control, contract expense. As a general rule, supply based contracts offer the best degree of cost control for the transit agency.

Contracts based on the service consumed are referred to as "demand-based" and typically involve the quotation of a price per passenger. These contracts are used most frequently in demand responsive services where the user has a choice between several different service providers. Demand-based contracts are riskier for both the transit sponsor and the contractors. Transit agencies need to make special efforts to maintain the overall cost of service within the budget, since a large unexpected increase in customer demand could push a public agency's cost beyond its budget. Contractors find it more difficult to predict the number of system users than, for example, to estimate the number of miles or hours a service might require, such as under a service supplied contract.

A final (and related) aspect of contractor compensation that should be recognized, but is not addressed directly in this paper, is whether the contractor or the agency bears the revenue risk. Research in the UK, where service contracting represents between six percent and 10 percent of the bus industry, compared the overall efficiency of minimum cost and minimum subsidy contracting methods (Tough, 1992). The conclusion was that the cost savings from having the contract based on minimum cost was significant and would generally outweigh any other differences in impact arising from the two contracting methods. The cost savings resulted from companies acting to minimize the financial risk that would be associated with the uncertain revenue in minimum subsidy contracts. Most companies discounted the expected revenue, some assumed that there would be no revenue, and some simply refused to bid on minimum subsidy contracts. Similar practices would be expected under any circumstances where a contractor is required to bear a risk that is not under its control.

Performance Standards

Most service contracts include some performance standards and some means of enforcing these standards. These may be incorporated in both fixed fee and cost-plus contracts for any type of service. Common performance standards are (Cox and Love, 1991):

a) ridership: This may be total ridership or ridership per some unit of service supplied, for example vehicle mile, vehicle hour, or vehicle trip.

b) on-time performance: For fixed route service, a trip is usually defined to be "on-time" if it is not early, and is not late by more than a specified amount (typically 5 minutes), at any designated stop. Many public agencies require that the contractor achieve a predetermined level of on-time performance (usually from 90 to 95 percent).

c) trip completion: This is the percentage, or number, of scheduled trips during a specified time period that were completed, whether or not on time. The required rate of trip completion always exceeds the required rate of on-time performance and generally is set at 98 percent or greater.

d) service quality: This can incorporate a great many elements, some of which cannot be easily measured, such as cleanliness of the vehicles and behavior of the contractor's employees.

e) record keeping and reporting: Virtually all contracts require that adequate records be kept by the contractor and that certain information be reported to the transit agency.

f) safety: Most contracts include safety standards related to both operation and maintenance.

These performance standards are often enforced through the use of incentive and/or penalty provisions. The fundamental principal of these provisions is that the profit motive is the driving force in business. The amount of effort that a contractor allocates to an area is assumed to increase with the presence of provisions that can increase or reduce profits. Incentive and penalty provisions are supposed to ensure that outstanding performance is rewarded with higher revenue (and hence profit) and poor performance by lower revenue.

Three points should be noted about incentive and penalty provisions:

a) The contractor's behavior will also be affected by the costs associated with different levels of performance, and the contractor will generally choose the course of action that will result in the highest expected net profit rather than the highest revenue.

b) A contractor may allocate so much effort to meeting an incentive that it sacrifices performance in other areas which are not subject to an incentive or penalty provision.

c) Most contractors are risk-adverse and may demand higher compensation if they are forced to bear a higher level of risk.

There are three types of incentive and penalty provisions based on direct impact on the contractor:

a) direct increases or reductions in revenue: For a financial incentive (or penalty) to be effective, the amount must be significant to the contractor. However, if an incentive (or penalty) is too high, it can lead the contractor to engage in political lobbying to obtain the incentive or avoid the penalty regardless of performance. High penalties can also result in a contractor going bankrupt. Contractors are also likely to raise their initial bids to compensate for the risk of incurring the penalty.

b) reputational: Contractors are interested a good relationship with the government agency administering the contract, and many contractors have contracts elsewhere or hope to in the future. A good working relationship enables both the agency and the contractor to reduce the resources devoted to dealing with each other and to monitoring the service. It also enables the contractor to use this operation as a reference to retain and win other contracts. If the working relationship is poor, and especially if the government agency has reason to doubt the accuracy of the reports made by the contractor, the government agency

may be able both to make operating the contract difficult for the contractor and to discourage other agencies from dealing with the contractor. This type of incentive and penalty can be included in a contract by (1) providing the administering agency with the power to investigate and conduct detailed audits of the contractor, which may only be used if the agency has reason to believe that the contractor is not filing accurate reports, and (2) authorizing the administering agency to make public reports on the performance of the contractor.

c) length of the contract: This generally occurs in one of two ways. First, many contracts include provisions authorizing the administering agency to terminate the contract under specified conditions. However, terminating a contract is problematic, especially if the administering agency does not have the ability to take over the service or to appoint another contractor on an interim basis. These problems include poor service by the contractor during the period between notice of termination and actual termination leading to a reduction in ridership, poor maintenance of equipment and facilities, legal and political challenges to the validity of the termination, and failure of the contractor to turn over all important information. Because of the ability of the contractor to cause these problems, termination is not as potent a weapon for the administering agency as it might first appear.

