THE ROLE OF CONTRACT STRUCTURING IN CONTRACTED PUBLIC TRANSPORT PERFORMANCE: THEORY AND PRACTICE

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ABSTRACT

1. This paper presents a short discussion of economic theory regarding contracting, followed by a discussion of current service contracting practice in the United States. The economic theory deals with situations where some piece of important information either is not possessed by both parties or cannot be verified by an impartial third party, such as a court. The discussion presents the theory for resolving situations where one party does not know exactly what the other party is doing and situations where one party enters the contract not knowing something of importance regarding the contract. A short discussion is also provided regarding different methods of collecting information, following which guidelines are drawn from economic theory regarding transit contracting. The second part of the paper discusses general and specific contracting practices in the United States, and compares these with the economic theory. The paper concludes with some comments on the use of the economic theory to improve the design of transit service contracts.

INTRODUCTION

2. For over a decade, there has been increasing disillusionment in the United States with the ability of the publicly owned transit monopolies to provide needed services efficiently and effectively. Many of the strategies being considered to improve the efficiency and effectiveness of transportation involve increasing the private sector's participation in the public transportation system, principally in terms of financing, service delivery and providing supporting functions (Teal, 1987). While each of these strategies may be valuable in specific situations, those involving service delivery (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.

3. 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 current "farebox" recovery ratio is approximately 37% (APTA, 1995) which implies that revenue at current fare levels would still generally fall below costs, even with the most optimistic reduction in operating costs through private sector service provision;
   - the significant fare increases necessary to sustain self-supporting transit would face both public and political opposition;
   - the public, government, and the transit industry all recognize that there are strong social, economic, efficiency and equity arguments supporting some level of subsidization for the great majority of transit services.

4. Consequently, an appropriate focus of attempts to increase the role of the private sector in direct transit service provision is subsidized contracted services. However, there is little inherent about private sector operation which guarantees greater efficiency than public sector operation; rather it is the existence of effective competition which will spur any operator (public or private) to improve performance to preserve its market position and/or increase its profits. The key then for transit agencies is to structure the contracting process, and the contract itself, in a manner that takes advantage of the potential for competition in the private sector and allows the transit agency to capture the benefits of competition.

5. This paper first presents a short discussion of economic theory regarding contracting. This is followed by a discussion of current service contracting practice in the United States, comparing the economic theory with actual practice. This discussion first reviews some of

the findings from a 1992 survey of US transit agencies focusing on their use of contracted services and forms of contracts (Halvorsen and Wilson, 1993), and then presents specific examples of types of contracting behavior.

CONTRACT STRUCTURE

6. Transit service contracts can be utilized for several different types of services and structured in a wide variety or ways. The following are the basic types of provisions that are generally included in a transit service contract: definition of the service to be provided, compensation, performance standards, and provision and maintenance of vehicles. This paper will address how each of these affects the outcome of the contract. Contracts also generally include provisions related to enforcement of the contract, such as the amount of notice that must be given of a breach of contract prior to contract termination or whether the courts or arbitration will be used to resolve disputes. This paper does include some discussion of enforcement provisions, but does not discuss the details of these provisions.

7. **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. 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 can be either dedicated (i.e., use vehicles exclusively committed to this demand responsive service) or market-based (i.e., use non-exclusive vehicles that are already providing service to other markets).

8. **Methods of Compensation:** There are two basic ways that a contract can be structured with respect to how a contractor is paid: cost-plus and fixed-price. Cost-plus has 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 regardless of the service outcome. Frequently such contracts include a cost ceiling limiting the total amount that will be paid to the contractor. In some cases the contract does not require the contractor to continue to provide service once the cost ceiling has been reached. 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. 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 has limited control over the cost of the contracted service.

9. 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 these savings represent additional profit. However, if costs rise, the contractor has no right to receive additional funds and may suffer a loss. Fixed price contracts are generally based either on the amount of service supplied (e.g., vehicle hours or vehicle miles) or the amount of service consumed (e.g., passenger trips). Fixed-price contracts in the United States are generally "gross" contracts -- in which the transit agency pays a fixed amount for the service and receives the service revenue. In both the United Kingdom and New Zealand, fixed-price contracts are more commonly "net" contracts -- in which the contractor retains the service revenue plus a set amount from the transit agency. (Travers Morgan, 1994) Therefore, in "net" contracts the contractor must not only estimate its own cost of providing the service, but also the revenue that it can obtain by providing the service.

10. **Performance Standards:** Most service contracts include 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 relate to:

    - **ridership:** This may be total ridership or ridership per some measure of service supplied, for example vehicle mile, vehicle hour, or vehicle trip.

    - **on-time performance:** A trip is usually defined as "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).

    - **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.

    - **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.

    - **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.

    - **safety:** Most contracts include safety standards related to both operation and maintenance (Cox and Love, 1991).

11. These performance standards are often enforced through the use of incentive and/or penalty provisions. Incentive and penalty provisions can be grouped into three types based on how the potential for profit is intended to be affected:

    - direct increases or reductions in revenue
    - reputational
    - length of the contract

12. What are referred to in this paper, and in the literature, as 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.

13. **Equipment and Facility Provision and Maintenance:** Another key element in the structure of a contract is the determination of whether the agency or the contractor maintains the vehicles, other equipment and facilities required to provide the contracted service. This affects the capital that a contractor must expend to enter into a contract, and who bears the risk of damage or wear to equipment and facilities in the absence of specific enforceable contract provisions.

CONTRACT ECONOMICS

14. Contract economics is a relatively new field of economics that deals with situations of *asymmetric information*. These are situations in which (1) at least one party to a transaction possesses, at some time, important information that another party does not possess or (2) important information cannot be verified by an impartial third party, such as a court. In either of these situations, in order for the agreement between the parties to be enforceable, it must be limited to those matters that will be known to both parties and can be verified by an impartial third party. Contract economics examines two closely related aspects of these situations. First, how can the party which lacks, or will lack, important information (referred to as the principal) (a) create a mechanism, in the form of a contract, and (b) behave, such that a party with the traits desired by the principal (referred to as the agent) (i) wants to enter into the contract, and (ii) then wants to behave in the manner desired by the principal. Second, what are the effects on other parties of the actions of the principal and agent. An important point is that all parties are assumed to act to maximize their own interests, regardless of the effect on other parties.

