Residential Solid Waste: Recycling Efforts Are Effective, But Opportunities Exist to Lower Rates

October 1996

Office of the City Auditor
Portland, Oregon

CITY OF
PORTLAND, OREGON
OFFICE OF THE CITY AUDITOR
Audit Services Division

Barbara Clark, City Auditor
Richard Tracy, Director of Audits
Mailing: 1220 S.W. Fifth Ave., Room 120
Portland, OR 97204

Walk In: 1400 S.W. Fifth Ave., 4th Floor
(503) 823-4005, FAX (503) 823-4459

October 18, 1996

TO: Mayor Vera Katz
Commissioner Charlie Hales
Commissioner Gretchen Miller Kafoury
Commissioner Mike Lindberg
Dean Marriott, Director, Bureau of Environmental Services

SUBJECT: Audit of the City's residential solid waste program, report #224

Attached is Report #224 on the City's residential solid waste program. The audit was conducted in accordance with our Fiscal Year 1995-96 audit schedule, and includes a summary of results at the beginning of the report.

We have reviewed drafts of the report with staff from the Bureau of Environmental Services. Their written responses are included at the back of the report. We ask the Bureau to provide us with a status report in six months detailing actions taken to address recommendations we have made. The status report should be distributed to members of the Council and to the Audit Services Division.

We appreciate the cooperation and assistance we received from staff at the Bureau of Environmental Services, Metro, and the cities that participated in our survey.

Barbara Clark

Barbara Clark, CPA
Portland City Auditor

Audit Team: Richard Tracy
Ken Gavette
Janis Hull
Eric Hofeld

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A Report by the Audit Services Division
Report #224

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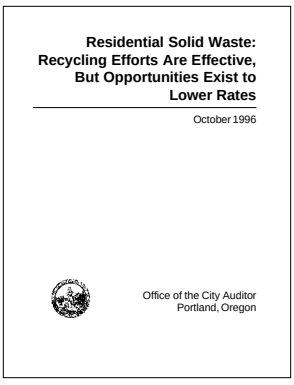

Production/Design

This report was produced in-house using desktop publishing software on IBM and compatible personal computers, and a Postscript laser printer. Aldus Pagemaker 5.0 and 6.1 for Windows were used to produce the finished product. Tables were created manually using Pagemaker, while Wordperfect 6.1 for Windows, ABC SnapGraphics, Harvard Graphics and Quattro Pro for Windows were used to enter text, produce graphs/figures, and produce flowcharts.

Desktop Publishing: Robert Cowan

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Summary

In accordance with the Oregon Recycling Act of 1991, the Portland metropolitan region actively pursues a variety of recycling programs to reduce the amount of waste disposed in landfills and to conserve nonrenewable resources. Metro has responsibility for overall planning and management of solid waste disposal in the region while cities and counties regulate the collection of solid waste and recyclable items. This report analyzes the City of Portland's solid waste collection system managed by the Bureau of Environmental Services.

Highly Effective Recycling Program

Portland has one of the most successful recycling programs in the country. Compared to other cities, we divert more waste from our landfills and recycle more types of items. As a result, we produce fewer tons of waste per household than any other city we surveyed. The Bureau recently received a $5,000 award from the American Forest and Paper Association for having the best curbside recycling program in the country for cities with a population of 100,000 or more.

Over the past four years residents have reduced the amount of waste disposed in landfills by 12 percent and now recycle almost 37 percent of residential waste. Approximately 80 percent of households in Portland partici-

pated in curbside recycling in 1995 up from only 39 percent in 1991. Citizens also seem highly satisfied with garbage and recycling services – 76 percent rated garbage services good or very good in 1995 while 77 percent rated recycling services good or very good.

Opportunities to reduce residential rates

Portland's effective garbage and recycling program comes with a price. Monthly residential garbage rates are among the highest in the nation. Although Portland has added new services and reduced rates the past six years, Portland's monthly bills are the fifth highest overall among cities we surveyed and third highest among cities with only once per week refuse collection.

We found that several factors contribute to high residential garbage rates. First, Portland's aggressive recycling and waste diversion program requires more labor and equipment which increases the cost per ton of collecting regular waste. Our consultant for this audit, Ecodata, Inc., indicated that when comparing Portland's rates to others, most of the difference can be attributed to high recycling and diversion of waste from the landfill.

