

TCRP

REPORT 68

Part-Time Transit Operators: The Trends and Impacts

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TCRP REPORT 68

**Part-Time Transit Operators:
The Trends and Impacts**

CHARLES RIVER ASSOCIATES INCORPORATED
Boston, MA

SUBJECT AREAS
Public Transit

Research Sponsored by the Federal Transit Administration in Cooperation with the Transit Development Corporation

TRANSPORTATION RESEARCH BOARD — NATIONAL RESEARCH COUNCIL

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The nation's growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands. Research is necessary to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry. The Transit Cooperative Research Program (TCRP) serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

The need for TCRP was originally identified in *TRB Special Report 213—Research for Public Transit: New Directions*, published in 1987 and based on a study sponsored by the Urban Mass Transportation Administration—now the Federal Transit Administration (FTA). A report by the American Public Transportation Association (APTA), *Transportation 2000*, also recognized the need for local, problem-solving research. TCRP, modeled after the longstanding and successful National Cooperative Highway Research Program, undertakes research and other technical activities in response to the needs of transit service providers. The scope of TCRP includes a variety of transit research fields including planning, service configuration, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices.

TCRP was established under FTA sponsorship in July 1992. Proposed by the U.S. Department of Transportation, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). On May 13, 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA, the National Academies, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Committee.

Research problem statements for TCRP are solicited periodically but may be submitted to TRB by anyone at any time. It is the responsibility of the TOPS Committee to formulate the research program by identifying the highest priority projects. As part of the evaluation, the TOPS Committee defines funding levels and expected products.

Once selected, each project is assigned to an expert panel, appointed by the Transportation Research Board. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, TCRP project panels serve voluntarily without compensation.

Because research cannot have the desired impact if products fail to reach the intended audience, special emphasis is placed on disseminating TCRP results to the intended end users of the research: transit agencies, service providers, and suppliers. TRB provides a series of research reports, syntheses of transit practice, and other supporting material developed by TCRP research. APTA will arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by urban and rural transit industry practitioners.

The TCRP provides a forum where transit agencies can cooperatively address common operational problems. The TCRP results support and complement other ongoing transit research and training programs.

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The members of the technical advisory panel selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and while they have been accepted as appropriate by the technical panel, they are not necessarily those of the Transportation Research Board, the National Research Council, the Transit Development Corporation, or the Federal Transit Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical panel according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

To save time and money in disseminating the research findings, the report is essentially the original text as submitted by the research agency. This report has not been edited by TRB.

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FOREWORD

*By Staff
Transportation Research
Board*

TCRP Report 68, “Part-Time Transit Operators: The Trends and Impacts,” will be of interest to individuals who manage public transportation operations or who manage human resources in transit systems. The report examines how part-time labor has affected the cost and performance of transit systems over the past 25 years and considers how part-time labor can be meaningfully incorporated into the workforce of transit systems.

In the late 1970s, transit systems throughout the United States sought ways to reduce operating costs. Labor-related costs were increasing, as were transit deficits. Many transit systems began using part-time labor, often with reduced wages and benefits, to save costs. The introduction of part-time employees at this time was controversial, as most labor representatives opposed having a two-tier workforce (i.e., having some workers earn higher wages and receive more benefits than others). Many transit professionals doubted whether the potential savings would be realized and feared that service quality and safety would deteriorate.

To address this issue, some studies were conducted during the first half of the 1980s. These studies assessed the potential impacts of part-time labor on both the cost and the quality of public transit services. These studies found that while savings were achieved, the extent of savings varied significantly from place to place depending on the service schedule, management practices, and the concessions made in order to establish the right to hire part-time operators. Analyses of the impact of part-time operators on service quality were less consistent and less conclusive. However, the past decade’s changes in the workforce, particularly its labor shortages, have added a new and interesting twist to this matter: recently, many transit agencies have had difficulty filling vehicle operator positions, whether part-time or full-time. This difficulty has complicated the discussion of how to use part-time employees efficiently.

TCRP Project F-7 was conducted to re-examine this provocative topic nearly a quarter of a century after using part-time labor became fairly widespread. The objective of TCRP Project F-7 was to inform transit system management, governing boards, labor unions, and employees how to realize the benefits of using part-time transit operators while avoiding potential negative impacts. This research on part-time operators reflects concern for transit system operating costs, safety, service reliability, customer satisfaction, labor-management relations, and employee satisfaction.

The project’s research team was led by Charles River Associates Incorporated. Michael Kemp of Charles River Associates and Professor Charles Lave of the Department of Economics at the University of California, Irvine, were co-principal investigators for the study. The other members of the team included Shomik Mehndiratta, Sean Peirce, Geoffrey Carliner, and Eric Nierenberg at Charles River Associates; Professor Genevieve Giuliano at the University of Southern California; Principal Brian McCollom at McCollom Management Consulting Inc.; and consultants John T. Doolittle, Ellin Reisner, and Norman A. Weintraub.

The results of this research indicate that 1–10 percent of operating costs can potentially be saved by using part-time labor. However, the researchers found that at present, agencies were having a very hard time recruiting operators, full-time or part-time. They determined that the use of the part-time operator position, as it is currently structured, is partly responsible for that recruitment problem: many agencies require *all* new operators to start as part-time, work long spreads without premiums for lower wages, and receive partial benefits. Such policies, carry-overs from an era when transit operator jobs were relatively high paying and attractive, make less sense when the transit operator job is no longer as lucrative or attractive.

The study recommended specific steps that transit agencies could take to address shortages in both part-time and full-time operators while retaining many of the cost savings associated with using part-time operators. Specific recommendations included structuring part-time jobs for people who actually want permanent part-time jobs and hiring full-time operators without requiring that they start in part-time positions. The study also found that human resources departments in most agencies were not prepared for the transition from an environment where transit operator jobs are scarce to one where applicants are scarce. In this context, the study concluded that human resources personnel in transit agencies needed to work more closely with the operations department to more effectively recruit and hire both part-time and full-time employees.

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Nierenberg at Charles River Associates; Professor Genevieve Giuliano at the University of Southern California; Principal Brian McCollom at McCollom Management Consulting Inc.; and consultants John T. Doolittle, Ellin Reisner, and Norman A. Weintraub. Charles Lave and Shomik Mehndiratta were the primary authors of this report.

Executive Summary

CONTEXT

Roughly a quarter of a century has passed since the US transit industry began significant use of part-time labor. This study set out to report on the outcomes, focusing on the following:

- *Retrospective* questions: how well has this innovation worked, how has it affected labor relations, and what are its impacts on costs and productivity?
- *Here-and-now* questions: how can transit agencies improve their use and management of part-time labor, and are there “best practices” (for training, scheduling, part-time to full-time transition rules, and so on) that beneficially could be spread throughout the industry?

The need for part-time labor derives from the service demands of the transit market: demand is frequently highly concentrated into the morning and evening commute periods. Many operators are needed during the peak hours; fewer are needed in between. Furthermore, the length of time from the start of the morning peak to the end of the evening peak is too great to be served by a single transit operator working a conventional eight-hour shift.

Historically, transit agencies have handled this scheduling problem in several ways: *split shifts*, with a substantial amount of premium “spread” pay to compensate for the inconvenience to the operators; *overtime pay*, to permit coverage of a longer driving schedule; or *guaranteed pay*, where an operator is scheduled only for a short workday but is given extra pay to bring the total up to an eight-hour guarantee. All of these “solutions” produce the result that operators are in effect paid for more hours than they actually work. Management sees the extra pay-hours as waste; labor sees them as compensation for the onerous work schedules. On either view, dealing with these extra pay-hours is at the heart of the move to part-time operators. Part-time operators are usually scheduled to augment peak period service — that is, they may work 3–4 hours in the morning and/or afternoon peak, and may or may not work additional hours.

Moreover, the transit industry’s needs for part-timers seemed to fit well with contemporaneous trends in the labor market, most notably the emergence of a class of so-called *dedicated part-timers*. Some of these were looking to supplement their primary income with a part-time job, people like fire fighters and school teachers; and some were people with no jobs but who wanted only part-time work, people like students and homemakers. All told, part-time labor seemed like a good way to cut agency costs while matching peak time bus-driving jobs with people looking to work only part-time — at second jobs or in part-time careers.

FINDINGS

- Our analysis suggests that the net cost savings to transit agencies achieved by employing part-time operators (PTOs) range from one to ten percent of total operator costs. The level achieved depends on a variety of operational and contractual factors such as the amount of peaking in the daily operating schedule and the strictness of the work rules in the labor agreement, particularly the restrictions on maximum spread time.
- However, whatever gross cost savings can be achieved directly in the agency's accounts from using PTOs for a particular portion of work, there are a number of other considerations — largely intangible — that are likely to have an *indirect* effect (possibly large) on financial performance. First, there can be impacts on agency “morale” and on the general tenor of labor relations at the agency. Secondly, the prospect of employing PTOs, or of liberalizing constraints on PTO use, is a not uncommon management stance in collective bargaining. The ultimate outcome may or may not be a change in PTO policies, but the convincing *threat* of a cheaper labor hour may still be a valuable bargaining chip. Relatedly, when the right to liberalize PTO use *is* achieved in the collective bargaining process, it may well be at the expense of provisions that will negatively affect other parts of the agency's cost structure.
- The morale-related problems are in part a result of the fact that few if any agencies have sincerely tried to tailor the part-time jobs to be attractive to dedicated part-timers — the people actually looking to work for only a limited number of hours each week. Indeed, our study has found:
 - In many circumstances, the PTO jobs are filled by workers who actually want *full-time* work. Management *requires* them to serve a stint as PTOs, often a very long stint, before they can become full-timers.
 - The present *structure* of the PTO position makes it very unattractive for workers who want primarily part-time work. For example:
 - In most of our case studies, we found that part-timers were typically used to operate a split shift of *two* peak-hour tripper runs on weekdays. Typically, a workday consisted of two short runs, one in the morning peak and one in the evening peak, with no compensating payment for the long spread. This was generally for the five consecutive weekdays; indeed, some agencies *required* PTOs to work such 30-hour weeks.
 - This 30-hour workweek requirement eliminates from consideration for the PTO position anyone who wants to hold another commercial driving job concurrently, since he or she would likely run foul of the US Department of Transportation's hours-of-work guidelines that regulate the hours of service for commercial drivers.
 - At most agencies, PTOs have no ability to specify the *times* at which they want to work. This is an obvious problem for someone who would want to balance personal and other work considerations together with a PTO job.

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- This issue is further accentuated by instability in PTO runs across schedule and work roster “shakeups.” A PTO who has been working a run that accommodates a class schedule or a second job finds that the new roster may have put the run right into the middle of these other obligations.
- Finally, many agencies operate only daytime training programs, requiring trainees to commit the entire working day for one or more weeks. Such schedules are clearly not geared toward dedicated part-timers trying to accommodate other work or personal obligations.
- In practice then, the policies of many agencies treat PTO jobs as essentially lower-paid full-time jobs, with demanding hours and without the work rule protections and premiums afforded to full-timers.
 - PTOs usually get no spread premiums, and often end up working long spreads for six hours of pay in a day.
 - PTO wage and fringe rates were generally lower than corresponding full-time rates. However, over successive contracts, collective bargaining agreements have been slowly reducing the wage and benefit differences, converging toward equal wage rates and proportional fringes.
- In the present booming economy characterized by historically low levels of unemployment, transit agencies are finding it very hard to hire *any* operators, full-time or part-time. Our analysis suggests that PTO policy has some role to play in transit management’s current difficulties. The potential full-time recruits are deterred by the prospect of a required PTO stint characterized by demanding schedules, lower pay and fringes, and an indefinite promotion time for the transition to full-time work. Few competing driving jobs carry the same requirement.

RECOMMENDATIONS

Should agencies currently considering the use of PTOs move forward? The evidence is mixed. Our analysis does indicate that the use of PTOs has resulted in net cost savings of between one and ten percent in total operator wages and benefits. However, our analysis also suggests that, in most (but not all) places, these savings are currently more due to differences in wages and benefits than to differences in work rules (schedule efficiency savings). Since our evidence also suggests that, for a variety of reasons, PTO wages and fringes tend to approach FTO rates over time, it is not clear how sustainable PTO-associated cost savings will be. Further, we find that some of the schedule savings from PTOs, generated by scheduling morning and afternoon peak trippers over 13-hour split shifts, are so onerous for PTOs that recruiting and retention is difficult, especially in today’s tight job market.

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If agencies do decide to structure PTO runs so that they are more attractive to dedicated part-timers, there is the risk that the schedule savings will decline. In addition, there is the question of opportunity costs. Some of the net value of PTOs depends on what management gives up or forgoes in exchange for the right to use them to the desired extent. In order to be able to bargain intelligently, the agency needs to carry out detailed runcut simulations in advance, to understand the *total* labor cost picture. If that type of preparation is done, it may prove more effective for management to concentrate more on the contract provisions that govern the use of full-time operators, or that affect absenteeism or sick leave.

What we *can* say without ambiguity is that once an agency starts to use PTOs, it needs to do a better job of attracting and deploying part-timers than is currently customary. Otherwise, the enticing potential cost-savings may be greatly reduced or even eliminated. We have some specific recommendations about the use of PTOs in practice, most of which are based on existing practices at some of the transit agencies that we analyzed for this study.

- *Restructure labor contracts so that the cap on PTO use is a function of total PTO hours, not the number of part-time operators.* This provides more flexibility for the agency, but also encourages the hiring and use of dedicated PTOs who wish to work only 15–20 hours per week (for example, weekday afternoons only).
- *Create part-time work rules and contract provisions that will attract people who actually want part-time work.*
 - *Offer stability in PTO schedules across runcuts.* Since dedicated part-time workers are highly likely to be people with extensive outside commitments, it is absolutely essential that they have at least a modicum of stability in their work hours and assignments.
 - *Offer flexible working hours and customized work assignments.* In a similar vein, accommodating PTOs requires preparing work assignments based not solely on operational considerations, but also on the needs of the employee.
 - *Harmonize PTO work schedules with U.S.DOT operator rules.* This would make bus driving more attractive to some people who hold other part-time driving jobs.
 - *Replace onerous split-shift runs with trippers, to the extent possible.* In particular, requiring that PTOs work a combination of morning and afternoon trippers makes it hard for PTOs to accommodate other work or personal responsibilities.
 - *Reserve some weekend and evening assignments for those PTOs who prefer such work.*
 - *Offer training sessions at night and on weekends,* to provide more flexibility for those with other time commitments to join the transit labor force as dedicated PTOs.
- *Allowing the use of informal (or even formal) coping mechanisms for dealing with emergency childcare problems* can make a big difference to *both* PTOs and full-time operators. Such provisions include allowing operators to swap runs or to carry cell phones for emergency childcare contact.

EXECUTIVE SUMMARY

- *Eliminate the policy that full-time operators can only be hired from the PTO ranks.* This policy is probably a significant cause of the current operator shortage. People who need full-time work will find an offer of months of enforced part-time work much less attractive. It is very likely that the policy reduces the quality of the transit labor force, since the best candidates will have alternative offers and hence are less likely to put up with a job that starts with lower wages and benefits.
- *Develop a more proactive, higher-profile role for the Human Resources Department.* The Human Resources Department can be expected to have the most detailed knowledge of the personal needs and time commitments of prospective employees. In an ideal world, the Human Resources Department would not only represent the interests of the agency in the labor market, but also actively represent within the agency the demands of potential recruits. If HR were able to work with the Operations Department to help create PTO work assignments suitable for people who actually want part-time work, everybody would gain.

Chapter 1. Introduction and Summary of Findings

THE PURPOSE OF THIS STUDY

Over two decades have passed since the US transit industry started to introduce part-time labor on a significant scale. It is time to evaluate this experience. There are *retrospective* questions: how well has this innovation worked, how has it affected labor relations, and what are its impacts on costs and productivity? There are *here-and-now* questions: how can transit agencies improve their use and management of part-time labor, and are there “best practices” (for training, scheduling, PTO to full-time transition rules, and so on) that could beneficially be spread throughout the industry?

This study was aimed at the concerns of transit management, organized labor, and public funding agencies — the groups most involved in providing transit services. Our primary objective has been to provide useful answers to questions like these:

- What can we conclude about the positive and negative consequences of using part-time operators? Specifically, what can be said about their impact on labor-management relations, employee morale, and operating costs?
- What are the main factors — controllable or uncontrollable within a given transit district — that make the use of PTOs a “success” or a “failure”?
- What guidance can be given — to transit agencies, labor unions, and sponsoring governments — to help them maximize the long-term benefits from the use of part-time operators while avoiding negative impacts?

A BRIEF HISTORY OF THE TOPIC OVER THE LAST 25 YEARS

The need for part-time labor derives from the service demands of the transit market: demand is concentrated in the morning and evening commute hours. Many operators are needed during the peak hours; fewer are needed in between. Furthermore, the length of time between the start of the morning peak and the end of the evening peak is too great to be served by a single transit operator on a conventional eight-hour workday.

Historically, transit agencies have handled this scheduling problem in several ways: *split shifts*, with a substantial amount of premium “spread” pay to compensate for the inconvenience to the operators; *overtime pay*, to permit coverage of a longer driving schedule; or *guaranteed pay*, where an operator is scheduled only for a short workday but is given extra pay to bring the total up to an eight-hour guarantee. All of these “solutions” produce the result that operators are in effect paid for more hours than they actually work. Management sees these extra pay-hours as waste; labor sees them as compensation for the onerous work schedules. On either view, the

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resulting high ratio of pay-hours to platform-hours (driving hours) is at the heart of the move to part-time operators. Part-time operators usually work more in conformance with the peak; i.e., they may work three to four hours in the AM or PM peak and may or may not work additional hours.

The use of part-time operating personnel, working for shorter periods than a full eight-hour shift, appears to make a lot of economic sense for the transit agency. About 25 years ago, a handful of agencies started using part-time operating staff¹ during peak periods to lower their operating labor costs. However, the adoption and use of PTOs does not necessarily benefit all of the affected interest groups, and indeed, it remains controversial. Initially at least, full-time labor and their representatives resisted the use of part-time operators in most cases. In order to gain or assert the right to use PTOs, many transit agencies incurred significant costs, either by way of concessions to labor unions or as a result of strikes.

Further, it was not clear whether part-time operators would have the same performance levels and standards as were expected from full-time labor. If the PTOs considered their transit jobs as short-term, what absentee rates could be expected? Further, without permanent job status, would PTOs tend to be short-term employees, and would the resulting high attrition rates and increased training costs nullify the potential cost savings? Would safety be compromised by the introduction of a cadre of (for example) less experienced bus operators driving in peak traffic conditions?

Some answers to these questions were systematically sought in the early 1980s in U.S.DOT-funded studies by Charles Lave and his colleagues at the University of California, Irvine.² In the first of these studies, Lave and Chomitz undertook simulations of transit labor costs for five properties under changed work rules, to explore the sensitivity of the costs to the detailed work rule provisions. This simulation involved the microlevel scheduling of vehicles and operators (“runcutting”).

In the second study, Lave and his co-workers analyzed data for some ten years of experience with part-time operators at five (mostly West Coast) transit agencies. This research provisionally answered some of the questions associated with the use of part-time labor. It found that “part-time work has inherently lower absenteeism; holding sick-pay and probation effects constant, part-time drivers have lower absenteeism than full-time drivers.” It found that holding constant

¹We will use the term “part-time operators” (PTOs) to connote all part-time operating staff categories whose work is essential throughout the weekday peak periods, including vehicle drivers, conductors, guards, and station personnel. However, we will focus attention particularly on *vehicle operators*, who form the largest component of part-time staff.

²Chomitz, Kenneth M., and Lave, Charles A. (1981), *Part-Time Labor, Work Rules, and Transit Costs*, Washington, DC: US Department of Transportation, Urban Mass Transportation Administration; Chomitz, Kenneth M., Giuliano, Genevieve, and Lave, Charles A. (1985), *Fiscal and Organizational Impacts of Part-Time Labor in Public Transit*, Washington, DC: US Department of Transportation, Urban Mass Transportation Administration.

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driving experience, part-time drivers had lower accident rates than full-time drivers. And one particularly prophetic conclusion, “there is a tendency for transit agencies to hire the wrong people for part-time work; 75–85 percent of those hired actually wanted full-time work The quit rates of part-time drivers vary strongly with external economic conditions, moving inversely with the local unemployment rate.”³

With respect to cost savings, the essence of the Lave team’s findings is as follows. There are indeed potential operating cost savings to be gained from the use of PTOs. However, the magnitude of the potential savings varies across transit agencies. The primary influences on savings potential are the details of the existing operating environments (most prominently, the level of flexibility in the labor agreements) and the magnitude of the peak/base ratio, the number of buses in service at the peak divided by the number in day-base service.

The Lave team estimated two different kinds of cost savings from using part-time labor. First, they estimated the increase in schedule efficiency that occurs because of the reduction in premium pay that goes to operators for odd runs, which causes the ratio of pay-hours to platform-hours to decline. Second, the hourly cost of part-time operators is lower because they generally receive lower wage rates and fewer fringe benefits. Thus even where the part-timers made little difference in schedule efficiency, a transit agency might still reduce costs because a portion of its workforce was paid at a lower rate.

Apart from direct cost savings, a potential — and important — benefit of the use of PTOs was that it would allow transit agencies to provide services not possible with conventional full-time labor agreements. However, the research found that the degree to which these potential savings are realized also varies across agencies. The main factors influencing the level of “success” with PTOs are the ways in which PTOs were used, and the concessions that agencies made to labor in order to establish the right to hire PTOs.

At roughly the same time as the second Irvine study, two other relevant efforts were also underway. An evaluation was undertaken of the Massachusetts Bay Transportation Authority’s experience in increasing the PTO proportion of surface operators from zero to 19 percent over a 15-month period.⁴ In contrast to the Lave team’s results, the MBTA study did find higher rates of accidents and absenteeism among the PTOs than for full-time operators.

³See abstract in Lave, Charles A. (1986), “Absenteeism, Accidents, and Attrition: Part-Time versus Full-Time Bus Drivers,” *Transportation Research Record* 1078, pp. 62–71.

⁴Attanucci, John, Wilson, Nigel H. M., and Vozzolo, David (1984), “An Assessment of the Use of Part-time Operators at the Massachusetts Bay Transportation Authority,” *Transportation Research Record* 961, pp. 21–28.

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Littleton MacDorman undertook a synthesis of the use of part-time operators in the US industry, under the auspices of the National Cooperative Transit Research Program, published in 1986.⁵ One of MacDorman's recommendations was to increase the industry's use of computerized runcutting both in planning (examining the cost savings potential of work-rule changes) and in operations (realizing the maximum savings in practice). U.S.DOT's Federal Transit Administration (then UMTA) supported the testing in Los Angeles by ATE Management & Service Company of a computerized Canadian model for estimating labor costs, which proved to be significantly cheaper to deploy than the runcutting software that was most popular at the time.⁶

It is now almost two decades since this flurry of interest and activity in the mid-1980s. Over that time, actual experience with PTOs has resolved some of the key questions asked then, and given rise to some important new issues. It seems clear that the use of PTOs in the transit industry is here to stay. More and more agencies have adopted the practice, or are considering doing so. As Lave and MacDorman foresaw, the experience with (and outcomes of) using PTOs appears to have been mixed, varying markedly across transit properties. However, there has been no recent attempt to document this experience in a systematic way. No clear consensus or guidelines on the advisability and process of adopting PTOs has yet emerged. What kinds of operating environments and agencies would most benefit from the use of PTOs? Under what circumstances is it likely that using PTOs will be more expensive (in the near and long term) than it is worth? Is there a set of standards or guidelines that can be developed to facilitate "good practices"? There *are* lessons to be learned from analyzing more closely the experience accrued in the last decade, and this was the primary motivation for the current TCRP study.

After this brief exposition of the aims and rationale for this study in the context of previous analyses of PTOs in transit, the rest of this chapter has four parts. We next present a brief discussion of the methods and sources for this inquiry, augmented in the appendices. We then present a summary of our salient findings, followed by a summary exposition of our recommendations. At the end of the chapter there is a brief description of the structure of the rest of this report.

⁵MacDorman, Littleton C. (1986), *Use of Part-time Operators*, NCTRP Synthesis of Transit Practice 9, Washington DC: National Research Council, Transportation Research Board.

⁶ATE Management & Service Company, Inc. (1984), *Estimating the Cost of Work Rule Changes in Transit*, Washington DC: US Department of Transportation, Urban Mass Transportation Administration.

METHODS AND SOURCES

THE STUDY STRATEGY COMBINES BOTH QUANTITATIVE AND QUALITATIVE APPROACHES

We would have liked this study to result in strongly authoritative statements about part-time operators *in the US transit industry as a whole*. In that ideal world, we would have extensive, high-quality, uniform, detailed data about each mode operated by each transit system, which would permit sophisticated statistical analysis across transit systems and over time. We would be able to test a variety of hypotheses, and end up drawing strong conclusions about the outcomes that could be clearly linked to variations in part-time labor policies.

This was, of course, daydreaming. Notwithstanding the data riches of the *National Transit Database* (“Section 15 data”), there were significant gaps in the information needed to carry out a full analysis, across all transit systems, of all the different types of outcomes that might be ascribed to PTO practices.

Moreover, even were it feasible to undertake such a broadly conceived quantitative analysis of the industry’s experience, it is obvious that it would not have answered *all* of the questions we were interested in. Some of the impacts are inherently qualitative in nature, or if quantitative, unlikely to have been appraised in uniform ways across different systems. Much of what we sought were the answers to questions (asked of managers, board members, union representatives, and part-time employees) like “*How has this worked out for you?*” “*What could have been done better?*” “*Why did that happen?*” and so on.

For this reason, detailed individual case studies formed the backbone of our study. Each case study of the experience of a selected transit agency involved interviews with a variety of different local “actors” involved in, or affected by, the evolution of the PTO policies and practices there, along with the assembly and analysis of data for that agency.

The level of detail varied across the case studies but was such that the project funding levels allowed us to do no more than ten such studies. There were reasons also to make a *purposive* selection of cases, to reflect places that have an “interesting story to tell” or a particularly rich lode of data to mine. The key weakness of such a *purely* case study-oriented approach is that by itself, it provides no basis for drawing authoritative (as distinct from impressionistic and anecdotal) conclusions about US transit as a whole.

Consequently, in order to put into a more representative national perspective the findings from the individual case studies, we also conducted some quantitative analysis across a broader, more representative set of transit properties. Much of this effort was in the form of a limited survey conducted early in our study of 24 bus systems. In addition, we used two different sources of

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publicly available data to supplement the case study and survey data: the National Transit Database and various data published by the industry's trade association, the American Public Transit Association (APTA).

PUBLICLY AVAILABLE DATA SOURCES

Under the mandates of the Federal Transit Act, the Federal Transit Administration (FTA) compiles annual reports that provide detailed summaries of financial and operating data for the mass transit agencies in the United States. The most recent data tables available during the course of the study were for the FY1997 report year, which were released to the public in early 1999. These tables, formally known as the *Data Tables for the 1997 National Transit Database Report Year*, are a standard source of publicly available data for the US transit industry. A summary of the strengths and weaknesses of these data and details of the particular information we used are presented in Appendix A.

We also used two reports periodically produced by the American Public Transit Association: the *Top Hourly Wage Rate Summary* and the *Labor Practices Summary*. The *Top Hourly Wage Rate Summary* report is published quarterly and provides data on the top hourly wage rate of PTOs and full-time operators for a self-selected sample of agencies. It also has data on the high, low, and mean wage rates by region, the effective date of existing labor agreements, their expiration dates, and certain benefits (such as attendance incentives) offered to either full-time or part-time operators. However, the benefits information is only found in footnotes, making it difficult to compile.

The *Labor Practices Summary* contains information on (1) the number of part-time bus operators that work for a particular transit agency, (2) the maximum number of hours they are allowed to work, (3) the maximum percentage of a full-time operator's salary that a part-timer can attain, (4) the days and/or time of day part-time operators are allowed to work, and (5) the size of benefits such as retirement plans, health insurance, sick pay, and so forth. This summary was published annually between the late 1980s and 1993, at which time it was discontinued.

Both APTA reports are available in hard copy only. As a result, they are expensive data sources to use because painstaking transcription and data entry is required. In the interests of economy, we collected and analyzed the APTA data for a selection of 24 transit agencies deemed to be preliminary case study candidates.

SURVEY OF BUS OPERATORS

We supplemented the published sources with data from a survey of transit agencies undertaken in mid-1998. We surveyed a stratified random sample of US *bus* systems, chosen to be representative of bus transit as a whole. We selected the reported number of part-time operators as the most appropriate stratification criterion, and used the most recently available version of the

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National Transit Database file (at that time) to design and select a sample to replicate the industry PTO statistics most accurately for a given total sample size.

We mailed the paper-and-pencil survey to an issued sample of 77 agencies drawn from 33 states on the basis of the number of part-time operators on their rolls. Appendix B summarizes the sampling plan and the number of responses achieved. We received completed questionnaires from 31 of the 77 systems, including a high representation of systems in the stratum that included the 12 to 15 bus systems with the largest number of PTOs on their rolls in 1995. The sampling fractions were sharply lower in the strata representing progressively smaller systems.

A copy of the survey instrument and the cover letter accompanying it are also included in Appendix B. In summary, the survey asked three types of questions:

- *Questions about the agency's use of part-time operators.* This included questions on the incidence of part-timers, the benefits received by part-timers, work rules and labor provisions related to the use of PTOs, PTO-FTO (full-time operator) hiring policies, and the attrition rates of PTOs.
- *Questions about the agency's relationship with its FTOs.* There were questions on the attrition rates, work rules and labor contract provisions governing FTO assignments, and the level of FTO benefits.
- *Questions about peaking in the agency's schedule and costs incurred for bus operating time.*

The overall response rate for the survey (about 40 percent of the issued sample provided responses) is at about the level anticipated, based on results from previous surveys of transit properties.

THE DETAILED CASE STUDIES

Our goal was that across the case studies, the selected properties should provide variety in terms of agency scale, the more general labor relations environment, cost performance, and so on. Each case study needed to have an interesting story to tell relative to the range of factors likely to influence the “success” or “failure” of PTO initiatives. It was futile with a small number of cases to seek representation, because there is no way that the cases could capture the whole range of US transit experience with part-time operators. On the other hand, while we looked for *exemplary* situations, we avoided cases that appeared to be unique, unless there were strong countervailing reasons to include them on other criteria.⁷

As well as selecting cases because of features of their current or peak PTO experience that represented exemplary situations, other pragmatic considerations like tractability and cost of

⁷In other words, we were seeking candidates for detailed case study using a “replication logic,” rather than a “sampling logic.” See Yin, Robert K. (1994), *Case Study Research: Design and Methods*, Thousand Oaks CA: Sage Publications.

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pursuing the case were important. “Tractability” includes aspects such as the quality of the relevant data and/or institutional records (or memory), the interest of the agency’s management and labor in cooperating, the existing established relationships with members of the study team, and so on.

Among the exemplary situations with an established base of relevant historical information and analysis, the five agencies studied by the UC Irvine team in their 1980s work were at the top of the list: *Seattle Metro* (now King County Transit), *Central Contra Costa Transit Authority*, *Detroit SEMTA* (now SMART), the *Orange County Transit District*, and *Portland Tri-Met*. Two of the members of our study team (Charles Lave, the co-principal investigator, and Genevieve Giuliano) were members of the earlier studies, and were very familiar with the agencies, their structure, personnel, and data. Boston’s MBTA had also been investigated in an independent evaluation of its early experience in employing PTOs, and was also a strong candidate for inclusion on this criterion.

What structural features constitute having an “interesting story” to tell? In brainstorming together, networking, reviewing the literature, examining the data from the small random sample of properties, and consulting the TCRP project panel members, the study team looked for promising examples of the following types of situations:

- *Agencies with a record of success in hiring and using PTOs.* King County Transit in Seattle was of interest because it was thought to be the largest employer of PTOs in the country. Seattle has a long tradition of hiring and using PTOs, and was one of the first agencies to do so.
- *Agencies with ownership and governance structures that affect the markets for PTOs.* The Denver RTD was judged to be particularly interesting because of the existence of two different governance structures in parallel: a unionized workforce operating directly under the RTD, and non-unionized workforces operating under legislatively mandated private operators providing contract services to the RTD.
- *PTO to FTO transitions.* We looked for agencies that have particularly interesting *rules* relating to part-time to full-time status transitions, or agencies that have had particularly interesting *experiences* relating to part-time to full-time status transitions. As the study progressed, we found this to be an important factor determining the availability of PTOs to fill positions. The Valley Transit Authority (in the San Francisco–San José metropolitan region), the Greater Bridgeport Transit Authority, and the Cleveland RTA were all picked at least partially for their innovations in this respect.

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- *Agencies using PTOs in innovative ways.* Two agencies, the Cleveland RTA and the GBTA in Bridgeport, were interesting because they were using PTOs in unusually innovative ways.

Based on such criteria, we conducted case studies of varying levels of intensity at the following eight transit agencies:

1. Boston MBTA in Boston, Massachusetts
2. Portland Tri-Met in Portland, Oregon
3. King County Metro Transit in Seattle, Washington
4. Orange County Transit Authority in Orange County, California
5. Santa Clara Valley Transportation Authority, San José, California
6. Denver Rapid Transit District, Denver, Colorado
7. Cleveland Regional Transit Administration, Cleveland, Ohio
8. Greater Bridgeport Transit Authority, Bridgeport, Connecticut

While our initial thinking had been to structure all of the case studies to include a core of essentially identical questions addressed in uniform ways, we subsequently decided that it would be more efficient to focus our study at some sites in a more narrowly focussed manner. Indeed by the time of our mid-project meeting with the TCRP project panel, the study team had decided that spending the same amount of time duplicating all of our efforts at each agency was not the best use of the project's resources. At the meeting, the panel and the study team identified the agencies as candidates for either a full-blown case study or a smaller, more focused "mini-study." Orange County, Boston's MBTA, and Portland's Tri-Met were identified as possible initial candidates for such mini-case studies.