The other way the term of the contract can be used in incentive and penalty clauses is by explicitly basing the decision of whether the contract will be renegotiated with the same contractor or rebid.

Penalty clauses are referred to in contracts as liquidated damage clauses. Liquidated damage clauses are defined in US law as an agreement by the parties to a contract as to the harm suffered by one of the parties to the contract when the other party violates specific provisions of the contract. They are considered appropriate only when the harm cannot be measured easily and the amount provided in the clause is a reasonable estimate of the harm. For example, it is very hard to measure the harm suffered by a transit agency if fewer trips are completed than are required by the contract. Penalty clauses, on the other hand, are defined in US law as a contract provision requiring a party to pay an excessive amount if they violate the contract and generally are not enforced by US courts.

Equipment and Facility Provision and Maintenance

Another key element in the structure of a contract is the determination of which party provides and maintains the equipment and facilities required to provide the contracted service. Requiring that a contractor provide and maintain all of the required equipment and facilities will increase the contractor's expenses and restrict the number of firms capable of bidding for the contract. However, the contractor will also have a greater incentive to maintain the equipment and facilities properly. If the transit agency provides all or most of the equipment and facilities, it will enable more firms to bid and increase competition, but it will also reduce the incentive to maintain the equipment and facilities properly unless appropriate clauses are added to the contract and performance is monitored.

Survey on Contract Structure

During late 1991, a questionnaire was mailed to the approximately 500 United States transit agencies that report information to the United States government under Section 15, and 135 of these agencies responded. The questionnaire asked if the agency contracted for any transit service and, if so, for information on the service and the structure of the contract.

The survey was divided into two principal sections. The first section requested general information on the agency including its total budget and the types of transportation services that it offered both directly and through a contractor. The second section requested detailed information on each bus, paratransit, and

commuter rail service that the agency offered through a contractor. This second section was divided into six subsections. The first subsection asked for an identification of the contractor and whether it was a government agency, a private business, or another type of entity such as non-profit corporations or charitable organizations. The second subsection asked about the type of service being contracted and whether the vehicles used were dedicated to this service.

The third subsection asked for financial information about the contracted service including amount paid to the contractor and amount spent by the agency for monitoring and administration. The survey did not ask which entity received service revenue or the amount of this revenue so this was asked during follow-up communications. Also, in many agencies, there was no specific organization or budget for monitoring or administering contracts. These duties were assigned to personnel with other responsibilities, and no allocation was made of either their time or the expenses.

The fourth subsection asked the agency to describe the contract for the contracted service, including how the contractor was compensated and identifying any performance standards and incentive and penalty provisions. Many of the agencies were unable to classify the compensation provisions or the standards and incentive and penalty provisions in the manner set out in the survey. This resulted in calls to the agencies for clarification and review of many of the contracts being used by the agencies.

The final two subsections of the survey requested data for the calculation of a set of performance statistics for each of the services offered by the responding transit agencies. The first of these two subsections asked for information on the amount that the contractor spent on several different areas including vehicle operations, maintenance, and capital expenses and what the agency spent on monitoring the contractor. The last subsection asked for information on ridership, vehicle miles, vehicle hours, the type of vehicle used, and characteristics of the service. Almost all of the transit agencies responding did not collect the requested information on the costs of the contractor and many agencies did not collect some of the requested information on the service provided and consumed. This made it impossible to compare the performance of different contractors.

Survey Responses

In the remainder of this paper, a series of tables summarize the results of the survey. Wherever possible, there is a short analysis of how the results compare with those of a 1985 survey by Teal (Teal, 1987). These two surveys had markedly different objectives. The Teal survey researched the extent and characteristics of transit service contracting, seeking responses from virtually every agency in the US that provided or purchased transit services. This survey, on the other hand, was designed to identify and obtain information from a substantial cross section of transit agencies that contracted for transit service to analyze issues associated with contract structure.

Tables 2 and 3 summarize the responses to this survey and the differences between the respondents to this survey and the earlier Teal survey.