Portland's franchised collection system also contributes to higher rates because it may be more costly than awarding a contract for services to a single hauler. Although Portland haulers are relatively efficient and customers are satisfied with services, 49 independent haulers cannot achieve economies of scale possible with fewer haulers serving more customers. Our consultant estimates that a single hauler could provide refuse collection services to households for about $1.25 per month less. While there is

no guarantee that a contractor would provide lower costs and equivalent service, Ecodata's analysis indicates the potential savings to be gained with fewer haulers.

We also found that residential bills are affected by various methods used by BES to set rates. Although the model intends to ensure fairness to both garbage haulers and ratepayers, most haulers make more than the standard operating margin (profit). Of 20 haulers receiving detailed reviews in 1995, all but three earned more than the 9.5 percent standard, averaging 13.7 percent as a group. Moreover, average hauler profits increased from 10.1 percent in 1992 to 13.7 percent in 1995.

High profits are due largely to a strong recycling market over the past few years. However, several other factors influence hauler profits at the expense of ratepayers. First, profit is allowed on tipping fees although haulers face little risk in recovering this cost. Second, the model allows operating margin to be earned on itself, that is, profit on profit. Finally, the standard operating margin may be set too high to encourage more consolidation of garbage companies and a reduction in total system costs. We estimate that addressing these factors could save Portland's garbage customers between $900,000 and $1 million per year (See Appendix C).

More Study and Better Coordination May Help Reduce Metro's Impact on Rates

The final major condition affecting residential rates is the relatively high "tipping fee" or disposal charge at Metro regulated transfer stations. While tipping fees throughout the nation vary greatly depending on funding and operating factors, our survey found that the current fee of $75 per

ton is one of the highest in the nation. Three-fourths of this fee offsets the cost of operating transfer stations, transporting waste by truck to Columbia Ridge landfill, and operating the landfill. The Metro Auditor indicates that little can be done to adjust existing contracts with the landfill operator, Oregon Waste Systems Inc., or the transport company. However, we believe there may be opportunities to reduce the remaining quarter of the disposal fee which is currently used to support Metro's solid waste planning staff, general government, and other Metro programs. Detailed study and better coordination may help reduce the impact of these activities on residential rates.

Recommendations

We make a number of recommendations in Chapter 5 of this report to continue effective solid waste and recycling service while reducing residential garbage rates. In brief, we recommend:

- Continue franchised garbage collection system, but modify franchise agreements and rate setting methods in order to reduce over-all system costs and lower residential rates.
- More complete reporting on hauler performance and profits.
- Review of opportunities to reduce the impact of Metro operations on residential garbage bills.
- Develop new goals for the recycling program.

Chapter 1 Introduction

This audit reviews the performance of the Solid Waste and Recycling Division of the Bureau of Environmental Services. The division is responsible for managing the collection and recycling of solid waste in the City of Portland. The audit was approved by the City Auditor and included in the Audit Services Division's FY1995-96 Audit Schedule. We conducted our audit in accordance with generally accepted government auditing standards. We limited our audit to those areas specified in the audit objectives, scope and methodology section of this report.

Recycling and Solid Waste Management in Oregon

The Oregon Opportunity to Recycle Act of 1983 established the State's commitment to recycling solid waste. The legislation required governments to offer recycling opportunities to the citizens of Oregon. Specifically, it required residential curbside recycling collection for cities with more than 4,000 people, recycling at solid waste disposal sites, and education and promotion programs designed to raise awareness of recycling opportunities.

In 1991 the State legislature passed the Oregon Recycling Act. It strengthened the 1983 Act and established a statewide integrated solid waste management program and

solid waste reduction goals. The Act declared a statewide recovery goal of 50% by January 1, 2000, and mandated a number of recycling efforts such as recycling containers, collection of recyclables on regular waste collection days, and variable rates to encourage recycling.

The Oregon State Integrated Resource and Solid Waste Management Plan, published in 1994, defined recycling as "any process of obtaining from the waste stream, by presegregation, materials which still have useful physical or chemical properties...to manufacture new products." Recycling is a key part of the collection and disposal process for solid waste. The plan states that recycling is preferred over disposal, energy recovery, or mixed waste composting because the material has value as a resource since it conserves virgin material and other non-renewable resources. The plan calls for recycling to be the primary method of waste management in the state of Oregon.