We did, indeed, focus our efforts at these agencies towards well-defined narrow ends. From Portland and Boston, we obtained data to quantify cost savings from the use of PTOs. At Orange County we concentrated on the effect of changes in FTO work rule provisions on the efficacy and need for PTOs.

Moreover, even at the sites where we conducted more comprehensive studies, we took advantage of the special opportunities presented at each case study site. For example, Denver was of particular interest because of the existence of a parallel market for RTD operators in the form of services stationed and operated by legislatively mandated private contractors.

The bulk of the research was carried out using mostly face-to-face interviews with transit officials, local union representatives, and some part-time operators. More details of the methods used to conduct the case studies are presented in Appendix A.

OVERVIEW OF TRENDS IN PART-TIME OPERATORS IN TRANSIT

RIISING LABOR COSTS AND THE EMERGENCE OF THE “DEDICATED” PART-TIMER — THE CONTEXT WITHIN WHICH PART-TIME OPERATORS WERE INTRODUCED IN TRANSIT

In the transit industry in the late seventies, full-time operators were paid relatively well, usually better than non-union workers in comparable jobs – perhaps a reflection of government support for the industry, as well as strong unions. For example, during the period of high inflation between 1967 and 1976, when most blue collar wages were barely keeping up with inflation, the wages and benefits of full-time transit operators increased 41 percent faster than the inflation rate (Chomitz and Lave 1981, p. 10).

At the same time, transit agencies were being asked to increase service and decrease fares to make transit affordable to the poor. The result was an enormous increase in deficits. As a consequence, transit agencies were looking for ways to reduce costs. The search was especially strong at those agencies where costs were pushed up even more by high peak/base ratios. It was no accident then that it would be Seattle Metro, with a peak/base ratio of nearly 3:1, that would pioneer the use of part-time labor in 1977–78.

Moreover, the transit industry’s needs for part-timers seemed to fit well with contemporaneous trends in the labor market, most notably the emergence of a class of so-called *dedicated part-timers*: people looking to supplement their primary income with a part-time job, others who had complicated personal lives to balance and wanted only a part-time job, as well as students who wanted part-time work. Indeed, the Labor Department’s estimates reported in the 1997 monthly review of labor trends suggest that as many as 82 percent of the people who reported “usually working part-time” were doing so out of personal preference.⁸ The fire fighters and school teachers looking for secondary sources of income, and the students and homemakers looking solely for part-time work, drove much of the public debate about the desirability and availability of part-timers. All told, part-time labor seemed at the time like a good way to cut costs while matching peak time bus-driving jobs to people looking for part-time jobs — at second jobs or in part-time careers.

⁸ See Hedges, Janice, and Gallogly, Stephen (1977), “Full and Part-Time: A Review of Definitions,” *Monthly Labor Review* 100, no. 3, pp. 21–28, for a discussion of using 35 hours as the cut-off between full- and part-time. Only 1.5 percent of workers reported that less than 35 hours was considered full-time work on their jobs. Furthermore, Hedges and Gallogly indicate that the characteristics of jobs with 30 to 34 hours per week were more similar to jobs with 25 to 29 hours than to jobs with 35 to 39 hours. Nardone, Thomas (1995), “Part-Time Employment: Reasons, Demographics, and Trends,” *Journal of Labor Research* 16, no. 3, pp. 275–92, finds that there has been no trend in the percentage of workers reporting 30 to 34 hours of work since the 1970s.

In summary, when first introduced, the use of part-timers held the promise for being a win-win solution, addressing operators' concerns about long work hours, as well as management's concerns about rising labor costs. One of the goals of this study has been to analyze the extent to which the promise of the dedicated part-timer was realized. To that end, we spent considerable effort in this study to find agencies that are trying to hire such dedicated PTOs, i.e. hiring PTOs who really wanted to work part-time. Unfortunately, as the summary in the next few sections will detail, we were largely disappointed in this quest — both Seattle Metro and Santa Clara Valley Transit have recently initiated such attempts, but it is still too early to evaluate them.

COST SAVINGS BUT NO DEDICATED PART-TIMERS — THE TRANSIT EXPERIENCE WITH PART-TIMERS

Transit agencies often gained the right to use PTOs in the face of stiff union opposition. The number of agencies employing PTOs has risen steadily since the 1970s. Table 1 shows the extent to which the largest transit agencies in the United States (those agencies with more than 500 full-time employees) use PTOs in their operations. The table shows that 55 of the 67 transit agencies that reported having more than 500 full-time employees also reported using PTOs in 1997. A comparison of the ratio of part-timers to full-timers for 1997 (shown in Table 1) with similar figures for 1984 (as calculated by MacDorman⁹) suggests that on average there has been a moderate increase in the use of part-timers among the largest US transit agencies: part-timers now constitute about 11.9 percent of the operators in the 55 large agencies that use part-timers, compared to 8.9 percent in 1984.

⁹MacDorman 1986, p. 5.

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Table 1. Use of Part-Time Operators in Large US Transit Systems (More than 500 Full-Time Employees). FY 1997

	Number of Agencies	PTOs as Percentage of FTOs: Average across All Agencies in 1997
Agencies that reported using part-timers	55	11.9%
Agencies that reported not using part-timers	12	0%

Note: Part-time and full-time operator counts have been obtained from counts of “vehicle operations” personnel reported in the NTD. It is possible that the NTD data include some employees that are not operators, but rather employees in categories such as system security and fare collection. This issue is explained in more detail in Appendix A.

Sources: Study team analysis; 1997 National Transit Database data.

In other words, most interested agencies have eventually won the right to use PTOs, though with constraints on how they may be used. The most common restrictions are a maximum time for each operator of 30 hours per week, only tripper (short assignments, usually 2–4 hours along) and peak period use, and no weekend use. A detailed summary of typical PTO contract provisions is presented in Table 13.

Reinforcing the results of previous studies, our own analysis found evidence that the use of part-timers does generate operational cost savings. We estimate cost savings in the range between 1 percent and 10 percent of total operational costs. These savings vary with the peak/base ratio at the agency, the labor environment at the agency, and the size of the PTO workforce. Calculations at specific agencies suggest that the agencies we studied — Orange County, Portland Tri-Met, Boston MBTA, Seattle Metro, and the GBTA at Bridgeport — were saving between 1.5 and 8 percent of total operational costs.

However, we also found that the lower costs have been achieved at the expense of labor morale. The potential for matching dedicated PTOs with PTO jobs has not been achieved. Our findings suggest that most agencies start *all* new operators as PTOs, even those seeking full-time work. Consequently, operators looking for full-time jobs are *required* to serve as part-timers for a period that ranges from three months to two years, depending on the agency and on the state of the economy, before obtaining full-time status. In other words, *agencies often force people who really want a full-time position to fill most of the part-time positions.*

PTO work is significantly less desirable than work as a full-time operator for someone who really wants a full-time job. The pay and fringe benefits for PTOs are lower than those for FTOs are, and the PTO work schedules are considerably worse. PTOs are usually limited to 30 hours of work per week, on weekday tripper runs. Further, most PTO contracts impose a limit on the number of PTOs that can be hired. To maximize financial savings from the use of PTOs, management may make

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PTOs work two trippers a day, one in the morning and one in the afternoon. Since there are no work-rule protections for PTOs, part-timers are, in effect, required to work split shifts without any compensating split-shift premium.

Potential recruits view part-time work as “paying their dues”: an unpleasant but necessary period that needs to be spent in order to get in the door to an ultimately desirable FTO position.

From its very inception, labor has disliked the part-time requirement. We found the stated position of the unions to be that the use of PTO positions exploits labor by using a dual scale for the same job. There are other possible reasons for unions to oppose PTOs:

- PTO implementation would reduce the number of FTO — “gravy runs” — those that earned high amounts of premium pay.
- PTOs could also be considered a potential threat to the number of FTO positions.

Labor has continually opposed part-time arrangements and has fought to get part-time wages and benefits on the full-time scale. Our survey indicates that labor has been largely successful in equalizing pay and fringes for PTOs, sometimes through negotiation and sometimes through arbitrators who approved the “*same job same wage scales, proportional benefits*” argument. We note that the interests of FTOs are also served by higher PTO wages: any reduction in the cost savings from PTOs will reduce management’s incentives to use PTOs.

THE COSTS TO TRANSIT MANAGEMENT OF USING PTOs

Our study indicates that when used as they are presently used, PTOs generate cost savings relative to full-time operators. However, we also found that operator hiring and use practices at agencies are imposing significant, tangible costs on transit agencies at present. The PTO position, as currently structured and defined, is a cause of low morale among both PTOs and FTOs. In addition, it causes labor recruitment problems (in a tight job market it is harder to get operators to accept the mandatory PTO stint), and the resultant operator shortage is costing transit agencies substantially in terms of overtime payments, and in some cases missed runs.

We also found that in most circumstances, the indicators transit management has used to measure the costs of PTOs relative to FTOs — accident rates, absenteeism rates, and attrition rates — are inappropriate. Fundamentally, comparing full-time and part-time absentee, accident, or attrition rates informs us of the relative quality of the part-time versus the full-timer *only* when it is possible to compare samples of the two *different kinds of operators* with the *same level of experience*. However, when all of the part-timers are essentially future full-timers, and all the full-timers started as part-timers, comparing the performance of full-timers and part-timers at the same agency is essentially a comparison of the *same kinds of operators* with *different levels of experience*.

The results of such tests are both predictable and meaningless. For example, previous studies (including the previous Lave study) have shown that accident rates decline during the first few years of driving experience. Given that the FTOs will have gone through the experience of PTO work, one cannot use this data to compare the effect of full-time or part-time work on accident rates. FTOs will have lower accident rates because they have more experience. (Furthermore, the really bad PTO drivers will not have been promoted.)

Attrition rates present a similar problem. We expect attrition to be higher during the first part of a driving career as the recruits learn that the job either does or does not suit them. Given that FTOs are ex-PTOs, they will have lower attrition rates because they have more experience.

Absentee rates present a problem in the reverse direction. Given that most PTOs really want FTO work, and given that management may not automatically advance all of them, PTOs will be under real pressure to be on their best behavior, and hence will have a lower absentee rate. This effect will be reinforced by the fact that the PTOs actually want a full-time income but are earning less than that, and hence their need for extra income will also reduce absenteeism.

THE CURRENT CONTEXT: AN INDUSTRY-WIDE OPERATOR SHORTAGE

The predominant issue in the industry over the two-year course of our study has been the industrywide shortage of operators. Most of the transit agencies we talked with were short of drivers and were finding it difficult to recruit operators (though there were some exceptions). Agencies such as Seattle and Denver, which require that operators serve a PTO stint, were having a particularly hard time: many interested recruits already had full-time jobs and were put off by the PTO apprenticeship requirement.

When we asked agencies why they were having trouble hiring operators, most of them blame the tight labor market. And their assumption, sometimes explicitly stated, is that when unemployment returns to “normal” levels, so will the attractiveness of operator jobs. But by treating the problem as temporary, they are generally ignoring structural features of their hiring practices that reduce the attractiveness of both full-time and part-time jobs for potential recruits.

In the short term, some agencies seem to be dealing with this shortage of operators using (often mandatory) overtime, an expensive operational solution. In addition, our research indicates that agencies are trying to increase recruiting by relaxing some of their recruiting guidelines: Seattle lowered the eligible age to 18, and other agencies are considering relaxing some of their driving record requirements.

Our evidence suggests that the *mandatory part-time* requirement may well be part of the reason for the shortage of operators. Specifically, the requirement of a part-time stint at partial benefits and long work spreads discourages applicants for full-time jobs. Similarly, potential applicants for the part-time positions (dedicated part-timers) are discouraged by structural features such as

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long work spreads that make it difficult to hold a second job. This problem is further accentuated because part-timers are unable to specify their work hours in many cases.

Our case studies indicate that a few agencies have recognized and attempted to solve these structural problems. We found that many of the transit managers we talked to appreciated that the PTO requirement causes problems. First, they understand that the mandatory PTO stint causes morale problems and is detrimental to labor-management relations. Second, they believe it reduces the quality of the labor pool available to transit — the best potential operators will have more opportunities and will take jobs in other industries;¹⁰ only those who lack alternatives will be willing to put up with the PTO-service requirement. And finally, in tight labor markets, the required PTO stint makes for shortages of both PTOs and FTOs.

Consequently, some agencies are trying to attract and hire dedicated PTOs for PTO positions by undertaking some amount of structural reform. However, it is our understanding that two of these agencies (Denver and Cleveland) have had only limited success with this policy. A third agency (Seattle) is still in the first year of what looks like a promising experiment. Our analysis suggests that agencies will need to do more than they have previously done in order to attract and retain dedicated PTOs.

RECOMMENDATIONS

There are two questions that this study seeks to address. First, should agencies not currently using part-timers consider using them? Second, what are the best practices for agencies that already have the capability to hire and use part-timers?

The evidence of cost savings associated with the use of part-timers clearly suggests that there is the potential for gains to transit management from using part-timers. On the flip side, our study also finds that as currently structured in most agencies, the PTO position at best forces potential full-timers to serve a stint at an unpleasant job that they don't like, and at worst, becomes a serious impediment to hiring *any* operators in a booming economy.

Some transit agencies believe their recruiting programs will be cured once the economy returns to its usual level of unemployment. But our analysis of long-term trends suggests that there are two reasons to expect otherwise. First, transit wages no longer have a commanding premium above those of other blue-collar jobs, so potential operators will not be willing to put up with as much of a difficult apprenticeship in order to get to such jobs. Second, the change in women's work patterns now places much greater emphasis on the need for jobs with stable, dependable

¹⁰Note again the data showing that operator quit rates go up in tight job markets and down when unemployment rises (Lave, 1986). That is, alternative opportunities play a large part in the operators' willingness to work in transit jobs.

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work hours, and hence operators have less ability to deal with the inter-shakeup schedule changes that are now common in PTO assignments.

But in any event, the mandatory PTO apprenticeship tends to repel the best workers. Many transit managers are now thinking very seriously about two changes:

- Hiring FTOs “off the street” directly into FTO jobs; and/or
- Structuring part-time jobs to attract dedicated part-timers.

In the course of the study we found many innovative practices and experiments currently underway to implement these changes. Our recommendations will focus on these innovative practices. While we will present evidence indicating that there are workers who want dedicated PTO jobs with stable convenient work schedules, it is clear that creating such jobs will require significant will and effort from transit agencies. We will focus our recommendations on providing guidance for such an effort. More specifically, we will explore what transit agencies can do to design PTO positions that both generate cost savings and are able to attract dedicated part-timers who want the positions. We believe there is a role for dedicated part-timers in transit. Moreover, were the transit industry able to design the PTO job in such a way that dedicated part-timers could be hired and retained, we expect it would be mutually beneficial to management and organized labor.

THE STRUCTURE OF THIS REPORT

The next chapter offers estimates of the operational cost savings associated with the use of PTOs. Chapter 3 presents the results of our case studies, showing how the PTO solution is structured at the sites we have chosen and how well the arrangements have performed. We suggest reasons why agencies are having a hard time hiring and retaining dedicated PTOs.

Chapter 4 focuses on the people who do PTO work. Specifically, it presents the results of detailed interviews with transit operators about how their childcare needs are met within changing operator work schedules.

Chapter 5 presents our recommendations regarding the effectiveness, costs, and best guidelines for the use of PTOs in transit.

Chapter 2. The Potential for Cost Savings

INTRODUCTION

The *raison d'être* for the use of part-time operators in the transit industry has always been their potential for generating operational cost savings. In this chapter we present two distinct kinds of estimates of these savings: the results of detailed micro case studies at individual transit agencies, and the results of regression analyses on the 255 transit agencies in the National Transit Database. Since the micro case studies are based on theoretical runcuts, rather than actual before/after data, the case studies can be viewed as estimates of the *potential* cost savings. Since the regression analyses are based on comparisons of costs across agencies, they are in a sense the *actual* outcome of using part-time labor.

There are three ways in which transit managers have expected the use of part-timers to provide savings. By comparison with full-time operators, the part-timers have been expected to have lower wage structures, lower fringe benefits, and more flexible work rules. We present our findings about work rules for full-timers and part-timers, as well as the evidence on wage and benefit structures.

In the course of the study we have been able to analyze three independent kinds of data that together build a rich picture of the extent to which the use of part-timers actually generates savings for transit agencies. The most authoritative way to estimate the savings associated with the use of part-timers is to cut operator runs with and without the use of part-timers, to show the differential cost implications and to explore how they might be sensitive to work-rule and wage structure changes. We were able to analyze such experimental runcuts for three transit agencies: Orange County, Portland, and Seattle.

We complement these analyses with estimates of cost savings generated at the Boston MBTA, the Denver RTD, and the GBTA at Bridgeport. In some cases these estimates have been developed internally by management at the systems themselves. Though the estimates were not generated using the rigor associated with experimental runcuts, they do help place the results of the experimental runcuts within the context of savings in other specific operating environments.

Even so, one of the inherent limitations of the case study approach remains that cost savings depend on many factors that vary across transit agencies, and over time even in one transit agency. These include such supply-side factors as the work-rule flexibility in the agency's contract with its union, as well as demand-side factors such as the peak/base ratio for the service provided by the transit agency.

Any choice of a small number of case studies therefore risks painting an atypical picture of the national situation. Our third empirical approach, therefore, has been to carry out an aggregate

analysis using a nationwide sample of properties, to put the individual estimates of savings obtained in particular operating environments into a more general perspective.

THE RATIONALE FOR PART-TIMERS

FACTORS THAT INFLUENCE THE USE OF PART-TIME OPERATORS

As MacDorman states in his synthesis report:¹¹

Part-time operators provide an opportunity for cost savings and productivity improvement in transit systems because of the combined effect of transit service schedule characteristics, labor agreement provisions, and work rules on the assignment of work to vehicle operators.

MacDorman provides a very useful discussion of the factors influencing the use of part-time operators, and we will not duplicate that detailed description here. However, it is useful to recapitulate briefly the combination of demand- and supply-side factors that appear to make it productive to use part-time operators.

On the demand side, the transit service schedule is characterized by the *peaking* characteristic; there is usually more demand (and thus more service) for transit during the morning and afternoon “rush hours” than at other times of the day. These two peaks in demand are usually spread (unevenly) across a period of approximately 13 hours between 6:00 AM and 7:00 PM. Consequently, it isn’t possible for a single operator on a continuous 8-hour shift (a “straight run”) to operate a vehicle for the whole of both the morning and evening peaks. However, it may be possible for a single operator to provide this service either if the 8-hour shift is split into two segments, four hours each during the morning and evening peak with a break in between (a “split run”), or if the shift is extended for more than 8 hours.

Such a work schedule is not attractive to many employees, however, and as a result of collective bargaining, most labor agreements in the transit industry restrict or give extra compensation to operators for these schedules. In this operating environment, transit properties should be able to attain significant savings by using part-time operators to cover peak service.

Part-time operators offer three sources of productivity improvements, all in the form of cost savings:

- PTOs permit transit agencies to reduce the amount of premium and guaranteed pay entailed by a service schedule staffed entirely by FTOs;
- PTO wages are generally lower; and
- PTOs generally have lower fringe benefits than FTOs.

¹¹MacDorman 1986, p. 7.

WORK RULES AND LABOR AGREEMENT PROVISIONS

PTOs are most useful in agencies where rigid work rules or unfavorable labor agreements make it very costly to operate peak period schedules. How common are such situations?

Unfortunately, there is no easily available source of public data that reports details of FTO work rules and compensation practices. Both in our case studies and in our survey of transit agencies, we asked the agencies detailed questions about their compensation practices for full-time operators. In this context we should note that any discussion of industry practices regarding compensation is hindered by the absence of industrywide standards or common practices. In fact, both the language and the content of work-rule policies and labor-agreement provisions regarding FTO compensation vary considerably across agencies and specific labor agreements.

This is not to say, however, that there are no guides to industry practice. Indeed, MacDorman identifies a series of common *types* of labor-agreement provisions and work rules. Also, some common types of provisions are stated and defined in a form filled out by all transit agencies with over 100 revenue vehicles per mode, as part of federal reporting requirements.¹² In our survey we used definitions of work rules and compensation practices compatible with these two sources.

Each agency's answers to these questions were qualitative and complex, with language varying according to the specific provisions of the agency's labor agreement. Consequently, these data are difficult to summarize and impossible to aggregate. Nonetheless, Table 2 summarizes the *main themes* emerging from the survey responses.

¹²*National Transit Database*, Form 321: Operators' Wages.

CHAPTER 2. THE POTENTIAL FOR COST SAVINGS

Table 2. Common Work Rule and Labor Agreement Provisions Governing Full-Time Operator Wages

Guaranteed pay (daily/weekly) — Daily or weekly hours for which FTOs are guaranteed wages.

- Guarantees are standard. Virtually all (except two) of the agencies responding to our survey guarantee FTO wages. We also found this to be true at all of our case study sites.
- Two forms of guarantees are prevalent: 8 hours per day or 40 hours per week.

Overtime cutoff (scheduled and unscheduled) — Number of hours after which FTO is entitled to additional wages.

- With few exceptions, most agencies list an overtime cutoff of 8 hours per day.
- 40-hour standard for premium pay defined by statute (FLSA).

Split-run restrictions — Two or more pieces of work with non-operating time between.

- Contractually stipulated average split-run maximum spread of 13.0 hours.
- Smaller agencies do not face maximum length restrictions as often as larger systems do.
- FTOs on average guaranteed straight runs (i.e., no non-operating time in between) on 73% of total assignments.

Spread premium cutoff — Number of hours after which FTOs receive premium pay on a split run.

- Of 24 agencies answering our survey, 22 report at least one cutoff for spread premiums.
- In some cases spread premiums exist as a step function, with wage premiums augmented at the second spread premium cutoff (e.g., premium of 50% regular pay given at 11 hours, which rises to premium of 100% regular pay at 13 hours).

Intervening pay allowance and pyramiding premiums — Intervening pay: Wages paid during non-operating period of split runs. Pyramiding premiums: Ability to receive both overtime and spread premiums for the same run.

- Low response rate; when intervening pay exists it tends to be for short periods (such as 1/2 hour) or in special circumstances (pullout time from foreign division).
 - The data from our survey suggest that 69% of full-time operators in 48% of the agencies are eligible to collect pyramiding premiums.
 - Agency size does not appear to influence pyramiding.
-

Source: Study team survey responses, 1998; case studies conducted by TCRP team, 1998–2000.

THE ROLE OF PAY/PLATFORM RATIOS

Suppose we wish to predict whether a given transit agency would get significant savings from using part-time labor. Are there any simple, quick indicators that might help with such a prediction? One such indicator might be the peak/base ratio. A schedule where the peak/base ratio shows three times as many buses in the peak as there are in the base service can be very expensive to operate with full-time operators. The runcut for such a peaky schedule will have many short pieces of work during the peak hours. Combining the pieces for a full-time operator cannot be done efficiently: operators must receive extra hours of pay to compensate for working long spreads, or to bring them up to eight pay-hours if their runs are too short. The result is that hours of pay can be considerably greater than hours of work.

Another possible indicator to predict potential PTO savings is the strictness of the work rules. For example, a requirement that no split shift can have a total width greater than 11 hours will make it very expensive to serve peak hour demand because one driver cannot cover both daily peaks.

But neither of these possible indicators, peak/base ratios or strict work rules, is a sufficient predictor of the amount of money that can be saved by using PTOs. A transit agency with a high peak/base ratio might have flexible work rules so that it can cover its schedule quite efficiently. Or a transit agency with strict work rules might still have efficient runcuts simply because its daily peaks are quite flat or quite close together.

The best single indicator of potential savings from PTOs is the pay/platform ratio: total hours of operator pay divided by total hours of actual platform (driving) time. If an agency has, say, a pay/platform ratio of 1.08 (hours of pay are only 8 percent greater than hours of driving), we know that either the service schedule or the work rules is easy, maybe both. And we know that adding part-time drivers to such a transit agency cannot do much to increase the schedule efficiency. (Though PTOs might decrease dollar costs if their pay and fringe benefits are low compared to FTOs.)

What makes the pay/platform ratio especially interesting is that it *combines* the impacts of demand-side peaking effects and supply-side labor work rules. That is, if a transit agency's labor agreement provides flexibility in the assignment of various work pieces, the system may have a low pay/platform ratio even if its schedule is characterized by high peaking ratios. The pay/platform ratio, however, will also be highly influenced by management's ability to schedule and manage the operator work force optimally, according to existing labor management provisions.¹³

¹³The multivariate analysis of costs for a national sample of properties presented later in this chapter explores the role of pay/platform ratios in greater depth.

THE ROLE OF WAGE RATES AND FRINGE BENEFITS

In the late 1970s and early 1980s, much of the potential associated with the use of part-timers was related to *lower wage rates* for part-time operators than for full-time operators. PTO wage rates were lower because of both lower *top hourly* wage rates for PTOs and slower rates of wage progression. Furthermore, in a wage structure that typically rewards longevity, PTOs usually had less *experience* (and thus, less seniority and less pay) than FTOs.

Using APTA survey data in his 1986 report, MacDorman found that approximately 25 percent of responding agencies had lower wage rates for PTOs than FTOs. As stated previously, APTA data are expensive to compile. For current purposes, Table 3 presents historic and 1997 wage rates for a *selection* of 24 agencies. This selection focuses on a preliminary list of case study candidates identified relatively early in our study. It excludes some properties later chosen as case studies, and includes others that were later not selected for detailed examination.

The table presents historic data for the *top hourly wage rate* for bus operators. It shows that 11 of the 24 agencies maintained two-tiered wage rates at some time between 1982 and 1997. The PTO top hourly wage rate ranged from 50 percent to over 90 percent of the FTO rate in these cases. Eight of the agencies in the sample — Dallas DART, Chicago CTA, Albany, Austin, Milwaukee, MTA–Long Island, Denver, and Phoenix — maintained wage differentials in September 1997. The differentials ranged from just 2 percent in the case of Dallas to 49 percent for the MTA–Long Island bus system and 35 percent for Chicago CTA. Even so, a majority of the wage differentials were relatively stable over time.

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Table 3. Wage Differentials between FTOs and PTOs

Part-Time and Full-Time Wage Rates Always the Same (Observation dates: Nov-82, Nov-85, Oct-88, Sep-97)		
Orange County, CA	San Diego	Cleveland
Portland, OR	Delaware Transit	Indianapolis
Seattle	New Jersey Transit	Louisville
Detroit – SEMTA/SMART	Madison, WI	Montgomery Co., MD
Minneapolis–St. Paul		
Part-Time Wage Rates Converge toward Full-Time Rates		
Boston	Dallas	Cincinnati
Denver		Kansas City
Part-Time Wage Rates Diverge from Full-Time Rates		
Chicago – CTA	Albany	Austin
Part-Time Wage Rates Maintain Constant Proportion		
Milwaukee	MTA – Long Island	Phoenix

Source: Study team extract from APTA, *Top Hourly Rate Summaries*, 1982–97.

Fringe Benefits

MacDorman suggested that differences in fringe benefits — sick leave, holiday pay, vacation, health insurance, and retirement — were an important source of the cost savings associated with part-time labor. Moreover, comparing 1983 and 1984 APTA data he found that “the proportion of transit systems in each category (of benefits) providing no benefits (to PTOs) is decreasing while the proportion providing reduced benefits or benefits comparable to FTOs is increasing.”

MacDorman’s assessment of the fringe benefit situation in 1984 was based on the responses of 112 agencies to an APTA labor practices summary. While we know of no source of current equivalent data, Table 4 summarizes analysis of complementary data from our own survey. We asked questions about the availability of fringe benefits to PTOs relative to FTOs for FY96. The weighted results from these data, which represent the entire US PTO population, allow us to comment on the benefits received by PTOs across the nation at present. Table 4A suggests that in most categories — holiday pay, vacation, health insurance, and retirement — over half of the PTO population receives at least some level of benefits. When *agency* percentages are used instead of *operator* percentages (Table 4B), the results do not change very much, although the “no benefit” percentages increase, which indicates that PTOs at agencies employing more PTOs tend to receive a higher level of benefits.

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Table 4A. Part-Time Operator Benefits — Percentage of Operators

Benefit	1996 PTO Benefits Compared to FTO (per hours worked)		
	Same	Lower	None
Sick leave	36%	6%	58%
Holiday pay	15%	46%	39%
Vacation	38%	21%	41%
Health insurance	8%	68%	23%
Retirement	32%	20%	47%

Source: Study team analysis of 1998 survey responses.

Table 4B. Part-Time Operator Benefits — Percentage of Agencies

Benefit	1996 PTO Benefits Compared to FTO (per hours worked)		
	Same	Lower	None
Sick leave	15%	8%	77%
Holiday pay	15%	35%	50%
Vacation	19%	23%	58%
Health insurance	13%	33%	54%
Retirement	25%	17%	58%

Source: Study team analysis of 1998 survey responses.

ESTIMATES OF COST SAVINGS

EXPERIMENTAL RUNCUTS

Experimental Runcuts at Portland Tri-Met

Tri-Met is a relatively large transit agency in a medium-sized city. It was one of the early adopters of part-time labor. Through the generosity of their schedulers, we were able to obtain some experimental runcuts based on the service schedule at one of their garages.

Table 5 summarizes the basic results. Each column is a separate runcut, but all three runcuts deliver an identical amount of service, 1925 platform hours. The three runcuts assume different PTO quotas: PTOs as a percentage of total operators range from 10.3 percent to 29.8 percent. The first three rows show the number of PTOs and FTOs that are used for each runcut and the ratio of PTO runs to total runs. The next four rows show the number of pay hours and platform hours for each kind of labor. Then the table shows the pay and platform hours for the labor force as a whole together with the ratio of the two. Runcut 1 has a relatively efficient pay/platform ratio of 1.093.

Table 5. Experimental Runcuts at Portland Tri-Met

	Runcut 1	Runcut 2	Runcut 3
Number of PTO runs	24	34	73
Number of FTO runs	208	203	172
PTO runs / total runs	10.3%	14.3%	29.8%
PTO pay hours	131	186	416
PTO platform hours	128	179	393
FTO pay hours	1,973	1,911	1,671
FTO platform hours	1,797	1,746	1,532
Total pay hours	2,104	2,097	2,087
Total platform hours	1,925	1,925	1,925
Pay / platform ratio	1.093	1.089	1.084
Total runcut cost / day: pay + fringes	\$55,882	\$55,340	\$53,240
Change between runcuts	1 to 2		1 to 2
Change in pay / platform ratio	-0.33%		-0.48%
Change in total cost / day	-0.97%		-3.79%

Source: Study team analysis, 2000.

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The next row shows the total labor cost per day of each runcut. This takes into account not only the different number of hours paid to PTOs and FTOs but, more important, the difference in cost per hour of the two kinds of labor. Given the contractual provisions for pay and benefits at this agency, and given the average seniority level of the operators, the average FTO costs the transit agency \$27.04 per platform hour, and the average PTO costs the agency \$19.38 per hour.¹⁴ These pay numbers are used to calculate the total labor cost of each runcut, for example, \$55,882 per day for Runcut 1.

One of the striking things about the table is that big changes in the percentage of PTO runs do not produce a big reduction in pay hours. Between Runcut 1 and Runcut 3, the share of PTO runs goes from 10.3 percent to 29.8 percent, but total pay hours only go down from 2,104 to 2,087. This also shows up in the very small change in pay/platform ratios. That is, the change in schedule efficiency is very small. The runcutter said he could have done Runcuts 2 and 3 in such a way as to produce a somewhat bigger change in pay hours, and hence a somewhat bigger drop in the pay/platform ratio. But his goal is to minimize total labor cost, not total pay hours, and given the low cost of PTOs compared to FTOs, it is optimal to have a runcut with a lot of PTO hours. The best runcut is the one that comes closest to using up the full quota of PTOs that are allowed by the labor contract, even if the extra PTOs are not making much difference in schedule efficiency. Looked at another way, even if the schedule were perfectly flat and there were no premium hours being paid to FTOs, the agency can still save money by using as many PTOs as are allowable.

The last two rows in the table show the relative effects of increased schedule efficiency and decreased average pay. Consider what happens between Runcut 2 and Runcut 3. The proportion of PTO runs more than doubles, from 14.3 percent to 29.8 percent, but the pay/platform ratio falls by only 0.48 percent. On the other hand, the increased proportion of PTOs saves enough in wages and fringes to lower operating cost by 3.79 percent.

There is a more general point here. For transit agencies whose pay/platform ratio is relatively low now, the major determinant of PTO cost savings will be the differential in wages and fringes between PTOs and FTOs. Two agencies that start out at the same pay/platform and add 10 percent PTOs can get quite different results depending on the pay and fringe provision in the contract.

Experimental Runcuts at Orange County

The Orange County Transportation Authority runs a relatively large transit agency serving a suburban area of about two million people. It has used part-time labor for twenty years, but the

¹⁴At this transit agency, fringe benefits for PTOs are proportional (on an hourly basis) to those received by FTOs. Health benefits are the one exception. FTOs receive medical/dental coverage for themselves and their families; PTOs receive medical/dental coverage only for themselves.

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proportion of PTOs has fluctuated considerably depending upon the budget situation. When operating funds have been cut, the agency has been forced to reduce hours of service and, since the contract protects FTO jobs, it is the PTOs who are dismissed first. At the time of our site visit the proportion of PTOs was very low, but the agency was contemplating a significant increase. We analyzed the cost implications of the proposed increase.

The use of PTOs can save money through two different paths. It can improve schedule efficiency by moving toward a situation where hours of pay fall and become more nearly equal to hours of driving; i.e., the pay/platform ratio is reduced. And even if the use of PTOs does not improve schedule efficiency, it can still lower operating costs because PTOs receive lower compensation rates.

