

Transit Privatization in Denver: Experience in the Second Year

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The performance of the Denver Regional Transportation District (RTD) and its contractors during the second year of privatization, July 1, 1990, through June 30, 1991, is described. Cost, profitability, safety, quality of service, and contractor compliance experience is updated from previously published results from the first year. In addition, new findings are discussed regarding the source of savings, maintenance inspections, and bus operator wages and turnover. On the basis of actual cost history, a short-term incremental analysis demonstrated a savings of \$2.5 million, or 12.5 percent. On a long-term fully allocated basis, the savings were estimated at 25.8 percent without depreciation and 31.0 percent with depreciation. The contractors' profitability was approximately 2.4 percent, measured as revenues over expenses. In terms of bodily injury and property damage accidents, on-time performance, maintenance reliability, and complaints and commendations, there was no consistent difference between the performance of RTD and that of the contractors. More than half of the savings in actual operating costs was due to the lower wages and fringe benefits paid by the contractors. Whereas the contractors experienced higher bus operator turnover as a result, there was no indication that safety and quality of service were affected. The contractors' rate of operator terminations for cause and resignation was similar to that of RTD. The contractors' lean maintenance staffing may be the cause of observed instances of maintenance deficiencies.

The performance of privatized transit services of the Denver Regional Transportation District (RTD) is documented for the period July 1, 1990, through June 30, 1991. It is based on a study prepared in response to a request by the State of Colorado Highway Legislation Review Committee (1).

Privatized transit services in the Denver region were significantly expanded in response to the provisions of Colorado Revised Statutes 32-9-119.5, as amended, specifically the provisions of Senate Bill 164 of 1988 and Senate Bill 8 of 1990 (hereinafter referred to as SB 164). SB 164 required that RTD contract at least 20 percent of its service to qualified private businesses in negotiated contracts.

This paper follows up portions of prior papers by Peskin et al. (2,3). It updates the cost, safety, and quality of service experience and the contractor compliance experience. The paper also addresses important new findings regarding the source of cost savings, vehicle maintenance, and operator wages and turnover.

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COMPARISON OF RTD'S NET IN-HOUSE COSTS OF PROVIDING TRANSIT SERVICE ON PRIVATIZED ROUTES WITH NET COST TO RTD OF PRIVATIZATION

Basis of Cost Comparison

The cost comparison involved two alternative approaches in order to provide a realistic range in which the eventual fiscal results of privatization will probably reside. This was accomplished through the estimation of incremental and fully allocated costs.

The purpose of incremental costing analysis was to identify near-term "bottom-line" effects of different management decisions, each resulting in alternative revenue and cost flows. This approach was addressed in the analysis in two ways:

- Administrative costs: the incremental analysis computed the actual reductions in such costs during the analysis period. The fully allocated analysis (described later) implied a theoretical reduction in administrative costs proportionate to the quantity of service privatized.
- Depreciation costs: the incremental analysis does not address the sunk capital-related costs for depreciation.

Short-term incremental cost analyses may, therefore, provide an achievable lower boundary of projected financial impacts based on actual cost results.

Fully allocated cost analyses implicitly assume that all costs are directly related to the level of service provided. The interpretation of long-term savings, as projected in a fully allocated cost analysis, was made in the following context:

- RTD's administrative costs were influenced more by board and federal policy, organizational structure, and fixed capital plant than by service levels. The fully allocated cost analysis assumes that such costs are directly related to the quantity of service provided and thus projects pro rata savings. The likelihood of this occurrence was remote. Savings in administrative functions were dependent more on management initiatives and board policy than on service levels.
- Long-term financial forecasts, and the fully allocated cost projections on which they were based, imply that RTD had the ability to modify the infrastructure that was assembled to operate the preprivatized service. This included a large administrative staff and large discrete fixed assets (e.g., garages) that may have been less efficiently deployed as a result of reducing directly operated service.

Long-term fully allocated cost analyses may, therefore, provide a theoretical upper boundary of projected financial impacts.