The state requires that local governments develop and implement solid waste reduction programs. In the Portland area, the Act gave responsibility for solid waste planning to Metro, the regional government for the three county region. Metro also assumed the role of managing the disposal of all solid waste in the region as set forth in Chapter 5.05 of the Metro Code.

Metro manages or regulates three transfer stations in the region and has a long-term contract with Oregon Waste Systems Inc. to dump at least 90 percent of the waste generated in the region at their Columbia Ridge landfill in Arlington, Oregon. In addition, Metro contracts with a private trucking firm to transport waste from area transfer stations to the regional landfill in Arlington. In January

1996, Metro finalized its Regional Solid Waste Management Plan. The City of Portland, and other local governments in the region, are responsible for designing and administering solid waste and recycling collection programs for their jurisdictions. Local governments' solid waste contracts, resolutions and ordinances must be consistent with Metro legislation and solid waste plans.

Solid Waste Management in Portland

The Solid Waste and Recycling Division of the Bureau of Environmental Services (BES), oversees the collection of solid waste and recyclable material from residential and commercial sources within Portland's urban services boundary. The system serves about 127,000 households and about 50,000 businesses.

The goal of the program is to reduce solid waste by undertaking aggressive source reduction and recycling activities. Portland franchises private garbage haulers to collect residential solid waste. The City sets the rates that can be charged by the haulers, prescribes items subject to recycling and establishes service schedules and standards. Commercial accounts are not franchised and haulers must compete for business.

Prior to 1991, the City of Portland only regulated garbage haulers in a limited way. Haulers were required to obtain a City license but residents could employ the hauler of their choice and negotiate rates for garbage service. Some haulers offered recycling to their customers but there was no city-wide standard for this service. Collection days and frequency of collection varied throughout the City.

In order to achieve recycling goals established by the State and Metro, the City of Portland developed a revised approach to regulate haulers. The City established a system that awards franchises to haulers to provide residential garbage and recycling services in defined geographic areas at a regulated rate. For a variety of reasons, the City chose not to operate its own system using municipal employees or to competitively bid garbage service to a few haulers. Principally, the City wanted to ensure effective recycling service, reduce the potential risks of poor contractor performance, and minimize the effects on the existing garbage haulers doing business in the City.

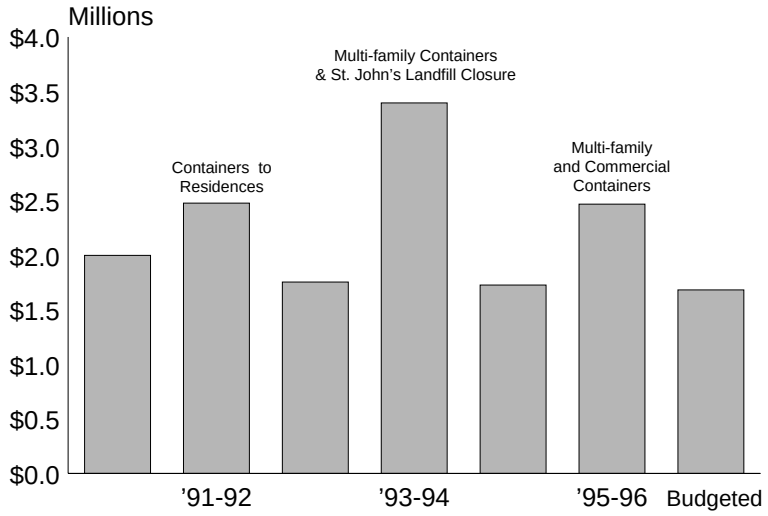
The City Council set several primary program goals for the new program:

- reduce the amount of solid waste generated per capita by 10% before 1997.
- achieve a 60% recycling level by 1997.
- establish fair rates that encourage waste reduction.

The primary source of revenue for the City's solid waste program is a franchise fee of 4 percent (reduced from 5 percent last fiscal year) of the residential hauler's gross revenue and a permit fee of $3.15 per ton on commercial haulers. The division has a staff of 10 assigned to two major programs – residential and multi-family/commercial. The day-to-day operation of the division is shared by two program managers, reporting to the Director of the Business Services Group of BES.