15. Contract economics makes two principal assumptions about the nature of the environment in which the parties enter into a contract. The first assumption is that there is a single principal who drafts and offers the contract and a number of parties competing to be awarded the contract. This assumption means that the negotiating power of the parties competing to win the contract is minimized, allowing the principal a free hand in designing the contract and insuring that the agent will settle for a contract that results in the agent obtaining his or her minimum acceptable level of utility*, which is referred to as a reservation level of utility. Therefore, in order for contract economics to be useful in finding an optimal contract in a real world situation, the principal offering the contract must insure that a substantial number of potential agents will be interested in competing for the contract.

16. The second major assumption of contract economics is that the party offering the contract must understand the potential contractors' objectives as well as their cost and utility functions. Otherwise, a contractor may find an unanticipated way to comply with a contract that results in reduced benefits to the principal. As will be discussed later, it will rarely (if ever) be true in the real world that either party fully understands any other party's objectives and cost and utility functions. Generally however, each party will be able to make reasonably good assumptions as to the factors that are likely to affect the other parties' behavior.

17. There are two principal categories of situations of asymmetric information, referred to as *moral hazard* and *adverse selection*. These are discussed in the following sections.

MORAL HAZARD

18. Moral hazard refers to the problem in which both parties start out with equal information, but one person does not later get full information about either the relevant actions of the other person (referred to as the hidden action problem) or the circumstances surrounding these actions (referred to as the hidden information problem). The contractor or employee supplying unobservable effort is the prototypical hidden action case, while the expert manager making observable decisions, but for unobservable reasons, is an example of a hidden information case.

19. The basic contract design problem for a principal faced with a moral hazard issue has been formulated as designing a contract that causes the agent to take the action which maximizes the principal's expected utility. Such a contract must provide the agent with an expected net positive utility from accepting the contract and taking the action desired by the principal that is (1) at least equal to his or her reservation level of utility, and (2) greater than or equal to his expected net level of utility from accepting the contract and choosing any other action.

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* Utility, in economics, is a generalized measure of the degree to which a person, company, or government, achieves its objectives. For companies, utility is generally considered to be directly related to the profit the company generates.

20. In theory, this contract design problem can be solved through a two step process. The first step consists of finding the lowest cost contract that will cause the agent to take each specific action. The second step consists of selecting the contract, and resulting action by the agent, that will result in the highest utility to the principal.

21. This method works in a few simple cases. One of these is if the agent is not averse to risk, which means that the agent receives the same utility from receiving a lottery of potential payments as from receiving the expected value of the lottery. In this case, the principal can design the contract that is equivalent to selling the venture to the agent, who as the new sole proprietor now chooses the optimal action in his own best interest. If an agent is averse to risk, he or she would prefer to be paid a guaranteed wage and will demand to be compensated for bearing any uncertainty with respect to the outcome. However, the guaranteed wage provides no incentive for the agent to perform as desired by the principal. Therefore the principal is forced to balance his cost of not giving the agent a strong enough incentive to do what he wants, and the additional compensation that the agent will demand for facing risk.

22. A second simple case is if there is a set of outcomes, one of which may occur whenever the agent chooses any action other than that desired by the principal, but that will never occur if the agent chooses the action desired by the principal. In theory, the principal can assign an extreme penalty to these outcomes, such as shooting the agent, so that the agent will never choose any action that might result in the penalty being incurred. This is agreeable to the agent since he knows that he will never be subject to this penalty as long as he performs the action desired by the principal.

23. More generally, the difficulty of the problem is directly related to the number of the agent's possible actions, the number of possible outcomes, and the degree to which different actions give different potential results. When there is a very limited choice of actions, an optimal contract can normally be computed using this process. However, when there are many options, this process can lead to a monstrously complex contract, full of incentives and penalties for numerous specific outcomes.

24. In the real world incentive schemes do show variety, but not to the degree predicted by the basic theory of contract economics. (Hart, 1987) Linear or piece-wise linear schemes, such as piece-work contracts and stock options, are used frequently and across a large range of environments. The prevalence of these relatively simple incentive schemes can partly be explained by the costs of writing and enforcing intricate contracts. However, a more fundamental reason is that incentive schemes need to perform well across a wide range of circumstances. The more options the agent has, the more poorly an intricate incentive scheme will perform (Hart, 1987).

ADVERSE SELECTION

25. Adverse selection refers to the situation in which one of the parties starts with information unknown to the second party but which relates to the benefits or risks that entering into a contract will have to the parties. For example, a company entering into a contract generally has knowledge about its abilities that is unknown to the other party to the contract, but which affects the expected value of the contract to both parties.

26. The basic idea for resolving this problem is for the principal to offer either: (i) a single contract to a group of competitors that is designed so that only people of the type that the principal is interested in will expect that they can make a sufficient profit, and therefore these people will be the only ones to bid for the contract, or (ii) a menu of contracts designed so that people will disclose the needed information about themselves when they select the contract in which they are interested. The principal's problem then is to find a set of contracts, each consisting of a set of payments to any agent accepting the contract for every possible outcome, which will result in every potential agent taking the action that maximizes the principal's expected utility. If there are more potential agents than the principal desires to employ, the principal will want the excess agents to choose not to accept any contract offered by the principal. Again, the contracts must be designed so that (1) each agent the principal desires to hire must prefer entering into the contract designed by the principal for his type over entering into a contract with some other principal; and (2) each agent's expected net level of utility from entering into the contract designed for his type must be higher than the agent's expected net level of utility from choosing any of other contracts offered by this principal.

27. If the principal is only seeking one agent the problem is simplified because the principal offers only one contract for one agent. The contract must then be designed such that the desired type of agent is willing to enter into the contract, but no other type of agent is willing to enter into the contract.