Assuming that the Teal report provides a fairly accurate characterization of the size and number of transit agencies, these two tables show that in the current survey a significantly higher share of responses was received from independent transit authorities than from cities and counties. Furthermore, a significantly higher share of responses was also received from large transportation agencies (with 51 or more vehicles) than from small transportation agencies.

The differences between the respondents to this survey and the Teal survey are the result of two factors. First, the current survey contacted only those agencies that file reports with the federal

Table 2

Type of Transit Provider Responding				
	MIT Survey		Teal	
	Number	Percent	Number	Percent
Independent Authority	60	44	255	31
City	56	41	410	50
County	8	6	111	13
Other	11	8	48	6
Total	135	100	856	100

Table 3

Size of Transit Provider Responding				
	MIT Survey		Teal	
	Number	Percent	Number	Percent
1-50 Vehicles	81	60	717	84
51 or more Vehicles	54	40	139	16
Total	135	100	856	100

Table 4

Contracting by Service Type		
	Number	Percent
Fixed Route Contracting Only	7	5
Paratransit Contracting Only	53	39
Fixed Route and Paratransit Contracting	19	14
Paratransit and Other Contracting	2	1
No Service Contracting	54	40
Total Responses Received	135	100

Table 5

Frequency of Contracting				
	Fixed Route Bus		Paratransit	
	Survey	Teal	Survey	Teal
Direct only	76%	77%	33%	65%
Direct and Contracted	11%	3%	15%	3%
Contracted only	14%	20%	53%	31%

government under Section 15. Agencies that did not receive any funding from the federal government or that received funding only under Section 16b2, a special program for rural transit agencies, were not contacted. Second, a majority of the agencies contacted did not respond to the survey. Since we do not know how well the responding agencies represent the entire universe of transit agencies, it is impossible to state, even probabilisticly, how closely the results from this survey reflect the entire universe of transit agencies. A common method of dealing with this problem is to examine subsections of the population being studied. For this reason, some of the following analyses will state overall results and also results by type and size of transit agency.

The higher representation of large transit agencies and independent transit authorities in the survey would be expected to result in a greater percentage of transit agencies that contracted but only for some of the transit services they provide. Furthermore, since these agencies are specialists in transit, they might have a better understanding of their own objectives and the costs of the service and, therefore, be more likely to use fixed fee contracts with incentive and penalty provisions.

Prevalence of Contracting

Table 4 summarizes the types of services contracted by the transit agencies responding to the survey. Over 90 percent of the respondents that contracted used it to provide paratransit service with most (72 percent) of these agencies not contracting for any other transit service.

Table 5 shows the percentages of transit agencies, which offer either fixed route bus or paratransit, that provide it through contracting and the comparable percentages from the Teal report. Table 5 shows several interesting differences between the results of this survey and the 1985 Teal survey. First, both surveys report an almost identical percentage of fixed route bus service being provided directly by the transit agency. However, the Teal survey reported a far greater percentage of agencies providing such service solely through a contractor and a far lower percentage providing service both directly and through contractors. The current survey also indicated a much higher use of contracting for the provision of paratransit service than in Teal's survey.

To determine whether the observed differences in the use of contracting are due to actual changes in the use of contracting or differences in respondents to the two surveys, Tables 6 and 7 show the percentages of different types and sizes of transit agencies providing all, some, or none of their total transit services through contracting as revealed by each survey. The numbers printed in bold indicate that the differences between the two surveys is significant at the 95 percent confidence level.

These tables show that, for virtually every type and size of agency surveyed, significantly fewer agencies did not use contracting, and significantly more use a mix of contracting and direct operation compared with Teal's survey results. This is not surprising considering the increased use of contracting in the United States shown by Table 1. However, another possible explanation is that, since this survey was primarily about the structure of contracts, there may have been a higher response rate from transit agencies that contracted transit service than from those that do not. Based on the available information it is impossible to tell exactly how much of the difference is accounted for by bias in the response rate and how much reflects a real increase in the use of contracting.