Path 1 — Lower Compensation for PTOs

The top of Table 6 shows the comparative cost of fringe benefits. It shows that FTOs get fringe benefits equal to 36.65 percent of their wage rate, while PTOs get fringe benefits equal to 31.31 percent of their wage rate. The various fringe benefit categories are equal except for sick leave and vacation pay — PTOs accumulate these benefits at only half the rate of FTOs. Overall, PTO fringes are 5.34 percentage points lower.

The bottom part of Table 6 presents the difference in wage rates: \$15.33 per hour for the average FTO and \$10.23 per hour for the average PTO.¹⁵ The cost of fringe benefits is added to get the total cost, wages plus fringes: \$20.95 per hour for the average FTO and \$13.43 for the average PTO. It is \$7.52 per hour less expensive to use PTOs, a 36 percent reduction.

¹⁵For simplicity, the analysis assumes that all PTOs are paid at the starting rate of \$10.23 per hour.

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Table 6. Experimental Runcuts at Orange County: Calculation of Savings from Wages and Fringes — FTOs vs. PTOs

Fringe Benefits	Comparative Fringe Benefits (percent of average wage rates)	
	FTOs	PTOs
Variable		
Pension	2.55	2.55
State unemployment insurance	0.42	0.42
Worker's compensation	5.10	5.10
Medicare (FICA)	1.10	1.10
Life insurance	0.13	0.13
Awards	0.27	0.27
Miscellaneous fringe benefits	0.07	0.07
Subtotal	9.64	9.64
Fixed		
Health care	11.10	11.10
Uniform	0.53	0.53
Subtotal	11.63	11.63
Vacation		
Sick leave	2.79	1.40
Holiday pay	4.17	4.17
Vacation	5.87	2.94
Other absences	0.52	0.52
Sick leave pay-off	1.01	0.51
Vacation pay-off	1.02	0.51
Subtotal	15.38	10.04
Total Fringe Benefits	36.65	31.31
Comparative Total Compensation		
Full-time operators		
Average FTO earns \$15.33 per hour		
Cost of fringe benefits: 36.65% * \$15.33 = \$5.62 per hour		
Total hourly cost of FTOs = \$15.33 + \$5.62 = \$20.95 per hour		
Part-time operators		
PTO starting salary is \$10.23 per hour		
Cost of fringe benefits: 31.31% * \$10.23 = \$3.20 per hour		
Total hourly cost of PTOs = \$10.23 + \$3.20 = \$13.43 per hour		
Labor cost saving = \$20.95 - \$13.43 = \$7.52 per hour		

Source: Study team analysis, 2000.

Path 2 — Improved Schedule Efficiency

At the time of our site visit, the agency wanted to explore the possible cost savings from increasing PTOs to 20 percent of the total operators. We were able to analyze experimental runcuts for two of their bases. These are summarized in Table 7. At each base the total platform time is held constant while the proportion of PTOs is increased to 20 percent of the total number of operators. For example, at the first base, there are 2,008 platform hours of service before and after the number of PTOs is increased. But increasing the amount of PTO platform hours, from 26 to 328 hours reduces the number of total pay hours from 2,196 to 2,161. Thus the ratio of pay hours to platform hours fall from 1.094 to 1.076, a 1.6 percent improvement in schedule efficiency. For the other base, the improvement in schedule efficiency (the fall in pay/platform ratio) is 1.3 percent.

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Table 7. Experimental Runcuts at Orange County Using 20 Percent PTOs

	Garden Grove		Irvine	
	Current	20% PTO	Current	20% PTO
FTO Pay-Hours/Day				
Platform	1,982	1,680	460	406
Report	34	27	9	7
Clear	2	2	0	0
Travel	89	65	34	28
Paid break	3	0	1	0
Overtime	55	38	11	9
Makeup	3	2	1	1
Total	2,168	1,815	516	450
PTO Pay-Hours/Day				
Platform	26	328	16	70
Report	1	8	1	3
Clear	0	0	0	0
Travel	1	10	0	2
Paid break	0	0	0	0
Overtime	0	0	0	0
Makeup	0	0	0	0
Total	28	346	16	75
FTO + PTO pay-hours	2,196	2,161	532	525
FTO + PTO platform-hours	2,008	2,008	476	476
Pay / platform ratio	1.094	1.076	1.118	1.103
Change in schedule efficiency				
Garden Grove base				
Reduction in pay/platform ratio: 1.094 to 1.076 = 1.6%				
Irvine Base				
Reduction in pay/platform ratio: 1.118 to 1.103 = 1.3%				

Source: Study team analysis, 2000.

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Table 8 combines the hourly cost estimates from Table 6 with the pay-hour estimates from Table 7 to compute the operating cost of the four runcuts — two “befores” and two “afters.” At the first base, the cost of wages plus fringes decreases from \$45,796 per day to \$42,671 when the proportion of PTOs is increased — a 6.8 percent drop in costs. At the second base, the cost of wages plus fringes decreases from \$11,025 per day to \$10,435 when the proportion of PTOs is increased — a 5.4 percent drop in costs.

Table 8. Experimental Runcuts at Orange County: Change in Total Cost of Operators

Garden Grove base
Current situation
2168 FTO hours * \$20.95 + 28 PTO hours * \$13.43 = \$45,796
Using 20% PTOs
1815 FTO hours * \$20.95 + 346 PTO hours * \$13.43 = \$42,671
Total Cost Saving = \$3,125, which is 6.8%
Irvine base
Current situation
516 FTO hours * \$20.95 + 16 PTO hours * \$13.43 = \$11,025
Using 20% PTOs
450 FTO hours * \$20.95 + 75 PTO hours * \$13.43 = \$10,435
Total Cost Saving = \$590, which is 5.4%

Source: Study team analysis, 2000.

Table 9 breaks out the components of the cost savings from increased PTOs. As expected, given the relatively low pay/platform ratios at Orange County, increased schedule efficiency did not contribute much. Rather, most of the savings come from the lower compensation of PTOs. For the Garden Grove base, the overall cost reduction was 6.8 percent, of which 1.6 percent came from increased schedule efficiency and 5.2 percent from lower PTO compensation. For the Irvine base, the overall cost reduction was 5.4 percent, of which 1.3 percent came from increased schedule efficiency and 4.1 percent came from lower PTO compensation. That is, differential compensation contributed about three times more than the change in schedule efficiency.

Table 9. Experimental Runcuts at Orange County: Disaggregation of PTO Cost Savings

Garden Grove base	
Savings from increased schedule efficiency	1.6%
Savings from lower pay and fringes	5.2%
Total savings from 20% PTOs	6.8%
Irvine base	
Savings from increased schedule efficiency	1.3%
Savings from lower pay and fringes	4.1%
Total savings from 20% PTOs	5.4%

Source: Study team analysis, 2000.

Experimental Runcuts at Seattle Metro

Metro is a large transit agency in a large metropolitan area. It was one of the very first agencies to use a significant proportion of PTOs, and in recent years PTOs have been more than 40 percent of the operator force. At the time of Metro's original PTO expansion, the agency explained that its primary goal was increasing peak hour service to help with the ever increasing congestion in the region. The desired increase in peak hour runs would have been prohibitively expensive without a high proportion of PTOs.

How much do PTOs save at Metro? Table 10 shows an experimental runcut for a typical base. The first column shows the runcut that was actually being used two years ago. That runcut used 54.6 percent PTOs and achieved a pay/platform ratio of only 1.065.

The experiments looked at what would happen if all the PTOs were removed. The scheduler explored two different ways to substitute for the PTOs. First the schedule was recut with more FTOs: the number of FTOs increased from 132 to 194. This still left a lot of small pieces of work, so these were covered as overtime hours worked by the FTOs, and an increase in premium pay for overtime and spread bonuses. The number of pay hours rose and the pay/platform ratio rose to 1.148. As a second way of handling the missing PTOs, the scheduler put together all the short pieces of work into regular runs, which pushed up overtime hours by a very large amount, and led to a pay/platform ratio of 1.221.

Table 10 shows that replacing the PTOs by means of extra FTOs and extra overtime work would have caused a 7.8 percent decrease in schedule efficiency. Or replacing the PTOs with extra FTOs working very long spreads would have caused a 14.6 percent decrease in schedule efficiency. That is, either method of replacing the PTOs would have been very expensive, but doing it via extra overtime would have been the cheapest solution. Note that the 7.8 percent and

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14.6 percent figures only show the change in schedule efficiency: given the difference in hourly costs between PTOs and FTOs, the cost increase would have been much greater.

Table 10. Experimental Runcuts for Seattle

	Current Runcut	Use Overtime Instead of PTOs	Use Long Spreads Instead of PTOs
Platform hours	1,684	1,684	1,684
Other	90	135	129
Overtime	18	58	218
Spread bonus	2	56	25
Pay hours	1,794	1,933	2,056
Pay/platform ratio	1.065	1.148	1.221
FTO assignments	132	194	229
PTO assignments	159	0	0
% PTO use	54.6%	0.0%	0.0%
Change in Schedule Efficiency			
Using more overtime by FTOs			
Increase in pay/platform ratio: 1.065 to 1.148 = 7.8%			
Convert pieces into regular runs with long spreads			
Increase in pay/platform ratio: 1.065 to 1.221 = 14.6%			

Source: Study team analysis, 2000.

THE EVIDENCE FROM OTHER AGENCIES

Ideally, we would have liked to replicate the Tri-Met type of analysis at all of our case study sites, but this was much too ambitious given data access limitations, the depth of our contacts with personnel at the case study sites, and budgetary limitations. Experimental runcuts are very time-consuming, and require a significant amount of cooperation from the agency's scheduler.

However, from three of the other sites — Bridgeport, Boston, and Denver — we were able to obtain some quantitative estimates of PTO-related cost savings. These estimates, while not based on detailed experimental runcut analysis, are valuable indicators of the character and magnitude of savings in those properties. In some cases, notably Denver, these estimates reflect management's own perception of the savings associated with the use of part-timers.

PTO Cost Savings for the Denver RTD

In the case of the Denver RTD, the estimates were based on an internal study conducted by RTD management to estimate the costs of replacing all the PTOs with FTOs. The analysis was based on January 1999 costs and employment levels. In that month, the Denver RTD employed about 1,100 FTOs and 197 PTOs to operate 685 buses.

The logic of the analysis is summarized in Table 11. Denver RTD first translated the 197 PTO runs into an estimate of the full-time equivalents (FTEs) that would be needed to replace them. The second step of the calculation was to determine total RTD cost per hour of operation, for both PTOs and FTOs. The final step was to calculate total annual labor costs for both PTOs and FTOs.

Step 1. The number of FTEs needed to replace 197 part-time runs.

This is the part of the analysis that would be conducted optimally by generating an experimental runcut using only FTEs (no PTOs) on the schedule. In the absence of such runcut data, the RTD analysis assumed:

- The RTD would need to hire one full-timer to replace *each* of the 136 part-timers who were operating *split runs*.
- The agency would need to hire one full-timer for every *two* of the 61 part-timers who were assigned a tripper run.

As shown in Row 1 of Table 11, this generated an estimate of 167 FTEs to replace the 197 PTOs.

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Table 11. Estimated Cost of Replacing Part-Timers with Full-Timers at the Denver RTD

	Actual Part-Time in January 1999	PTOs Replaced by FTOs	
Number of operators	197	167	1
Effective hourly pay for Year-1 operators	\$12.73	\$13.67	2
Annual pay-hours without spread time per operator	1,523.6	2,080	3
Annual spread time hours at 12.28% of platform time per operator	0	202.7	4
Annual wage and percentage costs per operator	\$19,388	\$29,819	5
Annual health and welfare cost per operator	\$1,620	\$3,960	6
Total annual cost per operator	\$21,008	\$33,779	7
Total annual cost	\$4,138,621	\$5,641,138	8

Source: Denver RTD internal memorandum, February 1999.

Step 2. Estimating total RTD costs per operator

Next a calculation was made of the total annual cost to the RTD per operator. As Rows 2 through 7 of Table 11 show, these costs comprise three components.

- *Effective hourly pay for new operators.* Row 2 of the table shows the effective hourly rates of \$13.67 per hour for full-timers and \$12.73 per hour for part-timers. These costs are derived using:
 - Identical hourly wages in March 1999 (\$11.81 an hour) for starting full-time and part-time operators.
 - An identical cost burden of 7.75 percent for PTOs and FTOs related to FICA and Medicare.
 - An 8 percent pension cost for full-timers only.
- *Annual pay hours for operators including spread-time premiums.* The total pay hours for full-timers and part-timers are calculated assuming that:
 - All operators are paid for 52 weeks a year.
 - Full-timers are paid an average of 40 hours a week, while part-timers are paid 29.3 hours a week (based on January 1999 averages for part-timers). Multiplying these hours by 52 weeks yields the estimates of annual regular pay-hours shown in Row 3 of Table 11.

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- Estimates of annual spread time hours. While part-timers are not eligible for the spread-time premium, full-timers at the Denver RTD receive time-and-a-half for a spread greater than 11 hours. Based on January 1999 data, the RTD calculated that in the January 1999 runcut, 12.28 percent of the platform time was eligible for the spread premium. The estimates of spread time for FTOs based on the 12.28 percent average are presented in Row 4 of Table 11.
- Multiplying the regular pay hours by the effective hourly rate and adding a 50 percent premium for the spread hours from Row 4 of the table yields the estimate of total annual wage expenditure in Row 5.
- *Annual health and welfare cost for operators.* As Row 6 of Table 11 indicates, the analysis uses actual rates of \$3,960 per year per operator for full-timers and \$1,620 annually per operator for part-timers.

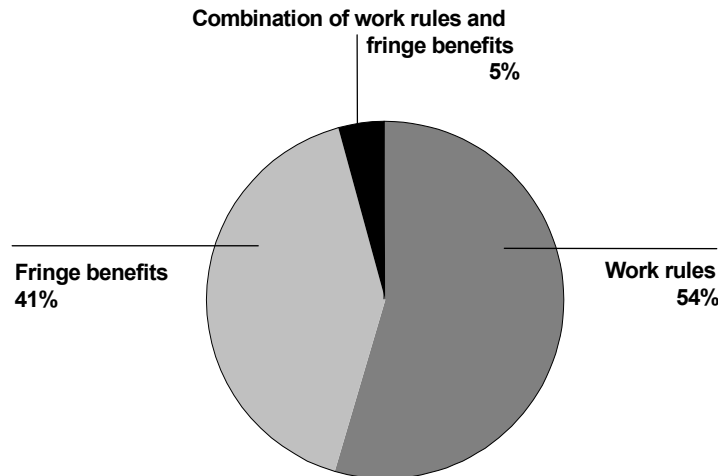
Step 3. Calculating total annual costs

Total costs of operating the existing part-time runs, using either part-timers or full-timers, can then be calculated by multiplying the per operator costs in Row 7 by the operator needs identified in Row 1. As Row 8 of Table 11 indicates, these calculations suggest that while operating the 197 part-timer runs currently costs the agency \$4.13 million, operating these runs using full-timers would cost \$5.64 million, or an additional \$1.5 million dollars annually.

Given that the RTD spent a total of \$53.4 million in 1999 on operator wages and fringes, this translates to a savings of 2.8 percent. Figure 1 presents the breakdown of these savings by isolating savings attributable to wage rate difference, differences in fringe and benefits, and differences in work rules.

By calculating the difference in pay hours between the PTO and FTO scenarios, and by calculating the difference in costs per PTO work hour, we can analyze the source of the PTO-related savings. Figure 1 shows that about 54 percent of the savings can be attributed solely to the work-rule flexibility associated with the use of PTOs, and 41 percent of the savings are derived from the lower fringe benefit costs associated with the use of PTOs. The rest of the cost saving comes from the combination of fewer paid hours at lower rates. It is worth reiterating that these estimates have been developed by the Denver RTD independently of our study, and we have neither verified these estimates nor made our own independent estimates.

Figure 1. Estimated Cost of Replacing Part-Timers with Full-Timers at the Denver RTD



Source: Study team calculations based on internal Denver RTD memorandum, February 1999.

PTO Cost Savings from the GBTA in Bridgeport

At the Bridgeport GBTA, we were able to obtain operating cost data that allowed an estimate of the cost savings associated with the use of PTOs.

The manner in which GBTA uses part-timers is unusual. Instead of cutting scheduled runs for the PTOs, GBTA only uses PTOs on the extraboard, i.e., to operate open runs after the FTO extraboard is depleted. The PTOs are free to accept or decline the work offered to them; there is a 25-hour weekly maximum, but no minimum. Jobs that remain unfilled after all the PTOs have been contacted go to FTOs on overtime.

Part-timers are on the same wage progression as full-timers: the starting hourly wage is currently \$10.18, which increases annually up to a maximum of \$16.97. PTOs do receive overtime pay for hours worked in excess of eight per day, but they do not receive spread-time pay, health insurance, or other fringe benefits, except for a small uniform allowance.

Because part-time operators are paid a straight-time wage and receive no fringe benefits, using PTOs is more cost-effective, for any given hour of open work, than either pressing FTOs into overtime service or hiring additional FTOs to staff the extraboard. More specifically, for each hour worked by a PTO on straight time rather than an FTO on time-and-a-half, the Authority

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saves the overtime wage premium.¹⁶ Similarly, for each full-time position that can be pared from the extraboard, the Authority saves the cost of employee fringe benefits.

We examined the Authority's 1999 payroll data to prepare estimates of the cost savings; the calculations are summarized in Table 12. They assume an average base wage of \$15.27 per hour (that is 90 percent of the top wage of \$16.97) and 7,096 hours of straight-time work on the part of PTOs (the actual 1999 total). The use of PTOs represents an annual cost savings of approximately \$54,000 compared to using FTOs on overtime for those labor hours.

Table 12. Bridgeport GBTA: Estimates of Cost Savings with PTOs

	PTOs	FTOs on Overtime	New FTO Hires
PTO straight-time hours (1999)	7,096	7,096	7,096
Base wage rate	\$15.27	\$15.27	\$15.27
Effective wage rate	\$15.27	\$22.91	\$15.27
Total wages	\$108,377	\$162,566	\$108,377
New hires	0	0	5
Health insurance cost per employee	\$6,602	\$6,602	\$6,602
Annual benefits expense	\$—	\$—	\$33,012
Total expense	\$108,377	\$162,566	\$141,389
PTO savings compared with			
FTOs on overtime	\$54,189		
Hiring additional FTOs	\$33,012		

Source: Study team calculations based on GBTA 1999 payroll data.

But this calculation tends to *overstate* the cost savings, since the Authority also has the option of hiring additional FTOs for the extraboard. The calculations in Table 12 assume that each new FTO could feasibly cover 1,700 hours of open work annually on straight time, implying that five extra FTOs would be required to cover the 7,096 hours of open work. While there is no wage differential between FTOs and PTOs, the Authority in this scenario saves about \$6,600 per employee annually on benefit costs,¹⁷ or approximately \$33,000 in total. This figure would be

¹⁶GBTA managers estimated that the average level of experience — and thus the average base wage — is about the same for PTOs and FTOs. (This is due, in part, to the fact that several of the PTOs are retired FTOs with full seniority.) Thus there are no cost savings, on average, from a base wage differential between PTOs and FTOs.

¹⁷The Authority's monthly costs for employee health insurance are: \$238 for a single person, \$524 for two-person coverage, and \$663 for family coverage. About 60 percent of operators have family coverage and about 20 percent have single coverage, and the balance have two-person coverage. Our annual cost figure represents a weighted average.

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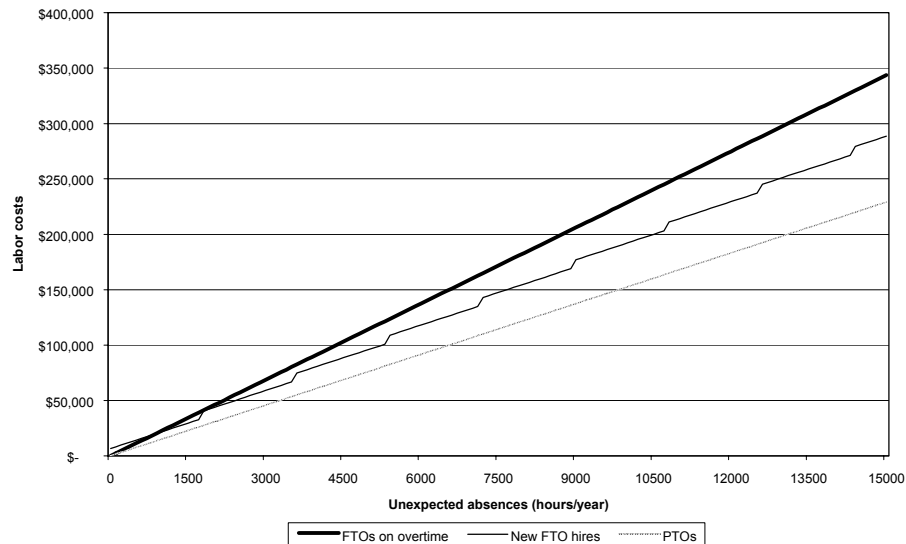
even higher if, due to union work rules or an unusually wide intertemporal dispersion of open work, more than five additional full-time operators were required to cover the hours of open work.

Hence, the \$33,000 figure should be regarded as an approximate lower bound on the level of cost savings, with the \$54,000 savings over using FTOs on overtime as the upper bound. This represents roughly 1.0 to 1.6 percent of the Authority's total annual operator labor costs of approximately \$3.4 million.

Figure 2 generalizes from the specifics of these 1999 data and shows the costs of covering hours of open work in Bridgeport with PTOs, with FTOs on overtime, and with new FTO hires.¹⁸ Note that using a PTO is, in theory, always the least-cost way of covering any given hour of open work, because PTOs receive a straight-time wage and no benefits. However, the downside to relying heavily on PTOs rather than on full-time operators on the extraboard is that when PTOs are unavailable, open work must be covered by FTOs on overtime — which is, generally speaking, the most costly arrangement.

¹⁸The assumptions with regard to wage rates and benefits costs are the same as in Table 7.

Figure 2. The Benefits of PTOs as a Function of Unexpected Absences per Year at the Bridgeport GBTA



Source: Study team calculations based on GBTA 1999 payroll data.

This is of particular concern in Bridgeport, where the nature of the PTO positions is such that the part-timers work on their own terms; that is, they are never *required* to accept a work assignment. Our conversations with Authority management and our analysis of 1999 payroll data both indicate that part-timers generally do not work the maximum 25 hours per week, even when that is possible, and that several members of the PTO roster scarcely work at all. So part of the cost savings of using PTOs is erased by the concomitant reliance on FTOs on overtime.

On the other hand, the amount of open work does vary considerably from week to week (which is not surprising since this reflects *unexpected* operator absences). As we have seen, work rules and the temporal dispersion of the work also limit the cost-effectiveness of hiring additional full-timers to work the extra board. During weeks with little open work, some of these extra operators might find themselves with a lot of free time on their hands. Thus, PTOs offer a way to cope with the peaks in open work while avoiding the fixed costs of fringe benefits for full-timers on the extraboard.

In this case, then, minimizing labor costs requires striking a balance between extremes. On the one hand, relying on PTOs provides the opportunity to cover open work at the lowest cost, but at the risk of having to rely on costly FTO overtime to cover what the PTOs cannot (or do not want to) do. Hiring more FTOs for the extraboard represents a middle course, but this too can be costly (on a per-hour or per-revenue mile basis) if the fixed costs of fringe benefits are not spread over a sufficiently large number of operator hours.

PTO Cost Savings from the MBTA at Boston

We were given access to an interesting evaluation of PTO impacts that had been done by the Boston MBTA. Due to a very powerful union, Boston was one of the latecomers to the part-time operator movement, and it did not gain the right to use PTOs until 1982. It has a high peak/base ratio of 2.6, and a long spread time between morning and evening peaks. The impact of these factors was somewhat mitigated by the fact that its operators were permitted to cover 13-hour spreads — though with high bonuses: the 11th hour of spread received a 150-percent bonus and the 12th and 13th hours received a 200-percent bonus.

Prior to the introduction of PTOs, the pay/platform ratio was 1.15; i.e., the agency was paying for 15 percent more hours than they were actually using. But their PTO contract allowed an unusually high proportion of PTOs, and by Spring 1988, PTOs were covering 37 percent of all runs. As a result, the pay/platform ratio fell to 1.03 — an exceptionally low ratio compared to other transit agencies. Schedule efficiency had improved by 10.4 percent ($1 - 1.03/1.15$). The reduction in operating costs were even greater, because PTOs had lower pay and fringes than the FTOs. MBTA management's own analysis of cost-savings associated with the use of PTOs (not verified independently by the study team) suggests that MBTA management perceived savings from lower spread premium payments alone to be worth at least \$4 million annually as of 1990.¹⁹

A MULTIVARIATE ANALYSIS OF PTOS AND OPERATING COSTS

So far we have concentrated on micro case studies at individual transit agencies. In this section we use an alternative method: regression analysis over a national cross-section of transit agencies, specifically the 255 transit agencies in the National Transit Database. There are tradeoffs between the two kinds of analysis. Detailed case studies can provide accurate measurement of changes in the specific circumstances of a few transit agencies. Cross-section regressions provide a less accurate measure over a much larger sample. One gives up detail to gain breadth.

To measure the cost impact of PTOs, we built a regression model of “Operating Cost per Vehicle-Hour,”²⁰ using data from 255 transit operators in the National Transit Database. The model examined the effect of changes in the PTO variable, while holding constant the effects of:

¹⁹ Castaline, Alan H. 1990. “Work Rule Flexibility: Method To Reduce PTO Requirements.” Paper presented at the Fifth Workshop on Computer-Aided Scheduling of Public Transport, Montreal Canada, p. 8.

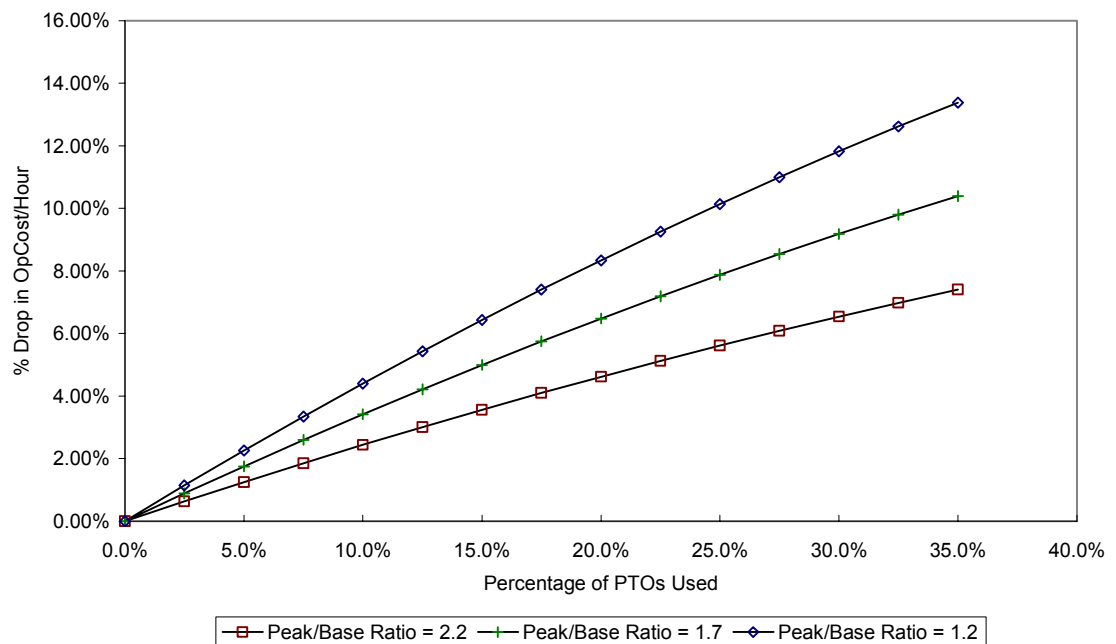
²⁰ “Operating cost” includes only direct operating costs: driver salaries and fringes, plus services. It does not include fuel/tires, maintenance, or general administration. Source: rows 1-4, column F, Form 301 in the National Transit Database. For the average transit agency, these operating costs amount to 86 percent of vehicle operations expenses, and vehicle operations are 59 percent of total operating expenses. Thus the operating cost measure used here constitutes 51 percent of total operating expenses. We choose this restricted definition of operating cost because it is the cost component that will be most directly affected by changes in the use of PTOs.

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(a) driver cost, (b) schedule profile, (c) schedule efficiency, (d) management incentive to lower costs, (e) local cost levels, and (f) economies of scale. The model was initially estimated using data from the large transit operators, only those with 100 or more buses — and the model was subsequently confirmed by testing it on the small agencies.

Figure 3 shows the results for large transit agencies. Details of model development and testing can be found in Appendix C. The vertical axis shows the expected reduction in Operating Cost per Vehicle-Hour that results from using various amounts of part-time labor. Three curves are shown, corresponding to the estimated savings for agencies that have peak/base ratios of 2.2, 1.7, and 1.2. The three curves show the interaction between the peak/base ratio and the effect of PTOs: PTOs have a bigger cost impact at peaky agencies. The median transit agency, among the large agencies, has a peak/base ratio of 1.7, the middle curve in Figure 3. That curve estimates that moving from a situation with no PTOs to a situation with 10 percent PTOs will reduce operating cost per vehicle-hour by 3.4 percent.

Figure 3. PTO-Related Cost Savings at Large Agencies (100–1,551 Buses)



Note: “Percentage of PTOs Used” has a different meaning here. Instead of the ratio of PT *operators* to total *operators*, it is the ratio of PTO *hours* to total *hours*. (The NTD only has data on hours.) Since PTOs are usually limited to less than six hours per day, the scale must be read differently. For example, if the typical PTO works five hours per day and the typical FTO works 8.5 hours per day, a 20 percent ratio of operators would produce a 13 percent ratio of hours. Since PTO contract restrictions are stated in terms of operators, to find the predicted cost savings from a 20 percent PTO quota, one would go to the 13 percent point on the horizontal axis.

Source: Study team analysis based on 1997 NTD data.

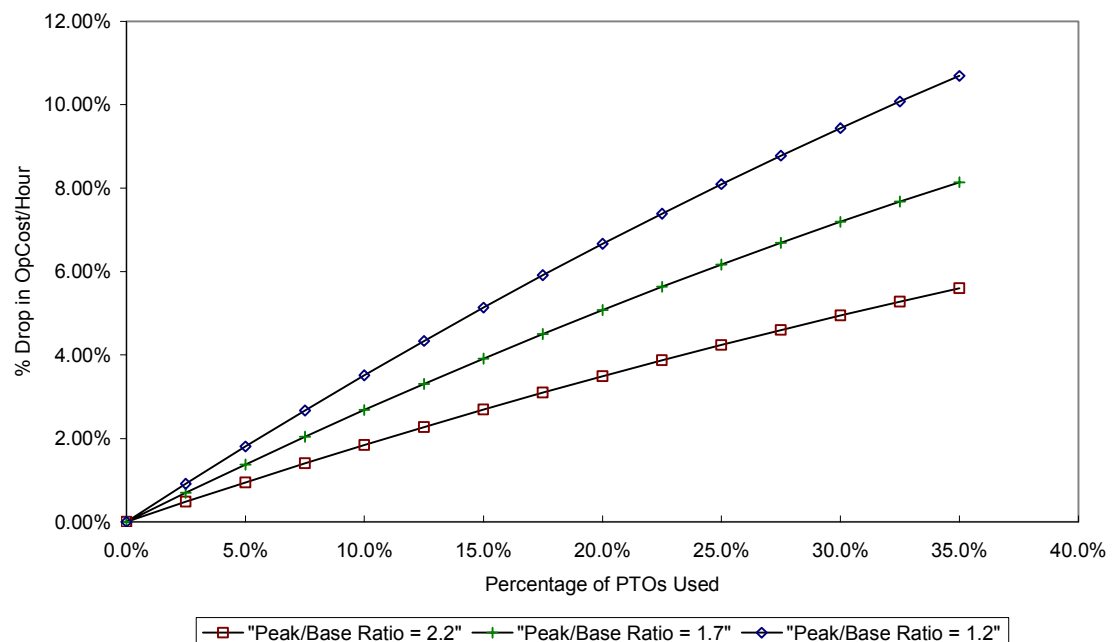
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The regression results accord well with expectations:

- A given percentage of PTOs produces greater savings at agencies with higher peak/base ratios.
- The curve rises at a decreasing rate — for the typical agency with a 1.7 peak/base ratio, the change from 0–5 percent PTOs produces a 1.76 percent reduction in operating cost per vehicle-hour, but the change from 20–25 percent PTOs produces a reduction of only 1.40 percent.

Figure 4 shows the estimates for the smaller transit agencies, those with fewer than 100 buses. The results are generally similar to those for the large agencies, but the savings are somewhat lower. The typical small agency has looser work rules than the large agencies, so adding some given percentage of PTOs will not produce as much impact on costs.

Figure 4. PTO-Related Cost Savings at Small Agencies (3–99 Buses)



Source: Study team analysis based on 1997 NTD data.

This general point should be emphasized. The impact of PTOs is strongly influenced by the labor environment at a transit agency. For example, one of our case study agencies had an unusually low pay/platform ratio, despite its 1.5 peak/base ratio, because its work rules were unusually permissive.

The graphs plot the expected savings from use of PTOs at a typical transit agency. If an agency is markedly atypical, the graphs should not be used to make predictions about savings. Rather, one should estimate the savings by performing an experimental runcut.

CONCLUSIONS

Part-time operators can reduce costs at almost all transit agencies. They do so through two different effects. First, the use of PTOs can improve schedule efficiency by reducing the number of situations where full-time operators are given extra pay to compensate them for onerous work schedules. That is, the use of PTOs to cover odd pieces of work can reduce the number of situations where FTOs need extra compensation, so FTO pay-hours drop to match their driving hours. The second effect works through differential compensation: PTOs generally receive lower wages and fringe benefits than FTOs, so moving a run from an FTO to a PTO produces a direct reduction in total labor costs.