28. If a principal is seeking more than one agent, the problem becomes much more difficult. For example, assume an agency wants to contract with the two lowest cost paratransit providers. It could invite all potential producers to submit a bid with their hourly cost of operation, which for the winners would be their amount of compensation. Faced with this situation, the lowest cost provider generally will have no incentive to show the principal that it can produce for any lower cost than slightly cheaper than the third lowest cost provider, provided it knows or it can estimate this cost. By bidding at that cost, the lowest cost provider will still obtain one of the contracts and the difference between its bid and actual costs will be additional profit for it. In order to get this provider to state its cost of operation accurately, the principal will need to offer it a different contract which provides it with greater net benefit than it receives by imitating a less efficient provider.

29. The primary real world difficulty with using the above method to solve situations of adverse selection is similar to the difficulty discussed above for the moral hazard problem. There are many potential agents, each with a large array of potential behaviors. The principal can only estimate the characteristics that he desires and attempt to make a contract that is an approximate solution to the problem. It is also important to remember that if a contract is drafted to appeal to only a narrow range of potential contractors, that the agency can destroy the primary source of benefit from the contracting process, the competition between bidders to obtain the contract.

30. Again, as in moral hazard situations, it is vital for a principal not only to design an optimal contract but also to ensure that the potential agents learn about the contract accurately and believe that the principal is committed to entering into the contract as written. If the contract is not accurately communicated to the potential agents, they will not respond in the desired manner. If the agents do not believe that the principal is committed to entering into the contract as written, the potential agents will generally not act in the same manner that they would if they believed the principal was committed to entering into the contract. If they did act in the same manner, this would provide the principal with a cheap method of obtaining information about the type, or abilities, of the potential agents. Instead, most agents can be expected to try to act to convince the principal that he needs to pay higher compensation to agents. For example, an agent could overestimate its costs, expecting that all other agents will do the same, and hoping that the principal will agree to pay compensation based on the inaccurate higher costs.

31. It is also important in dealing with adverse selection situations for the principal to insure that potential agents are bound by their responses. For example, principals need to insure that potential agents do not under-estimate their costs, or over estimate their abilities, when seeking a contract, with the expectation that the contract will be renegotiated to provide for additional compensation to the agent.

THE ECONOMICS OF OBTAINING INFORMATION

32. In general, there is a cost associated with a principal providing virtually any information to a potential contractor or obtaining virtually any information about either a potential contractor or the performance of a contractor. This cost can vary considerably with the type of information and the required level of detail and accuracy. When there is a cost to obtaining the information, the issue is whether the value of the information is greater than its cost. In contract economics, information is considered to be valuable if both the principal and the agent can be made strictly better off with a contract that uses the information than with a contract that does not use the information, ignoring in this calculation the cost of acquiring the information (Holmstrom, 1979).

33. The easiest information to disburse and obtain is often referred to as "cheap talk". This type of information includes public announcements by a principal about a contract that it intends to offer and actions by potential agents to publicize their reputations. This information is not

directly targeted to any particular person and is generally spread through the news media or by casual conversations by people in a particular industry so that the cost of obtaining it is virtually zero. Its actual value is difficult to measure, especially because its accuracy is unknown, but its low cost can make it quite cost effective, especially in resolving issues of adverse selection.

34. Reputation is an example of "cheap talk", since the cost of learning a person's reputation is generally low. Reputation is often valuable information since it is a signal of the agent's ability and past effort. Obtaining a good reputation generally has a cost to an agent in the form of high effort, but it generally will also give the agent the ability to demand a greater payment because the expected value of the agent is higher than that of an agent with a worse reputation.

35. One of the methods of obtaining information that is advocated by many researchers is the use of contests (Holmstrom, 1982). Contests are defined as any compensation scheme in which a principal that uses several agents bases their compensation on their relative performance. The compensation can be based on an ordinal or cardinal ranking of the agents. Examples of contests include situations where a company (1) awards a prize to the salesman with the highest sales, (2) allocates a bonus pool among its salesmen based on the percentage of total sales that each generated, and (3) penalizes the salesman with the lowest sales by not giving him a raise for the next year. Contests can be valuable if the performance of all agents is affected by some common outside factors. For example, if all salesmen for a company are affected in a similar manner by general economic conditions and the existence of competing products. The stronger the correlation is between how the factors affect different agents, the more the agent's compensation will be based solely on their relative ability and effort, thereby also reducing the risks facing by each agent. Contests can increase the incentives for agents, especially to encourage them to abandon their natural risk aversion and adopt "riskier", but more profitable courses of action, since they are rewarded for outperforming other agents (Nalebuff, 1983).

36. There are two principal problems associated with the use of contests. First, in every contest one (or more) of the agents are penalized, either because they were unlucky or because another agent worked harder. There is a risk that these agents could become demoralized and reduce their efforts, thus continuing to lose. This can create a social problem, the creation of a group of people, generally the least able, who no longer put effort into their work, and can also destroy much of the effectiveness of the contest because all agents know in advance that some agents will expend only a low level of effort. Second, in many cases it is difficult to prevent "collusion" between the agents, where "collusion" is defined as any cooperative effort by a group of agents to circumvent the principal's intent in creating the contest. Examples of collusion include all agents agreeing to expend only a low level of effort in their work or agreeing that only one person will work hard during each period. If the agents are able to "collude" this also destroys much, if not all, of the effectiveness of the contest.

37. Related to contests is the idea of "yardstick competition". In a yardstick competition the compensation of an agent is based on how the agent's performance compares with that of

another agent, who may or may not have the same principal. There is also no necessity for the second agent to be compensated according to the same scheme. Like all contests, this is useful only if the performance of each agent is a function of that agent's ability and effort and of external factors, and there exists some correlation between how the external factors affect the two agents. The stronger the correlation is between how the factors affect the two agents, the more the agent's compensation will be based solely on their individual ability and effort. This idea is reflected in the common use of dual sourcing, despite the possible loss of economies of scale. Note however, that yardstick competition is also vulnerable to "collusion" by the agents.

APPLYING CONTRACT ECONOMICS TO REAL WORLD SITUATIONS

38. There are many limitations to applying contract economics in real world situations. One of the most important is in situations in which the principal has more than one task or objective for the agent. The reason for this is that incentive contracts affect not only the total amount and quality of effort made by an agent, but also the allocation of that effort among these various tasks. If the agent's performance on one or more of the tasks cannot be measured, the value of the agent's total performance can be reduced by providing an incentive for some of the agent's tasks.