A comparison of the percentages of agencies that contract for at least some of their services provides insight into the increase in contracting. Independent authorities, cities, and other agencies show a significant increase in the percentage of agencies that contract for some service. Only counties show a significant change in the percentage of agencies contracting for all of their transit services. If the change in contracting were due solely to non-response bias, the changes in the percentages of agencies providing

Table 6

Frequency of Contracting by Type of Agency				
	All	Some	None	N
Independent Authority				
Survey	10.0%	48.3%	42.7%	60
Teal	12.9%	20.4%	66.7%	255
City				
Survey	21.4%	39.3%	39.3%	56
Teal	30.5%	5.4%	64.1%	410
County				
Survey	50.0%	25.0%	25.0%	8
Teal	20.7%	12.6%	66.7%	111
Other				
Survey	27.3%	27.3%	45.4%	11
Teal	37.5%	6.3%	56.3%	48

Table 7

Frequency of Contracting by Size of Agency				
	All	Some	None	N
1-50 Vehicles				
Survey	23.5%	27.2%	49.4%	81
Teal	27.1%	6.2%	66.7%	717
51 or more Vehicles				
Survey	11.1%	63.0%	25.9%	54
Teal	9.3%	37.2%	53.5%	139

Table 8

Basis for Selection					
	Total	Fixed Route Bus		Paratransit	
		Comp.	Non-comp.	Comp.	Non-comp.
For-profit Companies	86	19	2	62	3
Non-profit Companies	23	0	1	14	8
Government Agencies	10	1	1	3	5
Total	119	20 (83%)	4 (17%)	79 (83%)	16 (17%)
Teal's Survey	289	63 (53%)	55 (47%)	91 (54%)	79 (46%)

some or all of their service through contracting should be similar. The differences in the percentages of systems providing all and some of their services through contracting are consistent with the growth in contracting of paratransit services shown in Table 1, especially the use of contracted paratransit service by agencies that previously provided all services directly.

Contracting Process

This section summarizes the methods used to select the winning contractor and, when competitive, the total number of bids obtained from potential contractors. A competitive process includes any process in which the transit agency requests bids for providing the service from several potential contractors, regardless of the number of bids actually received.

Table 8 shows the process used to select each contractor classified by the type of winning contractor. Since the table is based on the number of contracts reported by responding agencies, the total is greater than the number of agencies using contractors. Teal's results are included for comparison.

This table shows a marked difference from Teal's statistics on the contractor selection process. Teal found that in only a bare majority of paratransit and fixed route bus service contracts was the contractor selected through a competitive bidding process compared to over 80 percent of each type of service in this survey. These differences are significant at a 95 percent confidence level. Teal also found that for 19 percent of the paratransit services and 24 percent of the fixed route bus services the contractor was selected through a negotiation process, while the remaining contractors had contracts renewed. In the above table all of these are listed as non-competitive, since Teal states that there is a strong implication that the renewals were negotiated and not competitively bid. The table indicates that there has been an increase in the use of competitive contracting. Since competition for the contract is the basis for cost savings associated with service contracting, this would be very positive for improving the overall cost-effectiveness of the agencies utilizing service contracting.

Table 8 also shows that for-profit companies obtained over 80 percent of the competitively bid contracts but only about 25 percent of those that were not competitively bid. The high percentage of competitively bid contracts won by for-profit contractors may indicate that for-profit companies are able or willing to operate at lower costs than other organizations or that they are more desirable as contractors. However, it could also be that government agencies rarely bid on transit service contracts and that they win a large percentage of the ones that they do bid on. To examine this issue properly, it would be necessary to identify all of the unsuccessful bidders for these service contracts and examine the comparative success rates of for-profit companies and government agencies. It would also be necessary to obtain accurate information about why the successful bidder was chosen.

The low number of non-competitive contracts obtained by for-profit companies is not surprising because most states require governmental and quasi-governmental bodies to use competitive bidding except under special circumstances. The objective of this law is to reduce the risk of impropriety in awarding contracts. A common exception to the competitive bidding requirement allows these bodies to contract for services from other governmental bodies. Non-competitive contracts with for-profit companies occurred in the following ways. One agency provides a fixed passenger subsidy and allows any interested entity to carry passengers, however, the passenger selects the carrier. Two agencies combine a bidding process with community review to select a contractor. The remaining agencies merely formalized prior informal relationships with the companies that became the contractors.

Table 9 summarizes the number of bids obtained by agencies using a competitive award process. For perspective on these numbers, a comparison can be made with London and Argentina. London Transport

is currently contracting 38 per cent of its bus network to 28 different entities. It obtains an average of five bids for each route contracted (London Transport Annual Report 1991/1992). Argentina is contracting the entire Buenos Aires commuter rail and subway network in five packages. Bidders are required to be consortia composed of domestic and foreign companies experienced in operating commuter railroads or subways. The consortia are also required to have very large financial resources and must post substantial bonds. Argentina has obtained three or four bids for each segment of the network. The experience of London Transport, Argentina, and some US cities raises a question about why many US cities were able to obtain only one or two bids for contracted service.

Compensation Provisions

Table 10 summarizes the types of compensation provisions used for all contracted transit services based on the type of selection process used (competitive or non-competitive) and the type of contractor (private, non-profit, or government agency).