Cost Allocation Model

A state-of-the-art cost allocation model, which addressed differences in labor productivity and unit cost associated with the different types of service that RTD operated, was updated for this study. The model was calibrated on the basis of actual costs for the analysis period. It distinguished labor productivity and other unit cost factors for peak and off-peak service, different types of buses, and different RTD bus garages. It was thus possible to apply the model at the route level.

The cost allocation model did not include the costs of "retained functions," which included various administrative and operations functions that RTD continued to provide regardless of whether it operated the routes to be privatized. Many of these functions represented systemwide responsibilities that could not have been economically privatized or that RTD was specifically mandated to perform.

Retained functions included the following:

- Board office
- General manager's office
 - General administration
 - Public relations
 - Intergovernmental relations
- Legal counsel
 - Litigation, real estate
 - Property management
 - Risk management (accident reporting system)
 - Liability insurance (shared equipment and facilities)
- Materials management (privatization contract administrator)
 - Communications (entire department)
 - Customer service and scheduling (entire department)
 - Finance
 - Public relations
 - Revenue collection
 - Controller, administration
 - Financial reporting
 - Ridership reporting
 - Commercial advertising
 - Capital planning, budget, grants administration
 - Information systems: systems applications and associated manpower related to traffic checking, scheduling, customer communications, maintenance reporting, facilities maintenance, warranty, accident reporting, bus stop inventory, farebox maintenance, bus assignment, farebox revenue reporting, general ledger (portion), budget (portion), financial management system (portion), personal computers (portion)
 - Administration
 - Print production management
 - Janitorial services (mall stations)
 - Planning and development: system planning
 - Bus operations
 - Security (stations and garages)
 - Administration (manager of contract services, leases for park-and-ride lots)

- Operations analysis, service monitoring (maintenance reporting system)
- Transportation services dispatchers, street supervisors (portion), mall supervision
- Facilities maintenance: public and transfer (including the maintenance of 10,000 bus stops, 415 bus shelters, 45 park-and-ride lots, the Market Street and Civic Center stations and Boulder Transit Center; and the 16th Street Mall)
- Maintenance services: new warranty and quality control (routine inspection of contractors' buses)
- Vehicle maintenance (radio mechanics, supervisors, and parts)
- Support vehicle maintenance (snow removing and landscaping vehicles and equipment used at park-and-ride lots; some street supervisors' cars).

The retained functions represented \$12.9 million, or approximately 12.4 percent of actual expenses (omitting depreciation and excluded functions, explained later). In addition, the cost allocation analysis did not address various capital project-related and one-time-only expenses. Such excluded functions represented \$11.8 million, or 11.39 percent of actual expenses (omitting depreciation).

Results of Cost Analysis

Figure 1 summarizes the results of the incremental cost analysis. Actual savings resulting from privatization were estimated at \$2.5 million, or 12.5 percent of RTD's in-house cost. This is lower than previously published projections of incremental savings because this projection includes half of calendar year 1990 (previously projected to operate at an incremental cost of 1.8 percent) and half of calendar year 1991 (previously projected at an incremental savings of 18.8 percent), and because RTD's actual costs were lower than projected, due partly to lower inflation.

Figures 2 and 3 show the results of the fully allocated cost analysis: a savings of \$5.1 million (or 25.8 percent) without depreciation and of \$7.5 million (or 31.0 percent) with depreciation. These values are higher than previously published

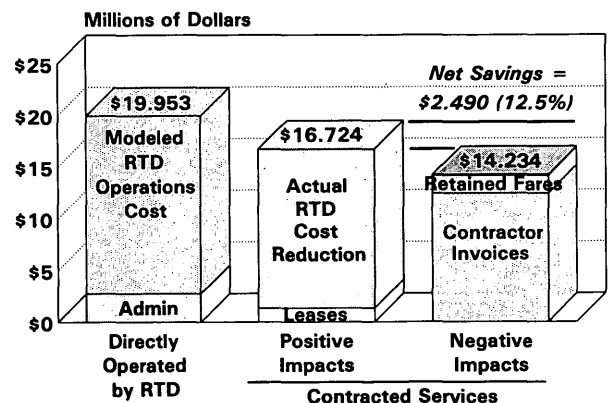


FIGURE 1 Incremental cost comparison (without capital costs).