Most of the literature on PTO cost savings has concentrated on the first effect, the improvement in schedule efficiency. The best single predictor of this effect is the existing pay/platform ratio — hours of operator pay divided by hours of driving time (platform time). The pay/platform ratio incorporates the combined effects of both the work rule restrictions at a transit agency and the shape of its daily service schedule. If schedule efficiency is already relatively good, with pay/platform ratios of less than 1.10, then adding PTOs will not make a big difference. For example, in the runcuts for Orange County, adding PTOs to garages with initial pay/platform ratio of 1.0–1.1 improved schedule efficiency by only 1.3–1.6 percent. Or in the runcuts for Portland, adding PTOs to a garage with an initial pay/platform ratio of 1.09 improved schedule efficiency by only 0.3–0.5 percent. Contrast this with the 7 percent change in schedule efficiency at Seattle if PTOs are added to a garage whose peak/base ratio was about 1.15.

There are much greater potential cost savings associated with the second cost-saving effect — lower wage and fringe benefits for PTOs. For example the runcuts at OCTA and Portland produced wage and fringe savings that were more than triple the savings from improved schedule efficiency. That is, when the pay/platform ratio at a transit agency is in the ordinary range, most of the cost-saving effect will probably come from the individual contract provisions regarding wages and fringes.

This point has implications for the amount of specific guidance we can give to transit agencies through this report. We cannot give a table that tabulates pay/platform ratios and PTO percentages, and then predicts the resultant cost savings. Such a table could not take account of the wage and fringe benefit provisions in a local labor contract — and our results show that such provisions are likely to dominate the actual savings. To predict the actual savings from PTOs at a given transit agency, that agency must do experimental runcuts based on its own contract.

We now move from the local perspective, "What can my transit agency save by using PTOs?" to the national perspective, "How much effect do PTOs have at the average transit agency?" The regressions that we fitted to the data in the National Transit Database produced good evidence that the use of part-time labor lowers the operating cost at transit agencies, other factors held constant. The results are summarized in Figures 3 and 4. Use of part-time labor may not lower operating cost at every agency, but it certainly does so at the typical agency.

Chapter 3. Labor Force Issues in Today's Transit Industry

INTRODUCTION

As we have gone around the country for our case study interviews, we have found that the major concern of transit managers is the shortage of labor. They cannot get enough drivers to cover their schedules. Most transit managers believe the main cause of their recruiting problems is nothing more than the tight labor market. They believe that when unemployment returns to “normal” levels there will be plenty of applicants again.

Our analysis indicates that it will not be that simple. The operator shortage is not going to go away on its own. To preview the main finding of the next two chapters: It has become harder to get enough operators because the job has become less attractive. There are two reasons for this. First, there has been an unfortunate interaction between management and labor over the implementation of part-time labor. At almost all transit agencies, someone wanting full-time work must first serve as a part-time operator, a position with limited earnings and usually a highly undesirable work schedule as well. The origins of this requirement are diverse, and both management and labor have supported it at various transit agencies. Regardless of the origin, when potential full-time transit operators are faced with this onerous apprenticeship, they are likely to look elsewhere for work.

The limited earnings are, of course, an inherent feature of part-time work, and are only a problem because the operators had really wanted full-time work. The undesirable work schedules are a side effect of the labor contract: almost all contracts put a quota on the number of PTOs; management has an incentive to get maximum use from this quota, so it assigns them two trippers per day, and hence a very long spread time.

The second reason for the declining attractiveness of transit work is the changes in the demographic characteristics of the labor force. Most families are now dual-worker families, even families with very young children. Something that was once taken for granted — childcare provided by a stay-at-home spouse — is now a serious constraint on the kind of position that can be filled by people with children. The combination of childcare responsibility and the irregular, often changing work hours of the transit operator, make that job a lot less attractive for a major segment of the labor force. Chapter 4 takes up the issue of changing demographics and its consequences.

The discussion in this chapter is organized in four sections. We start with illustrative narratives of the PTO experiences at two specific agencies. We then describe the salient structural features defining the PTO work environment in the transit industry more generally. This is followed by an examination of the impacts of PTOs on a transit agency's costs and other performance measures. The final section draws on all of this evidence to outline the most significant issues related to the use of PTOs.

ACTUAL AGENCY EXPERIENCES

We begin with a brief description of the experiences of two specific case study sites, to illustrate in very concrete forms the larger issues that are analyzed in greater detail later in the chapter.

AGENCY A. FULL CIRCLE ON THE HIRING FRONT

Agency A had been hiring part-timers since the early eighties and had always hired FTOs solely from the ranks of PTOs. According to a senior manager, most PTOs achieved full-time status in a period ranging from two to eight months. In the late eighties some operators hired into part-time positions were offered full-time positions directly from training.

In 1992, there were service cuts. In consequence, the wait for PTOs wanting to achieve full-time status increased to two years. This resulted in a morale problem among the PTOs, and subsequently management felt that the prospect of a two-year PTO stint was leading the best-qualified prospect to go elsewhere, resulting in lower-quality transit employees.

To address this perceived problem, Agency A decided in 1994 to start hiring people who *wanted* part-time work for their part-time positions, and to hire FTOs directly off the street. The hope was that this policy would yield both a higher-quality full-time operator, since potential FTOs would not be required to work part-time in the beginning, and a happier PTO force since all the part-timers would want only those jobs.

Agency A's strategy for identifying such dedicated part-timers (people who wanted part-time jobs) was to ask all PTO applicants to sign an agreement rendering them ineligible for a full-time position at the Agency until they had put in a year and a half of part-time work. According to Agency A management, the hope was that this clause would discourage people who really wanted full-time work (and thus would never really be happy with part-time work) from applying for part-time positions. Then Agency A would hire either for part-timers or for full-timers several times a year. Our understanding is that each cohort of new trainees would comprise only part-timers or full-timers, not a mixed group.

In practice, this seemingly sensible change did not have its desired effect. The part-time positions continued to be filled by individuals who primarily wanted full-time positions. Our conversations with the labor-relations manager at Agency A and the union representative suggest that the new hires signed the agreement either:

- Out of ignorance; or
- From a belief that this was still their best shot at an Agency A full-time job; or
- From a belief that once they got their feet in the door, the agreement could be renegotiated.

Consequently, whenever the agency advertised for FTOs, many recently hired PTOs applied, and when management pulled out the agreement showing them that they were ineligible, the PTOs

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were unhappy. They complained through the union grievance process; they complained directly to management; and they left their part-time jobs in reaction.

In general, the PTO morale became really low, indeed lower than in the previous regime where the PTO position was essentially a wait stop for a FTO position. The union grieved the management's right to hire FTOs off the street, and the issue went to arbitration in 1995. Agency A won the right to continue its policy in 1998 and was doing so until mid-1999. However, it has had a hard time finding either FTOs or PTOs in the current economy, and has lost some of the PTOs who wanted to be FTOs because of the agreement.

In late 1999, the agency was about 55 full-time drivers short. They were making do with a smaller extraboard and with high levels of overtime. However, they still had some part-time operators who wanted to become full-time operators but were ineligible because of the hiring agreement. The human resources manager told us that very recently management at the agency had decided to waive the agreement and offer full-time positions to all the PTOs, on two conditions:

- The person had served as a part-timer for a minimum of six months (described to us as a "minimum experience" criterion); and
- The agency had found a replacement for the part-time position.

The director of bus operations also told us that in general the agency was planning to revert to a system whereby all FTOs would be hired from the pool of PTOs to assure that PTOs were available. That is, the agency has now come full circle in its hiring policy.

AGENCY B. A SEVERE SHORTAGE OF OPERATORS, THOUGH PRIVATE AGENCIES RUNNING PARALLEL OPERATIONS ARE ABLE TO FIND OPERATORS AT LOWER PAY LEVELS

Agency B hires all new recruits into PTO positions after they finish six weeks of training. When FTO slots are available, PTOs are converted to FTOs using a conversion process based on the driver's record (driving, complaints, and so forth).

In July 1999, Agency B had about 1,100 FTOs and 150 PTOs on their staff, but was short 115 operators. The local economy was booming and the agency was finding it hard to get new recruits despite a \$11.67 per hour starting wage. They were trying a variety of innovative recruitment strategies. For example, in the summer of 1999 they hosted a job fair and barbecue for potential recruits, where qualified individuals (valid driving license, clean driving record, and so forth) received a \$50 incentive to fill out a driver application form. In the interim, the agency was spending a lot of money on overtime pay.

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The union had suggested that Agency B hire FTOs directly off the street instead of making potential recruits go through a PTO period. The union suggested that the agency continue to hire PTOs as well. Agency B management has decided not to do this for two reasons:

- This is a precedent that the management does not want to be stuck with when the economy changes. They find that requiring new recruits to be PTOs gives them their PTO pool, which generates considerable cost savings. While the general manager firmly believes that there exist various groups of people who might be interested in dedicated PTO positions, the agency had thus far not been very successful in identifying and recruiting them.
- Private contractors who operate selected routes for the agency complained. The private contractors pay their operators significantly less than the agency. The contractors claim that one of the main reasons why operators still prefer working with them rather than the agency is because they do not want to sacrifice a full-time job with the private contractors for a part-time job at the agency. The contractors were very apprehensive that if Agency B offered to hire FTOs off the street, then all their drivers would switch to the agency. The contractors also felt that such a move would be an unfair “changing of the rules midstream,” since the bids they made to provide services to Agency B assumed a job environment defined in part by an agency job that was “unattractive” because of the PTO stint.

The labor contract allows PTOs to constitute no more than 21 percent of the workforce. Part-timers can work up to 6 hours per day and 30 hours per week. PTO starting wage rates are the same as for FTOs, though there is some differential in wages of experienced FTOs versus PTOs. PTO benefits are lower than FTO benefits (e.g., no family healthcare coverage). In addition, PTOs get no spread premiums or work guarantees.

To obtain the maximum savings out of PTOs within the framework of the labor contract provisions, the agency usually required PTOs to work intensive weekly shifts of 30 hours consisting of AM and PM peak trippers on weekdays. These schedules — which can result in 14- to 15-hour days with no spread premium for 6 hours of work — are more onerous than the parallel existing FTO work environment.

Such schedules make little sense for a dedicated part-timer who would want to work part-time either to accommodate multiple part-time jobs or to accommodate other personal obligations (such as children or other family members). Not surprisingly, more or less all of the PTOs at Agency B were in effect “forced PTOs,” that is, individuals paying their dues by serving as PTOs en route to the FTO job they really want. The morale of these PTOs was low, and they were looking to move to full-time status as soon as possible.

The local union representatives complained that these forced part-timers are “victimized”: they share equal work and equal responsibility but are not treated equally. Over successive contracts the union had chipped away at any wage and benefit differentials in an attempt to get PTOs to parity with FTOs. Starting PTO wages used to be \$3 per hour lower than FTO wages until the last contract, when an arbitrator granted the parity in starting wages. The union was worried that

the management was using part-timers to undermine the work rules and the work environment for the FTOs by essentially creating a parallel low-wage structure that circumvents union work rules, but is otherwise no different from a regular full-time job.

THE PTO JOB IN THE TRANSIT INDUSTRY

As the experience of these two agencies illustrates, three important structural elements define the PTO work environment in the transit industry today:

- Past collective bargaining agreements governing the use of PTOs;
- Hiring and PTO-FTO transitions including the agency's dedication to, or its indifference toward, making the jobs attractive to people wanting permanent part-time work; and
- The structure of typical PTO runs.

The implications of these structural elements are important because they directly affect both the cost savings accruing from the use of part-time operators and the overall performance of the transit agency.

LABOR CONTRACT PROVISIONS

Labor contracts play an important role in determining how part-timers are used at an agency. They usually specify:

- The number of part-timers the agency can have on its rolls;
- The total number of hours a part-timer can work;
- The kinds of work assignments a part-timer can operate;
- PTO to FTO transition rules; and
- Wages and benefits for part-timers.

We discussed our findings about FTO wages and benefits in the previous chapter (see Table 4). Table 13 summarizes survey data regarding restrictions on PTO work rules. The most prevalent restrictions apply to the number of part-timers that can be employed, and the maximum number of hours they can work in a day or week. Fairly typical is the survey response of one large East Coast transit agency, which reported that part-time operators can work a maximum of 6 hours per day or 30 hours per week, and cannot exceed in number 24 percent of the full-time operator labor force. Less common are restrictions on the maximum assignment length for part-timers (58 percent of PTOs affected) and the time of day in which part-time operators are permitted to work (64 percent of PTOs affected).

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Our case studies reinforced these survey findings:

- In all of our case studies the number of part-timers were restricted by the labor contract, usually as a percentage of the full-timers.
- The number of hours a PTO could work was limited to between 25 and 30 hours a week.
- In all but two agencies (Bridgeport GBTA and the Cleveland RTA), part-timers were restricted to tripper runs on weekdays. At Cleveland, management had won the right to use part-timers on weekends in the latest contract. At the GBTA, part-timers are used to supplement the extraboard and are only allowed to work on open work after the extraboard is exhausted.

Table 13. Work Rules and Labor Agreement Provisions for Part-Time Operators

Guaranteed PTO pay — Conditions, if any, under which part-time operators are guaranteed wages

26% of PTOs are not guaranteed any wages.

74% of PTOs, most of them in a few relatively large agencies, are guaranteed at least 2–4 hours per assignment.

PTO number restrictions — Limits on the percentage of part-time operators that can be employed and their maximum hours

PTO limitations are usually based on a percentage of the number of FTOs employed.

91% of PTOs work at agencies with limits on the maximum percentage of PTOs that can be employed.

PTO assignment length restrictions — Limits on the length of PTO work assignments

58% of PTOs face assignment length restrictions.

Typically takes the form of a maximum spread imposed on PTO assignments.

One common restriction is a PTO assignment maximum length of 6 hours per day.

PTO hour/trip restrictions

87% of PTOs are restricted in the total amount of work they can perform in a day/week.

Most prevalent restrictions are contractual maxima of 6 hours/day or 30 hours/week.

PTO time-of-day restrictions

Time-of-day restrictions affect 64% of PTOs, mostly in a few large agencies.

Often designed to prevent PTOs from working on weekends and evenings.

Note: The estimates of PTO percentages in this table are derived from survey responses weighted to represent the entire national PTO population.

Source: Study team analysis of survey responses, 1998.

HIRING AND TRANSITION POLICIES

An important element in the initial attractiveness of the part-time labor concept was the synergy between the needs of the transit industry and the needs of a part of the labor force. Transit, the thinking went, had a peaking structure that would benefit from the service of employees who wanted to work only at peak times. At the same time, it seemed there were a growing number of people who wanted only part-time jobs, either to supplement a regular full-time job or to accommodate other family and personal needs.

Using PTOs to operate peak hour trippers seemed like a win-win strategy, both for transit agencies trying to cut costs, and for people looking for part-time only work. Thus it is somewhat ironic that in the present, far from looking for such dedicated part-timers, most transit agencies fill part-time ranks by requiring *all* new operator recruits to start work as part-timers.

It is fairly typical for agencies to require all new operators to serve as part-timers. As positions become available in the full-time ranks, part-timers are promoted to full-time status. The duration of service as a part-timer varies considerably depending upon fiscal health of the transit agency: if it is expanding service, promotion is swift; if it is shrinking, promotion will be very slow and PTOs may even be let go.

Most of our case study agencies have all but given up the idea of hiring people who actually want part-time work. The managers say they have tried to find such people, but have had almost no success at all. They know that national statistics reveal a significant fraction of the population who are looking for part-time work, but they believe that such people are just not interested in driving jobs. The managers say that the only way they can fill their PTO slots is to require a stint of PTO work from people who actually want full-time work.

However, as we shall see, our study revealed that the typical transit agency has not paid much attention to structuring PTO jobs to be particularly attractive to the dedicated part-timer. Indeed, in many ways, the typical PTO job has been designed as an inferior, somewhat exploitative full-time job, and we believe it should be little surprise that transit management has had problems attracting people looking for part-time positions.

We also found two agencies that have been successful at finding people who want part-time work. We will describe their experience below.

THE STRUCTURE OF THE TYPICAL PTO JOB

Since PTOs are cheaper for the agency than FTOs — lower benefits, fewer work-rule restrictions, and sometimes lower wages — transit agencies try to use them to the maximum extent allowed under the labor contract. Also, since PTOs do not receive any premium pay for split shifts, schedulers tend to give them split shifts — both an AM and a PM tripper. Indeed, in most of the agencies we studied in detail, we found that part-timers were typically used to operate a split shift of two peak hour tripper runs on weekdays. Typically, a run consisted of three-hour

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trippers in the AM and PM peak for the five consecutive weekdays. Indeed, some agencies *required* PTOs to work such 30-hour weeks.

The 30-hour workweek requirement also eliminates from consideration for the PTO position anyone who wants to hold another commercial driving job, since they would likely run afoul of the US Department of Transportation's hours-of-work guidelines that regulate hours of service for commercial drivers.²¹

Moreover, at most agencies, PTOs have no say about the *times* at which they would work. This is an obvious problem for someone who would want to balance personal and other work considerations together with a PTO job. This issue is further accentuated by instability in PTO runs across shakeups: a PTO who has been working a run that accommodates a class schedule or a second job finds that the new shakeup has put the run right into the middle of these other obligations.

A partial explanation for the instability in PTO work assignments could be the manner in which scheduling managers use runcutting software. Most runcutting programs are based on linear programming tools, which are often unstable. Consequently, small changes in the parameters of a runcut — such as small changes in wage structure and distribution across operators — has the potential to radically influence the resulting runcuts *without* lowering total costs very significantly. Unless part-time work is explicitly removed from the runcut (which a scheduler at the Cleveland RTA had started doing on an experimental basis), it is likely that there will be little stability in the jobs cut for PTOs across shakeups.

Finally, most agencies operate only daytime training programs that require trainees to commit the entire working day for one or more weeks. Such schedules are clearly not geared towards dedicated part-timers trying to accommodate other work or personal obligations.

Our interviews at the Bridgeport GBTA suggest that the nature of PTO use at smaller agencies is different from that of larger agencies. Agencies that serve smaller transit districts usually have relatively low peak/base ratios; indeed, at the GBTA the peak/base ratio is very close to one. Consequently, there are few tripper runs and the need for part-timers in the traditional role of relieving peaking is limited. In the GBTA we found that PTOs were being used to supplement a small extraboard on all days of the week.

OPERATIONAL IMPACTS OF USING PART-TIMERS

The experience of other agencies across the nation can do much to inform existing full-time operators and labor leadership about potential impacts part-timers can have on FTOs. Earlier studies had identified three areas of concern for the transit manager: higher accident rates, higher

²¹For more details, see US Department of Transportation (2000), *49 CFR Parts 350, et al. Hours of Service of Drivers; Driver Rest and Sleep for Safe Operations; Proposed Rule*, issued by the US Department of Transportation, Federal Motor Carrier Safety Administration, *Federal Register*, May 2, 2000.

attrition rates, and higher absentee rates for part-timers. In this section we present our findings related to these costs, as well as other costs that we found to be dominant at the agencies we considered: hostility in labor-management relations, problems with part-time labor morale, and negotiation costs.

ACCIDENT, ATTRITION, AND ABSENTEEISM RATES

How are PTOs as workers? Are they dedicated and reliable, do they have high turnover rates? Do they have higher accident rates than FTOs? Attanucci et al. (1984) had found that PTOs at the Boston MBTA were a less reliable labor force. The Lave team (Chomitz et al. 1985), using data from five other transit agencies, had found that PTOs compared very favorably to FTOs: rates of accidents, absenteeism, and attrition for PTOs were at least as good as those of FTOs and often better. We wanted to make similar comparisons for the labor force today.

Unfortunately this did not prove to be possible, because of the changes in the way FTOs are recruited. We encountered a basic problem in methodology. The comparison requires looking at similar groups of PTOs and FTOs, but there are no similar groups anymore: under current hiring policies, all FTOs are ex-PTOs. Thus the FTOs are more experienced, and the bad apples among the PTOs were screened out during the optional PTO to FTO promotion. So, for example, comparing accident rates for a first-year PTO and a first-year FTO is meaningless, because the first-year FTO has had several years of extra experience. (And the bad drivers were screened out during the promotion process.) Likewise, we cannot compare turnover rates: people who discover they don't like the job will drop out during their PTO years, thus inflating the measured stability of the FTO labor force.

Absentee rates present a problem in the reverse direction. Given that many PTOs really want FTO work, and given that management may not automatically advance all of them, PTOs may be motivated to be on their best behavior, and hence may have a lower absentee rate. This effect will be reinforced by the fact that the PTOs actually want a full-time income but are earning less than that; hence their need for extra income will also reduce absenteeism.

What we need is a comparison between FTOs who are hired off the street and PTOs. Though we cannot make this comparison at the moment, such data will be available in the future because some agencies have recently begun to experiment with hiring dedicated PTOs, and hiring FTOs without requiring them to work as PTOs first. Such data should be available in about two years.

HIRING COSTS

We have mentioned that the primary reason that drove agencies to use their PTOs as intensively as they were allowed under their labor contract was the limit on the *number* of PTOs the agency was allowed to have on their rolls. However, independent of that constraint, agencies spend a fixed amount to hire and train operators, and to get a return on this capital, the agency has an incentive to maximize the hours that PTOs work. In this respect the case of the private operators in Denver is illustrative.

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Both of the operators had a few “dedicated part-timers” — about five each — working for them. Both operators thought that in the tight labor market in which they were operating, they needed every operator they could get, and PTOs were welcome. However, neither of the private contractors had invested much effort in looking for dedicated PTOs. They did not find the use of such PTOs cost-effective, given the fixed costs of training operators (about \$3,500 for the private contractors), the nature of the schedules they were operating, and their work rules (which were more flexible than the rules under which the unionized RTD workforce operated).

MORALE AND RELATIONS WITH ORGANIZED LABOR

In most agencies we found that the existence of PTOs continues to be a stumbling block in the development of congenial labor-management relations. Although part-timers were members of the operator union in all of the agencies we studied, and although the union leaders did represent the PTOs on their issues, the union was always unhappy with the parallel existence of two sets of operators with different work rules and pay scales. The unions' position is *same pay and the same rules for the same work*. Part-timers are always an issue in contract negotiations. In some of the agencies, labor demanded elimination of PTOs in every contract negotiation (though unsuccessfully).

In many instances, management would have to weigh any benefit they would get from a PTO-related contractual change against the opportunity cost of negotiating on some other front.

ISSUES IN THE USE OF PART-TIMERS TODAY

THE UNAVAILABILITY OF OPERATORS IN THE PRESENT MARKET

The predominant issue in the industry over the two-year course of our study has been the shortage of operators. Most of the transit agencies we talked with were short of drivers and were finding it very difficult to recruit them. Agencies that require all new operators to serve a PTO stint, such as Seattle and Denver, were having a particularly hard time: many interested recruits already had full-time jobs and were put off by the PTO service requirement (with partial fringe benefits at best).

When we asked agencies why they were having trouble hiring operators, most of them blamed the unusually low unemployment rate and increased competition with other driving occupations. And their assumption is that when employment returns to “normal” levels, so will the demand for operator jobs. But by treating it as a temporary problem, they are generally ignoring structural features of their hiring practices that reduce the attractiveness of both the full-time job and part-time job for potential recruits.

In the short-term, some agencies seem to be dealing with this shortage of operators using (often mandatory) overtime, an expensive operational solution. In addition, our research indicates that agencies are trying to increase recruiting by relaxing some of their recruiting guidelines: Seattle

lowered the eligible age to 18, and other agencies are considering relaxing some of their driving record requirements.

Reasons for the Shortage — The Role of the PTO Position

That the transit industry is finding it hard to hire operators is in itself unusual, and the reasons for it are worth understanding. Twenty-five years ago when a transit agency announced that it was hiring, there would be long lines of applicants. Today, our research suggests that most agencies seem to face labor shortages. What has changed?

First, by the mid- to late 1990s several trends that are outside the transit agencies' control seem to have converged. First, a *booming economy* has increased alternative opportunities for potential transit operators. Second, our analysis suggests that the transit operator job is no longer *perceived* to be as attractive as it once was. The two trends are obviously related. Increases in driving-related job opportunities in occupations with less peaked demand, such as trucking and package delivery, have served to highlight the unpleasant hours and long shifts of transit operator jobs.

Childcare needs combined with family demographic trends have also made transit jobs less attractive. A job whose work schedule changes from shakeup to shakeup causes real problems for a family with two working parents and young children. And these are exactly the kinds of demographic changes that have occurred: more women now work outside the home, and they are going back to work sooner after the birth of their children. This topic is discussed in more detail in Chapter 4.

However, our evidence also suggests that the transit operator job is actually getting worse, and the *mandatory part-time* requirement is part of the reason. Specifically, the requirement of a part-time stint at limited wages, partial benefits, and long spreads discourages applicants for full-time jobs. Similarly, potential applicants for the part-time positions (dedicated part-timers) are discouraged by structural features such as long spreads, which make it difficult to hold a second job or to handle childcare obligations. This problem is further accentuated because part-timers have little choice in their work hours.

Paradoxically, rigid *seniority rosters*, one of the cornerstones of organized labor's efforts in transit, seem also to diminish the attractiveness of the transit operator job in an indirect manner. More specifically, the interaction between union seniority rules and an environment of low transit growth means that newly hired drivers have to do undesirable runs (splits, weekends,

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nights) for more years than they would have in the past. The effect of this factor is further accentuated by the existence of separate seniority lists for part-timers and full-timers. Thus, operators who are promoted from part-time to full-time start at the bottom of a new seniority roster after just having worked their way through to the top of the part-time roster.

Our case studies indicate that a few agencies have recognized and attempted to solve these structural problems. Many of the transit managers understand that the mandatory PTO stint causes morale problems and is detrimental to labor-management relations. And much more important, they believe it reduces the quality of the labor pool available to transit — the best potential operators will have more alternative opportunities and will take jobs in other industries; only those who lack alternatives will be willing to put up with the PTO service requirement. And finally, in tight labor markets the required PTO stint makes for shortages of both PTOs and FTOs.

Consequently, some agencies (Cleveland, Denver, Santa Clara, Seattle) are trying to attract and hire dedicated PTOs for PTO positions by undertaking some amount of structural reform. Seattle, in particular, has made a very concentrated effort, which is described at the end of this chapter.

PTOS ARE USUALLY NOT A PRIMARY FOCUS OF MANAGEMENT THESE DAYS

We have found that PTOs and PTO issues, though they were a concern, were not a high priority in any of the agencies that we examined. In almost all of the agencies we studied, some more important, unrelated issue was a more pressing concern, and often this issue had ancillary implications for the use of PTOs. For instance:

- At one agency (Agency B in our earlier discussion) the primary focus of management in the transit district is private contracting, mandated by the state legislature. We found that the agency's PTO policy was significantly influenced by the management's commitment to making a success of the private operator experiment. In mid-1999 the agency was short of operators and was considering trying to attract recruits by waiving the compulsory part-time stint for new hires. This plan was shelved, however, partly because the private contractors were concerned that they would lose their operators to the agency if such a waiver were to be implemented. Management at the agency agreed, and remained short of drivers while still requiring new FTO recruits to serve a PTO stint.
- Another agency was using PTOs to reduce costs that may well be completely avoidable. This agency uses part-timers for "open work," i.e., runs originally scheduled for FTOs, but now open because the scheduled operator cannot do the run. PTOs are called after the extraboard is exhausted. Managers argue that the use of PTOs is a cheaper way to operate such runs than the short-term alternative of paying some other FTO overtime (at time and a half) to operate the run. However, as the union president pointed out, management could also hire more FTOs and have a longer extraboard. Our analysis (based on data on daily overtime

costs) suggests that scope does indeed exist for the agency to reduce their overtime costs by hiring more FTOs and having a longer extraboard. Thus, though PTOs were cheaper than paying FTOs at overtime rates, other equally effective (or more effective) solutions were also available to the agency.

INTERNAL COORDINATION IS WEAK AND THE HUMAN RESOURCES DEPARTMENT IS OFTEN NOT ADEQUATELY EQUIPPED

Perhaps reflecting the relatively low priority of PTO issues among transit management these days, we found that weak internal coordination between different elements of transit management hampered the effective use of part-timers. In almost all of the agencies we visited we heard a range of explanations, both for the reasons underlying labor policy and (even more alarmingly) for some of the policies themselves. It is our assessment that there are potential efficiencies to be gained from stronger communications among transit management personnel. Nowhere was this more apparent than in the relationship between the human resources and operations departments.

In almost all of the agencies that we studied, the level of communication and teamwork between human resources and operations was inadequate. Ideally human resources, which has direct knowledge of the working conditions desired by potential recruits, should work with operations to help develop schedules and work that are both cost-effective and suitable from the operator's point of view. Instead, the schedules often make it virtually impossible to find any dedicated part-timers. Moreover, since all new recruits were first expected to operate as PTOs, in the booming low-unemployment economy of the late 1990s most transit agencies have found it hard to hire operators at all.

Finally, in some agencies we found that human resources personnel were not aware of crucial elements of the PTO job description. In one case, human resources personnel were completely unaware of the steps that operations personnel had been taking to cut runs that were customized to the needs of PTOs. Clearly, the recruiting-effectiveness of such operations measures is severely compromised if they are not communicated to prospective recruits.

THERE ARE SOME INNOVATIONS THAT ARE WORTH HIGHLIGHTING

Some of the agencies had implemented innovative ideas that are well worth more general consideration.

- *Stable PTO jobs across shakeups.* In one of its four transit districts, the Cleveland RTA is working with part-timers to create shifts that are stable across shakeups, by removing part-time assignments from the computerized runcut.
- *Replacing two three-hour trippers — one in the morning peak and the other in the afternoon peak — with a single 4–5 hour tripper as the predominant part-time run.* This is another innovation being tried by the Cleveland RTA. Such straight runs make the PTO schedule

much more attractive. In addition to providing work either in the morning or in the afternoon peak alone, such schedules make it possible for PTOs to hold another job or attend to personal responsibilities.

- *Using PTOs for open work by calling on PTOs when the agency needs them.* The Bridgeport GBTA does not cut scheduled runs for its PTOs, but uses them to fill open work when the extraboard is used up. When work for PTOs comes up, the GBTA dispatchers call eligible PTOs (who have not completed their week's allowance of work) in order of seniority and *ask* them if they would like to take that work. All of the PTOs hold other jobs and work for the GBTA on their own terms. The GBTA usually finds that it has enough open work for all the PTOs who want work in a particular week. Thus, there is in some sense a spot market for PTO work and the PTO jobs are attractive for dedicated PTOs. Indeed, the GBTA has many such dedicated part-timers (school teachers, school bus drivers, retirees, police officers) on their PTO rolls.
- *Using PTOs for weekend work.* Cleveland RTA had negotiated the right to use part-timers for weekend work. This lets the RTA hire part-timers who have other full-time jobs during the week and who are only available to drive on weekends. At the same time, it allows more full-timers to take weekends off. Not surprisingly, across all the agencies that we studied, weekend and night runs were among the last runs chosen by full-timers.
- *Evening training courses.* The Boston MBTA offers a choice between evening and day training for new hires, so that the courses are more likely to fit into the trainees' schedules. We found it remarkable that this level of flexibility was not offered by other agencies. (Most of the agencies we interviewed demand that potential PTOs go through several weeks of training on a full-time basis during the day — a practice that clearly discourages the recruiting of dedicated PTOs.)
- *Focused PTO recruiting efforts.* Seattle has just completed the first phase of a program to improve general recruiting and especially to find and hire people who specifically want part-time work. The stress of the initial effort was to improve internal coordination of hiring efforts, to aggressively recruit part-timers who actually wanted part-time positions, and to evaluate systematically the effectiveness of their recruiting efforts. Paid advertising that highlighted the pay and benefits of the part-time position was found to be the most effective channel to reach individuals who actually wanted to work part-time.

Chapter 4. Part-Timers in the Labor Market

INTRODUCTION

This chapter presents the results of our analyses of the market for part-time positions and the characteristics of the people who fill those positions. In Chapter 3 we reported that the single most important problem about transit operations today is the shortage of operators and the inability to recruit enough new ones. We suggested that much of the recruiting problem stems directly from the policies of the transit agencies themselves. Potential recruits who want full-time work are discouraged by the requirement that everyone start out as a part-time operator. Potential recruits who want part-time work are discouraged by the difficult and unreliable working schedules.

In this chapter we present findings from three complementary analyses that support and provide more depth to these observations. In the first section, we start with a short summary of national trends in part-time work. This summary establishes the existence of a significant and growing pool of workers who are primarily interested in permanent part-time work. This finding raises some important questions. To what degree has the transit industry been able to tap into that pool? And to the degree it has been unsuccessful, why has it failed? What are the issues and factors that makes the PTO job, as it is currently structured, unattractive to potential recruits?

Have transit agencies been able to tap into the pool of workers who want part-time work? The second section of this chapter examines this question by means of questionnaires at two transit agencies. The results confirm that the transit industry has been largely *unsuccessful* in finding “dedicated part-timers.” Rather, it has filled these positions by forcing those who want full-time work to serve a stint as PTOs. Many operations people believe that the end result is low morale and lower quality of labor, since the best candidates will not put up with such a requirement.

The third section speaks directly to the question: if a class of dedicated part-timers exists, why can’t transit agencies recruit them? Part of the answer was provided in Chapter 3: inappropriately long work schedules and variability across shakeups make the PTO position quite unattractive for those who only want part-time work. We present the results of a case study that explores the interaction between the work responsibilities and personal obligations of transit operators in a large metropolitan region. The case study draws on extensive interviews with PTOs to provide a concrete sense of the problems associated with PTO jobs and their demands.