Previous research has stated that cost-plus contracts are the most common form of service contracts, although transit agencies and contractors may be better off by using fixed fee contracts (Mundle, 1984). Table 10 indicates that fixed fee per unit of service provided contracts are the most common for transit. While this type of contract has been suggested as the best for most transit agencies and contractors, the magnitude of the move toward fixed fee contracts is surprising. One possible reason is that cost-plus contracts may be used more frequently by cities, towns, and independent authorities that contract for all their transit service, a group that other data may be under-represented in this survey. A second reason may be that cost-plus contracts are more common when the parties have little or no information on the requirements for operating a service or its costs, such as when a service is being initiated. As operating experience is accumulated, it may be easier for the parties to estimate future operating costs and, therefore, to negotiate a fixed fee contract.

Eleven of the 17 contracts with for-profit companies with compensation based on a fixed fee per unit of service consumed are with taxi companies. In 10 of these, the taxi companies use their regular vehicles to provide paratransit service in addition to their normal taxi service, making the service a fairly easy expansion of the service they offer.

The table also shows that when contractors are selected through a competitive process, for-profit companies are the contractors for 92 percent of the cost-plus contracts, 83 percent of the fixed fee per unit of service supplied contracts, and only 75 percent of the fixed fee per unit of service consumed contracts. This raises an issue of whether for-profit companies may be less likely to bid on contracts in which the compensation is based on a fixed fee per unit of service consumed, possibly because of the additional risk involved. This is examined in Table 11, which summarizes the number of bids received by type of compensation provision for all transit service contracts.

Table 11 shows a significant reduction in the number of bids received when the compensation is fixed fee per service consumed compared to either cost-plus or fixed fee per service provided. A possible explanation is that contractors avoid the risk associated with these fixed fee per service consumed contracts by not bidding. However, this result could also be explained if the agencies that are proposing this type of contract are less effective at marketing the contract to potential contractors.

Use of Incentive and Penalty

Table 12 summarizes how often incentive and penalty provisions were included in contracts and under how many contracts cash incentives were paid to the contractor or cash penalties were imposed on the

Table 9

Number of Bids for Competitive Award						
	Fixed Route Bus			Paratransit		
	N	Range	Median	N	Range	Median
For-profit Companies	19	1-8	4	62	1-35	3
Non-profit Companies	0	-	-	14	1-5	1
Government Agencies	1	4	4	3	1-3	2

Table 10

Methods of Compensation in Transit Service Contracts		
	Competitive	Non-competitive
For-profit Companies		
Cost-plus[1]	12	2
Fixed per Unit Supplied[2]	54	1
Fixed per Unit Consumed[3]	15	2
Total	81	5
Non-profit companies		
Cost-plus	0	2
Fixed per Unit Supplied	9	4
Fixed per Unit Consumed	4	2
Other[4]	1	1
Total	14	9
Governments		
Cost-plus	1	0
Fixed per Unit Supplied	2	1
Fixed per Unit Consumed	1	3
Other	0	2
Total	4	6

[1] This includes contracts where the contractor only received reimbursement of costs and no additional fee.
[2] This includes all contracts where the compensation is based on the contractor providing an agreed amount of service for a set fee.
[3] This includes all contracts where the compensation is based on the amount of service including per passenger fees.
[4] This includes contracts where the compensation is a percentage of taxes collected in an area or where the agency only provides specific assets such as vehicle and office space and/or services such as maintenance.

contractor. Separate categories are provided based on the type of service provided and the type of contractor. None of the three contracts for fixed route bus service with non-profit organizations or governments included any incentive or penalty provisions.

Table 12 shows several interesting points about the inclusion and use of incentive and penalty clauses. First, both incentives and penalties are more common in fixed route bus contracts with for-profit contractors than they are for paratransit service. This indicates that, when transit agencies are dealing with a fixed route bus operation, they are generally more certain what they want from the contractor and how to measure the contractor's performance. Therefore, they would be more likely to specify specific standards and associated incentives and penalties in a fixed route contract.

Second, penalty clauses are more frequently included in contracts with for-profit companies (39 of 86) then are incentives (18 of 86). This may be because agencies are subject to strict budget constraints for contracted service and also may find it difficult to justify paying extra profit for the contractor for just doing the job properly. Penalty clauses would be easier for an agency to include in a contract since they do not directly increase the agency's budget and can easily be justified as punishment for a contractor doing a bad job. It should be noted that penalties may increase the contractor's risk, causing the contractor to demand higher compensation and therefore indirectly result in an increase in the overall cost of the contract. Interestingly, incentive provisions are as common as penalty provisions in contracts with non-profit companies and governments, although both are less common than in contracts with for-profit companies. Over 44 percent of the contracts with for-profit companies contained penalty provisions, while only about nine percent of the contracts with non-profit companies or governments contained them. This indicates that penalty provisions may be seen as more effective and/or more needed in contracts with for-profit companies.