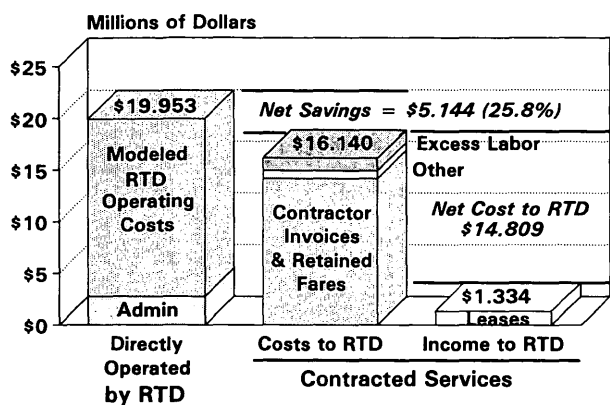


FIGURE 2 Fully allocated cost comparison (without capital costs).

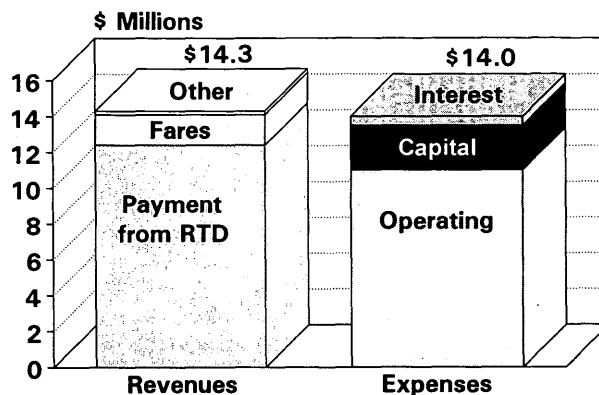


FIGURE 4 Contractors' probability.

projections because of

- Higher depreciation costs due to the addition of RTD's new \$32 million RTD district shops and operations center complex and, to a lesser extent, new buses;
- Lower contractor invoice costs than projected;
- Lower RTD labor costs charged to privatization (offset by a larger portion of retained function costs, as described earlier); and
- Lower underutilized labor costs due to higher-than-projected attrition of mechanics.

ANALYSIS OF CONTRACTORS' ACTUAL COSTS AND PROFITABILITY

Figure 4 gives a summary of the analysis of the contractors' actual costs and profit on expenses. The analysis was based on financial statements provided by the contractors. Profitability was measured in terms of revenues less expenses for the local operations of each contractor. An allocation of corporate overhead expense was included, but it was not possible to analyze profitability from the overall corporate standpoint (e.g., return on investment or return on equity) because of the unavailability of overall corporate financial statements.

This analysis determined that the contractors earned a profit of \$337,000 out of total expenses of \$14.0 million, or 2.4 percent. This compares to a loss of \$217,000, or 2.1 percent, during the first year of privatized service.

SAFETY AND QUALITY OF SERVICE

The privatization performance audit also addressed nonfinancial measures: safety, on-time performance, maintenance reliability, and complaints and commendations. Because of differences in operating conditions (e.g., density of street traffic) and passenger loadings, the comparison of safety and quality of service between RTD and the contractors distinguished between several fundamentally different types of bus services:

- Local/limited radial routes: routes operating largely on surface streets and either passing through or terminating in downtown Denver. Limited routes operate over the same streets as local routes but make fewer stops; they operate primarily during the peak periods. The contractors provided 8 percent of systemwide local/limited radial service.
- Local/limited nonradial routes: routes operating largely on surface streets but not entering downtown Denver. These routes, sometimes referred to as "cross-towns," generally encounter less congested streets. The contractors provided 52 percent of systemwide local/limited nonradial service.
- Express routes: routes between suburban park-and-ride lots and the Market Street Station or the Civic Center Station in downtown Denver. The contractors provided 26 percent of systemwide express service.

Safety

Figures 5 and 6 show safety performance in terms of bodily injury and property-damage accident rates. Bodily injury accidents (per 100,000 passengers) are vehicle and nonvehicle accidents that involved injury to a passenger or other person. The contractor's rate was 40 percent lower than RTD's on local/limited radial routes and 26 percent higher on local/limited nonradial routes. There was no significant difference between RTD and the contractors on express routes.