This analysis looks at the conflict between the PTO’s inherently strict schedule-performance requirements and the random emergencies that occur because of childcare responsibilities. We note, further, that the importance of these issues is accentuated because as the other analyses suggest, prime age women, and in particular displaced homemakers, are major candidates for dedicated part-time work.

NATIONAL TRENDS

Working part-time is very common in the United States and is becoming increasingly so. Here we present some findings from analyses of national trends in part-time work in the US economy. The more extensive research on which this summary is based is presented in Appendix D.

WHAT ARE THE TRENDS IN THE SIZE OF THE NATIONAL POOL OF PART-TIMERS?

During the average week in 1997, 30.7 million people (roughly 24 percent of the labor force) reported that they worked less than 35 hours, the official government definition of part-time work. CPS data indicate that the vast majority of people who work part-time do so for personal reasons, such as to accommodate childcare or schooling; such “voluntary” part-timers account for 82 percent of all part-time workers, or about 14 percent of the total workforce. However, an additional 4.1 million people, about 3 percent of the total workforce, worked part-time *involuntarily*, either because they had been placed on partial layoff by their employers, or because they wanted full-time jobs but could only find part-time work.

From the 1950s until 1970, the rate of voluntary part-time work rose sharply, as homemakers, retirees, and children of the postwar baby boom looked for work that would fit with the other activities in their lives. Since then, the voluntary part-time work rate has been relatively stable. By contrast, the rate of involuntary part-time work fluctuates with the unemployment rate — during recessions, firms lay off some workers and put others on short hours, especially in highly cyclical industries like manufacturing and construction. Even in industries that are not cyclical, employers can take advantage of high unemployment by hiring part-time workers at lower cost in terms of wages and fringe benefits than they would have to pay full-time employees. For example, during the mild recession of the early 1990s, the unemployment rate went over 7 percent and involuntary part-time work climbed to 5.7 percent. Since then, as the unemployment rate fell under 5 percent in 1997, the involuntary part-time work rate fell to 3 percent, its lowest level since the 1970s. Concerns in the early and mid-1990s that increasing numbers of workers were being forced into part-time work no longer seem well placed.

WHO ARE THE VOLUNTARY PART-TIMERS?

Voluntary part-timers are much more likely to be teenagers or women and much less likely to be prime-age men than other workers are. For example, about 38 percent of voluntary part-time workers were prime-age women (25 to 54). This is only slightly higher than their 34 percent share of total employment. By contrast, prime-age men were only 7 percent of the voluntary workforce but 39 percent of all workers. Women over 55 were 11 percent of voluntary part-time workers but 5 percent of all workers. Men over 55 were 7.4 percent of part-timers, only slightly more than their 6.6 percent share of the total workforce.

These percentages suggest that most of the candidates for part-time jobs as transit operators are likely to be prime-age women, and many of the rest will be older men. Most young people who voluntarily work part-time are students who will want full-time jobs when they finish their schooling, usually not in the same industries or occupations as their part-time jobs. Relatively few prime-age men want part-time work, and a significant fraction of those who do may be in poor health and not suited for transit operating jobs.

SURVEY OF PART-TIME OPERATORS

As a result of our case studies and contacts with transit agencies, we discovered that two agencies have conducted research in an effort to understand and solve PTO recruitment and retention problems. Here we summarize the salient findings from the two surveys.

Agency A conducted a survey of PTOs in 1997 in response to difficulties in recruiting qualified candidates. Surveys were distributed to all 200 PTOs, and 73 (37 percent) were completed and returned. The survey asked questions on job satisfaction, expectations about the job, and open-ended questions on problems outside the job and on how the job might be improved.

Agency B conducted a multi-phase study of PTO recruitment during 1998–1999 in response to a severe operator shortage. The study included focus groups with supervisors and with PTOs, trial recruitment activities, and a detailed cost analysis of recruiting and training. In this case, PTO focus group participants were selected by supervisors, and long-time “career” part-timers were targeted.

These studies have limited comparability because of differences in sample selection and survey method. Nevertheless, they provide some useful information. The two studies identified a similar set of problems in recruiting and keeping PTOs:

- Most PTOs want full-time work, and are disappointed with the long time it takes to achieve full-time status. PTOs are generally dissatisfied with hours worked (not enough), and many are dissatisfied with pay and benefits, which they see as not sufficient to offset the short hours and difficult work (a consequence of wanting a full-time job). Many PTOs felt that they had been misled regarding how long it would take to get a full-time position.
- Split shifts are arduous and make it difficult to accommodate other jobs or family activities. Work is made more inconvenient due to variability across shakeups and transfers between garages that may require long commutes to work.
- Recruitment and training takes too long and is too inconvenient. The recruitment process can easily take six months. People who need a job cannot afford to wait six months before they are assigned to training. People who are looking for a second job, or for strictly part-time work, have a hard time scheduling full-time training.

Agency B's study provides valuable information on problems related to recruitment and training. The agency has just begun a concentrated effort to identify and hire employees who actually want part-time work. They experimented with different forms of advertising and have collected data on their comparative effectiveness. (A summary is provided in Appendix E.) The agency's effort to attract only part-time drivers had a fair degree of success. Surveying all the applicants by means of an anonymous questionnaire, the agency learned that 28 percent wanted part-time work, and another 30 percent said they wanted full-time work but were willing to work as PTOs for "a couple of years." Students, displaced homemakers and retirees were most likely to desire part-time work.

Combining these two groups, the average cost of advertising, screening, and training someone who is at least willing to be a part-timer, was \$3,788. The cost will likely drop as the agency obtains more experience and can fine-tune the program.

CASE STUDY OF BUS TRANSIT OPERATORS

Why do the agencies not find very many of the "dedicated part-timers" identified in all the national surveys among PTOs in transit? Here we present evidence that illustrates how arduous schedules combine with increasingly complicated personal obligations to make the transit operator job, and in particular the PTO job, much less attractive than it was in the past. What has changed is the character of the typical American family. Fifty years ago, the typical bus driver was a man with a stay-at-home wife who provided any necessary childcare. Today, the typical operator is from a dual-worker family and shares in the childcare responsibility.²²

A study by Ellin Reisner, conducted in a large metropolitan transit organization, observed that operator family patterns were very diverse, reflecting changing family demographics within the transit industry and American society at large.²³ As a result of these changes, conflicts between work schedules and childcare responsibilities have become more frequent and important. Split-shift scheduling, frequent changes in work schedules across shakeups, and rigid work rules cause problems for operators juggling the demands of work and family. Conflicts between work and family also affect the transit agency's ability to recruit and retain the operators it needs if it is to meet service requirements.

²²In 1969, 23 percent of working mothers had children under three years of age. By 1998 that percentage had increased to 63 percent. See Pappano, Laura (2000), "Running Out of Time," *Boston Globe Magazine*, June 25, 2000.

²³Reisner, Ellin (2000), "Work/Family Spillover: A Qualitative Study of Public Transportation Operators", Ph.D. diss., Boston University, May 2000 (available through University of Michigan Microfilms in Fall 2000).

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Extensive research has identified the difficulties that workers face in balancing jobs and family life.²⁴ Several studies on occupational stress of transit operators have documented characteristics of the operator job that affect health and well-being,²⁵ and Reisner found that these same job characteristics also have a negative effect on operators' ability to balance work and family responsibilities.

Some specific examples of stress at work causing conflict between work and family life include workload and fatigue spilling over into the home, performance at work, and psychosomatic complaints.²⁶ Bartone (1986) found that bus operator stress also results in hidden costs to transit agencies due to illness, absenteeism, poor performance problems, low morale, and difficulties with passengers.

This section summarizes a study of work/family spillover at a large metropolitan transit agency. The study involved observation and interviews of 19 operators, 11 women and 8 men. Of the 11 female operators: 4 were married, 2 were divorced, and 5 were single mothers, 2 of whom

²⁴For white collar and professional workers, see Hughes, Diane, Galinsky, Ellin, and Morris, Anne (1995) "The Effects of Job Characteristics on Marital Quality: Specifying Linking Mechanisms in the Work and Family Interface," in *The Work and Family Interface: Towards a Contextual Effects Perspective*, ed. Gary L. Bowen and Joe F. Pittman, Minneapolis MN: National Council on Family Relations; Sears, Heather and Galambos, Nancy (1992), "Women's Work Conditions and Marital Adjustment in Two-Earner Couples: A Structural Model, *Journal of Marriage and the Family* 54, pp. 789-97; Voydanoff, Patricia (1989), "Work and Family: A Review and Expanded Conceptualization," in *Work and Family: Theory, Research, and Applications*, ed. Elizabeth B. Goldsmith, originally published as special issue of *Journal of Social Behavior and Personality*, Newbury Park CA: Sage Publications; Hochschild, Arlie (1989), *The Second Shift*, New York: Avon Books; Bowen, Gary L. and Pittman, Joe F., ed. (1995), *The Work and Family Interface: Toward a Contextual Effects Perspective*, Minneapolis MN: National Council on Family Relations. For blue collar and shift workers see Work/Family Directions (1995), *Addressing the Work-Life Needs of Shift and Plant Workers: Strategies for Maximizing Employee Productivity*, Boston MA: Work/Family Directions. For public transit operators, see Grosswald, Blanche (1999), *I Raised My Kids on the Bus: Transit Shiftworkers' Coping Strategies for Parenting*, unpublished working paper, Berkeley CA: Center for Working Families, University of California; see also Reisner 2000.

²⁵Studies on occupational stress experienced by transit operators include Rydstedt, Leif W., Johansson, Gunn, and Evans, Gary W. (1998), "A Longitudinal Study of Workload, Health, and Well-Being among Male and Female Urban Bus Drivers," *Journal of Occupational and Organizational Psychology* 71, no. 11, pp. 1-34; Winkleby, M., Ragland, D.R., Fisher, J.M., and Syme, S.L. (1988), "Excess Risk of Sickness and Disease in Bus Drivers: A Review and Synthesis of Epidemiologic Studies," a report on research funded by the Urban Mass Transit Authority, US Department of Transportation, *International Epidemiologic Journal*; Ragland, David R., Winkleby, M.A., Schwalbe, J., Holman, B.L., Morse, L., Syme, S.L., and Fisher, J.M. (1987), "Prevalence of Hypertension in Bus Drivers," *International Journal of Epidemiology* 16, no. 2; and Bartone, Paul (1986), *Stress and Health in Chicago Transit Authority Bus Drivers*, manuscript in preparation. These studies are summarized in Reisner 2000, where the relationship of these characteristics to work/family conflict is discussed.

²⁶Rydstedt, et al. 1998. Both hypertension studies (Ragland, et al. 1987 and Winkleby et al. 1988) and the Reisner 2000 study on work/family spillover found that the relationship of hypertension to bus operator stress results from transit operators' being pressured to perform complex tasks within rigid time schedules, taking high levels of responsibility for both passengers and equipment, and having very low levels of control over how their work is conducted.

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were living with their children's fathers. Of all the operators, 4 were current PTOs and 13 were current FTOs who had been working as PTOs. Of the 8 male operators: 2 were custodial parents (one divorced, one a single parent); 1 was a part-time operator married to a part-time operator; 3 were married with working spouses; and 2 were divorced (one a step-father and the other living with a female operator). Both divorced fathers were also noncustodial parents providing child support. Two operators were parents of disabled children.

All married and cohabiting couples were dual-earner families. One full-time male operator had been a sole breadwinner before his children began attending school, but then his wife had returned to work. All but one current or formerly part-time operator had taken the position seeking a full-time job. The married male operator had initially wanted only part-time work to supplement his employment as a bookkeeper, but left this lower-paying white collar job when he determined he could earn more once he became an FTO.

The family patterns and childcare obligations of operators are major factors in their ability to manage their work schedules. Yet, by tradition, the manner in which operator schedules are constructed does not take nonwork considerations into account. This was obviously less of an issue when the job was dominated by male breadwinners with spouses at home to care for children. The industry's reliance on the seniority system has always limited scheduling choices for operators with fewer years of service, but today it creates considerable stress for operators and their families.

These problems are doubled for PTOs seeking full-time work. The operator starts out as a low-seniority PTO on the least desirable work schedule, gradually builds up seniority until it becomes possible to pick a work schedule that does not conflict with childcare obligations, then finally achieves the desired FTO status. But at that point, seniority goes back to zero and the operator goes back to work schedules that conflict with childcare obligations again. This status change often involves transfer to a work location that is less convenient, thus increasing travel time for the operator. This transition to FTO status, though desired for economic reasons, may therefore increase work/family difficulties. The transit agency's policy of requiring part-time employment before promotion to full-time status creates general resentment among operators and lowers morale. And for operators with childcare obligations it is even worse because it affects schedule-juggling and childcare arrangements, as operators move from desirable part-time hours during the day to the bottom of the seniority list for full-time work, which is usually late in the day, at night, and on weekends. The operators are then faced with finding childcare for nights and weekends or, if possible, alternating schedules with spouses to meet childcare needs.

An example of how the experience of moving from PTO to FTO status increases stress for operators and reduces morale can be seen in the experiences of Eleanor, a 37 year old married operator with three children. Eleanor works days and her husband works nights. Their alternate schedules enable them to minimize childcare costs but negatively affect family life and marital relations.

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While part-time, Eleanor's commute to work was 35–60 minutes each way. When she became full-time, Eleanor was transferred to the garage farthest from her home and across the heavily trafficked metropolitan area, thus increasing her commuting time to one to two hours each way. Both as a part-time and full-time operator Eleanor picked an alternate schedule with her husband. Eleanor says "my work hours run my whole life." She picked a shift starting after 9 AM so she could see her children off to school. On a typical day, Eleanor wakes at 5 AM so that before breakfast she has handled a number of household tasks. Then Eleanor tries to spend some time with her children before school: "It's the only time I really get to see them."

Working nights, Eleanor's husband gets home after she has left for work and then sleeps until the children return from school. His afternoons are taken up with the children's sports and other activities. Eleanor tries to end her work day no later than 8:15 PM, so she can be home fifteen minutes before he leaves for work. Her schedule was somewhat easier before she was promoted and transferred to her current garage because she had a shorter commute. Because of her long commute, once at the garage, she cannot return home during breaks, which can be several hours. If one of the children becomes sick at school or another emergency arises, her husband handles it. She and Richie, her husband, share household and childcare responsibilities. Richie provides after-school care, cooks dinners, and shops for groceries. Despite sharing responsibilities with her husband, Eleanor describes being very stressed by the long commute and workday where she is away from home from 13 to 15 hours each day.

Eleanor desperately wanted to be transferred to a garage closer to home to shorten her commute, but she can't because of the work rules and her low seniority. When asked why she and her husband did not consider moving closer to work, she explained that it would be difficult for her to move away from her support network and uproot her children from their friends and school. Where she currently lives, she has reliable sitters who are usually available when she needs them, particularly on snow days.

Eleanor likes her job, enjoys dealing with the public, and values the salary and benefits, but there are no flexible options for her to ease the strains from the rigidity of the current system. She remains uncertain but hopeful that she will eventually be able to transfer closer to home. Yet she worries because her commute and work schedule allow her so little time with her children and husband. With different days off and working opposite shifts they have little time for themselves that is not occupied with other family activities. Eleanor's difficulties have affected her marriage and led her to seek counseling to deal with her work/family conflicts. Despite enjoying her work, Eleanor's poor scheduling options, the agency's work assignment policies, and the seniority system negatively spill over into her family life.

The kind of schedule-juggling that Eleanor and her husband do is typical of many shift workers (Work/Family Directions 1995). Since both of their job schedules are based on seniority, they also cannot get vacation time together. They have not had a summer vacation together since they

were married eight years ago. And, according to Eleanor, with her seniority ranking she cannot get a summer vacation for five to ten years.

The vacation dilemma is a typical issue for operators who have young children and low seniority. Eleanor said that taking an unauthorized week off without pay would provide her with the family time she wants, but she knows it would be very bad for her personnel record. If she were to miss work for some unforeseen reason, she fears losing her job. Eleanor was very ambivalent over the choice of risking discipline for family time because she wants to have a good performance record. But she worries that the rigid scheduling system is negatively affecting her relationship with her husband and the time she wants to spend with her children.

Putting family ahead of work has consequences for operators and often, several pointed out, it has consequences for transit management because of absenteeism and negative morale.

QUALITY OF WORK AND PTO PERFORMANCE

This section provides case examples that illustrate how work, family life, and transit operations interact. The study explored strategies and tradeoffs employed by the operators to juggle childcare needs in the context of the scheduling system, organizational structure, and rules.

Seniority, work rules, and tight schedules increase operator stress and directly affect operators' schedule-juggling and morale. Workplace culture, social support, wages and benefits, and electronic communication tools were found to be key determinants of operators' ability to manage their work and family lives. As Eleanor's experiences show, characteristics of the job, such as long hours, long unpaid breaks between shifts, and long commutes to and from work, contribute to operators' experience of stress and low morale, and they interfere with marital and family relations. Some operators also attributed stress to dangerous working conditions, including negative interactions with difficult passengers.

Both the PTOs and FTOs have problems balancing family lives with their work schedules. But there is one important difference between the two groups of operators: PTOs have less income. This means that many theoretically possible childcare solutions are not available to PTOs. PTOs are less likely to have enough income to afford a second car to shorten their commute times, and hence must commute by public transit. Long commutes increase the amount of time the PTOs must be away from their children. The commute time also compounds itself: long commutes mean that PTOs cannot easily go home between halves of a split shift, they cannot respond to childcare emergencies, and so on. Likewise, lower PTO incomes and the high cost of nearby housing preclude PTOs from solving the commute-time problem by locating near their workplace. Dual earner families with only one car are also challenged to coordinate its use if public transportation is not a convenient option.

PTOs have less income as a consequence of the policies created by management and unions. Because of unions' fears, collective bargaining agreements restrict the maximum number of

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PTOs to protect FTO jobs. Then management, wanting to derive maximum advantage from this quota, requires the PTOs to work two shifts per day. This in turn interacts in an unfortunate way with management's policy of requiring all operators to start as PTOs. People seeking part-time work to supplement their income do not apply for PTO positions because their schedule could not accommodate 6–7 hours of split work that takes up a whole day. The only people who will put up with the onerous PTO work schedule are those who seek full-time work.

To minimize childcare expenses, partners in dual earner families decide to work opposite shifts to provide childcare. But this exacts a cost on family life. Operators who have reliable support systems and live near their workplace fare best, but economic considerations regarding housing and availability of social support are the main determinants of where operators live. To manage their work and family lives, operators trade off convenience for social support and adequate, affordable housing.

Operators may try to do everything right to meet their work responsibilities and optimize their family lives, but the current system often seems to work against them. The experiences of Ed and Carol Lyons, both PTOs, illustrate how the system creates stress and negative morale and makes work and family responsibilities more difficult to balance. Unlike some operators interviewed, who appeared to be poor planners, Ed and Carol Lyons were very careful in thinking through their options and arranging their schedules to meet their work and family needs. But, even so, they had no control over their work lives and could not carry out their plans.

Ed and Carol Lyons have been part-time operators for four years. When they started on the job, they were assigned to the same garage, located near their home. Two years later, Carol was transferred to a garage that is more than 15 miles from their home and on the opposite side of the heavily trafficked metropolitan region. As a part-timer, Carol worked a split shift, and because she had a six-hour break, she made the long commute twice a day. To meet her parenting responsibilities, she requested a transfer to a garage closer to her home. She even offered to give up her seniority to get the transfer but was refused because of work rules and scheduling needs.

Childcare responsibilities and the fact that Carol and Ed only had one car required close planning to coordinate their schedules, especially because of Carol's long commute twice a day. Although there was no public transit service from their home to Ed's garage, it was a 20 minute walk to work. However, commuting on the system would have required Carol to take several buses and a subway ride, doubling her already long commute.

A year and a half later, in the Spring, Carol was still at the same distant garage, but her increased seniority now enabled her to pick a straight six-hour shift. This eliminated her twice-daily round trip commute. Three months later, Ed was the highest ranking part-time operator and eligible for promotion to full-time status. He asked for the promotion for the summer schedule pick, and asked to be assigned to garages near to his home

because they only had one car. However, when the list was published, he was not promoted — only the central city garage had any full-time openings. This produced financial problems, as Carol was expecting a second child and would soon be taking unpaid maternity leave. They had been counting on Ed's change to FTO status because they needed his full-time income to support their growing family.

Ed had to accept an assignment at the Central City garage to obtain his FTO promotion for the fall schedule. He went there to pick work. Carol accompanied him to ensure that they could coordinate schedules when she picked her work the next day. With only one car, their need to supervise their daughter, and both working at garages requiring long commutes, Carol and Ed picked complementary schedules. Although Carol had acquired high seniority as a PTO and could pick the best PTO schedule in her garage, she instead selected a less desirable split schedule with alternate days off so that she and Ed could both get to their work and care for their daughter. After selecting schedules that met their needs, they began considering a move closer to their work assignments to minimize their commutes.

At this point, the transit agency froze PTO promotions to full-time as it attempted to privatize two bus garages (one being the garage where Ed was scheduled to become full-time). Because Ed had not picked part-time work at his current garage, he was forced to work the extraboard list, which resulted in his having an erratic schedule. Furthermore, Carol's schedule no longer complemented Ed's, and she had given up a straight six-hour shift for a split shift and nonconsecutive days off.

Thus the Lyons both ended up with worse schedules, schedules that could not meet their childcare needs, leaving their 10-year old daughter unsupervised after school. Nor could they proceed with their plan to buy a home because of uncertainty about where they would be working.

The point is that there are serious conflicts between the characteristics of the operators' job and the operators' need to balance work and family obligations. Furthermore, the Lyons family's experience illustrates that these problems cannot be solved by conscientious planning on the part of the operators.

INFORMAL STRATEGIES AND COPING MECHANISMS

The informal support culture at the workplace is a key resource for operators coping with stress and the random contingencies of childcare. This culture is built upon relationships among operators and supervisors and reflects the traditions, norms, beliefs, attitudes, and values of operators and supervisors in the garages. The study revealed that in regard to work/family balance it served a different role for the male and female operators interviewed for this study.

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The women see the workplace culture as a primary source of tactical assistance for securing emergency childcare support. The men interviewed found the workplace culture primarily a resource for relieving work stress. The single fathers interviewed commented about receiving and appreciating tactical assistance from co-workers and supervisors, but also valued its role in relieving work stress.

Single custodial fathers' work/family issues were the same as those of single custodial mothers, but they expressed the belief that they received more support from supervisors and managers about meeting their family responsibilities than single mothers did. Although the role of the workplace culture differed for the men and women, it was for both a cornerstone of their ability to integrate work and family life because it served to mediate stress from home to work for the women and from work to home for the men. The workplace culture benefited the transit agency as well as the operators because it enabled both male and female operators to meet their work responsibilities, reducing the negative impact of difficult encounters with difficult passengers and providing last-minute childcare assistance in emergencies.

At the time of the study, the administration was eliminating valued elements of the workplace culture. For example, the administration discontinued supervisors' ability to provide informal flexibility such as permitting operators to swap schedules. This action was most troubling to the operators who saw this as their only flexibility option. The women also feared their informal, unsanctioned strategies, such as child swapping on buses, would result in disciplinary action as the administration emphasized strict rule adherence. (The rules forbid taking your child with you when operating a bus, so the operators get around this by taking each other's children with them when there is a childcare crisis.)

Within the rigid work structure, operators developed strategies to increase flexibility at work. Some use the strategy of "credibility banking." The idea is to work hard and be really reliable in order to establish a reputation as a good worker. Then if a childcare emergency comes up, you can ask your supervisor for a temporary schedule change or time off. In effect, you are investing time and work up front to gain credibility as a deserving worker so you can cash in some of your reputation later if an emergency arises. But credibility banking only works in situations where management is stable. Unfortunately for the operators, there were frequent management changes during the period of the study, thus wiping out the operators' credibility bank.

Work location assignments, the availability of social support and back-up help in emergencies are major factors in operators' success or failure in managing their work and family lives. The changes in the workplace culture were particularly difficult for operators who relied on it as their main source of social support. Single and dual-earner parents with limited childcare resources available during their work hours spoke of making every effort possible to maintain schedule consistency, but with seasonal ridership fluctuations and management efforts to maximize operator utilization, this was not always possible. Operators with reliable support from family members experienced the least stress, while those without reliable social support described living

from one crisis to the next. In the case of Eleanor, Ed, and Carol, alternating schedules greatly limited their time with their spouses and children and resulted in stress spilling over from work to family and family to work. Eleanor had reliable childcare and social support, but her long commute and her work schedule were stressful. Ed and Carol were great at planning to meet their needs but had no back-up childcare or social support other than each other. The strain resulting from meeting alternating schedules has a strong negative effect on family life and significantly contributes to operators' poor morale.

In addition to the significance of the family, work culture, and social support in successfully meeting work and family responsibilities, a surprising finding in the study was that cell phones and beepers are very important to operators. Those who used these tools reported very specific and limited uses: to monitor latchkey or disabled children, for schools and childcare providers to have an emergency number, to contact partners about delays and to coordinate childcare, and for providing immediate access to assistance in case of danger. Operators said that carrying a cell phone or beeper reduced the stress of managing family responsibilities. Although these tools were officially not permitted, management did not enforce the rule against them as long as operators did not abuse the privilege. The operators knew that abuse of these tools could result in an accident or cause them disciplinary problems, so they were very careful about how they used them.

The key value of these tools was relieving operators' stress over their unsupervised latchkey children and allowing people in their support network to contact them if needed. The tools were remarkably valuable for reducing stress and were, in fact, the only source of personal control over the operators' work lives identified during the interviews. Their importance is captured by Carol Lyons:

I don't want to take any chances, that's why I got the phone. If I didn't have my phone I would be in a panic... because I constantly worry about her [daughter] anyway. But to go off and not have a way for her to be in touch with me and leaving it to the desk, forget about it. Talking on the phone is not the thing to do when you are driving.

COMPENSATION FACTORS

Wages and benefits are the basis of economic security and are critically important to the operators. Wages and benefits provide the compensation that is the tradeoff for undesirable working conditions and hours. With the generous pension benefit available after 23 years of service, it is also the incentive that minimizes voluntary turnover, despite the occupation's stressful nature.²⁷ It has also moved formerly low-income workers into the middle class. So, despite the difficulties reported by many operators about schedule-juggling and rigid work rules,

²⁷Rystedt et al. 1998.

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the benefits, wages, and pension are paramount. The operators deeply fear privatization, the organizational challenge to their economic security.

One operator exemplified the significance of the role of wages and benefits as an attraction, motivator and tool for retention. Olivia started out as a part-time operator. Because of the wages and benefits, she was determined to keep her job, having spent years in low-paying jobs without health insurance for her family.

There is no other job I could have gotten that would have taken as good care of me and my kids. Before coming to the Authority, I never dreamed I could get a job with a good retirement. And, now I own my own house too. Where would someone like me ever be able to get a job like that? Besides, I like helping people and I really get a lot of satisfaction from my job.

A highly recognized operator for her customer service performance, Olivia was fortunate to have family members to help with childcare and she lived near her garage, reducing her commuting time. Olivia said that many other women found the work environment and hours too difficult and quit; describing how unprepared they were for the rigidity of the rules and schedules, and how difficult the “ol’ boy” culture was to adjust to; their experiences mirror those reported in studies of women in other “non-traditional” jobs.²⁸

Work as a public transit operator is extremely attractive to women working in low-wage jobs like nursing assistants and home health aides. They are accustomed to shift and holiday work and their interpersonal skills translate into good passenger relations. However, often, as parents of young children, without reliable support systems they may quit or be fired because their family responsibilities conflict with their work schedule and they cannot afford to pay for childcare.

One such example described by a supervisor was a female operator with several small children who was repeatedly late to work or absent and was subsequently terminated. He commented, “Although I know she needed the job, I really did her a favor firing her. She was leaving her children home alone when she came to work. That shouldn’t be.” The supervisor recounted how he used to think about the children being at home alone in their apartment for hours, and the danger of leaving them unsupervised. He ended by repeating, “I really did her a favor, you can’t function on this job like that.” The misfortune of this situation is that the supervisor was genuinely interested in helping this employee, and did not want to terminate her, but he knew of

²⁸See Walshok, Mary Lindenstein (1981), *Blue-Collar Women: Pioneers on the Male Frontier*, Garden City NY: Anchor Books; and Amy Swerdlow et al. (1989), *Families in Flux*, New York: Feminist Press.

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no organizational resources or support to help her deal with these issues.²⁹

Situations like this are expensive to the transit agency that has invested in training and must go through a formal termination process. It also reflects the situation of many people in the labor pool seeking operator jobs. Transit agencies are facing the same problems other employers of blue and white collar workers face: a greater need for job flexibility and more scheduling options.

The work/family issues presented in this chapter reveal the difficulties experienced by PTOs and recently promoted FTOs trying to meet their responsibilities at work and at home because of stressful aspects of the job and exhausting work schedules. The labor agreement constrains scheduling options, making work/family balance more difficult to attain. This has become a serious issue for dual-earner and single-parent families. Informal strategies for managing childcare emergencies and the use of cell phones are the only tools available to operators to manage work/family responsibilities. Yet these informal strategies are not officially permitted.

Creating a true part-time workforce, deploying part-time operators in desirable part-time schedules, would reduce the strain on operators attempting to balance their work and family lives. Such schedules would attract people who want part-time work, instead of requiring people who want full-time jobs to work undesirable split shifts. Further, such part-time scheduling, particularly the use of PTOs on weekends, would improve the schedules for low-seniority FTOs who face the same difficulties caring for young children and meeting work requirements.

CONCLUSIONS

The results of the three analyses presented in this chapter reinforce each other. The first analysis indicates that a sizable pool of dedicated part-timers does indeed exist. Further, the data suggest that *prime-age women*, including a large number of displaced homemakers, comprise a large segment of this population of dedicated part-timers.

The PTO survey results indicate that transit agencies have been largely unsuccessful in recruiting among the ranks of the dedicated part-timers. The majority of PTOs want full-time work. This causes dissatisfaction with the job on the part of PTOs, and makes recruiting and retaining PTOs in a tight job market difficult and costly. The PTO “apprenticeship” makes it more difficult to hire qualified FTOs, which further affects morale and service quality. Some case study agencies had such shortages of drivers that unfilled runs were worked regularly by the extraboard, and in some cases runs were missed for lack of drivers. These problems can easily offset savings

²⁹At this transit agency, there actually is a childcare program that provides subsidies to employees on an income-based sliding scale. The care is provided in a number of “approved” centers in the metropolitan region. The program has a full-time manager who could have been contacted by the supervisor or union representative to determine eligibility and assist in securing childcare services.

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associated with using PTOs. These studies suggest the need to:

- Target the PTO position to those who want part-time work;
- Separate the FTO and PTO hiring, training, and work tracks; and
- Make the PTO job more convenient and attractive by offering longer single pieces of work, and reducing variability in work assignments.

The case study further illustrates the difficulties associated with the PTO jobs currently offered by agencies in the context of today's labor environment. First, the changing demographics of the workforce intensify conflicts between the work schedule and household activities and responsibilities. More drivers have full or partial responsibility for childcare, and more drivers are part of multiple-worker households. The case study revealed that childcare and other household responsibilities made it very difficult for drivers to cope with the inconvenience and rigidity of the job. This was particularly true for the PTOs and for households with limited income who had fewer economic resources for dealing with childcare problems.

It is worth noting that the change in demographics is not a recent phenomenon: the most rapid influx of women into the workforce (and changes in household roles of men and women) took place in the 1980s. What changed for transit agencies in the 1990s was the job market. Historically, transit's relatively high wages and benefits have offset the inconvenience of the job. However, these advantages do not apply as much to part-time work, which seems to combine the worst schedule with the lowest pay. The shortage of PTOs indicates that potential PTOs have other, better employment options.

Second, the variability of driver schedules adds to worker stress and morale problems. Having a work schedule that varies from one shakeup to another makes it very difficult to maintain childcare arrangements and coordinate work schedules with other household members. Mandatory garage reassignment may result in long commutes, further adding to the burden of the job. These problems are worse for PTOs who seek full-time work, as they may have to transfer garages in order to go full-time, and they must negotiate two seniority lines. For transit agencies that have stable service schedules, it seems relatively straightforward to establish a runcutting policy that will retain stable pieces of work across shakeups, especially for the part-time runs. Although workforce considerations may encourage mandatory transfers between garages, at a minimum such transfers should be solicited on a voluntary basis.

Third, the rigidity of the job adds needless stress and precludes informal arrangements to cope with day-to-day worker emergencies. For example, transit management's decision to prohibit schedule swapping, in the interview study above, eliminated an important option for drivers with childcare problems. Cell phones provide a critical emergency link that benefits both the agency and the driver. Restricting worker's options for coping with childcare and household problems puts them in the position of having to break the rules (take their children on a bus) or take more

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days off. Rigidity is in part explained by the adversarial relationship between management and the drivers and their union, where every aspect of the driver's job is a potential contract issue.

Fourth, the structure of collective bargaining agreements regarding PTOs has added to the undesirability of the job. The restriction on the *number* of PTOs that may be hired (usually a small percentage of FTOs) creates the incentive to use PTOs for as many hours as possible, which means two short shifts per day, with very long breaks between shifts. A contract restriction based on the proportion of *hours* that the PTO can drive would cure this problem. The restriction on *what work* PTOs may perform limits PTO work to weekdays, again leading to short pieces of work during the peak. Weekend work for PTOs would improve the attraction of the job and would give more FTOs weekends off. Although these outcomes are clearly desirable for management (since it would make it easier to hire dedicated PTOs), as well as for existing FTOs, the contract and the adversarial process that produces the contract has so far precluded weekend work for PTOs at many agencies.

The requirement that FTOs must be drawn from PTOs adds to the undesirability of the PTO job. As the case study pointed out, future FTOs must endure several years of low pay and benefits, must go through the PTO seniority roster and then start at the bottom of the FTO roster, and may have to accept a garage assignment far from home in order to get a full-time position. Since most PTOs really want full-time work, they dislike the part-time job and resent such a long and difficult apprentice period. Given the many problems associated with the current practice, it seems clear that the PTO and FTO job tracks should be separated.

