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Abstract

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Doctor of Philosophy in Engineering - Civil and Environmental Engineering

University of California, Berkeley

Professor Martin Wachs, Chair

After a half-century of increasing public ownership and rising costs, public transit agencies in the U.S. began to experiment with competitive contracting of their operations during the1980s. Previous research tells us much about possible cost savings from contracting, but we know relatively little about how it has affected transit workers. This study examined impacts of contracting out fixed-route bus services on labor by investigating the compensation packages of drivers.

The study covers 12 operators of three types, from 1995 to 2001: private contractors, public operators with no contracting, and public operators who contracted out for some or all of their service. Driver compensation at each bus operator was analyzed in four components using equivalent pay hours: platform hours, hours spent due to work rules defined in labor contracts, paid absences, and fringe benefits. By comparing pay hours to platform hours, labor utilization of each operator was examined.

Drivers for five private bus contractors were paid about $10 to $11 per hour (in 2001 dollars), which is $6 to $8 less than drivers at seven public agencies. Privately hired drivers are likely to receive fewer benefits, valued at only 25% of their yearly compensation, compared to 35% for public drivers. Paid absences showed especially notable differences. Privately hired drivers received the dollar equivalent of 15 days off annually versus 52 days off for their public counterparts.

Private operators showed higher levels of spending on overtime, because their drivers were each likely to work 100 to 200 hours more per year than their public counterparts in order to achieve marginal wage improvements. Also the higher rate of driver turnover and poor safety records at private operators caused more spending on various forms of insurance (e.g. unemployment, worker's compensation insurance, and liability). Driver training also costs private contractors more than public ones. Overall, private contractors paid 52% less in driver compensation, while their hourly operating costs were 43% less. In sum, it appears that cost savings from contracting achieved at the expense of labor, but not necessarily with an increase in genuine productivity.

Professor Martin Wachs, Chair Date

To my family

Acknowledgments

I cannot express enough my appreciation to Professor Martin Wachs, my advisor and mentor, who has led me throughout the course of research, with his constant endurance and guidance. Although my research experience with him was very worthy and rewarding, his exemplary life on the private and professional levels affects me the most. Again, I thank him for his tremendous support and especially his patience with my sluggish work process. I also wish to thank Professor Elizabeth Deakin for her insights and guidance, on both personal and academic matters. Especially, without her exceptional generosity during this pivotal stage of my life, I would have been lost and could not have pursued this degree at all. I also would like to give my warm gratitude to Professor Mark Hansen for his valuable insights and essential feedback.

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CHAPTER 1. INTRODUCTION

Public transit is labor-intensive, and labor costs for personnel such as bus drivers, subway train operators, and mechanics make up approximately three-quarters of the total cost of service. The public transit work force is also highly unionized. Starting in the early 1960s, the public transit industry in the United States shifted from largely private to largely public ownership and operation. There has been a dramatic increase in service costs and deficits over the same period of time. Between 1950 and 1980, the inflation-adjusted operating cost per revenue-hour of transit service rose 183 percent. Most of this increase was covered by public subsidies and went to pay for increased wages (Pucher, et. al 1983). Since the early 1980s, in an effort to reduce deficits, public transit operators have been urged to reduce their labor costs by contracting out all or part of their service to private companies on a competitive basis.

Proponents of transit contracting argue that where transit operations have been contracted out in the United States and Europe, the quality of service appears to have improved, and the cost to taxpayers reduced. Opponents argue that the cost reductions are not true measures of improved efficiency, because most of the savings usually come from depressing wages, reducing fringe benefits, and imposing more demanding work rules, which is merely a transfer of costs at the expense of the well-being of the transit workforce. It would appear that the rate of increase in transit wages and fringe benefits has been slower since the introduction of contracting; however, it is difficult to find reliable information because many of the studies of the impacts of contracting have been ideologically charged.

While previous research on transit contracting tells us a great deal about cost savings and increased management flexibility from the perspective of transit managers, we still know relatively little about the ways in which the movement toward transit contracting has affected transit workers. This study seeks to examine the impacts of the contracting of transit services on labor-related expenses and labor conditions, including wages, fringe benefits, and work rules. To examine how different contract provisions affect transit labor, I studied four cases which cover operations by 12 different entities: five private contractors and seven public agencies. Among those, four of them are a control group with similar characteristics as private contractors, but who did not contract out service.

The labor-related expenses and working conditions in the cases will be compared by 1) analyzing labor costs including specific expenses defined in labor contracts such as how the work force is utilized (shifts, premiums, the use of part-time workers, and the like) and the details of fringe benefits, such as the number of paid holidays, vacations, and the like, 2) breaking down labor costs into equivalent paid hours of platform time, work-rule restricted hours, absences, and fringe benefits, and 3) developing and calculating a measure of labor utilization and productivity, the ratio of pay hour to platform hour. Both longitudinal and cross-sectional studies will be performed to measure trends in labor-related expenses that extend over three to nine years.

This dissertation has six major parts. Chapter I contains the introduction and explains how the dissertation is organized. Chapter II consists of three sub-chapters, including background information about the transit industry, the theory and motivation

behind contracting practices in the United States, and an overview of previous studies done on this question.

Chapter III addresses my research questions and methodology. In section 1 and 2, I present my research objectives and the operators that I selected as case studies, describing the sources for my data and their limitations. Then, I explain the framework used to analyze the data. I discuss various factors that go into defining labor costs and ways to characterize working conditions for transit workers, with special attention to drivers, and describe the measures I developed and used for this study. The scope and limitations of the study are discussed in the last section in Chapter III.

The next four chapters (Chapter IV, V, VI and VII) are the main analysis of this study where I examined all 12 operators together, synthesizing the findings from the individual case studies, with respect to unit costs, drivers' wages, drivers' benefits, and labor utilization of three different types of bus operators – private, public controls, and pubic in-house operations.

In the last three chapters (Chapter VIII, IX, and X), I conclude with a summary of key findings, further discussion and analysis outside of the original research questions, policy recommendations, and questions that should be addressed in future studies.

The final part is appendices and references, which include the description of primary data sources, definitions of transit terms, and detailed tables and figures.

CHAPTER 2. BACKGROUND

2.1. Industry Background

In U.S. transit service history, the provision of transit service has shifted between the public and private sectors. Contrary to current beliefs, transit service does not necessarily have to be provided by public agencies; publicly operated transit service is relatively a recent phenomenon in the United States. Until the early 1960s, the majority of transit was provided by the private sector. However, as private providers experienced worsening deficits, with resulting decay in infrastructure and services, local governments stepped in, followed by the federal government, and assumed responsibility.

In the early years of the conversion to public transit operation in the 60's, local governments procured transit service from private companies with the support of federal transit subsidies under the 1964 Urban Mass Transportation Act (Richmond 2001). This act introduced federal grants for capital investments that could be used to buy out private companies entirely or subsidize their capital costs. Initially, federal grants were restricted to capital investments; however, that changed with the National Mass Transportation Act of 1974, which authorized federal funds for transit operating assistance as well (Weiner 1992).

Federal funding for public transit kept increasing through the 1960s and 1970s. During the same period, public ownership and operation of transit service also increased. Two decades of increasing public ownership and subsidy stabilized both the provision and consumption of transit service, but at the price of rapidly deteriorating productivity. Between 1950 and 1980, inflation-adjusted operating costs per revenue-bus-hour of

transit service rose 183 percent. During this period transit went from a profit-making operation to one in which fare revenues covered, on average, less than 40 percent of operating costs.

In response to skyrocketing public subsidies, the Reagan Administration in the early 1980s placed a new emphasis on both reducing federal funding for public transit and increasing the involvement of the private sector, mainly through contracting. The federal Urban Mass Transit Administration (UMTA) funded a series of studies which concluded that contracting-out to private providers for transit operations, vehicle maintenance, and administrative support could reduce unit operating costs from 10 to 50 percent (Teal *et al.* 1987; Cervero 1988). Pointing to such studies and to changes in federal legislation affecting contracting by public agencies, UMTA began requiring that applicants for grants for discretionary funds seek out and document private-sector participation in the planning and provision of transit service.[1]

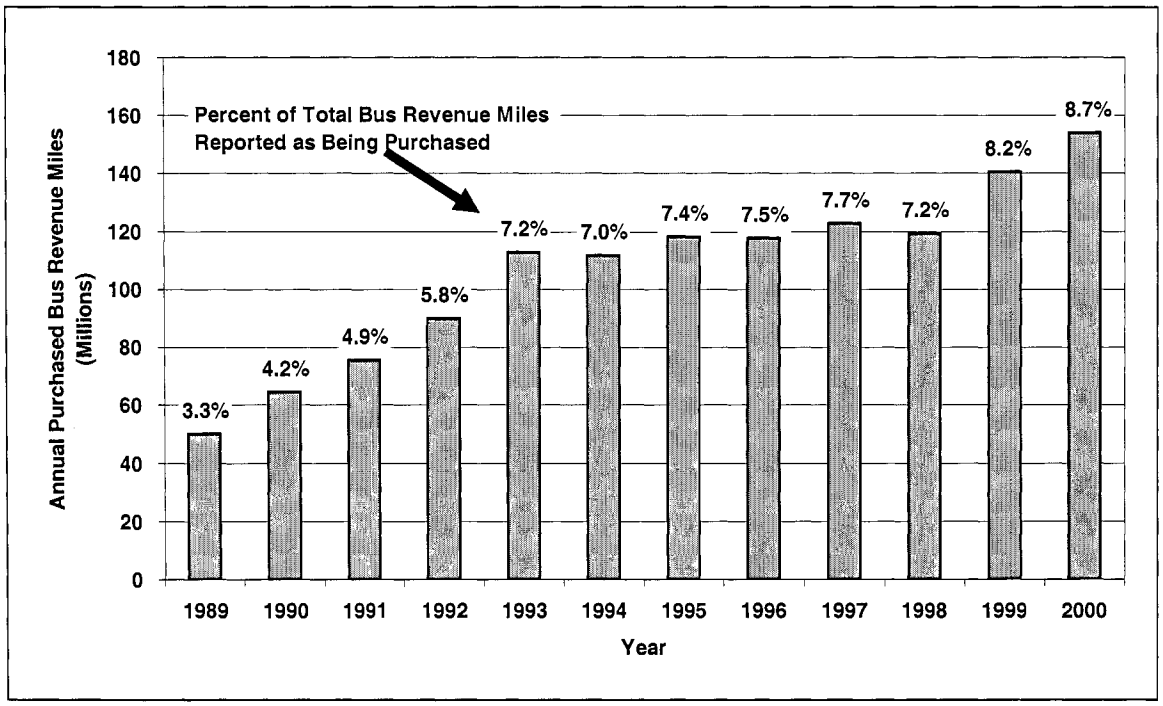
This new requirement represented a significant change in federal policy regarding transit labor. Whereas Section 8(e) of the 1964 Urban Mass Transportation Act had *allowed* public transit agencies to contract for services, provided that strict protections of publicly employed workers outlined in Section 13(c) were observed, the Surface Transportation Assistance Act of 1982 expressly *required* federal grant recipients to develop their transit service programs in consultation with the private sector (Black 1991).

The federal share of transit operating costs peaked at 22 percent in 1980. By 1984, it had fallen to 7 percent (APTA 2000). The withdrawal of federal support continued

[1] The guidelines were published in the Federal Register (51 FR 3306) on 24 January 1986 and further refined by UMTA in Circulars C7010.1 and C7005.1, issued 5 December 1986.

throughout the 1980s, forcing state and local governments to assume more of the costs of transit service subsidies. That, in turn, caused them to examine ways to contain their spiraling costs, and privatization was one of them. A number of states, such as California, New York, Texas, Massachusetts, and Connecticut, adopted privatization-friendly legislation (McCullough 1997, p.32). Many public transit agencies began contracting with private companies for transit service. This shift toward private contracting, largely motivated as it was by policies promulgated by the Reagan Administration, was greeted with considerable hostility by organized labor (Black 1991).

Figure 2-1: Change of Total Bus Revenue-Miles of Contracted-Out Services in 1989-2000



Source: Calculated from the National Transit Database (NTD), in 1989-2000

However, despite these developments, through the 1980s and 1990s, transit service was still provided predominantly by public transit agencies. By 2000, only 11.4 percent of operating expenditures for all transit modes were spent to purchase service from private firms, and much of that was spent on demand-responsive services, notably

paratransit, where 68.7 percent of expenditures were spent to buy private service. Among the fixed-route transit modes, 9.5 percent of bus expenditures were spent to purchase private service, 7.2 percent of commuter rail expenditures, and 0 percent of light and heavy rail expenditures (NTD 2000). In 2000, about 18 percent of vehicle-hours in all modes (bus service having 7 percent and demand-responsive services having 65 percent) were provided by contractors, a percentage that had changed very little since 1994 (TRB 2001).

Table 2-1: Transit Service under Contracting in 2000

	Operating Expense	Revenue Vehicle Miles	Revenue Vehicle Hours
All Modes	11.43%	21.22%	18.40%
Bus	9.54%	8.86%	7.06%
Demand Responsive	68.67%	66.12%	65.41%

Source: Calculated from the National Transit Database (NTD), in 2000

In the Untied States, a handful of large private companies have dominated the market for bus contracting. Over the years, small local bus contractors have lost share, and large nation-wide ones have merged with international contractors. For example, First Transit Inc., which is part of First Group, the largest surface transportation company in the U.K., bought out ATE from Ryder Systems Inc. in 2000, making First Transit the largest private-sector provider of urban bus service in the U.S.

The second largest player in contracting fixed-route transit service is Laidlaw Inc., specializing in school buses, intercity bus service, and municipal transit, as well as ambulances and hospital emergency department management. Laidlaw acquired Mayflower (a school bus and public transit operator) in 1995, the DAVE Companies in 1997, and Greyhound Lines, Inc. in 1998. ATC/Vancom (a.k.a. ATC), another top private transit contractor, and Forsythe & Associates, Inc. were acquired by U.K.-based National

Express, one of the world's largest international transportation groups, in 2000. In 2000, those three big players–First Transit, Laidlaw, and ATC–accounted for all but a small fraction of fixed-route contract costs in the U.S., which represented 30 percent of all fixed-route transit spending.

Section 13(c) of the 1964 UMTA Act

When UMTA began to require applicants for discretionary funds to seek out and document private-sector participation in transit service planning and provision in the early 1980s, one specific concern was how it could affect employees of failing or financially unsound private transit providers that might be purchased by municipalities and other public entities using federal assistance. Employees at those providers could lose their jobs, collective bargaining rights, or other rights they had gained through collective bargaining (Jennings, Smith, and Traynham 1976). While this new requirement in federal legislation and circulars promoted the contracting of transit service, a potentially large hurdle to contracting existed in an older section of the law designed to protect employees' rights, Section 13(c) of the 1964 UMTA Act. Agencies receiving federal funding are subject to this labor protection clause mandating that no recipient of federal money can "worsen the position of a transit employee".

The provisions, commonly referred to as Section 13(c), were written into the legislation as part of transit unions' influential role during the 1960s in shaping federal policies for buying out failing private operators. Section 13(c) specifically protected employees who might be adversely affected by industry changes resulting from financial assistance under the act. The rise of union influence has its roots in the early days of transit history. Then, the relatively low skills needed for some transit jobs, coupled with

generally low profit margins and high demand for services, created a situation in which the most vulnerable workers, typically immigrants, were exploited by private transit operators (Jones 1985). As transit unions became powerful, working conditions and wages gradually improved. This was capped by the unions' success in winning the protections in Section 13(c) (Black 1995).

Contracting proponents claim that labor unions have used Section 13(c) to delay or prevent funding of vital transit projects, in particular those projects which might improve labor efficiencies. There is, however, little quantitative evidence to confirm this. Of over 800 Section 13(c) cases filed with the Department of Transportation between 1964 and 1995 concerning transit projects perceived as being a detriment to labor, only three grant applications were denied (Black 1995). Proponents of transit service contracting have frequently argued that Section 13(c) of the Urban Mass Transportation Act of 1964 gives transit unions *de facto* veto power over management attempts to contract for transit service. They claim that the union does not necessarily have to file a grievance, but the mere threat of one can delay projects and even financially cripple the agency (Love and Seal, 1991; Fielding, 1987).

Since states and municipalities are exempt from the federal National Labor Relations Act (NLRA), public transit agencies would not be required to bargain collectively with transit unions or honor existing collective bargaining agreements unless their state laws specifically required them to do so. In addition to collective bargaining rights, employees could potentially lose the right to strike and pension and retirement benefits. Section 13(c) of the UMTA Act and its administration by the U.S. Department of Labor require that adequate labor arrangements be made to ensure that employees are

not harmed as a result of federal funding, and that the payment for up to six years after layoff – one day of pay per one day of work– should be provided for an employee whose job is eliminated as a result of economies or efficiencies (Woodman, et al. 1995).

The shift to public ownership of transit systems caused many states to pass or change statutes governing labor relations with public employees, so that the authority shifted from the NLRA to state and local laws (Jennings, Smith, and Traynham 1976). Between 1964 (the year UMTA was passed) and 1976, 40 states passed transit authority legislation. Among these 40 states, 28 included employee protection clauses in the legislation to avoid conflicts with section 13(c)[2], while the remaining 12 did not (Jones R.L.1985)[3].

The passage of the UMTA Act made a significant difference in the transit statutes in terms of the guaranteed right to organize and bargaining rights for public transit employees (Jones R.L. 1985). In contrast, some state legislation was passed to limit the rights of transit employees. The Massachusetts legislature passed the Management Rights Act and overrode key provisions of contracts between the MBTA (Massachusetts Bay Transportation Authority) and its union (Black 1991). For example, the state law prohibited automatic cost-of-living adjustments for wages and authorized management to contract-out transit service and hire part-time employees (Black 1991).

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[2] These twenty-eight states include Alabama, California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Michigan, Massachusetts, Minnesota, Nebraska, New Jersey, New Mexico, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Utah, Virginia, Washington, West Virginia, and Wisconsin.

[3] These twelve states include Arizona, Florida, Georgia, Iowa, Kansas, Mississippi, Missouri, Nevada, New Hampshire, New York, South Carolina, and Texas.

2.2. Competitive Contracting

2.1.1. Transit as Government Responsibility

Unlike many publicly provided goods, nearly all mass transit service was originally privately owned and operated. In general, transportation has been considered the joint responsibility of the government and the private sector. Some modes, like bus transit (until the mid-1960s), taxis, and maritime freight have traditionally been the responsibility of the private sector. As recently as the time of the Housing Act of 1961 and the UMTA Act of 1964, private companies were the main providers of bus transit in the United States.

Traditional economic and social justifications for public provision of transportation include the benefits of cross-subsidization, economies of scale, and improved coordination (Nicosia 2001). Cross-subsidization by the government from more profitable routes to less profitable ones would be needed to ensure universal service since private firms would neglect less profitable routes or areas. Because these often coincide with the areas where low-income people reside, cross-subsidization also addresses some of the social welfare concern of making mass transit widely available.

There were also concerns about economies of scale. Some economists argued that transit infrastructure requires large fixed costs, making it a case of a natural monopoly. Therefore, the argument went, a small private company would not be able to take advantage of economies of scale. Finally, there was the issue of coordination. The existence of multiple private firms might create useless duplications in densely populated areas in an effort to exploit profitable routes, leading them to neglect other areas.

Increased coordination across routes and services under a single provider would increase the quality of transit (Nicosia 2001).

The government provision of a public good or service usually occurs in four situations (Dowall 2000). The first is a natural monopoly. This holds when a large initial investment is needed. Examples include the Interstate Highway System, the Hoover Dam, and the California Aqueduct. Rail transit could be categorized as this type of service. A second is excludability, meaning that it is possible to exclude non-payers from using a good or a service. Private entities may not be interested in providing services if it is impossible to exclude non-payers from using them. This is a major reason that the public sector provides parks, lighthouses, navigation aids, police and fire protection. A third case for government intervention is for a non-rivalrous good such as national defense. If additional consumers can enjoy the benefits of a public good without detracting from the benefits received by other users, consumers are unwilling to pay for such services.

A final argument for government provision is that a public good or service will generate substantial benefits, in other words it is a merit good. Examples of merit goods include basic education, and water purification systems. Merit goods are those to which people are entitled as a birthright, simply by virtue of being members of society and regardless of ability to pay. To ensure that a merit good is provided in sufficient quantity, the government encourages more production for example by subsidizing the good or service, by encouraging philanthropic support for it, or by providing the merit good itself.

Some argue that public transit can be justified as a merit good on the basis of government's cross-subsidization and the social goals it addresses. For example, both transit users and non-users pay for transit because federal, state, and local government

revenues subsidize capital and operating expenses of transit. The social goals of universal service benefit not only low-income transit users, but also other commuters by lowering congestion and pollution levels in urban areas.

2.1.2. Privatization in Mass Transit

Private sector involvement in transit service generally takes one of the following five forms. First, some transit services are privately owned and operate completely outside public regulation and with no public subsidy. Jitneys and the unregulated cabs that are common in developing countries and in immigrant neighborhoods in large U.S. cities are in this first group. Second, some transit services are privately-operated, for-profit enterprises that receive no public subsidy, but are publicly regulated. This includes taxis, airport shuttles, and tour buses. Third, some transit companies are privately operated but also receive public subsidies and are publicly regulated, such as those found in New York, New Jersey and other places.

Fourth are formerly publicly-owned and -operated services that, as a result of privatization or deregulation, have been sold to private firms that now own and operate them. Bus transit service outside of Greater London in the United Kingdom falls into this fourth group. Lastly are the cases where public agencies procure the provision of service from private firms. London Regional Transport is an example of this group. It contracts-out fixed-route transit service to private firms through tendering (or bidding) (Glaister and Beesley 1991). Many public transit agencies in the U.S. also contract out: for fixed-route bus service, demand-responsive service (DRS), vehicle maintenance, and management and administration.

While the term "privatization" applies to the fourth and fifth instances in which

the provision of service shifts from the public to the private, and private sector involvement increases, the terms "transit service contracting" or "tendering" are generally reserved for the fifth category. This is the most common form of privatization of fixed-route bus transit service in the U.S., because it allows public agencies to keep control over fare levels, the quantity of service provided, and larger policy decisions.

2.1.3. Motivations for Contracting-Out

The prime motivation for contracting-out public transit is to reduce operating costs and improve efficiency. Various arguments for the importance of the cost savings achieved by contracting-out transit have been made. According to past studies, contracting can result in cost savings for the following four reasons.

1. *Labor cost differences*: Labor costs, which comprise a significant share of operating costs, are typically lower in private firms because more flexible work rules and the use of part-time or non-unionized workers depress wages (Cox, 1991; Mundle, Kraus, and Hoge 1990; Morlok and Viton 1985; Peskin, Mundle, and Varma 1993).[4]

2. *Diseconomies of scale*: Transit wages are positively correlated with firm size. Since large transit agencies face diseconomies of scale of cost-efficiencies due to large overhead costs, many scholars inferred that larger firms may lower operating costs by contracting out for services (Morlok 1984; Morlok and Viton 1985; Cervero 1988; McCullough 1997).

3. *Flexibility and efficiency*: Public transit agencies may reduce the cost impact of peaking by contracting-out commuter services in peak periods and may increase the

[4] Hamermesh (1975) examined 48 publicly operated bus systems for the years 1963-1971 and found that a shift to public ownership of privately owned facilities had statistically significant effects on wage increases when controlling other variables (e.g., regional differences, cost of living, the "quality of labor").

efficiency of their labor and vehicle utilization (Morlok and Viton 1985; Tomazinis and Takyi 1989). Moreover, some argue when private firms operate in a competitive market, they are considered to be more flexible, more adaptive to technological change and innovation, and more able to provide service in a cost-efficient manner (Morlok and Viton 1985; Savage 1986; Black 1991) because they may control labor more easily. For example, automatic fare collection equipment can be adopted more easily by private firms because they face less opposition from private drivers (Black 1995).

4. *Competition*: Introducing competition as well as the threat of competition can bring reorganization of agency management, gaining more flexibility from unions and more responsiveness to user needs. For example, unions may accept an increase in part-time labor in order to reduce an agency's interest in contracting.

Another motivation for transit contracting is as an expression of *policy direction.* Richmond (2001) argues that decisions about contracting-out transit service are driven by ideology and politics among stakeholders in local governments and transit agencies. In case studies that included both fixed-route bus services and demand-responsive services, Richmond found a conflict between conservatives who advocate reducing government's size and liberals who consider the provision of public transit service a social responsibility. The former advocated changes that would encourage contracting while the latter sought to impose barriers to such changes. Richmond further argues that even though the procurement of private transit service (or another form of privatization) has reduced costs and improved service, they have often been byproducts of changes adopted for ideological reasons rather than outcomes resulting from the exercise of analytical logic.

For example, several state laws require contracting, including Colorado, which passed provisions in Senate Bill 164 in 1988 and Senate Bill 8 in 1990 that require the Denver Rapid Transportation District to contract at least 20 percent of its service to qualified private businesses in negotiated contracts (Peskin, Mundle, and Varma 1993). Massachusetts general Law 161b requires competitive bidding in procurement of all transit service outside the Boston area and California, New York, Texas, and Connecticut have also adopted privatization-friendly legislation (McCullough 1997: Richmond 2001).

2.3. Past Studies: Results and Arguments

A large body of research on transit service contracting examines whether and to what extent it reduced costs. Many of the studies were not published in peer-reviewed scholarly journals and have sometimes taken the form of "dueling studies" of the same transit operator commissioned by competing stakeholders in debates over contracting (KPMG Peat Marwick 1990, 1991; Ernst and Young 1991, 1992, 1993; Peskin, Mundle and Varma 1993; Karlaftis, Wasson, and Steadham 1997; Sclar 1997; Denver RTD Public Financial Management 2001). Most of these studies have sought to estimate changes in operating costs and subsidies after a particular transit operator began contracting, but the financial results of contracting have been the subject of considerable debate.

Past studies have also generated disagreement over what effects from contracting should be measured and how best to measure them. Most of the early research reported savings estimated to be on the order of 10 to 40 percent per unit (e.g., per vehicle-mile, per vehicle-hour) of contracted service in comparison to directly provided service. For example, in the case of Denver Regional Transportation District, Peskin, Mundle and

Varma (1993) report cost savings of $ 12.5 percent based on an incremental cost analysis and 25.8 percent based on a fully allocated cost analysis in one year for fixed-route bus services (1990-1991 dollars). Similarly, Denver RTD Public Financial Management (2001) reports at least $40.1 million dollars (or 31 percent) over nine years based on a fully allocated cost analysis (in nominal dollar value from 1991-1999). Three reports by Ernst & Young (1991; 1992; 1993) to Los Angeles County Transportation Commission on contracted service for the Foothill Transit District show a 43 percent cost savings. Karlaftis, Wasson, and Steadham (1997) compared a cost efficiency indicator using monthly data from the Indianapolis transit system for a six-year period and found cost efficiency increased by 22 percent on contracted out routes.

In addition, Teal (1985) and Teal and Giuliano (1986) show significant cost savings for six cases of fixed-route transit services and six cases of commuter bus services. The cost savings on average were 39 percent and 43 percent for fixed-route services and for commuter bus services respectively.

There are several reasons for the variation in findings regarding the effects of contracting. First, there is significant variation in methods used to measure costs (cost allocation models) and therefore cost savings. Second, there is inconsistency between models in which cost items are included, so that the outcomes are by no means comparable. Sclar, who has been a vocal critic of research into cost savings through transit contracting, argues that most studies that claim significant savings either ignore or substantially underestimate the "transaction costs" public agencies incur when they draw up requests for bids, evaluate bids, negotiate contracts, and, especially, monitor contracts with private providers (Sclar, Schaeffer, and Brandwein 1989; Sclar 1989, 1997, 2000).

In addition to these methodological problems, they may be biased in order to represent the political positions of the authors. Richmond (2001) points out that quantitative evidence has been used often to reinforce preconceived ideas, instead of providing objective information regarding economic gains. Different theoretical approaches[5], with the assumptions of each approach structured to enhance its political potency are used by proponents and opponents of contracting for political ends. Types of cost allocation models, cost items included in the model, and a consideration of short-term and long-term effects have been focal issues in this debate

A second group of studies addresses the complex nature of decision making regarding contracting, taking into account conditions other than economic ones. Transit employee unions often oppose any type of privatization because it puts union members at risk of losing wages, benefits, or even jobs. Elected officials often must balance the political consequences of opposing the unions versus the potential positive political fallout if privatization produces economic benefits. In addition, legal and regulatory considerations can affect the feasibility of shifting to contracting out transit service. For example, in Los Angeles, bus service in the Foothill Transit Zone was successfully privatized in 1988 in part because its legal and financial restructuring would exempt it from the labor-protection clauses of Section 13 (c) of the Urban Mass Transportation Act (O'Leary 1993).

Regression analysis by Lopez-de-Silanes, Shleifer, and Vishny (1997) to measure the effects of regulatory, political, and economic factors on the selection of the mode to

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[5] Types of cost allocation models, cost items included in the model, and a consideration of short-term and long-term effects have been focal issues in this debate

provide public service[6] using data for counties that experienced a shift from public to private provision of services found: 1) factors that reduce the political benefits of in-house public provision, such as state clean-government and anti-union laws, make privatization more likely, and 2) factors that increase the cost of government spending, such as state laws restricting government financing and measures of the state's financial trouble, make privatization more likely.

Luger and Goldstein (1989) used a discrete choice (logit) model to examine the effects of the UMTA Section 13(c) clause on the decision to contract-out fixed-route and commuter express services, based on data from a survey of transit managers, the National Transit Database, the U.S. Census, and other sources. They found that Section 13(c) does not appear to reduce the incidence of contracting, controlling for other factors, including transit service characteristics, demographics of served areas, area economic conditions, and characteristics of transit managers and unions.

Nicosia (2001) found from her modeling the agencies' decision to contract that public agencies in areas where government worker unionization rates are high and private unionization rates are low are significantly more likely to adopt contracting. Similarly, larger agencies with higher average costs, in part due to higher wages, are also more likely to contract.

These studies show the decision to contract for part of or all of a public transit service, is rarely, if ever, purely a business decision. Decision-making in public transit is highly politicized and constricted by political norms, local customs, statutes, public regulations, and contracts themselves. Another important implication of these studies is

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[6] It examined five services such as airports, landfills, libraries, nursing homes, and hospitals separately, but did not examine public transit service due to the limited number of cases.

that the operating characteristics of an agency can affect the likelihood of that transit service being contracted-out. In other words, high-cost transit operators may be more motivated to pursue contracting than low-cost operators, which causes simultaneity and selection bias problems that can interfere with empirical analysis.

Overall, while the existing literature gives us a taste of contracting's impacts on costs and demand, the current body of research has some weaknesses. First, few studies have explicitly examined the relationship between contracting and labor regulations and labor unions. This is mainly due to the lack of data about labor conditions at private firms[7]. Many scholars have indirectly attributed cost savings to lower labor costs and lower levels of unionization in the private sector. Richmond (1992) found driver wage differentials greater than $5.00 per hour between the former Southern California Rapid Transit District and the private contractors in the new Foothill Transit District in the San Gabriel Valley of Los Angeles. In Denver, after four years of employment, even the highest paid contract drivers earned roughly 77 percent of the earnings of Denver Regional Transit District drivers (Peskin, Mundle and Varma 1993).[8] However, given problems inherent in measuring cost-savings due to transit service contracting, most previous studies' conclusions that observed cost savings are due primarily to contractors' lower labor costs are, by and large, inferential.

Also, only a few previous studies of urban transit contracting have specifically examined contracting's effect on fringe benefits and work rules. Peterson *et al.* (1986) found that the compensation levels for unionized bus drivers and non-unionized drivers at

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[7] The labor related expenses of purchased transportation are not mandatory in the NTD datasets. This problem will be discussed further in the part about data acquisition, which appears later.

[8] Similar findings of public-private wage differentials were found in studies of the Bay Area Rapid Transit District, San Diego County (Metropolitan Transportation Development Board 1996), and Houston (Moore and Newman 1991).

private companies were, on average, 21 percent and 45 percent lower than their respective counterparts in public agencies. Herzenberg (1982) concluded that the MBTA in Boston saved approximately $12,000 daily by contracting out 12 bus routes to private firms: specifically, lower wages saved the MBTA $2,000 to $4,000 per day; fringe benefits reductions lowered costs by $3,700 per day; and less restrictive work rules were estimated to save another $1,400 per day. Downs (1988) reported that the private firms in New York achieved a 30 percent savings in operator costs by not paying premiums for split shifts, despite the fact that hourly wage rates were close to those paid by public agencies.

In addition, some previous research has suggested that transit contracting both weakens the bargaining position of unions representing transit workers and reduces overall levels of unionization in the transit industry (Giuliano, and Lave 1985). Some studies have also found evidence of a "chilling effect" on labor demands in the public sector after transit contracting has been initiated for a portion of service. Talley (1991) found that when the Tidewater Transportation District in Virginia began contracting for paratransit service, the Amalgamated Transit Union local quickly agreed to work rule concessions in exchange for guarantees of job security for publicly employed drivers and mechanics. Bladikas *et al.* (1992) studied the contracting experiences among one dozen transit agencies around the U.S. and found what they termed contracting's "positive ripple effects" on the costs of operating public services.

Finally, Hurwitz (1992), McCullough (1997), and Morlok (1996) found that unionized transit workers at public agencies have in numerous cases agreed to wage concessions when competing with private transit operators for service contracts. Despite

occasional references to the effects of contracting on transit unions, there has been no systematic research on unionization among private contract transit providers. Anecdotal evidence suggests that levels of unionization are often lower among new contract operators, but that such operators are often quickly organized after initiating contract transit service; though often by the International Brotherhood of Teamsters instead of the Amalgamated Transit Union or the Transport Workers Union.

The second weakness is, as Teal (1991) and McCullough, Taylor, and Wachs (1998) separately point out, that there are not many studies that examine the long-term effects of contracting out. Because of the potential change in the level of competition in the bidding process as well as the nature of cost estimation, the long-term effects of contracting can be significantly different from the short-term ones.

Another weakness is that many of the past studies have focused exclusively on the effects of contracting out, and have generally failed to control for other external factors affecting the costs of transit service operation. McCullough, Taylor, and Wachs (1998) employed multiple regression models to examine the effects of contracting-out on cost-efficiency,[9] but did not include other factors considered in two other studies—Pucher, Markstedt, and Hirshman (1983) and Pickrell (1985)—that used regression analysis to examine the effects of federal transit subsidies. In addition, few past studies have examined what aspects of contracting have contributed most to cost reductions.

Finally, few studies (Nicocia 2001) account for the endogeneity of the contracting decision due to relationships between costs and the contracting-out decision. This has not

[9] They regressed operating expense per revenue vehicle hour in 1993 on fourteen independent variables including factors related to contracting, labor utilization, agency size, the level of peaking, and other service and area characteristics for 61 transit systems.

been adequately considered in previous multivariate analyses of estimations of the costs or the unit costs.

CHAPTER 3. RESEARCH DESIGN AND METHODOLOGY

3.1. Research Objectives

While previous research on transit contracting tells us a great deal about cost savings and increased management flexibility from the perspective of transit managers, we still know relatively little about the ways in which the shift toward transit contracting has affected transit workers. Contracting policy will directly and indirectly have effects on various groups of people, from management to transit users and taxpayers, but more significantly on industry employees. It is important to examine contracting's impact on transit employees because it is not clear that contracting results in a real efficiency gain, and I believe that job creation and redistribution of income are important in addition to cost-efficiency. Therefore, this study examines the effects of transit service contracting on transit workers and on their work conditions. The overall goal is to examine how the different contract provisions affect transit labor and employment, and the efficiency with which the work force is utilized.

I will address the following three primary research questions in this study:

1. How do compensation packages, work rules, and work force utilization compare between publicly and privately employed transit drivers? If cost savings are gained merely by enjoying the wage gap between the private and public sectors, then a contracting policy transfers public funds away from providing jobs and income to public transit employees. I will examine trends in labor conditions and costs such as changes in wages, fringe benefits, flexibility in changes of service (schedules or routes), premiums included in labor contracts, workforce retention, labor productivity (efficiency), and

similar factors. I will seek to determine whether contracting had a chilling effect on compensation of publicly employed drivers, and whether there is convergence between public and private compensation packages in metropolitan areas where both types of service exist. I will focus on both public and contracted-out services within the same metropolitan area.

2. If there is a significant difference in compensation packages and work rules between drivers hired by public and private operator, what factors explain the differences? How much is attributed to: (1) different management practices in public versus private organizations, (2) the presence or absence of unions (3) the seniority and experience of the drivers, (4) stand-by times for unscheduled absences, and (5) other unknown factors.

3. How does contracting-out transit service affect agencies and unions representing bus transit workers, and what are the policy implications? Under what particular circumstances is it appropriate for a transit system to consider privatization? How can a transit system increase the efficiency of its operation without excessive adverse impact on drivers? What issues should be addressed by management and transit boards, in case of their initiating contracting?

3.2. Selection of Case Studies Based on National Transit Database

For this study, I have selected four cases, which include 12 bus operators in the United States, based on the availability of data about private contractors in the National Transit Database (NTD). As controls, each case will include an operator with similar characteristics (as defined in Table 3-3) that have not contracted-out service. While the effects of contracting on privately operated services can be examined by analyzing purchased transportation service data, contracting's indirect effects on in-house services

can also be examined by analyzing firms that partially contracted out and comparing their in-house services before and after contracting was instituted. In this section, I will discuss the method and process of selecting cases for this study, as well as the nature of the data and the data sources.

3.2.1. Data Sources

Before discussing the selection of cases included in this study, issues concerning data sources, mainly the National Transit Database (NTD), must be addressed. The case studies and the framework for analysis are primarily determined by data availability, and that is a function of what is furnished by contractors in their reports for the NTD.

The necessary data are collected from two different sources. The first is existing data from various surveys. The second is interviews I conducted with selected public transit operators in the case studies. (No contractors were interviewed, because they rejected my requests.) Existing data sources are summarized in Table 3-1.

Table 3-1: Summary of Existing Data Sources

Sources	Content	Level
National Transit Database (NTD) of the Federal Transit Administration for all agencies in urbanized areas (previously known as the UMTA Section 15 Report) from 1993-2001	Operating, revenue, and expenditure data for all public transit systems that received federal funding	Firm and Mode
Transit Contracting Survey conducted by the Transportation Research Board (TRB) of the National Academy of Sciences in the year 2000	The nature of the contracts, including their structure and duration, as well as a survey of general managers	Firm and Mode
U.S Bureau of Labor Statistics, Department of Labor in each state, 2000	Unionization and union membership by state	State
U.S. Bureau of Census Data, 2000, Summary Tape File 1 and 3A.	Regional social, economic, and environmental data of UZA[10]	MSA[11]
The American Chamber of Commerce Research Association (ACCRA), 2000	Cost-of-living Index (COLI)	MSA

[10] Urbanized Area
[11] Metropolitan Statistical Area

The primary data source, the NTD[12], contains a wide array of operating, revenue, and expenditure data for all public transit systems that received federal funding. The datasets are combined to create a panel of more than 500 firms annually in all modes of urban transportation. The datasets also include each firm's contracting status by each mode in Form002. The NTD report includes more than 15 different forms for different data categories such as revenue resources, inputs and costs, characteristics of service consumed, and the like.

However, it is very important to note issues surrounding the NTD before going any further. First, only operators receiving federal money for transit are required to file a report, and they are not required to file all the forms, although operators may submit information voluntarily. All labor-related forms—Operator's Wages Form (321), Fringe Benefits Form (331), and Transit Agency Employee Form (404)—are only required of firms that directly operate transit services with 100 or more revenue vehicles. In other words, there are no labor-related data for contracted-out services unless the contracted-out public firm or the contractor voluntarily responds. This is the main reason that most previous studies of the contracting of transit services have not addressed the variables related to labor. Most private contactors' labor-related data as well as operation and expense data are only partially available. Since my research focuses on labor as well as contracting experiences, these data have defined the choice of case studies (as well the number of case studies).

Other issues concerning the NTD are cost allocations by transit mode. There is no standardized cost allocation model used by all. For example, to allocate labor costs, an

[12] The more detailed information of NTD Forms I used in this study is explained in Appendix 1.

agency may use vehicle-hours for drivers, vehicle-miles for maintenance personnel or the number of peak vehicles for other staff members (McCullough 1997). Also different ways of capitalizing operating expenses across operators make it difficult to standardize the costs of contracting. For example, agencies that require contractors to purchase vehicles will have the amortized costs for vehicles passed on to the agency as an operating expense; while agencies leasing vehicles to the contractors will have the expenses appear as part of the capital costs of the agencies themselves.

Finally, the evolution of the NTD reporting system has affected the reporting data. Over time, required items have been added, deleted, or modified. Before 1992, the nature of any contractual relationships between public agencies and their contractors was not required to be reported; therefore, there is no way to tell from the data themselves whether or not an agency contracted-out. In addition, reporting requirement thresholds for private contractors have been changed over time. In 1989, the threshold number of vehicles operated at maximum service was 50, but in 1992, it changed to 100. If the number of peak vehicles is below the threshold, the contracting public agency files one aggregate report for its directly operated service and its small contractors, rather than filing separately. A significant shift in NTD filing forms in 2002 also narrowed the scope of operators and the studied time periods. Since 2002, reporting forms have been modified dramatically, and most data related to labor (work rules as well as benefits packages) have been simplified or deleted from NTD reports.

The other existing data source I used is the Transit Contracting Survey conducted by the Transportation Research Board (TRB) of the National Research Council in 2000. This survey contains responses from more than 250 transit systems about transit contracts,

including such information as the structure and duration of contracts, contract dollar amounts, payment basis, and characteristics of the service contracted for (i.e., urban, suburban, rural, local, express, circulation, downtown or parking). Public transit managers' perceptions of strengths and weaknesses of the contracting experience are also included. However, the names of contracting companies are not. More details about the NTD and TRB Contracting Survey are available in Appendix 1.

The second source of data consists of letter and telephone interviews of pubic transit operators that I have carried out. The primary reason for these interviews is to gather more historic background information, and obtain a better picture from the perspective of involved groups, not to collect additional data.

3.2.2. Selection of Case Studies

The original intent of this study was to examine 30 to 40 cases in a more quantitative manner, but I was limited to four, which encompass 12 bus operators in the U.S. The number suitable for study is limited because existing data are not complete for most contracting fixed-route bus operators in the U.S., partly because private contractors are not required to supply data, and partly because the three major nationwide players in transit contracting (First Transit Inc., Laidlaw Transit Service Inc., and ATC) refused my requests for information.

I chose the case studies purely on the basis of the data furnished by contractors on two forms filed as part of NTD Reports, the Operators' Wage Form (321) and the Fringe Benefits Form (331). It is important to note that only operators receiving federal monies for transit are required to file an NTD report. Although operators may voluntarily submit

reports, transit agencies subsidized exclusively by state and local grants as well as private contractors may not show up in the database.

Moreover, the two forms in the NTD reports that contained wages and fringe benefits of drivers, are only required of firms that directly operate transit services having 100 or more revenue vehicles. In other words, there is no labor-related data for contracted-out services unless the parent public firm or the contractor voluntarily responds (or, in some instances, the contractor is required to file with the NTD under its contract with the public agency). Also the financial data and employment statistics for privately held firms are not publicly available, and almost all the contractors that I contacted over the last two years declined my invitation to participate.

For example, only 11 private contractors filed these two forms (321 and 331) in 1999, the latest year in which the NTD was available when this study started in 2001. Five of those 11 operate in New England and the New York/New Jersey area, and the remaining six are scattered among Texas (2 operators), Colorado (1), Nevada (1), and California (2). Moreover, one of them, Laidlaw Inc., which is under contract with the Regional Transportation District of Denver, Colo., did not file any forms for the NTD Reports for 2000 and 2001; even though it was operating under the same contracts.

After telephone interviews with 25 public agencies and letter and telephone contacts with private contractors, I decided to focus on cases involving five contractors working with four public transit entities,[13] none of which is located in the Eastern U.S. I excluded Eastern U.S. agencies because of different characteristics of the contractors,

[13] The term "entity" was used since two of the four public agencies contracted out all service, and their operation is solely under contracts. And the name of the public agency is generally used for identification to public or/and for receiving funding.

mainly the non-competitiveness of bidding processes[14]. The history of contracting in those cases is generally much longer than other cases and some of them were never under public operation. Moreover, five of them provide service in New York City and the state of New York.

The four case studies are:

- **Case 1: Dallas Area Rapid Transit (contractor First Transit Garfield), and VIA San Antonio**
- **Case 2: Foothill Transit Zone (with contractors Laidlaw and First Transit), Santa Monica's Big Blue Bus, and Los Angeles County Metropolitan Transit Authority**
- **Case 3: Citizen Area Transit in Las Vegas (contractor ATC/Vancom), and the City of Phoenix**
- **Case 4: Houston METRO (contractor First Transit), and Metro Transit in Minneapolis.**

Each case consists of either two different types of transit operations based on the provision of its service or three, if a public agency contracted out some of its service, rather than all. The breakdown is as follows:

- **Group A**: Private companies which won contracts from public agencies.
- **Group B**: Public agencies operating fixed-route buses under similar conditions that did not contract-out in those time periods, which are determined by the contracting cycles of Group A.

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[14] Rather than selected by a competitive bidding process, some of long-history private operators are under franchise agreements, in which the private carrier is given exclusive rights to provide service along a given route. Some researchers argue that without any competition, franchise operators have no incentive to provide cost efficient service (Morlok and Viton 1985).

- **Group C**: Directly operated (not contracted-out) services among fixed-route operators comprising Group A. This type of public agency is also called a "hybrid", and if a public agency that contracts out all its service to private operators, the operator of Group C will be absent.

Group A is the private companies which won contracts to offer fixed-route bus operations. I attempted to select private contractors that have re-bid their contracts at least twice, so that the number of contracting cycles is two or more. Setting this condition serves two purposes. First, it allows the investigation of trends after the renewal of contracts and gives a look at some longer-term effects of transit contracting. Second, it enables examination of whether there is a convergence of compensation packages for public and private drivers. While a private operator may lower its bid price to win a first contract, it is not likely to do so for a renewal, if the price proves to be unrealistically low. Also, at the time of contract renewal, a private operator is probably able to estimate operating costs more accurately, based on experience.

It is important to examine both public and private firms over different time periods to assess the impacts of privatization on transit service employees in both types of organizations. For the comparison, two more categories of transit system will be selected to match with the experimental group: 1) similar agencies which did not contract-out any fixed-route service in the same periods, and 2) the non-contracted services operated directly by the same public agencies which were identified in the first group.

Table 3-2: Three Different Types of Transit Operators in Each Case

Contract %	None	Some	All
Public	Group B	Group C	N/A
Private	N/A	Group A	Group A

Including the group B, "control" organizations in each case study enabled me to separate the effects of privatization from other economic trends that might be influencing the transit industry in particular, or regional economies in general. Also, as McCullough (1997) notes, comparing small private companies with large public transit operators is inappropriate. The time periods to be studied are determined by the services which were contracted-out, so that members of Group B will be studied over time periods determined by the contracting cycles of Group A.

Counterparts to each member of Group A were selected based on their sharing the following characteristics: 1) geographic region, 2) cost of living, 3) union environment, 4) service area, 5) size of operation, and 6) and nature of service such as urban, suburban, rural, express, etc. For example, the counterpart to Foothill Transit Zone in southern California is Santa Monica Big Blue Bus, which serves the same metropolitan area and is a similar size operation.

Table 3-3: Variables used in Selecting "Public Control Operator"

Variable	Description	Source/Level
GEO	Geographical region	City, State, FTA region
COLI	Cost-of-living Index (COLI)	MSA by the ACCRA[15]
UNION	Public unionization rates	State by the Bureau of Labor Statistics
SERV_MIL	Square miles of service area	Service area from NTD Form001
SERV_POP	Population of service area	Service area from NTD Form001
iMVEHOPRT	Vehicle operated in maximum service	NTD Form 406
j_TEXPENSES	Annual operating expenses	NTD Form 301
iVREVHRS	Annual total of revenue vehicle hours	NTD Form 406
i_Unlinked Trip	Annual unlinked passenger ridership	NTD Form 406
SERV_CHA	Same service characteristics	TRB Survey - Urban, Suburban, Rural, Local, Express, Circulation, Downtown/Parking

The third type of transit system, Group C, is composed of directly operated (not contracted-out) services among fixed-route operators comprising Group A, when one

[15] The American Chamber of Commerce Research Association

public agency provides services through both public and private operators. This group will be absent when a public agency contracts all its service out to private operators. For the purpose of comparing wages, fringe benefits, and work rules among public agencies, this group is very useful. Table 4-3 is a summary of 12 selected operators in four case studies. (More detailed characteristics of operators and the selection process for the four cases are discussed in Chapter 4.1.)

Table 3-4: Four Case Studies

Types of Operators	Group A Private company that won contract with Group C	Group B Public agency who did not contract	Group C Public agency with some contracting
Case 1	First Transit at DART	VIA San Antonio	DART
Case 2	1. Laidlaw at Foothill 2. First Transit at Foothill	Santa Monica's Big Blue Bus	LAC MTA
Case 3	First Transit at Houston METRO	Metro Tranisit at Minneapolis	Houston METRO
Case 4	ATC/Vancom at CAT of Las Vegas	City of Phoenix	Not Applied

3.3. Analysis Framework

In order to examine the net effect of contracting on transit drivers, the following questions must be addressed. First, what factors can explain the status of transit bus drivers? Second, from whose point of view should the analysis be done? Third, what is the best measurement of these factors? This chapter addresses these questions as they relate to transit contracting.