Since FY1991-92, the staffing has remained relatively constant. As shown in Figure 1, Division expenditures have fluctuated from a high of $3.4 million in FY1993-94 to

Figure 1 Solid Waste Division Expenditures



Source: City Budget documents

$1.7 million budgeted in FY1996-97. Fluctuations are mainly due to the addition of new programs, such as the purchase and distribution of recycling containers to residential customers in FY1991-92 and to multi-family complexes in FY1993-94 and FY1995-96. In 1993-94, $1.7 million was paid to Metro for the closure of the St. John's Landfill.

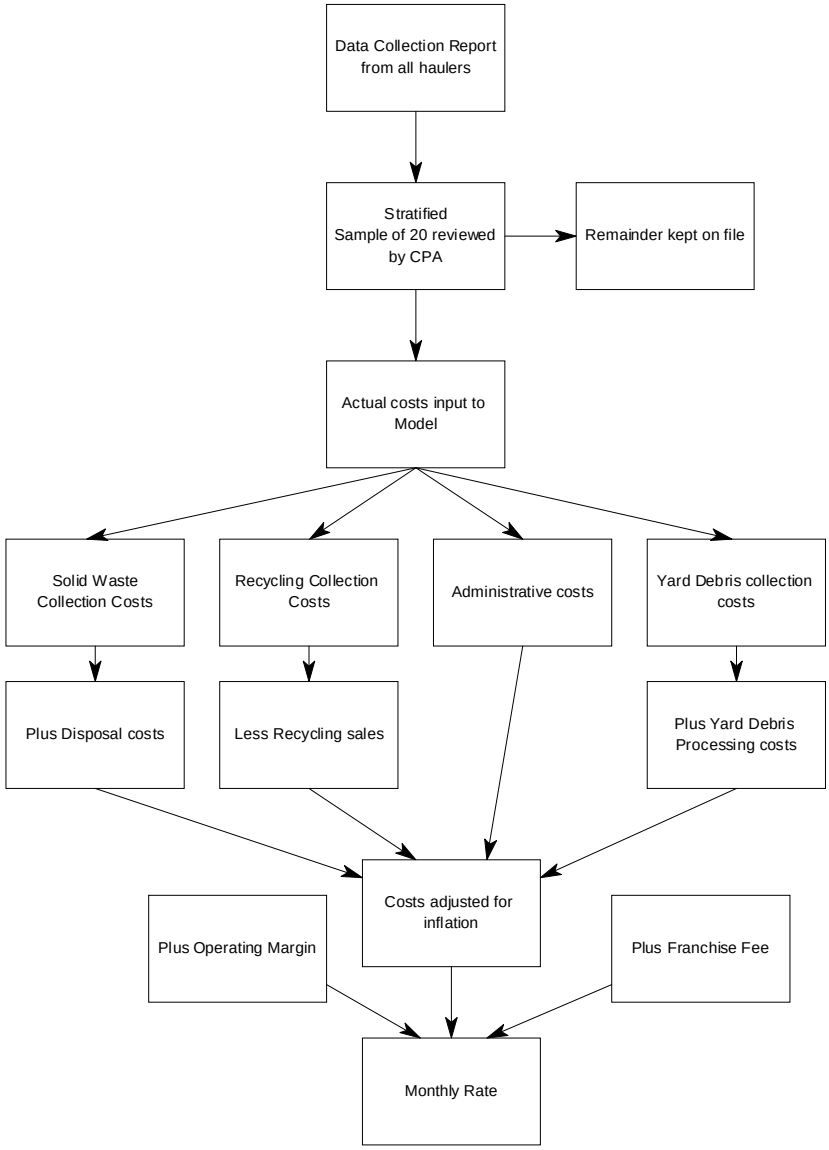
The major program areas for the residential section are customer information services, field inspection and enforcement, recycling education, illegal dumping prevention and enforcement, franchise system management and program development. The commercial section implemented a new commercial recycling program January 1, 1996 that requires all businesses to recycle at least 50 percent of their waste. Staff has also spent significant time in past years setting up recycling depots at apartments and training apartment managers to promote recycling.