39. One example of this problem that has been in the news recently is incentive contracts for teachers. Teachers are generally assumed to be teaching both basic skills, which can be assessed through standardized tests, and a range of skills related to creative thinking and communication, which are not tested by standardized tests. The problem is that providing teachers with a contract rewarding them based on their students' performance on standardized tests would motivate them to teach basic skills better, and would cause them to reallocate effort to teaching basic skills and away from teaching other skills. Depending on how the teachers' employer values the two skills, this could result in either a reduction or an increase in the employer's utility.

40. A related basic problem is that most principals have difficulty in defining their own utility function, especially the tradeoffs between costs and benefits, and therefore in defining exactly what it wants the contractor to do. This is certainly true in the transit field where it is difficult to evaluate tradeoffs between different measures of service quality.

41. Another important limitation is that the parties both need to have the same information about the objectives of at least the agent and preferably both parties and the costs of the possible actions by the agent. If the parties do not have the same information, incentives that are thought to have one effect by the principal may have a different effect on the agent. It is crucial for the principal to understand the costs to the agent of his potential actions, since an incentive provision will encourage the agent to engage in the minimum cost action that will fulfill the incentive provision.

42. It is vital to remember that incentive and penalty schemes can be effective only if the agent understands how his choice of actions will affect his expected net benefit. If an incentive scheme is based on a factor that is totally out of the agent's control, it can not be expected to affect the agent's performance. For example, if a contract for the provision of a commuter rail service includes an incentive provision based on the cleanliness of the stations, which are cleaned by the transit agency, there will probably be no change in the contractor's behavior although the contractor may demand higher payments to compensate for the risk of being assessed this penalty. On the other hand, special care needs to be taken if an incentive scheme is based on a factor that a contractor can affect through more than one type of action. For example, an incentive provision based on the number of complaints about service quality reported to the transit agency could encourage a contractor to improve service, but could also encourage the contractor to make it more difficult for passengers to make complaints about service quality.

43. Finally, contract economics often relies on (1) intricate mechanisms requiring the parties to be able to calculate expected utility under every possible future state of the world and distinguish minute changes in expected utility, and (2) use of extreme sanctions under some conditions. In practice, parties are not able to calculate their expected utility precisely but instead rely on estimates. Furthermore, truly extreme sanctions, such as death or slavery, cannot be included in contracts and even monetary penalties are limited by the initial wealth of the parties and bankruptcy laws.

APPLICATION OF CONTRACT ECONOMICS TO TRANSIT SERVICE CONTRACTING

44. The traditional model for designing an incentive contract, as discussed in the transportation literature, is a method for affecting the agent's behavior by rewarding, or punishing, the agent based on whether specific service standards are met. Designing the contract is a sequential process in which the first step is to identify desirable performance by the contractor, often in terms of unobservable quantities, then to find indicators to provide information about this performance, and finally to devise a set of payments based on the performance as shown by these indicators. The principal difference between this and the contract economics approach is that contract economics explicitly considers the net benefit to the principal, the net benefit to the contractor, and the verifiability of the outcome. Utilizing the theory of contract economics provides an opportunity to increase the principal's net benefit and reduce substantially the problems of monitoring the contractor's performance and of enforcing the contract provisions.

45. At present, contract economics can not be used to design an optimal contract in transit service contracting for three principal reasons. First, transit agencies will typically have multiple objectives, which are often not clearly articulated, for contracting. These multiple objectives will generally include minimizing the cost, or deficit, of the service and insuring good service

quality. Because many aspects of service quality cannot easily be measured and the transit agency rarely has any explicit means of weighing the value of meeting each objective, it is impossible to formulate the transit agency's utility function. Without a utility function for the transit agency, it is impossible to use the method described above to compute an optimal contract.

46. Second, contractors almost always will have a very rich set of alternative actions to choose from in operating under a contract. Modeling this range of options and attempting to compute the optimum actions by the contractor, much less the optimum set of payments to cause the contractor to take these actions, would be a computational nightmare.

47. Third, contractors will generally have multiple objectives, so that calculating their utility functions will be difficult or impossible, and will rarely be willing to disclose either their precise objectives or their precise costs since possession of this information by a competitor would result in a competitive disadvantage.

48. However, insight into the design of the contracting process, the contract, and specifically the incentive and penalty provisions, can be drawn from this field of study. The following paragraphs discuss a number of these insights.

49. **Maximize Competition:** If a transit agency does not obtain the participation of a substantial number of potential contractors, the transit agency loses much of its power to determine the terms of the contract and, therefore, to maximize its utility.

50. **Understand the Potential Contractors:** Aside from considerations of reputation, contractors will generally provide service of a lower quality at a higher cost than they would if the agency had perfect information about the contractor's utility and costs (Laffont and Tirole, 1986). The better the transit agency understands these, the better it can draft a contract that will result in the contractor behaving as desired. The transit agency should also pay special attention to non-cash objectives of the potential contractors, especially objectives related to its reputation, in order to improve the contractor's performance and reduce the agency's costs.

51. **Risk Premiums:** If a contractor is at all averse to risk, it will demand higher compensation if it is forced to bear any of the risk, the higher the risk, the higher the compensation demanded. The optimal contract will then involve the agency bearing more of the risk, by reimbursing more of the contractor's costs, as the contractor becomes more risk averse and/or the contract becomes more risky (Laffont and Tirole, 1986).

52. **Technology Choices:** Fourth, if a contractor must make an unobservable, or uncontractible, technological choice between reducing fixed costs or variable costs the contractor will be biased toward lower fixed costs and higher variable costs, especially if the agency reimburses some or all of the contractor's variable costs (Laffont and Tirole, 1986).

53. **Overallocation of Resources:** If a contract is to include any incentive or penalty provisions, careful attention must be paid to insuring that the contractor does not overallocate its resources to those tasks to which the incentive or penalty provisions apply. For example, in any sort of flat fee contract where the transit agency provides the vehicles, care must be taken to insure that the contractor does not save money by cutting preventive maintenance, which would result in a long-term cost to the transit agency outside the contract (Holmstrom and Milgrom, 1991).