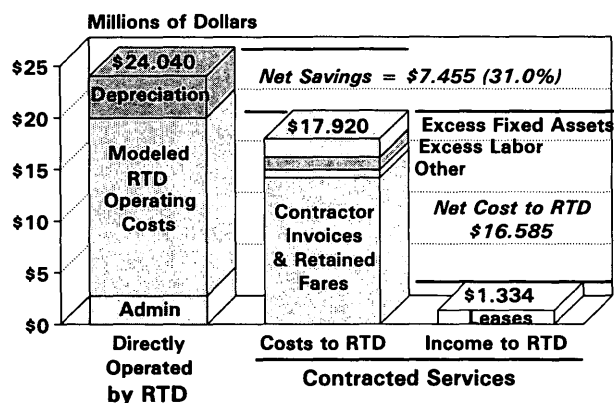


FIGURE 3 Fully allocated cost comparison (with capital costs).

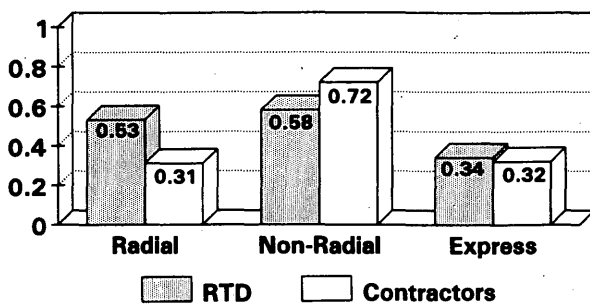


FIGURE 5 Bodily injury accidents per 100,000 passengers.

Property-damage accidents (per 100,000 vehicle-mi) are vehicle accidents that did not involve an injury. The contractor's rate was 22 percent lower than RTD's on local/limited radial routes and 15 percent lower on express routes. There was no significant difference between RTD and the contractors on the local/limited nonradial routes.

On-Time Performance

Figure 7 summarizes on-time performance, which addressed the conformance of bus arrival times to RTD schedule adherence standards. Buses more than 5 min later than scheduled were defined as late, and buses more than 1 min earlier than scheduled were early.

On-time performance was measured by RTD traffic checkers at selected time-points for local/limited radial and non-radial routes. On-time performance of express routes was measured at the Market Street and Civic Center stations for all trips. Early arrivals of the express routes were ignored since passengers were not inconvenienced.

The 1990-1991 on-time performance of RTD and the contractors was similar overall, with the contractors running early less often on the local/limited nonradial routes. Both RTD and the contractors improved on-time performance over 1989-1990.

Maintenance Reliability

Maintenance reliability was measured on the basis of the rate of vehicle miles between mechanical road calls (as recorded

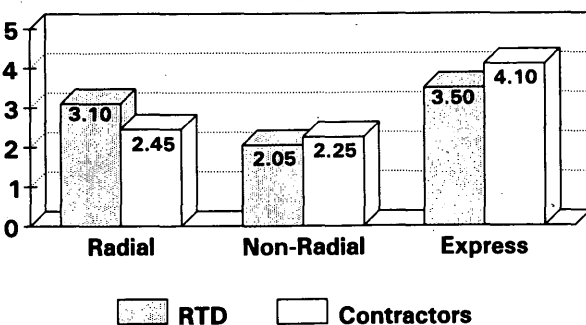


FIGURE 6 Property-damage accidents per 100,000 vehicle-mi.

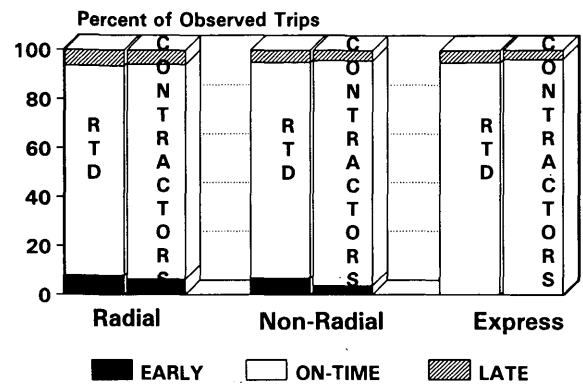


FIGURE 7 On-time performance.

by the RTD dispatch center). A higher value indicates better performance. This included road calls due to mechanical failure or the need to replace a bus for mechanic reasons. It did not include road calls due to operator requests for a supervisor, accidents, passenger illness, or other emergencies.