Although the results presented here are based on a case study of a single agency, the labor practices and contractual arrangements relevant to this discussion are relatively consistent within the industry. Other industries have been more responsive and have applied a range of flexibility options to support work/family integration of shift workers (Work Family Directions 1995). This lack of responsiveness is a potential explanation for the difficulties in hiring and keeping PTOs experienced by all of our case study transit agencies.

Chapter 5. Recommendations

What can transit agencies do to make better use of PTOs, given the current context governing the hiring, use, and promotion of part-timers in the transit industry? Is it possible to use PTOs in situations that are truly *win-win* for employees and transit agencies?

In this section we synthesize our major findings to present a set of PTO-related *action* recommendations for transit agency managers. In doing so, we focus our efforts on two principal questions: (1) In a collective bargaining environment, is using part-time operators a relatively attractive strategy to reduce costs? (2) If so, how should the PTO position be structured to create the most beneficial arrangement for both the transit agency and the part-timers themselves?

THE POTENTIAL FOR COST SAVINGS IN A BARGAINING FRAMEWORK

- It is important to *create part-time work rules and contract provisions that will attract dedicated part-timers* who actually want part-time work. The most important change is to create attractive, stable work schedules for them. Options like weekend work and 4–5 hour trippers would do this. And elimination of mandatory dual-tripper assignments would make a large difference.
- Second, structure the contract so that the cap on PTO use (if any) is a function of *total PTO hours*, not the *number* of part-time operators. This provides more flexibility for the agency, but also encourages the hiring and use of dedicated PTOs who may work only 15- to 20-hour weeks (for example, weekday afternoons only).
- The use of PTOs can reduce operating costs, but the reduction may not be as large as some managers expect. Thus there is a real risk that contract concessions on other labor issues — to win the right to use PTOs — can end up costing more than the PTOs will save. Detailed runcut simulations must be done in advance to evaluate the total labor cost picture, and it may prove more effective for management to concentrate on the contract provisions that govern the use of PTOs, or that affect absenteeism or sick leave. Although there is no question that, on average, the transit agencies that use PTOs have lower operating costs (see the regression study in Appendix C), the details of contract concessions and PTO implementation are critical to producing this result.

CHANGING THE NATURE OF THE PTO POSITION

Seeking out “dedicated” part-timers who actually want part-time work is a crucial part of reducing the morale problems that often plague the PTO position. The evidence from our case-studies suggests that when an agency has been able to provide a stable work environment that

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allows the part-timer an element of flexibility, it has been able to find and retain committed, long-term dedicated part-timers. However, our evidence also suggests that, at a minimum, several elements of *stability* and *flexibility* need to be incorporated into the PTO position in order to make it attractive to dedicated part-timers in a highly competitive job market. These include:

- *Stability in PTO schedules across runcuts.* Since dedicated part-time workers are highly likely to be people with extensive outside commitments, it is absolutely essential that they have at least a modicum of stability in their work hours and assignments. Such stability allows them to plan for childcare or other personal needs without having to worry about an upheaval at the next runcutting shakeup. One way we have seen an agency achieve this has been to remove PTO assignments from the normal computerized runcut.
- *Flexible working hours and customized work assignments.* In a similar vein, accommodating PTOs requires preparing work assignments that take some account of the needs of the employee. In practice, this may require looking for common need patterns across PTOs — for example, getting off in time to take care of children after school or having mornings free for classes, and then cutting groups of runs to accommodate those common needs.
- *Harmonizing PTO work schedules with U.S.DOT operator rules.* This would allow a PTO to hold other driving jobs.
- *Replacing onerous split-shift runs with trippers to the extent possible.* In particular, requiring that PTOs work the combination of morning and afternoon trippers makes it hard for PTOs to accommodate other work or personal responsibilities. It will be easier to attract dedicated part-timers by cutting PTO runs that are more easily compatible with outside commitments, such as morning-only or afternoon-only assignments.
- *Reserving weekend and evening assignments for those who actually prefer such work.* A dedicated part-timer with a second job is more likely to be free and attracted to a PTO position if (s)he could work at such times. This is potentially a win-win situation for organized labor, since weekend and night shifts are generally considered relatively unattractive pieces of work.
- *Offering training sessions at nights and on weekends* provides more flexibility for those with other time commitments to join the transit labor force as dedicated PTOs. The common practice of requiring prospective PTOs to attend training sessions during normal daytime working hours is self-defeating, as it unnecessarily narrows the pool of potential operators.
- As pointed out in the conclusions section of Chapter 4, *allowing the use of informal coping mechanisms for dealing with emergency childcare problems* can make a big difference to both PTOs and FTOs. This would include such measures as allowing operators to swap runs or to carry cell phones for emergency childcare contact.
- *Eliminating the policy that FTOs can only be hired from the PTO ranks.* This policy is probably a significant cause of the current operator shortage — people who need full-time work will find an offer of part-time work much less attractive. And it is very likely that the

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- policy reduces the quality of the transit labor force since the best candidates will have alternative offers and hence are less likely to put up with a job that has lower wages and benefits than they want.
- *Developing a more proactive, higher-profile role for the Human Resources Department.* The Human Resources Department can be expected to have the most detailed knowledge of the personal needs and time commitments of prospective employees. In an ideal world, the Human Resources Department would not only represent the interests of the agency in the labor market, but also actively represent within the agency the demands of potential recruits. If HR were able to work with the Operations Department to help create PTO work assignments suitable for people who actually want part-time work, everybody would gain.

We recognize that some of these recommendations appear to increase the cost of using PTOs. But compared to what? The proper comparison is not to the labor surplus days of twenty years ago, but rather to the cost of current operations. Today's labor shortage is probably not just the transitory side-effect of a tight job market. There is substantial evidence that the labor shortage will continue because the driving job, as currently structured, has become less attractive to today's labor force. Certainly the conflicts with childcare responsibility in dual worker families will continue, since there is no sign that women are about to leave the workforce.

There is a good chance that many of these recommendations will produce significant improvements in morale — improvements that will reduce operating costs and improve efficiency. Moreover, most of our recommendations are grounded in actual *practice* from at least one of the agencies we visited over the course of this study. That is, they stem from ideas generated by transit managers in their efforts to solve their labor shortages.

Appendix A. Our Sources and Methodology

NATIONAL TRANSIT DATABASE

Under the mandates of the Federal Transit Act, the Federal Transit Administration (FTA) compiles annual reports that provide detailed summaries of financial and operating data for the mass transit agencies in the United States. The most recent data tables currently available are for the 1997 report year. These tables were released to the public in early 1999. These tables, formally known as the *Data Tables for The 1997 National Transit Database Report Year*, are a standard source of publicly available data for the US transit industry.

All transit agencies that receive urbanized area formula funds (Section 5307) from the Federal Transit Administration are required to submit an annual National Transit Database (NTD) report. This report provides a summary of the key financial and operating statistics for each transit agency. The reported NTD data are reviewed for completeness and reasonableness. In some cases, data items are compared with values reported in prior years or with “normal” expected values developed from data reported by other transit agencies. These checks performed on the NTD data ensure that the data are reasonable, but do not guarantee that each data item is accurate.

The analysis in this report relies on data reported on employee counts and operators’ wages. The employee counts were used to assess the percentage of transit operators who are part-time workers. This data is reported in **Transit Agency Employee Form (404)**. All transit agencies are required to report the person count for full-time and part-time employees on the last day of the fiscal year by four functional categories:

- Vehicle operations,
- Vehicle maintenance,
- Non-vehicle maintenance, and
- General administration.

Transit vehicle drivers (revenue vehicle operators) are generally the largest employee group in vehicle operations. However, this category also includes employees in categories such as transportation administration and support, ticketing and fare collection, and system security. Therefore it is possible that using the employee counts for vehicle operations might produce an incorrect count of the number of part-time vehicle operators. Fortunately, the NTD provides some data that allow us to determine the extent to which this is an issue.

In addition to being *required* to report the total number of full-time and part-time vehicle

APPENDIX A. OUR SOURCES AND METHODOLOGY

operations employees, transit agencies can (optionally) report employee counts for vehicle operations by the following categories:

- Transportation administration and support,
- Revenue vehicle operations,
- Ticketing and fare collection, and
- System security.

In 1997, 101 bus systems provided employee counts using the optional employee categories for vehicle operations. From the data reported by these systems, it was found that using the employee counts for vehicle operations as a whole generally reflected the detailed information provided for revenue vehicle operations. Table A-1 presents a summary of those results. Table A-1 shows that for two-thirds of the systems, there was less than a five percent absolute difference in PTOs as a percent of FTOs between the percent calculated from the revenue vehicle operations data and the percent estimated from the vehicle operations data. There was less than a ten percent absolute difference for over 84 percent of the reporting systems.

Table A-1. Difference between Revenue Vehicle Operations and Vehicle Operations. Part-time Employees as a Percentage of Full- Time Employees

Absolute Difference	Count	Percent
Greater than 10%	16	15.84%
5% to 10%	18	17.82%
Less than 5%	67	66.34%
	101	100.00%

Source: National Transit Database 1997.

The data on operators' wages is used in this report to assess the efficiency of using part-time operators. Data on operators' wages paid is reported on the **Operators' Wages Form (321)**. The measure "pay/platform ratio" is used to assess efficiency and is calculated as total operating and non-operating time paid in dollars divided by total platform time expenditures.

Caution is needed when assessing the pay/platform ratio calculated from **Operators' Wages Form (321)**. The data used reflects not only the efficiency gained by using part-time operators, but also the level of operator absenteeism and the efficiency with which management addresses this problem.

The pay/platform ratio also does not include data on fringe benefits, an important component in total employee compensation. Since fringe benefits often differ between FTOs and PTOs, ideally they should be examined. Unfortunately, disaggregated data on fringe benefits is not reported by operator type in the NTD reports.

THE CASE STUDIES

The backbone of this study was the detailed case studies that we undertook of individual properties across the country. Here we describe briefly the structure of the case studies and the kinds of questions and data we collected from the individual case-study sites.

THE FOCUS OF THE CASE STUDY INVESTIGATIONS

The case study investigations were driven to derive insight into four broadly defined issues:

- How do elements of an agency's operating environment influence the potential gains from the use of PTOs? In other words, when, and in what circumstances, should transit agencies explore the PTO option?
- What has been the implementation experience? Specifically, to what degree have anticipated potential benefits been realized? What have been the other consequences, positive or negative, anticipated or unanticipated?
- What appear to be good and bad practices in the use of PTOs? What are the policies that maximize cost savings and productivity, and yet minimize antagonism and conflict?
- What are the indirect effects – the “hidden” costs and benefits – of using PTOs? How can these be anticipated, and factored into the transit agency's decisionmaking process? In particular, what is the relationship between PTO usage, the three As (absenteeism, accidents, and attrition), and elements of the agency's operating environment (the state of the economy, the existing labor agreements, the climate and geography in which the agency operates, etc.)?

Addressing these questions required us to focus on a set of more concrete issues for inquiry at the case studies. These principal questions or issues that we looked to the case study sites to exemplify can be broadly categorized as *agency impacts*, and *labor impacts*.

Agency Impacts

We focused on three kinds of impacts PTOs have at transit agencies:

- On labor productivity and (gross and net) operating costs
- On service quality (including all relevant impacts on accidents, absenteeism and attrition)
- On morale

The focus of our effort was to assess the impacts of PTOs on those transit agencies that have adopted it. How far have anticipated cost savings been realized? What have the costs been of using PTOs? To what extent are the three As – accidents, absenteeism, and attrition — the appropriate ‘costs’ of using PTOs. How do the outcomes appear to vary with the nature and circumstances of

APPENDIX A. OUR SOURCES AND METHODOLOGY

the PTO policies? What do transit managers think are the positive and negative aspects of the changes that have occurred at their agencies? With hindsight, what would they now wish to have done differently?

Labor Impacts

We also looked at multiple issues concerning labor/management relations and employee job expectations and satisfaction. How has organized labor's attitudes and response to part-time labor evolved over time? Similarly, to what degree have unions influenced PTO policy in transit?

An issue that turned out to be crucial had to do with the characteristics of the people hired as part-time operators. We found that while many agencies had hoped to recruit a new class of transit operator—working mothers, students, retired people, and so on—people who would be attracted to a job that provided flexibility, people who actually wanted *part-time* work, in general this effort was less than successful. For a variety of reasons the PTO positions were filled by people who wanted full-time work, and who tended to take PTO jobs as a pathway toward such work.

CASE STUDY DATA COLLECTION AND ANALYSIS

One or more members of the study team was responsible for each case study, using standards and protocols developed to apply across case studies. The team members responsible for a specific case study were selected on the basis of prior association with the transit system, geography (minimizing travel expenses), and specialist knowledge relative to any particular circumstances germane to that case. Not surprisingly most Western US case studies were handled by Professors Lave and Giuliano, while most cases in Eastern or Central areas were handled by CRA staff members Jack Doolittle and Brian McCollum.

The list of local people to interview in each case was determined both from our prior knowledge about the case study site and by judicious choice of people for the first couple of interviews at that location. All interviews with local management and labor were carried out using so-called “semi-structured” questionnaires

The questions in the semi-structured interview protocols are summarized below.

Agency Officials (General Managers, CFOs, Labor Relations Specialists, Inside or Outside Lawyers, Scheduling Managers, and/or Board Members)³⁰

Addressing the potentials of PTOs. Why did the agency consider using PTOs? What was the initial labor reaction? What kinds of concessions (if any) did the agency make to the union in exchange for the right to use PTOs?

³⁰We recognize that the people involved in making an initial decision about the use of PTOs may no longer be around in many agencies, particularly if that decision was taken over a decade ago. However, there still may be some middle-level people present with institutional longevity. And in any event, we should be able to obtain the documentary evidence of changes in the labor contract details.

APPENDIX A. OUR SOURCES AND METHODOLOGY

The implementation experience. What do transit agencies think has been the effect of PTOs on their operations? Specifically, did PTOs generate the expected savings? Did use of PTOs increase labor productivity? Did it allow the agency to offer new services? What are the ways in which these agencies use PTOs?

How costly did the concessions made to labor work out to be? What have been the effects of these agreements? To what extent did these agreements hamper/nullify the benefits the agency envisioned would come with PTOs?

What are the demographic characteristics of the individuals who have been hired as PTOs? Have they changed over time? How do those characteristics compare to the transit agency's prior expectations?

The learning element. In what way has the agency's attitude towards PTOs evolved over time? How have the actual policies relevant to PTO use evolved over time?

Unexpected problems and benefits. What has the agency found to be the unexpected problems, i.e. the disadvantages or key disappointments of the experience with PTOs? Have there been key unexpected benefits?

What does the agency believe to be the ideal role of PTOs? If the agency were to revisit the PTO issue with a fresh slate and the benefit of hindsight, what would their attitude and strategy be?

Labor Representatives (Local Union Officials)

Initial reactions. What was the initial reaction of organized labor to the concept of PTOs? What were the main concerns? To what degree were these concerns addressed before the agency began the use of PTOs?

The implementation experience. What does labor think has been the effect of PTOs on operations? Specifically, were labor's prior concerns (if any) still troubling them?

How effective did labor think that the safeguards they had instituted turn out to be? How beneficial did the concessions won in exchange for PTO use turn out to be?

How did PTOs influence the labor movement itself? Were the PTOs members/active members in the union? To what extent was the union now addressing PTO interests? What effect did that have on the labor management relationship overall?

The learning element. In what way has labor's attitude towards PTOs evolved over time? How have the actual policies relevant to PTO use evolved over time?

Unexpected problems and benefits. What has labor found to be the unexpected problems of PTO use? What have they found to be the key unexpected benefits of PTO policy?

APPENDIX A. OUR SOURCES AND METHODOLOGY

What does labor believe to be the ideal role of PTOs? If labor were given a chance to revisit the PTO issue with a fresh slate and the benefit of hindsight, what would their attitude and strategy be?

Part-Time Operator Representatives

Motivation. Why did they apply for PTO positions? What were they hoping to get from this job? What are their short, medium and long term plans professionally? How typical are they of other PTOs at the property?

Experience. What do they think of the operating environment, and their wage and benefit structures? Are they satisfied with their job, and its prospects? What are their main complaints?

Attitude and relationships. What is their attitude towards, and relationship with, the agency? What is their attitude towards, and relationship with, the full-time operators, and the labor union?

Appendix B. CRA Survey of Bus Operators

We targeted this quantitative survey exclusively to motor bus operators (or motor bus operations of multi-modal agencies). Past experience has shown that, because of the highly skewed size distribution of US transit properties, it is usually possible to obtain an adequate characterization of the US bus industry using a relatively small, stratified random sample of 30 to 40 properties, as long as the sample includes virtually *all* of the *largest* agencies of interest. This is intuitively reasonable. Exclude (or “lose”) only one or two of the largest transit agencies from the sample and the precision of the resulting data will obviously suffer much more markedly than if large numbers of smaller agencies are “lost.”

We designed a stratified, random sample with the goal of achieving 40 responses. The stratification factor selected was the absolute number of part-time operators reported for properties in the National Transit Database for report year 1995. We investigated the distribution of this statistic for the 331 agencies that operated their own motor buses (rather than purchase transportation) and subsequently divided them into nine strata. Table B-1 describes the strata boundaries and the number of transit systems allocated to each stratum. We allocated the sample to the different strata using the Neyman allocation method, which optimizes the sample precision for a given total sample size.³¹

Table B-1. Stratified Sample Design for the Survey of Bus Agencies

Number of PTOs	Stratum #	Size of Stratum	Sample Size in Stratum
over 300	9	3	3
200 to 300	8	5	2
150 to 200	7	4	1
100 to 150	6	9	2
60 to 100	5	13	3
30 to 60	4	24	4
15 to 30	3	35	3
less than 15	2	145	12
None	1	93	10
Total		331	40

Source: Study team calculations based on data from the 1995 National Transit Database.

Assuming an average response rate of 50 percent, we issued a sample of 77 properties. In the highest stratum (stratum 9) we needed responses from all of three agencies (Seattle-Metro, Minneapolis-St. Paul-MCTO, and Chicago-RTA-CTA), so oversampling was not possible.

³¹ Cochran, William G. (1977), *Sampling Techniques*, 3d ed., New York: John Wiley & Sons, pp. 96–99.

APPENDIX B. CRA SURVEY OF BUS OPERATORS

Having calculated the sampling fraction appropriate to each stratum, transit agencies were selected at random within the stratum. The agencies selected are presented in Table B-2.

Table B-2. CRA “Issued Sample” — Survey of Motor Bus Operators

Company	City	State	Reported PTOs	Stratum
Minneapolis-St. Paul-MCTO	Minneapolis	MN	366	9
Seattle-Metro	Seattle	WA	1105	9
Chicago-RTA-CTA	Chicago	IL	820	9
San Antonio-VIA	San Antonio	TX	285	8
Baltimore-Maryland-MTA	Baltimore	MD	233	8
Los Angeles-LACMTA	Los Angeles	CA	234	8
Portland-Tri-Met	Portland	OR	258	8
Oakland-AC Transit	Oakland	CA	162	7
Denver-RTD	Denver	CO	189	7
Akron-Kent State	Kent	OH	126	6
Iowa City-CAMBUS	Iowa City	IA	102	6
Davis-UNITRANS	Davis	CA	110	6
Miami-MDTA	Miami	FL	126	6
San Diego Transit	San Diego	CA	83	5
CT-Carey Transportation	Milford	CT	65	5
Cincinnati-SORTA	Cincinnati	OH	98	5
Flint-MTA	Flint	MI	82	5
Maryland-Ride-On	Rockville	MD	91	5
Kansas City-KCATA	Kansas City	MO	84	5
Tucson-Sun Tran	Tucson	AZ	47	4
Charlotte-CTS	Charlotte	NC	34	4
Des Moines-Metro	Des Moines	IA	34.9	4
LA-OCTA	Orange	CA	50	4
El Paso-Sun Metro	El Paso	TX	37	4
Detroit-SMART	Detroit	MI	44	4
LA-Foothill Transit	West Covina	CA	51	4
Columbia-CATS	Columbia	MO	33	4
LA-Montebello	Montebello	CA	27	3
Lubbock-Citibus	Lubbock	TX	25.6	3
Springfield-SMTD	Springfield	IL	24	3
Austin-Capital Metro	Austin	TX	21.9	3
Pocatello Urban Transit	Pocatello	ID	21	3
Louisville-TARC	Louisville	KY	17	3
Greater Bridgeport TD	Bridgeport	CT	8	2
Petersburg Area Transit	Petersburg	VA	9	2
Harrisburg-Cat	Harrisburg	PA	4	2
Birmingham-Max	Birmingham	AL	5	2
Medford-RVTD	Medford	OR	2	2

APPENDIX B. CRA SURVEY OF BUS OPERATORS

Table B-2. (continued)

Company	City	State	Reported PTOs	Stratum
Waterloo-MET	Waterloo	IA	1.1	2
NY-Clarkstown Mini-Trans	Nanuet	NY	15	2
Benton Harbor-Twin Cities	Benton Harbor	MI	0.2	2
Richmond-GRTC	Richmond	VA	12	2
Eau Claire-ECT	Eau Claire	WI	4	2
Johnstown-CCTA	Johnstown	PA	9	2
Chattanooga-CARTA	Chattanooga	TN	8	2
Poughkeepsie-LOOP	Poughkeepsie	NY	13	2
Santa Rosa-City Bus	Santa Rosa	CA	9	2
Ann Arbor-AATA	Ann Arbor	MI	1.8	2
Bakersfield-GET	Bakersfield	CA	6	2
Fayetteville-Springdale	Fayetteville	AR	11	2
Scranton-Colts	Scranton	PA	4	2
Fort Wayne-PTC	Fort Wayne	IN	4	2
Oshkosh-OTS	Oshkosh	WI	0.4	2
Huntsville	Huntsville	AL	8.9	2
West Palm-CoTran	West Palm Beach	FL	1	2
Muncie-MITS	Muncie	IN	12.2	2
Charlottesville Transit	Charlottesville	VA	6	2
Reno-Citifare	Reno	NV	0	1
Stamford-CT Transit	Hartford	CT	0	1
Danville-DTS	Danville	VA	0	1
San Francisco-BART	Oakland	CA	0	1
Wichita-MTA	Wichita	KS	0	1
Augusta-Aiken County	Aiken	SC	0	1
Tulsa-MTA	Tulsa	OK	0	1
NW IN-East Chicago	East Chicago	IN	0	1
Asheville-City Coach	Asheville	NC	0	1
Delaware-DAST	Dover	DE	0	1
San Angelo-Antran	San Angelo	TX	0	1
Florence-PDRTA	Florence	SC	0	1
Springfield-CU	Springfield	MO	0	1
Beloit-City of Beloit	Beloit	WI	0	1
NJ/NY-Rockland	Bergenfield	NJ	0	1
Charleston-SCE&G	Columbia	SC	0	1
Colorado Springs Transit	Colorado Springs	CO	0	1
Battle Creek-BCT	Battle Creek	MI	0	1
Monroe-MTS	Monroe	LA	0	1
Greenville-GTA	Greenville	SC	0	1

Source: Study team analysis, 2000.

The survey instrument was mailed, along with a cover letter to the General Managers (or their equivalents) of the 77 agencies in the issued sample. We sent out a reminder postcard to the non-responding agencies after four weeks (in the middle of May 1998). We finally received

APPENDIX B. CRA SURVEY OF BUS OPERATORS

responses from 33 of the 77 properties, a return rate of about 43 percent. Table B-3 presents a summary of response rates by stratum.

Table B-3. CRA Phase I Survey

Strata	Number of PTOs in 1995 NTD	Desired Sample	Issued Sample	Achieved Sample
1	0	10	20	6
2	< 15	12	24	10
3	15 to 30	3	6	3
4	30 to 60	4	8	3
5	60 to 100	3	6	2
6	100 to 150	2	4	0
7	150 to 200	1	2	2
8	200 to 300	2	4	4
9	Over 300	3	3	3

Source: Study team analysis, 2000.

Our analysis of the data indicates that most of our questions were clear and the respondents were able to answer them. However, the results also indicate that a large number of agencies did not (or were unable to) supply the quantitative data asked for in questions 9 (details related to PTO and FTO attrition rates) and 13 (details about operating and non-operating times). For instance, of the 33 responses received, only 12 agencies attempted to respond to question 13.

The survey instrument and cover letter that were used in the survey follow.

SURVEY INSTRUMENT AND ACCOMPANYING COVER LETTER

April 15, 1998

Dear :

Some twenty years after part-time operators began to be introduced in several major transit systems, the *Transit Cooperative Research Program* has commissioned a study to identify and appraise the industry's experience with part-timers. The study, which is being carried out by Charles River Associates in conjunction with the University of California, Irvine, will examine what the successes and failures have been, to provide guidance to both transit properties and transit labor in developing successful policies.

The main component of the study will be detailed *case studies* of a small number of transit properties with particularly relevant or instructive experiences of part-time operators. However, to place those examples within the context of transit *bus* operations nationally, and to build a more complete picture of the use of part-timers in US bus transit services, we are also assembling data for a statistically representative sample of properties.

Your agency was selected in that sample. We have drawn data for your agency from the 1995 *National Transit Database*, and (for some of the agencies in our sample) also examined supplementary information on file with APTA. However, in order to construct a richer picture of the national experience with the use of part-time bus operators, we would like to include information that is not obtainable from those central databases. Accordingly, we would be very grateful if you would have the appropriate member of your staff answer the enclosed questionnaire for your agency, and return the completed form to the study team in the prepaid envelope.

I know that transit agencies get many requests for information and that it is difficult to respond to every one. However, obtaining a clearer picture of the level and nature of part-time operations, and determining the factors that make for long-term success in using part-time operators, has been identified by the industry as a priority research topic. Consequently, we would be most grateful for your cooperation. The data for *individual* transit agencies from this questionnaire will not be identifiably published, but used only in statistical analyses to generate estimates for the national transit industry.

Please complete and return the survey in the accompanying self-addressed envelope by May 15th 1998. If you have any questions or need clarifications, please don't hesitate to call me or Shomik Raj at (617) 425-3373.

Sincerely yours,
CHARLES RIVER ASSOCIATES INCORPORATED

Michael Kemp
Vice President

APPENDIX B. CRA SURVEY OF BUS OPERATORS

Some twenty years after part-time operators began to be introduced in several major transit systems, the *Transit Cooperative Research Program* has commissioned a study to identify and appraise the industry's experience with part-timers. The study will examine what the successes and failures have been, to provide guidance to transit properties and transit labor in developing successful policies.

The main component of the study, which is being carried out by Charles River Associates in conjunction with the University of California, Irvine, is *case studies* of a small number of transit properties with particularly relevant or instructive experiences of part-time operators. However, to place these studies within the context of transit *bus* operations nationally, and to build a more complete picture of the use of part-timers in US bus transit services, we are also assembling data for a statistically representative sample of properties.

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All terms are as defined in the data that you provide to the U.S.DOT for the *National Transit Database* ("Section 15 data"). In this survey, we are interested in data for the fiscal year 1996, that is, the fiscal year ending in the calendar year 1996. Further, we are interested only in "motor bus" operations (code MB).

Please complete and return the survey in the accompanying self-addressed envelope by May 15th 1998. If you have any questions or need clarifications, please call Shomik Raj at (617) 425-3373.

About your system's peak capacity

1. In the schedule that your system *currently* operates, what is the *maximum* number of motor buses operating in revenue service at any given time?

Enter peak number of motor buses operating _____

2. Please circle the days of the week on which this peak motor bus service operates.

Mo Tu We Th Fr Sa Su

3. On these days, what is/ are the time period(s) when that maximum number of buses is in revenue service?

From [:] a.m. / p.m. to [:] a.m. / p.m.

APPENDIX B. CRA SURVEY OF BUS OPERATORS

and from [:] a.m. / p.m. to [:] a.m. / p.m.

About your system's use of part-time motor bus operators

4. At any time during **1996**, were there any labor agreement constraints in effect that limited your system's ability to employ part-time bus operators?

- a) Was there any restriction on the **number** of part-time bus operators that you could employ?

no	1
yes (please describe below)	2

- b) Were there any restrictions concerning the **length of assignments** of part-time motor bus operators?

no	1
yes (please describe below)	2

- c) Were there any restrictions governing the total **number of hours or trips** that a part-time motor bus operator could work in a day or a week?

no	1
yes (please describe below)	2

- d) Were there any restrictions on the **times or days** on which you were allowed to use part-time motor bus operators?

no	1
yes (please describe below)	2

APPENDIX B. CRA SURVEY OF BUS OPERATORS

5. During **1996**, how many part-time motor bus operators were employed by your agency? Enter as many of these answers as you are able:

Smallest number at any time: [_ _ _]

Largest number at any time: [_ _ _]

Average number over the year: [_ _ _]

If any of the numbers are less than the maximum allowed under labor agreements, did your agency hire more part-time operators?

we haven't increased the number of part-timers 1

we are planning or trying to increase the part-timers 2

no increase in part-timers has occurred or is planned 3

APPENDIX B. CRA SURVEY OF BUS OPERATORS

6. This question concerns the benefits (if any) to which your part-time motor bus operators are entitled, and how the benefits compare to those of full-time bus operators.

	Part-Time Operators	Full-Time Operators
a) Enter any guaranteed work-hours (enter zero if there is no guarantee)	_____ hours per _____.	_____ hours per _____.
b) Are there seniority requirements to qualify for this guaranteed minimum? If so, specify briefly.	_____ _____ _____	_____ _____ _____
c) Paid vacation. Specify briefly the amount and any conditions.	_____ _____ _____	_____ _____ _____
d) Paid sick leave. Specify briefly the amount and any conditions.	_____ _____ _____	_____ _____ _____
e) Retirement and/or health-related benefits. Specify briefly, with relevant conditions.	_____ _____ _____	_____ _____ _____

APPENDIX B. CRA SURVEY OF BUS OPERATORS

7. Are there any labor agreement conditions regarding part-time operators and the hiring of new full-time motor bus operators? For example, are you required to hire full-timers first from the pool of part-timers? Please characterize any conditions like that, and how they worked in practice (e.g., "In the most recent year, a total of ____ full-time hires included ____ former part-timers").

What are your experiences with part-time motor bus operators?

8. Please complete this table for the year 1996 (or for your fiscal year 1996):

	Part-Time Operators	Full-Time Operators
a) Average number of motor bus operators	<hr/>	<hr/>
b) Number of motor bus operators at the beginning of the year who terminated during the year	<hr/>	<hr/>
c) Platform hours	<hr/>	<hr/>
d) Sick days (hours) reported	<hr/>	<hr/>
e) Sick days paid	<hr/>	<hr/>
f) Sick days with absence of 30+ working days	<hr/>	<hr/>

9. a) Does your agency use run-cutting software for motor bus operations?

no	1
yes (please describe below)	2

APPENDIX B. CRA SURVEY OF BUS OPERATORS

- b) Are full-time operator schedules developed separately from the schedules for part-time operators?

no	1
yes	2

10. Has your agency ever developed any estimate of the cost savings from using part-time motor bus operators rather than full-time operators? If so, summarize briefly, saying how and when you developed this estimate, and the scale of part-time operations to which it relates. If you can append documentation of this estimate on a confidential basis, please do so.

About your wage agreements

11. We are interested in labor agreement constraints in effect that governed the wages paid to full-time operators during the year **1996**.

- a) Premium pay (pay that is over and above the straight time pay). In the year **1996**, what (if any) was the *rate of scheduled overtime premium* (that is, the bonus above straight time pay for hours scheduled and worked in excess of a specified number of hours per day or per week).

_____, effective above ____ hours per ____.

- b) In the year **1996**, what (if any) was the *rate of unscheduled overtime premium* (that is, the bonus above straight-time pay for hours not scheduled and worked in excess of a specified number of hours per day or per week). This includes overtime resulting from an employee working on his/her scheduled day off. If yes, please detail below.

APPENDIX B. CRA SURVEY OF BUS OPERATORS

- c) In the year **1996**, was the agency required to guarantee some element of pay for full-time operators? If yes, please detail below.

- d) In the year **1996**, was the agency required to pay tripper premiums (that is, a premium for allocating to a full-time operator two or more schedules with less than a specified break between trips)? If yes, please detail below.

- e) What are the rules and restrictions involving split runs? Specifically, in the year **1996**, what (if any) *spread-time premium* – that is, a bonus above straight-time pay for hours worked after a specified number of hours from the start of the operator's day – was the agency required to pay?

- f) What were the restrictions (if any) on your agency in the allocation of schedules to full-time operators with respect to the *length* and *duration* of split runs?

- g) In the year 1996, was the agency required to allocate to full-time operators any minimum percent of straight runs?

- h) In the year **1996**, was the agency required to pay an *intervening pay premium* in any circumstances? If so, describe the circumstances and the premium.

APPENDIX B. CRA SURVEY OF BUS OPERATORS

- i) In the year **1996**, were full-time operators able to accumulate pyramiding premiums – that is, was it possible for an operator to collect more than premium for a period of work, such as an overtime premium, as well as a spread-time period for the same shift? Please describe the rules that applied.
-
-

12. Please fill out the following for the year **1996**. Please include information for both full-time and part - time operators.

Line No.	Time Classification	Amount Spent	
		Dollars	Hours
1.	Operating Time	_____	_____
1a.	Report, turn-in time, breaks and allowances	_____	_____
1b.	Platform time – line service	_____	_____
1c.	Platform time – charter and special	_____	_____
1d.	Travel and intervening time	_____	_____
1e.	Minimum guarantee time – call out, daily, weekly	_____	_____
1f.	Overtime premium – scheduled & unscheduled	_____	_____
1g.	Spread time premium	_____	_____
1h.	Other operating time	_____	_____
1i.	Total operating time	_____	_____
2.	Non-operating paid work time	_____	_____
2a.	Stand-by time	_____	_____
2b.	Other non-operating paid work time	_____	_____
2c.	Total operating and non-operating time	_____	_____

APPENDIX B. CRA SURVEY OF BUS OPERATORS

13. Name of person filling out the survey: _____.

Job title: _____.