54. If these insights are correct, and assuming that the overwhelming objective of a private contractor is maximizing its long-term financial well-being, specific contract provisions of the types discussed above would be expected to have the following types of effects.

55. **Compensation provisions:** Cost-plus contracts provide no direct financial incentive for controlling costs.* Increased costs could arise from efforts to improve service, efforts to maximize employee satisfaction, efforts to minimize the probability of accidents or waste. The first three of these causes can often result in political support from riders, politicians and/or labor for the contractor to continue to provide service under the contract, increasing the chance for the contractor to continue to profit from the service in the future. Therefore, a contractor operating under a cost-plus contract might be expected to pay higher wages or provide additional benefits to its employees, offer expanded or higher quality service and/or perform more maintenance than would be the case if the contractor was operating under a different type of contract. Note that a cost-plus contract in which the contractor's profit is a percentage of the costs paid under the contract would provide an additional incentive for the contractor to increase the costs of the service. The contractor's costs are generally fairly easy to verify so the monitoring and administration costs of the contract would typically be low. Note that an indirect financial incentive to control costs is provided since the contractor generally must be the low bidder (having the lowest estimated total costs) and exceeding the estimate will generally adversely affect the contractor's ability to obtain contracts from this, or possibly other, transit agencies in the future.

56. Fixed price contracts provide a clear and direct incentive for the contractor to minimize costs, since any amount not paid as costs becomes part of the contractor's profits. However, only by having multiple companies bidding, and awarding the contract to the low bidder, can the transit agency obtain the benefits of the reduced costs. If the compensation is based only on the amount of service provided, it provides no direct incentive for the contractor to provide a high quality service, since high quality service generally costs more and would therefore reduce the contractor's profit. However, if the compensation is based on the amount of service consumed, the contractor has an incentive to provide high quality service in order to maximize ridership

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* If the transit agency only reimburses the exact amount of costs set forth in the contractor's bid, regardless of actual costs, and the contract cannot be amended easily to reimburse higher actual costs, the contract should be treated as a fixed fee contract rather than a cost-plus contract.

and therefore income. The amount of service provided by a contractor is often easy to verify, especially if the contractor provides a shuttle or loop service. The amount of service consumed is generally much more difficult to verify since it requires measurement of the number of passengers and/or passenger-miles. With any type of fixed fee contract the contractor may demand higher payments as compensation for bearing additional risk.

57. Net cost contracts add greatly to a contractor's risk, since it must estimate something outside its control -- the ridership and revenue on the service being bid. Furthermore, the transit agency, not the contractor, is generally responsible for marketing the service, including distribution or schedules and maps, and/or maintenance of associated facilities, such as bus shelters and transfer stations. This further raises the contractor's risk, since these have a significant effect on ridership. Contractors can therefore be expected to demand a risk premium on net cost contracts. The size of this premium will depend on the amount of information that exists regarding current ridership on the service and the arrangements regarding marketing and maintenance of associated facilities. Net contracts may or may not result in contractors providing better service to increase ridership. This will depend on the cost of improving service, the contractor's opinion regarding how likely it is that better service will lead to higher ridership, and the length of the contract (i.e., the time during which the contractor will reap the benefits of the higher ridership). However, long-term net cost contracts also increase the risk to the contractor because it is necessary to project ridership farther into the future.

58. **Performance standards, incentives and penalties:** Since these are generally provisions designed to guide specific facets of the contractor's behavior, they always create a risk that they will cause a contractor to apply too little effort to other aspects of its contractual responsibilities. Depending on the magnitude of the incentive or penalty and the elasticity of ridership, ridership standards may encourage contractors to provide higher quality service and to improve marketing of the service, increasing total costs, provided that the contract is long enough that the contractor will anticipate receiving additional revenue as a result of the additional riders. However, since many of the factors governing ridership are not solely under the control of the contractor, generally including fares, schedules, and regional economic conditions, the contractor can be expected to demand a higher price if it may be penalized for reductions in ridership, in order to compensate it for the additional risk.

59. On-time performance, trip completion, cleanliness and other service quality standards will generally have the same effect as ridership standards and tend to increase both service quality and cost. In addition, use of any of these service quality standards will tend to concentrate the contractor's attention on the specific aspects of service quality that are incorporated in these standards, and away from difficult to measure aspects such as operator behavior, which may be of equal (or greater) importance. In addition, use of service quality standards can lead to substantial difficulties in measuring and verifying compliance. However, service quality standards are the principal method that an agency has to influence the contractor's current

behavior and insure satisfactory service quality. Other methods, such as threatening to terminate the relationship or attempting to affect the contractor's reputation, tend to come into play primarily when there are already major problems with the contractor's performance.

60. Maintenance incentives, penalties and standards have very different levels of importance depending on which entity provides the vehicles, as discussed below. In either case, maintenance standards can be used to help insure satisfactory service quality and safety by requiring that all equipment works and by reducing the risk of breakdowns and accidents. If these standards require specific actions by the contractor, such as preventive maintenance every 3,000 miles, they will add to the contractor's cost but will not increase its risk.

61. Safety incentives, penalties and standards, based, for example, on the numbers of roadcalls or accidents, may help improve service quality by insuring that the contractor pays sufficient attention to safety. Like maintenance standards, these will generally be more important if the vehicles are owned by the agency. These standards can also be very important if the agency insures the contractor against some or all of the costs associated with accidents, such as lawsuits by injured passengers.

62. Record keeping and reporting standards will generally have two principal effects. First, they focus contractor attention on providing the transit agency with the desired information. Second, they provide the contractor with guidelines as to the areas in which the transit agency is interested and will focus the contractor's attention on avoiding problems in those areas. For example, if the contractor is required to make regular reports on on-time performance, even if there is no explicit standard for on-time performance, the contractor will want the reports never to show a substantial reduction in performance. Of course, if the transit agency relies solely on the contractor for information about the contractor's performance, the contractor will have an incentive to provide information showing that it is doing a better job than it actually is doing. Therefore, the transit agency will need to establish a credible system for monitoring the accuracy of the contractor's reports, to provide the contractor with an incentive to report accurately. In order to minimize the cost of the monitoring program and ensure accurate reporting, the agency should only require the contractor to provide reports that are important to the agency, provide the contractor with enough time to prepare accurate reports and impose significant penalties for inaccurate reports.