Third, penalties and incentives are more commonly enforced when the contractor is a for-profit company than when it is a non-profit company or government. In almost 24 percent of the contracts with for-profit companies containing penalty provisions, penalties were assessed, and in almost 53 percent of the contracts containing incentive provisions, incentives were paid. In contrast, neither penalties nor incentives were exercised in any contracts with non-profit companies or governments.

Fourth, in contracts with for-profit companies, incentives were exercised much more commonly than were penalties. Furthermore, in several cases only very small penalties were imposed. For example, under one contract calling for base payments to the contractor of over $3 million, $619 of penalties were assessed. This data does not explain whether this is due to the penalties being triggered only by unlikely events, insufficient data collection to prove that the penalty applied, or political concerns which could make imposition of penalties difficult.

Some of this difference may be because contractors will demand payment of incentives if they are due, while penalties are only paid if the agency collects the data required to prove that the penalty applies and takes the enforcement initiative.

Fifth, the most common types of penalties and incentives are related to service quality and maintenance/safety. This reflects many transit agencies' concerns that contractors may not be as interested in service quality, maintenance, and safety as the agency would like. As discussed previously, contractors may be less interested in service quality than the transit agency unless the contractor has a financial interest in increasing the ridership of the service or the reputation of the contractor is tied to the service quality. Contractors may also be less interested in maintenance if the vehicles are provided by the transit agency. Contractors may be less interested in safety if the agency bears the cost of insurance and the agency's name, not the contractor's, is associated with the service.

Table 11

Number of Bids by Type of Compensation			
	N	Range	Median
Cost-plus	13	1-11	3.5
Fixed fee/Supplied	65	1-17	3
Fixed fee/Consumed	20	1-6	1

Table 12

Use of Incentives and Penalty Provisions by Type of Contractor				
	Incentives		Penalties	
	Number	Exercised[1]	Number	Exercised
Fixed Route Bus: For-profit Companies (21)				
Any	7	5	13	5
Ridership	2	2	0	0
Service Quality	6	3	13	5
Economic Efficiency	1	1	0	0
Maintenance/Safety	5	4	10	5
Reporting	0	0	3	2
Paratransit: For-profit Companies (65)				
Any	11	7	26	6
Ridership	3	2	5	1
Service Quality	5	2	22	4
Economic Efficiency	2	1	6	1
Maintenance/Safety	5	3	14	3
Reporting	3	2	12	3
Paratransit: Non-profit Companies (22)				
Any	2	0	2	0
Ridership	0	0	0	0
Service Quality	1	0	2	0
Economic Efficiency	1	0	0	0
Maintenance/Safety	1	0	1	0
Reporting	0	0	1	0
Paratransit: Government (8)				
Any	1	0	1	0
Ridership	0	0	0	0
Service Quality	1	0	0	0
Economic Efficiency	1	0	0	0
Maintenance/Safety	1	0	0	0
Reporting	0	0	1	0

[1] The term *exercised* means contracts under which the transit agency actually paid incentives to a contractor or required the contractor to pay a penalty.

Table 13

Use and Enforcement of Incentive and Penalty Provisions by Size and Type of Transit Agency				
	Incentives		Penalties	
	Number	Exercised	Number	Exercised
Total Number of Vehicles Controlled by Agency: Fixed Route Bus				
Over 50 Vehicles (11)	4	3	8	4
50 or fewer Vehicles (10)	3	2	5	2
Total Number of Vehicles Controlled by Agency: Paratransit				
Over 50 Vehicles (49)	9	5	20	6
50 or fewer Vehicles (10)	5	2	9	0
Type of Transit Agency: Fixed Route Bus				
City (9)	4	4	5	2
County (1)	1	0	0	0
Independent Authority (9)	3	1	7	3
Other (2)	0	0	1	1
Type of Transit Agency: Paratransit				
City (36)	3	1	11	0
County (7)	1	0	1	0
Independent Authority (47)	9	5	15	5
Other (5)	1	1	1	1

Table 12 raises the question of why penalties and incentives are enforced in some contracts and not in others. To explore this issue, Tables 13 examines whether the frequency of using and enforcing incentives and penalties varies with the characteristics of the transit agency.