The comparison in Figure 8 was limited to the April-June quarter because route-level data were not available before April 1990. In April-June 1991, the contractors' maintenance reliability performance was 45 percent worse than RTD's on local/limited radial and 54 percent worse on nonradial routes. There was no significant difference between RTD and the contractors on express routes.

Complaints and Commendations

Complaints and commendations were measured on the basis of the rate of complaints per 100,000 passengers received at RTD's telephone information center.

Operator Performance Complaints

Operator performance complaints included charges of driving carelessly, acting with discourtesy, not knowing the route, failing to call stops, using improper procedures (which included other, unclassified complaints), providing incorrect information to passengers, passing a bus stop, passing a passenger waiting for a bus, and causing a passenger to miss a

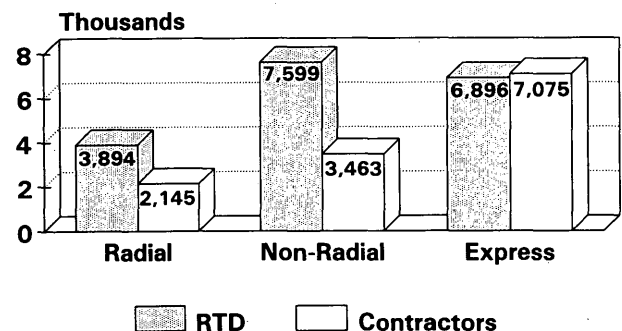


FIGURE 8 Maintenance reliability: miles between mechanical road calls.

transfer. The contractors' experience was 36 percent worse than RTD on local/limited radial routes, similar on local/limited nonradial routes, and 24 percent better than RTD on express routes.

Maintenance Complaints

Maintenance complaints addressed problems with the mechanical condition and the cleanliness of the bus. Local/limited radial and nonradial route complaints were negligible for both RTD and the contractors. The complaint rates for both RTD and the contractors were negligible on local/limited radial and nonradial routes. The contractors' complaint rate was 22 percent higher than RTD's on express routes.

On-Time Performance Complaints

The contractors' "early" complaints were not significantly different from RTD's on local/limited radial and nonradial routes; the contractors' complaints were 65 percent lower on express routes.

RTD's and the contractors' "late" complaint rate was negligible on local/limited radials and nonradials. The contractors' rate was 65 percent lower than RTD's on express routes. For RTD and the contractors, the "no-show" complaint rate was also negligible on local/limited radial and nonradial routes. The contractors' rate was 26 percent lower than RTD's on express routes.

Commendations

The contractors' commendation rate was similar to RTD's on local/limited radials, 46 percent better on local/limited nonradials, and 15 percent better on express routes.

CONTRACT COMPLIANCE

The contracts included provision for RTD to assess liquidated damages in those cases of observed lack of compliance by the contractors. Figure 9 summarizes the number of liquidated

damages incidents, by contract provision, assessed by RTD in each of the first 2 years of privatization. The most frequently assessed liquidated damages continued to be those regarding on-time performance and nonfunctioning wheelchair lifts. Assessments equaled 0.25 percent of contractors' costs in 1990-1991, compared with 0.29 percent in 1989-1990.

MAINTENANCE REVIEW

A review of the contractors' maintenance activities was undertaken to determine if they were properly following the maintenance standards specified in their contracts with RTD and in their vehicle leases. The review included inspections of the contractors' maintenance facilities, review of maintenance procedures, observation of maintenance activities, and spot inspections of randomly selected vehicles. This review was undertaken by Transportation Support Group, Inc.