63. **Providing and maintaining equipment and facilities:** If the contractor has the responsibility for providing and maintaining all of the equipment and facilities, and these assets are either usable for other purposes or will, if properly maintained, have a significant value at the termination of the contract, the contractor will have an incentive to maintain these assets in the most cost effective manner possible. However, since most of these assets are extremely expensive, forcing the contractor to purchase them at the beginning of the contract is likely to reduce the number of entities that are interested in, and able to enter into, the contract, potentially reducing the benefit from using private contractors. Furthermore, if some (or all) of

the assets have little (or no) value outside the contract, such as specialized vehicles for a paratransit service, the contractor may not be willing to enter into a contract unless it is compensated for the risk of having worthless equipment left on its hands at the termination of the contract. The longer the term of the contract, the more the equipment will depreciate over the term of the contract and the lower the risk to the contractor.

64. If the transit agency provides the equipment and facilities for use by the contractor, the contractor will often have an incentive to reduce its expenses by minimizing maintenance of this equipment and the facilities. This would be especially true with a fixed fee contract, less so with a cost-plus contract.

65. If the parties enter into a long term contract, the agency leases the vehicles to the contractor, and the contractor is responsible for replacing equipment that is damaged due to inadequate maintenance or accidents, the contractor will tend to provide an adequate level of maintenance, at least during the early years of the contract when it would anticipate facing the consequences of inadequate maintenance.

66. **Term of contract:** Both transit agencies and contractors receive a benefit from long term contracts because it minimizes the cost to them of re-contesting the contracts. Long term contracts also increase the risk to both parties because of the increased possibilities of something unanticipated happening that substantially affects the costs and benefits of the contract to the parties. Long term contracts also give the transit agency the ability to base the contractor's compensation partially on its average performance. This can benefit both parties since if matters beyond the contractor's control that affect how its performance is perceived by the transit agency are not perfectly correlated from year to year, these factors will have less impact on the average than in any single year.

SUMMARY OF EFFECTS OF CONTRACT STRUCTURE ON TRANSIT SERVICE CONTRACTS

67. Based on the foregoing, it is possible to draw some conclusions about how different contract provisions would interact, how they would be expected to affect the behavior of transit service contractors, and how they should ideally be used in a transit service contract.

68. Incentive and penalty provisions, other than those related to economic efficiency, will generally cause a greater increase in effort in a cost-plus contract than if the same provisions were included in a fixed fee contract. This is because the costs of complying with the provisions are passed on to the transit agency so that the incentive or penalty is reflected directly in the profitability of the contract. Therefore, for incentives and penalties to have the same effect on the contractor, the incentives and penalties need to be larger in a fixed fee contract than in a cost-plus contract.

69. Similarly, there may be a greater need for service quality and maintenance related incentive and penalty provisions in gross fixed fee contracts because this provides an implicit incentive to reduce costs by reducing service quality and maintenance. A net fixed fee contract generally has less need for these incentives and penalties, however they may be needed in a specific contract if ridership will not respond quickly to changes in the quality of service.

70. All incentive and penalty provisions provide a risk of directing an excessive amount of the contractor's resources to areas that are subject to the provision and away from other important areas, reducing the net benefit of the contract to the transit agency. The more specific, and the greater the size of, the incentive or penalty provisions, the greater the risk of such redirection. Short term contracts may also increase the risk of such redirection, especially redirection from areas such as preventive maintenance, since the contractor is less likely to suffer adversely from the redirection. Use of incentives and penalties related to ridership will tend to reduce the risk of such redirection by encouraging a contractor to provide safe, good quality service, provided that the contract has a long enough duration that the contractor would expect to feel the effects of its actions on ridership.

71. Sharing the revenue from the service with the contractor through a net contract or partial net contract is one method of providing a ridership-based incentive/penalty. This type of provision can have several benefits. First, it will encourage the contractor to be diligent about collecting all revenue. Second, it may also cause the contractor to balance short term cost reductions that could result from lowering maintenance or service quality against the potential for a reduction in revenue during the remainder of the contract term. This second benefit will only be significant if the term of the contract is long enough that the contractor, and not just the transit agency, will expect to receive a benefit from the increased revenue. In addition, if the contractor receives only a portion of the passenger revenues, its internal valuation of this future revenue will be lower. Therefore, incentives and penalties related to ridership will generally provide the greatest benefit in contracts where the parties anticipate a long term relationship. In shorter contracts, the agency will generally need to place greater reliance on specific service quality incentives, penalties and standards. In addition, as shown in Tough's (1992) research, requiring contractors to obtain some of their revenue from the revenue of the service increases the contractor's risk and may lead to increases in the cost of the service and a reduction in the number of companies bidding for the service. Note that this is contrary to the results reported in the Travers Morgan (1994) study which stated that an analysis of Wellington Regional Council tender prices found that "in the absence of patronage information provided in the RFT's, almost all tenderers overestimated revenues." If a transit agency guarantees a minimum revenue to the contractor from ridership, the risk to the contractors can be substantially reduced. However, this will also reduce effectiveness of this incentive with regard to service quality.

72. Useful information about the performance of a contractor can be obtained from comparing its performance with other contractors, whether or not they are employed by the same transit

agency, as long as there is some correlation between the factors affecting the contractors. Useful information can also be obtained by comparing the performance over time of a single contractor.

73. The origin of the benefits of contracting is the competition between potential contractors seeking the contract. Only by insuring that there will be substantial competition for its contract can an agency obtain these benefits.

74. Transit agencies have several different types of incentives and penalties available for use in a contracting situation. Transit agencies need both to be clear about their own objectives and to obtain good information on the objectives of the transit contractor in order to select and structure incentives and penalties most effectively. Holding meetings with potential contractors prior to requesting bids offers an opportunity for transit agencies to obtain some of this information.