3.3.1. From Whose Perspective?

Before discussing what factors can explain drivers' status and how contracting's effect on labor should be measured, I want to address the second question: "from whose

point of view should the analysis be done?" The answer is both management's as well as the employees'. Examining transit workers' status and their work conditions without considering the impact on the efficiency of the transit agency would be pointless.

Certainly, the substantial strength of organized labor in the transit industry compared to other sectors of the economy has brought some high labor costs and inefficiency to the industry. However, labor is not the only source of inefficiency. The unhealthy financial structure of transit agencies has been compounded by the availability of government subsidies and policy-making by elected board members. Expensive governmental polices and programs have led local agencies to focus on financially inefficient goals such as serving the disabled and to pursue capital-intensive transit such as rail in order to qualify for more federal assistance. Moreover, soft budget constraints and the pursuit of politically motivated agendas have led public transit to expand to low-density suburban areas.

Private contractors' actual and expected ability to pay lower wages has always been a key element in pursuing contracting of transit services. However, if contracting's lower wages and budgetary costs do not create any real productivity increases (e.g. better on-time performance, safety records, less spending on non-operating time, etc.), the savings are gained by reducing the labor resources required and worsening labor conditions. Contracting's opponents, who are generally labor supporters, often argue that contracting is an attempt to "turn back the clock" on labor's gains to an era where employees worked long hours for little pay and few benefits (McCullough 1997). Contractors have generally hired their own workforce and paid less than the equivalent wages and fringe benefits at public organizations (Richmond 2000). Since employees of

private contractors are not as likely to be represented by unions, contracting might worsen labor conditions. As Gomez-Ilbanez and Meyer (1993, p.279) pointed out, "the cost advantages claimed for privatization are sometimes transfers from one group to another rather than real resource savings for the economy as a whole" without a productivity increase.

Since both labor and management, including boards of directors, can cause transit agencies' inefficiency, it is critical to examine labor conditions in respect to labor costs and cost-efficiencies of the agency. That is the only way to answer the question of how a transit system can increase efficiency of operation without exploiting transit workers. Also, drivers' wages and benefits packages, as well as costs incurred by following work rules and maintaining certain workplace conditions are confined to one agency. Without a real efficiency gain, what seems like a cost saving is just a transfer from one group to another. Therefore, both elements in labor costs and labor conditions with respect to the efficiency of individual agencies will be examined in this study.

3.3.2. Variables Explaining the Status of Drivers

Various factors can explain the status of drivers. Besides regular wages, employees' compensation packages include fringe benefits such as paid absences and restrictions on work assignments as defined in labor contracts. In this study, four variables - wages, fringe benefits, paid absences, and work rule payments – and detailed items in these four factors will be compared to explain driver's working conditions between publicly and privately employed drivers.

Wages would be the most significant indicator of labor conditions for a driver and labor costs for an agency. Labor contracts of transit service operators include the

maximum wage rates, the rates for part time workers, the increase in rates as length of employment increases, and the like. The wage rates of transit agency employees directly determine production costs.

Work rules are the regulations concerning how work is scheduled, assigned, and performed. They are established to improve working conditions for transit employees, to assure the safety of passengers, and to compensate employees for long work days due to transit service peaking. Contract provisions establish specific work rules such as:

1) maximum length of the work day;

2) minimum time off between shifts;

3) how work is assigned among employees, i.e., straight, split or tripper runs;

4) how employees are compensated, i.e., straight time, overtime, or other premiums;

5) and who within the organization may perform a particular task, i.e., full-time or part-time personnel.

The details of significant work rules for the three groups will be compared. It will allow us to see if there is any relationship between the weakening of work rules and contracting, particularly less stringent rules on split shifts and overtime compensation, and more flexible use of part-time drivers. Also stand-by times for absent drivers are directly related to the inefficiency of an operator. One other critical work rule item related to contracting may be the training time and instructor premium for training if the driver turn-over rates are high.

Fringe benefits are those programs of value to employees that are separate from regular wage compensation. Included are paid vacations, sick leave, health coverage,

retirement plan, uniform allowances, and the like. They accounted for 24.2 percent of all operating costs of all agencies reporting to the NTD in 2000. Only wages accounted for a higher proportion, and fringe benefits have been growing at a more rapid rate. Fringe benefits for workers in the three groups and three time periods will be compared to identify significant and rapidly increasing items.

Work rules cover *absences* (most absences are a part of fringe benefits), which occur when an employee is unavailable for work, whether for scheduled or unscheduled reasons. In the case of scheduled ones such as holidays and vacations, management is informed beforehand, but to cover workers absent for unscheduled reasons management must be able to respond immediately. Thus, an extra group of drivers is usually ready in the case a scheduled driver is absent. This is called stand-by. These drivers generally receive a full day's pay and full fringe benefits; even though they may not drive a bus. These absences have a profound impact on transit productivity and costs.

In summary, driver's compensation is composed of earnings and benefits. Earnings are the sum of 1) basic pay based on hourly rates and work hours, and 2) the payment imposed by driver's work rules (such as premiums, stand-by time, time spent on union functions, etc.). Drivers' benefits include paid absences and other fringe benefits, which an agency either pays directly to drivers or pays to insurance companies or the government (e.g. pensions) on behalf of a driver.

Equation 3-1: Driver's Compensation

- Driver's Compensation = Earnings + Benefits
- Earnings = Basic Pay + Payments Based on Work Rules
- Benefits = Paid Absences + Other Fringe Benefits

In this study, the four factors of driver compensation- wage rates, fringe benefits, paid absences, and work rules - are compared directly in dollar values as well as in terms of unit costs per the service hour. In addition, detailed components of these four, such as insurance costs, holidays, overtime, etc. were analyzed. The definitions of various terms in work rules, fringe benefits, and absences used in the study are explained in Appendix 4.

3.3.3. Ratio of Pay Hours to Platform Hours

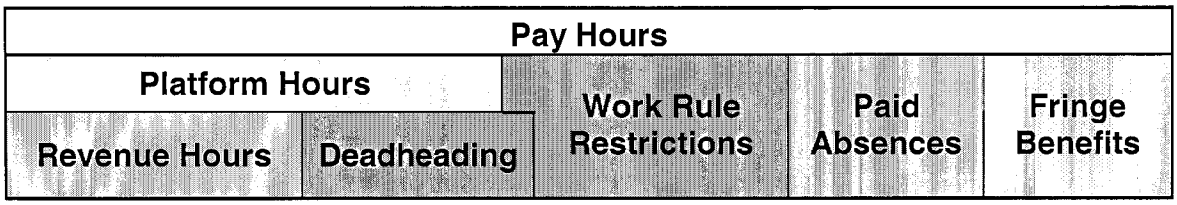
For this study, the "*Ratio of Pay Hours to Platform Hours*" is the measure of labor productivity (or labor utilization) used for examining labor costs and labor conditions of each operator. In this section, I define the ratio of pay hours to platform hours and identify variables included in it. Like other scholars before me, I have tried to answer what inputs and outputs should be included in order to measure transit productivity and efficiency, to address my research questions.

Over the years, various kinds of *productivity and efficiency measures* of transit service (a ratio of input to output) have been developed and used by scholars studying transit performance since federal subsidy programs began in the mid-1960s. An example of these measures includes operating costs per revenue vehicle-hour or -mile, a ratio of revenue vehicle-hours to total vehicle-hours, a ratio of driver pay-hours to vehicle-hours, and the like. Measuring transit productivity and efficiency is critical because it helps managers and policy makers understand how productivity and efficiency are affected by factors such as contracting, federal transit subsidies, and providing elderly and handicapped accessibility.

Usually it takes more than one pay-hour to make one hour of actual revenue service, because a number of contractual restrictions require paying for additional time to

schedule service. The pay-hour figure is the sum of the hours in revenue service to transit users, deadheading, and all other increments for which operators are paid based on work rule restrictions, absences, and fringe benefits. Payment of the platform hours and hours spent due to driver's work rules are paid to a driver as earnings, and there are also benefits. And each item has cumulative impact on the labor-related expenses of a single agency. The following bar (Figure 3-1) summarizes the driver pay hours of an agency and the labor-related costs and hours are broken down and quantified into four categories.

Figure 3-1: Breakdown of Drivers' Pay Hours



- Pay hours consist of all hours for which a driver is paid. In addition to platform hours, there are hours for other activities associated with revenue service. And there are hours paid for overtime, health plans, holidays, vacations, illnesses and the like.
- Platform hours consist of the time an operator is on board the bus, either preparing for service, carrying passengers in line service, or deadheading.
- Deadheading consists of the miles and hours that a vehicle travels when out of revenue service. Deadheading includes leaving or returning to the garage or yard facility, changing routes, and operating the bus at any other time that there is no reasonable expectation of carrying revenue passengers. It is included in total vehicle miles and hours, but not in total revenue vehicle-miles and -hours.
- Revenue vehicle-hours consists of the time that a vehicle travels in revenue service. It includes layover periods that the driver spends in the vehicle at resting points.

Deadheading falls under both platform hours and work rule restrictions because work rule restrictions are classified into both revenue and non-revenue operations (mainly administrative functions). For example, the layover periods in the vehicle at a resting point are classified as platform hours, while some travel time to or from an operating station to a relief point of a cover falls under work rule restrictions.

Pay hours consists of all hours for which a driver is paid including not only the non-revenue operating hours such as time spent deadheading, traveling to a starting point, reporting/turning-in, waiting in split-shifts, and standing-by in case of absences, but also hours for other activities associated with revenue service such as health plans, holidays, vacation, sick leave, etc. The ratio of pay hours to platform hours measures labor utilization efficiency: the higher the ratio, the higher the unit cost; thus it is also an indicator of labor productivity.

The concept of using this labor productivity measure to calculate the impacts of labor contract provisions on transit operators' efficiency was first used by Mundle et al. (1990). Using a similar measure of labor utilization efficiency (the ratio of driver wages to total revenue vehicle-hours), McCullough, Taylor, and Wachs (1998) found this variable to be the second strongest predictor of cost efficiency.

To account for variables explaining labor costs and labor conditions, the ratio has been developed a little further. I have broken down and quantified all labor expenses incurred by drivers (which are summed as an agency's spending on driver compensations) and dollars into four categories of pay hours: platform hours, work rule restrictions, fringe benefits, and paid absences. For unit comparisons, I will convert the monetary number into hour-equivalents for operators, which is the total cost divided by

average platform cost per platform hour. Then, the ratio of each categorized hour—work rule restrictions, fringe benefits, absences and total pay hours—to platform hours for each year for all the cases will be calculated to analyze the changes in the utilization and the productivity of labor operation and management of each firm and to identify the convergence of compensation packages of public and private companies.

Equation 3-2: Calculation of Ratio of Pay Hours to Platform Hours

As seen in Figure 3-1, drivers' total pay hours are divided into four categories; platform hours, work rules, paid absences and fringe benefits. Then, let j denote the item in pay hours, and item j such as platform hours, overtime (among work rules), sick leave (among paid absences), health plan (among fringe benefits) are members of $\boldsymbol{J}$.

Set $\boldsymbol{C}_j$: Agency's spending on item j, $j \in \boldsymbol{J}$, and

$\boldsymbol{H}_j$: Equivalent pay hours for item j, $j \in \boldsymbol{J}$.

Then, let r denote the average hourly rate ($/hour) and is defined as platform costs per platform hours and we can write

$$r = \frac{\boldsymbol{H}_p}{\boldsymbol{C}_p}$$

where $\boldsymbol{H}_p$ is platform hours and $\boldsymbol{C}_p$ is platform costs.

And by definition, $\boldsymbol{H}_j = \frac{\boldsymbol{C}_j}{r}$ for all j. Consequently, we get the ratio of each pay hour j to platform hours as

$$\boldsymbol{R}_j = \frac{\boldsymbol{H}_j}{\boldsymbol{H}_p} = \frac{\boldsymbol{C}_j}{\boldsymbol{C}_p}, \quad \text{or all } j$$

Thus, we conclude that overall labor utilization, defined as *Ratio of Total Paid Hours to Platform Hours* is

$$\boldsymbol{R}_{Total} = \sum_{j \in J} \boldsymbol{R}_j = \frac{\sum_{j \in J} \boldsymbol{H}_j}{\boldsymbol{H}_p} = \frac{\sum_{j \in J} \boldsymbol{C}_j}{\boldsymbol{C}_p}$$

Note that the ratio of categorized hours to platform hours *actually compares costs*, rather than hours, of payments based on driver's work rules, fringe benefits and paid absences to the unit costs of producing platform hours. For example, if the ratio of work rules to platform hours is 0.5 for Hamlet Agency, the costs of driver's work rules are one-half of platform costs. In other words, to produce one platform hour, this agency paid drivers a half of an extra hour worth of money arising from work rules. It also means that one third of a driver's earnings in this agency are payments based on work rules since earnings are the sum of basic pay for working platform hours and payments based on work rules.

3.3.4. Average Platform Costs per Platform Hours

To capture the hours of work rules, fringe benefits, and paid absences equivalent to the money spent on each item, average platform costs per platform hour are used for unit comparison. Developing a new indicator of unit costs, *average platform dollars per platform hour*, gives us two advantages in researching contracting as well as transit performance.

First, it represents the generalized hourly wages of one agency. Despite the intuitive logic that predicts the effect of wage differences on decisions as well as cost-savings of contracting, no studies have been able to fully test this effect, because of the limited availability of data on wage levels in individual agencies. Obtaining wage rates has been one of major difficulties in studies of transit contracting, since the only way to do so is to examine the labor contracts of each agency and its union or, in cases where there is no union, to interview drivers. Some previous studies tried to use proxies taken from the wage rates reported by the U.S. Department of Labor's Bureau of Labor

Statistics for local government transportation workers and private school bus drivers, delivery drivers, and the like (Luger and Goldstein, 1989). Only some case studies (Herzenberg, 1982; Richmond 2001) have documented the actual wages differences between public and private drivers.

The *average platform costs per platform hour* is a way to represent average hourly rate for only drivers in individual agencies and thus identify one of the most critical data elements missing in most transit performance and transit contracting research. The numerator, platform dollars, includes the basic hourly pay of each driver. It does not include other costs, including labor costs for premiums and fringe benefits, salaries for administrative staff and support workers such as mechanics, as well as other operating expenses for fuel, supplies, utilities, maintenance, interest, taxes and the like.

The denominator, platform hour, is the time drivers spent in the vehicle. It does not include any report time, turn-in time or non-operating work time such as student training time, accident reporting time, time spent on union functions, and the like. Platform hours do not double-count any premium or overpay hours.

This unit cost can be a generalized wage rate because it is the average for one agency, weighted not only by the work hours of each driver, but also by the mix of drivers. It accounts for the different work hours and wage rates of each driver with respect to part-time or full-time work, seniority, and different labor agreements. Even in the same agency, the wages of drivers differ on the basis of how many hours they work as well as their rate of pay. For example, Joe, a part-time driver hired to reduce the morning/afternoon peaks and working only five hours a day, earns much less compared to John, a 12-year, full-time driver working eight-hour days.

Table 3-5: Example of Accounting for an Operator's Time and Costs

Example: A Hamlet Transit Agency bus operator earns $10.00 per hour and works 9 hours, composed of the following:

- 5 minutes of report time and 10 minutes of turn-in time.
- 8 hours and 45 minutes of platform time of which 8 hours is platform time at regular pay, 30 minutes is scheduled overtime at time-and-a-half, and 15 minutes is unscheduled overtime at time-and-a-half plus a $0.20 per hour premium for late-shift work.
- Overtime and shift premiums are paid at one-half the base wage rate.

Actual Work Hours	Dollars	Hours
Report/Turn-in Time of 15 minutes = 0.25 hrs* $10 per hour	$2.50	0.25 hours
Platform time of 8 hours and 45 minutes =8.75 hrs * $10 per hour	$87.50	8.75 hours
Total overtime premium of 45 minutes: i) Scheduled Overtime of 30 minutes ii) Unscheduled Overtime of 15 minutes =0.75 hrs *0.5* $10 per hour	$3.75	0.75 hours
Shift Premium of 15 minutes =0.15 hrs * ($0.20 per hour +$10 per hour)	$1.30	0.25 hours
Total Paid Operating Work Time	$95.05	10 hours

Source: *1998 National Transit Database Reporting Manual* by FTA

As seen in the example, a Hamlet Transit Agency bus operator earns $95.05 for 9 hours of work, rather than $90. Notice that the average platform hours per platform costs is still $10 per hour even though a driver receives $10.56 per hour ($95.05/ 9 hours) for this day. The difference of $7.55, ($95.05 of the total paid work time minus $87.50 of platform hours) is caused by work rules.

Also, the total hours of operating work time is not the sum of actual hours, since the work time under premiums is double counted, once in the line of platform hours and once for each premium. To avoid this double-counting of some work rule items, the dollars due to work rules are converted into hour-equivalents, rather than using reported hours in NTD Form 321, in the calculation of the ratio of work rule hours to platform hours.

The degree of seniority that drivers at an agency have is a critical factor affecting labor costs since seniority-based wage increases can be substantial. Furthermore, drivers' hiring dates can affect their wages, because they might fall under different contracts. In the average platform cost per platform hour, the different work hours of each driver are weighted by the denominator, and the different wage rates are weighted by counting both a numerator and a denominator for each driver.

In addition to providing access to previously unavailable data on transit agency wages, this measure of platform cost per platform hour has a second advantage, more narrowly related to my study. This generalized wage rate can be used to convert dollars into hour-equivalents for fringe benefits, paid absences, and work rules for individual agencies, which is the cost of each item in pay hours divided by average platform cost per platform hour.

3.3.5. Significance of Drivers' Work Rules in Transit Operation

Transit system operations in general require unique work schedules of vehicles and vehicle operators to accommodate peaking, as do other transportation modes. And driver's governing work rules are very complex and constraining. An individual agency has different sets of work rules based on labor contract agreements between the union and its management or custom. Some work rules such as 30-minute layover periods during a run, meal allowances and breaks, overtime as half of regular pay, etc., are similar across all bus operators.

For example, in the Hamlet agency, maximum work time is 8 hours 15 minutes daily, meaning work that exceeds this threshold is considered overtime. The minimum paid number of hours is 8 hours. So if a driver's run on a certain day was 7 hours and 45

minute, the 15 minutes short of minimum paid hours is added as a minimum guarantee to make his/her paid hours come to 8 hours.

Typically, an operator (driver) will be scheduled to drive a route in the morning hours and return to drive another route later in the afternoon or evening hours. First, he/she will report to work at an operating station (or garage), obtain instructions for the run from a dispatcher, and locate the vehicle to operate (the report time). And he/she will depart from the operating station to a starting point of a certain route (deadhead from depot) and perform a scheduled service (revenue service). During his/her daily run, the driver will take breaks between trips (the platform layover time as well as other breaks) and meal breaks.

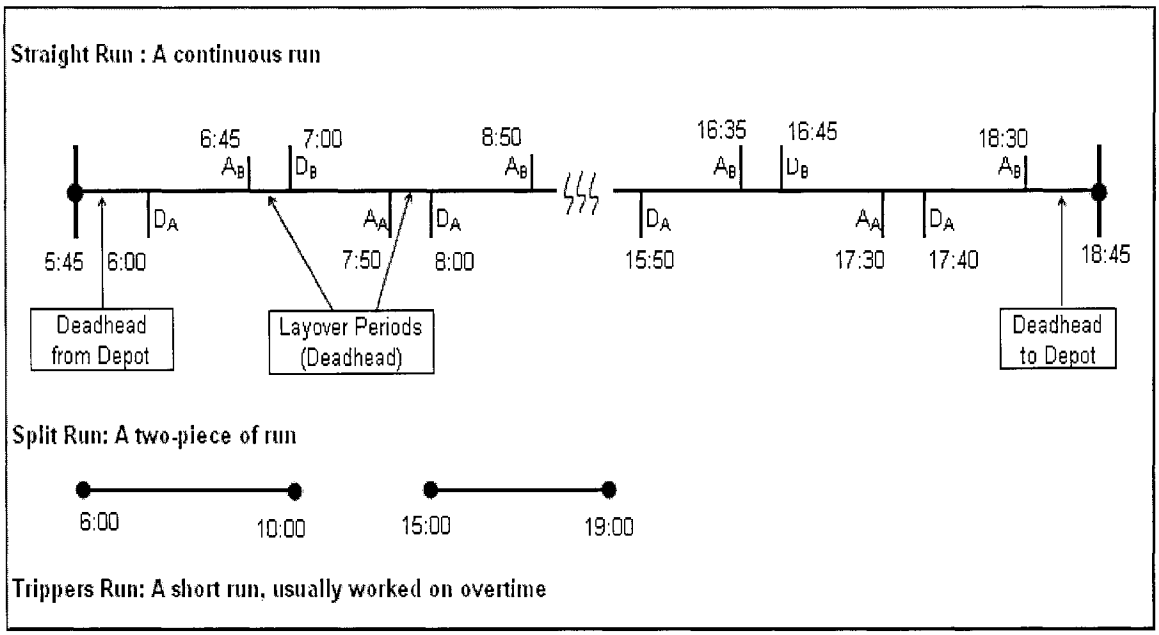
If the driver is scheduled to drive another route in the afternoon, he will drive to the starting point of that route (deadhead). Later, he will return the vehicle to the garage (deadhead to depot) and report back to dispatcher at the conclusion of its run (turn-in time). In the case that a driver's work starts or finishes at a point other than operating station such covering other driver due to the absence or accidents, he/she will be paid traveling time between the operating station and the relief point (travel time).

There are different types of duties: straight, split, and trippers as seen in Figure 3-2. A straight run is a continuous working schedule of a driver within a day, just like a regular job. A split run and a tripper are any piece of non-continuous runs, in order to accommodate daily peaking.

Related to different types of runs, the spread-time is the time between the time that the driver first reports and the driver's last release from duty. Drivers working more than specific hours receive "spread-time premiums". In Figure 3-2, both the straight run

and the split have a spread of 13 hours. If the agency's threshold for spread premiums is 10 hours, a driver who works the straight 13 hour run in Figure 3-2, will be compensated for eight hours at the regular rate, two hours at the overtime rate, and three hours premium due to the over-spread hours. A driver who operates the split run, such as in Figure 3-2, would also receive a "spread time premium" for the three hours of no-work in spite of working only eight hours. The threshold of a spread varies from one agency to another (usually 10 to 14 hours a day).

Figure 3-2: Different Types of Runs



Generally, overtime is the work time in excess of eight hours in any day and is compensated at one and one-half the rate of regular pay. But a driver's work hours in excess of the scheduled time of a regular run (i.e. the time exceeds a spread-time threshold) are also considered overtime. Since drivers are paid weekly, management compares the overtime in excess of 40 hours in one week and the weekly sum of the time in excess of a spread-time daily for each driver. Some agencies compensate whichever is shorter for a driver; while other agencies pay the greater of one or the other. And one

agency may have more than one threshold for spread or overtime as well as associated rates. For example, the time exceeding 10 hours is compensated at a rate of an extra 50%, and the time exceeding 11 hours is paid at a rate of an extra 100% of regular pay. Holidays and Sundays may have a different threshold for spread.

A driver who works in early morning or late night shifts (sometimes working Sundays or holidays) can receive a shift premium in addition to regular pay. There is also a six-hour safety rule that a driver must take at least six hours off between the scheduled finishing time of one day and the scheduled starting time of the next day's work.

Table 3-6: Definitions of Key Drivers' Work Rules Used in This Study

- **Report/Turn-in Time**: The time taken by a driver to report to the dispatcher, obtain instructions for the run, locate the vehicle and depart the operating station or dispatch point to undertake the run (report time); return of vehicle at the conclusion of its run (turn-in time).
- **Paid Breaks and Meal Allowances**: Break time other than platform layover time and intervening time, and allowances for company paid meals.
- **Travel and Intervening Time**: The time spent in traveling between the operating station and the relief point (travel time), and for the incidental time between any two pieces of a run (intervening time).
- **Minimum Guarantee**: The small amount of non-work time for which a driver will be paid in order to meet the guaranteed minimum for the number of hours for a day or a week
- **Overtime Premium**: The bonus above straight time pay
- **Spread-Time Premium**: The bonus above straight time pay for hours worked after a specified number of hours from the start of the operators' day.
- **Shift Premium and others**: The bonus above straight time pay for the time during the day that is subject to special pay differentials (shift premiums) and any operating time
- **Stand-By Time**: The time an operator spends at the operating station, at the transit agency's direction awaiting assignment of a piece of work.
- **Other Non-Operating Paid Work Time**: The time an operator spends on the job in a capacity other than operating or stand-by time. This includes, but is not limited to: Instructor premium for operator training, student training, accident reporting, witnessing, union functions, run selection, transportation administration, revenue vehicle movement control, ticketing and fare collection, and customer service.

Source: Based on *1998 National Transit Database Reporting Manual* by FTA

The importance of drivers' work rules in transit operations cannot be emphasized enough, with respect to both labor costs and labor conditions. First, they were established to improve working conditions for transit employees, to assure the safety of passengers—stemming from the practice by transit operators in the beginning of the last century of using low-wage immigrant operators who drove without layovers or breaks between shifts—and to compensate drivers for long work days due to transit service peaking. In the early days of transit, poorly paid immigrants worked in the horse-drawn omnibuses for 14 to 16 hours per day under abusive conditions, and transit companies suffered from low morale and had trouble keeping quality employees (McCullough 1998).

In general, transit drivers work very long hours and have very irregular schedules while punctuality is strictly enforced. Many have to report to work before 4 o'clock in the morning to start the work day for morning peak runs and they sometimes must work at night in dangerous neighborhoods. Driving a transit bus is repetitive but stressful and sometimes dangerous. Transit drivers experience higher rates of cardiovascular disease, hypertension, gastrointestinal, and musculoskeletal problems than other workers with similar skills (Carrere et.al., 1991).

Second, significant portions of drivers' earnings come from payments for drivers' governing work rules, about 15% to 30%. Change in any work rules defined in labor contracts is not an easy task and may bring labor opposition and even a grievance filing since they are a critical source of drivers' income.

Third, work rules are hard constraints in transit scheduling and also indications of the degree of inefficiency stemming from excessive practices such as paying a spread-time premiums for non-work hours, stand-by hours, the restrictive use of part-time

employees during peak periods, the restriction on interlining routes, cash-out periods, and so on.

Almost all work rules are absolutely necessary, but we do not always know how constraining they are. Some of the rules, such as those governing breaks and meal allowances, became fixtures across operators, while others are not necessarily relevant to the original goals of ensuring the safety of passengers and drivers nor suited to today's transit reality. Moreover, we can show they are the roots of some inefficient transit operations regarding drivers as well as the locations and structures of routes and garage, and scheduling. For example, poor scheduling of drivers and buses, whether imposed by inefficient management or restrictive work rules, would cause more operating costs arising from extra report and turn-in time as well as more minimum guarantee, etc.

The common practice of paying spread-time premiums for non-work hours during split runs and tripper runs, and paying minimum guarantees where a driver is scheduled to work a shorter-day, but is paid extra to meet to eight-hour minimum work schedules, have been criticized as imposing excessive labor costs on the transit agency for time that drivers are not working. From the management point of view, all of those pay hours due to restrictive work rules are inefficient above a certain level. On the other hand, labor views them as the compensation for inconvenient and irregular schedules for drivers.

And the biggest constraints in scheduling vehicles and drivers are the practice of a driver's bidding for the selection of work and work rules based on seniority rating. Regular drivers are able to bid on their runs, hours, days-off, position on the stand-by lists, and other assignments quarterly in some agencies, every six months at others, based on their ratings and classification with their agencies. Then they know what time they

will start work, how long the off-duty break will be, and what time they will finish. Some of the most senior operators are able to choose work that consists of consecutive assignments and work a straight eight-hour run. However, the number of those assignments is low compared to the overall number.

The non-regular drivers (e.g. probationary, part-time drivers, etc.) are those who have not achieved regular operator status and they are more likely to work on other than straight runs. They must endure the inconvenience and unpredictability of a varying and inconsistent work schedule because they are scheduled to fill in, as needed, with little notice. Their total hours per week could range from 20 to 60 depending on workload availability. Turnover among these drivers is much higher than that of regular drivers and the recruitment and retention problems of these drivers are ubiquitous (Arbitration Ruling 2000).

Driver absenteeism is a chronic problem as well. It causes significant payments for stand-by time as well as more payments for traveling time and overtime premiums of cover drivers. An extra group of drivers is usually ready at the operating station to cover drivers absent for unscheduled reasons. These stand-by (or cover) drivers generally receive a full day's pay, even though they may not drive a bus. If a cover driver fills in for an absentee in places other than operating stations, an agency will pay travel time to/from the relief point.

In addition, some work rules ensure that drivers will be paid during the time spent on the job in a capacity other than operating. These times are categorized as a non-operating work time, which includes instructor premium for operator training, student training, accident reporting, witness, union functions, run selection, transportation

administration, revenue vehicle movement control, ticketing and fare collection, and customer service.

Work rules governing the use of part-time drivers are also critical to transit operation. Although the use of part-time drivers is absolutely necessary to meet the needs at peaking, work rules may constrain management's flexibility in using them. According to NTD, 11% of employees working on vehicle operations are part-time (among agencies who reported in Form 406) during 1999 to 2001, while they perform 6% of works (hours). A part-time driver is usually assigned to weekday peak hour trippers and many agencies' collective bargaining agreements prohibit or limit a part-time driver from working other than these tasks. The contract provisions at some agency even include the caps on part-time workers' 1) work hours 2) pay rates in terms of percentages of full-time drivers' level, and/or 3) the allowable percentage of the workforces.

The relaxation of many of these work rules should improve the efficiency of transit operations. Therefore, expenses and hours paid for work rules should be emphasized as the indicator of true labor inefficiency, rather than as an indicator of working conditions.

Among the ratios to platform hours of the four categorized hours (overall, fringe benefits, paid absences and work rules), the importance of the ratio of work rules to platform hours should be noted. Lower ratios of work rules to platform hours indicate more efficient operations and better labor utilization. If the hypothesis is true that the private sector may provide service with more flexible work rules and enjoy real efficiency gains from contracting, then less money and fewer hours should be allocated to work rules to produce service hours.

3.3.6. Breaking Down the Steps to Calculate Labor-Related Hours

To examine trends in labor costs and conditions, including wages, fringe benefits, and work rules, the labor utilization measure of "Ratio of Pay Hours to Platform Hours" is developed in the study. Other key indicators concerning labor costs and conditions are used to compare public and private operations. For the construction of the ratio of pay hours to platform hours and the calculation of other key indicators, the following steps will be taken for each operator.

Step 1. The common unit costs, *operating costs per revenue vehicle-hour* (and *labor costs per revenue vehicle-hour) are* calculated for each firm based on NTD Forms 301 and 406.

Step 2. The time and hours of *wages* and *work rules* (based on NTD Form 321) are classified and broken down into details.

Step 3. The *average platform costs per platform hour* is calculated for each operator, and will be used for 1) an indicator of wage rates of drivers and 2) converting the monetary number into hour-equivalents.

Step 4. Expenses of *fringe benefits* and *paid absences* (based on NTD Form 331) are broken down and converted into hours.

Step 5. *The number of full-time and part-time drivers* (based on NTD Form 404) are calculated for each firm.

Step 6. *Annual earnings and benefit packages per drivers* are calculated based on data from Step 3 to Step 5

Step 7. *The level of deadheading* (based on NTD Form 406) is calculated for each firm, examining vehicle utilization as well as restrictions on work rules.

Step 8. *The ratios of each categorized hour to platform hour* for each year for all cases (based on the data from Step 2 to Step 4) are assembled and calculated.

As an example of breaking down labor-related expenses and calculating the ratio of labor utilization, I compared the public transit system that contracted-out, the Metropolitan Transit Authority of Harris County (as known as Houston METRO), in Houston, Texas, and its private contractor, First Transit, Inc., in the year 2000. This is an example of the comparison of an entity from Group A and Group C, with the purchased transportation operation and the in-house operation within the same public agency.

In Table 3-7, *wages* and *work rules*[16] are broken down into the following details.

Table 3-7: Decomposition of Wage and Work Rules

	Houston METRO		First Transit (Houston)	
	Dollars	Hours	Dollars	Hours
Platform Time				
Line Service	37,606,098	2569,000	4,057,328	418,356
Charter and Special Service	947,610	64,734	29,702	3,052
Subtotal	**38,553,708**	**2633,734**	**4,087,030**	**421,408**
Operating Paid Work Time				
Report, turn-in time	0	0	181,147	19,312
Travel and intervening time	290,888	204,923	0	0
Minimum guarantee time	2,656,251	181,458	7,549	803
Overtime premium	6,850,009	632,923	365,589	78,477
Spread time premium	0	0	0	0
Other operating time	0	0	43,225	4,661
Subtotal	9,797,148		597,510	
Non-Operating Paid Work Time				
Stand-by time	473,828	32,369	200,444	21,472
Other non-operating work time	4,045,895	276,389	707,631	80,183
Subtotal	4,519,723	308,758	908,075	101,655
Total Operating Paid Work Time	52,870,579		5,592,615	

Source: Based on and modified from the NTD Form 321, in 2000

[16] The definitions of various terms in breakdowns of work rules, fringe benefits, and absences are explained in Appendix 4.

Scheduled and unscheduled *absences* will be analyzed in following manner.

Table 3-8; Breakdown of Absences

	Dollars	Hours
Vacations Holidays		
Sick leave		
Others		
Total		

And the next Table 3-9 is breaks down expenses and converts hours of *fringe benefits* except paid absences.

Table 3-9: Decomposition of Fringe Benefits

	Houston METRO		First Transit (Houston)	
	Dollars	Hours	Dollars	Hours
FICA or railroad retirement and/ or PERS	10,787,345	736,920	829,030	85,480
Pension and long-term disability insurance	9,709,584	663,294	0	0
Health insurance	5,517,330	376,907	858,626	88,532
Dental plan	263,361	17,991	0	0
Life insurance plan	1,193,458	81,529	0	0
Short-term disability insurance plan	0	0	0	0
Unemployment insurance	309,035	21,111	135,095	13,929
Workers' compensation insurance or Federal Employee Liability Act Contribution	259,314	17,715	932,994	96,200
Uniform and work clothing allowances	895,161	61,151	152,274	15,701
Other fringe benefits.	16,210,979	11,07,427	100,785	10,392
Total	45,145,567	3,084,046	3,008,804	310,234

Source: Based on and modified from NTD Form 331 for 2000.

Table 3-10: Dollars and Time Spent on Each Pay Hour

	Houston METRO		First Transit (Houston)	
	Dollars	Hours	Dollars	Hours
Platform hours	38,553,708	2,633,734	4,087,030	421,408
Work Rules Restrictions	14,316,871	1,328,062	1,505,585	204,908
Fringe benefits	45,145,567	3,084,046	3,008,804	310,234
Absences	19,789,589	1,351,894	205,140	21,152

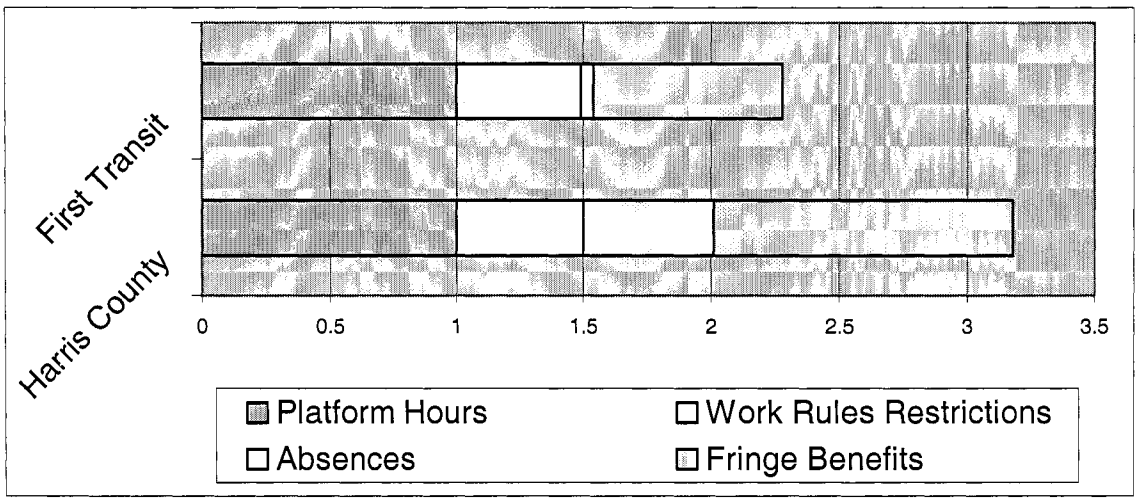
For converting the monetary number of these into hour equivalents for each operator, the average cost per hour for each operator will be calculated based on platform hours and platform hours' cost. Here, the average cost per hour of Firm 6008 is $14.64 ($38,553,708 divided by 2,633,734 hours) and Firm 6087's is $9.70 ($4,087,030 divided

by 421,408 hours) in Table 3-10. Thus, the equivalent hours are calculated from each cost item divided by average cost per hour. After breaking down all labor-related expenses, I will calculate the ratio of each categorized hour to platform hours for each year for all cases to analyze the changes in labor utilization and to identify the convergence of compensation packages of public and private companies. The bar measure like Figure 3-3 will be presented for the detailed years and firms.

Table 3-11: Examples of Ratio of Pay Hours to Platform Hours

	Platform Hours	Work Rules Restrictions	Absences	Fringe Benefits	Total Paid Hours
Houston METRO	1	0.5	0.51	1.17	3.18
First Transit	1	0.49	0.05	0.74	2.28

Figure 3-3: Examples of Labor Dis-Utilization Ratio Bar



According to the ratio of labor utilization, both operators appear to have almost the same ratio of work rule restrictions to platform hour. However, absences differ significantly between Houston METRO and its contractor, First Transit. The ratio of fringe benefits to platform hours of this public system is greater than one. It indicates that the public operator paid more in fringe benefits than wages in this year. Overall ratios of total pay hours to platform hours are 2.28 for the contractor and 3.18 for the public bus

system. This means that the contractor paid less money to operate an hour of actual service. According to this example, the contractor is clearly utilizing its workforce more efficiently than the public operator.

3.3.7. Other Key Indicators Included in the Study

Besides two prime indicators, the ratio of pay hours to platform hours and the generalized wage rates, several other supplementary indicators concerning labor costs and labor conditions are compared to understand better the comparisons between publicly and privately operated firms and their drivers. The terms, Directly Operated (DO), and Purchased Transportation (PT), describe a public agency's in-house operation and what an agency purchases.

Operating costs per revenue vehicle hour is probably the most frequently used performance measure for the cost-efficiency of a transit system. This operating unit cost is defined as total operating expenses per revenue vehicle-hour. Both the denominator and numerator are available for both in-house operations as well as purchased transportation for all operators who filed with the NTD; therefore, this operating efficiency indicator is calculated for DO, PT, and the system total for each agency, if applicable. The calculation of this measure (and hourly labor costs) only goes back to 1995, due to changes in the NTD form for filing operating expenses.

The other unit cost, labor cost per revenue vehicle-hour, is also calculated for two reasons. First, this hourly labor cost provides the general labor cost-efficiency as well as the percentage of labor costs, if compared to operating costs per revenue vehicle-hour. Secondly, this unit cost takes into account one of the labor costs missing from the primary indicator, the ratio of pay hours to platform hours, since the numerator here

consists of wages (salaries) of drivers, salaries for all other employees, and fringe benefits for all employees. This unit cost is available only for DO and the private contractors who filed separately from their mother agency.

There are two different ratios of fringe benefits to platform hours for all operators. The term, "fringe benefits," in this study excludes items associated with absences, except as otherwise specified (such as the second ratio discussed in this section). The first ratio is based on ***annual fringe benefits (excluding paid absences) for all employees (in all modes)*** for breaking out detailed itemizations of each categorized hour, such as pension/retirement plan, health and dental plan, insurance, etc. The other ratio is based on the ***aggregated annual fringe benefits (including paid absences) of drivers***. To answer the research questions in this study, the second ratio, using *fringe benefits for drivers only*, must be used. But only the aggregated amount of these fringe benefits is available for each operator, meaning the detailed information such as health plan or insurance costs are unknown. Therefore, I decided to use both, and estimated the breakdowns of items in fringe benefits and paid absences of drivers (see more details of estimations in Chapter 6).

Annual dollars of earnings and benefits per driver are calculated. The primary indicator, the ratio of fringe benefits and paid absences to platform hours, does not give us a sense of the monetary value of benefits packages for each driver, while it shows how much more one agency paid for benefit packages to produce one unit hour. Perhaps, actual dollars of earnings and benefits per worker is a more direct and correct indicator of labor conditions for transit drivers.

However, I am very reluctant to use these measures primarily for two reasons. First and most important, the high turnover rate of drivers in the transit industry in

general makes it difficult to achieve an accurate count of the number of drivers at one agency, which makes the NTD's employee statistics unreliable. The NTD reporting manual instructs filers to report an actual person count of employees (full-time or part-time, permanent or temporary) who hold approved and filled positions *at the end of the fiscal year* (NTD 1998). The number is just a snapshot of one agency's employment at one moment in the year, because it does not account for driver turnover or layover at one agency.

The second reason for my reluctance to use any measure based on employee statistics is that I could not develop any formula that would account for part-time workers in a way that I could analyze their labor conditions and costs. Each operator has a different share of part-time workers, which affects costs for wages and fringe benefits differently. The major distinctions between full-time and part-time workers are that 1) part-time workers work less than the local definition of full time, and 2) these persons are not provided with the full benefits package (e.g., sick leave, vacation, and insurance benefits) associated with full-time employment.

The wages of part-time workers are determined by 1) basic wage rates and 2) the hours she/he works. Their benefits are determined by the specific provisions in individual agencies' labor contracts. I could neither collect all this information on each operator, nor develop a way to account for all this information, which is the critical part of my study. This problem should not be underestimated since part-time workers not only are paid lower wages than full-time workers, but, more importantly, receive much smaller benefits packages—sometimes, none at all. Therefore, any measure that uses the number of drivers is a secondary indicator in my analysis.

Fortunately, most operators in the cases I examine, and, more importantly, the private contractors, employ a relatively low percentage of part-time workers, under 10%, except in the case of VIA and Metro Transit, which are still under 25%. Overall private contractors have fewer than 3% of their workforce as part-time, which also has critical implications (which will be discussed later in my analysis). Any dollar amounts (of wages, fringe benefits, or paid absences) per drivers are exaggerated in those agencies which have a lower percentage of part-time workers than those with higher percentages, since the figures are not weighted to reflect full- and part-time shares.

The level of deadheading, the ratio of total vehicle hours to total vehicle revenue-hours, is also a well-known measure of vehicle scheduling utilization as well as restrictions based on work rules. High levels of deadheading are caused not only by driver work rules, but also badly located depots, poor scheduling routines, and a dispersed service area. Work rules may prohibit the interlining of routes or limit the use of part-time employees for peak period service, thus interfering with a scheduler's ability to develop cost-efficient runs (McCullough, 1997). More details on time classifications regarding deadheading and work rules are described in Appendix 3.

3.4. Limitations of the Study

In my analysis of the impacts of contracting-out on labor-related costs and conditions in the transit industry, comparing especially public agencies and private firms before and after contracting-out, I will focus on contracting-out the operation of *fixed-route bus* transit service rather than rail and demand-responsive services for the following reasons. First, in the U.S., where this study takes place, nearly all rail services are directly operated by public agencies. Second, agencies contract-out most demand-responsive

services mainly because many public transit agencies do not have much expertise in its provision.

The scope of this study leaves out the demand side of transit service, the transit users. I mainly address the supply side, both agency management and employees, by examining efficiency (operating costs, labor costs, and labor productivity) and labor conditions. Also I tried to take into account the perspectives of other key players acting on or affected by contracting-out policies, such as transit agency boards of directors, local politicians and taxpayers; even though they are directly examined .

Also in this study, the analysis focuses only on aspects relating to operating efficiency and productivity under contracted-out operation and public operation. In other words, service quality and other equity issues are not addressed.

The biggest limitation of this study is the small size and bias of the samples, due to the need to use case studies. All four cases studied represent some of the biggest privatization efforts in the U.S.; thus, they are not a good representation of general bus contracting practices in the U.S. For example, in 2000, 160 public transit agencies were involved in roughly 400 bus contracts, each one averaging 20 vehicles and $2,750,000 in contracting costs. However, for the four cases, the average for a contract is about 157 vehicles and $22,100,000. Since the cases in this dissertations include all possible private contractors in the U.S. for which data is available (besides New England and NY/NJ area, which were omitted for reasons previously discussed), it is hard to correct for this limitation.

The other limitation of this study lies in the need to use data about breakdowns in fringe benefits and paid absences of all staffs and all modes rather than those of bus

vehicle operations, in other words, the drivers (although the data for platform hours/costs and hours/costs spent on work rules are based on drivers). The reason for not using fringe benefits for drivers is that they cannot be broken out in detail, although the aggregate values for drivers can be calculated and have used to estimate the breakdowns.

CHAPTER 4. UNIT OPERATING COSTS

Although each case in this study tells a unique story, there are several characteristics observed across all four, which include five private contractors, three in-house public operators, and four public control agencies. In the following four chapters, I try to synthesize the findings from the individual case studies with respect to three different types of operators: private contractors, public control operators, and public in-house operators.

The next four chapters are organized into discussions of the following aspects of these operators' practices: 1) unit operating costs, 2) earnings for drivers, including wages and payments arising from drivers' work rules, 3) driver benefits, and 4) labor utilization in terms of the ratio of drivers' pay hours to platform hours.

In this chapter, profiles of the fixed-route bus operators included in this study, and their unit operating costs, in terms of operating expenses per revenue vehicle hour, are discussed as background.

4.1. Profiles of Operators

Twelve bus operators are included in the four cases in this study. Each case consists of either two different types of transit system based on the provision of its service or three, if a public agency contracted out only some of its service. Group A is made up of private companies that won contracts from public agencies. And Group B and Group C are public bus operators. In particular, Group B is the controls, public agencies operating fixed-route buses under conditions similar to their counterpart Group A, but that did not contract out. Group C is the directly operated services (no contracting)

among bus operators comprising Group A. For example, among all bus operation of DART, the contracting portion provided by First Transit belongs to Group A, and the non-contracting portion are included in Group C. And if a public agency that contracts out all its service to private operators, the operator of Group C will be absent for a certain case. Some characteristics of three groups of these 12 operators in four cases and their service area are summarized in Table 4-1.

The first case is Dallas Area Rapid Transit (DART) in Texas and its contractor First Transit Inc. DART has contracted out some part of its service since its establishment in 1994, and First Transit has (in most respects) been awarded the contract since the beginning. For the comparison of the operation of First Transit at DART, VIA Metropolitan Transit at San Antonio was selected as a control operator. VIA San Antonio is the only transit system in a Texas metropolitan area in that does not contract out its bus service. (It does contract for demand-response services.) Naturally, for the in-house operation comparison, the in-house operation of DART was studied.

All three operators provide similar kinds of service: buses that run on urban and suburban routes as well as express and downtown circulators; additionally, DART's heavy rail, commuter rail, and high occupancy vehicle (HOV) lanes have drawn much local and national attention. Under its contract with DART, First has also provided local, suburban, downtown, express, and urban circulator bus service.

In the terms of the size of operation, revenue vehicle hours as well as the number of vehicle operated in maximum service of VIA is similar to those of the in-house operation of DART itself rather than those of First at DART. However, in terms of budgets and service consumption, DART has a much larger scale of bus operation,

almost twice the operating expenses and over 25 million more annual passenger unlinked trips than VIA. The time period of analysis in this case study is between FY1993 to FY2000 and part of FY2001.

The second case is Foothill Transit Zone in southern California. It is unique among the cases because management and operations are both under contract and have been since its establishment; as a result, there are no actual employees. ATC (formerly Forsythe & Associates) has held the contract for management and administration since Foothill was founded in 1988. Operations have been under contract to two private operators, Laidlaw, Inc. and First Transit, Inc. (formerly Ryder/ATE).

In this case study, Santa Monica Municipal's Big Blue Bus was selected as a control group because this operator has been frequently considered Foothill's opposite in terms of a transit model. Both Foothill and Santa Monica are regarded as the municipal bus operators that provide service in Los Angles area independently of the Los Angeles County Metropolitan Transportation Authority (MTA). They each have relatively similarly sized operations in terms of peak vehicles as well as similar operating costs.

For the in-house operation that Foothill could be compared to, the Los Angeles County Metropolitan Transportation Authority (MTA) was the obvious choice. Actually, Foothill contracted out its all service, which means there is no in-house operation; however, before the establishment of Foothill, service was provided by SCRTD, now the MTA. LAC MTA is one of the five largest transit systems in the United States. In revenue vehicle hours, it is more than 10 times larger than the two Foothill operators combined and has almost nine times as many peak vehicles. The time period covered by the analysis is part of FY1995 to FY1998 and the entire period from FY1999 to FY2001.