The contracts between RTD and the contractors required buses to be maintained in a clean and safe condition. Periodic maintenance was required, and deferring maintenance was prohibited. Specifically, the contracts required

- Daily cleaning of bus interiors and exteriors;
- All preventative maintenance performed at regularly scheduled intervals, as specified in the manufacturers' maintenance manuals, within 1,000 mi of the scheduled interval;
- Wheelchair lifts maintained in a ready and usable condition when in revenue service;
- Body and exterior surfaces maintained in a safe, sound, and accident-free condition;
- Non-safety-related accident damage repaired within 3 weeks of occurrence; and
- Functioning heating and cooling systems.

The leases of RTD buses included specific bus maintenance and cleaning program requirements:

- Maintenance personnel: knowledge of buses and their components, tools and equipment, maintenance procedures, inspection procedures, repair procedures, and engine, transmission, and electrical system diagnosis.
 - Bus cleaning: daily interior and exterior cleans, bimonthly (or every 2,000 mi) interior washing.
 - Preventative maintenance, warranty work, quality control
 - Maintenance within 1,000 mi of specified mileage intervals for components, assemblies, and systems;
 - Maintenance performed to ensure that warranties remain valid;
 - Components changed out at specified intervals;
 - Conformance to all federal, state, and local exhaust requirements; and
 - Alignments performed annually or as needed.
 - Mechanical maintenance program: the following components inspected, serviced, and repaired or replaced at specified intervals and in safe and working condition before a vehicle enters revenue service or at all times:
 - Wheelchair lifts;
 - Brakes;

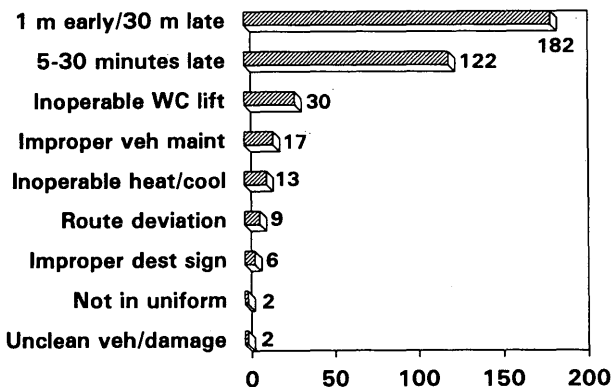


FIGURE 9 Liquidated damages assessments.

- Engine oil;
- Body and frame;
- Mechanical, electrical, fluid, air, and hydraulic systems;
- Interior free from exhaust fumes;
- Heating and air-conditioning systems; and
- Seats.

In addition, the contractors were required to maintain a sufficient spare parts inventory.

- Maintenance recording system: up-to-date vehicle file maintained for each vehicle and copies of inspection reports routinely submitted to RTD.

Figure 10 illustrates the maintenance staffing levels of the contractors and compares these levels with similar privately operated transit systems and with RTD and its public-sector peers. The contractors' maintenance staffing was relatively lean for mechanics but comparable for support staff (cleaners, shifters, utility workers). This may be partly explained by the relatively low age of the contractors' fleets, as shown in Figure 11.

Figure 12 portrays the results of inspections of randomly inspected vehicles. Of 155 buses on the contractors' properties, 21 (or 14 percent) were randomly selected for inspection. Buses were inspected for 22 specific maintenance areas. On the basis of the inspection of the contractors' maintenance facilities, review of maintenance procedures, and spot inspection of randomly selected buses, the following observations were made:

- Eleven of the 21 contractors' buses that were inspected were used, or were planned to be used, in transit service with safety-related conditions apparent (e.g., marginal or smooth tire treads, passenger doors opening and closing fast, long brakes, and cracked windshield glass).
- Lack of measured filling system for engine oil and transmission fluid was sometimes leading to under- or overfill conditions.
- The contractors stored some buses in unpaved parking areas, contributing to dusty conditions on some buses.
- All contractors were using the RTD maintenance reporting system forms.
- The contractors' maintenance tools and service equipment were adequate.