Setting Residential Rates

A critical component of the City's franchised garbage collection system is the rate setting process established by the Division of Solid Waste and Recycling. The goal of the rate process is to ensure that garbage haulers recover reasonable costs and have the opportunity to earn a fair profit while also ensuring that customers pay a fair price for garbage service. To achieve both of these objectives – fairness to haulers and rate payers – the Division developed a rate methodology that allows haulers to recover costs based on a weighted average of costs, plus a standard profit of 9.5 percent. The operating margin was established by the Bureau of Environmental Services in 1991, based on a survey of government solid waste systems conducted by Hilton, Farnkopf, and Hobson, a California firm specializing in municipal management issues, and a survey of private refuse company profits by Robert Morris Associates. The rate calculation methodology is shown in Figure 2.

At the end of each year, haulers submit financial reports to the Division that contain details on expenses and revenues. Haulers must include only those costs associated with collecting solid waste and recycling from City of Portland residential customers. From the total reports submitted by the haulers, a sample of 20 hulers plus the two recycling districts is selected for detailed review and verification by a contracted independent certified public accountant (CPA). The sample and rate methodology is weighted toward the costs of the large haulers. Larger haulers have a greater chance of being selected. The CPA checks the financial records of each hauler to verify if all revenues are included and costs are reasonable and proper.

Figure 2 Rate Calculation Model



Source: ASD summary of Bureau rate documents

For example, costs associated with non-franchised customers (such as commercial customers) or with acquiring other routes cannot be included. In addition, wages and salaries to managers and employees must reflect current salaries of other private sector companies and local union wages to be included for rate-making purposes.

After the reviews are completed, a weighted cost is computed for several cost components: solid waste collection, recycling, yard debris, and administrative costs. Total costs are reduced by revenues earned from recycling and adjusted for changes in the annual inflation rate. The standard operating margin of 9.5 percent and the City's franchise fee of 4 percent is added to the weighted cost to determine the monthly rate to be charged to residential garbage customers for the current year. A rate review can be called for at any time that it is presumed that current rate schedules result in average operating margins that vary by 1 percent from the 9.5 percent standard. The Division has conducted four rate reviews since inception of the program.

The intent of the rate model is to provide a reasonable return to the average hauler, and to give incentives and disincentives to haulers that are either very efficient or inefficient. All haulers recover the same amount of revenue from each customer regardless of how efficient they actually are. Consequently, companies that operate more efficiently than average can earn additional profit, but those haulers that are less efficient than average will earn less. Haulers, therefore, are not guaranteed a profit and the City does not cover operating losses incurred by inefficient companies.

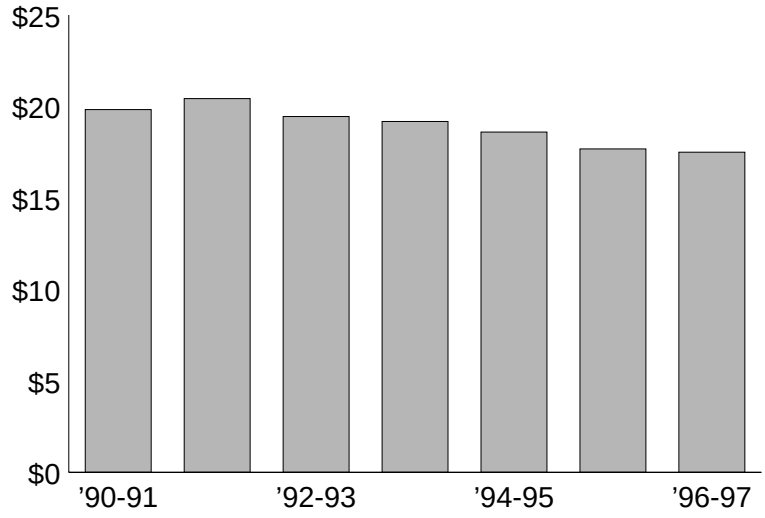
Table 1 Components of the Standard Monthly Solid Waste and Recycling Rate: FY1996-97
(32 Gallon Container Once per Week)

Regular Solid Waste Collection	$6.60
Disposal Fee *	3.89
Collection of Recycled Items	3.10
Yard Debris Collection	1.55
Operating Margin (Profit) (9.5% of $17.50)	1.66
City Franchise Fee (4.0% of $17.50)	0.70
Total	**$17.50**

* Disposal Fee is based on the Metro regulated charge of $75 per ton of waste.