Table 4-1: Characteristics of Bus Operators Included in the Study (2001)

	Group	Company	City	ST	UZA Ranking	Union Member	COLI	Service Area (Sq miles)	Service Area Population	Number of Peak Vehicles	Annual Unlinked Trips (1000)	Modes
CASE 1												
	C	Dallas Area Rapid Transit Authority	Dallas	TX	6	6.5	98	689	1904330	441	75,481	Bus, DR, LR, CR
	A	First Transit, Inc. (DART)	Garland	TX	6	6.5	98	689	1904330	247	13,470	Bus
	B	VIA Metropolitan Transit	San Antonio	TX	30	6.5	85	1234	1358087	420	49,981	Bus, DR
CASE 2												
	A	Laidlaw (Foothill)	West Covina	CA	2	18.8	135	292.5	1344166	115	44,499	Bus
	A	First Transit (Foothill)	West Covina	CA	2	18.8	135	292.5	1344166	118	53,022	Bus
	B	Santa Monica Municipal	Santa Monica	CA	2	18.8	135	51.4	458506	138	22,533	Bus, DR
	C	Los Angeles County MTA	Los Angeles	CA	2	18.8	135	1423	8450001	2026	336,309	Bus, LR, HR
CASE 3												
	C	Metropolitan Transit Authority of Harris County	Houston	TX	10	6.5	92	1285	2632241	1050	99,183	Bus, DR, Vanpool
	A	First Transit (Houston)	Houston	TX	10	6.5	92	1178	2457673	131		Bus
	B	Metro Transit	Minneapolis	MN	16	18.3	106	1105	2256442	792	73,348	Bus
CASE 4												
	A	ATC/Vancom, Inc	Las Vegas	NV	31	16.7	105	542.2	1110642	231	51,380	Bus, DR
	B	City of Phoenix Public Transit Department	Phoenix	AZ	13	6.6	96	476	1350000	286	36,534	Bus, DR

All statistics in this table are from NTD in FY 2001, otherwise specified.
The population ranking out of serving UZA (Urbanized Area) designated by the U. S. Bureau of the Census in 2000.
The unionization membership by state is based on the Bureau of Labor Statistics in 2002 and refers to a percentage of employees represented by a union including members of a labor union as well as workers who report no union affiliation but whose jobs are covered by a union or an employee association contract.
The cost-of-living index (COLI) of the American Chamber of Commerce Research Association is from the third quarter 2002.
Modes : DR (Demand Responsive Service), LR (Light Rail), HR(Heavy Rail), and CR (Commuter Rail).

The third case is Citizen Area Transit (CAT) in Las Vegas and its contractor ATC/Vancom, Inc. The entire operation of CAT is run under the largest private bus operating contractor in the United States. This case is particularly unusual for two reasons. First, it has always been operated privately, even though ownership was transferred to a public agency in the early 90s. The other aspect that makes it unique is the unusual service environment of Las Vegas, where there are significant demands from tourists day and night. Tourist traffic is concentrated on the 301 routes that serve the Las Vegas Strip. They run 24 hours a day and are critical a source behind CAT's high cost-efficiency and farebox recovery ratios, which are among the best industry.

Since CAT contracted out all service to private operators, Group C is absent, while the control is the City of Phoenix Public Transit Department among Valley METRO in Arizona. Actually, the City of Phoenix contracted out some of its service to Laidlaw as well as the Regional Public Transportation Authority (which is the local MPO). But since no other operator in Nevada and Arizona has similar characteristics, the City of Phoenix was chosen as the control counterpart of CAT's contractor, ATC/Vancom. ATC and the City of Phoenix have similar size service areas, and operations, in terms of peak vehicles and operating expenses. But the service consumed (unlinked trips) and the service supplied (revenue vehicle hours) are much larger for ATC. The time period of analysis in this case study is between FY1995 to FY2001.

The final case is the Metropolitan Transit Authority of Harris County (METRO), in Houston, Texas, and its contractor, First Transit at Houston. The METRO transit system is composed entirely of bus-based operations including 150 local, express, park &

ride, downtown circulator, and cross-town bus routes with more than 1,000 vehicles. About 10 to 15 percent of its operation is under contract.

Naturally, the in-house operation of Houston METRO was chosen as Group C. On the other hand, it was very difficult to choose the control operator for Houston METRO. There is no possible choice among operators in the same state because most operators in Texas have contracted out some of their service to private contractors. Moreover, with the exception of DART, which has already been selected in this study, there are not even agencies of similar size to Houston METRO in the same FTA region, which is made up of Texas, Oklahoma, New Mexico, Louisiana, and Arkansas.

So I decided to look for Houston METRO's control among the largest 15 bus operators in the United States, since Houston METRO is one of them. Eight operators were eliminated from consideration, since they had contracted for bus service. The remaining seven were compared to Houston METRO based on the sum of residual squares of the following nine factors: geographical region, cost-of-living index (COLI), unionization rates, infrastructure (vehicles operated in maximum service), total operating expenses, service supplied (annual revenue vehicle hours), service consumed (annual unlinked passenger trips), service area characteristics (the ratio of revenue vehicle miles to revenue vehicle hours) and the type of service provided. Using these criteria, I chose Metro Transit in Minneapolis as the control. The time period covered by the analysis in this case study is part of FY1995 to FY1997 and the entire period from FY1998 to FY2001.

Table 4-2: Selection of Houston METRO's Control Operator[17]

Company	CITY	ST	Bus Contracting	UZA Rank	COLI	Union Member	Number of Bus	Operating Expenses (000)	RVH (000)	RVM/ RVH	Unlinked Trips (000)	Service	Residual Sum of Squares
Houston METRO	Houston	TX	✔	10	94	6.5	1181	$188,842	3,060	14.3	99,183	Bus, DR, Vanpool	0
Metro Transit	Minneapolis	MN		16	102	18.3	792	$185,396	1,840	13.7	73,348	Bus	268.1
King County DOT	Seattle	WA		14	115	20.0	976	$253,523	2,470	13.4	72,257	Bus, Trolley, DR, Vanpool	4828.2
Port Authority Allegheny	Pittsburgh	PA		22	110	16.6	848	$198,536	2,260	13.1	66,022	Bus, DR, Light Rail	609.2
Washington-Metro	Washington	DC		8	123	17.8	1212	$329,000	3,247	11.2	142,648	Bus, DR, Heavy Rail	20626.7
Chicago Transit Authority	Chicago	IL		3	105	20.6	1627	$523,014	6,406	10.0	301,691	Bus, DR, Heavy Rail	112089.3
New York City Transit	New York	NY		1	225	26.5	3387	$1,410,982	12,781	7.9	926,018	Bus, DR, Heavy Rail	1511890.3

Residual Sum of Squares of i operator = $\Sigma i\ (\mathbb{Y}i - \mathbf{Y}_{\text{Houston METRO}})^2$

$= (\text{Diff. UZA Rank})^2 + (\text{Diff. COLI})^2 + (\text{Diff. Union Memberships})^2 + (\text{Diff. Number of Bus /100})^2 + (\text{RVH/100000})^2$

$+ (\text{Diff. Operating Expenses / 1000000})^2 + (\text{Diff. RVM/RVH})^2 + (\text{Diff. Unlinked Trips/ 10000000})^2$

for each 6 operator.

[17] The source of this table is the same as Table 4.1.

A crucial obstacle to making comparisons among the different cases is discrepancies in the datasets as a result of operators reporting data for differing time periods. The data for several private operators are incomplete for certain years during the study period, which creates gaps in the comparison matrix of years and operators in Table 4-3. Only recently, most private contractors of this study started to file NTD (National Transit Database) reports. I determined where comparisons for private contractors could be made based on a case-by-case evaluation of the availability of the data. For example, even though the two Foothill private contractors started operation in the late 1980's, they have only filed NTD reports since 1998 for most data and since 1999 for labor-related data. Similarly, First Transit at Houston METRO started to file NTD reports in 1997. First Transit at DART did not file labor-related data in 2001.

In Table 4-3, a matrix of studied time period, the dark shaded cells indicate where data are not available. The light shaded cells represent where only partial information is available (for operational and expenditures data, but not labor-related data).

Table 4-3; Matrix of Years and Operators Based on the Data Availability

YEAR	1993	1994	1995	1996	1997	1998	1999	2000	2001
Group A : Private Contractors									
First (DART)	Partial	Partial	All	All	All	All	All	All	Partial
First (Houston)					Partial	All	All	All	All
First (Foothill)						Partial	All	All	All
Laidlaw (Foothill)						Partial	All	All	All
ATC/Vancom (Las Vegas)			All	All	All	All	All	All	All
Group B: Public Control Operators									
VIA San Antonio	Partial	Partial	All	All	All	All	All	All	All
Metro (Minneapolis)			All	All	All	All	All	All	All
Santa Monica			Partial	Partial	Partial	All	All	All	All
City of Phoenix			All	All	All	All	All	All	All
Group C: Public In-House Operators									
DART	Partial	Partial	All	All	All	All	All	All	All
Houston METRO			All	All	All	All	All	All	All
LAC MTA			Partial	Partial	Partial	All	All	All	All

It must be also noted that the 12 bus operators encompassed by this study may not be representative of the general practice of bus transit contracting in the U.S. For example, the sample is heavily biased toward large operations. With the exception of Santa Monica, the six public agencies included here are among the top 25 bus operators in the U.S. in terms of revenue vehicle hours. In addition, the public operators' combined averages are influenced by the weighting of the Los Angeles County MTA, which is two to four times as large as the other public operators.

In addition, all five contracted-out operations are located in the southwest and west, and are among the largest private operations in these areas, along with San Diego Transit, Denver RTD, and City of Los Angeles. At four out of the five private contractors (the exception of Laidlaw at Foothill Transit), drivers are represented by nation-wide unions; which differs from small-scale bus contractors elsewhere, where unionization is uncommon.

4.2. Operating Cost Per Revenue Vehicle Hour

The purposes of this chapter are 1) to provide background information about unit operating costs for operators and cases included in this study, and 2) to showcase and explain the analysis and methodology that I used in the next several chapters.

I begin by describing the various transit agencies statistically to show how cost efficiency varies among three different types of operators. However, this comparison does not directly examine the net effect of contracting on cost efficiency since I did not control for other influential factors[18]. For the first step of analysis, the common cost-

[18] While contracting seemed to have some impact, we must not forget that there are many dimensions affecting cost efficiency, and these factors influence one another. In the past, a number of

efficiency indicator, *operating cost per revenue service hour* is compared for all 12 operators in Table 4-4, including five private operations, four public control operations and three public in-house operations. All dollars are indexed to inflation and expressed in 2001 dollars. Also the trends at individual agencies during the studied years are illustrated in Figure 4-1 by each case and the weighed average of three types of operators.

Also in the bottom of Table 4-4, descriptive statistics such as weighted averages, arithmetic average, and variances are compared for three different groups of operators. In addition, the results of ANOVA and the Wilcoxon two-sample tests for the weighted average of 12 operators are also compared to examine the values in these groups are from the same pool. While ANOVA tests the hypothesis that means from two or more samples are equal (drawn from populations with the same mean), the null hypothesis of the latter is that the populations from which the two samples are taken have identical median values. Lower p-values of both tests, such as less than 0.05; indicate that means or medians of each group are more likely to differ.

The Wilcoxon two-sample test is also called the rank sum test or the Mann-Whitney test. It is a non-parametric statistical test, which does not need to know the distribution of the data. This test is much more sensitive than the two-sample Student t-test, especially for small numbers with unknown distribution. However, it has little power

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variables were used in the analyses to explain cost efficiency, and they differ significantly. They include internal factors and operating characteristics of transit agencies (e.g. size of operation, peak to base ratio, vehicle scheduling, labor utilization, RVM/RVH, input price, type of agency, and the like) and external or environmental characteristics (e.g. service area population, density, cost of living, unionization rate, climate, topography, and the like). Among the numerous studies on cost efficiency of transit, there are about six regression studies (Pucher, Markstedt, and Hirschman 1983; Perry and Babitsky 1986; Shughart and Kimenyi 1991; McCullough, Taylor, and Wachs 1998; Nicosia 2001; Iskei 2004) that have included a variable related to contracting, but there have bee inconsistent findings about its economic effects. Among the six studies mentioned above, Pucher, Markstedt, and Hirschman (1983) and Nicosia (2001) concluded that contracting reduces the cost to produce transit service, while other four studies did not find that contracting resulted in improved cost efficiency.

when the total sample size is seven or less, such as the comparison between Group B (four operators) and Group C (three) throughout the study. In this case, the test always gives a P value greater than 0.05 no matter how the groups differ. The following three individual Wilcoxon two-sample tests are performed for medians of each group;

1) between Group A and Group B – private contractors versus public controls;

2) between Group B and Group C – public controls versus public in-house; and

3) between Group A and Group (B+C) – private versus all public operators.

The test between Group A and Group C is not performed in most cases, since the magnitude of the difference between these two groups is generally larger than the others. Although it is not appropriate to perform several Wilcoxon tests, comparing two groups at a time when there are more than three groups (generally the Kruskall-Wallis or ANOVA are used in that case), the scope of each individual test, such as comparing private contractors and public operators, is more proper in the context of this study. Similarly the same tests are performed throughout the study for the weighted average of other measures, such as drivers' hourly rate, drivers' paid absences, and so on.

Clearly, private contractors operated more cost-efficiently than public agencies among operators included in this study. All private contractors ranked at the bottom at this unit cost. And one public control operator, VIA San Antonio, had similarly low unit costs. On average (in terms of 2001 dollars), operating costs per RVH at private contractors were about $52 with a standard deviation of $7.85, while they were about $92 for public agencies with a much larger deviation of $20. Among public operators, LAC MTA and DART, both public in-house operations, have exceptionally high operating costs per RVH, fluctuating around $100 over the years.

Table 4-4: Operating Costs per Revenue Vehicle Hours in 2001 Dollars (1995-2001)

Group	Operator	Operating Costs Per RVH ($ per Hour)		Revenue Vehicle Hours	Operating Expenses
		Average	2001	Average (1000 hrs)	Average ($1000)
CASE1					
C	DART (DO)	$102.75	$99.84	1,465	144,198
A	First (DART)*	$64.03	$53.39	641	33,714
B	VIA San Antonio	$52.23	$54.94	1,387	71,723
CASE2					
A	Laidlaw (Foothill)**	$44.06	$44.80	374	16,016
A	First (Foothill)**	$55.55	$52.48	365	12,079
	Foothil Total**	$63.65	$64.24	600	36,976
B	Santa Monica (DO)	$66.82	$67.64	437	25,573
C	LAC MTA (DO)	$108.05	$98.84	6,065	757,436
CASE3					
C	Houston METRO	$74.86	$62.03	2,696	189,732
A	First (Houston)*	$52.22	$49.62	226	16,056
B	Metro (Minneapolis)	$93.98	$100.78	1,840	162,062
CASE4					
A	ATC (Las Vegas)	$46.79	$48.91	1,207	47,752
B	City of Phoenix (DO)	$84.89	$104.31	654	56,306

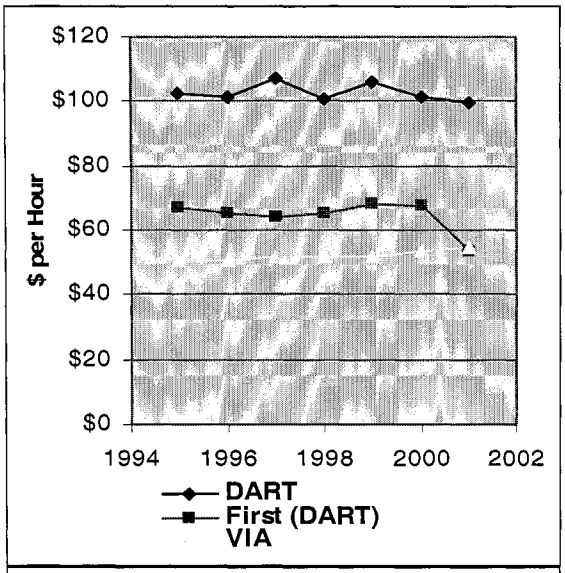
All data are from NTD and calculated by author.
The average of each operator is a weighted average across years.
* the average from 1997 to 2001. ** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.
The operating expenses of Foothill Total include expenses reported by two private bus operators as well as other expenses of bus operation reported by Foothill itself.

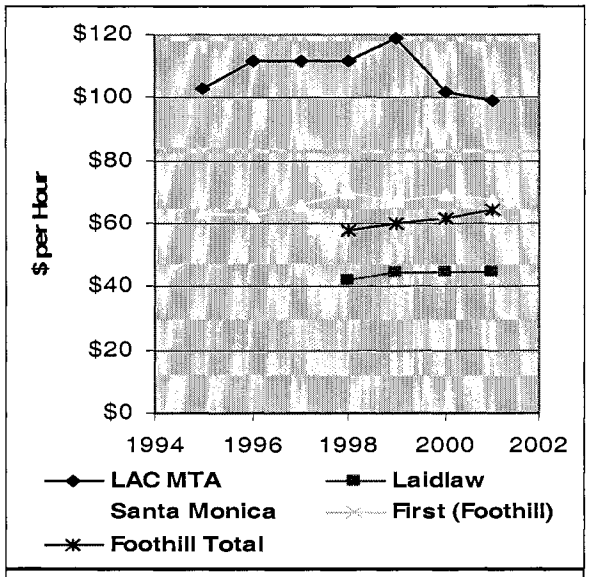
Group		*Observations*	*Weighted Average*	*Arithmetic Mean*	*Variance*
Private Contractors	Group A	5	$51.93	$52.53	61.566
Public Agencies	Group B + Group C	(7)	$92.40	$83.37	402.549
- Control	- Group B	4	$76.29	$74.48	347.430
- In-House	- Group C	3	$98.96	$95.22	317.836
Difference					
Public – Private	Group (B+C) – Group A		$40.47*	$30.84	
Control – Private	Group B – Group A		$24.36**	$21.95	
In-House – Control	Group C – Group B		$22.67***	$42.69	

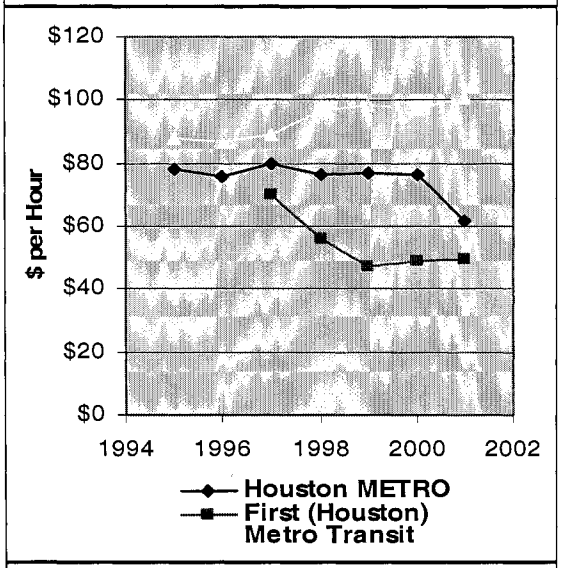
The p-value of ANOVA (Group A, B and C) is 0.009242[19].
Ttwo-tail exact p-values of the Wilcoxon Two-sample Tests : * p =<0.0090, ** p <=0.0466, and ** p<= 0.1984.

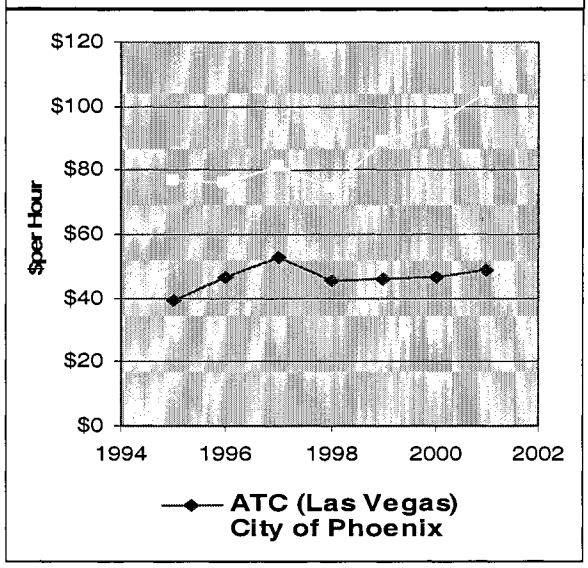
[19] The results of ANOVA are in Appendix 6.

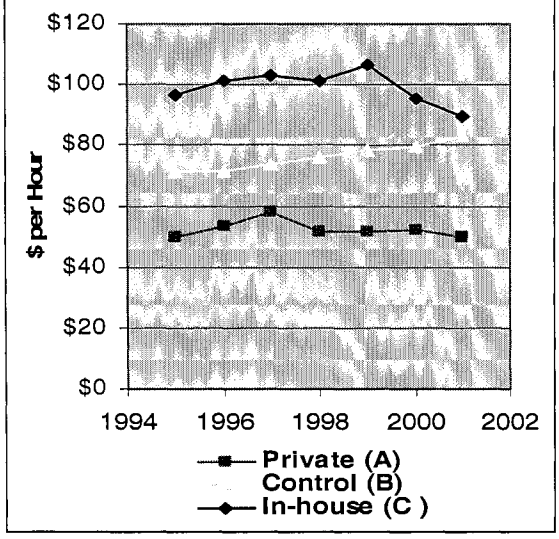
Figure 4-1: Trends of Operating Costs per RVH (1995-2001)









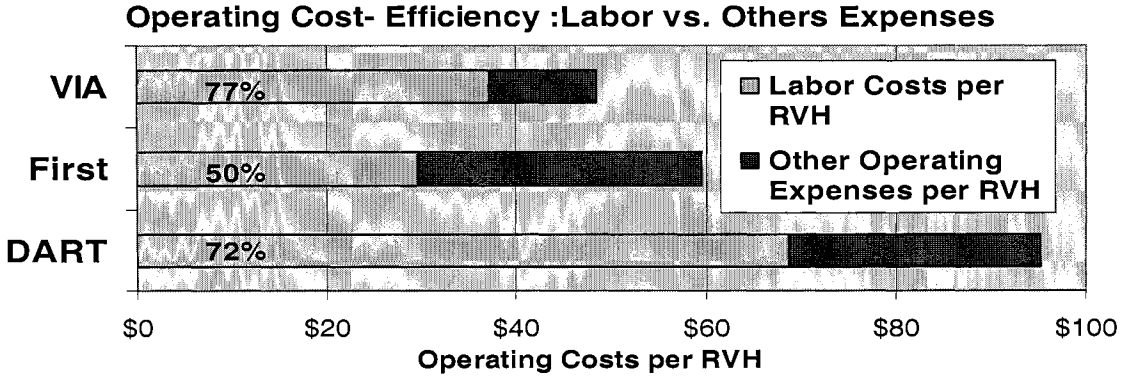


Note: All data are calculated by author from the National Transit Database.

Operating cost efficiency and its trends at several operators are worthy of more exploration. First of all, VIA San Antonio displayed the lowest operating costs per RVH among all public operations at $52. Unlike other cases, hourly operating costs of private contractors at DART (First Transit), in all years in the time frame (the mean of $64 during 1995 to 2001) have always been more expensive than those at public control counterpart, except 2001, the year of renewal with DART. On the other hand, DART, with a mean of $102, is much more expensive than VIA even though the size of in-house operations of DART and VIA is similar.

Not only does VIA have lower hourly costs than the other four operators in Texas, including two of the private contractors, but VIA also displayed substantially low hourly costs for factors such as fuel, materials, maintenance, administration, and other support items among operating expenses.

Figure 4-2: Percentage of Labor Costs in Operating Cost Efficiency : DART, First and VIA



As seen in Figure 4-2, VIA always has the highest share of labor costs in its operating expenses, an average of 77% over seven years, compared to 72% at DART and 50% at First Transit, in spite of the lowest hourly costs among the three; indicating its lower efficiency of its labor relative-efficiency and much higher relative-efficiency of other factors. For these factors, VIA's hourly costs are only $12 (the second lowest

among the 12 operators in this study) and accounted for less than one-quarter of hourly operating costs overall, which were $52. On the other hand, its labor cost per RVH is higher than all five private contractors' in this study.

While Santa Monica's hourly operating cost ($67 in 1997-2001) is $10 to $20 more than those for the two private operators at Foothill, they are similar to those for Foothill Total, which include the costs of two bus operation contractors (Laidlaw and First) as well as other expenses (related to bus) reported by the management contractors (ATE, formerly Forsythe & Associates). The additional costs were billed to ATE, and they account for normal administration costs as well as the "transaction costs" incurred, when a public agency draws up requests for bids, evaluates them, negotiates contracts, and, especially, monitors contracts with private providers. When these costs are included, the actual difference in hourly costs between Santa Monica Municipal and Foothill is about $3.

On average, LAC MTA has the highest hourly costs ($108.05 from 1995 to 2001)—$64, $53 and $41 higher than Laidlaw, First and Santa Monica, respectively. However, its operating costs have trended downward rapidly following 2000, especially after a strike and a new labor contract, when its hourly costs fell $17 in one year.

The fact should be noted that the MTA's high hourly operating costs reflect several unique circumstances stemming from the MTA's regional prominence that create a burden. The MTA's operating costs include significant security costs incurred not just because of a higher crime rate in inner-city Los Angles as opposed to Santa Monica, but also because the MTA pays for its own security by hiring private contractors. By contrast, Santa Monica relies solely on the local police force. Additionally, MTA's costs of

procurement are charged directly to its budget, whereas Santa Monica receives them at no charge from the local city government (Richmond 2001) and does not report them as costs.

At a mean of $47 (always less than $50 per hour over seven years), the hourly costs of ATC/Vancom at Las Vegas are lower than those of operators of similar size: the City of Phoenix, VIA San Antonio (both Group B) and DART (Group C). However, these unit costs constitute only ATC's billing and indeed exclude other expenses paid by its parent agency, the Regional Transportation Commission (RTC) of Southern Nevada. These separate RTC expenses include not only costs for planning and administration (advertising, service quality monitoring efforts, servicing fareboxes and security cameras), but also the cost of bus fuel, which is uncommon.

The bus operations of the City of Phoenix (the control of ATC) also displayed noticeable trends of operating cost-efficiency. During the studied period from 1995 to 2001, its operating costs per RVH of the in-house operation went up by almost by 36% (from $77 to $104). This change is the biggest increase among all operators. In 2001, the year following a strike, these skyrocketing hourly operating costs made Phoenix the most costly among all 12 operators.

While operating unit costs of all operators have gradually increased over the years, to different extents, there are a few exceptions. The private operator at Houston METRO is probably the only operator that displayed a trend of constant decline in hourly operating cost. From 1997 to 1999, operating costs per RVH of First (Houston) dropped by more than 25%, from $70 to $50; while they went up during the last two years of the

contract (the renewed contract started in 2002). In 2002 (outside of the time frame), its hourly costs again have dropped from $50 to $48.

The in-house operation of Houston METRO also shows a notable trend, a 21% decrease, especially in 2001 which had a drop of $12 in one year, mainly due to savings from reimbursement of insurance costs, and other transfers of expenses. In addition, its hourly cost for factors other than labor is the lowest among all operators, only $2 per RVH on average (ranging $7 to $10 during the seven-year study period).

Like First Transit at Houston, other private contractors' hourly operating costs showed a tendency to drop after contract renewal. First Transit at DART displayed a gradual increase in hourly operating costs from 1996 to 2000, and then a rapid fall in 2001, the first year of renewal. Also ATC's hourly costs decreased from $53to $45 after renewal in 1998.

Overall three different types of bus operators displayed very distinctive operating cost-efficiencies as observed in Table 4-4. In general, the average operating costs per RVH of private contractors (Group A) is $40 below the average of all public operations (Group B and Group C). On average, Group A shows the lowest hourly operating costs, followed by Group B and Group C. Also the difference of hourly operating costs between two types of public operators (Group B and Group C) is smaller than the difference between each group and Group A. In other words, the difference between privatized operations and in-house operations by public agencies is greater than that between privatized operations and public operators in the control group: average hourly costs of $47 versus $24

As seen in the result of ANOVA, the variability between groups is about twice larger than the variability within groups. Especially the variance of Group A is much smaller than those of the two other groups, indicating private contractors of various characteristics have similar operating cost-efficiencies, in contrast to public agencies.

As seen in the last graphs in Figure 4-1, average hourly operating costs of Group C have decreased by 8% from 1995 to 2001; while they have increased at the other two groups. Especially, the MTA, the most costly operator in the study, improved its hourly costs after the 2000 strike, lowering them to under $100. On the other hand, the average of Group A showed almost no change in hourly operating costs, after adjusting inflation, in contrast to a rapid rise of 17% at Group B. Overall, difference between Group A and Group C has been narrowed, while one between Group A and Group B have been widened much substantially.

During the studied time period, public agencies who contracted out clearly showed much more substantial decreases in operating unit costs, especially compared to those who did not. The difference in hourly operating costs between in-house operation and the total operation (in-house and private operation combined) at public agencies who contracted out some parts of their service – Group C versus the total of Group A and C – gave us the simple idea of how much private contractors lowered overall hourly operating cost at public agencies[20], which varies immensely depending on the size of operation at both public and private, as well as their cost-efficiency. In the case of DART, the private operation lowered its total combined hourly costs by almost $10. This led to the greatest

[20] Numerous studies in the past argued over methodology (marginal costs versus fully allocated costs) and which cost-items should be included, to measure how much cost-savings are incurred by private contracting. In this study, I compared the simple differences in hourly operating costs between public in-house and the total at an individual agency, which does not answer directly this question of cost-savings, but rather gives the idea of the degree of the impact on hourly costs that private contractors can have.

reduction among the cases, because the private bus operation represents 30% of DART's total revenue vehicle hours. Other cases showed average differences between in-house operation and the total operation, of $1.60, $2.00, and $2.80 at Houston METRO, City of Phoenix, and the MTA, respectively.

Summary of Operating Costs per RVH

Overall, bus operations under public management have been less cost-efficient than those under private management among operators included in this study from 1995 to 2001 ($92 an hour versus $52, on average). One major exception is VIA San Antonio, one public transit agency which not only has lower hourly operating costs than the other four operators in Texas, including two of private contractors, but also displayed substantially low hourly costs for factors other than labor such as fuel, materials, maintenance, and administration. Also Santa Monica displayed relatively similar hourly operating costs to overall Foothill operation.

Private contractors' lower hourly costs and their cost-savings might have been exaggerated in some degree. Private contractors' reported operating costs sometimes did not account for the administrative costs of management, transaction costs due to contracting, or even costs for fuel, and billed to parent entities, such the regional planning agency (the Regional Transportation Commission (RTC) of Southern Nevada for ATC at Las Vegas), the management contractor (ATE for Foothill Transit Zone), or public agencies (DART, City of Phoenix, etc.). If these costs are directly billed to private contractors, their hourly operating costs might go up $10 to $20; then they would be similar to some public control operators such as VIA San Antonio and Santa Monica.

In general, hourly operating costs of public in-house operators in this study are almost $100, much higher than those of public controls (by 48%) and private contractors (by 30), which support findings in previous literature (McCullough 1997, Iseki, 2004) on the self-selection bias that larger and more expensive transit operators are more likely to contract out some of their service. However, hourly unit costs of public in-house operators have decreased by 8% during 1995 to 2001, compared to those at public control (an increase of 17%) as well as private operators (an increase of 0.2%). Again, this finding suggests that competition and the threat of privatization may bring concessions of hourly costs in the public sector.

CHAPTER 5. DRIVERS' WAGES

Various items can be used as proxies for the economic well-being of drivers, but the most direct one is wages. In this chapter, I compare three different components of drivers' wages. In the first section, I examine average hourly wage rates of transit operators, expressed by an individual operator's average platform costs per platform hour. Secondly, supplementary payments due to drivers' work rules are estimated from the ratio of hours of work rules to platform hours. Lastly, average annual driver earnings are calculated as an agency's total spending on drivers' salaries divided by the total number of full-time and part-time drivers.

Before proceeding, let's clarify the definitions and the scope of wages discussed in this chapter. According to the U.S. Department of Labor, the definition of wages is

> "hourly straight-time wage rate or, for workers not paid on an hourly basis, straight-time earnings divided by the corresponding hours. Straight-time wage and salary rates are total earnings before payroll deductions, excluding premium pay for overtime and for work on weekends and holidays, shift differentials, and nonproduction bonuses such as lump-sum payments provided in lieu of wage increases. "

On the other hand, the definition of earnings is

> "Remuneration (pay, wages) of a worker or group of workers for services performed during a specific period of time. The term invariably carries a defining word or a combination; e.g., straight-time average hourly earnings. Since a statistical concept is usually involved in the term and its variations, the producers and users of earnings data have an obligation to define them..... (The) average (earnings) is usually the arithmetic mean; that is, total earnings (as defined) of a group of workers (as identified) divided by the number of workers in the group."

Besides basic pay based on his/her hourly rate, a driver receives additional payments arising from his/her work rules such as premium pay, and other pay differentials, as stated in pay hours of drivers in the methodology. In this study, the

terms "hourly wage rate" or "annual basic pay" are used to represent the former (wages), while the term "earnings" of drivers is used to represent the sum of basic pay and additional payments resulting from work rules.

5.1. Drivers' Hourly Rates – Basic Pay

First, drivers' hourly wage rates at the individual operators are estimated based on average platform cost per platform hour. In the measure, the different work hours of each driver as well as the mix of drivers are weighted as discussed in Chapter 3.3.4. The denominator, platform hours, is the sum of the time that each driver spent in the vehicle, and the basis of drivers' work schedules. The numerator, platform dollars, is the sum of the basic hourly pay for all drivers. The different wage rates of each driver with respect to part-time or full-time work, seniority, and different labor agreements are weighted by counting the numerator, and the denominator.

Equation 5-1: Estimated Hourly Rates of Drivers

Let r denote the average hourly wage rates of drivers, expressed by platform costs divided by platform hours for operator i

$$r_i = \frac{H_{pi}}{C_{pi}}$$

where H_p is platform hours (the sum of the time each driver spent in the vehicle), and C_p is platform costs (the agency's spending on basic pay for all drivers).

Average hourly wage rates of drivers at 12 operators over the period studied are compared in Table 5-1 after adjusting for inflation. The lowest five, on average, are at the private operators. In general, drivers at private contractors received about $10 to $11 per hour (in 2001 dollars), while those at pubic agencies received about $16 to $17 per hour.

These differences between privately hired drivers and their public peers are statistically significant.

Table 5-1: Estimated Hourly Rates of Drivers: All Cases in 2001 Dollars (1995-2001)

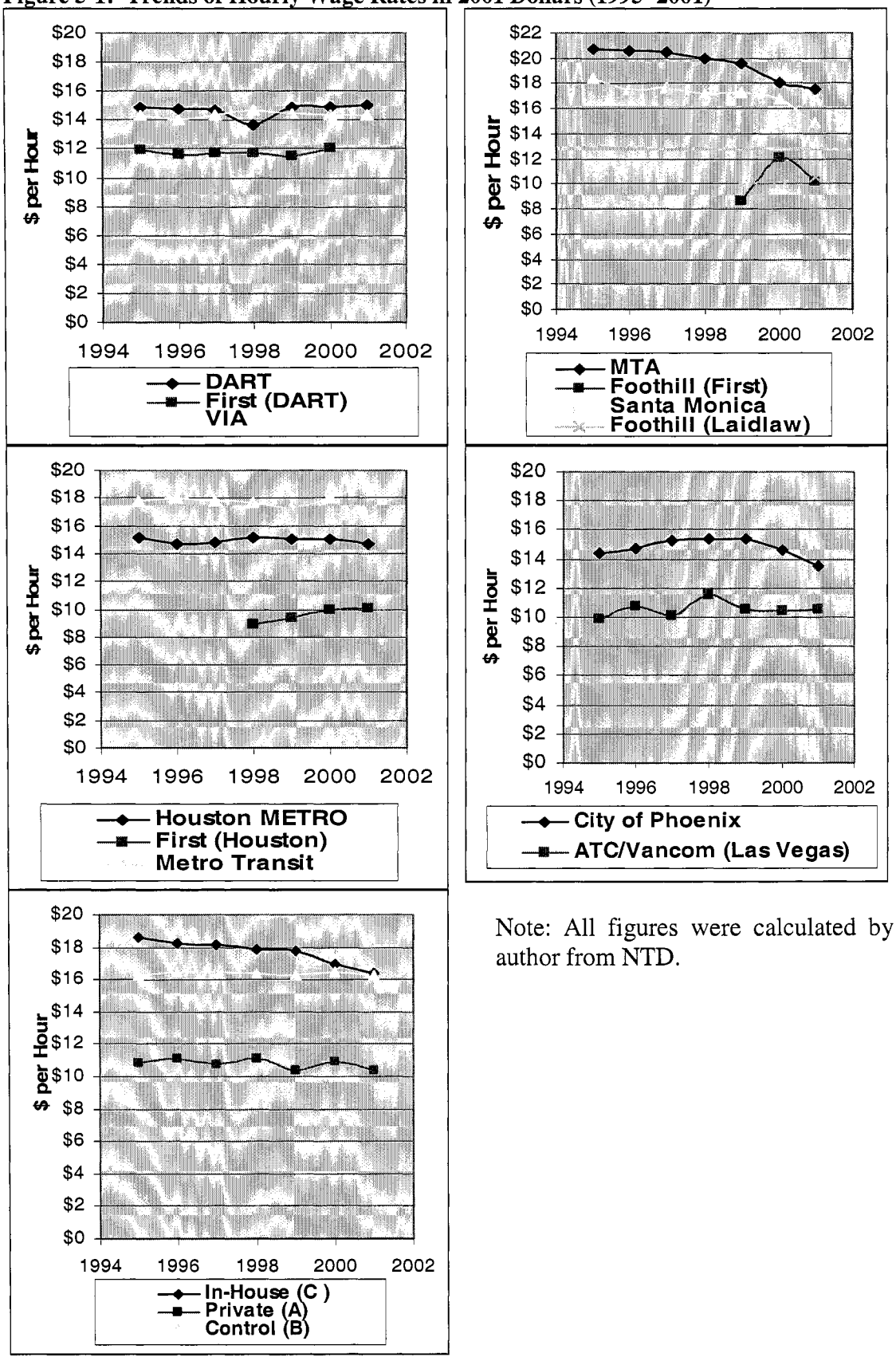
	Group	Operator	Average		2001		Difference
			$ per Hour	Rank	$ per Hour	Rank	2001- Mean
CASE1							
	C	DART (DO)	$14.70	6	$14.98	3	$0.28
	A	First (DART)*	$11.75	8	$12.01	8	$0.26
	B	VIA San Antonio	$14.69	7	$14.39	6	-$0.30
CASE2							
	A	Laidlaw (Foothill)**	$10.31	10	$10.54	9	$0.22
	A	First (Foothill)**	$10.27	11	$10.20	11	-$0.07
	B	Santa Monica (DO)**	$17.00	3	$14.94	4	**-$2.07**
	C	LAC MTA (DO)**	$19.53	1	$17.52	2	**-$2.01**
CASE3							
	C	Houston METRO	$14.92	4	$14.66	5	-$0.26
	A	First (Houston)***	$9.58	12	$10.02	12	$0.44
	B	Metro (Minneapolis)	$17.94	2	$18.90	1	$0.96
CASE4							
	A	ATC (Las Vegas)	$10.56	9	$10.50	10	-$0.06
	B	City of Phoenix (DO)	$14.72	5	$13.56	7	**-$1.17**

All data are from NTD and calculated by author.
The table of 2001 is based on values in year 2001 except for First (DART) in 2000,
The average of each operator is a weighted average across years.
* the average from 1995 to 2000.
** the average from 1999 to 2001.
*** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.

Group		***Observations***	***Weighted Average***	***Arithmetic Mean***	***Variance***
Private Contractors	Group A	5	$10.73	$10.49	0.6234
Public Agencies	Group B + Group C	(7)	$17.30	$16.22	3.8491
- Control	- Group B	4	$16.38	$16.09	2.6948
- In-House	- Group C	3	$17.70	$16.39	7.4291
Difference					
Public – Private	Group (B+C) – Group A		$6.57*	$5.72	
Control – Private	Group B – Group A		$5.64**	$5.59	
In-House – Control	Group C – Group B		$1.32***	$0.30	

The p-value of ANOVA (Group A, B and C) is 0.00089.
Two-tail exact p-values of the Wilcoxon Two-sample Tests: * p <=0.0025, ** p<= 0.0159), and *** p <= 0.8571.

Figure 5-1: Trends of Hourly Wage Rates in 2001 Dollars (1995- 2001)



Note: All figures were calculated by author from NTD.

Most operators in this study generally showed lower hourly wage for drivers than the national average, around $18 to $20 per hour. Among the 12 operators, drivers of First Transit at Houston received the lowest hourly wage, $9.58 from 1998 to 2001, and those at the MTA were paid the most, $19.53. First (DART) showed the highest hourly rates of drivers among private contractors, while VIA's were the lowest among public operators.

In terms of different types of operator, public in-house operators (Group C) showed the highest hourly rate for drivers, particularly the MTA, and private contractors (Group A) showed the lowest. The difference between these two groups is about $7, on average. The average hourly rate of the public controls (Group B) is $16.38, $5.64 higher than the average for Group A.

The differences in hourly wages between groups are all statistically quite significant, except for between Group B and Group C. As seen in the results of the Wilcoxon two-sample test in Table 5-1, the gap between Group B and Group C is $1.32 on average (and only $.30 in arithmetic average), not statistically significant. On the other hand, hourly rates of public drivers (Group B and C) showed a positive relationship with the cost of living in the service area, regardless of the different groups. The top three operators in terms of hourly rates are the MTA (Group C), Minneapolis, and Santa Monica (both Group B), which operate in the two most expensive areas.

The difference in wage rates within Group A is much smaller than the difference within each of the other two groups, and the standard deviation of five private operators in all years is less than $0.80. Also the result of ANOVA indicates that variability between the groups is 3.7 times larger than variability within them. In sum, privately

hired drivers at different operators received similar hourly wages that varied much less than public drivers, regardless of differences in service area as well as the size of operation. For example, both the top and the bottom operators among private contractors, First Transit (DART) and First Transit (Houston), operate in the same state, while drivers at two Foothill private operators received less than peers at First (DART) despite Foothill serving the L.A. metropolitan area, which had the highest cost of living in the study.

For drivers' hourly rates at individual operators, I will go into greater detail because of their significance. First, in the case of DART, its private contractor First Transit Garland Division, and VIA San Antonio, the private operator, have the lowest wage rates, a mean of $11.75 (in 2001 dollars).Next lowest were VIA and DART, with a mean of $14.69 and $14.70 from 1995 to 2001, in spite of paying the highest hourly rates among the five private contractors. The basic pay rates at all three of these operators have remained almost the same from 1995 to 2001, after being indexed for inflation. Overall, the wage gap among the three operators is below $3, which is the smallest difference between public and private operators, compared with other cases in the study. First (DART) showed the highest wage rates among Group A, including two other operations of First Transit, Houston METRO and Foothill, in spite of weak union environments in Texas compared with California.

The hourly wage rates at First Transit at Houston and Metro Transit at Minneapolis increased the most among all operators, as observed in Figure 5-1. The control, Metro Transit, showed a 6 % increase in hourly rates (after being adjusted for inflation) from 1995 to 2001, and in 2001, its driver wage rate of $18.90 was the highest among all operators, about $1.50 higher than the MTA's.

Unlike the case of DART, drivers at First Transit, the private contractor for Houston METRO, received much lower wages than their public sector peers, $5 less, and $7.50 less than drivers at their control group, Metro at Minneapolis. Their average hourly rate from 1998 to 2001 was $9.58, the lowest among all operators included in the study. First Transit's drivers in Houston start at $9.27 an hour and can earn up to $11.29 with five years experience, while their public peers at Houston METRO start at $8.85 but can earn up to $13.52 or $15.86, depending on their hire date, according to labor contracts (2000/2001 contract period). These huge differences are the second largest in hourly wages in the samples, topped only by the Los Angeles area operators. However, hourly wage rates at First (Houston) have increased more rapidly than those at Houston METRO and much faster than the inflation rate: an increase of 13% compared to a 0.4% decrease at Houston METRO from 1998 to 2001, after adjusting for inflation.

The three public operators in Texas displayed similar drivers' wage rates, $14.50 to $15, in contrast to their significant differentials in hourly operating costs. VIA had the lowest hourly wages as well as hourly operating costs among the three operators in Texas as well as among all public operators.

Among all four cases, the operators in the Los Angles area showed the biggest differences in hourly wages, $7 to $9, between public and privately hired drivers (around $10 for private drivers, $17 for Santa Monica's drivers, and $19 for the MTA's drivers), on average. These large differences are dampened by the influence of seniority and cost-of-living adjustments on hourly wages at public operators. Drivers at the two private operators receive similar wages to drivers at private operators in other cities. In Table 5-2, drivers' wages at Los Angles area operators are broken down as training rates, part-

time rates, starting rates and maximum rates. Another important component is the number of years a driver needs to achieve the maximum rate. A final significant measure is the rate that full-time drivers are paid in their third year of employment.

Table 5-2: Driver Wage Rates in LA Area

	Start Rate $	Max Rate $	Year to Max Rate	FT Rate at 3-rd Year of Employment $
MTA				
Full-time Operator Hired before 07/01/97	13.33	20.50	4.5	15.38
Full-time Operator Hired after 07/01/97	11.21	17.25	4	12.94-13.80
Part-Time Operator Hired before 07/01/97	12.30	14.35	4	
Part-Time Operator Hired after 07/01/97	11.21	13.80	2.5	
Part Time Training	8.63	8.63	N/A	
Santa Monica	11.03	11.03	**18.38**	5
Training	7.00	7.00		
Foothill - Laidlaw	8.75	8.75	12.40	**8**
Training	6.00	6.00	N/A	
Foothill - First Transit	**8.49**	**8.49**	**8.49**	
Training	7.25	7.25		

Source : Richmond (2001)[21]

For both private companies, starting rates are comparable to part-time or training rates at the public operators. Moreover, First Transit at Foothill does not award any seniority increases. It only adjusts for inflation. New hires are offered a slightly higher wage if they opt out of health benefits. (The former Laidlaw drivers enjoyed slightly higher wages and could earn seniority increases.) Within the course of three years, hourly wage rates peaked in 2000 for First, as a result of First Transit's taking on 100 drivers formerly employed by Laidlaw and keeping them at their 1999 Laidlaw rates.

Despite the fact that the mechanics and drivers working for First Transit were represented by the Teamsters and thus were paid union rates, non-unionized Laidlaw drivers were paid slightly better than those at First (and did receive seniority increases, as

[21] Rates are for 1999/2000 contract period, except for Laidlaw rates, effective 1/15/2000

noted). However, the starting rate was almost as low as the MTA's rate for drivers in training. Furthermore, it takes eight years to reach the maximum rate of $12.40, which is still lower than the starting rate of full-time MTA drivers hired before 1997. Privately hired drivers at three other contractors at Las Vegas, Dallas and Houston reach the maximum rate in five years.

Drivers at Santa Monica are paid substantially more than those at Foothill, while the hourly bus operating costs are about the same. Moreover, Santa Monica's top rate is the highest of all the operators, excluding the rates paid to veteran MTA drivers hired before July 1, 1997. The time a driver needs to achieve the maximum rate at Santa Monica is only slightly longer than at the MTA (five years versus four and a half). The United Transportation Union (UTU) represents drivers at both the MTA and Santa Monica.

Despite its lower top rates, MTA's average platform hourly costs are about $3 more, due to the higher proportion of senior drivers as well as drivers hired before 1997. In addition, average hourly rates at MTA dropped after the 2000 strike and following new contracts, although the new contract permits an 8.3 % if you want it to be "percent" or %. It appears both ways. wage increase over a period of three years. The 2000 contract at the MTA allows the use of more part-time drivers whose low hourly rates pushed down the average MTA wages[22].

ATC's driver pay levels were about $10.56 per hour from 1995 to 2001. They peaked at $11.12 in 1998, right after its renewal with RTC. During the 2001 contract period, the hourly wage rate of ATC drivers started at $6.50 during training and went up

[22] Also MTA's new contract allows 100 drivers (an increase of 55) to work 10 hour shifts without a split.

to $9.50 upon qualification. After that, rates went up to $12 per hour with $.50 annual increments, while the maximum rate for drivers hired under the previous contract was $14. More importantly, in 2001, the average hourly rate of all drivers was about $1 higher than the rate for a regular first-year driver (which started at $9.50). This finding directly points out the low percentage of senior drivers in the system and high rates of driver turnover at ATC.

The low wage jobs at ATC lack competitiveness against other jobs in Las Vegas. For example, Las Vegas' City Ride bus system, the only other public transit system in the Las Vegas Valley, starts its drivers at $15 an hour, and school bus drivers start at $13 per hour and go up to $15.63 an hour. Even maids' pay in Las Vegas hotels, $10.30 an hour with health coverage for all dependents, is more than that of drivers at ATC (*Las Vegas Review Journal*, Oct. 15, 2002).

The reasons for ATC's low hourly rates for drivers can be traced back to several factors. The low cost of living in Las Vegas and the weak union environment in Nevada as well as ATC itself contributed to their status. Nevada is a right-to-work state, where employees cannot be required to join a union. Only 65 percent of ATC drivers are unionized (Richmond 2001). Anther reason, which applies to all private contractors, is that the major source of the competitiveness for a private contractor who needs to win the contract is paying lower wages than competitors. Eventually this low wage status quo was broken in 2002 by a 38-day strike. Under the new labor contract after this long strike, bus drivers at ATC received a $3.50 raise, start at $11 per hour and reach the maximum rate of $15.50 per hour[23] (*Las Vegas Review Journal,* Oct. 15, 2002).

[23] ATC's 2002 contract also include that three paid holidays by 2005 and a 15% cap on drivers' contribution to health insurance.

Finally, in terms of trends from 1995 to 2001, many operators displayed little change or a decrease in hourly wage rates after adjusting for inflation. Both the MTA's and Santa Monica's wage rates have declined especially significantly, by $3.26 and $3.33, respectively. On the other hand, hourly rates of Metro at Minneapolis and First (Houston) have gone up by $1.10.