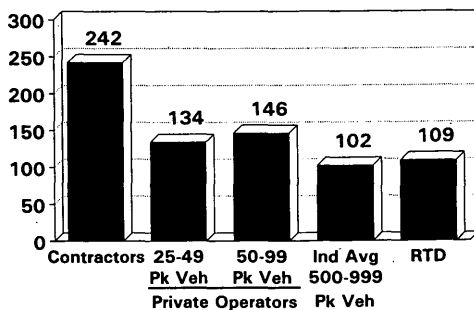


FIGURE 10 Maintenance staffing: thousands of vehicle miles per mechanic.

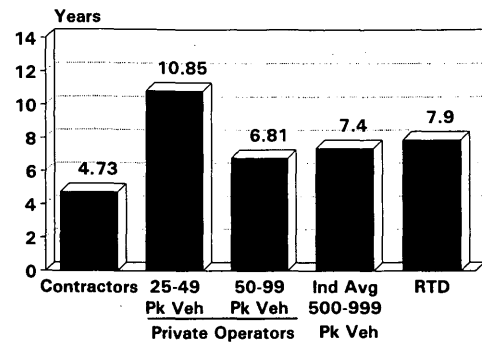


FIGURE 11 Average vehicle age.

SOURCE OF SAVINGS RESULTING FROM PRIVATIZATION AND ANALYSIS OF BUS OPERATOR WAGES AND TURNOVER

Source of Savings

Figure 13 summarizes the differences between RTD's actual incremental costs (based on the cost allocation model) and the contractors' actual costs. In terms of operating costs alone, more than half of the savings in actual costs was due to the lower wages and fringe benefits paid by the contractors. With capital costs included, bus operator and maintenance worker wages and fringe benefits accounted for more than 46 percent of the difference between RTD's and the contractors' costs.

The average costs of bus operator wages and fringe benefits per revenue hour of service were \$24.44 for RTD and \$14.20 for the contractors (41.9 percent lower than RTD).

RTD and contractor bus operator wages and turnover were analyzed in order to address the underlying sources of the savings identified earlier.

Wage Comparison

Figure 14 is a comparison of the wage rates paid by RTD and the contractors. The wage rate is determined by length of service. The RTD rates shown are for both full- and part-time bus operators. The contractors' wage rates are effectively full-time rates.

RTD's operator work force was predominantly at the top of the progression. More than 86 percent were at the top wage

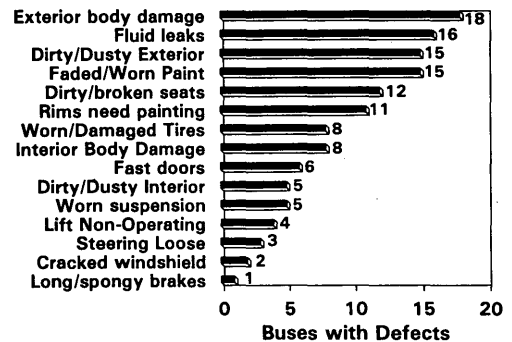


FIGURE 12 Maintenance defects: 21 inspected buses.

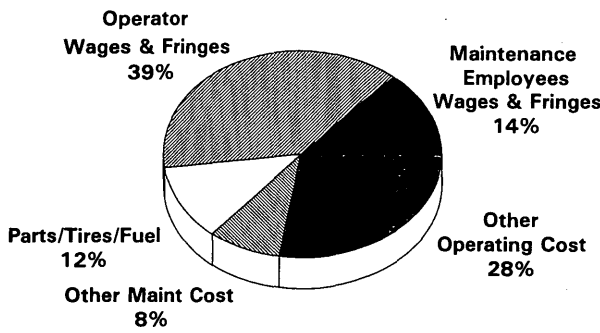


FIGURE 13 Source of operating cost savings.

rate, with more than 3 years of experience, as of the pay period ending June 22, 1991. The contractors' work force, being on the job for a shorter time, were not as high up the progression.

RTD hired nearly all of its bus operators as part-time employees and promoted them to full-time positions as vacancies occurred. The labor agreement allowed RTD a maximum number of part-time bus operators not to exceed 20 percent of its number of full-time bus operators. Thus, wage rate comparisons with the contractors should consider the RTD's part-time wage rate, at least during the first several years of privatized service.