Phone number (beginning with area code): _____.

Appendix C. Cross Sectional Analysis of PTO Cost Savings

THE MODEL

The aim of this analysis was to estimate the impact of PTOs by examining data from a cross section of transit agencies employing differing proportions of part-time labor. But operating cost is influenced by many factors other than the proportion of PTOs, so we must build a general model of operating cost that incorporates these other factors so we can take their effects into account and hold their influence constant.

Then we use the model to estimate the effect of changing the level of PTOs while holding constant the effects of the other factors. The dependent variable in the regression equation will be Operating Cost per Bus Hour. The explanatory variables will include the proportion of PTOs at each agency as well as all the other measurable factors expected to influence operating costs. The size, sign, and significance of the PTO regression coefficient indicate the importance of PTOs, holding all the other factors constant.

We now present the variables and specifications used to estimate our cost model.

DRIVER COSTS

Given that we are measuring direct operating costs, the major explanatory factor will be the wages and fringe benefits paid to drivers. Fringes are nearly proportional to wage rates, so to simplify, we will concentrate on the wage variable.

$$\text{Driver Cost} = \text{WageRate} \times \text{Driver Pay Hours}$$

The wage rate is primarily a function of the drivers' opportunity cost: what they would earn in an alternative job. We don't know that figure, but we can use the metropolitan area-specific median household income as a proxy for it. If the transit agency is located in an area where the median worker receives a high wage, then it will have to pay high wages to bid workers away from their alternative opportunities³².

The number of pay hours depends on the number of vehicle hours driven and on the pay-efficiency of the schedule. Pay-efficiency is the ratio of pay-hours to driving hours (platform hours) — the "pay/platform" ratio.

$$\text{Driver Pay Hours} = \text{Vehicle Hours} \times \text{Pay/Platform ratio}$$

³²This data is taken from US Census Bureau (1994), *County and City Data Book*, Washington, DC: US Department of Commerce.

APPENDIX C. CROSS SECTIONAL ANALYSIS OF PTO COST SAVINGS

Vehicle Hours depend upon the amount of bus service in a schedule. The pay/platform ratio summarizes the overall schedule efficiency. It rises if the peak/base ratio is high because there will be more split shifts, more instances where drivers receive 8 hours pay for short days, and so on. It also rises if the work rules at the agency are strict, because premium pay kicks in after shorter spread times, or schedulers have less flexibility in cutting driver runs. The pay/platform ratio is expected to fall if a transit agency employs a higher percentage of PTOs, because PTOs reduce the need for split shifts, short days, and so on.

$$\text{Pay/platform} = f(\text{peak/base ratio, work rules, \% of PTOs employed})$$

The National Transit Database gives peak/base ratios and the number of PTOs and FTOs. (It would be somewhat better to use a ratio of PTO hours, rather than a ratio of PTO drivers, but that data is not available at the time of this analysis.³³)

Unfortunately, we do not have any obvious way to measure the strictness of work rules at each agency. Furthermore, this is a highly important factor. For example one of our case study agencies has an unusually low pay/platform ratio (1.09) despite its medium-high peak/base ratio (1.5), and its tiny fraction of PTOs (3%). The explanation lies in their unusually permissive work rules. Their contract permits long maximum spread times and four-day ten-hour runs, and it pays travel time at only half the wage rate and it does not give spread premiums until the spread is quite long.

We assume that the principal determinant of the work rules is the negotiating power of the driver's union.

$$\text{Strictness of Work Rules} = f(\text{Union's negotiating power})$$

To a great extent, the union's negotiating power depends on a city's "transit dependence." If a large fraction of a city's commuters use transit, then a transit strike will have a major impact on congestion, causing serious consequence for all commuters, and hence serious public pressure to give in to the union. On the other hand a transit strike in a city where transit's modal share is low, will have only minor consequences, and will produce little public interest. So as a proxy measure of union negotiating power, we use "Percent of commute trips made via transit". That is,

$$\text{Strictness of Work Rules} = f(\text{transit mode share})$$

So we now have,

$$\text{Pay/platform} = f(\text{peak/base ratio, TransitModeShare, \% of PTOs})$$

³³It is our understanding that recent changes in the NTD database may provide the opportunity to obtain these data in the future.

APPENDIX C. CROSS SECTIONAL ANALYSIS OF PTO COST SAVINGS

An increase in the first two terms will cause an increase in the Pay/platform ratio, while an increase in PTOs will cause a decrease. So instead of using %PTOs in the model, we use its complement, %FTOs. Now Pay/platform is an increasing function of any of the three terms:

$$\text{Pay/platform} = f(\text{peak/base ratio}, \text{TransitModeShare}, \% \text{ of FTOs})$$

We also need to consider the interactions among these three variables. For example, a change in the proportion of FTOs will have a much bigger impact if the peak/base ratio is 1.9 than if it is 1.2. Or a change in the proportion of FTOs will have a much bigger impact if the work rules are strict than if they are loose. Thus, we cannot use a simple linear additive form. Rather we must include these variables in multiplicative form to calculate the implied number of pay-hours. That is,

$$\text{Pay/platform} = f(P/B \times \text{TransitModeShare} \times \% \text{FTO})$$

Now, what about the exact form of this variable? For each of the three terms in the interaction, is their effect linear or non-linear? For example, we know that the proportion of FTOs has a non-linear effect: when adding PTOs to the run schedule you put the first ones into the runs that have the highest pay/platform ratio, then the next PTOs go to the runs with the next highest pay/platform ratio, and so on. So each additional increment of PTOs produces less and less cost savings. You don't save twice as much by having 20 percent PTOs as you do by having 10 percent PTOs. To model a decreasing incremental effect we will use %FTOs squared. (Since the values are less than 1.0, squaring them makes them smaller: and successive changes in %FTO have less and less effect.)

And we would also expect TransitModeShare to have a non-linear effect. An increase from, say, 15 percent transit mode share to 30 percent will not double the public pressure to settle a strike. Given the near-saturation of the highway system, the chaos caused by pushing 15 percent of the commuters onto the street is already sufficient to generate plenty of public pressure. So we will model this term with a square root transformation. For the peak/base ratio we will use a simple linear form.

The interaction of these three terms (P/B, mode share, %FTO) determines the efficiency of labor use at a transit agency. This gets multiplied by the number of vehicle-hours scheduled to determine total labor hours, and then gets multiplied by the opportunity cost of labor to determine the total driver wage cost. That is, both vehicle-hours and opportunity cost will enter in a multiplicative linear fashion. So we have,

$$\text{Driver Cost} = f(\text{MedianIncome} \times \text{VehicleHours} \times \text{Peak/Base} \times \text{square root}(\text{TransitModeShare}) \times \% \text{FTO}^2)$$

Local Cost Level

The operating costs at a transit agency are obviously a function of more than Driver Costs. We need to include a term that measures the general cost level in the city where an agency operates. We use Median Household Income as a proxy for this general cost level. Thus we have:

$$\text{Local Cost Level} = f(\text{Median Household Income})$$

Management Incentive

Our society has decided to subsidize transit agencies for a variety of planning and welfare reasons. However such subsidies may in turn affect the costs they are meant to alleviate. In particular, economic theory says that such subsidies might reduce management's incentives to keep costs down, and there is empirical evidence to support that³⁴. To allow for this possibility in our own analysis, we include two subsidy measures in the equation: 1) Discretionary subsidies -- a measure of the proportion of operating expenses that are covered by the subsidies that are given at the discretion of state and local governments. 2) Management-Controlled subsidies -- a measure of the proportion of operating expenses that are covered from taxes or tolls that are under the control of the transit agency itself. Theory suggests that Management-Controlled subsidies may have a larger effect on costs since they are under management control and hence can be "counted on." Discretionary subsidies, by contract, are given at the discretion of government leaders and hence do not form a reliable basis for financing cost increases. Thus we have:

$$\text{Management Incentives} = f(\text{Discretionary Subsidies, Management-Controlled Subsidies})^{35}$$

Scale Effects

In many kinds of business, cost per unit changes as the size of the business expands, and it is reasonable to check for such an effect in the transit industry as well. Our measure of size is the number of buses used, and we will test to see the shape and sign of this effect.

³⁴See, for example Pucher, John, Markstedt, Anders, and Hirshman, Ira (1983), "Impacts of Subsidies on the Costs of Urban Public Transport," *Journal of Transport Economics and Policy* 17, no. 2, pp. 155–76.

³⁵Discretionary Subsidies are computed as the sum of state and local subsidies: National Transit Data Base Form 203, page 2, row 44 of column e. Management-Controlled Subsidies are computed as the sum of rows 18 to 24 of Form 203, page 1. Each form of subsidy is then converted into a percentage by dividing it by total operating funds, from all sources, row 41 of page 2.

APPENDIX C. CROSS SECTIONAL ANALYSIS OF PTO COST SAVINGS

THE DATA

We use 1997 data from the National Transit Database collected by the Federal Transit Administration. We screened out transit agencies that had Peak/Base ratios greater than 3.2, that had more than 60 percent PTOs, or that operated heavy rail transit systems. Such agencies are highly atypical, and their extreme values might bias the regressions. We also screened out those agencies that had incomplete data. We ended up with 255 agencies in the sample. These agencies range from 3 to 1,551 buses in maximum service. We would normally expect to find substantial operational differences between the large and small agencies so we split the sample to examine them separately.

Tables C-1 and C-2 report the average characteristics of the large and small transit agencies, using 100 buses and up as the dividing line. The peak/base ratios is 1.7 in the large agencies and 1.4 in the small ones. Transit's mode share is 11 percent in the cities where the large agencies operate and 3.5 percent in the cities where the small agencies operate. Household incomes are essentially equal in the two groups, and the percentage of PTOs used is similar: 10 percent in large agencies, 15 percent in small ones. Operating cost is \$35/hour in the large agencies and \$29 per hour in the small ones: this is the direct operating cost excluding expenses for maintenance or general administration. This cost definition is the one most relevant when explaining changes from PTOs.

Table C-1. Large Transit Agencies: 78 Cases

Variable	Average	Std Dev	Minimum	Maximum
TranModeShare	11.1%	14	.8%	53.4%
Peak/Base	1.7	0.48	0.97	3.14
OprtnCost/VH	\$31.4	7.0	\$20	\$48
MedianFamily\$	\$32,870	5,968	\$22,180	\$50,630
%FTO	0.90	0.10	0.52	1.00
#ofVehicles	296	456	104	1,551
%Dedicated\$	.163	.27	0	.844
%State/Local\$	.422	.26	0	.832

Transit Mode Share is entered as a percentage; the other percentage variables are entered as fractions of 100, thus .90 is 90 percent.

Operating Cost is the direct operating cost only, not including fuel/tires, maintenance, or general administration. This is the cost component that is most relevant to explaining the effects of adding PTOs to the labor force.

of vehicles is the maximum number of vehicles scheduled at the agency.

% Dedicated \$ is the proportion of total operating funds that come from taxes/tolls controlled by the transit agency itself.

% State/Local \$ is the proportion of total operating funds that come at the discretion of state and local governments.

APPENDIX C. CROSS SECTIONAL ANALYSIS OF PTO COST SAVINGS

Table C-2. Small Transit Agencies: 177 Cases

Variable	Average	Std Dev	Minimum	Maximum
TranModeShare	3.5	4	0.20	23.3
Peak/Base	1.43	0.44	0.88	2.88
OprtnCost/VH	\$25.0	6.4	\$11	\$50
MedianFamily\$	\$32,630	6,4281	9,910	50,680
%FTO	0.85	0.15	0.41	1.00
#ofVehicles	29	21	3	96
%Dedicated\$	.048	.15	0	.880
%State/Local\$	.531	.20	0	.930

Figures C-1 to C-7 show the frequency distributions of the major variables. With the exception of Figure C-4, the distributions are for the entire sample of 255 agencies.

THE REGRESSION ANALYSIS

We began that analysis by working with the sample of large transit agencies. Table C-3 reports the resulting regression model. All the variables were significant and with one exception, they had the expected signs. The equation explains 50% of the variance.

We had tried fitting both #ofVehicles and its square to check for the customary U-shaped cost curve. We found that only the linear term was significant, and furthermore it was positive. That is, rather than economies of scale, cost per vehicle increases as the transit agency becomes larger. For example, if an agency expands from 100 buses to 1,100 buses the expected cost increase is $1000 \times .00585 = \$5.85$ extra cost per vehicle hour.

The subsidy variables are quite interesting. For example, suppose an agency increases the proportion of its expenses that come from dedicated subsidies by 10 percentage points. The expected increase in operating costs is $0.1 \times 9.68 = 97$ cents per vehicle hour. Increases in State/Local subsidies produce an effect that is only about two-thirds as big. This result accords with theory: a transit agency is more likely to expand expenses when it has reliable income than when it has income that can change at the discretion of political actors outside the transit agency.

The effects of changing the PTO variable depend on the level of the other three variables in the interactive term. Figure 3 plots the estimated effects of increasing PTOs as a function of the peak/base ratio at a transit agency.

(To estimate the cost savings from use of PTOs, we use only the interaction term: plug in the median values for income, peak/base ratio, and mode share for the large transit agencies. Then

APPENDIX C. CROSS SECTIONAL ANALYSIS OF PTO COST SAVINGS

calculate the change in the size of the interaction term for a number of alternative values of the PTO variable.)

Table C-3. Regression Model for Large Agencies (78 Agencies: 104–1,551 Buses)

Variable	Regression Coefficient	"t" Ratio
\$*P/B*MS*FTO	.0000436	6.4
#ofVehicles	.00585	2.4
MedianFamily\$	.000130	2.0
%Dedicated\$	9.68	2.8
%State/Local\$	6.72	2.0
Constant	14.7	
R.Sq. = 0.499		
Standard Error of Estimate = 4.99		
$\$*P/B*MS*FTO: \text{MedianFamilyIncome} \times \text{Peak/Base ratio} \times \text{square root(TransitModeShare)} \times (\%FTOs)^2$		

We next estimated the same theoretical model for the sample of 177 small transit agencies. Table C-4 reports the results. All the variables were significant and the results were generally similar to those obtained in the large-agency regression model. Again there is no evidence of economies of scale, and again the dedicated subsidies produce a greater impact on cost than do the discretionary subsidies. The equation explains less of the variance, 28 percent compared to 50 percent at the large agencies. We believe this occurs because of the much greater diversity in operations at the small agencies, many of which operate fewer than 10 buses.

Table C-4. Regression Model for Small Agencies (177 Agencies: 3–96 Buses)

Variable	Regression Coefficient	"t" Ratio
\$*P/B*MS*FTO	.0000342	2.8
#ofVehicles	.0759	3.3
MedianFamily\$	.000173	2.7
%Dedicated\$	9.31	2.8
%State/Local\$	5.26	2.2
Constant	11.8	
R.Sq. = 0.276		
Standard Error of Estimate = 5.41		

Again, the interactive labor cost variable provides the best fit. Figure 4 plots the estimated effects of increasing PTOs as a function of the peak/base ratio at the transit agency.

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Figure C-1. Frequency Distribution — Peak/Base Ratio

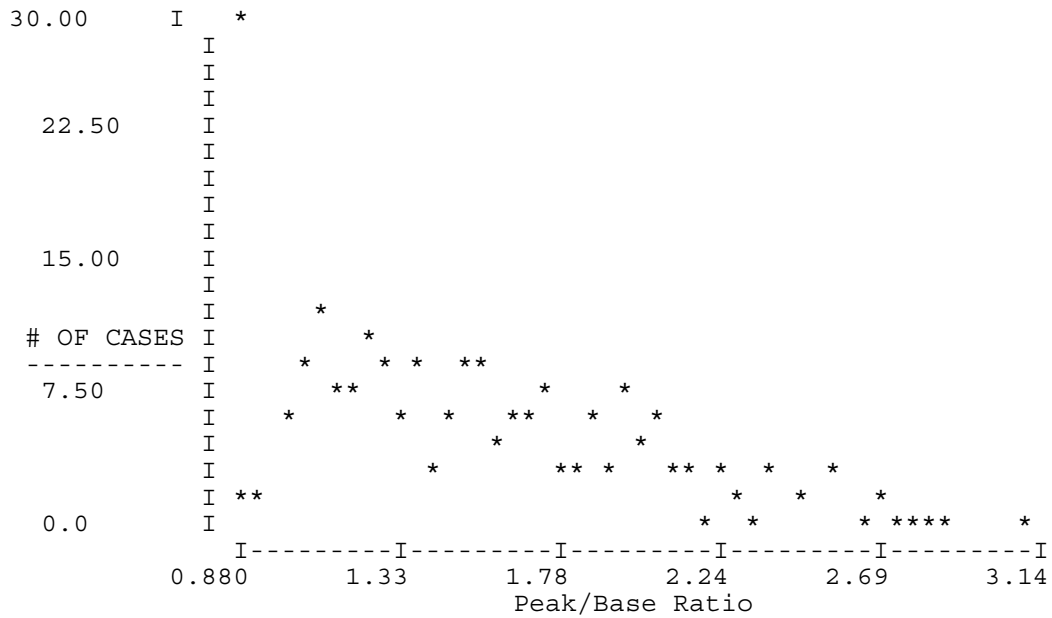
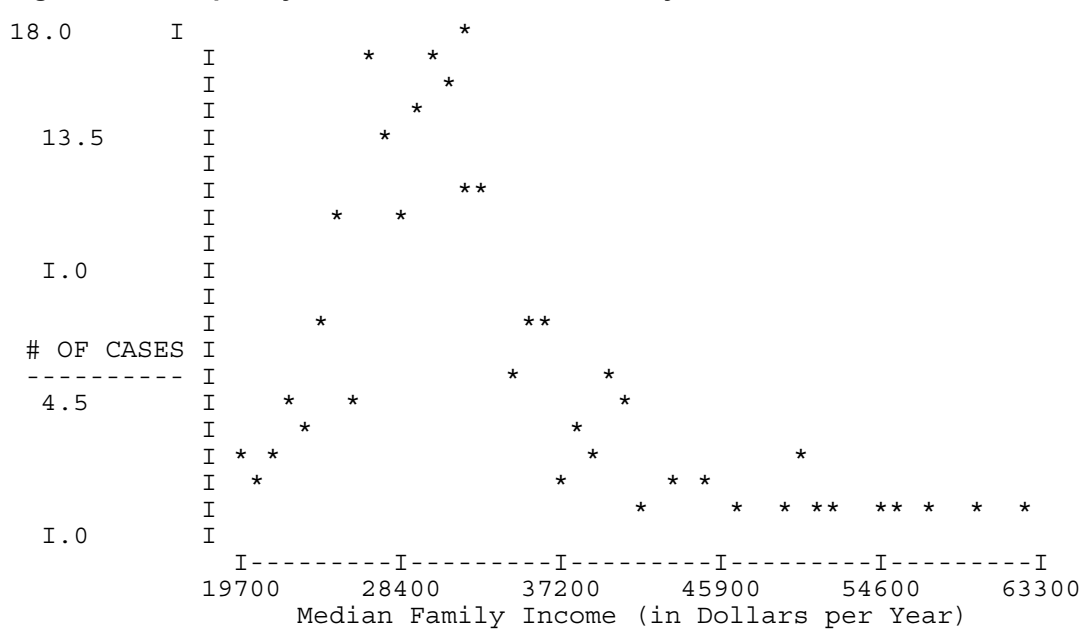


Figure C-2. Frequency Distribution — Median Family Income



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Figure C-5. Frequency Distribution—Transit Mode Share

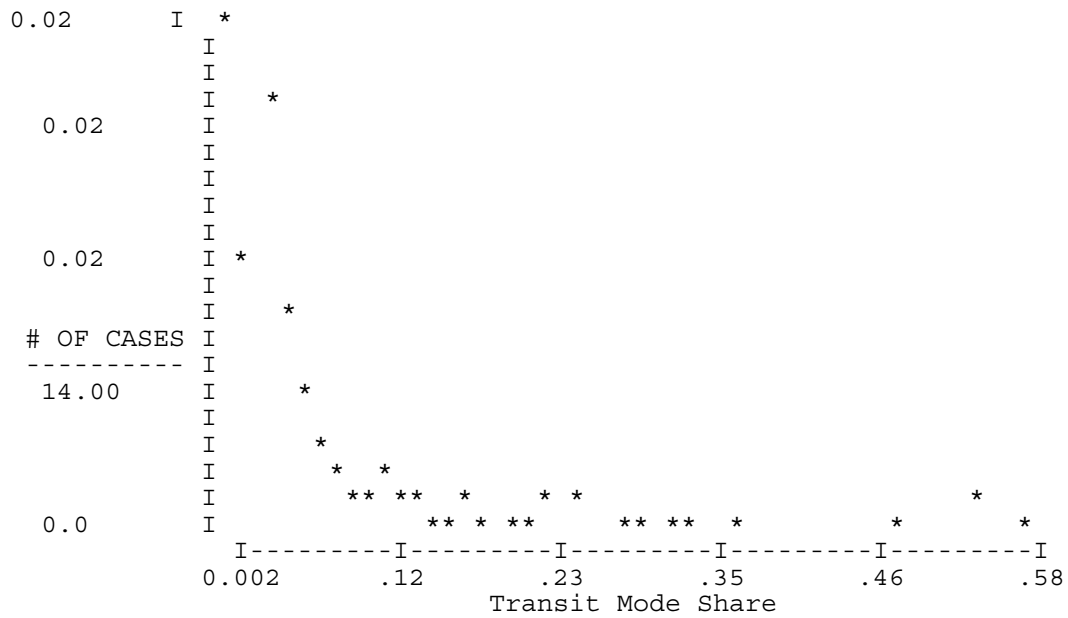
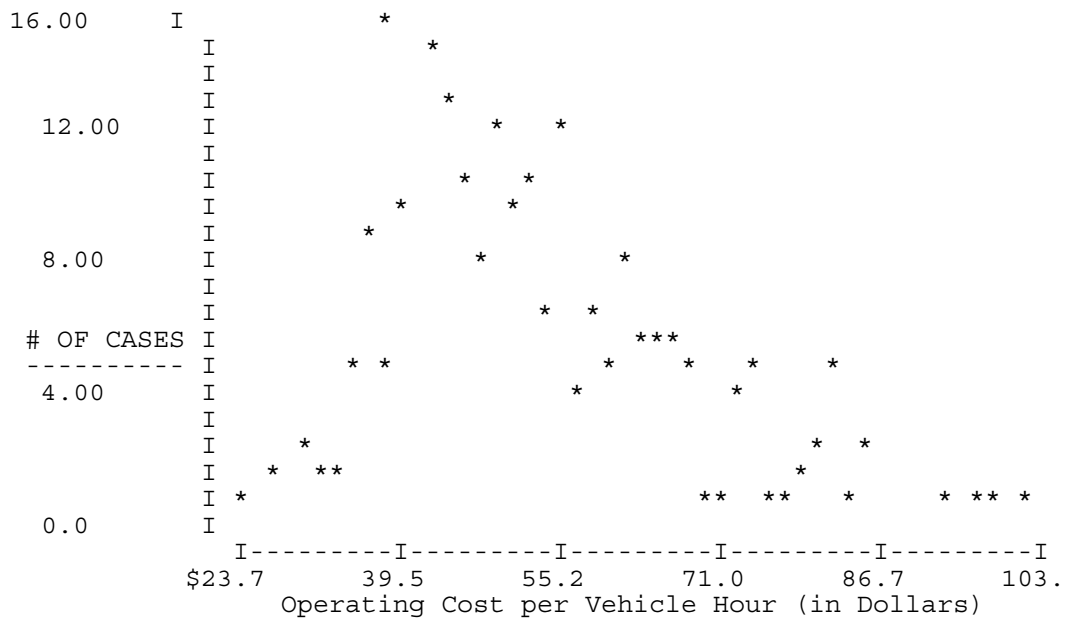
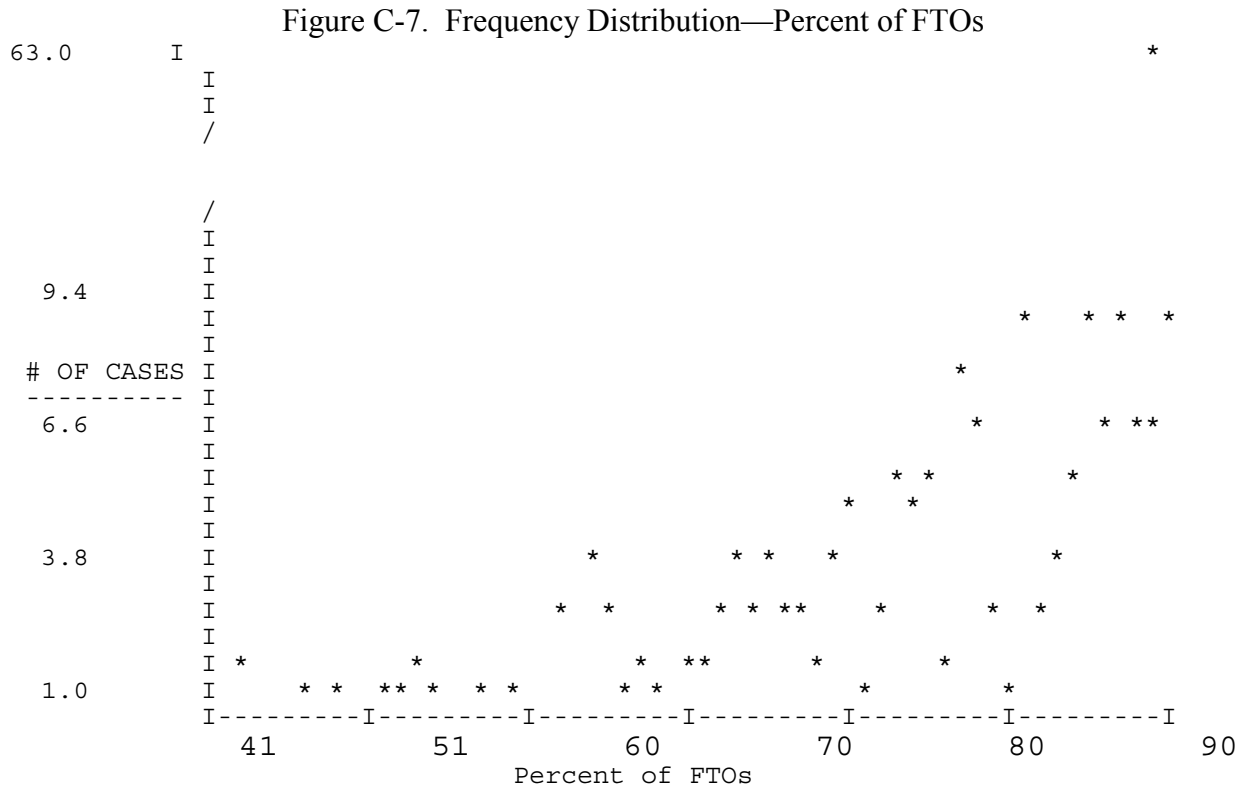


Figure C-6. Frequency Distribution—Operating Cost per Vehicle Hour



APPENDIX C. CROSS SECTIONAL ANALYSIS OF PTO COST SAVINGS



Appendix D. Part-Time Workers in the U.S. Economy

This chapter presents data on the number of part-time workers who would rather work full-time and the number and characteristics of workers who prefer part-time work. It also examines the evidence that there has been an increase since the 1980s in the number of involuntary part-time workers or of “contingent” workers, and more generally whether public unease about part-time work is justified. It concludes with a brief discussion of the implications of the August 1997 UPS strike for part-time transit work.

REASONS FOR WORKING PART-TIME

Working part-time is very common in the United States. During the average week in 1997, 30.7 million people reported that they worked less than 35 hours, the official government definition of part-time work.³⁶ This represents almost 24 percent of all people with jobs during the average week in 1997. Most people who work part-time do so because they take care of their children or other relatives, because they attend school or training programs, because they have retired from career jobs and prefer to work less than full-time, or for other personal reasons. Other people report in surveys that they have a regular full-time job, but worked less than usual during the survey week because they were on vacation, had a holiday, needed time off to care for children, or couldn’t work because of bad weather. Only a small percentage of all people who work part-time do so because they couldn’t find a full-time job or because their regular full-time employer temporarily put them on short hours.

Table D-1 presents information for 1997 from the Current Population Survey (CPS) on why people worked less than 35 hours during the week preceding the survey. Conducted each month by the Census Bureau for the Bureau of Labor Statistics, the CPS asks about 50,000 different respondents for information on the demographic and labor force characteristics of the members of their households. The vast majority of people who worked less than 35 hours (about 8 out of every ten part-timers) did so for personal reasons. About 8.5 million had full-time jobs but were temporarily working less than full-time because of “noneconomic reasons.” Of these, 4.2 million were on vacation or holiday. Another 3.6 million needed time off to care for their children (765,000) or for other personal reasons (2.8 million). Others lost work because of bad weather (635,000). These full-time workers appear in the statistics as working less than 35 hours, but they are not really continuing part-time workers.

³⁶See Hedges and Gallogly 1977 for a discussion of using 35 hours as the cut-off between full and part-time. Only 1.5 percent of workers reported that less than 35 hours was considered full-time work on their jobs. Furthermore, Hedges and Gallogly indicate that the characteristics of jobs with 30 to 34 hours per week were more similar to jobs with 25 to 29 hours than to jobs with 35 to 39 hours. Nardone (1995) finds that there has been no trend in the percentage of workers reporting 30 to 34 hours of work since the 1970s.

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Most of the remaining 22.2 million who worked less than 35 hours during the average week in 1997 usually had part-time jobs and chose to work part-time for noneconomic reasons. These 18.1 million “voluntary” part-time workers constituted 14 percent of the total workforce, and almost 82 percent of all part-time workers.³⁷ The largest group of these voluntary part-timers, 6.1 million constituting 27 percent of the part-time total, were students. Another 5.6 million, a quarter of all part-time workers, stayed home to care for children or other family members. An additional 1.9 million, or 8.4 percent, worked part-time because they were retired; another 705,000 (3.2 percent) worked part-time for health reasons; and 4 million (18 percent) worked part-time for unspecified noneconomic reasons.

³⁷They are voluntary in the sense that they and not their employers decided that they would work part-time. Many of them might have preferred to work full-time if they had access to reliable, inexpensive childcare or if they were in better health. See Presser, Harriet and Baldwin, Wendy (1980), “Child Care as a Constraint on Employment: Prevalence, Correlates, and Bearing on the Work and Fertility Nexus,” *American Journal of Sociology* 85, pp. 1202–13.

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Table D-1. Reasons for Working Part-Time During Survey Week, 1997 Annual Averages

	(000)	Percent of Total Part- Time Workers	Percent of Workforce
Usually part-time for noneconomic reasons	18,148	81.7%	14.0%
Childcare, other personal	5,555	25.0%	4.3%
Health	705	3.2%	0.5%
School, training	6,072	27.3%	4.7%
Retired	1,861	8.4%	1.4%
Other	3,955	17.8%	3.1%
Part-time for economic reasons	4,069	18.3%	3.1%
Usually full-time	1,407	6.3%	1.1%
Usually part-time	2,662	12.0%	2.1%
Usually full-time, less than 35 hours for noneconomic reasons	8,516		
Vacation, holiday	4,179		
Childcare, other personal	765		
Weather	635		
School, training	88		
Other	2,849		
TOTAL < working less than 35 hours per week	30,733		
TOTAL "part-time"	22,217		
TOTAL workforce	129,527	100%	

Source: Employment and Earnings, vol. 45, no. 1, January 1998.

Finally, 4.1 million people, constituting 3.2 percent of the workforce, worked part-time involuntarily, or as the CPS characterizes it, "for economic reasons." Of these, 1.4 million (1.1 percent of the workforce and 6.3 percent of part-time workers) usually had full-time jobs but were temporarily working part-time because their employers put them on partial layoff. An additional 2.7 million workers (2.1 percent of the workforce and 12 percent of part-time workers) wanted full-time jobs but could only find part-time work. These involuntary part-time workers may be a small percentage of all part-timers, but they are a substantial addition to the 6.7 million workers recorded as unemployed during the average week of 1997. Even in a year with the lowest unemployment rate in 27 years, underemployment continues to be a significant problem.

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Nonetheless, it is important to remember that over 80 percent of part-time workers in 1997 chose to work less than 35 hours a week because they were busy doing something else with the rest of their time – going to school, taking care of their children, or enjoying their retirement. Many of these people would possibly be potential candidates for part-time transit operating positions. These positions require good health, stamina, and low turnover, since inexperienced workers are not as safe as experienced operators. Therefore students, who in general are unlikely to remain in their part-time jobs after they complete their schooling, might not make good transit employees. People who work part-time because of poor health may also not meet the standards that transit agencies set to ensure public safety, and some older workers may be less likely to have the stamina for part-time transit jobs than prime-age workers. However, many of the 5.6 million people who worked part-time in 1997 in order to care for children or other family members, and some of the 1.9 million “retired” part-time workers, would possibly do well as part-time transit operators.

CHARACTERISTICS OF PART-TIME WORKERS

The age, sex, and marital status of voluntary part-time workers reflect their reasons for working less than 35 hours a week. As Table D-2 indicates, voluntary part-timers are much more likely to be teenagers or women and much less likely to be prime-age men than other workers are. In 1997, 22 percent of voluntary part-time workers were teenagers and another 14 percent were 20 to 24, compared with 5 and 10 percent of all workers in those age groups. Most of these young part-timers were students, though some of the women probably worked less than a full week in order to care for their children.