With respect to three different types of operators, hourly wages of drivers at Group A and Group B showed little change, a decrease of $0.43 and an increase of $0.06, respectively. However, those at Group C have gone down significantly over the years, by $2.26 (a 12% fall) after adjusting inflation, as seen in the last graphs of Figure 5-1. This finding suggests that contracting is likely to bring wage concessions from public operators when they are competing with private transit operators.

5.2. Drivers' Work Rules

Drivers' work rules in transit operations are significant because 1) they are designed to ensure the safety of passengers and drivers, and to compensate drivers for their irregular (and thus inconvenient) work schedules, 2) they account for a significant source of drivers' income (15% to 30%), and 3) they are a source of a significant degree of inefficiency and place constraints on transit scheduling. They are also a source of contention between management and labor as a result of management's efforts to weaken them, and labor's intense opposition.

In this section, I examine drivers' governing work rules in individual agencies by using the ratio of hours due to work rule to platform hours. This ratio actually compares the agency's spending on work rules to its platform costs, as noted in Equation 3-2. For example, Joe at Hamlet Transit Agency worked regular eight hours plus two hours of

overtime on certain day, and overtime paid at one-half of $10, his hourly rate. He received $30, ($20 plus $10 for premium) for the two hours of overtime, along with $80 for a regular shift. All regular compensation of $100 ($80 plus $20) is to be summed up as platform costs. And his overtime ratio to platform hours is 0.2 ($20/$100) in this case. In this section, I investigate overall work rules as well as individual items and their implications for operational efficiency.

Equation 5-2: Calculation of Ratio of Hours of Work Rules to Platform Hours

Let ***W, A,*** and ***F*** be the disjoint subsets of ***J*** (a vector of item in pay hours) and denote the set of work rules, paid absences, and fringe benefits. In particular, I used the symbol *w* (italicized, but not boldfaced) to denote a *w*-valued work rules. Thus, $w \in \boldsymbol{W}$ means *w* is a member of ***W*** as well as of ***J*** , where $\boldsymbol{W} \subset \boldsymbol{J}$.

Consequently, $\boldsymbol{R}_w$ is referred to as the ratio of a *w*-valued pay hour among work rules to platform hours and is given by

$$\boldsymbol{R}_w = \frac{\boldsymbol{H}_w}{\boldsymbol{H}_p} = \frac{\boldsymbol{C}_w}{\boldsymbol{C}_p} \text{ , for all } w,$$

since $\boldsymbol{R}_j = \frac{\boldsymbol{H}_j}{\boldsymbol{H}_p} = \frac{\boldsymbol{C}_j}{\boldsymbol{C}_p}$, for all j , from Equation 3.2.

where $\boldsymbol{H}_w$: Equivalent pay hours for work rule item *w*, $w \in \boldsymbol{W}$;
$\boldsymbol{C}_w$: Agency's spending on work rule item *w*, $w \in \boldsymbol{W}$;
$\boldsymbol{H}_p$ is platform hours and $\boldsymbol{C}_p$ is platform costs.

For an example, consider the case when *w* is overtime premiums. Then, the ratio of overtime premiums to platform hours is

$$\boldsymbol{R}_{overime} = \frac{\boldsymbol{H}_{overtime}}{\boldsymbol{H}_p} = \frac{\boldsymbol{C}_{overtime}}{\boldsymbol{C}_p}$$

Hence, the ratio of total work rules to platform hours is defined as

$$\sum_{w \in W} \boldsymbol{R}_w = \frac{\sum_{w \in W} \boldsymbol{H}_w}{\boldsymbol{H}_p} = \frac{\sum_{w \in W} \boldsymbol{C}_w}{\boldsymbol{C}_p}.$$

If a private sector operator may enjoy more flexible work rules and presumably operate in a more efficient manner, which operator should be spending less money and fewer hours on work rules to produce service hours. However, the opposite trend is observed across nearly all the cases, as seen in Figure 5-2. (To see more details on each work rule item of an individual agency in all years, go to Appendix 5.)

Overall, private contractors' average work rules ratios to platform hours (0.36) is by 0.12 higher than the public agencies' average (0.24), although the difference is not statistically significant as shown in Table 7-2 in Chapter 7. Among four categories of paid hours (total paid hours, work rules, paid absences, fringe benefits), work rules is the only one where private contractors have higher levels of spending (more money spent on work rules to produce one platform hour to transit user) than public operators.

In terms of the ratio of total work rules hours to platform hours ($\sum_{w \in W} \boldsymbol{R}_w$), VIA San Antonio showed the lowest figure, 0.12, in contrast to the 0.47 ratio registered by the highest among the 12 operators, ATC at Las Vegas. First Transit at Foothill is the lowest among private contractors, and the City of Phoenix is the highest among public operators. Also the three operators with the highest ratios are all private, ATC, Laidlaw at Foothill, and First (Houston), all of whom have ratios higher than 0.30.

This phenomenon is observed in most cases in this study. On average, drivers at the five private contractors were paid 27% of their earnings based on work rules, compared to 20% for public drivers. This finding is crucial because it indicates that the private bus operators do not necessarily utilize the workforce more efficiently or have more flexibility in day-to-day operations.

Figure 5-2: Average Ratios of Work Rules to Platform Hours : All Cases (1995-2001)

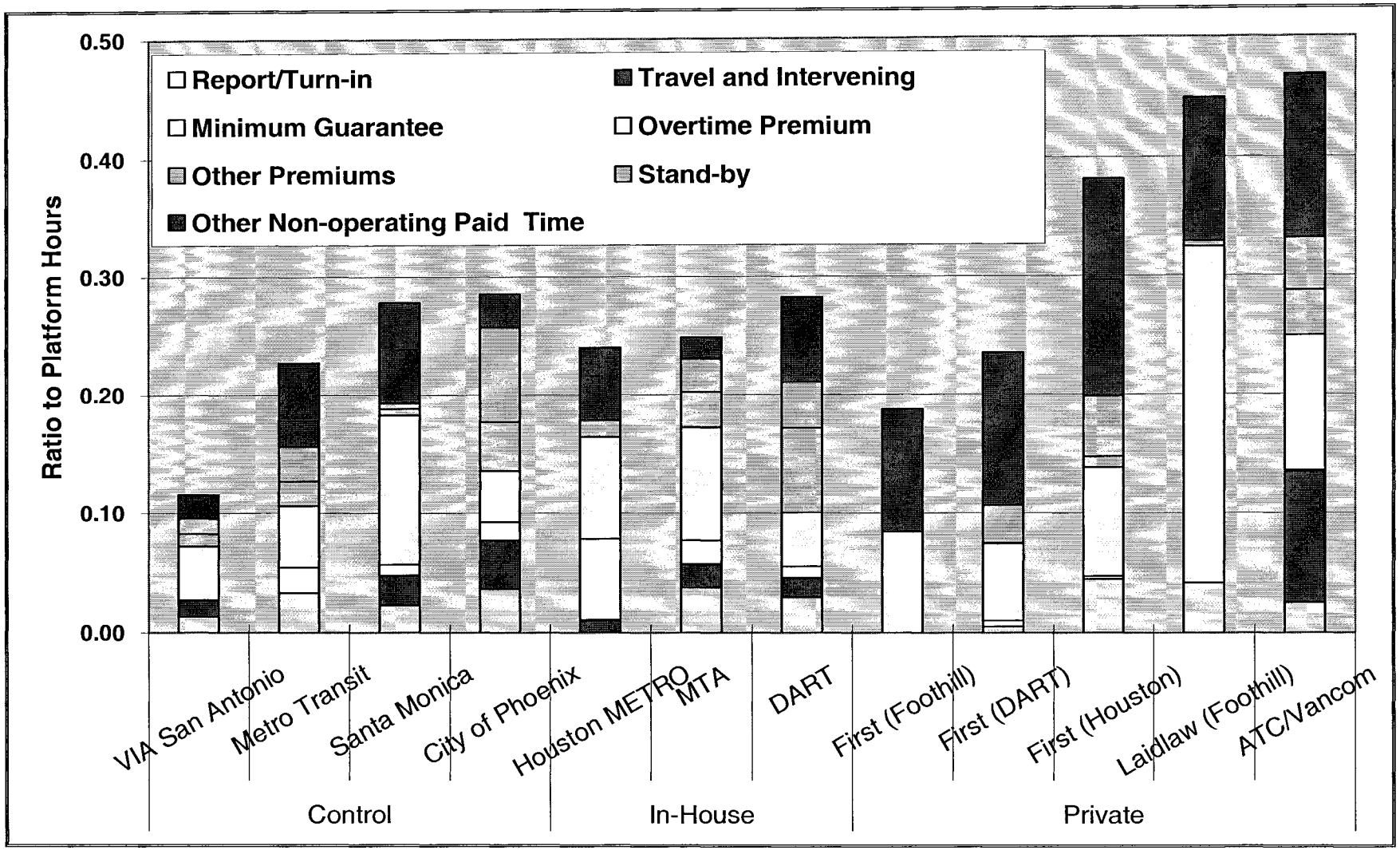
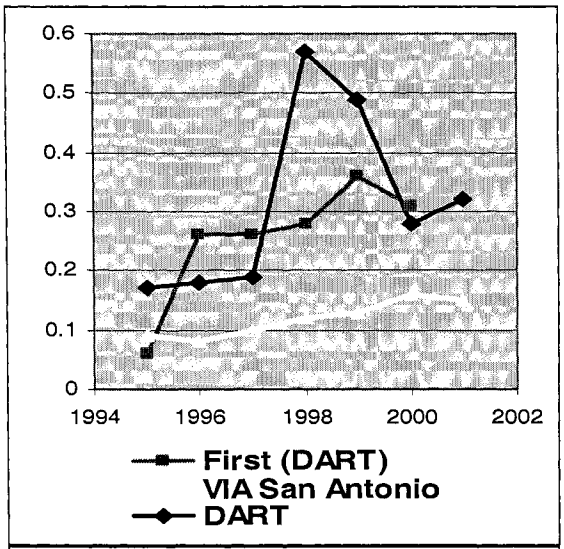
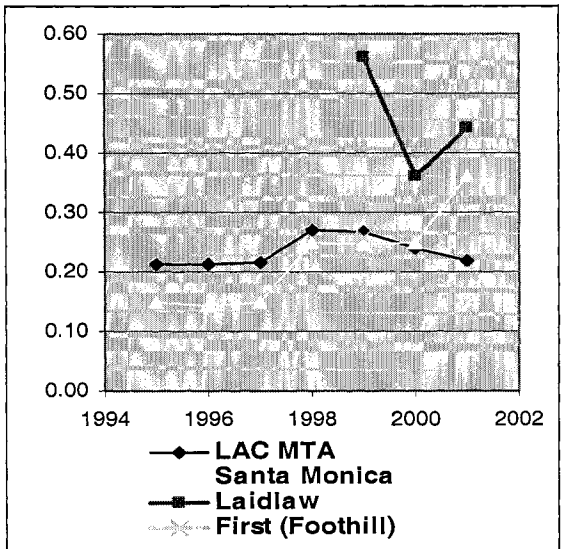
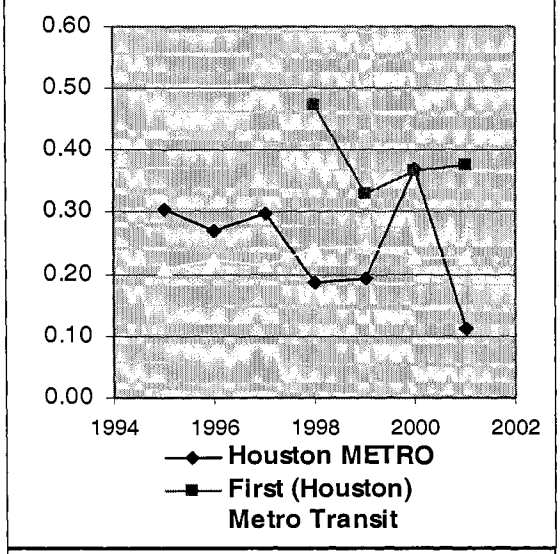
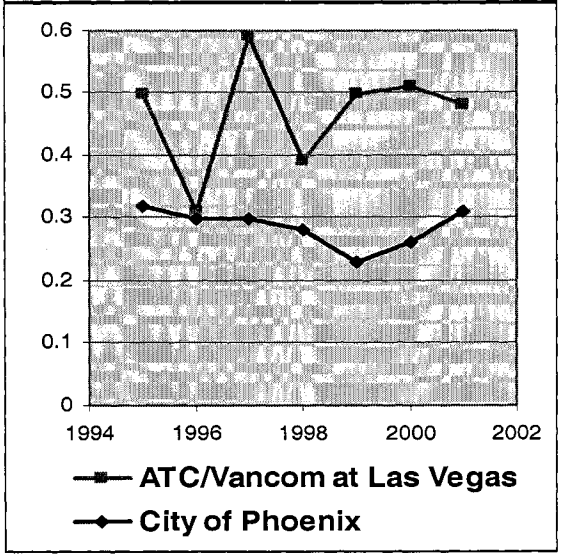


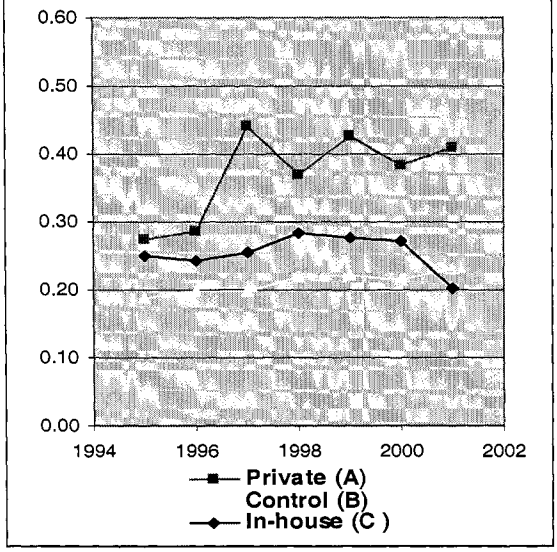
Figure 5-3: Trends of Ratios of Hours due to Work Rules to Platform Hours (1995- 2001)











Note: All figures are calculated by the author based on NTD.

The total work rules ratio to platform hours ($\sum_{w \in W} \boldsymbol{R}_w$) also shows how much drivers were paid based on work rules, since they are divided into 1) the basic pay based on platform hours and wage rates and 2) the payment arising from work rules.

Let's say John and Bill, drivers of ATC at Las Vegas and VIA San Antonio, respectively, worked the same 40 hours in the previous week, and both work at the same hourly rate of $12. In principle, they should receive the same earnings, but that is not the case. The $\sum_{w \in W} \boldsymbol{R}_w$ is 0.47 at ATC and 0.12 at VIA. Instead of both drivers being paid $480 for their 40-hour week, John would receive another $225 because of governing work rules at ATC ($480 * the work rule ratio of 0.47 at ATC) on average, but Bill would receive only $56 extra ($480 * 0.12) because of the rules at VIA. By the same token, if Bill and John are paid $24,000 annually (50 weeks[24] * 40 hours * $12 per hour), Bill would only be paid an additional $2,880 for work rules, while John would be paid an extra $11,280. This shows how significant work rules are in affecting a driver's income.

However, the actual dollar difference between two drivers of payments arising from work rules is smaller than in the above example, because VIA's drivers usually receive more than $12 per hour, compared to less than $12 for ATC's drivers. If John's hourly rates were the same as ATC's average of $10.56, he would receive $9,926 for work rules in a year. On the other hand, if Bill's rates are $14.69, VIA's average, he would be paid approximately $3,526 in a year. When the average hourly rates of each operator were applied, the estimated difference of average annual payments based on

[24] Based on 2000 work hours a year. Actually 52.14 weeks is in one year and about 2080 scheduled work hours in a year. During 1999 to 2001, the national average of actual work hours of full-time drivers are 1980 hours; while the average of private contractors included in this study is about 2120 hours a year.

work rules between public and private operators would be only about $160 to $570 more for privately hired drivers (see more details on page 122).

Table 5-3 : Ratios to Platform Hours of Selected Work Rules: All Cases (1995 to 2001)

Operator		Total Work Rules		Premiums (Overtime, Spread, etc.)	
		Ratio	Rank	Ratio	Rank
Group A	ATC (Las Vegas)	0.47	1	0.15	2
	Laidlaw (Foothill)**	0.45	2	0.28	1
	First (Houston)***	0.38	3	0.10	6
	First (DART)*	0.24	9	0.07	11
	First (Foothill)**	0.19	11	0.08	9
Group B	VIA San Antonio	0.12	12	0.06	12
	Santa Monica***	0.28	6	0.13	3
	Metro (Minneapolis)	0.23	10	0.07	10
	City of Phoenix	0.29	4	0.08	8
Group C	Houston METRO	0.24	8	0.09	7
	LAC MTA***	0.25	7	0.13	4
	DART	0.28	5	0.12	5
Group A Average		0.36		0.12	
Group (B+C) Average		0.24		0.10	
- Group B Average		0.20		0.07	
- Group C Average		0.25		0.11	
Diff. (Public - Private)		-0.12		-0.02	

* the average from 1995 to 2000.
** the average from 1999 to 2001.
*** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.

The distinct composition of each item in work rules ratios captures both the uniqueness of operation characteristics at each operator and the provision of service. Among various work rules items, overtime is one dominant item across all operators. Group A generally shows ratios in all items higher than public operators except for 1) report and turn-in time, and 2) minimum guarantee. There are two main sources of high spending on work rules at private contractors. One is their high percentage of overtime

premiums, and the second is other non-operating paid work time. The following sections provide more detailed discussions of items in work rules.

5.2.1. Overtime and Other Premiums

Among the different work rules items, the spending on overtime premiums is the largest for public operators and the second largest for private contractors. In transit, overtime is the work time in excess of eight hours in any day or in excess of a spread-time threshold. Since drivers are paid weekly, management compares the overtime that exceeds 40 hours a week and the weekly sum of the time in excess of a daily spread-time for each driver. The threshold of a spread varies from one agency to another (usually 10 to 14 hours a day). Some agencies compensate whichever is shorter for a driver, while others pay the greater of one or the other. Generally this time is compensated at one and one-half the rate of regular pay.

One agency may have more than one threshold for a spread or overtime as well as associated rates applied. For example, the time exceeding 10 hours is compensated at a rate of 150% and the time exceeding 11 hours is paid at 200% of regular pay. Since the same work hours are paid based upon either overtime premiums or spread-time premiums depending on each agency, the sum of all premiums (overtime, spread, shifts, etc.) of each operator is the focus of discussion in this section.

Rules on overtime and its premium are critical and sensitive factors negotiated between the drivers' union and management, because they are big contributors to drivers' earnings. For example, the 2000 strike of MTA drivers was a reaction to the MTA's demand to introduce a four-day workweek for 400 drivers who would work a 10-hour split shift over a 12-hour period without receiving any overtime. This was in addition to

an MTA demand to increase the use of lower-paid, part-time drivers. Under previous contracts, if a driver worked a 10-hour split shift over 12 hours, he/she would have received pay for the un-worked two hours as well as premiums for two hours in excess of the 10-hour-a-day spread, a total of 12 hours of basic pay plus a two-hour overtime premium. Under the new proposal, a driver would only receive 10 hours of basic pay.

In the end, the new 2000 contract did not allow the MTA to require this new work week for 400 drivers, as the it had wanted; however, it did allow the MTA to require 100 drivers (an increase of 55) to work 10-hour shifts without a split (i.e. 10-hours' pay for 10 straight hours with no overtime premium). As a result, the MTA's ratio of premiums (overtime, spread, shift, and the like) to platform hours declined from 0.14 before the new contract to 0.11.

On average, the ratio of overtime and other premiums to platform hours ($\boldsymbol{R}_{overtime/other\ premiums}$) at the five private contractors is 0.12 versus 0.10 for the seven public operators. As seen in Table 5-3, Laidlaw at Foothill has exceptionally high ratios of overtime premiums (an average of 0.28 in 1999-2001). Laidlaw's $\boldsymbol{R}_{overtime/other\ premiums}$ is the highest among all operators' all work rules items. VIA San Antonio has the lowest level of spending on overtime and other premiums (0.06 in 1993-2001), the same as what was observed in other work rules items. The gap of the overtime premiums ratios between these operators at the top and the bottom (0.12) would approximately transform into a yearly difference of $5,280 if drivers at both operators worked the same hours and were paid $12 per hour.

ATC at Las Vegas has the second highest level of spending on overtime and other premiums overall (0.15). Three public operators, Santa Monica, the MTA, and DART,

are the highest among public operators, with ratios of about 0.12 to 0.13. The other three operators in the Los Angles area, but not First (Foothill), placed in the top four in this ratio.

Why do the private contractors have high costs imposed by overtime and other premiums? This question is difficult to answer. One might expect that public agencies are more likely to have a high level of premium costs since they have more restrictive rules on overtime and spread-time (meaning higher pay rates or higher threshold of a spread). One possible answer would be that private contractors pay for more work hours of drivers, rather than pay more as a result of restrictive work rules on overtime and spread-time. Since privately hired drivers receive lower wages, they might be willing to work more hours to be paid more premiums and these premiums could be used to compensate for their low wages. In most cases, drivers at the five private contractors included in this study worked more hours than the national average (on average by 140 more hours per full-time driver during 1999 to 2001[25]); while drivers at the public agencies worked fewer hours than those at the private contractors and their work hours varied year by year compared the national average. Especially full-time drivers at First (Houston) and Laidlaw (Foothill) worked 200 and 217 more hours than the national average, respectively.

It is also not clear how much of this higher spending by private contractors is caused by scheduled or unscheduled overtime. If unscheduled overtime is the cause, that would mean that private drivers have high levels of absenteeism and poor on-time performance. The high level of stand-by time at private contractors certainly supports this scenario. (See the next section for more discussion of stand-by time.)

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[25] Prior to 1999, data of work hours by full-time and part-time drivers are not available.

On the other hand, if private contractors' higher spending on premiums is due to scheduled overtime, that implies that they use fewer drivers working more overtime to operate the same hours of service as public operators. The impact on safety of these practices is not clear. Since the base line of regular work hours may vary in each agency, and overtime may be a fixture in assignments, working overtime may or may not cause excessive driver fatigue and interfere with performance.

Regardless of whether the overtime is scheduled or unscheduled, private contractors' excessive spending on overtime and other premiums suggest that there are more work hours for their drivers, (consequently more fatigue of drivers and safety concerns) or/and driver absenteeism. Moreover, if this money were directly paid as wages, an operator could spend less, since overtime is paid more than the base wage rate.

5.2.2. Non-Operating Paid Work Time

Among work rules items, non-operating paid work time items offer the greatest distinction between public and private contracts and operations. The ratios of these items to platform hours ($\boldsymbol{R}_{\textit{non-operating paid work time}}$) are the highest among private operators and the second highest among public contractors (next to overtime premiums). They are classified into two items in the NTD forms, stand-by time and other non-operating paid work time; and both items showed higher ratios at private than at public, on average.

Stand-by drivers wait at the terminal in case scheduled drivers do not appear; generally, they receive a full day's pay even though they may never drive. Since not all stand-by drivers have to fill in for another driver, the cost of stand-by time is not a direct indication of drivers' absenteeism. However, an agency is more likely to assign more

drivers to cover, if its management expects more drivers might be absent. Still, when absenteeism is severe, spending on stand-by drivers is high.

In the case of the $\boldsymbol{R}_{\textit{stand-by time}}$, the gap between public and private (0.03 and 0.04, respectively) is minute, as seen in Table 5-4. The City of Phoenix (0.08) ranked highest among all operators, followed by First Transit at Houston (0.05), and ATC at Las Vegas and DART (both 0.04), implying that these operators suffered from high rates of driver absenteeism. On the other hand, two operators at Foothill reported zero.

Table 5-4: Average Ratio of Non-Operating Paid Work Time to Platform Hours : All Case (1995-2001)

Operator		Stand-by Time		Other Non-operating Paid Work Time	
		Ratio	Rank	Ratio	Rank
Group A	ATC (Las Vegas)	0.04	3	0.14	2
	Laidlaw (Foothill)**	0.00	11	0.12	4
	First (Houston)***	0.05	2	0.18	1
	First (DART)*	0.03	5	0.13	3
	First (Foothill)**	0.00	12	0.10	5
Group B	VIA San Antonio	0.01	9	0.02	11
	Santa Monica***	0.01	10	0.09	6
	Metro (Minneapolis)	0.03	6	0.07	8
	City of Phoenix	0.08	1	0.03	10
Group C	Houston METRO	0.01	8	0.06	9
	LAC MTA***	0.03	7	0.02	12
	DART	0.04	4	0.07	7
Group A Average		0.03		0.14	
Group (B+C) Average		0.04		0.04	
- Group B Average		0.03		0.05	
- Group C Average		0.04		0.04	
Diff. (Public - Private)		-0.01		-0.09	

* the average from 1995 to 2000.
** the average from 1999 to 2001.
*** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.

All the private contractors have exceptionally high other non-operating paid work time compared to platform hours. This time includes driver training, instruction

premiums, and time spent on union functions, run selection, accident reporting and witnessing. All five reported ratios greater than 0.10, which means that approximately one to one and half hours in every 10 of their work hours was spent on these non-vehicle-operation functions. It is the only item in the work rules that shows a statistically significant difference between public and private operators. Table 5-4 shows clearly that the top five are all private operators. First Transit at Houston (0.18) ranked the highest while the MTA was the lowest (0.02) Among the five private contractors, First Transit was the lowest (but still more than 0.10); while among public operators Santa Monica was the highest.

The costs arising from other non-operating paid work time accounts for one-third of work rule-related costs at private contractors versus one-sixth at public operators. This is the highest difference between public and private among all work rules, although items in other categorized hours (like pension and retirement, and vacations) show larger differences. On the other hand, the ratios between public in-house and control operators are almost identical.

One possible explanation for the exceptionally high $\boldsymbol{R}_{\textit{other non-operating paid work time}}$ at the private operators is their high spending on driver training and training premiums due to high rates of driver turnover. The ratios of other non-operating paid work time to platform hours were higher in the years when there was an increase in newly hired operators, such as in 1999 and 2000 at Laidlaw, in 2001 at Santa Monica and in 2000 at the MTA.

The other possible reason could be reporting differences among the different agencies. Some contractors, especially, skipped reporting other work rules items such as

stand-by time, minimum guarantee and report/turn-in time separately and included these items in other non-operating paid work time. Nevertheless, private operators in general are considerably different from public agencies.

Although most non-operating paid work time (e.g. stand-by time, run selection, ticketing and fare control, driver's training and so on) is absolutely necessary, it is important to know how many hours are spent on this function and how expensive they are. For example, VIA San Antonio has the lowest (0.03) average ratio of non-operating paid work time (including stand-by time) to platform hours, and First Transit at Houston METRO has the highest (0.23). Let's say Bill, a driver at VIA, and Tom a driver at First Transit, worked 40 hours of scheduled runs in the last week and at a similar wage rate of $12 per hour. For their 40 hours of work, they both were paid $480 in that week.

First, in terms of dollars, these ratios imply that for non-operating paid work time Bill, the driver at VIA, was paid an additional $16 for the week, while Tom received an extra $112. Annually this would amount to only an extra $720 for Bill in contrast to $5,520 for Tom if they work 40 hours a week for 50 weeks. Using the actual average hourly rates of each operator, the annual cost of non-operating paid work time would be $777 for the driver at VIA and $4,230 for the driver at First.

Secondly, when measured in the equivalent of hours, the difference in the ratios of other non-operating paid work time between the two operators is even more noteworthy. In one 40-hour work week, Bill, the driver at VIA, would have had to have worked one hour and 10 minutes to carry out these functions, compared to six hours and seven minutes for Tom at First. On average, only a little less than 3% of Bill's work hours are for these functions, in contrast to 15% of Tom's.

This example is for just for one driver at each agency, but it is applicable to all drivers according to their different wage rates and work hours. One agency's costs for these are the sum of wages paid for time spent on these functions by every driver. Clearly private contractors spent much more for this than public agencies, and it is hard to say that all of these costs are necessary or if they are efficiently spent, since they are not for vehicle operations.

5.2.3. Use of Part-Time Drivers

Part-time workers are an important element in transit operations because they allow management to smooth out the labor costs of coping with peak demand at either end of the weekday. In particular, part-time drivers can reduce labor costs in two ways: 1) by their low wage and benefits, since they are lower than corresponding full-time drivers' rates, and 2) by taking advantage of more flexible work rules such as not paying on spread premiums for part-time drivers or reducing overtime and minimum guarantee of full-time drivers

But work rules governing drivers sometimes limit management's flexibility in using them. Many collective bargaining agreements that labor has made with management include provisions concerning part-time drivers that restrict the tasks they are permitted to do, limit the maximum number of hours they may work, limit their maximum pay rates compared to full-time drivers' pay, and limit the maximum number of part-time drivers the agency may employ.

One of the rationales that transit contracting advocates gave is that private operators are more efficient because they can be more flexible in their use of part-time employees and use them better to reduce costs associated with peaking However, as

observed in Table 5-5, the percentage of part-time employees at private contractors is much lower than at public operators.

On average, about 2% of drivers are part-time at private contractors in contrast to 11% at public agencies, while the differences among the groups are not statistically significant. VIA San Antonio and Metro Transit at Minneapolis (both public operators) have hired part-time drivers at a rate of more than 24%. Notice VIA and Metro Transit also showed the lowest ratios of work rules among 12 operators in this study.

Table 5-5 : Percentages of Part-Time Drivers: All Cases (1995-2001)

Group	Operator	Average		2001		Difference
		% of Part-Time	Rank	% of Part-Time	Rank	2001- Mean
Group A	ATC (Las Vegas)	1.19%	11	2.38%	6	1.19%
	Laidlaw (Foothill)**	9.82%	3	**0%**	11	**-9.82%**
	First (Houston)*	1.44%	10	**0%**	10	-1.44%
	First (DART)	3.41%	8	**1.92%**	7	-1.49%
	First (Foothill)**	0.28%	12	**0%**	12	-0.28%
Group B	VIA San Antonio	24.72%	1	24.34%	2	-0.39%
	Santa Monica	9.48%	4	8.85%	4	-0.63%
	Metro (Minneapolis)	24.07%	2	27.31%	1	**3.24%**
	City of Phoenix	1.71%	9	1.04%	8	-0.67%
Group C	Houston METRO	5.11%	6	4.04%	5	-1.07%
	LAC MTA	8.24%	5	17.78%	3	**9.55%**
	DART	4.39%	7	0.16%	9	**-4.23%**
Group A Average		2.43%		1.54%		-0.89%
Group (B+C) Average		10.85%		14.43%		3.58%
- Group B Average		19.45%		20.20%		0.75%
- Group C Average		6.89%		11.53%		4.64%
Difference (Public - Private)		8.41%		12.88%		4.47%

* the average from 1997 to 2001.
** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.

Most operators have hired fewer and fewer part-time drivers over the years, especially Laidlaw (Foothill) and DART. Only three operators, including one private operator (ATC), showed increasing trends for the use of part-time drivers.

Metro Transit had more than 20% part-time drivers, rising to more than 27% in 2001. The MTA showed the most dramatic changes in terms of the use of part-time drivers. Its percentage dropped to less than 1% until 1997, after which it soared, reaching 18% in 2001. In the MTA's case, the dramatic increase since 2000 is a result of language negotiated in the new labor contract in 2000 allowing the agency to increase its part-time workforce from 650 to 980 (an increase of 350 versus the 450 that the MTA requested), although it also put a cap of 155 on the number of lowest-paid entry-level positions.

The bottom three operators (all private) in Table 5-5 had about 1% part-time drivers. Moreover, the definite trend of decline of the use of part-time drivers to zero percent is observed in all the private operators, except ATC at Las Vegas. This phenomenon indicates full-time drivers at private contractors have more demanding work schedules, and they might work more hours than public drivers. This confirms that the high level of overtime might be caused by more work hours of privately hired drivers.

One possible explanation for the low use of part-time drivers among private operators might be found in the low wages and low number of paid absences for private operators' full-time drivers. Private operators may not offer part-time positions in the tight labor market, since their full-time drivers receive similar wages and partial benefits packages as the part-time employees at public operators. On the other hand, privately hired drivers are definitely better off being full-time employees, despites low wages and few benefits, in comparison with being part-time drivers who work for contractors.

5.2.4. Deadheading and Other Work Rules

Deadheading is the term for the miles and hours that a vehicle travels when out of revenue service, such as leaving or returning to the garage or yard facility and changing

routes. The level of deadheading, the ratio of total vehicle hours to total vehicle revenue hours, is also a well-known measure of vehicle scheduling utilization. Excessive deadheading arises for three different reasons: 1) providing service to a dispersed and low density area, 2) poor scheduling of vehicles and 3) operating under restrictive labor agreements that may limit or prohibit interlining of routes.

In this study, the bus operations of private contractors displayed higher levels of deadheading than did the public ones (0.17 vs. 0.13), although it is not clear how significantly operating under private versus public operation affects deadheading, especially compared to the effect that the density of the service area has. To some degree, the larger deadheading by private operators might be predictable since private contractors are more likely to provide suburban express and rural service, which are inherently more dispersed and cover lower density areas than downtowns. Also it is possible that more inefficient routes are more likely to be assigned to private contractors when public agencies decided to contract-out.

In terms of ratio to platform hours, other work rules such as report/turn-in time, traveling and intervening time, and minimum guarantee are small (thus generating lower unit costs) compared to overtime and other premiums and non-operating paid work time. Also some private operators did not report these hours because they are so trivial. For example, four private contractors skipped reporting the minimum guarantee time, and others had a minimum guarantee ratio less than or equal to 0.02. Houston METRO had an exceptionally high 0.07 average ratio of minimum guarantee from 1995 to 2001, indicating some inefficiency lies in this item compared to other operators.

The ratios of report and turn-in time to platform hours of all operators ($R_{report/turn\text{-}in\ time}$) were less than 0.04 and not much different between public and private operators. In terms of the ratio of traveling and intervening time, public operators have less than 0.04 while four private operators reported zero. It is not clear whether the private contractors' spending on these items is included in non-operating paid work time or whether in actuality they did not compensate for this time.

On the other hand, ATC at Las Vegas has the exceptional high ratio of traveling and intervening time to platform hours (0.11 over 1995 to 2001), which is the greatest of among all operators for all years. This high ratio may be caused by high driver absenteeism. This intervening time may be also caused by events such as delays due to accidents, air conditioning mal-function, or non-scheduled vehicle clean-up (disruptions caused by cleaning up after drunken passengers), which frequently happened (*Las Vegas Review Journal*, February 17, 2002, Richmond 2001).

5.2.5. Summary of Drivers' Governing Work Rules

Here in this study, the work rule restriction of drivers at an individual agency is examined by the ratio of work rules to platform hours: smaller ratios indicate more flexible work rules and better utilization of the workforce. The ratio of work rule restriction hours to platform hours produces the most interesting results among all the categorized hours, because it identifies excessive spending components of operations for each operator and even each year.

For example, an excessive minimum guarantee ratio to platform hours such as observed in Houston METRO points out there might be some rooms for the improvement

in vehicle and route scheduling. And the higher report/turn-in time implies that management should pay attention to the smoother rotations of drivers.

Like ATC at Las Vegas, the higher travel and intervening time might have been caused by frequent air conditioning mal-functions and disturbances from drunken passengers. The shortage of drivers in a particular year would results in higher costs for overtime and other premiums.

The ratio of stand-by time to platform hours is a direct indicator of driver absenteeism. Based on this ratio, the City of Phoenix suffered from high rates of driver absenteeism, twice the average for all operators. First (Houston), ATC at Las Vegas and DART also showed high stand-by times. The gap in these ratios between public and private operators is minute. Another chronic transit agency problem, driver turnover, requires higher spending on training and training premiums, besides higher overtime premiums due to a shortage of drivers.

The crucial finding in this study is that four out of five private contractors (the exception being First Transit at Foothill) have higher work rules to platform hours ratios than their public counterparts; although the difference between public and private operators is not statistically significant. This rate of higher spending by private operators as a result of work rules has the critical implication that private bus operators do not enjoy more flexible work rules for drivers, and they are not inherently more efficient.

The higher ratios of work rules at private operators are directly rooted in overtime premiums and non-operating paid work time such as stand-by times and training time for new drivers. Also the higher spending on non-operating paid work time indicates problems of drivers' retention and turnover.

Excessive spending on overtime premiums comes from either1) having restrictive and labor-favoring overtime rules (e.g. a threshold of a 12-hour spread rather than a 10-hour one), 2) having higher overtime compensating rates (e.g. 200% rather than 150% of basic pay), or 3) compensating drivers for working more hours. Since the former two are not the case for private contractors, we can reach the conclusion that private's excessive spending on overtime premium is based on the last.

In addition, private operators hired much fewer part-time drivers than public operators did; 2% versus 11% among their drivers. Also a declining trend of the use of part-time drivers to zero percent was observed in four out of five private operators. This observation is the opposite of transit contracting advocates' belief that private operators can be more flexible due to fewer restrictions on their use of part-time employees.

5.3. Estimated Annual Earnings of Drivers

In this study, the average driver's annual earnings is calculated by dividing an agency's annual spending on *salaries of bus drivers and other employees for bus vehicle operations* (including transportation administration and support; ticketing and fare collection; and system security) by *the total numbers of drivers and staff working in the same functions* (full-time as well as part-time). These yearly earnings of a driver are the sum of payments based on basic pay rates (discussed in Chapter 5.1) for his/her work hours and payments based on work rules such as premiums for working overtime, training instruction, etc. (discussed in Chapter 5.2).

Before proceeding, it must be noted that there are several flaws in this measure. First, this indicator does not take into account any change in the number of drivers, such as the level of turnover at an individual agency, since the count of drivers is the number

reported at the end of the fiscal reporting year. Secondly, the vehicle operations staff other than drivers (e.g. dispatchers, schedulers, etc.) is included, since not all operators break out drivers as a separate category of employee. Third, the earnings of operators with a high percentage of part-time drivers are underestimated compared to those with a low use of part-time drivers, since full-time and part-time drivers are weighted equally.

In Table 5-6, the average driver's yearly earnings at the 12 operators from 1995 to 2001 are compared. For a privately hired driver, they were a little short of $24,000 and around $36,500 for a public driver.

Among all operators, drivers of First Transit at Houston received the least, and those at the MTA were paid the most; this was also the case for their hourly wage rates. First (DART) ranked the highest among five private contractors, and VIA ranked the lowest among seven public operators. The most notable operators in terms of yearly driver's earnings are the MTA and Santa Monica. They are the top two operators on average, but ranked 2nd and 4th in 2001. From 1995 to 2001, their drivers' earnings declined significantly, about 23% for both.

First Transit at DART is another operator that should be scrutinized. Its drivers' earnings are comparable to or even higher than drivers'earnings at some public operators. The same is true of its hourly rates, while those at VIA are the lowest among public operators. First's drivers at DART earned more than public drivers at VIA San Antonio as well as at the City of Phoenix. From 1995 to 2001, First's annual driver's earnings went up almost $10,000 (after indexing) and were higher than VIA (its control) in most years as seen in the first graphs of Figure 5-4. Moreover, its yearly driver's earnings were

not only the third highest among all operators in 2001, and but also $5,000 higher than its in-house peer, DART.

Table 5-6: Estimated Driver's Annual Earnings : All Cases in 2001 Dollars (1995-2001)

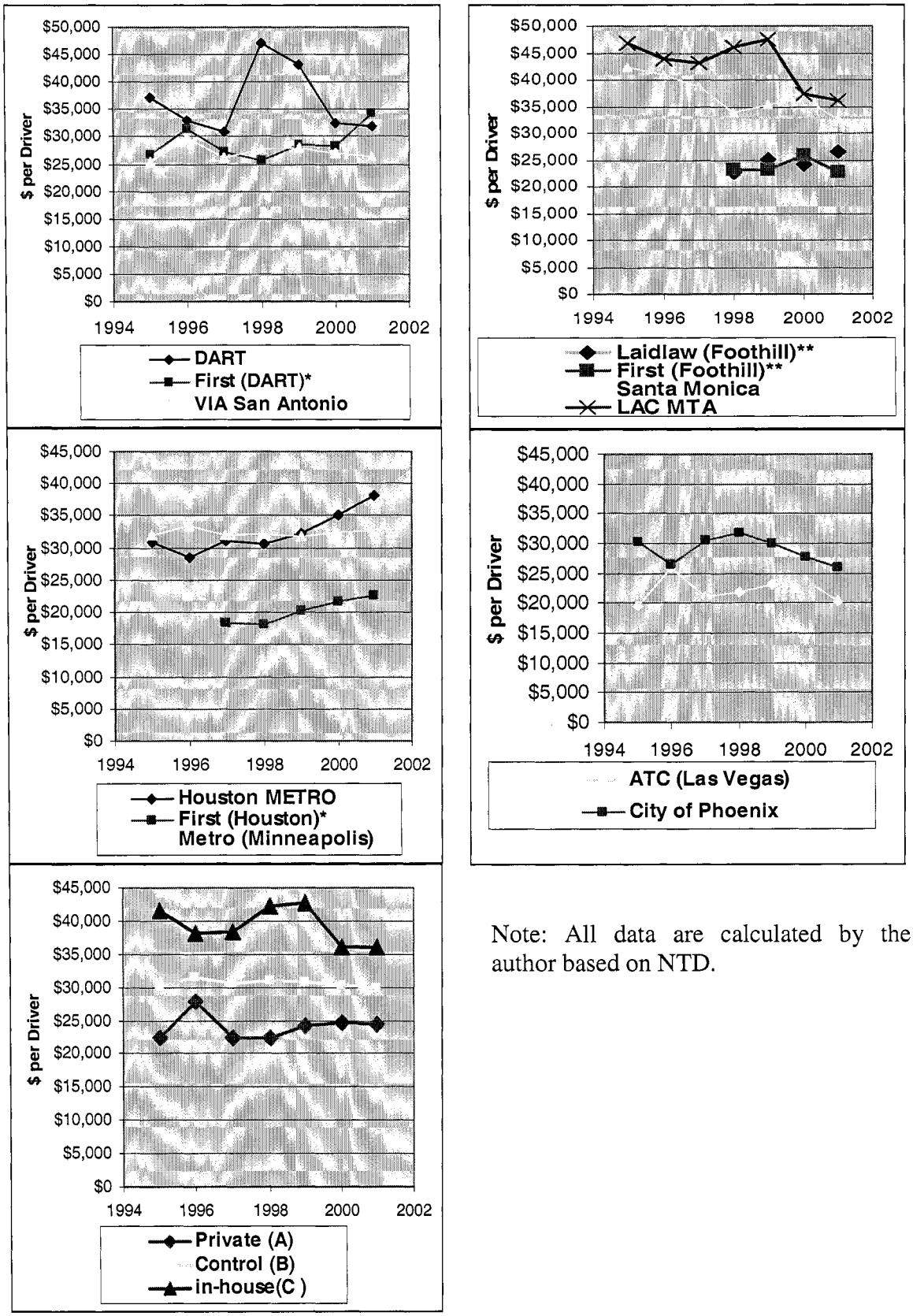
Group	Operator	Average		2001		Difference
		$ per Hour	Rank	$ per Hour	Rank	2001- Mean
CASE1						
C	DART (DO)	$36,026	3	$31,994	6	-$4,032
A	First (DART)*	$29,021	6	$34,396	3	$5,375
B	VIA San Antonio	$27,262	8	$26,552	8	-$711
CASE2						
A	Laidlaw (Foothill)**	$24,639	9	$26,619	7	$1,980
A	First (Foothill)**	$23,731	10	$22,756	10	-$975
B	Santa Monica (DO)	$36,652	2	$32,779	4	-$3,873
C	LAC MTA (DO)	$42,857	1	$36,054	2	-$6,803
CASE3						
C	Houston METRO	$32,302	5	$38,279	1	$5,977
A	First (Houston)*	$20,327	12	$22,606	11	$2,279
B	Metro (Minneapolis)	$32,376	4	$32,652	5	$277
CASE4						
A	ATC (Las Vegas)	$22,164	11	$20,384	12	-$1,780
B	City of Phoenix (DO)	$28,752	7	$25,992	9	-$2,761

The average of each operator is a weighted average across years.
* the average from 1997 to 2001.
** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.

Group		***Observations***	***Weighted Average***	***Arithmetic Mean***	***Variance***
Private Contractors	Group A	5	$23,960	$23,976	10637353
Public Agencies	Group B + Group C	(7)	$36,493	$33,747	27932173
- Control	- Group B	4	$30,667	$31,261	17528703
- In-House	- Group C	3	$39,172	$37,062	28657647
Difference					
Public – Private	Group (B+C) – Group A		$12,533*	$9,771	
Control – Private	Group B – Group A		$6,708**	$7,284	
In-House – Control	Group C – Group B		$8,505***	$5,801	

The p-value of ANOVA (Group A, B and C) is 0.005295.
Two-tail exact p-values of Wilcoxon Two-sample Tests : * p <=0.0101, ** p<= 0.0635, and *** p <= 0.4000

Figure 5-4: Trends of Yearly Drivers' Earnings of All Operators (1995- 2001)



Note: All data are calculated by the author based on NTD.

The trends of annual driver's earnings at an individual operator are very complex to interpret compared to trends of hourly rates since several factors influence these statistics. First, the payments arising from driver's governing work rules (15% to 30% of yearly wages) at an individual agency show distinctive patterns over the years (discussed in the previous section). Secondly, driver turnover as well as the number of part-time hires has changed constantly over seven years. The impact of part-time workers is critical to understanding annual earnings when an operator has a higher use of part-time drivers. The dollar value of earnings in those who use a higher percentage of part-time drivers is more likely to be underestimated.

For example, VIA's percentage of part-time drivers is more than 25% on average from 1993 to 2001, compared to First (DART)'s 3% as seen in Table 5-5 (page 109). The result that drivers at VIA seemed to have lower earnings than those at First (DART), is somewhat questionable, since VIA's much higher use of part-timers causes an underestimation of a regular driver's earnings.The overlap between drivers' earnings at First and VIA (as shown on the chart above) supports the conclusion that there is little difference between the two operators.

The same logic would be applied to annual driver's earnings of Metro Transit at Minneapolis. Its average percentage of part-time drivers from 1995 to 2001 is 24%. While its average hourly rate for drivers is the second highest on average among all operators, its average yearly earnings are around $32,400, the fourth highest.

Overall, driver's annual earnings at Group A have increased 10% from 1995 to 2001, compared to a 1% decrease of Group B and a 11% decrease of Group C, after adjusting for inflation. Except for First Transit at Foothill, four out of five contractors

displayed increasing trends of driver's annual earnings, especially since 1998, compared to two other groups of public operators.

Yearly earnings of driver at private contractors showed a more substantial increase in comparison to their hourly rates, which decreased 4%. This observation is largely due to the substantial increase of payments based on drivers' governing work rules (50%) at private contractors as observed in the last graph of Figure 5-3. The percentage of payments due to work rules in overall earnings of privately hired drivers has increased from 21% in 1995 to 29% in 2001, compared to the public drivers' increase of 19% to 19.5% in the same period.

Most public operators showed mixed trends of annual earnings of drivers during the seven years, but, nonetheless, those at the control operators have decreased much less, compared to those at pubic in-house. DART and the MTA displayed especially large fluctuations during this time, but levels have declined significantly since 1998. Two of the Group B operators also showed declining trends of earnings; at Santa Monica and the City of Phoenix, from 1995 to 2001, they have dropped almost $10,000, and $4,300, respectively.

5.4. Summary of Drivers' Wages

In general, drivers at private contractors earned about $10 to $11 per hour and around $24,000 as annual earnings, while public drivers received about $16 to $18 per hour and $36,500 annually. Among the 12 different operators, MTA drivers were paid the most, about $19.50 per hour, and drivers of First Transit at Houston received the least, $9.60, from 1998 to 2001.

Privately hired drivers received hourly wages similar to rates paid to part-time or training drivers in the public sector. Even when their starting rates are similar to those of public drivers, privately hired drivers generally receive slower seniority increases and have lower maximum rates to reach. For example, First (Houston) drivers start at $9.27 an hour and can earn up to $11.29 with five years experience, while their public peers at Houston METRO start at $8.85 but can earn up to $13.52 or $15.86, depending on their starting year. For the privately hired drivers at Foothill, it takes eight years for Laidlaw drivers to reach the maximum rate of $12.40; while there are no seniority increases for their peers at First Transit.

In addition, privately hired drivers received lower hourly wages compared to other jobs in the local market. For example, hourly rates of ATC's drivers are about $10.56 on average during 1995-2001, which is lower than other drivers in Las Vegas or even hotel maids. And the average hourly rate of all ATC drivers is only one dollar higher than the rate of a regular first-year driver in 2001, indicating the low percentage of senior drivers and high rates of driver turnover.

In terms of hourly rates, drivers at Foothill received the least, considering the high cost of living in the Los Angles area. Among the four cases, the case of four operators in the Los Angles area showed the biggest differences in hourly wages, $7 to $9, between public and privately hired drivers. Starting rates of drivers at Foothill are about $8 to $9, similar to part-time or training rates at the MTA and Santa Monica. Despite the fact that the drivers working for First Transit were represented by the Teamsters, and there was no union presence at Laidlaw, drivers at the latter were paid slightly better.

Another noticeable operator in terms of drivers' wages is First Transit at DART. Its hourly rates as well as annual earnings are not only the highest among private contractors, but also comparable to or even higher than those at some public operators. From 1995 to 2001, First's annual drivers' earnings were higher than VIA San Antonio (its control) in most years. Moreover, in 2001, its yearly drivers' earnings were the third highest among all operators and higher than earnings for a pubic in-house peer at DART.