75. All actions by a contractor involve some sort of cost, whether financial, such as material costs, labor costs and/or capital costs, or involving additional management effort. If a contract contains no incentives or penalties, either explicit or implicit, a contractor will take the course of action that will result in the lowest net cost, or highest net gain, to it. Especially with a fixed price contract this can result in the contractor providing a level of service that just barely makes it not worthwhile for the agency to terminate the contract and sue the contractor. With a cost-plus contract this can result in a contractor not exerting effort to control costs, since all of the costs are paid by the transit agency.

76. Termination of a contract always involves a cost to the transit agency. The significance of this cost depends on the amount of effort, money and other assets that the agency has invested in the relationship with the contractor, the cost of obtaining a substitute contractor, and the potential losses during the time between notice of cancellation of the contract and complete replacement of the contractor. Because of these costs, transit agencies should attempt to use a contract that will cause a contractor to operate as desired by the agency and not rely on a threat of terminating the contract to coerce the contractor into operating as desired.

77. There are two major ways that a transit agency can reduce the losses that may result from a contractor's actions between notice of cancellation of the contract and complete replacement of the contractor. One way is by contracting with more than one entity to provide the service, or portions of the service. This allows the transit agency to replace an unsatisfactory contractor much more rapidly. The second way is by including substantial incentive and penalty provisions in the contract which would continue to apply, and therefore probably affect the contractor's behavior, during the period between cancellation and replacement.

78. The more risk involved in a contract, the larger the premium that a contractor will demand. If the risk is related to the costs of operating the service, this risk can often be reduced by the

agency providing more information about the service to be contracted and the cost of any similar services in the region. For this reason agencies should generally hold conferences to allow potential bidders the opportunity to ask for additional information prior to requesting bids for the service.

79. An agency can also structure a contract to reduce the risk faced by the contractor, such as by lowering the contractor's fixed costs or by agreeing to reimburse all or a portion of the contractor's costs. If the contractor is risk averse, the agency should concentrate on relieving the contractor of risk over which the contractor has little or no control, such as the demand for the contracted service or capital expenses that must be amortized over the unknown length of the contract. This will provide the maximum benefit to the contractor and can be done through a contract that provides the contractor with fixed compensation plus adjustments in case there is a change in the service provided to cover the changes in the variable costs of providing the service. By leaving the contractor responsible for the difference between the estimated and actual costs, the agency provides the contractor with an incentive to control these costs. This suggests that this type of contract would generally provide the greatest benefit to the transit agency in terms of minimizing costs, and to the contractor in terms of minimizing risk.

80. One way that fixed costs could be lowered would be by the agency leasing the required vehicles to the contractor for the term of the contract and any extensions. Such a lease could require the contractor to return the vehicles in good condition and properly maintained in order to provide the contractor with an incentive to maintain the vehicles effectively. Agencies must remember that by designing a contract to reduce the risk faced by a contractor the agency will also reduce the contractor's incentive to minimize its costs.

U. S. Contracting Practices

General Contracting Practices

81. During December 1991 and January 1992, a questionnaire was mailed to the approximately 500 United States transit agencies which 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 following paragraphs describe some of the key findings from this survey. (Halvorsen and Wilson, 1993)

82. There has been significant growth in the use of transit service contracting by all types of agencies since 1985. Many more agencies now use contracting to provide some of their transit service, especially contracting for paratransit service, while continuing to provide fixed-route service directly.

83. The survey also shows 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 competition for the contract. However, the median number of bids obtained for paratransit contracts is only 3, compared to a median of 4 bids for fixed route bus contracts and 5 bids for London Transport's contracts. Furthermore, many of the agencies only obtained 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. For example, the median number of bids on cost-plus contracts was 3.5, on fixed-fee contracts based on the service supplied it was 3, and on fixed-fee contracts based on the service consumed it was 1. Also, if the transit agency provides the vehicles the median number of bids was 5 for fixed-route services and 4 for paratransit, while if the contractor provided the vehicles the median number of bids was 3 for fixed-route services and 2.5 for paratransit. These examples of avoiding contracts with risk are consistent with the findings of Tough's (1992) research regarding bidding for net versus gross contracts in the United Kingdom. Agencies may be able to increase the number of bids for their contracts by decreasing risk, however this is a subject that would probably benefit from additional research.

84. 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 enforced. In at least some cases this is due to a desire to maintain a close 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. This is especially possible since the contractor will rarely be significantly injured by the contractual penalties. It is important to note that this is very different from the behavior assumed in contract economics, that all contract provisions will be enforced exactly as written.

85. Most contracts utilize very small incentives and penalties, especially in comparison to 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 compared to the costs of the desired behavior to affect the behavior of the contractor.

86. On the other hand, many agencies utilize the implicit incentive of contract extension or renewal. This implicit incentive is especially important when the parties intend to form a close, a long term relationship. This type of incentive can either be expressly provided for in the contract (e.g., allowing a contract extension at the discretion of the agency if the contractor's performance is "superior") or by structuring future contract proposals to benefit the incumbent contractor.

87. 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.

Some Examples of Specific Contracting Practices

88. **Negotiating Power After the Contract is Signed:** One tactic used by some service contractors is to make a low bid on a proposal, and then to later request changes to the contract increasing the amount it is paid, generally by threatening to terminate the contract if the increase is not granted. This tactic relies on creating a situation in which either (1) it is less expensive for the agency to give in and pay the contractor the additional amount than it is for the agency to recontest the contract, or (2) the contractor has the right to terminate service in a shorter time than it would take the agency to obtain a replacement contractor. This type of situation is anticipated by contracted economics and emphasizes the need for the agency to structure the process, including the design of the contract, so that the contractor will behave as desired by the agency, instead of relying on a threat of terminating a contract.

89. **Competition:** It is universally accepted that one of the most important factors in obtaining contracted transit service at the lowest possible rate is maximizing the actual, and potential, competition. As discussed above, generally more bids are received if a contract provides that the agency will provide the vehicles and the contractor's compensation will be either a fixed fee or cost-plus. However, discussions with some major U.S. transit contractors sheds a different light on this issue. They state that a key factor in determining whether they will bid for a contract is their perceived chance of winning the contract. If an agency takes actions to make it easier for small contractors to bid, such as providing the vehicles, they view their chances of winning the contract as going down, and therefore are LESS likely to bid. Thus, the agencies decisions about providing vehicles and compensation not only influence how many potential contractors bid, but which contractors bid. This emphasizes the importance of understanding the utility functions of potential contractors, especially with regard to the decision about bidding on the contract.