Table 13 is limited by the small sample size in some of the categories, however, it does illustrate several points. With regard to paratransit systems, incentives and penalties were included approximately twice as often by large agencies as by small agencies, and penalties were enforced more often by large systems and by independent authorities. This indicates that inclusion and exercising of incentive and penalty clauses may be related to the agency's experience with operating and managing transit and paratransit. No similar pattern is evident with regard to fixed route bus systems, perhaps indicating that knowledge about how a bus system should perform is more widespread than similar knowledge about paratransit systems. Agencies may therefore be more willing to use contractual mechanisms to control contracts with regard to fixed route bus services and may desire more detailed hands on control with regard to paratransit systems.

Table 14 shows that for all contracts, incentives and penalties are included and exercised more frequently when there four or more bids. This is especially true with regard to the exercise of penalties in paratransit contracts, only one of which was exercised when the transit agency received less than four bids. A possible explanation may be that when the agency has a single contractor and had only a few bids for the contract, that it believes that enforcing penalty provisions may damage the relationship with the contractor and may result in the contractor providing poorer service.

Table 15 shows that while the number of entities providing paratransit service has no significant impact

Table 14

Use of Incentive and Penalty Provisions by Number of Bids on Contract				
	Incentives		Penalties	
	Number	Exercised	Number	Exercised
Fixed Route Bus				
Non-competitive (5)	1	1	1	1
One (3)	0	0	3	1
Two (1)	1	0	0	0
Three (4)	0	0	1	1
Four (2)	1	0	2	0
Five (2)	2	1	2	1
Six or more (4)	2	2	4	2
Paratransit				
Non-competitive (7)	0	0	1	0
One (22)	2	0	3	0
Two (19)	1	1	3	1
Three (19)	0	0	5	0
Four (12)	4	1	8	1
Five (7)	3	2	2	1
Six or more (9)	4	3	7	3

Table 15

Enforcement of Incentive and Penalty Provisions in Paratransit Contracts by Number of Paratransit Providers				
	Incentives		Penalties	
	Number	Exercised	Number	Exercised
Two or more (55)	6	5	17	5
One (40)	8	2	12	1

on whether incentive and penalty provisions are included in a contract, both incentives and penalties are more frequently exercised when more than one entity is providing the service. A possible reason for this is that a transit agency with multiple entities providing a service can replace a contractor more easily than if there is only a single contractor and thus is less concerned that enforcing a contract may damage the relationship between the agency and the contractor. Agencies with multiple contractors also need to avoid the appearance of favoring a contractor, which may result in the agency maintaining more of an arm's length relationship with all of its contractors, including strict enforcement of the contract.

Table 16

Use of Either Incentives and Penalties with Compensation Provisions in Paratransit Contracts			
	Fixed Fee per Unit Supplied	Fixed Fee per Unit Consumed	Cost-Plus
Ridership	4 (7.0%)	0 (0.0%)	3 (25.0%)
Service Quality	21 (36.8%)	5 (25.5%)	3 (25.0%)
Economic Effect	7 (12.2%)	1 (5.0%)	1 (8.3%)
Safety/Maintenance	14 (24.6%)	1 (5.0%)	3 (25.0%)
Reporting	11 (19.3%)	3 (15.0%)	2 (16.7%)
Total Contracts	57	20	12

Table 17

Length of Transit Service Contracts[1]						
	Cost-Plus		Fixed/Provided		Fixed/Consumed	
	N	Median	N	Median	N	Median
For-profit Companies	14	3.0	44	3.0	18	1.75
Non-profit Companies	1	1.0	13	1.0	4	2.0
Government Agencies	1	1.0	8	1.0	1	1.0
[1] This table excludes all contracts that do not contain am explicit contract length.						

Table 18

Number of Bids by Entity Providing Vehicles[1]			
	Number	Range	Median
Fixed Route Bus			
Agency	12	1-8	5
Contractor	9	1-6	3
Paratransit			
Agency	25	1-8	4
Contractor[2]	45	1-11	2.5
[1] This table excludes contracts which require both parties to provide some of the vehicles. [2] The numbers given in this line exclude one program involving a user side subsidy program with multiple providers. A total of 35 bids were received which would raise the median number of bids to three.			

Another interesting issue is the frequency with which incentive and penalty provisions are combined with different types of compensation provisions in paratransit contracts.

Table 16 shows, somewhat surprisingly, that there is no significant difference in how often incentives and penalties related to economic efficiency occurred in each type of contract. Because fixed fee contracts are for specific amounts, and cost-plus contracts do not have specific limitations, it would have seemed likely that more cost-plus contracts would include incentives and penalties related to economic efficiency.