Privately hired drivers at different operators received similar hourly wages compared to public drivers (meaning there was a much smaller variance for Group A, compared to others) regardless of operating in different service areas as well as working in different size operations, both of which are more likely to influence public drivers' wages.

With respect to three different types of operators, hourly wages of drivers at Group A and Group B showed little change, a decrease of $0.43 and an increase of $0.06, respectively. . However, those at Group C have gone down significantly over the years, by $2.26 (a 12% fall) after being adjusted for inflation, as seen the last graphs of Figure 5-1. This finding suggests that contracting is likely to bring wage concessions from public operators when they are competing with private transit operators.

Compared to hourly wages, earnings of drivers at private contractors showed a much larger increase, 10%, versus a 4% loss for public drivers. Except for First Transit at Foothill, contractors displayed increasing trends of driver's annual earnings, especially since 1998, than two other groups of public operators. The trends of annual earnings at private contractors reflect the net effect of changes in hourly rates and payments based on driver's governing work rules (a 50% increase in the same period).

One of the crucial finding in this study would be that four out of five private bus operators in this study showed a higher work rules ratio to platform hours, due to their higher spending on overtime premiums and non-operating paid work time such as training time for new drivers. In addition, they do not hire many part-time drivers. These findings suggest that private operator may not enjoy flexible work rules. The reason for theses observations might be found in the payments arising from work rules, since they are used to compensate for the lower hourly rates of privately hired drivers. The evidence of this suspicion can in Table 5-7 of the estimated annual payments arising from drivers' work rules.

In Table 5-7, the breakdown of annual payments equivalent to driver's earning are estimated in two cases. The first scenario is based on two assumptions: 1) a driver is paid the average hourly rate of his/her agency and 2) he/she worked 2000 hours in a single year. In Case 1, a driver's hourly rates at each operator and his work hours are given, and the estimation of the payments based on work rules was done in forwards direction at Table 5-7; starting with hourly wages and ending with annual earnings. On the other hand in Case 2, the estimation starts with a given average driver's annual earnings and was done backwards, without an assumption of annual work hours. And these two scenarios give us the quasi-confidence intervals for the actual dollar differences in payments due to work rules and their equivalent work hours.

Equivalent annual hours of dollar spending on work rules per driver are estimated under the assumptions that overtime and other premiums are compensated at 150% of hourly rates, and other work rules are compensated as straight time rate (100%).

Table 5-7: Estimated Annual Payments Equivalent to Drivers' Earnings : All Cases

CASE 1

If a driver works 2000 hours per year, and receives the average hourly rate paid by his agency in Table 5-1

		Hourly Rates	Annual Basic Pay	Additional Payments Due to Work Rules				Total Annual Earnings	Payments Due to Work Rules % in Total Earning	Equivalent Hours of Work Rules
				Premiums	Non-Operating Time	Others	Total Work Rules			
Group A	First (Foothill)	**$10.27**	$20,540	$1,732	$2,128	$0	$3,860	$24,400	16%	376
	First (DART)	**$11.75**	$23,491	$1,528	$3,775	$239	$5,542	$29,033	19%	472
	First (Houston)	**$9.58**	$19,154	$1,933	$4,483	$902	$7,318	$26,471	28%	764
	Laidlaw (Foothill)	**$10.31**	$20,630	$5,829	$2,576	$859	$9,264	$29,894	31%	898
	ATC/Vancom	**$10.56**	$21,120	$3,190	$3,820	$2,883	$9,893	$31,013	32%	937
Group B	VIA San Antonio	**$14.69**	$29,378	$1,630	$984	$799	$3,413	$32,791	10%	232
	Metro Transit	**$17.94**	$35,876	$2,623	$3,570	$1,957	$8,151	$44,027	19%	454
	Santa Monica	**$17.00**	$34,008	$4,469	$3,063	$1,933	$9,464	$43,472	22%	557
	City of Phoenix	**$14.72**	$29,444	$2,495	$3,181	$2,731	$8,407	$37,851	22%	571
Group C	Houston METRO	**$14.92**	$29,849	$2,573	$2,256	$2,345	$7,174	$37,024	19%	481
	MTA	**$19.53**	$39,061	$4,887	$1,813	$3,019	$9,719	$48,781	20%	498
	DART	**$14.70**	$29,406	$3,431	$3,247	$1,630	$8,308	$37,714	22%	565
Private Average		**$10.38**	$20,757	$2,545	$3,537	$1,468	$7,549	$28,306	27%	727
Public Average		**$16.36**	$32,719	$3,213	$2,348	$2,150	$7,710	$40,429	19%	471
	Control	**$16.31**	$32,625	$1,831	$2,604	$2,213	$6,648	$39,273	17%	408
	In-house	**$16.38**	$32,760	$3,684	$2,206	$2,402	$8,292	$41,052	20%	506
Public-Private		**$5.98**	$11,962	$668	-$1,189	$682	**$161**	$12,123	-8%	**-256**

- Hourly rates are based on platform hours per platform costs from Table 5-1.
- Annual basic pay = 2000hrs (40 hrs a week and 50 week a year) * Hourly wage rates of each agency.
- Annual payments based on total (each) work rules = Yearly basic pay * Ratio of the total (each) work rules to platform hours in Table 5-3
- Equivalent payments of Annual Earnings= Yearly basic pay + Total payments due to work rules
- Equivalent hours of dollars spending on total work rules = (Annual $ of overtime *50% + Annual $ of other work rules) / Hourly rates

CASE 2

If a driver receives the average yearly earnings for his agency, in Table 5-7

		Hourly Rates	Annual Basic Pay	Additional Payments Due to Work Rules				Total Annual Earnings	Payments Due to Work Rules % in Total Earning	Equivalent Hours of Work Rules
				Premiums	Non-Operating Time	Others	Total Work Rules			
Group A	First (Foothill)		$19,977	$1,684	$2,070	$0	$3,754	**$23,731**	16%	366
	First (DART)		$23,481	$1,527	$3,774	$239	$5,540	**$29,021**	19%	472
	First (Houston)		$14,708	$1,484	$3,442	$693	$5,619	**$20,327**	28%	587
	Laidlaw (Foothill)		$17,003	$4,804	$2,123	$708	$7,635	**$24,639**	31%	740
	ATC/Vancom		$15,094	$2,280	$2,730	$2,060	$7,070	**$22,164**	32%	670
Group B	VIA San Antonio		$24,425	$1,355	$818	$665	$2,838	**$27,262**	10%	193
	Metro Transit		$26,382	$1,929	$2,625	$1,439	$5,994	**$32,376**	19%	334
	Santa Monica		$28,672	$3,768	$2,582	$1,630	$7,980	**$36,652**	22%	469
	City of Phoenix		$22,366	$1,895	$2,416	$2,075	$6,386	**$28,752**	22%	434
Group C	Houston METRO		$26,043	$2,245	$1,968	$2,046	$6,259	**$32,302**	19%	419
	MTA		$34,318	$4,294	$1,593	$2,652	$8,539	**$42,857**	20%	437
	DART		$28,090	$3,277	$3,102	$1,557	$7,936	**$36,026**	22%	540
Private Average			$17,569	$2,154	$2,994	$1,243	$6,390	**$23,960**	27%	616
Public Average			$29,533	$2,900	$2,119	$1,940	$6,960	**$36,493**	19%	425
Control			$25,476	$1,430	$2,033	$1,728	$5,191	**$30,667**	17%	318
In-house			$31,259	$3,516	$2,105	$2,292	$7,912	**$39,172**	20%	483
Public-Private			$11,964	$746	-$875	$698	**$569**	**$12,533**	-8%	**-190**

- Annual Earnings = An agency's annual spending on salaries of bus drivers and other employees for bus vehicle operation / the total numbers of drivers and staff working in the same functions, from Table 5-6
- Annual basic pay = Annual earnings / (1+ Ratio of the total work rules to platform hours in Table 5-3)
- Annual payments based on total work rules = Annual Earnings – Annual basic pay
- Annual payments based on each work rules item = Annual payments based on total work rules* Ratio of each item/ Ratio of total work rules
- Equivalent hours of dollars spending on work rules = (Annual $ of overtime *50% + Annual $ of other work rules) / Hourly rates

Equation 5-3: Calculation of Estimated Annual Payments due to Work Rules of Drivers

for *i* operator	Case 1	Case2
Ratio of *w* item in Work Rules (R_w)	from Table 5-3	from Table 5-3
Hourly Rate (r)	from Table 5-1	N/A
Annual Basic Pay (b)	= r*2000 hrs	$= d^* (1 + \sum_{w \in W} R_w)$
Annual $ of *w* item in Work Rules (C_w)	$= b^* R_w$	$= \sum_{a \in w} C_w * R_w / \sum_{w \in W} R_w$
Annual $ of Total Work Rules ($\sum_{a \in w} C_w$)	$= b^* \sum_{w \in W} R_w$	= d - b
Annual Earnings (d)	$= b + \sum_{a \in w} C_w$	from Table 5-6
Equivalent actual hours of $\sum_{a \in w} C_w$	$= r^* \{C_{overtime}*0.5 + (\sum_{a \in w} C_w - C_{overtime})\}$	$= r^* \{C_{overtime}*0.5 + .(\sum_{a \in w} C_w - C_{overtime})\}$

The percentage of work rule payments expressed as a share of annual wages is about 27% for privately employed drivers, compared to 20% for public drivers, even though the actual annual dollar difference is small, from about $350 to $570. The more crucial implication might be found in the estimation of equivalent work rules hours, around 500 to 600 hours per year for a privately hired driver and around 350 hours for a public driver.

During 1999 to 2001, the national average of actual work hours of full-time drivers was 1,980 hours, while the average of those at private contractors included in this study is about 2,120 hours. This fact confirms again that private drivers might have worked about 190 to 260 more hours than public drivers for earning payments due to work rules[26] but still their work rule payments are less.

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[26] Usually, the work time under premiums or other work rules is double counted, in reported data in the NTD, once in the line of platform hours and once for work rules. On the other hand, the costs of these work rules are not double-counted. In other words, actual work hours of drivers are not the sum of platform hour and these estimated equivalent work hours from work rules, as stated in the Chapter 3 (see example in Table 3-6). In summary, we know a public and a private driver have worked these estimated hours only for work rules, on average, but it does not necessary mean these differences (150-250 hours) are the same in differences in actual work hours (140 hours) from empirical data.

The last graph of Figure 5-3, points out another critical implication of drivers' work rules, in relation to the indirect effect of privatization, in addition to the implications for privately hired drivers. According to the trends of the weighted averages at the three different provisions, the private contractors showed upward trends of work rules ratios to platform hour, more than 30% from 1995 to 2001, compared to a 25% increase at public control operators and a 10% decrease at public in-house operators. That suggests that competition and the threat of privatization brought concessions on driver's work rules in the public sector and gave more flexibility to management.

CHAPTER 6. DRIVERS' BENEFITS

Fringe benefits are programs of value to employees that are separate from regular wage compensation. Some benefits—such as sick leave, vacations and uniform allowances—may be paid directly to employees. Others—such as pensions, health plan, liability and other types of insurance—are paid on behalf of an employee. Some benefits such as Social Security, federal and state unemployment insurance taxes, and worker's compensation insurance premiums are legally required. These payments are transit agency costs over and above "labor" costs, but still arising from the employment relationship. They are the second largest spending in operating costs at a transit agency, next to wages (and salaries).

This chapter is organized by the following discussions of 1) paid absences, 2) other fringe benefits, and 3) average annual benefits of a driver calculated as an agency's total spending on drivers' benefits divided by the total number of full-time and part-time drivers. Also, individual items of drivers' benefits packages are compared by using the ratio of each item to platform hours.

For clarification, the term "fringe benefits" in this study excludes items associated with paid absences, while the term "benefits" are used to represent all benefits , including paid absences. In addition, the aggregated annual benefits (including paid absences) of drivers are available, while the details in individual benefits items for drivers, which are the focus of the study, are not. On the other hand, we know the details of agencies' spending on individual items but only in aggregated numbers for all employees in all modes. Therefore, the ratio of each item in a benefits package for all employees in all

modes is based on actual calculations from reported data, while the same ratios for drivers are estimated as noted in Equation 6-1.

Equation 6-1: Calculation of Ratio to Platform Hours of Hours Equivalent to Paid Absences and Fringe Benefits

Let A and F, respectively, denote the set of items in paid absences and fringe benefits, and both be subsets of J (a vector of item in pay hours). In particular, a denotes an a-valued absence where $a \in A$, and f denotes a f-valued fringe benefit where $f \in F$. And $A \subset J$ and $F \subset J$.

Consequently, R_a and R_f refer to the ratio of a a-valued paid absence to platform hours, and the ratio of f-valued fringe benefit to platform hours, and are given by

$$R_a = \frac{H_a}{H_p} = \frac{C_a}{C_p} \text{ ,and } R_f = \frac{H_f}{H_p} = \frac{C_f}{C_p} \text{ for all } a \text{ and } f, \text{ respectively}$$

since from Equation 3.2, $R_j = \frac{H_j}{H_p} = \frac{C_j}{C_p}$, for all j.

where H_j: Equivalent pay hours for item j, $j \in J$

C_j : Agency's spending on item j, $j \in J$

H_p is platform hours and C_p is platform costs.

Hence, the ratio of total paid absences to platform hours is defined as

$$\sum_{a \in A} R_a = \frac{\sum_{a \in A} H_a}{H_p} = \frac{\sum_{a \in A} C_a}{C_p}, \qquad a \in A .$$

Similarly, the ratio of total fringe benefits to platform hours is defined as

$$\sum_{f \in F} R_f = \frac{\sum_{f \in F} H_f}{H_p} = \frac{\sum_{f \in F} C_i}{C_p}, \qquad f \in F.$$

In particular, the estimated ratios *for drivers* for all a and f, are calculated by

$$\boldsymbol{R}_a \text{ of drivers} = \boldsymbol{R}_a \text{ of employees*} \frac{(\sum_{a \in A} \boldsymbol{R}_a \text{ of drivers} + \sum_{f \in F} \boldsymbol{R}_f \text{ of drivers})}{(\sum_{a \in A} \boldsymbol{R}_a \text{ of employees} + \sum_{f \in F} \boldsymbol{R}_f \text{ of employees})}$$

and

$$\boldsymbol{R}_f \text{ of drivers} = \boldsymbol{R}_f \text{ of employees*} \frac{(\sum_{a \in A} \boldsymbol{R}_a \text{ of drivers} + \sum_{f \in F} \boldsymbol{R}_f \text{ of drivers})}{(\sum_{a \in A} \boldsymbol{R}_a \text{ of employees} + \sum_{f \in F} \boldsymbol{R}_f \text{ of employees})}$$

6.1. Paid Absences

On some occasions, a driver is paid even when she or he is absent from work for reasons of personal or family illness, funeral attendance, jury duty, scheduled vacations, and so on. These paid absences are a part of the benefits that a full-time employee is entitled to receive.

Paid absences can be both taken or paid off or a combination of both. For example, a driver at Hamlet Agency with five years of experience may be entitled to three weeks of vacation in a year. Either he could take three weeks off, or he could be paid off at the end of year, or he can elect a combination of both. In this study, these payments made for paid absences of one agency are compared to the cost of producing service outputs, using the ratio of paid absences to platform hours.

This study identified that the most obvious distinction between publicly and privately hired drivers is that drivers at private contractors receive very small benefits in the form of paid absences. Value-wise, the costs of paid absences are the least significant

factor among the four categories of labor costs (the sum of basic wages, fringe benefits, paid absences and costs attributable to work rules).

Table 6-1 pointed out this clear distinction between employees' (and drivers') paid absences in pubic and private provision of transit service. Clearly the bottom five firms are operating under private management (the bold and italic ones). They showed a huge difference in paid absences compared to public operators, and this difference is extremely significant based on the Wilcoxon two-sample test.

From 1995 to 2001, the average ratio of drivers' paid absences to platform hours ($\sum_{a \in A} \boldsymbol{R}_a$ of drivers) of Houston METRO and Metro Transit at Minneapolis are the highest, at 0.25; and the ratio of First Transit at Foothill is the lowest, at only 0.01. And three operations of First Transit have the lowest share of payments for drivers' paid absences, all less than 0.05, compared to their platform costs. Vacation is the dominant factor among the four paid absences items in both public and private provision since the periods of vacation are longer than sick leave or holidays.

These paid absence ratios to platform hours can be interpreted in two ways. For example, Houston's high paid absence ratio means that to operate an hour of service, Houston METRO paid a driver extra money for paid absences, besides his hourly rates. And this additional payment for paid absences is 25% of regular pay, on average. If Joe, a full-time driver, earned $12 per hour, he would be paid extra $3 for these absences per every hour he worked. On the other hand, Harry, a driver at First (Foothill), would receive only $0.16 under the same situation. These amounts would add up to $120 for Joe and $7 for Harry, weekly. The annual amount of paid absences would be $6,200 and $340, if both drivers worked eight hours a day, five days in a week and 260 days in a year.

Table 6-1: Average Ratio of Paid Absences to Platform Hours: All Cases (1995-2001)

		Paid Absences of Employees					(Drivers)
	Operator	Sick Leave	Holiday	Vacation	Others	Total	Total
Group A	First (Foothill)**	0	0	0.01	0	**0.01**	**(0.01)**
	First (DART)*	0	0	0.04	0	**0.04**	**(0.03)**
	First (Houston)***	0	0	0.05	0	**0.05**	**(0.03)**
	Laidlaw (Foothill)**	0.02	0.03	0.05	0.003	**0.10**	**(0.08)**
	ATC (Las Vegas)	0	0.11	0.09	0.004	**0.20**	**(0.15)**
Group B	VIA San Antonio	0.06	0.09	0.13	0.01	0.29	(0.13)
	Santa Monica***	0.11	0.09	0.11	0.01	0.31	(0.22)
	Metro (Minneapolis)	0.07	0.10	0.16	0.03	0.36	(0.25)
	City of Phoenix	0.09	0.09	0.13	0.05	0.37	(0.23)
Group C	LAC MTA***	0.06	0.04	0.20	0.01	0.32	(0.19)
	DART	0.07	0.08	0.18	0.02	0.34	(0.14)
	Houston METRO	0.10	0.08	0.20	0.09	0.47	(0.25)
Group A Average		0.001	0.05	0.06	0.002	0.12	(0.08)
Group (B+C) Average		0.07	0.07	0.18	0.03	0.36	(0.20)
- Group B Average		0.07	0.09	0.15	0.03	0.34	(0.21)
- Group C Average		0.08	0.06	0.20	0.04	0.37	(0.20)
Diff. (Public - Private)		0.07	0.02	0.12	0.03	**0.24**	**(0.12)**

* the average from 1995 to 2000.
** the average from 1999 to 2001.
*** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.
Ratios in the brackets are estimated based on Equation 6-1, under the assumption that both drivers and other employees received the same level of paid absences, in terms of the percentage of their hourly rate.

Ratio of Total Paid Absences of Employees to Platform Hours

Group		*Observations*	*Weighted Average*	*Arithmetic Mean*	*Variance*
Private Contractors	Group A	5	0.116	0.081	0.00556
Public Agencies	Group B + Group C	(7)	0.357	0.352	0.00367
- Control	- Group B	4	0.333	0.333	0.00142
- In-House	- Group C	3	0.378	0.378	0.00714
Difference					
Public – Private	Group (B+C) – Group A		0.241*	0.271	
Control – Private	Group B – Group A		0.217**	0.252	
In-House – Control	Group C – Group B		0.045***	0.045	

The p-value of ANOVA (Group A, B and C) is 0.000225.
Two-tail p-values of the Wilcoxon Tests: * p <= 0.0025, ** p<=0. 0159 and *** p<= 0. 6286.

The other way to interpret this paid absence ratio to platform hours is the count of days off of paid leave, since paid absences are based on the days when a driver is absent from work. Let's assume Joe at Houston METRO and Harry at First (Foothill) worked 260 days (five days a week for 52 weeks) in the last year and both did not take any of the vacation, holidays or other paid absences that they are entitled to. Since paid absences can be either taken or paid off, the annual paid-off amount for each driver would be $340 and $6,200 as already seen in above.

These paid-off amounts are the same as the regular pay for 3.6 days for Harry and 64.4 days for Joe, assuming they worked 8 hours a day and 260 days in a year. So Harry either took 4 days off in the last year or received $340 instead, or took the combination of these two. In same way, Joe might have received $6,200 or have taken 64 days of vacations, holidays and so on. Or he took two days of sick leave, one day of jury duty, seven holidays, and two weeks of vacations, and he worked and was paid off for the rest of paid leave he is entitled to take.

In Table 6-2, average annual days off of drivers' paid leave and its equivalent dollars (average pay-off of drivers' paid leave) are estimated for two cases, by using the ratio of paid absences of drivers to platform hours. The first case is for when drivers at all 12 operators earned the same hourly rate of $12 and the second case is for when a driver receives the average hourly rate of his agency, calculated in the previous chapter. The average number of days off of drivers at private contractors is 15 days, compared to 52 days for public drivers.

Table 6-2: Estimated Annual Paid-Off and Day-Off for Driver's Paid Absences : All Cases

Operator		CASE 1			CASE 2		
		If hourly rate is $12			If hourly rate is the average of the operator		
		Hourly Rates	Paid-off in Year	Days-off In Year	Hourly Rates	Paid-off in Year	Days-off In Year
Group A	***First (Foothill)***	$12	$343	4	$10.27	$294	4
	First (DART)	$12	$668	7	$11.75	$654	7
	First (Houston)	$12	$715	7	$9.58	$571	7
	Laidlaw (Foothill)	$12	$1,990	21	$10.31	$1,711	21
	ATC (Las Vegas)	$12	$3,689	38	$10.56	$3,246	38
Group B	VIA San Antonio	$12	$3,206	33	$14.69	$3,924	33
	Santa Monica	$12	$5,517	57	$17.00	$7,818	57
	Metro(Minneapolis)	$12	$6,190	64	$17.94	$9,253	64
	City of Phoenix	$12	$5,717	60	$14.92	$7,110	60
Group C	*LAC MTA*	$12	$4,778	50	$19.53	$7,777	52
	DART	$12	$3,424	36	$14.70	$4,195	36
	Houston METRO	$12	$6,181	64	$14.72	$7,584	64
Private Average		$12	$1,481	15	$10.73	$1,295	15
Public Average		$12	$5,033	52	$17.30	$6,809	52
Diff. (Public - Private)		**0**	**$3,552**	**37 Days**	**$6.57**	**$5,514**	**37 Days**

The calculations in this table are based on the following assumptions:

- A driver at an individual agency works 8 hours a day, 5 days a week and 52 weeks a year (a total of 260 work days in one year).
- Case 1 is based on the scenario that drivers at all 12 operators earn the same hourly rate of $12.
- Case 2 is based on the scenario that a driver at each operator earns the average hourly rate of his/her company, estimated from Table 5-1.

Equation 6-2: Calculation of Estimated Annual Paid-Off and Day-Off of Drivers

For each *i* operator	Case 1	Case2
Hourly Rate (r)	$12	from Table 5-1
Average Ratio of Total Paid Absence for drivers ($\sum_{a \in A} R_a$)	from the last column of Table 6-1	
Annual $ of paid-off absences ($\sum_{a \in A} C_a$)	$= r * \sum_{a \in A} R_a$ * 8 hrs * 260 days	
The number of annual days off (Equivalent to $\sum_{a \in A} R_a$)	$= \sum_{a \in A} R_a$ / r / (8 hrs a day)	

Notice that the numbers of days off calculated from two different scenarios are identical, but the annual dollar amounts of pay-offs are $1,500 for privately hired drivers and $5,000 for public drivers if all drivers were paid $12 per hour and worked the same number of hours. The gaps in pay-off dollars between private and public drivers are wider in Case 2, where it is assumed that drivers were paid at the average hourly rates of an individual agency than in Case 1, where it is assumed that drivers at all 12 operators received the same rates.

Obviously, First Transit has paid the least amount for paid absence for its drivers: all three operations paid less than $1,000 annually. Also the days off for drivers at all three are all less than eight per year, with the lowest being fewer than four days off for drivers at its Foothill operation. These numbers are too small considering that there are six to 10 days of generally observed national holidays, let alone counting vacations and other paid absences. For example, ATC's drivers received the most days off or pay-offs among private contractors, 38 days off or the equivalent in compensation. However, only after 2002's strike, they would have received three paid holidays, Christmas, New Year's Day and Independence Day[27].

Among public operators, VIA San Antonio and DART paid the least amount for drivers' paid absences- 33 to 35 days, or the equivalent dollars. Both operators had lower spending on drivers' paid leave than ATC. On the other hand, annual pay-off dollars for drivers' paid absences at these two operators are larger than those at ATC if the higher hourly rates of public drivers are applied (Case 2).

Drivers at other public operators are entitled to have 52 to 64 days off or the equivalent dollars. The larger percentage of senior drivers at public agencies compared to

[27] Similarly, Laidlaw's drivers at Denver RTD received two holidays per year.

private contractors is one of the reasons that public agencies paid more money for paid absences, since senior drives are entitled to longer vacations.

Generally, a transit driver receives six to eight days of paid holidays in one year, and qualifies for one day of sick leave by working full-time for one month. The length of vacations of some public drivers is summarized in Table 6-3. Unlike holidays, some private contractors have similar rules governing length of work time to qualify for sick leave and vacations (Labor contracts between ATU and Laidlaw Inc, at Denver RTD, 2000). The differences between public and private bus operators observed in Table 6-2 mainly come from the mix of seniority of drivers and operators' rules of compensation over unused absences, besides paid holidays.

Table 6-3: Example of Length of Vacations

Eligibility - Length of Continuous Services	Number of work weeks of vacation
1 consecutive year	1
2 consecutive years	2
5 consecutive years	3
10- 12 consecutive years	4
20- 21 consecutive years	5
28-31 consecutive years	6
The maximum	6

Source: Labor Contract of ATU and Denver Regional Transportation District, and ATU and Massachusetts Bay Transportation Authority

This poor rate of paid absences for drivers at private contractors is also related to their low use of part-time drivers. Besides the extent of work hours, the most basic distinction between full-time and part-time employees across the entire industry is that the former are entitled to receive larger benefits packages associated with full time employment (e.g., sick leave, vacation, and insurance benefits), while the latter are not. This treatment of full-time workers as if they were part-time workers with no sick leave

and small holidays, and paying them wages similar to part-time workers, is observed among all the private contractors in this study.

6.2. Other Fringe Benefits

In this section, fringe benefits programs other than paid absences are examined across 12 operators by using the ratio of fringe benefits to platform hours. Most of these benefits such as pensions, health, dental and various types of insurance, are not directly paid to drivers, but rather paid to some other institution on behalf of the employee. Some benefits such as Social Security, federal and state unemployment insurance taxes, and worker's compensation insurance premiums are legally required. For almost all cases, an agency's costs attributed to these programs are larger than paid absences and work rules.

Average fringe benefits ratios to platform hours ($\sum_{f \in F} \boldsymbol{R}_f$)of 12 operators are compared in Table 6-4. Ratios of individual programs are based on agencies' spending on all employees in all modes. And ratios in the brackets (the last column)—the ratio of total fringe benefits of drivers to platform hours ($\sum_{f \in F} \boldsymbol{R}_f$ of drivers)—are estimated, based on an assumption that drivers and other employees received the same level of fringe benefits. The results of ANOVA and Wilcoxon test are compared in Table 7-2, along with other pay hour ratios to platform hours.

The different compositions of individual programs in fringe benefits (all employees in all modes) at each operator are summarized in Figure 6-1. Clearly Group C displayed higher levels of costs for fringe benefits than other types of operators in two aspects. First, their fringe benefits costs associated with other employees in other modes are higher than other groups since these operators operate more modes. Secondly, their

isolated fringe benefit costs of bus drivers are still higher than others. (For more details of an individual agency in all years, see Appendix 5.)

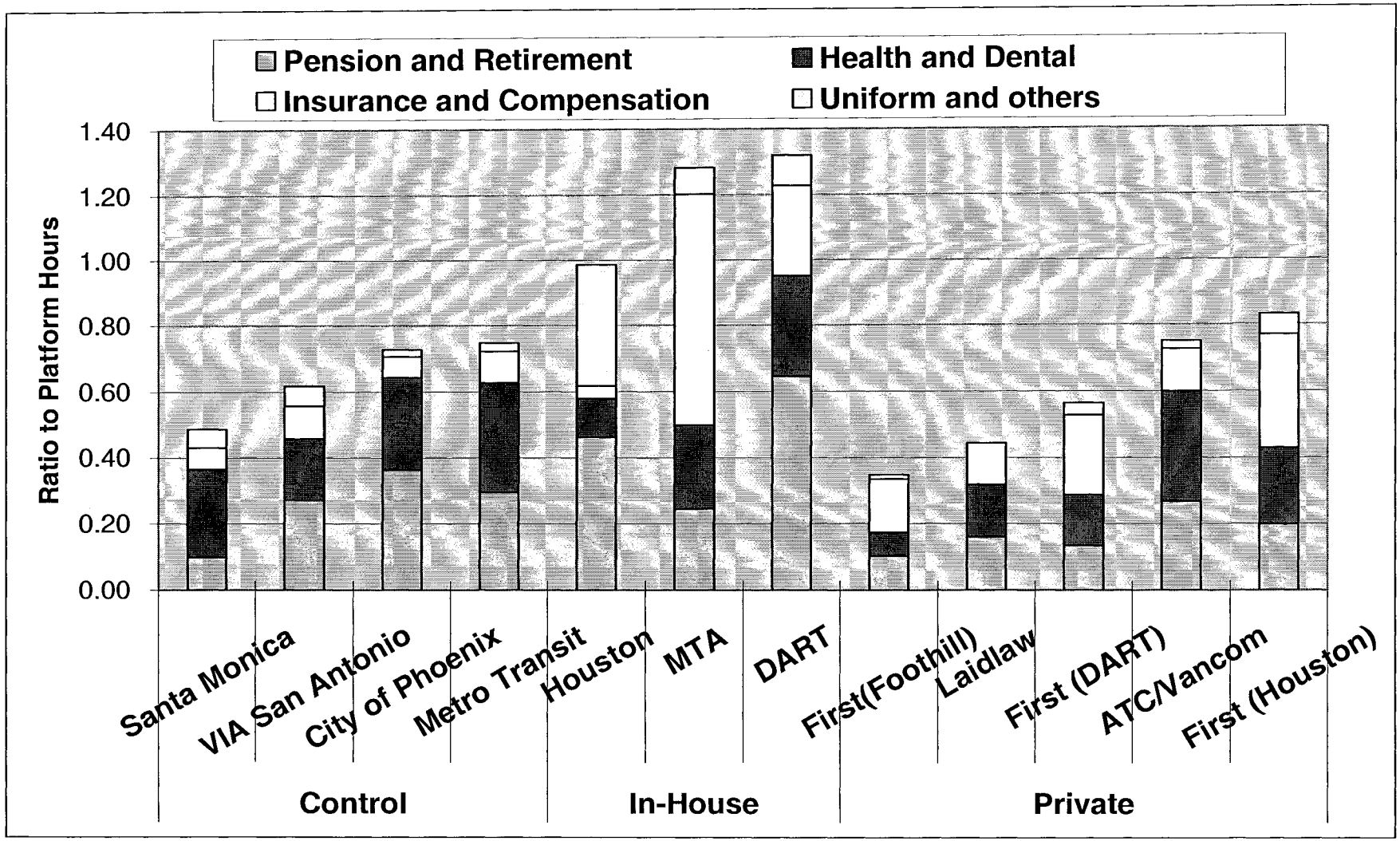
Among private contractors, two operators at Foothill have the lowest ratios on drivers' fringe benefits ($\sum_{f \in F} R_f$ of drivers). On the other hand, ATC at Las Vegas and First (Houston) showed not only a higher level of spending than the other three private operators, but also more than the most of the Group B operators.

Table 6-4: Average Ratio of Fringe Benefits to Platform Hours: All Cases (1995-2001)

		Fringe Benefits of Employees					(Drivers)
	Operator	Pension/ Retirement	Health/ Dental	Insurance	Others	Total	Total
Group A	***First (Foothill)****	0.10	0.07	0.16	0.01	0.35	(0.33)
	First (DART)*	0.13	0.15	0.24	0.04	0.56	(0.35)
	First (Houston)**	0.20	0.23	0.34	0.06	0.83	(0.51)
	Laidlaw (Foothill)*	0.16	0.16	0.13	0.00	0.44	(0.36)
	ATC (Las Vegas)	0.27	0.33	0.13	0.02	0.75	(0.51)
Group B	VIA San Antonio	0.27	0.19	0.10	0.06	0.62	(0.27)
	Santa Monica***	0.10	0.27	0.07	0.05	0.49	(0.35)
	Metro (Minneapolis)	0.30	0.33	0.10	0.03	0.75	(0.55)
	City of Phoenix	0.36	0.28	0.06	0.02	0.73	(0.45)
Group C	*LAC MTA****	0.24	0.25	0.70	0.08	1.28	(0.78)
	DART	0.65	0.30	0.28	0.09	1.32	(0.55)
	Houston METRO	0.46	0.12	0.04	0.37	0.99	(0.52)
Group A Average		0.20	0.23	0.19	0.03	0.65	(0.58)
Group (B+C) Average		0.35	0.24	0.31	0.12	1.02	(0.45)
- Group B Average		0.26	0.27	0.08	0.04	0.69	(0.42)
- Group C Average		0.45	0.23	0.34	0.18	1.21	(0.66)
Diff. (Public - Private)		0.15	0.01	0.12	0.09	0.38	(0.12)

* the average from 1995 to 2000.
** the average from 1999 to 2001.
*** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.
Ratios in the brackets are estimated based on Equation 6-1 under the assumption that drivers and other employees received the same ratio of paid absences to other benefits, in terms of the percentage to hourly rate.

Figure 6-1: Average Ratio of Fringe Benefits (All Employees in All Modes) to Platform Hour: All Cases



Again, it should be noted that the higher ratio does not necessarily mean higher monetary costs, rather a higher level of unit costs. For example, Metro Transit and ATC have the same ratio of fringe benefits to platform hour, 0.75, meaning that to produce one hour of service, an additional 75% of hourly pay is paid for drivers' benefits. Since the hourly wage rates at Metro Minneapolis are higher, the actual dollars spent on fringe benefits are higher than at ATC.

This is the reason why privately hired drivers at ATC and First (Houston) received much less in terms of annual dollars of benefits, while these two operators have higher ratios of fringe benefits to platform hours than some public operators. On the average over seven years, these amounts would add up to about $8,600 worth of benefits for each ATC driver each year, while the City of Phoenix annually pays a little more than $12,400 for every driver. Thus, the differences in annual fringe benefits in dollars of two operators, about $3,800 on average, are more substantial than the difference in the fringe benefits ratio.

Among private contractors, First (Houston) and ATC of Las Vegas have fringe benefits ratios ($\sum_{f \in F} \boldsymbol{R}_f$ of drivers) comparable to public operators, but the reasons are very different.

First (Houston) is the most noteworthy operator, in terms of fringe benefits, since its high fringe benefits ratios ($\boldsymbol{R}_{insurance}$) are derived from excessive insurance costs. There have been a few controversial fatality accidents caused by drivers at this operator. For example, a fender bender accident in an HOV lane caused by a driver under probation killed a nine-year-old girl in 2001. And in 2005, a woman was killed at a

pedestrian crossing with broken signal by bus whose driver had a record of reckless driving and deferred adjudication at the same company in 2003.

Interestingly, all three operations of First Transit have much higher insurance ratios than the others, except the MTA and DART. One reason is that the rates of insurance for large contractors are based their national corporate rates[28]. For example, if First Transit had an accident in Houston operating under contract with METRO, this could raise rates nationwide the following year. This is also applicable to its operation under contract with DART or even Foothill in California.

ATC at Las Vegas displays a higher fringe benefits ratio, a mean value of 0.75, than not only its control, the City of Phoenix, but also all four public control operators. Over the studied time period, ATC's overall fringe benefits have significantly increased around its contract renewal at 1997. The substantial increase in fringe benefits ratio in 1997 (a net increase of 0.26) at ATC is directly rooted in the growth in employment, the net increase of almost 100 employees, with a renewal of procurement. Another substantial increase in employment (almost 180 new jobs) in 2001 also results in a rise of fringe benefits ratios in the same year (a net increase of 0.08).

ATC's health/dental plan ratios to platform hours, the mean value of 0.33, are the highest among 12 operators. This high ratio informs us that health insurance coverage for ATC's drivers is fairly good and has constantly increased over the years, with an exception in 1996. However, ATC's health benefits were limited to drivers, not to dependents, and spouse coverage requires an employee contribution of $80 per month during the studied time period. However, based on the new labor contracts in 2002 after

[28] It is applicable to not only insurances for workers, but also liability and insurances for vehicles and riders, which is included in operating expenses of one agency.

the strike, health care premiums will be split, with drivers' contributions to employee health insurance capped at 15 percent and the company paying 85 percent beginning in 2003.

ATC also has higher ratios of insurance/compensation than Phoenix, with mean values of 0.13 and 0.06, respectively. This difference between the two operators is the second largest among all fringe benefits items, 0.07 on the average, behind the ratios of pension/retirement plan, which is 0.10 on average. Since a high amount of insurance/compensation (including life insurance, short-term disability insurance, unemployment insurance and workers' compensation insurance) implies low job security as well as the low safety, the reason for ATC's higher ratios in these items seems to be obvious, considering ATC's high rates of driver turnover as well as frequent interruptions in driving and disturbances caused by passenger, a unique problem among the cases studied, because of ATC's high level of tourists riding late at night and having a tendency to be more disorderly. Among all cases, the private operators generally have higher insurance/compensation ratios than public operators except for the MTA and DART.

In the case of First at DART, the fringe benefits ratio, the mean value of 0.56, ranges from 0.40 to 0.72 over eight years, peaking in 1996. They were even higher than those of VIA (a mean of 0.62) during 1996 to 2000 and have converged with VIA since 1996.

In the case of Los Angles Area operators, the biggest differences between public and private operators, especially comparing them with the MTA, come from fringe benefits among four categorized hours. Among all four operators, First Transit at Foothill has the lowest ratio of fringe benefits to platform hours, a mean of 0.35 during three

years, while those at the MTA are always higher than 1, which means this pubic operator paid an even greater amount of fringe benefits than the platform costs, in other words, wage rates for drivers. Laidlaw and Santa Monica show similar ratios of fringe benefits to platform hours, with mean values of 0.45 and 0.49, respectively. Moreover, First Transit showed not only lower hourly rates, but also lower ratios of fringe benefits among the four operators in Los Angles area.

Despite similar ratios of fringe benefits to platform hours, Laidlaw and Santa Monica have distinct compositions. Among all operators, Santa Monica has the lowest ratios of pension/retirement plan and insurance/compensation to platform hours while it has the highest health/dental plan cost ratio to platform hours. In Laidlaw's case, the pension/retirement plan item is the highest benefits item in 1999 and 2000 and the health/dental plan in 2001. Also, these ratios of health/dental plan have increased constantly for four years.

Generally, a high amount of insurance/compensation implies low job security as well as poor safety; in other words, it usually occurs to operators with high turnover rates, high accident rates and high crime rates. The last two factors would explain the exceptionally high ratios of insurance/compensation at the MTA in general. In addition, the peaking of this ratio experienced by the MTA in 1999 is explained by high costs of unemployment insurance in that year. Also, the MTA shows the highest ratios among the four operators for every item except health/dental plan, with an especially large insurance and compensation ratio (0.52 in 2001 and 0.97 in 1999).

The interesting fact about ratios of fringe benefits to platform hours is that each operator has a different combination of items and values in its benefits packages. The

most dominant item among fringe benefits packages is pension and retirement plans for public operators. For private contractors, all three—pensions, health plans as well as insurance— were significant.

The ratios of insurance costs to platform hours ($\boldsymbol{R}_{insurance}$) displayed the largest variance across operators, ranging from 0.04 at Houston METRO to 0.70 at the MTA. With the notable exception of the MTA, private contractors generally have higher spending on insurance than public operators since private bus operators generally have low job security and fewer senior drivers. Insurance is one dominant factor of private contractors over public agencies among the items in fringe benefits, due to poor safety records (e.g. First Transit at Houston) and high driver turnover (e.g. ATC at Las Vegas). Byproducts of high driver turnover - fewer experienced drivers, shortage of drivers and/or more work hours per drivers - may result in more accidents, which directly influences the insurance cost of operators.

In terms of driver's retirement plans and pension plans, all private contractors placed at the bottom ends of the rankings, and have lower ratios to platform hours than public agencies (the mean of 0.35 vs. 0.20). Two public operators at Texas spent the most compared to other operators for retirement and pension, while two pubic operators in the Los Angles area spent the least among public operators. (Santa Monica is the lowest, and the MTA is the sixth lowest among all operators.) No private operators, except ATC, currently pay for any driver pension plan; while both public operators do, and all pay for Federal social security, which is legally required.

In terms of health and dental plans for drivers, both public and private operators spent at similar levels (0.24 and 0.23, the average ratio of platform hours). However, the

variance within private contractors is much greater than at other types of operators. The $R_{health/dental\ plan}$ of four private contractors are below the average, and only drivers at ATC (ranked first among all operators) received full health coverage (but the same benefits are not applied to their dependents or spouses).

Between the two private contractors at Foothill, drivers at First Transit have poorer health plan coverage than those at Laidlaw, despite the union presence at First Transit. Laidlaw pays half the health insurance costs for the first four years of employment, and up to 90 percent thereafter, while First Transit pays $96 per month coverage for a single person, rising to $212 for a family, in contrast to $475 per month at Santa Monica (Richmond 2001).

6.3. Estimated Annual Benefits of Drivers

Drivers' annual benefits at each operator are calculated by its annual spending on drivers benefits divided by the total number of drivers. The same limitations as in the annual earnings of drivers, discussed in the Chapter 5.3 (page 114) are applicable to this measure. For example, this indicator does not take into account any change in the number of drivers in the transit system, while it is heavily affected by the percentage of part-time workers at an individual agency since both full-time and part-time workers are weighted equally. Also, different shares of part-time workers affect wages and fringe benefits differently, possibly benefits more heavily.

Table 6-5 displays drivers' average yearly benefits at 12 operators; the trends from 1995 to 2001 are illustrated in Figure 6-2. Clearly, the lowest five are private contractors as observed in Table 6-5. On average, privately hired drivers received $8,700

worth of benefits in a year, about a half value of benefits for public drivers ($20,500), and these differences between public and privately hired drivers are statistically significant.

Table 6-5: Estimated Drivers' Annual Benefits: All Cases (1995-2001)

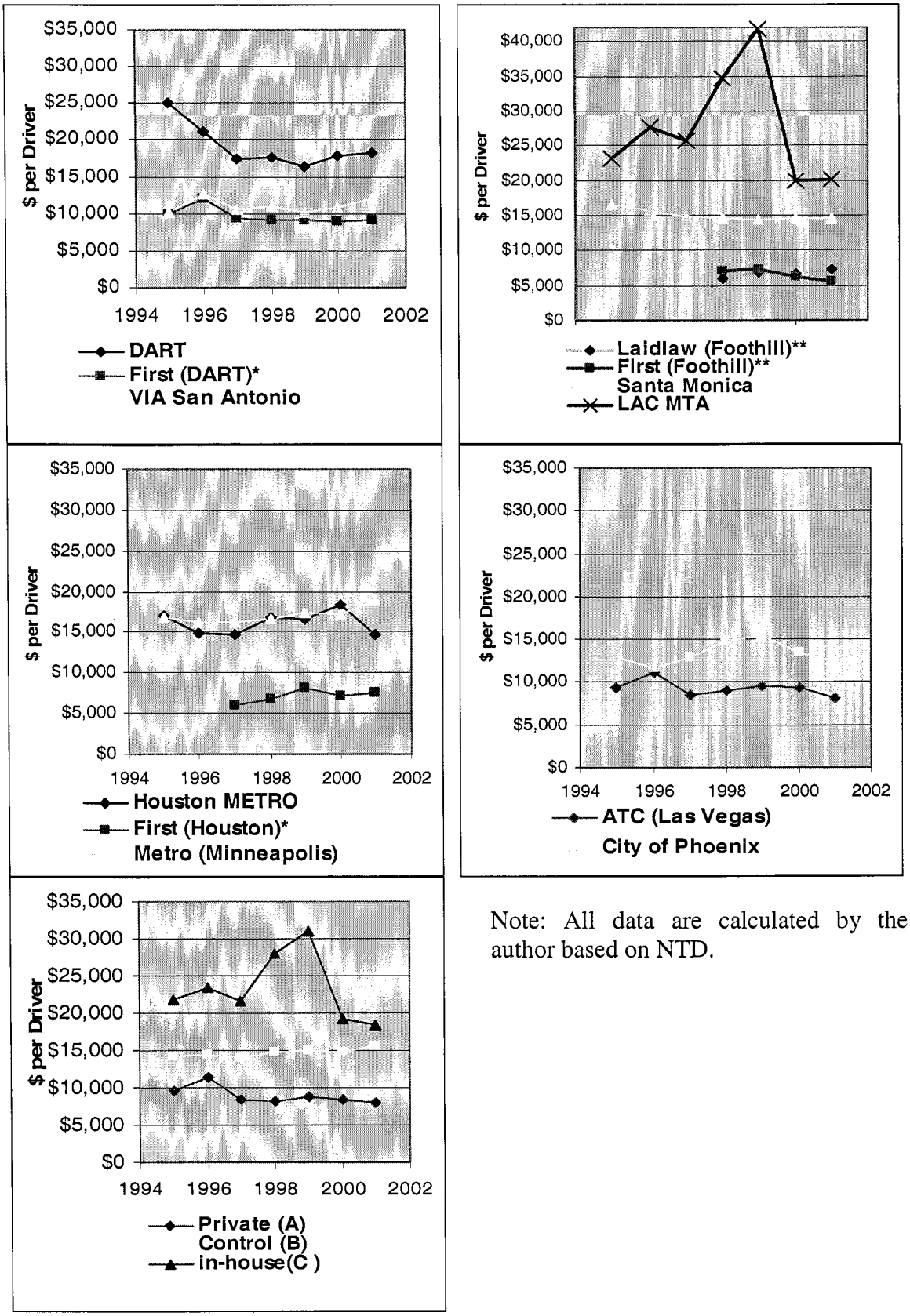
Group	Operator	Average		2001		Difference
		$ per Hour	Rank	$ per Hour	Rank	2001- Mean
CASE1						
C	DART (DO)	$19,040	2	$18,180	3	-$860
A	First (DART)*	$9,551	8	$9,155	8	-$396
B	VIA San Antonio	$11,052	7	$12,107	7	$1,055
CASE2						
A	Laidlaw (Foothill)**	$6,709	11	$7,279	11	$570
A	First (Foothill)**	$6,488	12	$5,493	12	-$995
B	Santa Monica (DO)	$14,914	5	$14,642	5	-$273
C	LAC MTA (DO)	$27,071	1	$20,130	1	-$6,942
CASE3						
C	Houston METRO	$16,102	4	$14,659	4	-$1,443
A	First (Houston)*	$7,200	10	$7,591	10	$391
B	Metro (Minneapolis)	$17,098	3	$18,922	2	$1,823
CASE4						
A	ATC (Las Vegas)	$9,209	9	$8,216	9	-$992
B	City of Phoenix (DO)	$13,294	6	$12,315	6	-$979

The average of each operator is a weighted average across years.
* the average from 1997 to 2001.
** the average from 1998 to 2001.
Others are based on the average from 1995 to 2001.

Group		*Observations*	*Weighted Average*	*Arithmetic Mean*	*Variance*
Private Contractors	Group A	5	$8,690	$7,831	2078815
Public Agencies	Group B + Group C	(7)	$20,466	$16,939	26640606
- Control	- Group B	4	$14,713	$14,090	6529898
- In-House	- Group C	3	$23,110	$20,738	32244854
Difference					
Public – Private	Group (B+C) – Group A		$11,776*	$9,108	
Control – Private	Group B – Group A		$6,024**	$6,258	
In-House – Control	Group C – Group B		$8,397***	$6,648	

The p-value of ANOVA (Group A, B and C) is 0.001123.
The two-tail p-values of the Wilcoxon Two-sample Tests : * p <=0.0025, ** p<= 0.0159, and *** p <= 0.1143

Figure 6-2: Trends of Annual Benefits of All Operators (1995- 2001)



Note: All data are calculated by the author based on NTD.

First Transit at Foothill has spent the least for driver's benefits (and is the third lowest in terms of annual wages), and drivers at the MTA received the most, among all operators. The difference between the two operators is $19,000 for each driver. Of those employed by private contractors, drivers at First (DART) were paid the closest to public drivers' benefits, the same as what was observed in wages and earnings, of all other private drivers. Among public operators, VIA San Antonio spent the least for driver's benefits, as was true for wages.

The most noteworthy operator in terms of annual drivers' benefits is the MTA. It displayed the highest in all three items of hourly operating costs, annual earnings, and benefits for drivers and showed similar trends in all three items: they skyrocketed until 1999 and dropped after 2000's strike (while costs attributed to work rules have been relatively constant). But the MTA's spending on drivers' benefits showed a much more substantial difference compared to other operators, while its wages and hourly operating costs were not so different. The scale of the peak in 1999 is larger for drivers' benefits (from $23,000 in 1995 to $42,000 in 1999), with driver's liability compensation being the biggest contributor.

Drivers' benefits at 12 operators ranged from about $6,500 at First (Foothill) to $27,000 at the MTA; while earnings ranged from $20,300 at First (Houston) to $42,900 at the MTA. The difference in benefits between publicly and privately hired drivers is more substantial than it is for earnings: benefits made up more than 40% of driver's compensation at public operators, while only 27% at private contractors.