Bus Operator Turnover Comparison

Figure 15 presents the turnover of RTD and contractor bus operators in terms of the percentage of bus operators resigned or terminated for cause after each 3 months of employment. RTD's experience is expressed in terms of operators hired during two periods:

- Since April 1989: only those bus operators hired during the same period of time that the contractors were hiring.
- Since January 1985: a stable period of hiring, extending several years before the impact of privatization. RTD reduced its hiring of bus operators in the year before the initiation of privatized services in order to minimize the financial impacts of the no-layoff provisions of SB 164. The attrition rate was

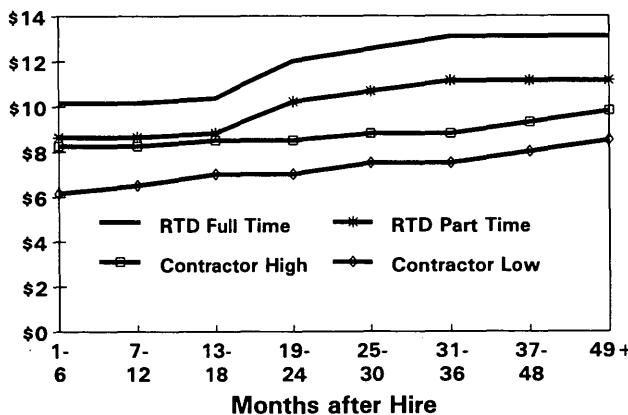


FIGURE 14 Bus operator hourly wage rates.

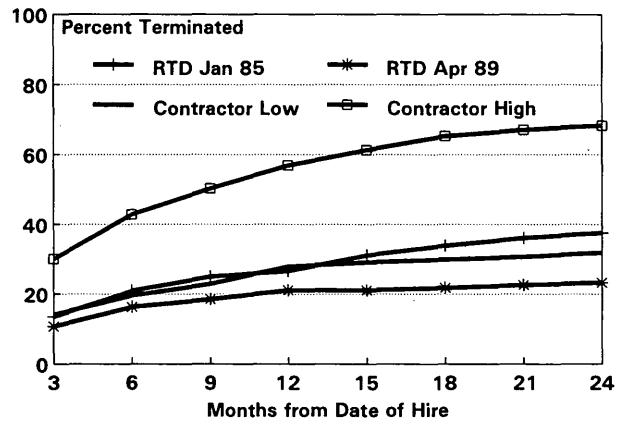


FIGURE 15 Bus operator resignations and terminations.

higher when the contractors initiated their hiring (particularly from April through November 1989).

The contractors experienced a significant range in rates of resignations and terminations for cause. The contractor with the lowest rate was similar to RTD's rate for operators hired since January 1985: nearly identical for the first 15 months of employment and actually lower than RTD's experience from 15 to 24 months of employment.

RTD's rate of resignations and terminations for cause was lower for its most recently hired bus operators, and this rate was lower than that experienced by the contractors. In terms of those bus operators hired since April 1989, after 24 months of employment RTD retained 12 percent more bus operators than the contractor with the best experience and 143 percent more than the contractor with the worst experience.

RTD's attrition before and after the contractors' peak hiring (April through November 1989) should be considered the norm, because RTD experienced a large number of resignations during the contractors' peak hiring, particularly of part-time bus operators who sought full-time positions with the contractors.

Figure 16 compares the causes of bus operator terminations at RTD and the contractors. Overall the experience was similar, with a larger proportion of RTD bus operators resigning during the contractors' peak hiring period. There was no indication that lower wages had a significant impact on the relative mix of terminations for cause and due to resignation.

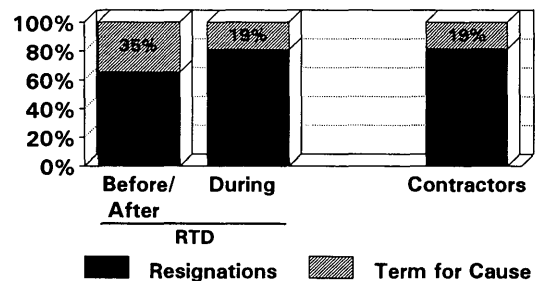


FIGURE 16 Bus operator turnover (RTD before, after, and during contractors' peak hiring).

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