Incentives and penalties related to service quality are used more frequently in fixed fee per service supplied contracts than in any other type of contract. As stated earlier, in these contracts the contractor has an incentive to reduce costs, potentially reducing service quality. In cost-plus contracts, there is no incentive to reduce costs. And in fixed fee per unit consumed contracts, there is an incentive to encourage people to use the service, potentially through providing high service quality.

Finally, incentives and penalties related to ridership were never used in fixed fee per unit consumed contracts. This is because the compensation provision provides a direct ridership-based incentive.

Length of Contract

Table 17 summarizes the length of the transit service contracts by type of compensation (cost-plus, fixed fee per service provided, and fixed fee per service consumed) and type of contractor winning the contract. This table excludes contracts that are do not include a specific length but are instead renewed automatically until one of the parties acts to terminate the arrangement.

This table shows that transit service contracts are short term, averaging three years or less with the longest contract reported being for six years. Since the average life span of a car or bus is greater than these contract lengths, contractors required to purchase vehicles with no active resale market may need to amortize the cost over a short life. This would indicate that contracts in which the agency owns the vehicles may have lower overall costs as well as a greater number of bidders.

Ownership of Vehicles

Table 18 shows the median number of bids received for fixed route bus and paratransit contracts when the contractor or the agency provide the vehicles.

This table shows an increase in the number of bids received when contracting for either fixed route bus or paratransit, when the agency provides the vehicles compared with when the contractor is required to provide the vehicles. This is consistent with expectations that requiring contractors to provide vehicles will reduce the number of contractors able or willing to bid on the contract.

Table 19 shows the frequency with which the contractor and the agency own the vehicles used in paratransit service and the use of maintenance based incentives and penalties.

Table 19 shows, as expected, that maintenance incentives and penalties are included most frequently when the agency provides the vehicles. In these cases, incentives and penalties are more important, since a contractor generally has less of an interest in providing good care for the agency's property than it has for its own. Table 19 also shows no statistically significant change in vehicle ownership since Teal's survey with most contracts still requiring the contractor to provide the vehicles.

Both these tables suggest that many agencies should consider providing the vehicles as a method of

Table 19

Ownership of Vehicles in Paratransit			
	Contractor	Both	Agency
Maintenance Incentive/Penalty			
Included	4	0	14
Not Included	57	4	16
Total Vehicle Ownership	61 (64%)	4 (4%)	30 (32%)
Teal's Survey	98 (58%)	8 (5%)	64 (37%)

increasing the number of companies willing and able to bid on the contract. Separating the vehicle ownership and maintenance responsibility from the operating responsibility may be a useful strategy in some cases.

Conclusions

This paper has showed modest growth in the use of transit service contracting by all types of agencies. Many more agencies now use contracting to provide some of their transit service, especially paratransit service.

The survey also showed growth in using competitive selection processes for obtaining contractors. This is important in that the origins of the benefits from transit service contracting is in the competition for the contract award. However, the median number of bids obtained for paratransit contracts is only three compared to a median of four bids for fixed route bus contracts and five bids for London Transport's tendered bus division services. Furthermore, many of the agencies obtained only one or two bids for their contract. The survey indicates that significantly fewer bids, on average, are obtained if the contract places additional risk on the contractor, such as by basing compensation on the amount of service consumed or by requiring the contractor to furnish the vehicles. Agencies may be able to increase the number of bids for their contracts by addressing these two issues, however this is a subject that would benefit from additional research.

Incentive and penalty provisions are included in a significant number of transit service contracts. Penalties are much more frequent than incentives and both are most frequent in contracts for fixed route bus service and in contracts with for-profit companies. However, many incentives and most penalties are not exercised. In at least some cases, this is due to a desire to maintain a close and positive working relationship with the contractor. However, some agencies may also feel constrained not to enforce the contract because of the possibility of the contractor reacting adversely and actually reducing the quality of service or abandoning the service. This is especially possible since the contractor will rarely be significantly injured by the contractual penalties.

Most contracts use small incentives and penalties compared with the size of the contracts. While many agencies assume that any difference in expected profit will motivate a contractor, there is some question whether these incentives and penalties are large enough to affect contractor behavior.

On the other hand, many agencies use the implicit incentive of contract extension or renewal. This incentive is especially important when the parties intend to form a close and long term relationship.

Finally, the survey suggests that the relationship between the agency and the contractor is a very important subject for future research, since the parties' behavior is often governed by an unofficial agreement, not by the formal written contract. Unfortunately, with the paucity of data available on unit costs of contracted services, it was not possible to draw any quantitative conclusions on the cost impacts of different contract structures. This remains an important topic for future research.

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