Among three different types of operator, the annual benefits of drivers at Group A and Group C have declined substantially, 17% and 15%, respectively, compared to a 11%

increase at Group B, from 1995 to 2001. Among operators in Group B, two operators, Santa Monica and the City of Phoenix, displayed decreasing trends of annual drivers' benefits, after indexing for inflation, while the other two, Metro Transit at Minneapolis and VIA San Antonio, showed the opposite trends (an increase of 13% and 19%). Considering the latter two operators have high percentages of part-time drivers, actual annual drivers' benefits would have risen more. The trends of drivers' benefits at three public in-house operators are the most volatile and fluctuated a great deal, but all three decreased over seven years, especially DART (by 27%).

Another significant trend is that contracting appears to have had a negative influence on privately hired drivers' benefits compared to their wages. Benefits overall of privately hired drivers have declined in a small degree during the studied time period, unlike their annual earnings, which increased. Also, drivers at First (DART) and Laidlaw (Foothill) received more or comparable wages compared to some public control operators such as VIA and Phoenix, which is not the case for benefits.

On the other hand, the level of annual drivers' benefits has been much more distinctive between Group A and Group B, compared to annual earnings. Drivers' annual benefits at most control operators fell into the brackets between $11,000 and $15,000, while Metro Transit and other in-house public operators fell into the higher bracket of $19,000 and above. Drivers' annual benefits for all private contractors fell into the range between $6,000 to $10,000, regardless of the size of operation and cost of living in the service areas, while wages are more influenced by the cost of living.

6.4. Summary of Drivers' Benefits

In general, the fluctuation in fringe benefits costs is mainly explained by two factors, a new labor contract or a change in the amount of workers employed. Both the creation as well as the loss of jobs bring an increase in fringe benefits. The former causes a rise in retirement/pension and health/dental plans, while the latter causes an increase in unemployment/compensation insurance.

In terms of dollars, the biggest differences in fringe benefits between public and private operators are the payments for retirement/pension plans, since four out of five private operators do not pay for pensions for their drivers (while all pay for legally required Social Security). In addition, the private contractors showed a unique composition of 1) significantly lower benefits of paid absences, and 2) higher levels of insurance costs due to the various combinations of more inexperienced drivers in the system, high driver turnover, poor safety records, and offering service to high crime areas.

The clearest distinction between publicly and privately hired drivers is the very few paid absences (with almost no sick leave) at private operators. Value-wise, these paid absence costs for drivers are the least significant factors among the four categorized pay hours. One of the reasons that private contractors showed the low level of spending on paid absences is the lower percentage of senior drivers, who are entitled to longer vacations.

Generally, the estimated yearly days off of paid absences that privately hired drivers can take is about 15 in comparison to 52 for public drivers, as observed in Table 6-2. Among private contractors, First Transit spent the least amount on paid absence for

their drivers. The paid-off amount of paid absences for drivers at all three of First's operations is less than $1,000 annually. Also the annual days off for their drivers are all fewer than eight (and fewer than four at its Foothill operation), which is similar to or even fewer than the number of generally observed national holidays.

Privately hired drivers have similar benefits to part-time workers with no sick leave and few or no holidays. This might be another reason for the fewer part-time drivers observed across all private contractors.

Drivers' annual benefits across all private contractors fell into the range of $6,000 to $10,000, regardless of the size of operation and cost of living in the service areas; while while benefits at their public counterparts are more influenced by these factors.

Unlike drivers' wages and earnings, there is no definite trend of an increase in drivers' benefits from 1995 to 2001. Only pubic control operators displayed more or less increasing pattern, especially Metro Transit at Minneapolis. By contrast, the ratios of fringe benefits at both private contractors and public in-house showed a downward trend, dropping 20% and 12%, respectively.

Among three different types of operator, only public controls showed an increasing trend (11% growth), while annual benefits at the other two groups have declined substantially. More importantly, contracting appears to have had a negative influence on privately hired drivers' benefits compared to their wages. Benefits of overall privately hired drivers have declined by 17%, compared to an increase of their annual earnings by 10% from 1995 to 2001. Also drivers at First (DART) and Laidlaw (Foothill) received wages that were higher than or comparable to wages at some public control operators such as VIA and Phoenix, which is not the case in benefits.

CHAPTER 7. LABOR UTILIZATION

When a driver works one hour, he receives more than one hour of pay. This can include supplementary pay from work rules (e.g. overtime premiums) and compensation in the form of benefits. In this study, the difference between work hours and pay hours for drivers are measured by the *ratio of pay hours to platform hours,* which represents how much one agency has paid drivers for producing one work hour. Platform hours is the time a driver is on board the bus, either preparing for service, carrying passengers in line service, or deadheading. They are the basis of drivers' work schedules and pay.

An agency's expenses for driver pay hours embrace all labor costs incurred by its employment relationship with its drivers. The payments of 1) drivers' platform hours and 2) hours spent on drivers' work rules are classified as drivers' earnings, while other payments are classified as benefits. In this study, the costs of driver pay hours are divided into four categories: platform hours, drivers' work rules, fringe benefits, and paid absences. These were all converted into hour-equivalents for operators. The higher the ratio of pay hours to platform hours, the higher the unit costs; thus the ratio is an indicator of labor utilization, or productivity.

Figure 7-1 describes the composition of different pay hour ratios of three different types of operators. In Table 7-1, the average ratios of the total paid hours to platform hours of 12 operators from 1995 to 2001 are ranked from the lowest to the highest. The descriptive analysis and the result of the Wilcoxon two-sample tests on ratios of three categories of pay hours of platform hours (total paid hours, hours due to work rules, and all benefits of drivers) are summarized in next three tables.

Figure 7-1: Labor Utilization Ratio Bar: All Cases

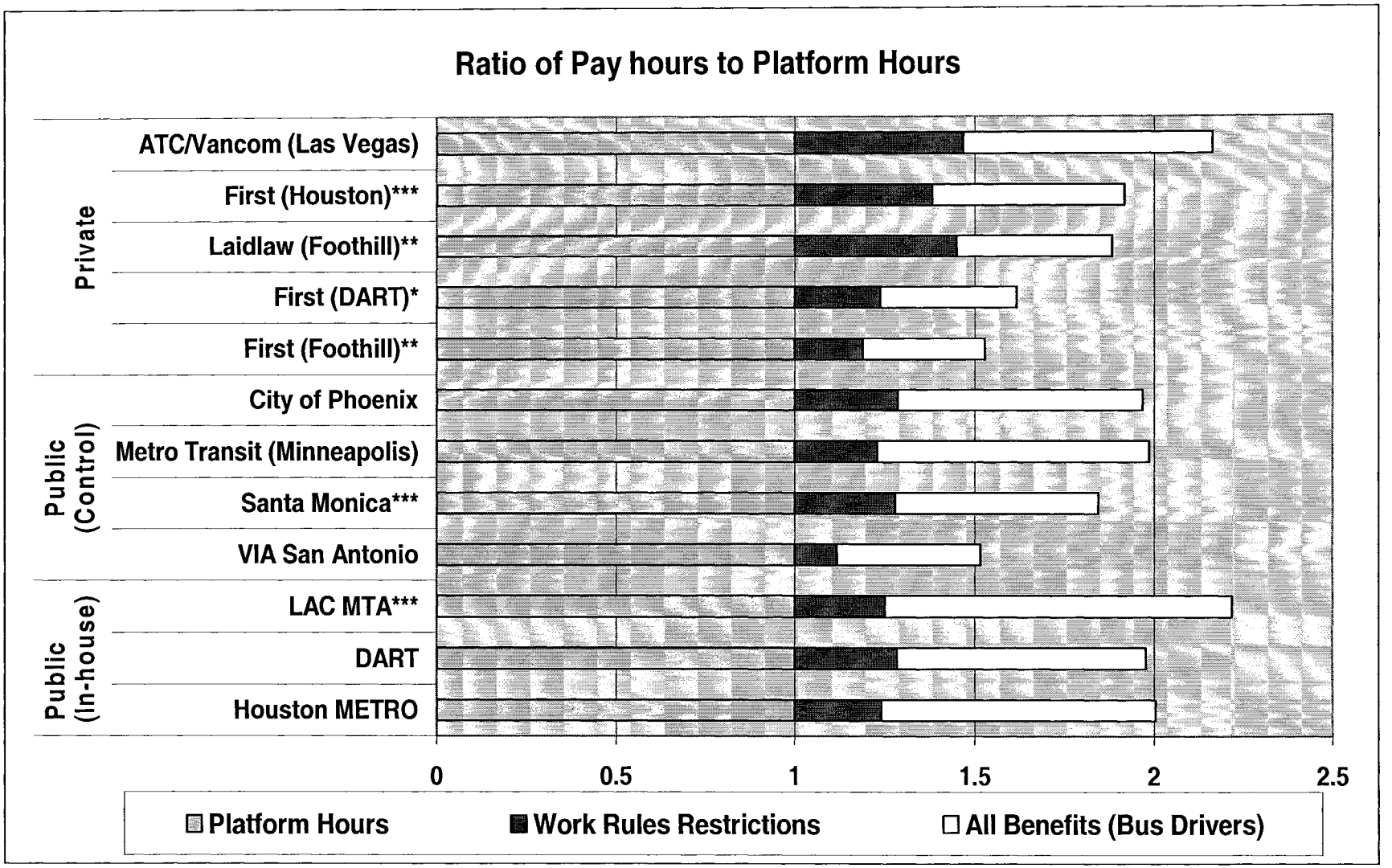


Table 7-1: Average Ratio of Pay Hours to Platform Hours : All Cases(1995-2001)

	Platform Hours	Work Rules Restrictions ($\sum_{w \in W} R_w$)	Fringe Benefits ($\sum_{f \in F} R_f$) of Drivers	Paid Absences ($\sum_{a \in A} R_a$) of Drivers	Total Paid Hours ($\sum_{j \in J} R_j$)
VIA San Antonio	1	0.12	0.27	0.13	1.52
First (Foothill)**	1	0.19	0.33	0.01	1.53
First (DART)*	1	0.24	0.35	0.03	1.62
Santa Monica***	1	0.28	0.35	0.22	1.84
Laidlaw (Foothill)**	1	0.45	0.36	0.08	1.88
First (Houston)**	1	0.38	0.51	0.03	1.92
City of Phoenix	1	0.29	0.45	0.23	1.97
DART	1	0.28	0.55	0.14	1.98
Metro Transit	1	0.23	0.51	0.25	1.99
Houston METRO	1	0.24	0.52	0.25	2.00
ATC/Vancom	1	0.47	0.55	0.15	2.16
*LAC MTA****	1	0.25	0.78	0.19	2.22
Private Contractors Average	1	0.36	0.45	0.08	1.90
Public Agencies Average	1	0.24	0.58	0.20	2.01
- Control	1	0.20	0.42	0.21	1.83
- In-House	1	0.25	0.66	0.20	2.11
Difference (Public - Private)	0	**-0.13**	0.12	0.12	0.11

* are the mean values from 1993 to 2000, ** the mean values over 1999 to 2001, and *** the mean values over 1998 to 2001.
Others are based on the mean values over 1995 to 2001.
The ratios of paid absences of bus drivers are estimated by using the ratio of paid absences (all staffs and all modes) divided by the ratio of fringe benefits (all staffs and all modes) in an individual agency.

Table 7-2: Ratio of Pay Hours to Platform Hours of Different Types of Operators

Ratio of Total Paid Hours to Platform Hours					
Group		*Observations*	*Weighted Average*	*Arithmetic Mean*	*Variance*
Private Contractors	Group A	5	1.90	1.85	0.054
Public Agencies	Group B + Group C	(7)	2.01	1.97	0.041
- Control	- Group B	4	1.83	1.86	0.029
- In-House	- Group C	3	2.11	2.13	0.013
Difference					
Public – Private	Group (B+C) – Group A		0.11*		
Control – Private	Group B – Group A		-0.07**		
In-House – Control	Group C – Group B		0.28***		

The p-value of ANOVA (Group A, B and C) is 0.1452.
The two-tail p-values of the Wilcoxon Two-sample Tests : * p <=0.2677, ** p<=0.9048, and *** p<= 0.0571.

Ratio of Hours due to Work Rules to Platform Hours

Group		Observations	Weighted Average	Arithmetic Mean	Variance
Private Contractors	Group A	5	0.36	0.35	0.0148
Public Agencies	Group B + Group C	(7)	0.24	0.25	0.0039
- Control	- Group B	4	0.20	0.23	0.0061
- In-House	- Group C	3	0.25	0.27	0.0014
Difference					
Public – Private	Group (B+C) – Group A		-0.12*		
Control – Private	Group B – Group A		-0.16**		
In-House – Control	Group C – Group B		0.05***		

The p-value of ANOVA (Group A, B and C) is 0.2032 .
The two-tail p-values of the Wilcoxon Two-sample Test: * p <= 0.2020, ** p<=0.2857 , and *** p<= 0. 6286.

Ratio of All Benefits (Drivers) to Platform Hours ($(\sum_{f \in F} R_f + \sum_{a \in A} R_a)$ of drivers)

Group		Observations	Weighted Average	Arithmetic Mean	Variance
Private Contractors	Group A	5	0.53	0.50	0.0166
Public Agencies	Group B + Group C	(7)	0.78	0.73	0.0262
- Control	- Group B	4	0.63	0.63	0.0133
- In-House	- Group C	3	0.86	0.86	0.0110
Difference					
Public – Private	Group (B+C) – Group A		0.25*		
Control – Private	Group B – Group A		0.1**		
In-House – Control	Group C – Group B		0.23***		

The p-value of ANOVA (Group A, B and C) is 0.0075.
The two-tail p-values of the Wilcoxon Two-sample Test : * p <= 0.0303, ** p<=0. 1905 and *** p<= 0. 0758.

First of all, the public control (Group B) showed the best labor utilization among three types of bus operators, although the difference between it and Group A is not statistically significant. Based on the ratio of total paid hours to platform hours, the average of the control group is 1.83, lower than that of private contractors by 0.07 and that of public in-house operators by 0.28. Five private operators paid approximately 1.90

hours for one work hour of drivers; pubic drivers overall received more than the double their work hours as pay hours. Overall, the private contractors have a lower ratio of total paid hours to platform hours than public operators (Group B and Group C combined).

While Group A and Group B showed similar ratios of total paid hours to platform hours on average, their labor cost structures associated with drivers are different, as seen in Figure 7-1. Both groups show similar spending on drivers' fringe benefits ($\sum_{f \in F} \boldsymbol{R}_f$ of drivers), 0.42 to 0.45 hours' worth of pay. The major differences between the two groups are found in their spending on drivers' work rules ($\sum_{w \in W} \boldsymbol{R}_w$) and paid absences ($\sum_{a \in A} \boldsymbol{R}_a$ of divers). About 0.21 hour's worth of pay was paid for drivers' absences for Group B and only 0.08 for Group A. On the other hand, operators in Group A have spent 0.36 hour's worth of pay on work rules, compared to 0.20 for Group B, on average.

Based on the ratio of total paid hours to platform hours, VIA San Antonio had the lowest ratio among 12 operators, while the MTA displayed the highest. The total paid hour ratios, 1.52 and 2.22, at these two agencies indicate VIA San Antonio generally paid drivers 1.52 hours' worth of pay for working one hour, while drivers at the MTA who worked one hour received payments equivalent to 2.22 hours, (or an extra 1.22 hours), on average.

Among private contractors, ATC at Las Vegas spent the highest amount of money to produce one hour (the second highest among all), since its work rule ratio is the highest among 12 operators, and its benefit ratio ($\sum_{f \in F} \boldsymbol{R}_f + \sum_{a \in A} \boldsymbol{R}_a$) of drivers is comparable to public operators. VIA and Santa Monica spent the least to produce one hour among pubic operators.

Among 12 bus operators included in this study, three—the MTA, ATC at Las Vegas and Houston METRO—showed ratios higher than 2 of the total paid hours to platform hours. In other words, these three paid more for supplementary costs than basic pay for drivers. On the other hand, for no operator in our sample is the ratio less than 1.5, suggesting that in majority of cases the supplementary costs are more than 50% of drivers' basic pay.

The ratios of different categories of pay hours to platform hours were already discussed in previous chapters. In general, the ratio of fringe benefits, $\sum_{f \in F} \boldsymbol{R}_f$ for drivers are larger than those for work rules ($\sum_{w \in W} \boldsymbol{R}_w$) and paid absences ($\sum_{a \in A} \boldsymbol{R}_a$). The paid absences ratios are exceptionally low at private contractors, except ATC at Las Vegas.

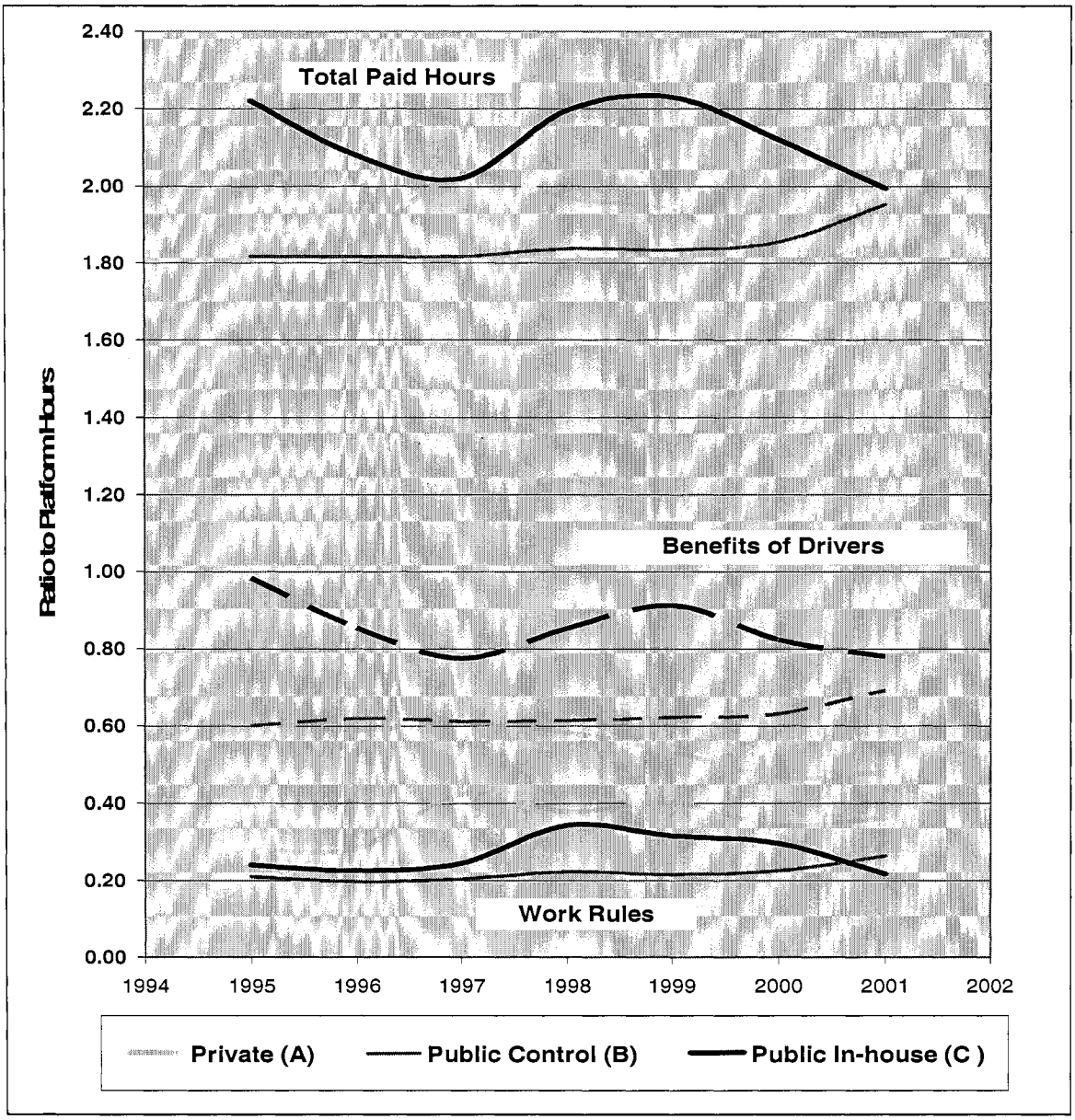
Drivers' work rule restrictions are the only category of pay hours for which private contractors have higher spending than public operators. While ratios of fringe benefits and paid absences to platform hours at private operators are lower than those for either type of public operators, their high ratios of drivers' work rules exceed those for Group B.

With respect to the trends of three different types of operators, the total paid hours ratios of Group B (the controls) was more or less constant from 1995 to 2000, and increased almost by 10% in 2001; and the same trends are observed in the $\sum_{w \in W} \boldsymbol{R}_w$, as well as the ($\sum_{f \in F} \boldsymbol{R}_f + \sum_{a \in A} \boldsymbol{R}_a$) of drivers for Group B.

The trends of Group C (public in-house operators) are quite interesting compared to the controls. While all three ratios of Group B in Figure 7-2 have increased, the

counterparts for Group C have decreased, more or less, during the studied time period and especially since 1999. In other words, labor utilization of public operators who contracted out have improved compared to public operators who did not engage in contracting, although it is unclear that the contracting is the main determinant

Figure 7-2: Trends of Ratio of Pay Hours to Platform Hours (1995-2001)



In terms of Group A (private contractors), their data to calculate these ratios are unfortunately incomplete for most years, as discussed in Chapter 4.1. For three years

(1999 to 2001) when all data are complete, the changes in the three groups' ratios of three categories of pay hours to platform hours are summarized in Table 7-5. Interestingly, all three ratios of both Group A and Group C decreased in contrast to increases in all three ratios of Group B during this period. And the magnitudes of Group C's decreases are 2 to 2.5 times larger than Group A's decreases for all three ratios to platform hours.

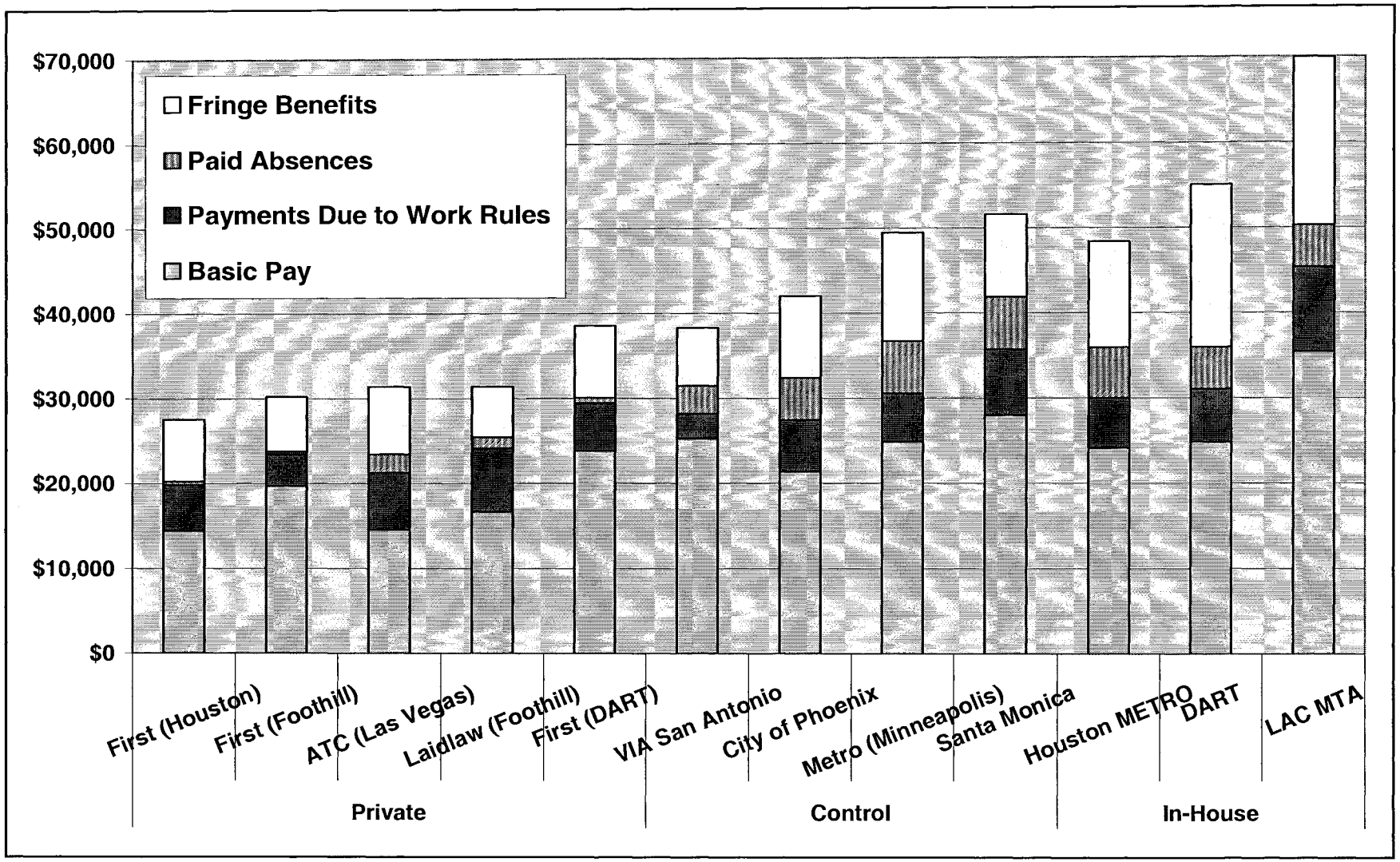
Overall the mean ratios of total paid hours to platform hours at three different types of operators seem to have converged at the end of the studied period, as shown in Figure 7-2. Group C's total paid hours ratio has gradually decreased over seven years with the bump in 1998; and the difference between Group A and Group C has been narrowed slightly. Unlike their total paid hour ratios, two other ratios of Group A and Group C did not converge over the years.

Table 7-3: Changes in Ratios of Total Driver Pay Hours to Platform Hours (1999 – 2001)

	Total Pay Hours	Work Rules	All Benefits of drivers
Private (A)	-5.0%	-7.9%	-9.8%
Public Control (B)	6.4%	0.7%	22.1%
Public In-house (C)	-10.6%	-6.4%	-31.6%

Based on the ratio of each category of hour to platform hours, the breakdowns of drivers' annual compensation are estimated for each operator in Figure 7-3. Average annual earnings of drivers, calculated in Table 5-6 is divided into basic pay and annual payment due to work rules, based on the ratio of work rules to platform hours, for individual operators. Next, average annual benefits of drivers, calculated in Table 6-5, is divided into annual payments for paid absences and annual payments for other fringe benefits, based on the ratio of each categorized hour to platform hours.

Figure 7-3: Breakdown of Driver's Annual Compensation (Average in 2001 dollars)



We can clearly see the composition of drivers' compensation at each operator in Figure 7-3, and this confirms several key findings from previous chapters. In terms of drivers' earnings, the MTA and Santa Monica are highest among all operators, probably as a result of the cost of living in their service area. For privately hired drivers, a significant portion of annual earnings is payments from work rules, compared to their public peers. In terms of drivers' benefits, the most notable difference is the very little paid leave for privately hired drivers, while the actual dollar difference is much larger for other fringe benefits.

One of the best examples that illustrates these key findings would be the case of VIA and First Transit (DART). Drivers' compensation is almost identical, $31,200 and $31,700, respectively; but with different compositions. The earnings of a driver at First Transit (DART) are higher than those of a driver at VIA, since the additional payment due to work rules is $2,200 higher for privately hired drivers. On the other hand, public drivers at VIA receive about $1,000 more in benefits and paid leave.

Summary of Labor Utilization

Among three types of operators, the public controls (Group B) showed the best labor utilization judging by the ratio of total paid hours to platform hours, although Group A (private contractors) was a close second. Both Group A and Group B showed similar ratios of total paid hours to platform hours and similar levels of spending on drivers' fringe benefits. On the other hand, Group A paid drivers more for their work rules and much less for paid absences than Group B did to produce one hour.

VIA San Antonio had the best labor productivity among 12 operators: overall paid drivers 1.52 hours' worth of pay for producing one hour.

Among different categories of pay hours, hours due to drivers' work rules are the only category for which private contractors have higher unit costs than public operators. In general, payments of fringe benefits for drivers are larger than those for work rules and paid absences. The paid absences ratios are exceptionally low at private contractors, except ATC at Las Vegas.

While public control operators showed increases of ratios of all three categories of pay hours of platform hours (total paid hours, hours due to work rules, and all benefits of drivers), the counterparts for public in-house operators as well as private operators have decreased, from 1999 to 2001. In other words, labor utilization of public operators who contracted out has improved compared to public operators who did not engage in contracting, although it is unclear that the contracting is the main determinant of this trend.

Overall, the mean ratios of total paid hours to platform hours at three different types of operators seem to have converged at the end of the studied period, while two other ratios (of work rules and fringe benefits to platform hours) did not.

CHAPTER 8. Key Findings Across All Cases

In this study, I examined findings from the individual case studies and synthesized them with respect to three different types of operators: 1) private contractors, 2) the public controls who did not engage in contracting, and 3) public in-house operations of agencies that partially contracted-out their service. The results of this synthesis are helpful in understanding fixed-route bus transit service contracting in the United States in terms of the cost structure of labor, and drivers' welfare and working conditions. Some components of labor costs and labor conditions showed clear differences between different types of operators (such as wage rates, paid absences for drivers, and some fringe benefits), but for other components, the differences are not so obvious. Following is a summary of the study's key findings for all the cases.

1. ***Privately hired drivers receive lower wages and substantially inferior benefits in comparison with publicly hired drivers.***

The most obvious finding of this study is lower wages and benefits for privately hired drivers. For example, privately hired drivers at five contractors included in this study receive about $10 to $11 in hourly rates (in 2001 dollars), about $6 to $8 less than publicly hired ones. Annualized, the difference adds up to roughly $10,000 to $12,000 less in terms of drivers' earnings during the years studied, decreasing to $9,600 in 2001. In terms of benefits, privately hired drivers' packages were worth approximately $8,000 to $9,000 in a year, by $11,800 less than public peers, as seen in Table 8-2.

The estimated hourly rates, and estimated annual earnings of privately hired drivers are about 38% and 34% below their counterparts in public agencies, respectively.

And their estimated annual benefits are 58% less. In conclusion, the contractors paid 52% less in overall driver compensations while the overall contract price (hourly operating costs) is 43 % less than that of running public buses.

Table 8-1 : Hourly Compensation of Bus Drivers (in 2001 Dollars)

	Hourly Compensations				
	Earnings		Benefits		
	Wage	Work Rule	Paid Absences	Fringe Benefits	Total
Private Contractors Average	$10.73	$3.90	$0.87	$4.86	$20.37
Public Agencies Average	$17.30	$4.08	$3.47	$9.97	$34.81
- Control	$16.38	$3.34	$3.38	$6.89	$29.99
- In-House	$17.70	$4.48	$3.54	$11.66	$37.38
Difference (Public - Private)	**$6.57**	**$0.17**	**$2.60**	**$5.10**	**$14.45**

Privately hired drivers received hourly wages similar to those of part-time drivers or even drivers-in-training in the public sector, and generally have a lower maximum rate that they can reach. In some case, private drivers were not awarded any seniority increases (e.g. First Transit at Foothill), or it took much longer to reach the maximum rate (e.g. eight years for Laidlaw at Foothill versus four to five years in general). Among five private contractors, a union presence seemed to have no significant impact on improving wages.

Privately hired drivers at different operators seemed to receive similar wages and benefits regardless of the geographic location of the service areas or the size of the operation. This is substantially different from publicly hired drivers, whose wages are more likely to be influenced by these factors.

2. ***A privately hired driver worked on average 100 to 200 hours more per year than a public driver in order to compensate for lower regular wages, but still did not always achieve the same annual earnings as his public counterpart.***

In this study, a higher level of spending on work rules - a higher ratio of work rules hours to platform hours - was observed at four out of five private contractors compared to public controls, the exception being First (Foothill). Overall, private contractors have generally lower operating costs per RVH (by $35) and relatively higher labor utilization than their public counterparts, but showed higher costs imposed by drivers' work rules. This last finding suggests a critical implication—that private contractors' cost savings are achieved at the expense of the welfare of transit workers, mainly due to lower wages and inferior benefits packages, rather than because they utilize their workforce more efficiently than public operators.

At first glance, it is perplexing that private contractors spent more on drivers' work rules than public operators did, because private contractors often enjoy more flexible work rules, and unions, if they are present, are likely to be weaker. One possible explanation might be that the payments based on work rules are made to drivers who are working excess hours in order to compensate for their lower wages. The empirical data from the NTD showed that privately hired full-time driver at operators included in this study worked around 150 more hours annually than the national average.

Expressed as a percentage of annual earnings, work rule payments are higher for privately employed drivers, 27 percent versus 20 percent for public drivers, even though the actual dollar differences are insignificant, annually $161 to $569 less for private drivers despite their extra time worked. In terms of equivalent work hours, private

operators incurred around 600 to 700 hours per year per driver in work rule costs versus around 425 to 470 hours per public driver, meaning that private drivers might have worked from 190 to 250 more hours in a year than public drivers to achieve marginal wage improvements, at best, over their public counterparts.

Another factor contributing to private operators' higher spending on work rules is excessive non-operating paid work time, most of which is taken up by training time for new drivers.

3. *Public and private drivers' wages and hourly operating costs show a possible convergence, but benefits do not.*

In terms of the long-term effects of contracting, in most cases, a possible convergence in earnings (basic pay plus additional payments due to work rules) and hourly operating costs between public and private operators is observed. But it is not clear whether drivers' benefits of public and private operators are converging.

As seen in Figure 8-1, the gap in hourly operating costs (the solid lines), between three public in-house operations and five private operators has decreased while the gaps between the public controls and private have increased, especially since 1998. Private operators and the public controls experienced a rise in hourly operating costs from 1995 to 2001, while public in-house operators have seen them fall during that period with the exception of the time after the MTA was included in 1998. They began decreasing again, starting in 1999. Including the MTA distorted the average hourly costs significantly. At the same time, Santa Monica's low hourly costs helped smooth out the increase in the average for the public controls caused by Metro Transit.

In terms of hourly wages, the group averages for all three types of operators have trended upward. The difference between private operators' average (the dotted lines in Figure 8-1) and both public in-house as well as public control operators has increased, and no obvious convergence among any three groups is observed.

Table 8-2: Wages and Benefits of Driver at Public and Private Operators (in 2001 dollars)

	2001	Average	Difference (2001- Average)
Estimated Hourly Wage Rates			
Private Contractors Average	$10.38	$10.73	-$0.36
Public Agencies Average	$16.36	$17.30	-$0.94
- Control	$16.31	$16.38	-$0.06
- In-House	$16.38	$17.70	-$1.32
Difference (Public - Private)	**$5.98**	**$6.57**	**-$0.58**
Estimated Average Annual Earning of Drivers			
Private Contractors Average	$24,394	$23,960	$435
Public Agencies Average	$33,957	$36,493	-$2,536
- Control	$29,910	$30,667	-$757
- In-House	$35,989	$39,172	-$3,182
Difference (Public - Private)	**$9,563**	**$12,533**	**-$2,970**
Estimated Average Annual Benefits of Drivers			
Private Contractors Average	$8,009	$8,690	-$681
Public Agencies Average	$17,512	$20,466	-$2,953
- Control	$15,685	$14,713	$971
- In-House	$18,430	$23,110	-$4,681
Difference (Public - Private)	**$9,504**	**$11,776**	**-$2,272**
Operating Costs Per RVH			
Private Contractors Average	$49.76	$51.93	-$2.17
Public Agencies Average	$87.49	$92.40	-$4.91
- Control	$83.26	$76.29	$6.97
- In-House	$89.28	$98.96	-$9.68
Difference (Public - Private)	**$37.73**	**$40.47**	**-$2.74**

All are the weighted averages in the studied time period of four public controls - VIA San Antonio, City of Phoenix, Metro (Minneapolis) and Santa Monica -, three public in-house operators - Houston METRO, LAC MTA, and DART - and five private contractors - First (Houston), First (DART), Laidlaw (Foothill), First (Foothill), and ATC (Las Vegas), between 1995 to 2001.

In estimated hourly rates, the data of First (DART) is from 1995-2000, and First (Houston) from 1998-2001. The data of Laidlaw (Foothill) and First (Foothill) are from 1999-2001.

In terms of estimated annual earnings, annual benefits, and operating costs per RVH, the data of First (Houston) were from 1997 -2001, and the data of two private contractors at Foothill were from 1998- 2001. Others were from 1995-2001.

Figure 8-1: Differences in Hourly Operating Costs in Hourly Wages Between Public In-house and Private Operators and between Public Control and Private Operators (in 2001 dollars)

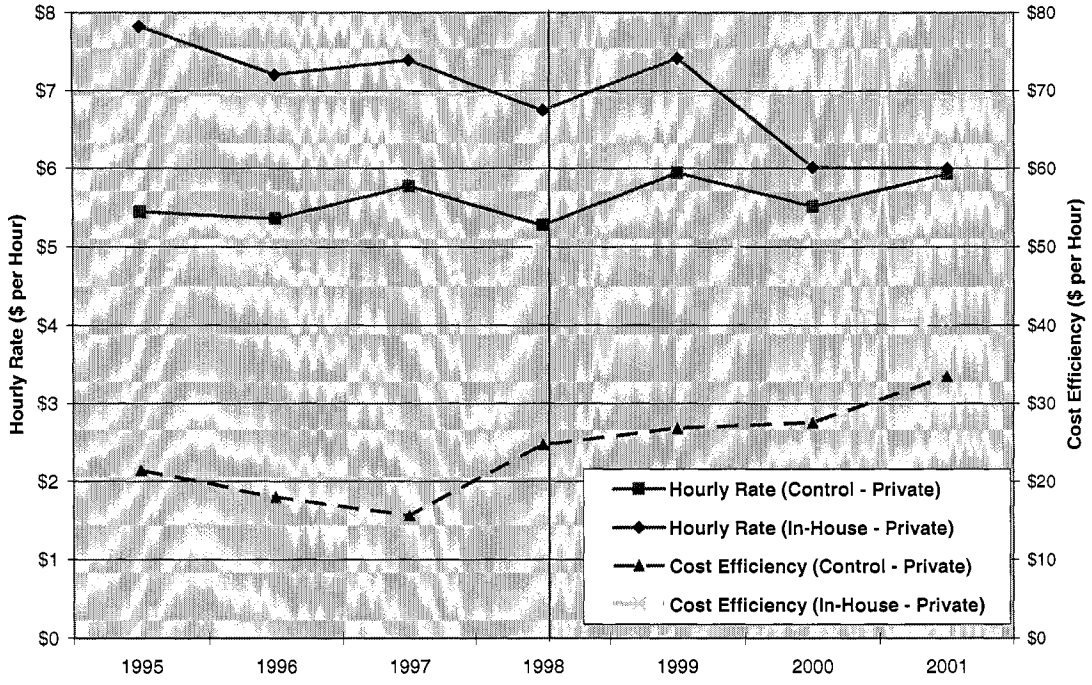
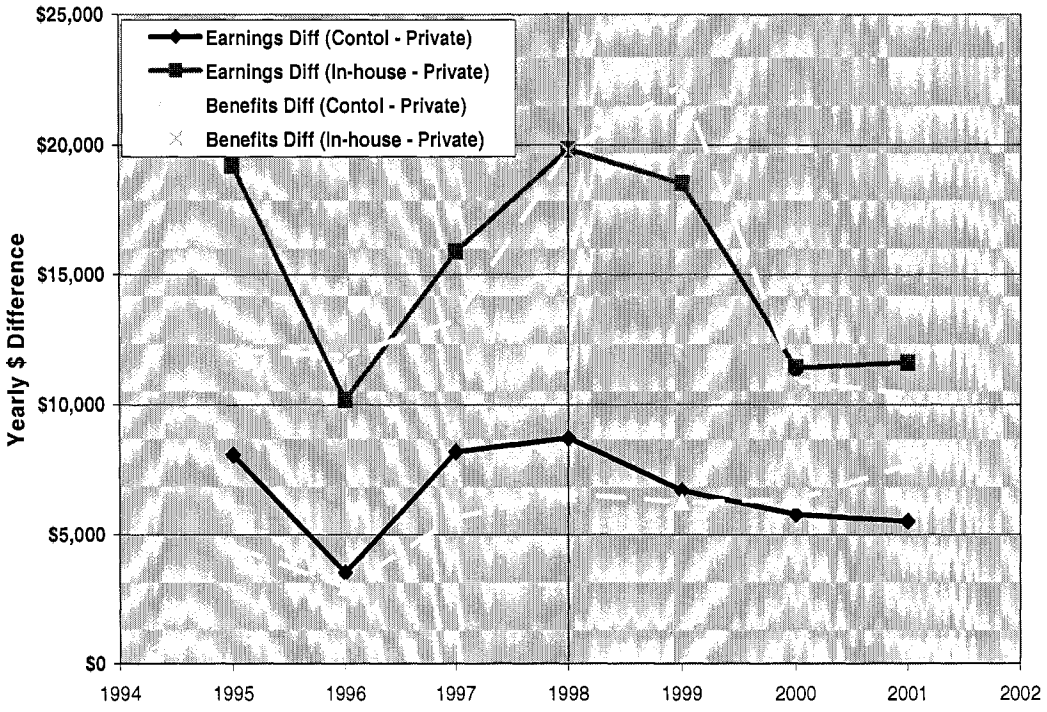


Figure 8-2: Differences in Annual Earnings and in Annual Benefits Between Public In-house and Private Operators and between Public Control and Private Operators (in 2001 dollars)



On the other hand, a possible convergence between public and private may be observed in drivers' yearly earnings (the solid lines in Figure 8-2). The difference in yearly earnings between public and private operators declined from 1995 to 2001, and the difference between private and pubic in-house has decreased more dramatically. The yearly dollar difference between private and public in-house was $11,600 in 2001 compared to around $20,000 in 1995 (with peaks at 1998), while the difference between private and the public controls also decreased, falling from $8,000 in 1995 to $5,500 in 2001.

One reason that yearly drivers' earnings, in contrast to hourly wages, showed convergence is the upward trend of payments due to drivers' work rules, referred to earlier. Although wage rates at private contractors have increased less than those at the other two groups and also lagged behind inflation from 1995 to 2001, their payments arising from drivers' work rules increased quite significantly. Private contractors' work rules hours per platform hours rose to almost 30%, compared to 25% at public control operators, and there was a decrease of 10% at public in-house operators.

In addition, the declining trends in payments from work rules in pubic in-house operators showed that the competition against private peers and the threat of privatization brought concessions from labor and resulted in lower payments due to the less-constrained work rules at public agencies that contracted out.

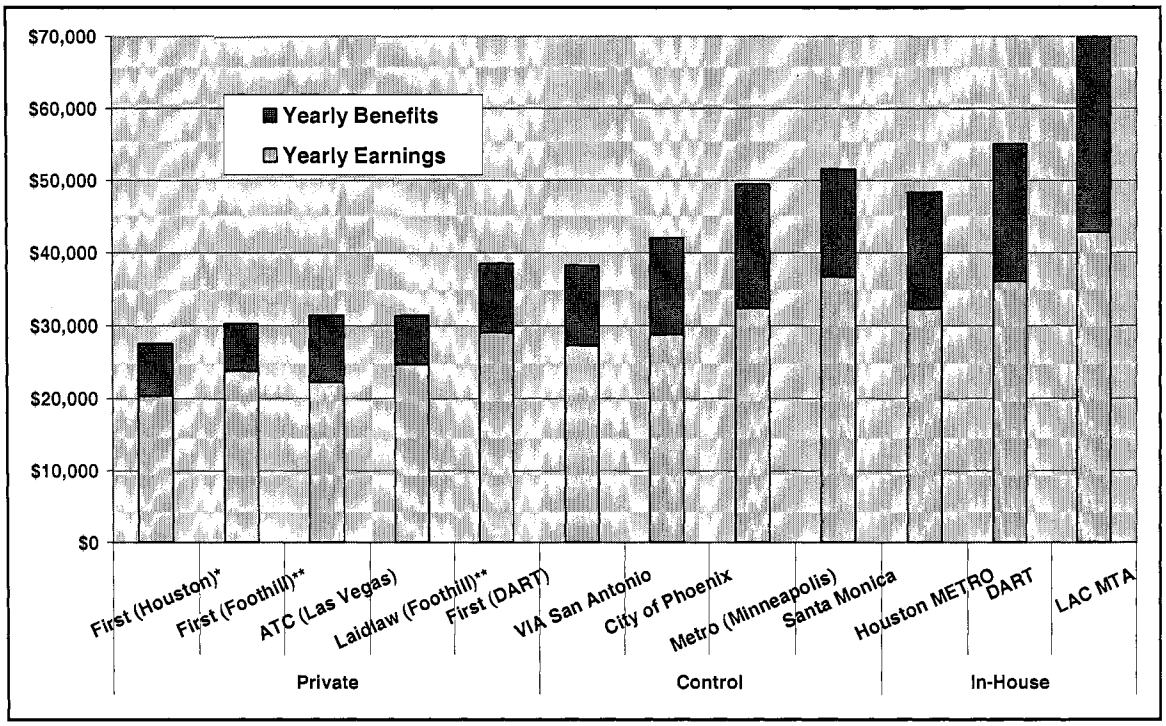
Figure 8-2 also identifies the trends for yearly drivers' benefits in 2001 dollars, which are unlike yearly wage trends. The gap in yearly benefits between private contractors and public in-house operators has decreased slightly, falling from $12,000 in 1995 to $10,000 in 2001, the time yearly benefits at both began to decline together. On

the other hand the opposite trend was observed in the gaps between private and public control operators, with an increase from $4,600 in 1995 to $7,700 in 2001.

4. ***Contracting appears to have had a negative influence on privately hired drivers' benefits compared to their wages.***

The impacts of contracting on drivers' benefits are quite different in comparison to their effect on drivers' wages as well as with respect to operations under different provisions, both public and private. Contracting not only affects, but also is affected by, public operation, such as labor organizing and pressure to pay wages more comparable to public driver counterparts, as has been observed throughout the study.

Figure 8-3: The Level of Drivers Compensation



Drivers' benefits at private contractors, however, have declined over the years, and note, also, the previously described trend from Figure 8-2, where drivers' benefits did not converge between public and private operators. From 1995 to 2001, the benefits of a

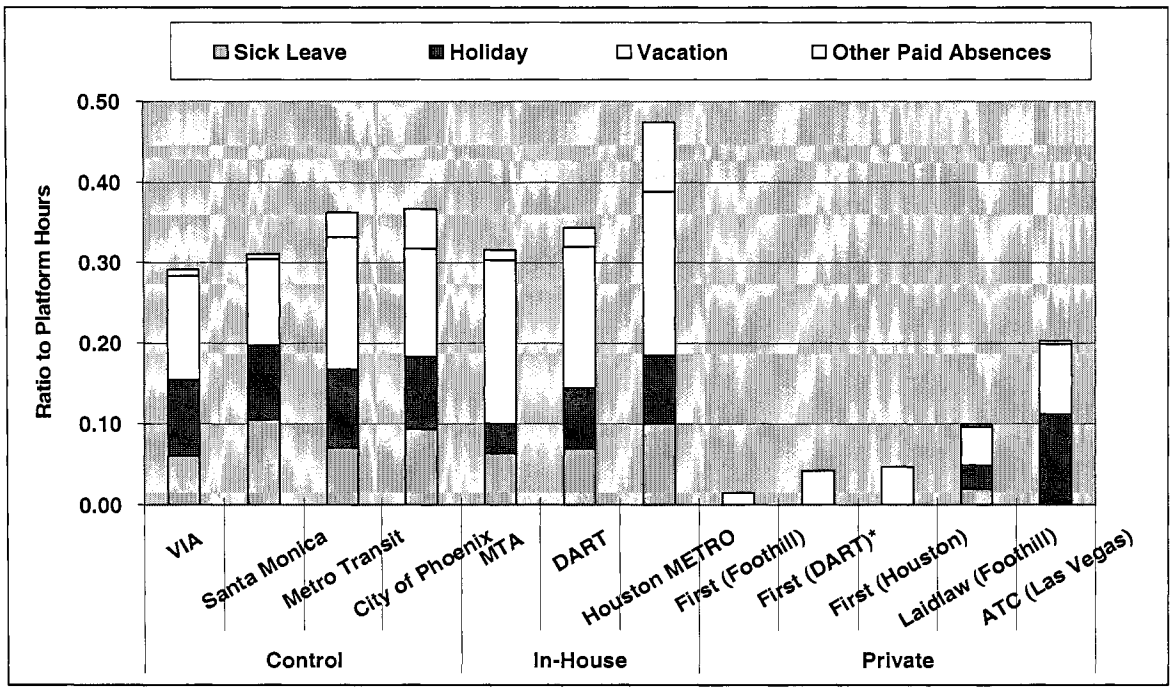
privately hired driver fell by $145, or $1,600 if inflation is considered. But in the same period, their yearly wages increased by $5,200 in terms of actual dollars, or $2,100 if adjusted for inflation.

In addition, Figure 8-3 describes the annual compensation level (earnings plus benefits) of a driver at 12 operators and explains that benefits made up more than 25% of a driver's yearly compensation at private contractors, while it was 35% at public operators. The lower percentages of fringe benefits of privately hired drivers are caused mainly by lower paid leave (around $3,500 less in a year), as well as lower pensions ($1,500 less). On the other hand, private contractors have paid more money for various types of insurance other than health and dental plans. Overall, drivers at private contractors received almost $12,000 less than public drivers for fringe benefits per year as seen in Table 8-2.