Source: Industrial and Solid Waste Division, BES.

Figure 3 Monthly Rate for 32-Gallon Can Service (Adjusted for Inflation)



Source: ASD analysis of rates.

According to Division staff, the model injects an incentive into the franchise approach by rewarding efficiency and penalizing inefficiency.

The current monthly rate for a standard weekly collection of one 32-gallon container is $17.50. The elements that comprise this rate are illustrated in Table 1.

Audit Objectives, Scope and Methodology

The primary objective of our audit was to evaluate the efficiency and effectiveness of the City of Portland's solid waste management program. In particular, we analyzed whether the program was meeting stated goals of reducing waste, increasing recycling, and ensuring fair rates for users and haulers.

To compare Portland's residential solid waste and curbside recycling rates and services to other governments, we surveyed 26 jurisdictions by mail. Dr. Barbara Stevens, of Ecodata, Inc., a nationally recognized expert in the field of solid waste, was hired to help develop, implement and analyze the survey. We included the six cities surveyed annually for our Service Efforts and Accomplishments report, and ten jurisdictions previously surveyed by BES. The remaining jurisdictions were suggested by Dr. Stevens based on her familiarity with other programs and a desire to get a cross section of contract, municipal and franchise systems. Twenty-three jurisdictions responded to our survey for an 88 percent response rate.

Our original scope of work included a detailed comparison of Portland costs to other cities' costs. However, we found that extreme differences in solid waste management

systems among jurisdictions made comparisons very difficult. To assess refuse collection, we relied on previously collected data from a 60 city survey conducted by Ecodata, Inc. in 1994. In general, because of the variations we found between jurisdictions, we recommend that comparisons with other cities or counties be approached with caution. We are confident, however, that our general comparisons of types and amounts of waste collected, service levels, recycling, and diversion rates are accurate and appropriate.

To examine the efficiency of Portland's franchised waste haulers, we asked Ecodata to analyze and compare haulers' refuse collection costs against the collection costs of cities in its database. Ecodata produced a report showing the expected costs of haulers under a franchised system like ours and also under scenarios with different numbers of haulers. We asked Ecodata to analyze the refuse collection cost component only because of the three major services (solid waste, recycling and yard debris) solid waste collection and disposal make up almost 60 percent of the ratepayer's bill. Also, because over half of Portland's households are already served by two large consolidated recycling companies. Ecodata's study is attached in Appendix B.

We also conducted a detailed review of the Bureau's economic model used to calculate rates. We examined the model's structural integrity and logic to determine if the spreadsheets were free of error and if the model produced a fair rate for rate-payers and a fair return for haulers. In addition, to determine if the operating margin allowed haulers is fair, we contacted those cities surveyed when the standard operating margin was developed. We also updated

the Robert Morris survey of the profits of private solid waste collection companies.

To assess the impact of disposal costs on residential garbage rates, we interviewed Metro officials and reviewed various program and budget documents relating to Metro's solid waste management program. We also compared Metro disposal costs to other cities in our survey sample. To determine if there were instances of duplication of effort we also reviewed the activities of both the Solid Waste Management Division and the Metro Regional Environmental Management Division. However, our review of Metro's solid waste management program did not constitute a full audit.

Because commercial recycling goals were not enacted by the City until 1996, our work focused primarily on residential waste collection. In January, City Council passed a new ordinance requiring businesses to recycle 50 percent of generated waste. As more data is gathered about the new commercial program, additional audit work may be warranted.