90. **Size and Complexity of Contract:** The size and complexity of the contract is also a key factor in determining how many potential contractors bid, and who they are. This occurs in two ways. First, the small and medium sized transportation operators in the U.S. have limited resources which provide an upper boundary on the size of the contracts on which they can bid. Limited resources also limit the amount of effort contractors can apply to the bidding process, and most contractors would prefer to utilize this to bid on several simple contracts rather than fewer, more complex contracts. Second, several larger U.S. transit operators states that contracts must be at least a certain minimum size or they will not bid if they do not already have a local presence. The basis of this is that the contracted operations must be large enough to cover the overhead cost of establishing a local presence

and also to provide a reasonable chance of winning the contract, by eliminating enough small operators as potential competitors. The Travers Morgan report (1994) suggested that one possible resolution would be for major agencies to tender a range of sizes of contracts, some attractive to small operators and others to large operators.

91. **Compensation:** One problem with paying contractors based on the amount of service provided or consumed that has occurred in several cities is that the contractors are required to apportion their relatively fixed overhead onto what may be a variable number of hours, miles or trips. If the number of, for example, service hours that would be required was overestimated, the contractor may not recover all of its overhead from the lower amount of service actually provided. If the number of service hours needed was underestimated, the contractor receives bonus profit, which may not have been anticipated by either party. A contractor in this situation may also incorporate a risk premium in its bid, because of the uncertainty of recovering its overhead. This can be addressed through a contract under which the contractor receives a fixed monthly fee for overhead, plus a fee based on the service provided or consumed. This type of contract is used increasingly frequently in the U.S., as it reduces risk for both the contractor and the agency, behavior suggested by contract economics.

92. **Enforcement of Incentives and Penalties:** As mentioned above, many agencies do not enforce penalties, or pay incentives, even when they are explicitly provided for in the contract. One agency, which has never enforce any penalties or been billed by the contractor for any incentives (although the incentive conditions have been met), stated that it and the contractor are primarily interested in working together to provide good service. Penalties and incentives are seen as incentives to cooperate, because both parties have the potential to make life difficult for the other party. The contractor provides good service, even providing some free service to charities in the area, at a low cost to the agency. The agency also uses less than one full time employee to monitor the contract. The agency reported that the key factors in establishing this relationship were: (1) designing the contract so that it was large enough to attract national companies as bidders; and, (2) designing the process so that it did not have to take the low bid, but rather could place more emphasis on obtaining a contractor interested in cooperating and providing good service. This agency illustrates a trend in many other industries where companies build tight working relationships with one, or a small number, of suppliers instead of relying on detailed "arm's length" contracts. In many cases this has been found to improve quality and significantly reduce costs for both parties.

93. Another agency which does not enforce penalties stated that they see the penalty provisions as (1) informing the contractor about the agency's concerns and (2) providing the city with a tool to use in negotiating with the contractor. These negotiations are used to insure that the contractor provides good service under the contract and also to convince the contractor to provide some services or benefits, such as additional employee training, that are not

expressly required by the contract. The agency does this primarily by implicitly threatening to stop being a "nice guy" and to start enforcing the penalties if the contractor is not cooperative. The agency further feels that if it were to enforce penalties, its relationship with the contractor would turn adversarial and the quality of service would drop dramatically. This agency does not have as good a relationship with its contractor and utilizes two more full time employees to monitor the contractor closely, than does the agency described above, for a slightly smaller contract. An important factor is that this agency used a low bid contractor selection process, because it felt that all contractors were only interested in profit and would only provide good service if they were closely monitored. Interestingly, the agency is currently paying a slightly higher rate than the national average for service under its contract.

94. Many other agencies do enforce penalties and pay incentives. This occurs most frequently when the agency has multiple contractors (who might object to any apparent favoritism to another contractor) and/or is required to have an "arm's length" contract (as distinct from a contract where the agency is given the right to control detailed aspects of the contractor's operations on an ongoing basis). In both of these cases the agency needs to use the contract, and just the contract, to influence the contractor, and it is in these contracts that the methods of contract economics can most easily, and usefully, be applied.

CONCLUSION

95. Contract economics provides some insights into the transit service contracting process, and a review of U.S. contracting practice indicates that these insights may also provide a set of good practical guidelines. The key insights are as follows:

- Agencies are best served if the contracting process, and contract, results in a contractor wanting to behave in the manner desired by the agency. This can be considered a "moral hazard" problem -- constructing a contract that will cause the contractor to behave in this manner, or an "adverse selection" problem -- finding a contractor that wants to act in the manner desired by the agency. Relying on threats of imposing penalties or terminating the contract is not as effective theoretically and is often infeasible in practice.

- It is important to structure the contracting process, and the contract, in a manner that encourages a substantial number of contractors to bid; otherwise the transit agency loses much of its power to maximize its utility from the contract. This means that the contract needs to minimize the risk to the contractor and eliminate unnecessary complexity. However, some provisions, such as the size of the contract and provision of vehicles, do not affect all contractors in the same way.

Decisions on these provisions therefore affect both the total number of contractors that bid and which types (or sizes) of contractors bid.

- Compensation provisions are an important source of risk for contractors, such as needing to allocate a fixed overhead to an uncertain amount of service being provided or consumed. Contractors tend to respond to such risks either by not bidding for such a contract or by charging a risk premium, in either case raising the cost of the contracted service.

- The greater the agency's understanding of both its own utility function, and of the contractor's costs and utility function, the more accurately the agency will be able to affect the contractor's behavior. Insufficient understanding of the contractor can result in incentives causing unanticipated behavior, including overallocating resources to the aspects affected by the incentive.

96. In addition, this study emphasizes that the relationship between transit agencies and contractors is often governed by unwritten, and often non-specific, agreements instead of the formal contracting process or written contract. Any analysis of contract structure or the contracting process needs to address these unwritten agreements, and this remains a fertile area for further research.

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