5. ***Differences in paid absences are a clear indicator of drivers being hired under different provisions.***

The most clear and crucial distinction between publicly and privately hired drivers is that the latter have very few paid days of leave. On average, drivers at public agencies receive three times or more paid absences than do drivers at private contractors- about 52 days off versus 15 days off in a year or the equivalent dollars for privately hired drivers as estimated in Table 6-2. These paid absences costs are the least significant factors among labor costs; however, the unique composition of small or no values for sick leave and holidays (and thus the much reduced number (or costs) of paid absences for drivers) is just another indicator of being a private contractor.

Figure 8-4: Average Ratios of Paid Absences to Platform Hour: All Cases



This low rate of paid absence for drivers at private contractors is one of the reasons for their low use of part-time drivers observed in this study. Besides the extent of work hours, the most basic distinction between full-time and part-time employees across the entire industry is that the former are entitled to receive a full benefits package; while the latter are not. Thus, private contactors might not need to hire part-time drivers since their full-time drivers receive similar wages and paid absences (no sick leave and fewer or no holidays), as part-time workers at public agencies. A full-time driver might cost the private operator the same as a part-time driver under a public operator's provisions in terms of paid absences. Moreover, it would be difficult for private contractors to recruit part-time drivers who would receive lower wages and benefits than their full-time drivers.

6. Private operators hired many fewer part-time drivers than public operators did.

The importance of the use of part-time drivers in transit operations is to reduce the costs associated with peaking. Part-time drivers can reduce labor costs in two ways: 1) by

their low wages and benefits, since they are lower than corresponding full-time drivers' rates, and 2) by taking advantage of more flexible work rules such as not paying spread premiums, or overtime, and minimum guarantees. One rationale that transit contracting advocates offered is that private operators are efficient and more flexible due to their better use of part-time employees.

However, the percentages of part-time employees at private contractors are actually much lower than at public operators (2% versus 11%, on average). Moreover, a declining trend in the use of part-time drivers to zero percent was observed in all private operators, except ATC at Las Vegas; while public operators showed increasing trends (1.5% at private versus 14% at public in 2001).

Figure 8-5: Percentage of Part-time Drivers at Three Types of Operators

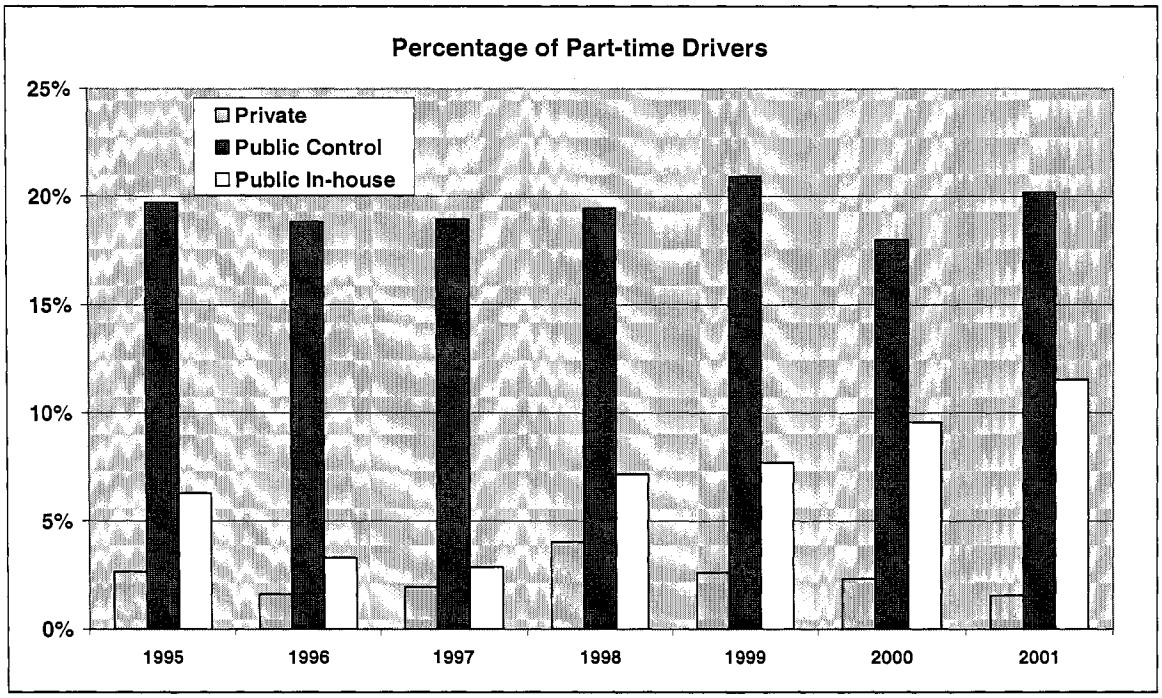


Figure 8-5 directly points out that the public control operators have used more part-time drivers than other operators (with the exception of the City of Phoenix), while the percentage of part-time drivers at public in-house operators has increased since 1997.

The trends appear to be negatively correlated with trends in work rules ratios and operating costs per RVH. One possible explanation for the low use of part-time drivers is the low wages and fewer paid absences for drivers at private operators. Private contractors do not need to hire part-time workers since their full-time drivers receive wage and benefits packages similar to those of the part-time drivers at public operators.

The finding that private contractors hired *fewer* part-time drivers than pubic agencies did, and its implications on whether the use of part-time drivers is desirable to public and private operators should be discussed further. Privately hired drivers are definitely better off being full-time employees, despite low wages and few benefits, in comparison with being part-time drivers who work for contractors. On the other hand, the management of private contractors did not achieve maximum possible cost savings because they did not fully take advantage of flexible work rules associated with the use of part-time drivers, because they achieved as similar or even greater cost saving from the low wages and benefits in general.

If one is a part-time driver for a public agency, the circumstances are more complicated. Basically there are two types of part-time drivers in the transit industry-voluntary and involuntary ones. In the case of the voluntary part-time driver, who either usually has primary income from another job or has no job but prefers to work as a part-timer (e.g. a homemaker), he/she benefits from being part-time driver. On the other hand, an involuntary part-timer is in a much less desirable position, because he/she is forced to be in that status due to work rules, with lower wage and benefits than full-time drivers, and more inconvenient schedules. In most cases, it is mandatory that new drivers start as part-timers before they became full-time employees.

7. ***Some public agencies provide efficient service with better wages and benefits than private contractors.***

A few public operators proved to be as efficient as private contractors (in terms of having similar or less stringent work rules as well as operating cost-efficiency) with better compensation packages for drivers. These findings encourage us to find alternative ways of improving transit efficiency without contracting or without necessarily imposing adverse effects on labor.

For example, VIA San Antonio was not only spending less on work rules as well as having better operating cost-efficiency, but also providing higher benefit packages for drivers, compared to First Transit at DART. VIA's operating costs per RVH were $52 from 1995 to 2001, versus $64 for First (DART). VIA's drivers receive about $3 more per hour. Although drivers at First (DART) received earnings that were $2,000 higher, VIA's drivers received $1,500 more in benefits, making their yearly compensation almost identical. If VIA's high use of part-time drivers (25% of the driver workforce) is considered, the full-time drivers at VIA received higher wages and benefits than those at First (DART).

VIA's case is truly remarkable in several aspects. First, its operating cost-efficiency is the best among public operators and third lowest among all 12 operators included in this study. Secondly, its spending on work rules governing drivers was extremely low, with a ratio to platform hours of 0.12, which is not only half of First (DART)'s, but also the lowest among all operators. Third, its use of part-time drivers is also the highest among all operators. Finally, VIA San Antonio showed high efficiency in factors such as vehicle fuel and maintenance, casualty and liability costs, and

administrative staffs. These operating costs for factors beyond labor were $12 per RVH from 1995 to 2001, the second lowest among all operators. VIA proved to be truly efficient in both labor and other factors, with flexible work rules.

A similar result is observed in the case of Santa Monica compared to Foothill. Santa Monica Municipal has an operating cost-efficiency similar to Foothill (two private contractors and management combined), $67 versus $64 per RVH, and its spending on work rules governing drivers (the ratio to platform hours) falls between the two Foothill private contractors. On the other hand, its drivers, on average, received about $7 more for hourly rates, $12,000 more for yearly earnings, and $7,500 more for yearly benefits than private drivers at Foothill.

On the other hand, First Transit, the private contractor of Houston METRO, spent more for work rules than not only the control operator, Metro Transit at Minneapolis, but also in comparison with direct service provision at Houston METRO, although its operating costs per RVH were lower than those two public operators. However, the compensation packages for private drivers were substantially below that of METRO's drivers, with a yearly value of $27,500 versus $48,500.

8. *The high unit costs of some labor-related items among contracting operators are observed throughout the study.*

The most compelling finding of this study is that some labor-related elements under contracting have higher unit costs than under public operations, such as overtime premiums, spending on various forms of insurance other than health and dental plans, and driver training and non-operating paid work time. These systematic patterns and reasons for these phenomena will be discussed in detail in the next chapter.

CHAPTER 9. Discussion of Labor Unit Costs among Contracted Bus Operations

Contracting bus transit operations in this study obviously operate more cost-efficiently than public ones, but do they enjoy a real efficiency gain? Although the competition with private as well as the threat of privatization seemed to bring improvement in the performance and cost-efficiency of public agencies, this study shows that contracting bus operations are not always more efficient than public operators, in terms of some factors related to labor as well as factors beyond labor such as fuel, supplies, administration, and so on. Moreover, it is possible that more costly labor is also more productive labor, e.g. better quality of drivers, better morale of drivers, less of a recruitment problem, fewer accidents, fewer customer complaints, etc.

This finding, which recurs throughout the analysis, should be examined further since it contradicts the common justification for privatization. In this section, I answer three basic questions concerning aspects of private contactors' inefficiency: 1) which items private contractors spent more on than public agencies per the same platform hours, 2) the causes of these differences, and 3) the significance of these differences is in terms of dollars.

9.1. Items on Which Private Contractors Spent More Than Public Agencies

First, I tried to identify which items private contractors paid more for than public agencies did to provide one service hour, in other words, the unit costs of these items rather than their absolute costs. They fall into three categories: 1) factors beyond labor, such as vehicles, fuel and maintenance, casualty and liability costs, and administration staffs, 2) insurance, and 3) overtime and non-work-related paid hours required under

work rules governing drivers. Although spending on these items is absolutely necessary in any transit operation, the question is how significant they are. In this section, I have divided the above items into two categories: input costs other than labor costs and input costs that are included among labor costs.

9.1.1. Input Costs Other Than Labor

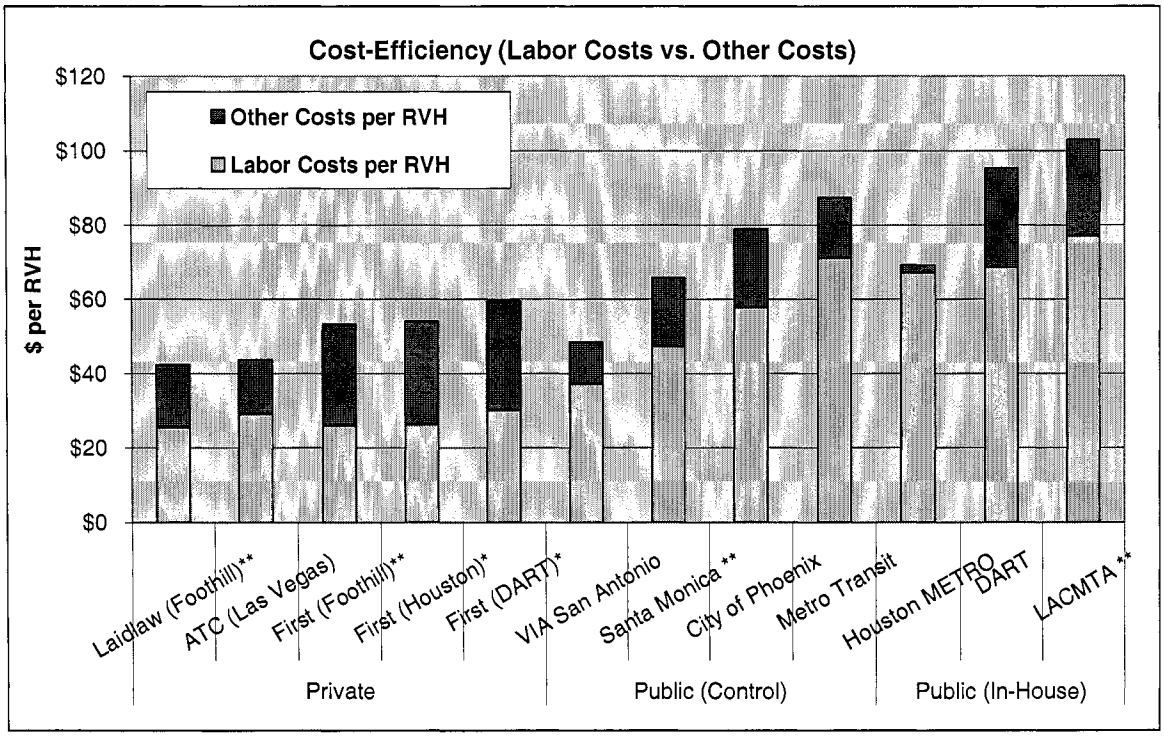
The prime goals of contracting out public transit are to reduce operating costs and to improve efficiency. For the cases in this study, the first goal seemed to definitely be achieved, but it not certain that the second one was. In general, private contractors show lower operating costs per RVH than public agencies: $50 vs. $84 (in actual dollars during 1995 to 2001); thus, private contractors have more cost-efficient operations. However, most private operations in this study experienced higher costs per RVH for factors other than labor (such as vehicles, fuel and maintenance, casualty and liability costs, administration staffs, and so on) as seen in Figure 9-1.

The three operations of First Transit especially illustrate this. They show more than $27 in operating costs (other than labor) per RVH, placing at the top three among all 12 operators. On the other hand, ATC at Las Vegas has $14.60 in other operating costs per RVH, the lowest among the five private contractors (the third lowest among all operators). However, if we consider that fuel costs are not included in this calculation since they are billed to and paid by ATC's parent public agency, the operating costs are understated, meaning that the real unit cost for ATC is higher.

Moreover, a significant portion of the planning and administrative costs of private contractors such as advertising, service quality monitoring efforts, servicing fareboxes, security cameras, and others are imposed on parent public agencies when service is

contracted-out. For example, the total operating costs per RVH of Foothill – two private bus contractors and the management is around $64 during 1998 to 2001. It was $10 to $20 more than their two bus contractors ($44 at Laidlaw and $56 at First), meaning the additional costs of $10 to $20 per RVH were billed to its management company (ATE, the former Forsythe & Associates).

Figure 9-1: Operating Costs per Revenue Vehicle Hours (1995-2001)[29]



In addition, pubic agencies provide vehicles to private contractors, as is the case with Houston MERTO, or provide operating or maintenance facilities to private contractors, as the MTA does to Foothill Transit. According to the TRB Transit Contracting Survey (2000), 34 % of responding public bus operators who contracted out provide maintenance facilities and equipment for their contractors, and 28% of them provide bus storage facilities.

[29] * is the mean from 1997 to 2001, and ** the mean values over 1998 to 2001.

In conclusion, the costs outside and beyond labor were critical to transit operations, although they are beyond the main scope of this study, and I examined them only on the surface. Their significance might have been neglected in the past, in relation to contracting operations and the unknown share of these costs that is imposed on the public agency when it contracts service out.

9.1.2. Input Costs Arising from Labor

Besides paying higher unit costs for items other than labor, private contractors spent more money on some labor-related items, specifically 1) insurance for drivers (not including health and dental plans), 2) overtime and other premiums, and 3) training costs and costs for non-operating paid work time.

Private contractors' unit costs for insurance for drivers such as life insurance, short-term disability insurance, unemployment insurance and workers' compensation is one item among fringe benefits that is higher than it is for pubic agencies, with the significant exception of the MTA[30].

As already discussed in Chapter 6, high costs of insurance for drivers are generally caused by 1) high levels of driver turnover or lay-off, 2) having less-experienced drivers in the system, 3) poor safety records, and 4) operating in high-crime service areas. The first three conditions fit the profile of private contractors. Their excess spending on various types of insurance would be considered inefficient spending since it represents a transfer to insurance companies.

High driver turnover is a chronic problem for transit operators in general, but particularly at private contractors, because of low wages and poor benefits. And operators

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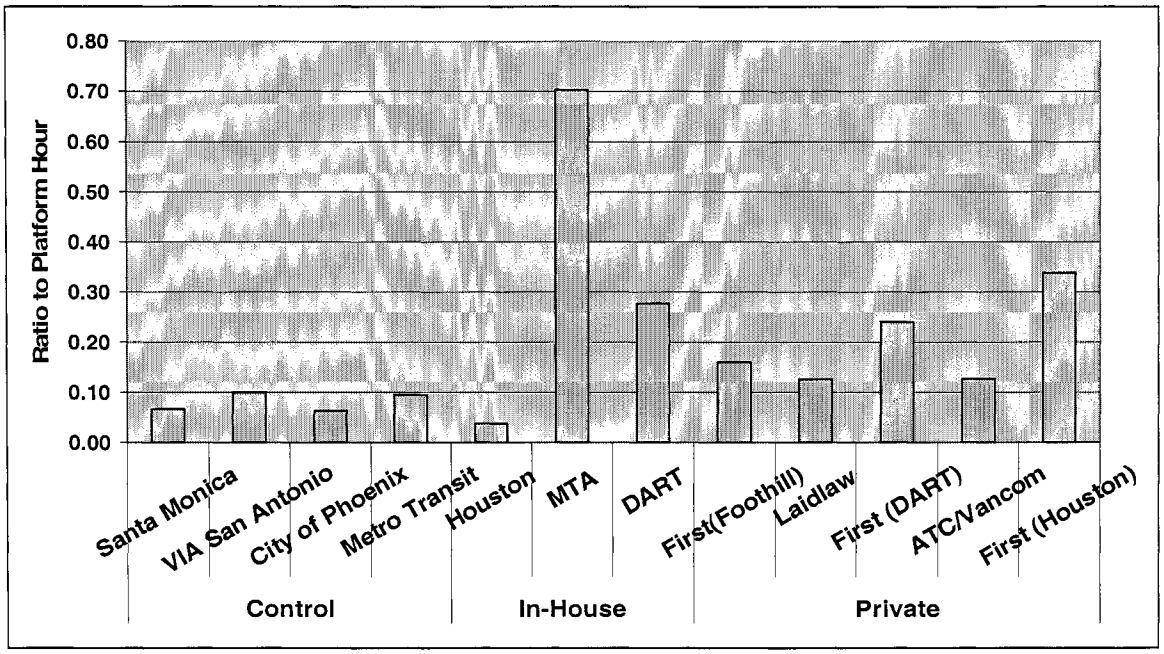
[30] MTA's high insurance costs are caused mainly by providing the service in high-crime inner-city areas.

with high driver turnover pay more for unemployment insurance. High driver turnover also implies that there are less-experienced drivers, and even fewer drivers in the system. Employing less-experienced drivers required operators to pay higher premiums for insurance. In general, employing fewer drivers than are needed would cause each driver's work hours to increase, which is reflected in the fact that the five private contractors included in this study reported work hours per driver that were 100 up to 200hours higher than the national yearly average.

Figure 9-2: Average Ratios of Insurance Costs to Platform Costs : All Cases (1995-2001)



Employing less-experienced drivers who are working more hours than average may lead to more accidents, which directly influence operators' insurance costs. Operators with poor safety records, such as First Transit at Houston, often pay higher premiums for life insurance, disability, and worker's compensation for statutory damages arising from injuries or deaths of drivers during their work.

Another possible reason for private contractors' higher insurance costs would be that their premiums are based on the national corporate rates on some cases, which can be affected by events outside their operations. For example, if First Transit had an accident in California operating under contract with Foothill, this could raise Foothill's rates nationwide the following year, which would cause DART to pay more. The same process applies to premiums for insurance covering vehicles, property, and liability for passengers.

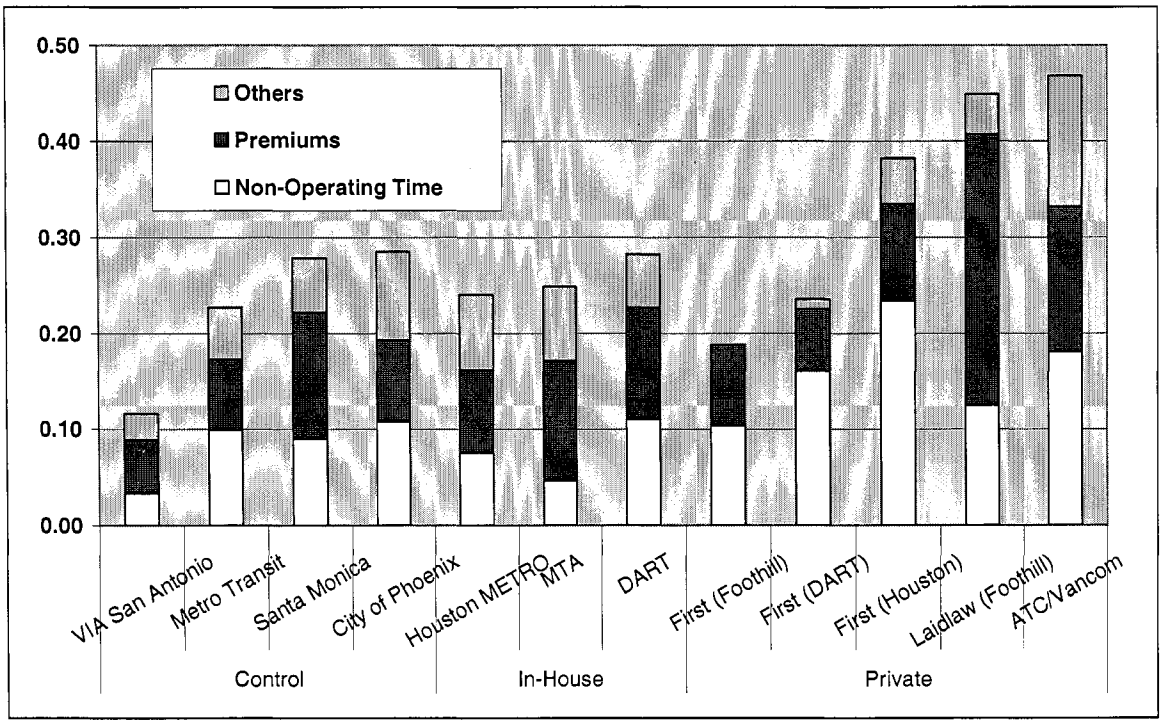
Next is the role that costs associated with drivers' work rules play at private operators. Despite the fact that private contractors tend to enjoy greater flexibility in scheduling and lower costs associated with using less-senior drivers, they still spend more money and devote more hours on work rules to produce the same service hour, as discussed in Chapter 5.2. Overall, expressed as a percentage of annual earnings, work rule payments are higher for privately employed drivers, 27 percent versus 20 percent for public drivers, even though the actual dollar differences are insignificant, annually $161 to $569 less for private hired drivers despite they worked extra 150 hours in a year.

High spending on work rules at private operators mainly comes from two factors. One is the high percentage of non-operating paid-work time, which includes stand-by time, driver's training time, premiums paid to trainers, time spent on union functions, run selection time, and accident reporting and witness time. On average, non-operating paid time is the most costly work rules item for private bus operators. All private contractors have exceptionally high non-operating paid work time compared to platform cost (all five have more than 0.1) as seen in Figure 9-3. That means that privately hired drivers spent one out of 11 scheduled work hours on these functions. The costs arising from these

items account for one-third of work rules costs at private contractors versus one-sixth at public operators. The difference in these ratios between public and private is the highest among all work rules on average, although items in other categorized hours, such as pensions and vacations, show larger differences.

Higher spending on these items implies an inefficient operation, since, by definition, non-operating paid work time is time and money an operator spends on the job in a capacity other than operating buses. One possible explanation is private contractors' high rate of driver turnover, resulting in high spending on training new drivers and other measures to compensate the disruption such high turnover causes.

Figure 9-3: Average Ratios of Work Rules to Platform Hours : All Cases (1995-2001)



The second factor is the high costs from overtime premiums paid by private contractors. On average, the ratio of overtime and other premiums to platform hours at private contractors is only slightly higher than at public ones (0.12 versus 0.10). However,

some private operators, such as Laidlaw (Foothill) and ATC (Las Vegas) have much higher ratios than others. Rules on overtime and its premium are critical and sensitive factors negotiated between drivers' unions and management, and a big contributor to drivers' wages. One might expect that public agencies would be more likely to have high levels of premium costs since they have more restrictive rules on overtime and spread-time, meaning higher pay rates and/or more spread time premiums [31] as explained in Chapter 3.3.5.

One reason why private contractors have high ratios of overtime premiums to produce the final product would be that overtime premiums are used to compensate for low base wages, and that private contractors' higher costs in this area might be caused by more drivers working more hours, rather than having more restrictive work rules on overtime and spread-time. In most cases, drivers at five private contractors included in this study worked about 100 to 150 more hours yearly than the national average; while drivers at the public agencies in this study worked fewer hours than private ones (and their rates compared to national averages varied).

What is not clear is how much of the high spending on this item is due to scheduled overtime or unscheduled overtime. If it's due to unscheduled overtime, that implies that privately hired drivers' absenteeism is high, and/or their on-time performance is poor. On the other hand, if scheduled overtime is the primary source, it implies that the drivers operate the same hours of service but with fewer drivers. (We do not examine here the impact of working more hours on transit safety and quality of service.)

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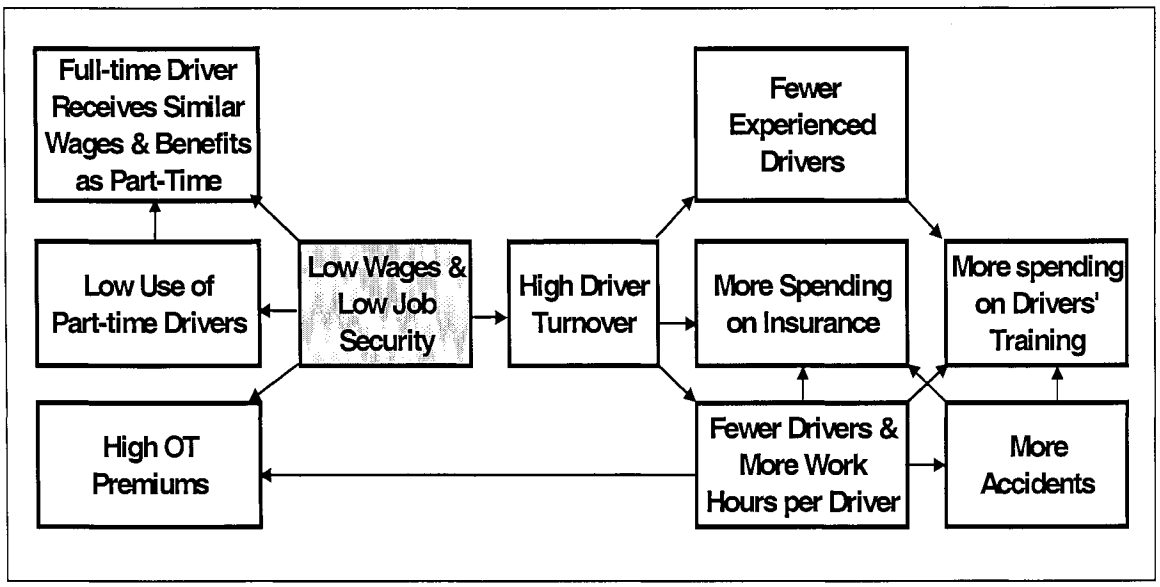
[31] The spread-time is the time between the time that the driver first reports and the driver's last release from duty. Drivers working more than specific hours receive "spread-time premiums. The threshold of a spread varies from one agency to another (usually 10 to 14 hrs a day).

Regardless of scheduled or unscheduled, *excessive spending on overtime* and other premiums is the result of inefficient aspect of operations. Moreover, if this money were directly paid as wages, an operator could have spent less, since overtime is paid at a premium of one-half the base wage rate, in addition to the base rate.

9.2. Sources of High Labor Unit Costs at Private Contractors

Why do private contractors spend more money on these items than public operators in spite of having more flexible work rules? Less competitive wages and less job security at private contractors help to explain this finding. They result in high driver turnover and a preponderance of inexperienced drivers at private contractors as illustrated in Figure 9-4.

Figure 9-4: Sources of High Unit Costs Associated with Labor among Private Bus Operators



Low wages, poor working conditions and uncertain job security for drivers at private operators make their jobs less attractive compared to other jobs in local labor markets, as seen in example of ATC at Las Vegas (page 93). For example, the hourly wage rate of drivers at ATC Las Vegas, the contractor of Citizen Area Transit, started at

$6.50 per hour as a training rate, and went up to $9.50 upon qualification, with pay rising to $12 per hour in 50-cent annual increments. These low wages are not competitive with what other jobs in Las Vegas pay and have created difficulties in attracting workers. For example, a driver for Las Vegas' City Ride bus system, the only other public transit system in the Las Vegas Valley, starts at $15 an hour; school bus drivers start at $13 per hour and receive up to $15.63 an hour. Even maids earn more than drivers at ATC, making $10.30 an hour with health coverage for all dependents (*Las Vegas Review Journal,* Oct. 15, 2002).

Moreover, the small difference between average wage rates of all drivers and new drivers' starting rates ($1 an hour) supports the low proportion of senior drivers in the system and high rates (48 percent annum, Richmond 2001) of driver turnover at ATC.

The higher rate of driver turnover creates chain-reaction effects on operations at private bus contractors. Not only are there fewer drivers in the system, but also fewer numbers of experienced drivers. While driver seniority was recognized in the past for its impact on labor costs, its impacts on accidents and the level of service are much more critical with respect to bus operations under private contractors.

There have been a few controversial fatal accidents caused by privately hired drivers. For example, a crash in an HOV lane killed a nine-year-old girl and was caused by a driver of First (Houston) still in the probationary period. Also a woman was killed at a pedestrian crossing in Houston by a bus operated by a driver with a previous record of reckless driving and deferred adjudication at the same company. Such accidents are the primary reason for high driver insurance costs at private contractors, along with high unemployment insurance costs.

Overall, all private contractors except for ATC, showed higher costs due to accidents than their public counterparts, judging by dollar spending on the transit property damage from accidents and incidents[32]. Overall, five private bus contractors in this study paid $0.34 for the total property damage per one revenue vehicle service hour, in comparison with $0.13 for seven pubic agencies, during 1998 to 2001. Especially, two private contractors at DART and First Houston spent $0.86 and $0.56 per RVH, respectively.

9.3. Significance of Inefficiencies among Private Bus Contractors

After observing higher unit costs for some labor-related items at private contractors, the question of how significant they are and how much they cost in terms of dollars must be answered. To address these questions, I compared the differences in ratios between private contractors and the averages of public agencies. There are three labor cost items for which private contractors show higher ratio to platform hours than public agencies: *overtime premiums, spending on training and non-operating paid time, and insurance cost.* The ratios per platform hour of these three items for five private contractors are replaced with the average ratio of their counterparts at public operators (the average of seven operators), except insurance. Then, I calculated new (adjusted) wage rates backwards holding constant other items in labor costs and platform hours, as explained in Equation 9-1.

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[32] Based on reported data from NTD Form 405 (Transit safety and security from) by fixed-route buses from 1998 to 2001. Prior to 1998, no disaggregate data for individual modes are available. The costs of total property damage include costs from any damage to transit property that requires the repair or replacement of transit agency vehicles or facilities (track, signals, and buildings) to a state equivalent to that which existed prior to the incident. However, they are based on the accident and incident reports of each operator, not claims filed. Usually, transit agencies are required to report any incidents resulting in an injury or fatality, and all incidents with transit property damage greater than $1,000.

The overall average public operators' insurance ratio to platform hours is much higher than private operators' average due to the MTA's exceptionally high costs in this area; therefore, the insurance ratio at private contractors is replaced by the public's average insurance ratios, excluding the MTA. On the other hand, these insurance costs include the costs associated with other employees than drivers in bus operation as well as employees in other modes. Private operators included in this study operate fewer modes than public operators, as seen in Table 4-1. Therefore, the estimation of adjusted wages of privately hired drivers due to insurance is very conservative since I replaced the insurance costs of private's average (with fewer modes) with those of public average (with more modes).

Equation 9-1: Calculation of Adjusted Wage Rates of Drivers in Private Operators

Let J_0 denote the subset of J for which private contractors show higher ratio of equivalent hours to platform hours than public agencies. And the ratio of each pay hour j to platform hours is given by

$$R_j = \frac{H_j}{H_p} = \frac{C_j}{C_j} .$$

where H_j is equivalent pay hours for item j, in particular H_p is platform hours; and C_j is agency's spending on item j, in particular C_p is platform costs.

Let $\overline{R}_j^{Private}$ *and* $\overline{R}_j^{Public}$ denote the average ratios of item j to platform hours of five private contractors, and of seven public agencies, respectively.

Then, $J_0 = \{j \in J : \overline{R}_j^{Private} \geq \overline{R}_j^{Public}\}$ of J

$= \{$*overtime, spending on non-operating paid time, and insurance*$\}$.

Suppose that some of private contractors' spending on three items of j is paid directly to drivers as base pay, instead of as parts of payments due to work rules and

fringe benefits, without any change in work hours (H_{pi}) and the total labor costs ($\sum_{j \in J} C_{ji}$) for operator *i*.. And suppose that the level of these private contractors' spending on *j*, expressed in ratio to platform hours, is the same as $\overline{R}_j^{Public}$, the average of seven public agencies in this study.

Now, recall from Equation 3-2 that the average hourly rates of operator *i* is

$$r_i = \frac{H_{pi}}{C_{pi}} \text{ , for all } i,$$

$$\text{and by definition, } H_j = \frac{C_j}{r} \text{ for all } j .$$

Then, by replacing higher each R_j of five private contractor with lower $\overline{R}_j^{Public}$, we get the adjusted wage rate, $\hat{r}_i$

$$\hat{r}_i = \{1 + \sum_{j \in J_0} (R_{ji} - \overline{R}_j^{Public}\ )\} * r_i \text{ ,} \qquad \text{for private contractor } i,$$

where H_{pi} and $\sum_{j \in J} C_{ji}$ are constant, and $1 \le i \le 5$.

Consequently, we observe that the difference between $\hat{r}_i$ and r_i is a transfer from work rules and fringe benefits to platform costs, which would be paid directly to the driver as an hourly wage rate, while overall drivers' compensation remains unchanged. Hence, the adjusted higher platform costs of five private contractors cause higher wage rates for their drivers by the increments of

$$\Delta_{ji} = (R_{ji} - \overline{R}_j^{Public}) * r_i, \qquad \text{for item } j \text{ for operator } i.$$

This exercise will give us the increments of the monetary number that transferred from those high unit cost items to hourly rates of drivers; while the overall labor costs and the final working and service hours of each private operator would be the same. Among the three, two work rules items are paid directly to drivers as supplementary pay,

and one fringe benefit item is not directly paid to drivers. However, we must remember that all three items are part of the labor costs.

Table 9-1 illustrates what happens to drivers' hourly rates (and annualized amounts) if private contractors would have paid the same amount as public agencies for those three high-cost items, and if the dollar differences were paid to drivers in their base pay. The bold numbers are the most incremented items among three items within an individual agency, in other words, each operator's least efficient items among the three.

Overall, if private operators paid higher hourly wages for their drivers, instead of the extra amounts for the three high-cost items above the public average, the average hourly wage paid by private operators would go up by more than $2.22 to $12.95, in comparison to the public average $17.30. Annualized, the increments after replacing all three would be added up to $4,400 for a privately hired driver.

Among five private contractors, the hourly rates of drivers for First Transit at Houston METRO would increase by almost $4.00; while those at First Transit at Foothill would increase the least, only $0.95. At three out of five operators, the adjusted hourly rate would increase by more than $2.

Among three high labor cost items, *training and non-operating paid time* is the most costly to private bus operators on average. On the other hand, insurance is the most costly item for all three operations of First Transit, especially its operation at Houston METRO, where insurance alone would raise the hourly rate around $2.17. Also First (Houston)'s hourly rate would increase by $1.55 due to non-operating paid work time.

Table 9-1: Adjusted Wage Rates (and Differences) of Privately Employed Drivers After Replacements by Overtime Premiums, Non-Operating Paid Time, and Insurance of Public Average Ratio to Platform Hour

Driver's Hourly Rates ($ per Hour)								
Wage Rates	First (DART)	Laidlaw (Foothill)	First (Foothill)	First (Houston)	ATC (Las Vegas)	Private Average	Public Average	**Difference (Public-Private)**
Original	$11.75	$10.27	$10.31	$9.58	$10.56	$10.73	$17.30	$6.57
Increment After replacing Overtime Premium	-$0.08	**$2.16**	$0.13	$0.19	$0.43	$0.35		$6.21
Increment After replacing Non- Operating Paid Time	$1.04	$0.55	$0.33	$1.55	**$1.15**	**$1.06**		$5.51
Increment After replacing Insurance	**$1.51**	$0.14	**$0.50**	**$2.17**	$0.16	$0.80		$5.76
0Adjusted Wage Rates (Increments) After Replacements of All Three	$14.21 ($2.46)	$13.12 ($2.85)	$11.27 ($0.95)	$13.50 **($3.92)**	$12.31 ($1.75)	$12.95 **($2.22)**		**$4.35**
Yearly Basic Pay (Above Hourly Wage Rates * 2000 hours per year)								
Original Basic Pay	$23,491	$20,540	$20,630	$19,154	$21,120	$21,469	$34,599	$13,130
Adjusted Basic Pay After Replacements of All Three	$28,419 ($4,928)	$26,242 ($5,702)	$22,539 ($1,909)	$26,990 **($7,836)**	$24,611 ($3,491)	$25,899 **($4,430)**		**$8,700**

- Public and private averages are the weighted averages of seven public agencies in the studied time period - VIA San Antonio, Houston METRO, LAC MTA, DART, City of Phoenix, Metro Minneapolis and Santa Monica) – and five private contractors - First (Houston), First (DART), Laidlaw (Foothill), First (Foothill), and ATC (Las Vegas). Except the public average of insurance excludes the MTA.
- Overtime premiums do not include other premiums (spread, shift, etc.) and non-operating paid work time includes stand-by time and other non-operating paid time in NTD Form 321.
- The assumption behind the calculation of new hourly wages is the total labor costs and platform hours at each agency were constant.

Laidlaw's most costly item is the overtime premium, which alone would raise hourly wages more than $2.16. At ATC (Las Vegas), the excessive non-operating paid work time would be converted to a $1.15 increase. The overtime premium would not increase the hourly rate at First Transit (DART) rather; it would lower it by $0.08.

Furthermore, if this adjusted hourly rate for each private operator would increase total labor costs, thus affecting drivers' overall compensations (while the platform hours of each operator would remain the same), privately hired drivers would have received lower payments due to work rules, because private operators' high spending on work rules had been lowered to the public operators' level. However, eventually, a privately employed driver would receive $4,400 more in basic pay, but $1,700 less for work rules, so $2,600 more in overall earnings, on average.

In particular, drivers at two private contractors at Foothill would have received similar compensation under the current spending level as well as under the new scenario with an adjusted hourly wage, about an increase of only about $700 per year. On the other hand, drivers at other three private operators would have received $1,800 (ATC) to $6,000 (First Transit at Houston) more than before. From management's point of view, this difference would have some impact on labor costs. Overall, private bus operators' costs would go up 15% on average (ranging from 5% to 17% among five) due to adjusted hourly wages. However, under the new scenario, their drivers would have worked many fewer hours. Surely, if current drivers worked fewer hours, more extra costs would be imposed (such as hiring new drivers and/or as make-up overtime). But still the trade-off of extra costs appears to be minor compared to the cost of other problems caused by low wages, as discussed in previous sections.

CHAPTER 10. CONCLUSIONS

10.1. Policy Implications

Contracting became one option for providing transit service in the United States starting in the 1980s. Four cases in this study tell its unique history and experience in fixed-route bus contracting, and they reveal much about not only the extent of differences in labor costs, labor productivity, and drivers' welfare, but also the sources of inefficiency for each operator. They also suggest many policy implications that need to be addressed, among them, the following.

1. *Public agencies that consider the option of contracting must be aware of the advantages as well as anticipate the possible problems and set realistic expectations.*

Privatizing public transit can bring about reform of transit agencies by introducing competition and the threat of privatization. But it is one option to solving current transit problems rather than the realization of an ideology. Transit contracting in the United States increased very slowly and even remained stagnant during the last decade, unlike the first decade (from the 1980's to early 1990s); while it has grown much more rapidly in Western Europe and worldwide.

One of reasons for the slow growth in transit contracting would be that the contracting decision was rarely a purely economic one in the first place. The decision regarding contracting falls within the realm of public decision making, and a large number of contracting decisions in the past were realized by a few ideologically charged politicians or government initiatives. More recent studies have shown a clearer picture of transit contracting, and its complex consequences were unforeseen in the past.

For example, Iseki (2004) showed that the actual cost-savings from contracting are rather modest compared to the original estimates found in studies conducted in the 1980s and early 1990s. And according to the TRB Transit Contracting Survey (2000), general managers of transit systems that currently contract cite problems with the quality of the contractor work force, employee turnover, and customer service as negative side effects of contracting, even though many are satisfied with the cost savings achieved.

Nicosia (2000) points out that the decision to contract seems linked to efforts by transit firms to side-step public service unions in favor of less organized, cheaper private sector labor, and in effect, the cost savings may come at the expense of labor. And Richmond (2000) also warned about the extreme case of the public San Diego Transit, which won the right to provide contracted service through offering pay well below area poverty levels.

Moreover, this study showed that there are high unit costs in some of the labor-related elements as well as other factors beyond labor under contracting bus operations that were not identified in previous studies, such as high spending on insurance, overtime premiums, and training and non-operating paid work time. This finding tells us that private bus contractors suffered problems of driver turnover and poor safety records.

2. *The key to successful privatization is the role of the public agency in selecting contractors, monitoring efforts, and ensuring fewer problems with labor.*

Some cases in the study provided us with some formulas for success as well as less controversy in privatization. For example, the crucial role played by DART in the course of its privatization cannot be overemphasized. By far, DART's management

efforts associated with contracting are notable among all cases in the study. Not only is the performance of private contractors important for success, but also monitoring, specification of responsibility, and clear communication with the private contractor are necessary conditions for successful transit contracting. This again agrees with the emphasis on the role of the pubic agency that initiated contracting in the existing literature.

In the case of privatization, less controversy is better; even if there is only moderate success in terms of cost-savings. Usually the traveling public does not distinguish between bus service offered by public agencies and that offered by private contractors unless there are strikes, controversial accidents, or noticeably poor service, caused by drivers. For example, Citizen Area Transit at Las Vegas was praised as a success of privatization with a high fare box recovery ratio, high-technology maintenance facilities, and responsive management, until a strike broke out in 2002. Throughout ATC's five and half week strike that began May 20 and ended June 27 in 2002, bus service was infrequent and ridership declined by 40 percent. Eventually the Regional Transportation Commission asked ATC/Vancom to pay $450,000 in damages for late and irregular bus operation.

The contracting experience at DART is less controversial than other cases with relatively moderate success, including two other cases at which the same private company, First Transit, was providing contracting services. First Transit, under contract with DART, had better wage rates (1st among private), higher compensation packages (1st among private), and better labor productivity (2nd among private) than other operations of the same company at Houston or at Foothill.

In fact, the public agency always sets the standard for private contractors. The same private contractors such as First Transit and Laidlaw have provided service to different public agencies under different contracts, and the labor conditions of drivers at each operation as well as their performance differ significantly. For example, drivers for First Transit at DART in this study receive higher wages and benefit packages than drivers for the same company at Foothill or Houston, usually keeping up with the standard of in-house operations.

3. *Some of the high unit costs at private bus operation can be preventable in some circumstances.*

Less competitive wages and low job security for drivers lie at the core of labor inefficiency at private contractors observed throughout the study. Low wages, poor working conditions and uncertain job security result in high driver turnover and recruitment problems.

The higher rates of driver turnover caused chain reaction effects on operations at private bus contractors. There were fewer drivers in the system, and there were fewer with experience, which requires more time and money to be spent on training. Third, private contractors paid more in overtime premiums to compensate for lower wages and payments on unemployment insurance. Fourth, the presence of less experienced drivers might affect accident rates and insurance costs and the level of service. All five private contractors included in this study had higher work hours than public operators in this study and more than the national average.

Job security is one of the most critical issues for labor in general. Transit contracting affects the job security of employees of both public and private operators. Drivers at some pubic operators choose or have already chosen job security over higher wages and benefits. Examples include drivers at San Diego Transit and perhaps also those at Santa Monica. On the other hand, employees at private operators can be dismissed instantly when a private firm's contract is not renewed.

I believe the above problems are preventable when management and elected board members embrace their responsibility and define certain protections for privately hired drivers, which have been already adopted by some public agencies. Mandatory wage floors would be one example, and the requirement of absorption of the workforce by a new contractor would be another, in the case of a change in contractors.

It has not only been private contractors, but also the decisions and the policy direction of transit boards that have been a force in keeping drivers' wages and benefits down. In the past, transit boards have not been involved in the wage negotiating process in some cases, saying that it is up to contactors to establish market rates. I believe that transit boards' allowing privately hired drivers to have only four days of paid absences per year is unethical, no matter how much cost-saving and cost-efficiency are achieved from it.

In the end, I want to emphasize that the lowest price must not be the dominant factor when boards choose among contract applicants. Ignoring existing or possible problems caused by low wages and achieving cost-saving by means of low wages without real efficiency gain would be only a superficial solution without addressing

fundamental problems. As much as cost-saving is important, the duty of public transit to provide a better quality of service to the public is just as, if not more, important.

4. *A few public operators proved to have less stringent work rules with better compensation packages than private contractors and comparable operating cost-efficiency.*

Some public operators such as VIA San Antonio, Santa Monica and Houston METRO spent less money and fewer hours on work rules hours to produce hours of service than private operators. And all three public operators had hourly operating costs below $70.

VIA's case is truly remarkable in several aspects. VIA San Antonio was not only spending less on work rules, but also providing higher benefits packages for its drivers with better operating cost-efficiency, compared to First Transit at DART. And it proved to be truly efficient in both labor and other factors among operating costs. Its operating costs were only $49 per revenue vehicle hour from 1995 to 2001, the best among public operators and 3rd lowest among all 12 operators included in this study. Its hourly operating costs for factors other than labor were only $12 per RVH from 1995 to 2001, or 33% of its operating costs.

And VIA's ratio of pay hours to platform hours and its level of spending on drivers' work rules was the lowest among all operators. Moreover, its use of part-time drivers is also the highest among all operators.

Santa Monica has cost-efficiency similar to Laidlaw at Foothill, but paid much higher wages and benefits. It has better labor utilization, less spending on work rules and higher use of part-time drivers, while drivers' hourly rates are $6 higher than at Laidlaw.

Houston METRO has $15 higher hourly operating costs than its private contractor, First Transit. This public agency spent less for work rules and has better efficiency in factors other than labor, while its drivers received much higher compensation compared to its private contractor ($26,000 versus $45,000).

These findings encourage us to find alternative ways of improving transit efficiency without necessarily imposing adverse effects on labor. Contracting has introduced competition to public transit and now the management levels or policy makers have the threat of contracting as leverage over labor. Labor may thus be more willing to agree on changes in collective bargaining agreements such as more flexible work rules that make direct service provision more cost-competitive and efficient.

It has been almost two decades since contracting became a common part of providing transit service in the United States, and it will definitely continue in the future. Therefore, the source of inefficiency at not only public providers, but also private providers must be addressed. At the end of the last chapter (page 186), I explored a scenario in which private operators paid higher hourly wages, instead of extra money for three high-cost items and examined the trade-off between higher wages transferred from inefficient items at private contractors. This exercise showed that making that transfer would increase the average hourly rates of privately hired drivers by $2 on average, and almost $4 for drivers at First (Houston).

In conclusion, one of most crucial responsibilities of management and elected board members when initiating transit contracting is to define certain protections for privately hired drivers; whether minimum wages or job security. Moreover, to avoid deteriorating quality of service and to prevent accidents caused by inexperienced or tired drivers, public agencies must define performance measures, followed by penalty and incentive clauses, conduct continuous monitoring efforts throughout the contracting periods, and keep close and amicable relations with both the contractor and organized labor. And I believe that the monetary impacts of slightly increased wages on labor costs and operating efficiency would be minor, compared to the savings realized by preventing high turnover, fatigue and low morale among drivers.

10.2. Future Research

At the completion of this study, I have more questions about bus contracting than I had before I started. I tried to conduct the research as thoroughly as possible, but there is considerable room for improvement.

First of all, more cases should be examined to understand more generally the practice of contracting, especially small contracting operations. The limited data from the private sector has been the biggest obstacle to this study. While each case provides fascinating stories and circumstances, results in this study are drawn from generalizations. This study has focused on discrete and unique cases and does not provide a comprehensive picture of the practice of bus contracting in the United States.