Table D-2. Age, Sex, and Marital Status of Voluntary Part-Time Workers, 1997 Annual Averages

	All Workers			Voluntary Part-Time		
	Total	Men	Women	Total	Men	Women
Total nonagricultural workers, 16+ years	100.0%	53.7%	46.3%	100.0%	30.1%	69.9%
16 to 19 years	5.1%	2.6%	2.5%	21.6%	9.9%	11.6%
20 to 24 years	9.7%	5.1%	4.6%	14.4%	5.7%	8.8%
25 to 54 years	73.3%	39.4%	33.9%	45.4%	7.2%	38.3%
55 years and over	11.9%	6.6%	5.3%	18.6%	7.4%	11.3%
Married, spouse present	57.8%	32.8%	25.0%	47.9%	9.3%	38.5%

Source: Employment and Earnings, vol. 45, no.1. January 1998, Table 22.

About 38 percent of voluntary part-time workers were prime age women (25 to 54). This is only slightly higher than their 34 percent share of total employment. By contrast, prime age men were

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only 7 percent of the voluntary workforce but 39 percent of all workers. Women over 55 were 11 percent of voluntary part-time workers but 5 percent of all workers. Men over 55 were 7.4 percent of part-timers, only slightly more than their 6.6 percent share of the total workforce.

These percentages suggest that most of the candidates for part-time jobs as transit operators are likely to be prime age women, and many of the rest will be older men. Most young people who voluntarily work part-time are students who will want full-time jobs when they finish their schooling, usually not in the same industries or occupations as their part-time jobs. Relatively few prime age men want part-time work, and a significant fraction of them may be in poor health and not suited for transit operating jobs.

CHANGES IN PART-TIME WORK SINCE THE 1950S

From the 1950s until 1970, the rate of voluntary part-time work rose sharply, as students, homemakers, and retirees looked for work that would fit with the other activities in their lives. As the number of youths rose following the postwar baby boom and the percentage of people in school in their late teens and early 20s rose, the number of people in these age groups looking for part-time work also rose. Women who in previous years would have stayed home to raise their children began looking for part-time jobs. With increased income from social security and private pensions, men in their 60s began to retire from their full-time career jobs in larger numbers and to seek part-time work. As a result of these shifts, the percentage of voluntary part-time work rose by more than half from the mid-1950s to the end of the 1960s.³⁸

Since then, the voluntary part-time work rate has been relatively stable. Prime age married women, including those with children at home, increasingly work full-time. The small decline in their rate of part-time work during the past two decades has been offset by increases in part-time work among older men who have retired from their career jobs but still want to work some hours each week.³⁹ As Figure D-1 shows, the rate of voluntary part-time work has stayed within a narrow band. The only exception was the increase between 1993 and 1994 that is more likely to be a statistical artifact than a real change. It resulted from the addition of questions to the CPS concerning the availability of part-time workers to accept full-time jobs. These changes in the survey produced an increase in the percentage of respondents judged to be working part-time for

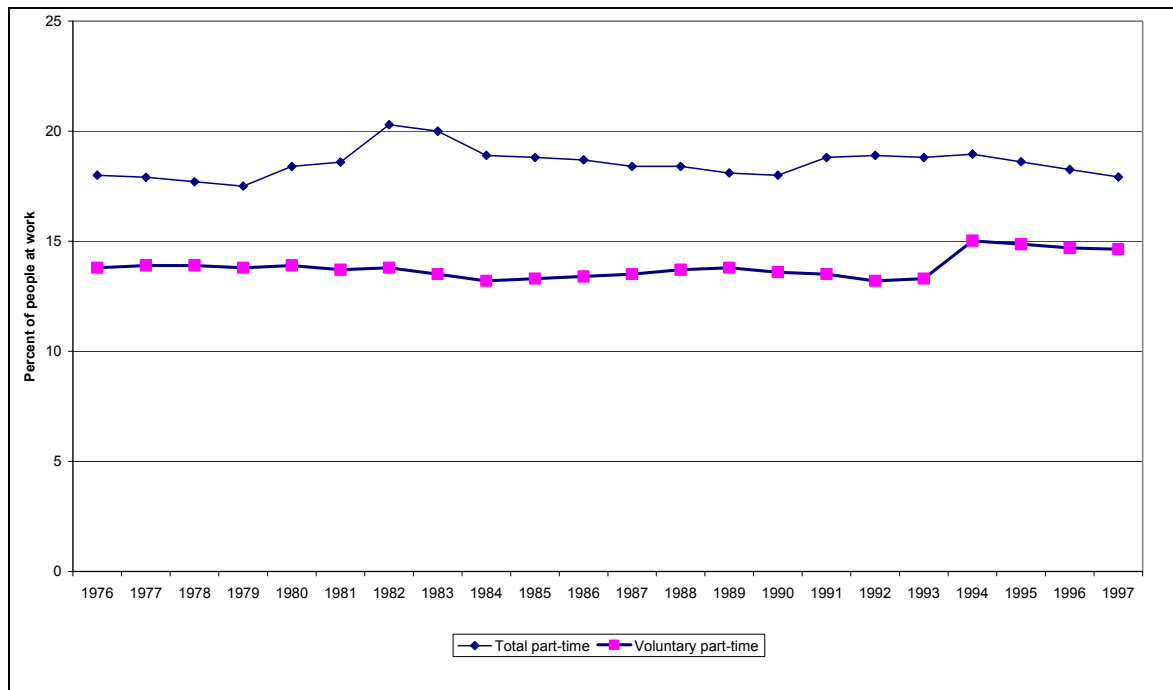
³⁸Deutermann, William and Brown, Scott (1978), "Voluntary Part-Time Workers: A Growing Part of the Labor Force," *Monthly Labor Review* 101, no. 6, pp. 3–10. See also Tilly, Chris (1996), *Half a Job: Bad and Good Part-Time Jobs in a Changing Labor Market*, Philadelphia PA: Temple University Press, ch. 2.

³⁹Table 2.3 in Tilly (1996) calculates rates of part-time work that would have existed if the rates for age-sex groups had remained constant between 1969 and 1993. He finds that increases in the rate of part-time work between 1969 and 1979 were due both to the shifting age-sex composition of the work force and to increasing part-time work within age-sex groups, but since 1979 all the increase has been due to within group changes in part-time work rates.

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voluntary (noneconomic) reasons, a decrease in involuntary part-time workers, and a small increase in the total percentage of respondents reported as working part-time.⁴⁰

Figure D-1. Trends in Part-time Work



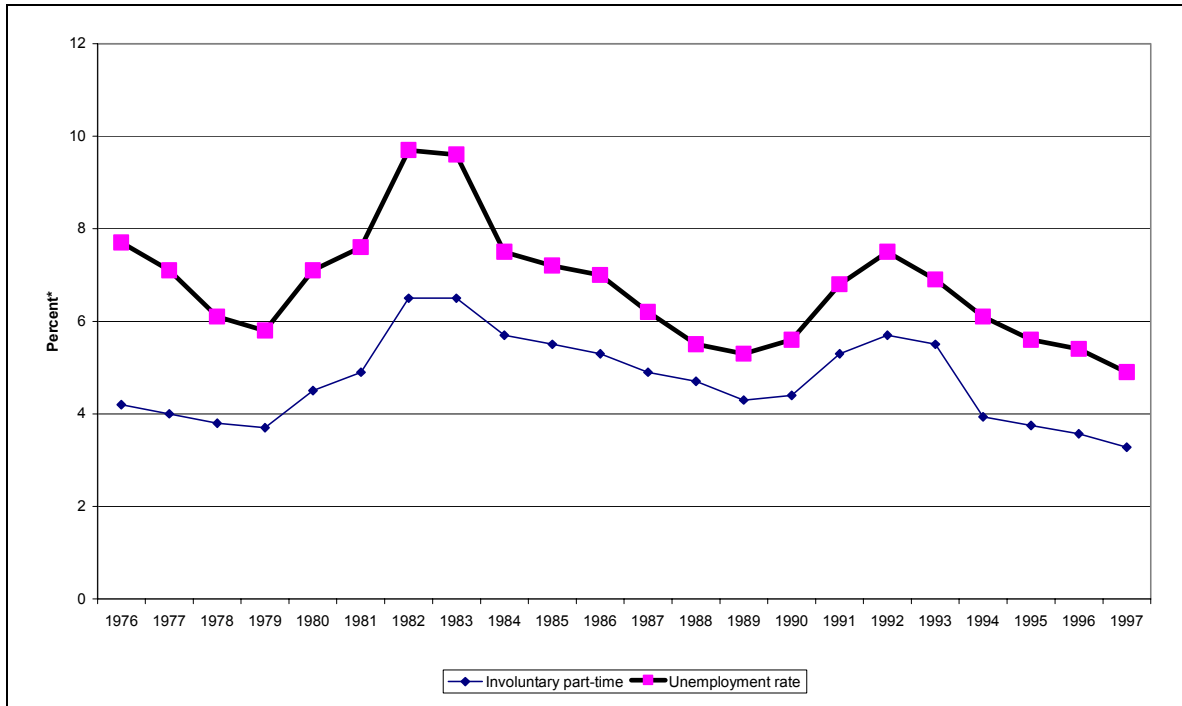
Source: Thomas Nardone (1995), "Part-time Employment: Reasons, Demographics, and Trends," *Journal of Labor Research*, 16, no. 3 pp. 275-92. Table 5. And *Employment and Earnings*. Various issues January 1990-98.

In contrast to the relative stability of voluntary part-time work, the rate of involuntary part-time work fluctuates with the unemployment rate. Figure D-2 shows fluctuations in these rates since 1976. During recessions, firms lay off some workers and put others on short hours, especially in highly cyclical industries like manufacturing and construction. Even in industries that are not cyclical, employers can take advantage of high unemployment by hiring part-time workers at lower cost in terms of wages and fringe benefits than they would have to pay full-time employees. In tight labor markets these employers might have difficulty finding enough part-time workers, but when unemployment is high people will accept such jobs rather than remain unemployed. Therefore the rate of involuntary part-time work rises with the unemployment rate in noncyclical industries like retail and wholesale trade as well as in highly cyclical manufacturing and construction.

⁴⁰Cohany, Sharon, Polivka, Anne, and Rothgeb, Jennifer (1994), "Revisions in the Current Population Survey Effective January 1994," *Employment and Earnings* 41, no. 2, pp. 13-37, explain these and other changes to the CPS and present tables with annual data for 1993 constructed from both the new survey and the old survey.

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Figure D-2. Involuntary Part-time and Unemployment Rates



*Involuntary part-time rate in percent of people at work. Unemployment rates in percent of the labor force.

Source. Thomas Nardone (1995), "Part-time Employment: Reasons, Demographics, and Trends," *Journal of Labor Research*, 16, no. 3 pp. 275-92 Table 5. And *Employment and Earnings*. Various issues January 1990-98.

At the end of the 1960s, when the unemployment rate was under 4 percent, the rate of involuntary part-time work was under 3 percent. As unemployment rose during the 1970s, so did the amount of involuntary part-time work. When the unemployment rate approached 10 percent during the deep recession in the early 1980s, the involuntary part-time rate rose to 6.5 percent. More recently, during the mild recession of the early 1990s, the unemployment rate went over 7 percent and involuntary part-time work climbed to 5.7 percent. Since then, as the unemployment rate fell under 5 percent in 1997, the involuntary PT work rate fell to 3 percent, its lowest level since the 1970s. Concerns in the early and mid-1990s that increasing numbers of workers were being forced into part-time work no longer seem well placed.

CAN PART-TIME JOBS BE GOOD JOBS?

Part-time jobs can be "good jobs," but often they are not. Numerous studies have found that part-time employees receive substantially lower hourly wage rates than full-time workers.⁴¹ Men

⁴¹See for example Tilly (1996); Averett, Susan and Hotchkiss, Julie (1996), "Discrimination in the Payment of Full-Time Wage Premiums," *Industrial and Labor Relations Review* 49, pp. 287-301; Ehrenberg, Ronald, Rosenberg, Pamela, and Li, Jeanne (1988), "Part-Time Employment in the United States," in *Employment, Unemployment, and*

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who work part-time receive just over half of what full-time male workers earn per hour, a percentage that has been stable for at least 25 years. Part-time female workers earn about 70 percent of the hourly wage of full-time female workers, a ratio that has declined by about 10 percentage points since the early 1970s as full-time women workers have moved towards equality with full-time men workers.

Some of the difference in hourly wages and fringe benefit coverage between full and part-time workers reflects differences in their characteristics. Part-time workers are more often women and students with less work experience than full-time workers, or semi-retired workers with many years of experience but perhaps fewer skills that are useful on their current jobs. However, even after adjusting for differences in education, age, experience, race, sex, and other personal characteristics, a wage gap of 10 to 30 percent between part-time and full-time workers persists. This gap exists for private sector workers and for federal government employees as well.⁴² In fact, a wage gap of 15 to 20 percent exists even for full and part-time jobs in the same workplace and the same occupation.⁴³

Part-time workers are also less likely to receive paid sick leave, paid vacation, pensions, or health insurance than full-time workers.⁴⁴ In 1992, 15 percent of part-time workers received health insurance through their employers, compared with 61 percent of full-time workers. However, 42 percent of voluntary part-time workers had health coverage through another family member and another 28 percent were covered in other ways. Only 15 percent of voluntary part-time workers had no health insurance, versus 16 percent of full-time workers and 38 percent of involuntary part-time workers.⁴⁵ The involuntary part-timers are much less likely to be covered under the health plans of other family members than are voluntary part-timers. Evidently, people who work part-time voluntarily are as successful as full-time workers in finding health insurance, but people who work part-time because they are unable to find full-time jobs are much less likely to find health insurance.

Part-time workers are also much less likely than full-time workers to participate in an employer-provided pension plan. In 1992, 58 percent of full-time workers were employed by firms that had pension plans, and 48 percent of these workers participated in these plans. By contrast, 30 percent of part-time workers were employed by firms that had pension plans, and only 11 percent

Labor Utilization, ed. Robert Hart, Boston MA: Unwin, pp. 256–87; Hotchkiss, Julie (1991), “The Definition of Part-Time Employment: A Switching Regression Model with Unknown Sample Selection,” *International Economic Review* 32, pp. 899–917; and Owen, John (1979), *Working Hours: An Economic Analysis*, Lexington MA: Lexington Books.

⁴²Lewis, Gregory (1998), “Part-Time Employment in the Federal Service: Do the Benefits Outweigh the Costs?” *American Review of Public Administration* 28, no. 1, pp. 61–74.

⁴³Lettau, Michael (1994), “Compensation in Part-Time Jobs versus Full-Time Jobs: What If the Job Is the Same?” Research Paper 260, Washington DC: US Department of Labor, Bureau of Labor Statistics.

⁴⁴Ichniowski, Bernard and Preston, Anne (1985), “New Trends in Part-Time Employment,” *Proceedings of the 38th Meeting of the Industrial Relations Research Association*, pp. 60–71.

⁴⁵Snider, Sarah (1995), “Characteristics of the Part-Time Work Force and Part-Time Employee Participation in Health and Pension Benefits,” *Journal of Labor Research* 16, no. 3, pp. 239–48.

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of part-timers actually participated in their employers' plans.⁴⁶ Part-time workers were more likely than full-time workers to work for small firms, which are less likely to offer pension plans to their employees than large firms. They were also less likely than full-time workers to meet the requirements for participating in pension plans even when such plans did exist.

Not only do most part-time jobs pay less and provide fewer fringe benefits than full-time jobs, but many of them also offer less training and less possibility of advancement.⁴⁷ Workers in these jobs understand that they are paid less than full-time workers, that they are gaining minimal skills with increased experience, and that they are unlikely to be promoted in these dead-end jobs. As a result, they frequently do not remain in these positions for very long. Turnover rates in many part-time positions are very high.⁴⁸

Employers that offer their part-time workers low wages, few fringes, and little training have calculated that what they save on compensation outweighs the cost of hiring a steady stream of new employees. Presumably, they could reduce their turnover by raising compensation, increasing training, and including the part-time workers in the career ladders of their firms. But the increased cost of this approach compared to the benefits of lower turnover among part-time workers is evidently too great.

Part-time jobs do not have to be dead-end, secondary jobs with low pay and no future. They can be, in Tilly's words, "retention" jobs. A minority of employers provide full fringe benefits to their part-time workers,⁴⁹ and others pay the same wage rate to part-time and full-time employees in the same or comparable positions. An intriguing anomaly in the general pattern that part-time workers earn less per hour than full-time workers is the finding of one study that, controlling for their decision of how many hours to work, women in professional and managerial occupations who chose to work part-time earned more per hour than women in those occupations who chose to work full-time.⁵⁰ This suggests that some firms may be willing to pay extra and make special accommodations in working hours for particularly valuable employees who want to combine careers with raising a family.

When employers offer decent pay, fringe benefits, and training to their part-time workers, these employees respond by staying on the job longer. One study of turnover rates in the 1980s found that the average tenure of part-time workers on their current job was 3.4 years, compared with 5.7 years for the average full-time woman and 8.1 years for the average full-time man.⁵¹ Since a large fraction of part-time workers stay on their jobs only briefly, many others, especially those in

⁴⁶Snider 1995.

⁴⁷See Tilly 1996 for case studies and a discussion of secondary part-time jobs.

⁴⁸Tilly (1996, pp. 59–60) cites examples of retail employers with turnover rates for part-time workers that were three times the rates for their full-time workers

⁴⁹Levine, Hermine Zagat (1987), "Alternative Work Schedules: Do They Meet Workforce Needs?" *Personnel* 64, no. 2, pp. 57–62.

⁵⁰Blank, Rebecca (1990), "Are Part-Time Jobs Bad Jobs?" in *A Future of Lousy Jobs*, ed. Gary Burtless, Washington DC: Brookings Institution, pp. 123–64.

⁵¹Rebitzer, James (1987), "The Demand for Part-Time Workers: Theory, Evidence, and Policy Implications" (mimeo). Cited in Tilly (1996).

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“good” part-time retention positions, must have turnover rates that are comparable to those of full-time workers.

The lessons from a large number of studies seem clear. Although many part-time jobs pay poorly and have high turnover, not all do. Paying a competitive wage, providing fringe benefits, and offering job security will attract an ample supply of workers who want part-time jobs and who will have low quit rates. Part-time jobs don’t have to be “bad jobs.”

CONTINGENT WORKERS AND PART-TIME WORKERS

Related to the public concern over part-time workers is a concern for other types of “contingent” workers who have only a tenuous connection to the firms where they work. Concern for them arises because of the belief that they have little or no job security, few fringe benefits, and lower pay than regular workers.⁵² A large fraction of contingent workers are part-timers, though most are not. Some groups of contingent workers have increased dramatically in size over the past two decades, while other groups have grown about as fast as the total workforce.

There are several ways of defining contingent workers.⁵³ One is based on the nature of the work arrangement. Under this approach, employees of temporary personnel supply firms who are sent to the workplaces of other firms, usually on a short-term basis, are perhaps the most conspicuous type of contingent worker. According the CPS, there were about 1.3 million such workers in February 1997. Other contingent workers included 2 million who were on-call. These workers have no guarantees of steady work but are called by their employers only as needed. In addition, 809,000 contract workers were employed by one firm but worked at the worksite of another firm, often on long-term contracts. Finally, 8.5 million independent contractors who are self-employed are sometimes classified as contingent workers.⁵⁴

Another approach, also used by the CPS, is to ask employees if they have had their current jobs less than one year and if they expect that their jobs will last less than one year into the future. Alternative definitions based on this approach also include self-employed independent contractors if they have been self-employed for less than a year, and employees who have had their current jobs for more than a year but who expect their jobs to disappear at some point in the future. Estimates of the number of contingent workers under these definitions ranged from 2.4 million to 5.6 million in February 1997.

Different groups of contingent workers have very different characteristics, different compensation, and different attitudes about their working arrangements. As Table D-3 indicates, two thirds of independent contractors were men, but men constitute only 49 percent of on-call

⁵²See for example Bellous, Richard (1987), *The Contingent Economy: The Growth of the Temporary, Part-Time, and Subcontracted Workforce*, Washington DC: National Planning Association.

⁵³See Plovica, Anne E. and Stewart, Jay (1996), “Contingent and Alternative Work Arrangements, Defined,” *Monthly Labor Review* 119, no. 10, pp. 3–10.

⁵⁴“Contingent and Alternative Employment Arrangements, February 1997,” US Bureau of Labor Statistics, [ftp://ftp.bls.gov/pub/news.release/History/conemp.020398.news](http://ftp.bls.gov/pub/news.release/History/conemp.020398.news) (link confirmed August 28, 2000).

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workers and 45 percent of temporary workers. Almost 58 percent of independent contractors were 35 to 54 years old, compared with 40 percent of on-call workers and 38 percent of temp workers. Less than 22 percent of independent contractors were under 35, compared with 44 percent of on-call workers and 53 percent of temp workers. About 74 percent of contract workers were full-time, as were 80 percent of temp workers, 83 percent of contract workers, and 82 percent of workers who had traditional arrangements with their employers, but for on-call workers the figure was 47 percent.

Table D-3. Contingent Workers, February 1997

	Independent Contractors	On-Call Workers	Temporary Workers	Contract Workers	Regular Workers
Number (000)	8,456	1,996	1,300	809	114,119
Age (%)					
16-24	3.2	21.5	22.6	10.0	14.8
25-34	18.3	22.5	30.3	34.2	25.4
35-54	57.6	39.8	37.7	45.3	48.1
55+	20.9	16.2	9.5	11.7	11.7
Men	66.6	49.0	44.7	69.8	52.7
Women	33.4	51.0	55.3	30.2	47.3
Full-time	73.6	47.4	80.3	82.8	82.3
Part-time	26.4	52.6	19.7	17.2	17.7
Preference					
Traditional Arrangement	9.3%	50.0%	59.2%	--	--
Current Arrangement	83.6%	40.0%	33.5%	--	--
It Depends	7.1%	10.0%	7.3%	--	--
Covered by					
Health Insurance	72.7%	67.3%	46.4%	81.7%	82.8%
Employer's HI	NA	19.6%	7.0%	50.2%	57.5%
Employer's Pension		19.2%	3.7%	35.7%	46.9%
Median Weekly Earnings (\$) (Full-Time Workers)					
Men	\$592	\$508	\$385	\$685	\$578
Women	\$400	\$286	\$305	\$439	\$450
Total	\$523	\$432	\$329	\$619	\$510

Source: Bureau of Labor Statistics, "Contingent and Alternative Employment Arrangements, February 1997" <http://ftp.bls.gov/pub/news.release/History/conemp.020398.news> (link confirmed August 28, 2000).

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The pay and fringe benefits of the different types of contingent workers reflect their experience and sex, as well as the desirability of their working arrangements. Table D-3 presents median weekly earnings of full-time workers. Most striking, perhaps, is that the percentage difference between men and women is greater for contingent workers than it is for regular workers, with the exception of temp workers. Regular male workers earn 28 percent more than women, but male independent contractors and contract workers earn almost 50 percent more, and male on-call workers earn 78 percent more. There are also very large differences among different types of contingent workers. Temps and on-call workers earn considerably less than independent contractors and contract workers, who earn more than regular workers.

Almost 73 percent of independent contractors were covered by health insurance, compared with 67 percent of on-call workers, 46 percent of temp workers, 82 percent of contract workers, and 83 percent of workers with traditional arrangements. However, only 20 percent of on-call workers and 7 percent of temp workers received health insurance from their own employers, and far smaller percentages of on-call and temp workers participated in pension plans than did other groups of workers.

Not surprisingly, in light of their earnings and fringe benefits, over 8 out of 10 independent contractors said that they preferred their current arrangements to a more traditional relationship with an employer, and only one in ten said they wanted a traditional arrangement. By contrast, half of on-call workers and 59 percent of temp workers wanted traditional arrangements and only 40 percent and 34 percent respectively preferred the arrangements they currently had. Contingent workers act on their preferences. One year after the survey in which they expressed their attitudes toward contingent and traditional working arrangements, 50 percent of temp workers had found traditional jobs, another 14 percent had dropped out of the labor force, 6 percent were unemployed, and 30 percent were still temp workers. By contrast, 85 percent of independent contractors were still independent contractors a year later.⁵⁵

Since the early 1970s, the number of temp workers has increased dramatically, from slightly over 100,000 to about 1.3 million in 1997. However, the number of independent contractors has grown at about the same rate as the total workforce. There has undoubtedly been an increase in jobs “contracted out” since the 1970s, though the data required to construct information on trends are not available.

PART-TIME WORKERS AND THE UPS STRIKE

Notwithstanding the evidence that the great majority of part-timers in the U.S. economy are not looking for full-time employment, the general public appears to be suspicious of part-time job arrangements. How this public suspicion may influence collective bargaining is well illustrated

⁵⁵Segal, Lewis (1996), “Flexible Employment: Composition and Trends,” *Journal of Labor Research* 17, no. 4, pp. 525–42.

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by the 15-day national strike of the International Brotherhood of Teamsters against the United Parcel Service of America (UPS) in August 1997.

Although there were several issues in the strike, the union successfully transformed the conflict into one “about part-time jobs and half-time pay,” and won almost all of its demands.⁵⁶ Several factors contributed to the union’s victory, including high UPS profits, UPS’s concern that it would lose customers to its competitors in a long strike, and perhaps the company’s inexperience in bargaining. However, widespread public support for the Teamsters was also very important in the company’s decision to give in to union demands. Polls showed strong public backing for the union.⁵⁷ Fair treatment of part-time workers strikes an emotional chord among many Americans and the public perception was that UPS treated its part-time workers unfairly.

Before the strike began, UPS’s part-time workers were eligible for health insurance, pensions, and other fringe benefits, and they were given priority in filling full-time positions. They were also paid higher wages than similar part-time employees of most other companies, including UPS’s main competitors. Nevertheless, the public perception during the strike was that UPS did not give its part-time workers an even deal. The starting wage was \$8 an hour for part-time work compared with more than \$14 an hour for full-time work though the nature of the mostly loading/unloading part-time jobs was different from the mainly driving oriented full-time jobs. Moreover, the starting wage rate for part-time workers had not been increased for 15 years.⁵⁸ The extremely high turnover among UPS workers also contributed to the public’s impression that UPS treated these workers as if they were expendable. By one estimate, out of 180,000 workers hired by UPS during 1996, only 40,000 remained with the firm at the time of the strike in August 1997.⁵⁹

Transit agencies are even more sensitive to public opinion than a privately held corporation whose customers are primarily other large businesses. The UPS strike might suggest that public opinion would be against increasing the number of part-time transit operating jobs. However, there are significant differences between the UPS situation with regard to part-time workers and the situation of local transit agencies.

Perhaps most important, many of the part-time UPS jobs involved loading and unloading trucks. “Physically, not many people could unload a trailer for eight hours a day. It’s also tough to work

⁵⁶AFL-CIO President John Sweeney, quoted in Schulz, John (1997a), “Digging In: Teamsters Gain \$10 Million Weekly Aid from AFL-CIO in Fight Against Beleaguered UPS,” *Traffic World*, August 18, 1997, pp. 10–14. Other issues in the UPS strike are not directly relevant to part-time work and transit agencies. The most important was UPS’s demand to withdraw from the Teamsters’ multi-employer pension funds and to set up a separate pension fund exclusively for its own employees. Such a withdrawal might ultimately have led to the collapse of these Teamster funds. Any Teamster leader who allowed withdrawals by UPS or other profitable companies would almost certainly have been defeated in the next union election. This UPS demand was therefore strongly opposed by the Teamster leadership, even though it might have benefited some Teamster members employed by UPS.

⁵⁷Schulz, John (1997b), “Many Winners, One Big Loser,” *Traffic World*, August 25, 1997, pp. 11–14.

⁵⁸John Schulz, August 25, 1997.

⁵⁹Kate Bronfenbrenner, director of labor education research at Cornell University, quoted in Krause, Kristin (1997), *Traffic World*, August 11, 1997, pp. 11–12.

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eight hours in a row at 4 a.m.”⁶⁰ The workers who filled these jobs were almost entirely prime-age men, many of whom might have preferred full-time jobs. UPS may only need workers to unload trucks for a few hours each day, but the types of workers it needs in these jobs often want full-time positions. In contrast, transit operating positions are far less strenuous and can be filled by women and older men who would not consider accepting jobs that required them to lift 70 pound packages for several hours straight. Transit agencies could fill their rush-hour operating jobs with workers who prefer part-time employment, even though UPS could not.

There are two lessons from the UPS strike for transit agencies interested in increasing part-time employment. First, part-time workers should not be treated as second class employees, and they should not be perceived as receiving second class treatment. Wage differentials with full-time workers in similar positions should be small. Part-time workers should receive pay raises along with the full-time workers. If turnover is high, the agency needs to examine the compensation or working conditions to correct the problem that is driving part-time workers away. Second, transit agencies should make every attempt to fill part-time positions with people who really want part-time work. Hiring people who view these positions as stepping stones to full-time work will only lead to disappointment, frustration, and conflict.

The advantages to transit agencies of using more part-time workers, and the advantages to many workers of finding well paid, secure part-time jobs as transit operators are too great to draw the wrong conclusions from the UPS strike. The conclusion is not that the public is against all part-time jobs and that all workers want full-time positions. The correct conclusion is that part-time workers should be treated fairly, compared to full-time workers in the same firm.

⁶⁰Mike Gallagher, labor-management consultant, quoted in Krause 1997.

Appendix E. An Experiment to Recruit Permanent PTOs

Seattle has always been one of the principal innovators with respect to use of part-time labor and it is no surprise that they have made an effort to deal directly with their PTO shortage. In February 1999 they put together a task force to develop methods for recruiting dedicated PTOs -- potential recruits who actually wanted part-time work. The task force contained members from operations, human resources (HR), marketing, and management information. They held focus group sessions with the base chiefs and HR personnel, and they reviewed the characteristics of existing PTOs to select the demographic groups most likely to want part-time work. They decided the most likely groups would be:

- Retirees — particularly men in the 45 to 64+ age brackets,
- Displaced homemakers — women in the 21 to 45 age bracket,
- Young adults, including students — men and women, 21 to 34.

They decided to pursue a number of recruitment efforts in parallel: radio and newspaper ads, inserts in bus stop information signs, ads on the customer-service voice messaging systems, and employment posters at customer-service sites. They added a full-time recruiter to visit job fairs, schools, and colleges; conduct workshops; and visit areas with heavy pedestrian traffic. And they also asked their existing employees to help by contacting likely candidates and referring them to Metro.

The advertising and direct recruitment efforts specified that Metro was looking for part-time operators, but there is no way to assure that these are the only people who will apply. When the applicants showed up for orientation, they were asked what kind of work they wanted: 11 percent wanted permanent part-time work, 17 percent wanted to work part-time for a least three years, 30 percent said they really wanted full-time work but were “willing to work part-time for a couple years,” and 41 percent said they wanted full-time work as soon as possible. (These were anonymous responses; names were not used because they would have biased the results since the applicants knew that Metro was looking for part-time operators.)

The questionnaire had some demographic data, and so it was possible to look at the responses by group characteristics. For each group we can compute the ratio “people wanting at least 3 years of PTO work” divided by “people who want full-time work as soon as possible.” Among those applicants who were retirees, the ratio is about 2.5 to 1, i.e., 2.5 times more wanted part-time work. Among those applicants who were students: the ratio is about 15 to 1. That is, the focus groups seem to have correctly identified the target populations of interest.

The questionnaire also asked the applicants how they had learned about the job. Table E-1 summarizes the information: 17 percent learned about the job via radio ads, 13 percent from transit ads, 13 percent from general word of mouth, 10 percent via the internet, 3 percent via job fairs, and 35 percent via referrals from existing Metro employees. Looking further at the kind of applicants brought in by each source, we see that some were more effective at finding potential PTOs. For

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example 42 percent of the applicants attracted by Radio ads wanted part-time work, compared to only 23 percent of those who came in because of Referrals. If we broaden the definition further and include those who want part-time work plus those willing to work part-time for “a couple of years,” 68 percent of those attracted by Radio ads either want part-time or are willing to do it, compared to 54 percent of those who came in via Referrals.

Table E-1. Effectiveness of Alternative Recruiting Channels. The Seattle Experience

Information Source	% of Applicants From That Source	% of that Source Who Want PT Work For At Least 3 Years	Those in Prior Column Plus Those Willing To Work PT For a “Couple of Years”	(Recruiting + Hiring + Training) Cost per Person in the Prior Column
Radio Ads	17%	42%	68%	\$10,156
Newspaper Ads	13%	29%	58%	\$10,144
Transit Ads	13%	35%	67%	\$3,259
Internet	10%	34%	63%	\$3,483
Job Fair	3%	24%	43%	\$5,999
Referral	35%	23%	54%	\$4,079
All sources	100%	28%	58%	\$3,788

Source: Study team analysis, 2000.

Advertising, screening applicants, and training them are expensive. If we look at the sum of these dollar costs divided by the PTO percentage attributable to each source we get the final column in the table. Even though Radio ads bring in the highest proportion of those wanting part-time work, the cost of the ads is sufficiently high that Radio advertising ends up as the most expensive way to recruit. If the goal is to get more operators who want part-time work (or who are willing to do it for a couple of years), it costs \$10,156 per trained operator to recruit via Radio ads. The most cost effective strategies are to use Transit ads, the Internet, and Referrals.

SUMMARY

The program is in its first year and already seems reasonably successful. Furthermore it seems likely that experience will lead to changes that permit more effective ad copy and more effective demographic targeting. But even under current numbers, the results of the experiment show that it is possible to find and recruit operators who are better suited to part-time work.

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Abbreviations used without definitions in TRB publications:

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ITE	Institute of Transportation Engineers
NCHRP	National Cooperative Highway Research Program
NCTRP	National Cooperative Transit Research and Development Program
NHTSA	National Highway Traffic Safety Administration
SAE	Society of Automotive Engineers
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
U.S.DOT	United States Department of Transportation

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