Chapter 2 Portland's Residential Solid Waste and Recycling Program is Effective

Our review indicates that Portland's solid waste and recycling program for residents is highly effective. We found that the program:

- made significant progress toward meeting its goals and objectives
- achieved a high level of recycling compared to other cities
- achieved a high rate of customer satisfaction with services

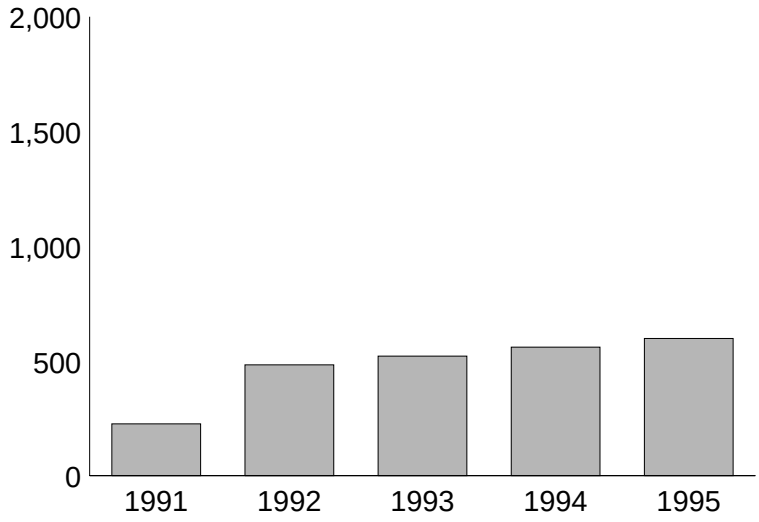
Significant Progress Toward Goals

Over the past five years, the program has reduced the amount of solid waste disposed of in landfills and increased recycling of useable materials. As shown in Figure 4, the amount of solid waste disposed of per household declined from 1,697 pounds per year in 1992 to 1,492 per year in 1995, a 12 percent reduction. In addition, the total pounds of recycled materials per household increased 165 percent over the past five years, from 226 pounds in 1991 to 598 pounds in 1995. The total amount of material set out for curbside collection declined about 4 percent between 1992 and 1995. The percent of residential households participating in recycling also increased from 39 percent in 1991 to 80 percent in 1996, which exceeds the Division's goal. In

Figure 4 Residential Pounds of Solid Waste Disposed of Per Customer Per Year

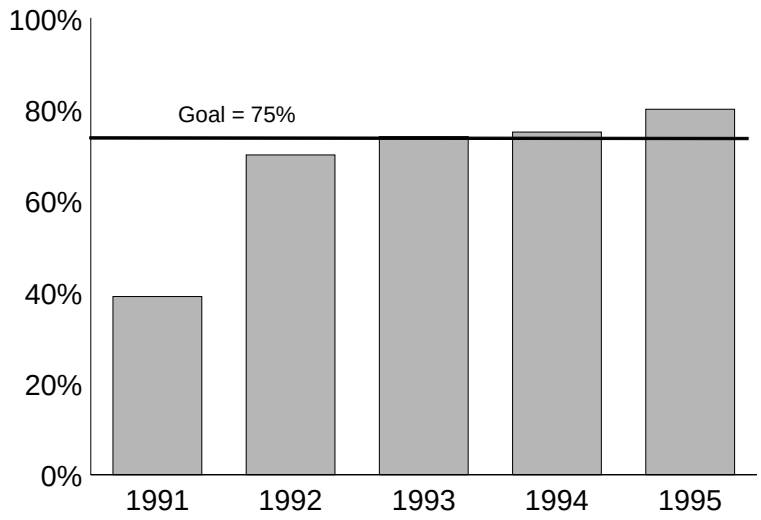
Source: Management Report for Solid Waste and Recycling, March 1996, BES

Figure 5 Residential Pounds of Solid Waste Recycled Per Customer Per Year (Excluding Yard Waste)



Source: Management Report for Solid Waste and Recycling, March 1996, BES

Figure 6 Residential Recycling Participation



Source: Management Report for Solid Waste and Recycling, March 1996, BES

total, the City recycled about 37 percent of its residential refuse and yard debris in 1995, up from about 28 percent in 1990.

However, City solid waste staff believe it will be difficult to meet the original Council goals of reducing total waste generated by 10 percent and recycling 60 percent of all solid waste by 1997. According to BES staff, the 10 percent total waste reduction is not easily measured because accurate data is not available on home composting and personal consumption. However, as shown in Figure 4, the amount of solid waste set out for residential refuse collection has declined by 12 percent since 1992.