On the other hand, the cases are among the largest privatization efforts in the nation, and drivers at four out of five contractors in the study are unionized. However, if these unionized drivers at large firms receive low wages and poor benefit packages as

observed in the analysis, those at small contracting operators are probably not faring better. Or perhaps, it is just the opposite: labor conditions at the several nation-wide corporations in transit contracting may be poorer than those at smaller local contractors. It is possible since the costs of small private operations with fewer than 10 to 20 peak vehicles would not impact the overall operating costs of the public agencies who contracted-out, and the small number of drivers at these private operators could receive compensation similar to their public peers. This possibility has been bothersome throughout the study and must be studied in the future.

In terms of methodology, there are several factors affecting or being affected by the nature of contracting, but not included or not thoroughly examined in this study, but which should be addressed in future work. First, the turnover rates of drivers at individual agencies, one of the most crucial factors that were affected by and had an effect on contracting, were not thoroughly addressed, due to a lack of data. The transit industry, in general, displays high driver turnover, but the extent to which it occurs under different provisions should be scrutinized in depth in the future.

Secondly, how to examine the different impacts of part-time and full-time drivers on wages as well as benefits on different provisions is another question to be covered in future research.

Third, the impact of different provisions on the level of deadheading was a question I could not answer in this study, because it is difficult to capture the different degrees of effects from 1) serving low-density areas and 2) poor scheduling, 3) more strict work rules and 4) selection bias that unprofitable and inefficient routes with system were more likely to be assigned to private contractors.

Finally, operating costs beyond labor and among labor costs of one agency, the salaries of employees other than drivers, are not included in this study.

In the future, equity issues that arise from a policy encouraging privatization should be addressed, above all. There would be so many questions to address; however, at least two questions must be answered. One is "*Where does the transfer go from drivers*?" Obviously some cost-savings from contracting went to private contractors, and I found some cost-savings transferred to insurance companies due to high insurance costs at private contractors. To address the missing parts of the cost-savings, the usage of money saved from contracting must be investigated fully, such as "Is it used to improve operations or provide more service?" "Is it used to increase wages and benefits for in-house employees?" or "It is used to keep taxes low?" and " In each case, who benefits from it? "

The other question is the impacts of contracting on redistribution of income. There is a heavy generational imbalance in income due to contracting. Recently hired drivers receive much less in wages and benefits and have thus paid almost the whole price of contracting. How to address this imbalance should be investigated.

APPENDICES

Appendix 1 Descriptions of Primary Data Source

National Transit Database

The NTD contains a wide array of operating, revenue, and expenditure data for all public transit systems that received federal funding. Modes include automated guideway, cable car, commuter rail, demand response, ferryboat, heavy rail, inclined plane, light rail, motor bus, trolley bus, and van pool. More than 500 firms and their mode level data are comprised of one observation for each mode provided by a firm each year, so the data for bus operations of one firm can be separated from its other modes. The datasets also include each firm's contracting status and the nature of contractual relationship by each mode in the Form 002. The NTD report include more than 15 different forms for different data categories such as revenue resources, inputs and costs, characteristics of service consumed, etc.

There are several limitations of the NTD. First, only operators receiving federal monies for transit are required to file a report. Since funding structures may play a role in the decision to contract out, the missing of theses operators certainly would limit the more insight. Also, not all forms of NTD are required by all transit agencies. For example, Form 002 (Contractual Relationship Identification Form) is only required of a seller (contractor) or a buyer (public agency), or both, that are involved in any contractual relation. More importantly, all labor related forms - Operators' Wages Form (321), Fringe Benefits Form (331), and Transit Agency Employee Form (404)- are only required of firms that directly operate transit services with 100 or more revenue vehicles. In other words, there are no labor related data for contracted out services unless the contracted out public firm or the contractor voluntarily responds. This is the main reason that most of previous studies in the contracting transit services have skipped the variables related to labor.

Another issue surrounding the NTD concerns the various, so non-consistent cost allocation methods by transit mode. It is typically done using the non-standardized cost allocation model across operators. For examples, to allocate labor costs, an agency may

use vehicle hours for drivers, vehicle miles for maintenance personnel or the number of peak vehicles for other staff members (McCullough 1997). The accuracy of the NTD cost data may vary depeding on the sophistication and type of the model used.

Appendix Table 1: Summary of Selected NTD forms

Form	Examples of Contents	Required to Respond
Transit Agency Identification Form (001)	▪ Full name of each agency ▪ Service Area Information (city, state, population, square miles) ▪ Type of organization (public or private) ▪ Types of modes and services	All operators – both directly operated (DO) and purchased transportation (PT, contracted)
Contractual Relationship Identification Form (002)	▪ Contractual relationship - whether a responder is seller or buyer, and who filed a report (both or one filed on behalf of the other) ▪ Monetary nature of contract	PT and its mother pubic agency
Operating Expenses Form (301)	▪ Categorical operation expenses (labor, fringe benefit, maintenance Purchase Transportation expenses, etc.)	All
Operators' Wages Form (321)	▪ Operating time in dollars and hours (platform hours, overtime premium, etc.)	DO and 100 or more revenue vehicles operated
Fringe Benefits Form (331)	▪ Fringe benefits in monetary value in employee total	DO and 100 or more revenue vehicles operated
Transit Agency Employee Form (404)	▪ Labor classifications of employee total hours and actual person count	DO and PT providers operating 100 or more vehicles at any time
Transit Agency Service Form (406)	▪ # of vehicles at maximum service ▪ Service supplied (total vehicle hours, total vehicle miles, etc.) ▪ Service consumed (passenger miles)	All

Also the different way of capitalizing of operating expenses across operators has affected the costs of contracting. Agencies requiring contractors to purchase vehicles will have the amortized costs for vehicles passed on to the agency as an operating expense, while agencies leasing vehicles to the contractors will have the expenses appeared in the capital costs of their agencies themselves.

Finally, the evolution of the NTD reporting system has affected the reporting data. Over time, the requirement item have been added, deleted, or modified. Before 1992, the

nature of any contractual relationships between the public agencies and their contractors was not required; therefore, there is no way to ensure whether an agency contracted out or not judging by the data themselves. In addition, the thresholds of reporting requirement to private contractors have been changed over times. The threshold number of vehicles operated at maximum services was 50 in 1989 and has been 100 since 1992. If the number of peak vehicles is under threshold, the contracting public agency files one aggregate reports for the directly operated services as well as on behalf of its small contractors, rather than files separately.

TRB Transit Contracting Survey

Section 3032 of the Transportation Equity Act for the 21st Century, enacted in June 1998, provided funding to the Transportation Research Board (TRB) of the National Research Council to conduct a study of the effect of contracting by public transit agencies for operations and administrative functions. The act specifically called for an examination of the rationale for decisions to contract for public transportation and an assessment of impacts on service cost and quality, customer service, safety and other aspects of service quality and quantity. In conducting this study, a special-purpose steering committee undertook a nationwide survey of transit agencies and their general managers in 2000.

This TRB survey contains responses about transit contracting by more than 250 transit systems (out of more than 500 agencies), including descriptive opinions of their general managers. This database includes details on transit contracts of responded agencies on each mode such as the structure and duration of contracts, contract dollar amount, the payment basis, and service characteristics (whether a service is urban, suburban, rural, local, express, circulation, or/and downtown/parking) of service awarded. Also this survey contains the year of current contract and previous contract awarded, the number of cycles service has been rebid, the number of bidder who participated in previous bidding, and the times the contractor for service has changed. Moreover, the perceptions of public transit managers regarding both the strengths and weaknesses of the contracting experience also included.

However, the respondents required to report the details of two largest contracts while the names of contracting companies are missing in this survey. In other words, the

firm-level data of public agency's contracting experiences might be examined while the researcher cannot answer on questions like which private players have failed to continue the service or hard to look at the merging trends among private contractors.

Appendix Table 2 : Summary of TRB Transit Contracting Survey

PART	Examples of Contents
Survey Part 1 (Agency and Contracts)	▪ Service region ▪ Agency size ▪ Existence of contracting and percent of service contacted ▪ Type of service contracted ▪ Type of service contracted ▪ Years of contracted (current and previous) ▪ Number of cycles and provider changes ▪ Number of bidders ▪ Options to extend contracts
Survey Part 2 (General Manager Survey)	▪ Existence of monitoring unit ▪ Performance rating ▪ Positive and negative effects ▪ Year began contracting ▪ The reason for stopping contracting

Appendix 2 Agency Size and Geographical Distribution

The following tables are based on NTD in FY 2000.

Appendix Table 3 : Size and Geographical Distribution of Population of Group A

# Of Vehicles Operated In Maximum Services	<25	25-40	50-99	100-249	250-499	500-999	1000+	Total
# Of Group A Population	0	0	24	5	3	1	0	33

FTA Region	0	1	2	3	4	5	6	7	8	9	Total
# Of Group A population	2	3	6	4	1	2	3	0	1	11	33

Appendix Table 4: Size and Geographical Distribution of All Bus Transit Operators

# Of Vehicles Operated In Maximum Services	Does Not Contract Out	Contracts For All Service	Contracts For Some Service	Total Number of Bus Operators
<25	125	58	3	186
25-40	70	20	6	96
50-99	27	10	15	52
100-249	36	4	16	56
250-499	17	0	4	21
500-999	10	0	5	15
1000+	4	0	3	7
Total	289	92	52	433

FTA Region	Does not Contract Out	Contracts for All Service	Contracts for some service	Total Number of Bus Operators
0	18	1	1	20
1	18	13	2	33
2	34	9	3	46
3	30	7	7	44
4	50	7	10	67
5	60	13	6	79
6	25	3	6	34
7	15	2	2	19
8	12	3	1	16
9	27	34	14	75
Total	289	92	52	433

Note : Region 0 : WA, OR, ID, AK
Region 1 : RI, NH, MA, ME, CT, VT
Region 2 : NY, NJ
Region 3 : WV, VA, PA, DC, MD, DE
Region 4 : TN, NC, MS, KY, GA, TL, AL, SC, PR, FL
Region 5 : WI, OH, MN, MI, IN, IL
Region 6 : TX, OK, NM, LA, AR
Region 7 : NE, MO, IA, KS
Region 8 : UT, SD, ND, MT, CO, WY
Region 9 : AZ, NV, HI, CA

Does not Contract Out

FTA Region	0	1	2	3	4	5	6	7	8	9	Total
<25	5	8	9	15	25	26	13	9	1	5	116
25-40	4	7	9	8	12	16	4	3	1	6	70
50-99	5		4	3	4	6		1		4	27
100-249	2	3	6	1	7	5	3	1		8	36
250-499			4	1		4	4			4	17
500-999	2		1	1	2	2		1	1		10
1000+			1	1		1	1				4
Total	18	18	34	30	50	60	25	15	12	27	280

Contracts for All Service

FTA Region	0	1	2	3	4	5	6	7	8	9	Total
<25		6	6	5	4	1	2	1	3	2	30
25-40	1	5	2		2	1	1	1		6	19
50-99		2		1	1	1				7	12
100-249			1	1		1				1	4
250-499											0
500-999											0
1000+											0
Total	1	13	9	7	7	13	3	2	3	34	65

Contracts for some service

FTA Region	0	1	2	3	4	5	6	7	8	9	Total
<25				1	1	1		1			4
25-40		1	1	2	2	1					7
50-99					2	1	4	0	0	6	13
100-249	1		1	2	5	2	1	1	0	3	16
250-499							1	0	0	3	4
500-999		1		1		1			1	1	5
1000+			1	1						1	3
Total	1	2	3	7	10	6	6	2	1	14	52

Total Bus Transit Operator

FTA Region	0	1	2	3	4	5	6	7	8	9	Total
<25	5	14	15	21	30	37	15	11	13	25	186
25-40	5	13	12	10	16	18	5	4	1	12	96
50-99	5	2	4	4	7	8	4	1	0	17	52
100-249	3	3	8	4	12	8	4	2	0	12	56
250-499	0	0	4	1	0	4	5	0	0	7	21
500-999	2	1	1	2	2	3	0	1	2	1	15
1000+	0	0	2	2	0	1	1	0	0	1	7
Total	20	33	46	44	67	79	34	19	16	75	433

Appendix 3 Definitions of Key Transit Terms in the Study

Platform Hours: The hours, during which an operator operates the revenue vehicle either in service or in deadheading, including layover periods in the vehicle at a rest point.

Platform Dollars: The dollars spent on Platform Hours

Deadheading: The miles and hours that a vehicle travels when out of revenue service. It includes leaving or returning to the garage or yard facility, or changing routes and when there is no reasonable expectation of carrying revenue passengers

Revenue Vehicle Hours: The miles/hours a vehicle travels while in revenue service. A transit vehicle is in revenue service only when the vehicle is available to the public and there is a reasonable expectation of carrying passengers.

Fringe Benefits Packages

- Retirement Plans: Payments or accruals to Federal social security or railroad retirement and/or a public employee retirement system fund required to be made by the employer on behalf of the employee.
- Pension Plans: Payments or accruals to pension funds required to be made by the employer on behalf of the employee under the terms of pension plans (including long-term disability insurance)
- Life Insurance Plans: Payments or accruals to insurance companies required to be made by the employer on behalf of the employee under terms of group or individual life insurance policies wherein the employee is the beneficiary.
- Short-Term Disability Insurance: Payments or accruals to insurance companies required to be made by the employer on behalf of the employee under the terms of group short-term disability insurance plans.
- Unemployment Insurance Plans: Payments or accruals to state and Federal agencies required to be made by the employer on behalf of an employee to provide continued compensation for the employee for a period of time in the event he is laid off.
- Workers' Compensation Insurance: Payments or accruals to insurance companies to indemnify the transit agency against statutory damages arising from injuries or death to employees while in the employ of the transit agency, and, payments or accruals to or for employees for uninsured losses for statutory damages arising from injuries or death to employees while in the employ of the transit agency.
- Holiday : Payments or accruals to employees for periods of time when absent from work due to recognized holidays and payments or accruals to employees of premiums incurred for work performed on recognized holidays.
- Other Paid Absence : Payments or accruals to employees for periods of time when absent

from work due to military duty, jury duty, death in the family, etc.

Work Rules Restrictions

- Report/Turn-in Time: The time allowed an operator to report to the dispatcher, obtain instructions for the run, locate the vehicle to operate and depart the operating station or dispatch point to undertake the run (report time); return of vehicle at the conclusion of its run (turn-in time).
- Paid Breaks and Meal Allowances: Break time other than platform layover time and intervening time, and allowances for company paid meals.
- Travel and Intervening Time: The time spent in traveling between the operating station and the relief point (travel time), and for the incidental time between any two pieces of a run (intervening time).
- Minimum Guarantee: The time necessary to meet the guaranteed minimum for the call out of a piece of work (minimum call out), for the number of hours for a day (daily minimum), and for the number of hours for a week (weekly minimum).
- Overtime Premium: The bonus time above straight time pay for hours scheduled and worked in excess of a specified number of hours per day or per week (scheduled overtime premiums), and for bonus time above straight time pay for hours not scheduled but worked in excess of a specified number of hours per day or per week (unscheduled overtime premiums).
- Spread-Time Premium: The bonus time above straight time pay for hours worked after a specified number of hours from the start of the operators' day.
- Shift Premium and others: The time during the day that is subject to special pay differentials (shift premiums) and any operating time
- Stand-By Time: The time an operator spends at the operating station, at the transit agency's direction awaiting assignment of a piece of work. Stand-by time is called show-up time or protection time by some transit agencies.
- Other Non-Operating Paid Work Time: The time an operator spends on the job in a capacity other than operating or Stand-by Time. This includes, but is not limited to: Instructor premium for operator training, student training, accident reporting, witness, union functions, run selection, transportation administration, revenue vehicle movement control, ticketing and fare collection, and customer service.

Source: Based on *1998 National Transit Database Reporting Manual* by FTA

Appendix 4 Wages and Benefits of Drivers (All operators)

Appendix Table 5: Annual Earnings of Drivers (Actual Dollars)

	1995	1996	1997	1998	1999	2000	2001	Mean
Private Operators								
Laidlaw (Foothill)				$18,538	$21,612	$21,422	$24,335	$21,435
Foothill (First)				$19,103	$19,725	$23,243	$20,795	$20,714
First (DART)	$20,431	$24,966	$22,279	$21,132	$24,069	$24,314	$30,738	$24,198
ATC(Las Vegas)	$15,660	$20,067	$16,563	$17,494	$19,185	$20,374	$17,854	$18,227
First (Houston)			$15,335	$15,471	$17,684	$19,486	$20,580	$17,888
Public (Control) Operators								
Santa Monica	$34,141	$34,009	$33,109	$28,616	$30,839	$31,546	$28,814	$31,197
VIA	$19,879	$23,510	$21,449	$23,352	$24,268	$24,087	$24,301	$22,969
City of Phoenix	$23,001	$20,421	$24,145	$25,938	$24,586	$23,244	$22,300	$23,281
Metro Transit	$23,753	$25,508	$24,971	$25,546	$25,732	$26,772	$27,441	$25,736
Public (In-house) Operators								
LAC MTA	$31,053	$33,360	$31,825	$36,418	$39,107	$32,544	$31,545	$33,516
DART	$23,993	$23,960	$22,828	$34,653	$31,774	$25,791	$25,192	$26,558
Houston METRO	$20,518	$21,176	$23,372	$25,657	$24,834	$28,288	$26,541	$24,225
Average								
Private	$17,415	$21,934	$17,969	$18,258	$20,367	$21,501	$21,767	$20,090
Public (Control)	$22,990	$24,437	$24,346	$25,264	$25,505	$25,782	$25,802	$24,920
Public (In-house)	$27,430	$28,759	$28,345	$33,411	$34,018	$30,586	$29,278	$30,139
Public Total	$26,121	$27,471	$27,173	$30,740	$31,131	$29,054	$28,116	$28,496

Appendix Table 6: Annual Benefits of Drivers

	1995	1996	1997	1998	1999	2000	2001	Mean
Private Operators								
Foothill (Laidlaw)				$5,564	$6,532	$6,421	$7,279	$6,437
Foothill (First)				$6,511	$6,834	$6,000	$5,493	$6,199
First (DART)	$8,532	$10,658	$8,442	$8,296	$8,524	$8,575	$9,155	$8,867
ATC(Las Vegas)	$8,134	$9,808	$7,744	$8,300	$8,962	$9,191	$8,216	$8,590
First (Houston)			$5,492	$6,161	$7,668	$6,949	$7,591	$6,859
Public (Control) Operators								
Santa Monica	$14,243	$13,929	$13,401	$13,384	$13,445	$14,231	$14,642	$13,932
VIA	$8,763	$11,238	$9,519	$10,090	$9,557	$10,558	$12,107	$10,260
City of Phoenix	$11,152	$10,335	$11,672	$13,710	$14,548	$13,020	$12,315	$12,365
Metro Transit	$14,470	$14,369	$14,758	$15,214	$16,341	$16,744	$18,922	$15,922
Public (In-house) Operators								
LAC MTA	$19,842	$24,485	$23,245	$31,882	$39,326	$19,366	$20,130	$25,010
DART	$21,539	$18,714	$15,757	$16,245	$15,445	$17,383	$18,180	$17,606
Houston METRO	$14,597	$13,259	$13,305	$15,437	$15,583	$17,922	$14,659	$14,902
Average								
Private	$8,280	$10,132	$7,630	$7,495	$8,214	$8,140	$8,009	$8,136
Public (Control)	$12,209	$12,755	$12,765	$13,552	$14,114	$14,294	$15,685	$13,693
Public (In-house)	$18,687	$20,645	$19,613	$25,682	$29,165	$18,746	$18,430	$21,360
Public Total	$16,777	$18,294	$17,605	$21,705	$24,060	$17,327	$17,512	$18,945

Appendix 5 Pay Hours Decomposition (All Operators)

Appendix Table 7: Ratio of Pay Hours to Platform Hours

Private Contractors								
Laidlaw (Foothill)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours					1	1	1	1
Work Rules					0.56	0.36	0.44	0.45
Absences					0.11	0.10	0.08	0.10
Fringe Benefits*					0.48	0.41	0.45	0.44
Total Paid Hours					2.15	1.87	1.98	1.99
First (Foothill)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours					1	1	1	1
Work Rules					0.26	0.17	0.15	0.19
Absences					0.02	0.01	0.01	0.01
Fringe Benefits					0.44	0.31	0.31	0.35
Total Paid Hours					1.72	1.49	1.47	1.55
First (DART)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours	1	1	1	1	1	1	N/A	1
Work Rules	0.06	0.26	0.26	0.28	0.36	0.31		0.24
Absences	0.04	0.05	0.05	0.05	0.05	0.04		0.04
Fringe Benefits	0.44	0.72	0.66	0.70	0.60	0.55		0.56
Total Paid Hours	1.54	2.02	1.96	2.04	2.01	1.89		1.84
ATC/Vancom at Las Vegas								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.50	0.31	0.59	0.39	0.50	0.51	0.48	0.47
Absences	0.20	0.17	0.20	0.19	0.21	0.20	0.23	0.20
Fringe Benefits	0.71	0.58	0.84	0.72	0.77	0.75	0.83	0.75
Total Paid Hours	2.40	2.06	2.62	2.30	2.47	2.47	2.54	2.42
First (Houston)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours				1	1	1	1	1
Work Rules				0.47	0.33	0.37	0.38	0.38
Absences				0.03	0.06	0.05	0.05	0.05
Fringe Benefits				1.06	0.85	0.74	0.75	0.83
Total Paid Hours				2.56	2.24	2.15	2.17	2.26
Public (Control)								
Santa Monica								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours				1	1	1	1	1
Work Rules				0.25	0.25	0.25	0.36	0.28
Absences				0.34	0.32	0.30	0.29	0.31
Fringe Benefits				0.44	0.43	0.48	0.58	0.49
Total Paid Hours				2.03	1.99	2.03	2.23	2.08
VIA San Antonio								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.09	0.08	0.10	0.12	0.13	0.16	0.15	0.12
Absences	0.27	0.30	0.31	0.29	0.29	0.29	0.32	0.29
Fringe Benefits	0.65	0.65	0.59	0.60	0.54	0.63	0.71	0.62
Total Paid Hours	2.01	2.03	2.00	2.01	1.97	2.08	2.18	2.03

* These amounts include the fringe benefits of all modes and all staff in each agency.

City of Phoenix								
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.32	0.30	0.30	0.28	0.23	0.26	0.31	0.29
Absences	0.28	0.36	0.36	0.38	0.39	0.39	0.39	0.37
Fringe Benefits	0.72	0.65	0.69	0.70	0.79	0.75	0.77	0.73
Total Paid Hours	2.33	2.31	2.35	2.36	2.41	2.41	2.47	2.38
Metro Transit at Minneapolis								
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.22	0.21	0.21	0.24	0.25	0.23	0.23	0.23
Absences	0.39	0.38	0.34	0.36	0.38	0.37	0.41	0.36
Fringe Benefits	0.84	0.75	0.68	0.74	0.79	0.78	0.84	0.75
Total Paid Hours	2.45	2.35	2.24	2.34	2.41	2.37	2.47	2.34
Public (In-house)								
LAC MTA								
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours				1	1	1	1	1
Work Rules				0.27	0.27	0.24	0.22	0.25
Absences				0.30	0.36	0.29	0.32	0.32
Fringe Benefits				1.30	1.63	1.09	1.12	1.28
Total Paid Hours				2.86	3.26	2.61	2.66	2.85
DART								
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.17	0.18	0.19	0.57	0.49	0.28	0.32	0.28
Absences	0.41	0.44	0.35	0.08	0.03	0.47	0.54	0.34
Fringe Benefits	1.25	1.22	1.24	1.34	1.65	1.31	1.43	1.32
Total Paid Hours	2.84	2.83	2.78	3.00	3.17	3.07	3.28	2.95
Houston METRO								
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.31	0.27	0.30	0.19	0.19	0.37	0.11	0.24
Absences	0.57	0.46	0.47	0.45	0.46	0.51	0.42	0.47
Fringe Benefits	1.09	1.05	0.95	0.94	0.94	1.17	0.83	0.99
Total Paid Hours	2.97	2.78	2.73	2.57	2.60	3.06	2.37	2.70

Appendix Table 8: Ratio of Pay Hour to Platform Hours using Fringe Benefits of Bus Drivers only

Private Contractors								
Laidlaw (Foothill)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours					1	1	1	1
Work Rules					0.56	0.36	0.44	0.45
Fringe Benefits ** (Bus Drivers Only)					0.47	0.41	0.43	0.44
Total Paid Hours					2.03	1.77	1.87	1.88
First (Foothill)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours					1	1	1	1
Work Rules					0.26	0.17	0.15	0.19
Fringe Benefits (Bus Drivers Only)					0.44	0.30	0.30	0.34
Total Paid Hours					1.69	1.47	1.45	1.53

** The value of fringe benefits used in this table includes paid absences but does not account for amount paid for other than bus drivers in each agency.

	First (DART)							
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	N/A	1
Work Rules	0.06	0.26	0.26	0.28	0.36	0.31		0.26
Fringe Benefits (Bus Drivers Only)	0.44	0.52	0.48	0.50	0.48	0.46		0.48
Total Paid Hours	1.51	1.78	1.73	1.79	1.85	1.77		1.74
	ATC/Vancom at Las Vegas							
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.50	0.31	0.59	0.39	0.50	0.51	0.48	0.47
Fringe Benefits (Bus Drivers Only)	0.78	0.66	0.74	0.66	0.70	0.68	0.68	0.69
Total Paid Hours	2.27	1.96	2.33	2.06	2.20	2.19	2.16	2.16
	First (Houston)							
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours				1	1	1	1	1
Work Rules				0.47	0.33	0.37	0.38	0.38
Fringe Benefits (Bus Drivers Only)				0.59	0.58	0.49	0.51	0.53
Total Paid Hours				2.06	1.91	1.86	1.88	1.92
	Public (Control)							
	Santa Monica							
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours				1	1	1	1	1
Work Rules				0.25	0.25	0.25	0.36	0.28
Fringe Benefits (Bus Drivers Only)				0.56	0.52	0.54	0.63	0.57
Total Paid Hours				1.81	1.76	1.79	1.99	1.84
	VIA San Antonio							
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.09	0.08	0.10	0.12	0.13	0.16	0.15	0.12
Fringe Benefits (Bus Drivers Only)	0.48	0.51	0.49	0.48	0.45	0.51	0.57	0.50
Total Paid Hours	1.57	1.59	1.59	1.60	1.58	1.67	1.72	1.62
	City of Phoenix							
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.32	0.30	0.30	0.28	0.23	0.26	0.31	0.29
Fringe Benefits (Bus Drivers Only)	0.64	0.66	0.63	0.68	0.73	0.71	0.72	0.68
Total Paid Hours	1.97	1.96	1.93	1.96	1.96	1.97	2.03	1.97
	Metro Transit at Minneapolis							
	1995	1996	1997	1998	1999	2000	2001	Mean
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.22	0.21	0.21	0.24	0.25	0.23	0.23	0.23
Fringe Benefits (Bus Drivers Only)	0.68	0.69	0.72	0.74	0.79	0.77	0.85	0.76
Total Paid Hours	1.91	1.90	1.93	1.98	2.04	1.99	2.07	1.99

Public (In-house)								
LAC MTA								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours				1	1	1	1	1
Work Rules				0.27	0.27	0.24	0.22	0.25
Fringe Benefits (Bus Drivers Only)				1.11	1.27	0.74	0.78	0.97
Total Paid Hours				2.38	2.54	1.98	1.99	2.22
DART								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.17	0.18	0.19	0.57	0.49	0.28	0.32	0.31
Fringe Benefits (Bus Drivers Only)	1.04	0.91	0.81	0.74	0.72	0.86	0.95	0.86
Total Paid Hours	2.21	2.09	2.00	2.31	2.21	2.14	2.27	2.17
Houston METRO								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Platform Hours	1	1	1	1	1	1	1	1
Work Rules	0.31	0.27	0.30	0.19	0.19	0.37	0.11	0.24
Fringe Benefits (Bus Drivers Only)	0.93	0.80	0.74	0.71	0.75	0.87	0.61	0.76
Total Paid Hours	2.23	2.07	2.04	1.90	1.94	2.24	1.72	2.00

Appendix Table 9: Ratio of Fringe Benefits to Platform Hours

Private Contractors								
Laidlaw (Foothill)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Retirement/ Pension Plan					0.173	0.153	0.157	0.16
Health/ Dental Plan					0.17	0.143	0.162	0.158
Insurance/ Compensation					0.132	0.112	0.135	0.126
Uniform and others					0	0	0	0
Total Fringe Benefits					0.475	0.408	0.455	0.4443
First (Foothill)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Retirement/Pension Plan					0.112	0.089	0.112	0.104
Health/Dental Plan					0.072	0.073	0.068	0.071
Insurance/Compensation					0.249	0.131	0.12	0.161
Uniform and others					0.009	0.017	0.012	0.013
Total Fringe Benefits					0.441	0.31	0.312	0.348
First (DART)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Retirement/Pension Plan	0.099	0.156	0.15	0.15	0.135	0.142	N/A	0.133
Health/Dental Plan	0.105	0.17	0.195	0.199	0.184	0.164		0.155
Insurance/Compensation	0.211	0.34	0.273	0.307	0.235	0.2		0.241
Uniform and others	0.022	0.056	0.039	0.044	0.049	0.041		0.036
Total Fringe Benefits	0.437	0.721	0.657	0.7	0.603	0.546		0.565

ATC/Vancom at Las Vegas								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan	0.232	0.173	0.291	0.249	0.279	0.296	0.307	0.267
Health/Dental Plan	0.279	0.235	0.29	0.283	0.397	0.354	0.406	0.332
Insurance/Compensation	0.181	0.152	0.235	0.166	0.061	0.076	0.09	0.127
Uniform and others	0.017	0.022	0.019	0.02	0.029	0.028	0.027	0.024
Total Fringe Benefits	0.708	0.582	0.836	0.718	0.765	0.754	0.829	0.75

First (Houston)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan				0.207	0.165	0.203	0.217	0.199
Health/Dental Plan				0.237	0.248	0.21	0.231	0.231
Insurance/Compensation				0.528	0.385	0.261	0.242	0.339
Uniform and others				0.084	0.057	0.062	0.055	0.063
Total Fringe Benefits				1.057	0.855	0.736	0.745	0.832

Public (Control)

Santa Monica								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan				0.1	0.067	0.096	0.126	0.098
Health/Dental Plan				0.228	0.251	0.273	0.304	0.266
Insurance/Compensation				0.057	0.052	0.067	0.086	0.066
Uniform and others				0.058	0.055	0.047	0.06	0.055
Total Fringe Benefits				0.444	0.426	0.483	0.576	0.486

VIA San Antonio								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan	0.312	0.303	0.278	0.246	0.254	0.247	0.254	0.271
Health/Dental Plan	0.198	0.18	0.16	0.199	0.145	0.181	0.232	0.187
Insurance/Compensation	0.073	0.1	0.087	0.085	0.088	0.148	0.168	0.1
Uniform and others	0.065	0.066	0.068	0.069	0.056	0.056	0.052	0.06
Total Fringe Benefits	0.648	0.649	0.594	0.599	0.542	0.633	0.706	0.617

City of Phoenix								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan	0.334	0.359	0.344	0.329	0.386	0.378	0.401	0.363
Health/Dental Plan	0.271	0.24	0.235	0.267	0.322	0.307	0.308	0.281
Insurance/Compensation	0.113	0.033	0.09	0.084	0.058	0.046	0.028	0.063
Uniform and others	0.002	0.017	0.022	0.02	0.023	0.022	0.034	0.021
Total Fringe Benefits	0.72	0.65	0.691	0.7	0.789	0.753	0.771	0.727

Metro Transit at Minneapolis								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan	0.324	0.359	0.274	0.311	0.295	0.294	0.303	0.296
Health/Dental Plan	0.337	0.315	0.304	0.322	0.351	0.364	0.386	0.331
Insurance/Compensation	0.137	0.058	0.08	0.08	0.115	0.093	0.123	0.095
Uniform and others	0.037	0.022	0.022	0.026	0.026	0.027	0.029	0.026
Total Fringe Benefits	0.835	0.754	0.68	0.739	0.788	0.778	0.84	0.748

Public (In-house)

LAC MTA								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan				0.21	0.251	0.246	0.272	0.245
Health/Dental Plan				0.216	0.286	0.261	0.257	0.255
Insurance/Compensation				0.809	0.966	0.526	0.516	0.703
Uniform and others				0.062	0.127	0.052	0.08	0.08
Total Fringe Benefits				1.296	1.63	1.086	1.125	1.282

DART								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan	0.646	0.581	0.638	0.737	0.72	0.641	0.73	0.646
Health/Dental Plan	0.272	0.278	0.285	0.286	0.284	0.303	0.368	0.305
Insurance/Compensation	0.245	0.292	0.24	0.251	0.581	0.235	0.232	0.277
Uniform and others	0.09	0.064	0.072	0.07	0.068	0.135	0.096	0.091
Total Fringe Benefits	1.253	1.215	1.236	1.344	1.653	1.314	1.426	1.319

Houston METRO								
	1995	1996	1997	1998	1999	2000	2001	Mean
Retirement/Pension Plan	0.47	0.439	0.488	0.475	0.457	0.532	0.398	0.463
Health/Dental Plan	0.103	0.109	0.116	0.111	0.12	0.15	0.109	0.117
Insurance/Compensation	0.045	0.034	0.037	0.037	0.042	0.046	0.028	0.038
Uniform and others	0.476	0.468	0.312	0.315	0.321	0.444	0.296	0.37
Total Fringe Benefits	1.093	1.051	0.953	0.938	0.94	1.171	0.831	0.987

Appendix Table 10: Ratio of Paid Absences to Platform Hours

Private Contractors								
Laidlaw (Foothill)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Sick Leave					0.022	0.02	0.016	0.02
Holiday					0.033	0.031	0.025	0.03
Vacation					0.055	0.046	0.042	0.047
Other Paid Absences					0.004	0.005	0.001	0.003
Total absences					0.114	0.102	0.085	0.1

First (Foothill)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Sick Leave					0	0	0	0
Holiday					0	0	0	0
Vacation					0.023	0.012	0.011	0.015
Other Paid Absences					0	0	0	0
Total absences					0.023	0.012	0.011	0.015

First (DART)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Sick Leave	0	0	0	0	0	0	N/A	0
Holiday	0	0	0	0	0	0		0
Vacation	0.038	0.047	0.047	0.053	0.049	0.039		0.043
Other Paid Absences	0	0	0	0	0	0		0
Total absences	0.038	0.047	0.047	0.053	0.049	0.039		0.043

ATC/Vancom at Las Vegas								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Sick Leave	0	0	0	0	0	0	0	0
Holiday	0.112	0.096	0.113	0.105	0.116	0.108	0.129	0.112
Vacation	0.081	0.07	0.086	0.08	0.09	0.089	0.101	0.087
Other Paid Absences	0.004	0.003	0.003	0.004	0.003	0.005	0.005	0.004
Total absences	0.197	0.169	0.201	0.189	0.21	0.202	0.235	0.203
First (Houston)								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Sick Leave				0	0	0	0	0
Holiday				0	0	0	0	0
Vacation				0.029	0.057	0.05	0.048	0.047
Other Paid Absences				0	0	0	0	0
Total absences				0.029	0.057	0.05	0.048	0.047
Public (Control)								
Santa Monica								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Sick Leave				0.151	0.143	0.074	0.066	0.106
Holiday				0.075	0.071	0.107	0.109	0.092
Vacation				0.111	0.094	0.11	0.111	0.107
Other Paid Absences				0.004	0.009	0.007	0.006	0.007
Total absences				0.342	0.317	0.299	0.292	0.311
VIA San Antonio								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Sick Leave	0.05	0.063	0.067	0.061	0.054	0.054	0.076	0.061
Holiday	0.091	0.094	0.101	0.095	0.096	0.093	0.102	0.094
Vacation	0.117	0.13	0.132	0.13	0.136	0.134	0.139	0.129
Other Paid Absences	0.008	0.008	0.008	0.007	0.008	0.007	0.008	0.008
Total absences	0.266	0.296	0.308	0.294	0.294	0.288	0.324	0.292
City of Phoenix								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Sick Leave	0.112	0.081	0.082	0.093	0.093	0.109	0.089	0.094
Holiday	0.153	0.114	0	0	0.115	0.119	0.127	0.09
Vacation	0.002	0.164	0.117	0.111	0.179	0.165	0.178	0.134
Other Paid Absences	0.018	0	0.16	0.172	0	0	0	0.05
Total absences	0.285	0.359	0.359	0.377	0.387	0.393	0.394	0.367
Metro Transit at Minneapolis								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Sick Leave	0.069	0.074	0.07	0.073	0.076	0.077	0.074	0.071
Holiday	0.11	0.104	0.091	0.095	0.1	0.099	0.106	0.097
Vacation	0.191	0.185	0.163	0.177	0.188	0.15	0.149	0.164
Other Paid Absences	0.024	0.016	0.018	0.017	0.017	0.04	0.077	0.031
Total absences	0.394	0.379	0.342	0.362	0.381	0.366	0.406	0.376
Public (In-house)								
LAC MTA								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Sick Leave				0.063	0.077	0.059	0.058	0.064
Holiday				0.027	0.033	0.032	0.056	0.037
Vacation				0.193	0.236	0.184	0.198	0.202
Other Paid Absences				0.013	0.015	0.012	0.011	0.013
Total absences				0.296	0.361	0.287	0.323	0.316

DART								
	1995	1996	1997	1998	1999	2000	2001	Mean
Sick Leave	0.103	0.102	0.075	0.028	0.012	0.075	0.054	0.069
Holiday	0.081	0.09	0.1	0	0	0.109	0.123	0.075
Vacation	0.185	0.206	0.15	0.052	0.023	0.266	0.338	0.176
Other Paid Absences	0.04	0.04	0.028	0	0	0.025	0.027	0.024
Total absences	0.41	0.438	0.353	0.08	0.034	0.475	0.542	0.344
Houston METRO								
	1995	1996	1997	1998	1999	2000	2001	Mean
Sick Leave	0.121	0.095	0.105	0.096	0.098	0.106	0.087	0.1
Holiday	0.096	0.077	0.088	0.083	0.082	0.095	0.073	0.084
Vacation	0.223	0.188	0.209	0.201	0.204	0.23	0.182	0.204
Other Paid Absences	0.127	0.096	0.072	0.068	0.079	0.083	0.082	0.086
Total absences	0.567	0.458	0.474	0.448	0.464	0.513	0.425	0.478

Appendix Table 11: Ratio of Work Rules Restriction to Platform Hours

Private Contractors								
Laidlaw (Foothill)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks					0.061	0.011	0.055	0.042
Travel/Intervening Time					0	0	0	0
Minimum Guarantee					0	0	0	0
Overtime Premium					0.343	0.247	0.266	0.283
Other Premium (Shift, Spread, etc.)					0	0	0	0
Stand-by Time					0	0	0	0
Other Non Operating Paid Work Time					0.155	0.1	0.11	0.12
Total Work Rules					0.56	0.362	0.442	0.449
First (Foothill))								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks					0	0	0	0
Travel/Intervening Time					0	0	0	0
Minimum Guarantee					0	0	0	0
Overtime Premium					0.144	0.065	0.056	0.084
Other Premium (Shift, Spread, etc.)					0	0	0	0
Stand-by Time					0	0	0	0
Other Non Operating Paid Work Time					0.115	0.105	0.093	0.104
Total Work Rules					0.259	0.171	0.148	0.188
First (DART)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks	0	0	0	0	0	0	N/A	0.005
Travel/Intervening Time	0	0	0	0	0	0		0
Minimum Guarantee	0	0.011	0.01	0.008	0.005	0.006		0.005
Overtime Premium	0.038	0.062	0.073	0.072	0.097	0.09		0.064
Shift Premium	0	0	0	0	0	0		0
Other Premium	0	0	0	0	0	0		0.001
Stand-by Time	0	0.039	0.036	0.038	0.047	0.048		0.032
Other Non Operating Paid Work Time	0.027	0.145	0.137	0.166	0.215	0.163		0.129
Total Work Rules	0.064	0.256	0.257	0.283	0.363	0.307		0.236

ATC/ Vancom at Las Vegas								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks	0.028	0.023	0.024	0.021	0.025	0.03	0.025	0.025
Travel/Intervening Time	0.115	0.111	0.121	0.098	0.109	0.113	0.111	0.11
Minimum Guarantee	0	0	0	0.007	0	0	0	0.001
Overtime Premium	0.198	0.136	0.232	0.055	0.074	0.098	0.077	0.113
Other Premium (Shift, Spread, etc.)	0	0	0.02	0.1	0.048	0.037	0.033	0.038
Stand-by Time	0.043	0.039	0.048	0.048	0.041	0.045	0.044	0.044
Other Non Operating Paid Work Time	0.112	0	0.141	0.066	0.201	0.187	0.188	0.137
Total Work Rules	0.496	0.308	0.585	0.395	0.498	0.509	0.478	0.468
First (Houston)								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks				0.045	0.041	0.044	0.048	0.045
Travel/Intervening Time				0	0	0	0	0
Minimum Guarantee				0.002	0.003	0.002	0.003	0.003
Overtime Premium				0.102	0.073	0.09	0.104	0.092
Other Premium (Shift, Spread, etc.)				0.017	0.011	0.011	0	0.009
Stand-by Time				0.04	0.052	0.049	0.06	0.051
Other Non Operating Paid Work Time				0.267	0.151	0.173	0.162	0.183
Total Work Rules				0.473	0.331	0.368	0.376	0.382
Public (Control)								
Santa Monica								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks				0.022	0.022	0.022	0.024	0.023
Travel/Intervening Time				0.026	0.029	0.026	0.021	0.025
Minimum Guarantee				0.008	0.009	0.011	0.008	0.009
Overtime Premium				0.112	0.111	0.099	0.178	0.126
Other Premium (Shift, Spread, etc.)				0.005	0.006	0.005	0.004	0.005
Stand-by Time				0.002	0.001	0.002	0.014	0.005
Other Non Operating Paid Work Time				0.073	0.068	0.085	0.11	0.085
Total Work Rules				0.248	0.245	0.25	0.359	0.278
VIA San Antonio								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks	0.011	0.011	0.011	0.011	0.012	0.019	0.019	0.014
Travel/Intervening Time	0.009	0.009	0.012	0.011	0.012	0.024	0.023	0.013
Minimum Guarantee	0	0.001	0.001	0	0	0	0	0
Overtime Premium	0.042	0.025	0.035	0.048	0.062	0.061	0.046	0.045
Shift Premium	0.002	0.003	0.003	0.002	0.002	0.002	0.003	0.002
Other Premium	0.007	0.009	0.013	0.011	0.009	0.006	0.008	0.008
Stand-by Time	0.014	0.013	0.013	0.011	0.01	0.011	0.011	0.013
Other Non Operating Paid Work Time	0.008	0.01	0.014	0.022	0.026	0.039	0.039	0.021
Total Work Rules	0.093	0.082	0.101	0.116	0.134	0.163	0.149	0.116
City of Phoenix								
	1995	1996	1997	1998	1999	2000	2001	Mean
Report/Turn-in, Breaks	0.036	0.035	0.036	0.034	0.038	0.038	0.036	0.036
Travel/Intervening Time	0.063	0.048	0.048	0.039	0.034	0.033	0.031	0.041
Minimum Guarantee	0.023	0.03	0.022	0.009	0.006	0.006	0.014	0.015
Overtime Premium	0.061	0.04	0.036	0.042	0.034	0.044	0.049	0.044
Other Premium (Shift, Spread, etc.)	0.031	0.037	0.041	0.047	0.048	0.048	0.035	0.041
Stand-by Time	0.104	0.105	0.109	0.098	0.048	0.045	0.06	0.08

Other Non Operating Paid Work Time	0.007	0.002	0.008	0.011	0.024	0.048	0.084	0.028
Total Work Rules	0.324	0.298	0.3	0.28	0.232	0.262	0.308	0.286
Metro Transit at Minneapolis								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Report/Turn-in, Breaks	0.031	0.03	0.03	0.036	0.035	0.035	0.034	0.033
Travel/Intervening Time	0	0	0	0	0	0	0	0
Minimum Guarantee	0.042	0.026	0.017	0.014	0.015	0.013	0.025	0.021
Overtime Premium	0.041	0.057	0.051	0.056	0.052	0.06	0.046	0.052
Other Premium (Shift, Spread, etc.)	0.022	0.017	0.017	0.024	0.023	0.02	0.024	0.021
Stand-by Time	0.028	0.025	0.029	0.025	0.03	0.027	0.035	0.029
Other Non Operating Paid Work Time	0.044	0.068	0.069	0.088	0.09	0.072	0.061	0.071
Total Work Rules	0.208	0.223	0.214	0.243	0.245	0.227	0.226	0.227
Public (In-house)								
LAC MTA								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Report/Turn-in, Breaks				0.042	0.043	0.041	0.026	0.038
Travel/Intervening Time				0.021	0.02	0.018	0.018	0.019
Minimum Guarantee				0.022	0.021	0.02	0.018	0.02
Overtime Premium				0.108	0.107	0.085	0.081	0.096
Other Premium (Shift, Spread, etc.)				0.031	0.031	0.026	0.03	0.03
Stand-by Time				0.023	0.029	0.031	0.03	0.028
Other Non Operating Paid Work Time				0.023	0.016	0.019	0.014	0.018
Total Work Rules				0.27	0.268	0.24	0.217	0.249
DART								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Report/Turn-in, Breaks	0.027	0.024	0.025	0.034	0.034	0.029	0.035	0.029
Travel/Intervening Time	0.012	0.01	0.014	0.024	0.02	0.018	0.02	0.016
Minimum Guarantee	0.01	0.008	0.007	0.01	0.009	0.009	0.007	0.01
Overtime Premium	0.035	0.034	0.035	0.047	0.046	0.074	0.073	0.045
Shift Premium	0.009	0.009	0.007	0.008	0.024	0.025	0.023	0.014
Other Premium	0	0	0	0.304	0.233	0.001	0.002	0.058
Stand-by Time	0.037	0.032	0.033	0.05	0.043	0.04	0.046	0.039
Other Non Operating Paid Work Time	0.043	0.061	0.066	0.095	0.078	0.083	0.112	0.072
Total Work Rules	0.173	0.177	0.186	0.573	0.486	0.279	0.317	0.283
Houston METRO								
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Mean**
Report/Turn-in, Breaks	0	0	0	0	0	0	0	0
Travel/Intervening Time	0.045	0.006	0.006	0.006	0.006	0.008	0.006	0.011
Minimum Guarantee	0.056	0.081	0.088	0.07	0.061	0.069	0.054	0.068
Overtime Premium	0.094	0.087	0.11	0.069	0.067	0.178	0.021	0.086
Other Premium (Shift, Spread, etc.)	0	0	0	0	0	0	0	0
Stand-by Time	0.02	0.017	0.017	0.015	0.011	0.012	0.009	0.014
Other Non Operating Paid Work Time	0.091	0.081	0.079	0.028	0.048	0.105	0.021	0.062
Total Work Rules	0.306	0.271	0.3	0.188	0.192	0.371	0.11	0.24

Appendix 6 Results of Testing Mean Differences of Three Types of Operators

Appendix Table 12: Results of ANOVA for Testing Mean Difference of Three Types of Operators

Operating Costs per RVH

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	262.6473	$52.53	61.566
In-House	4	298.2739	$74.48	347.430
Control	3	286.0857	$95.22	317.836

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3535.171	2	1767.585	8.24276	0.009242	4.256492
Within Groups	1929.968	9	214.4408			
Total	5465.139	11				

Average Platform Costs per Platform Hour

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	52.46738	$10.49	0.6234
Control	4	64.353373	$16.09	2.6948
In-house	3	49.158185	$16.39	7.4291

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	95.6627297	2	47.831	16.924	0.0008921	4.256492
Within Groups	25.4361938	9	2.8262			
Total	121.098924	11				

Estimated Annual Earnings

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	119880.9	$23,976	10637353
Control	4	125042.4	$31,261	17528703
in-house	3	111185.3	$37,062	28657647

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3.36E+08	2	1.68E+08	9.921867	0.005295	4.256492
Within Groups	1.52E+08	9	16938980			
Total	4.89E+08	11				

Estimated Annual Benefits

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	39156.16	$7,831	2078815
Control	4	56358.78	$14,090	6529898
in-house	3	62213.07	$20,738	32244854

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3.18E+08	2	1.59E+08	15.47316	0.001223	4.256492
Within Groups	92394663	9	10266074			
Total	4.1E+08	11				

Ratio of Total Paid Hours to Platform Hours

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	9.23	1.846	0.05408
Control	4	7.42	1.855	0.028967
in-house	3	6.39	2.13	0.0133

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.17658	2	0.08829	2.409223	**0.145219**	4.256492
Within Groups	0.32982	9	0.036647			
Total	0.5064	11				

Ratio of Work Rules to Platform Hours

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	1.75	0.35	0.01475
Control	4	0.92	0.23	0.006067
in-house	3	0.8	0.266667	0.001433

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.034025	2	0.017013	1.912313	**0.203184**	4.256492
Within Groups	0.080067	9	0.008896			
Total	0.114092	11				

Ratio of Benefits (Drivers) to Platform Hours

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	2.48	0.496	0.01663
Control	4	2.51	0.6275	0.013292

in-house	3	2.59	0.863333	0.011033

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.253105	2	0.126552	8.866244	0.007454	4.256492
Within Groups	0.128462	9	0.014274			
Total	0.381567	11				

Ratio of Paid Absences (Drivers) to Platform Hours

Anova: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
Private	5	0.3	0.06	0.0032
Control	4	0.83	0.2075	0.002825
in-house	3	0.58	0.193333	0.003033

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.058683	2	0.029342	9.658336	0.005753	4.256492
Within Groups	0.027342	9	0.003038			
Total	0.086025	11				

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