The 60 percent goal will not be reached for several reasons. One reason is that goals and regulations for recycling commercial waste, which make up almost half of all waste, did not begin until 1996. Also, BES staff told us

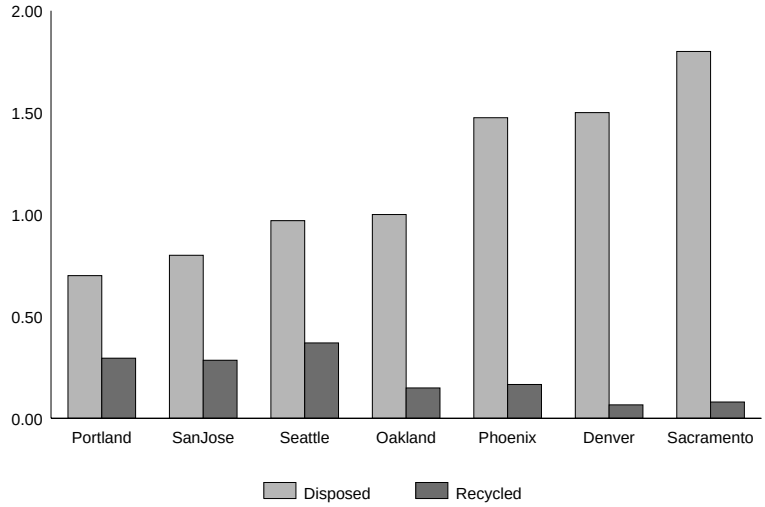
that the original goals were set assuming that 10 percent of the waste stream would to go Metro's Solid Waste composter which is no longer in operation. According to a recent article in Biocycle Magazine, Portland is not alone. The City of Seattle, recognized as a leader in recycling nationally, is also revising its own 60 percent recycling goal downward. City of Portland staff have not developed a revised goal to present to City Council.

Recycling efforts superior to most other cities

The City of Portland has implemented one of the most successful recycling programs in the country. About 80 percent of Portland households participate in the recycling program. As a result, the amount of refuse diverted from landfills to the recycling market was second highest among the jurisdictions surveyed. Excluding yard debris, Portland recycles about 28 percent of its solid waste, compared to an average of 13 percent for other jurisdictions in our survey. In 1995 haulers collected more than 131,600 tons of solid waste of which more than 37,400 tons was recycled. In addition, haulers collected over 69,000 gallons of motor oil, the second highest of the seven jurisdictions surveyed that collect motor oil curbside. Also, the amount of yard debris diverted from the landfill to composting facilities has increased from 102 pounds per household in 1993 to 276 pounds in 1995.

Portland's recycling program currently accepts fourteen different types of recyclables. While most cities collect newspapers, glass, steel cans, aluminum, plastic soft drink containers, and milk containers, Portland also collects cardboard, magazines, waste paper, scrap metals, motor oil, aseptic cartons, other plastic bottles, aerosol cans and phone

Figure 7 Total Tons Collected in 1995 Per Household (Selected Western Cities from Audit Services Survey)



Note: Does not include yard debris.
Source: ASD survey.

books. In those categories alone, we collected about 11,700 tons plus the 69,000 gallons of motor oil.

Portland's high recycling rate contributes to one of the country's lowest rates of refuse generation and percent of waste that is landfilled. About 0.7 tons of a Portland household's trash ended up in the landfill in 1995 compared to about 1.4 tons in the other cities we surveyed and 1.3 tons in Ecodata's national survey.

Customers Highly Satisfied with Services

Portland's residents give high marks to garbage and recycling services. As shown in Table 2, citizens have rated both garbage and recycling services relatively high in recent years. Seventy six percent of residents rated their

Table 2 Satisfaction with Garbage and Recycling Services and Costs (Percent rating service good or very good)

	Garbage Services	Recycling Services	Costs
1992	78%	72%	31%
1993	76%	74%	32%
1994	76%	75%	36%
1995	76%	77%	37%

Source: Annual City Auditor Citizen Survey

garbage service as good or very good the past three years, down slightly from 78 percent the first year of the survey. Satisfaction with recycling services has increased from 72 percent rating it good or very good in 1992 to 77 percent in 1995.

Despite the fact that residents are satisfied with the services, they are less satisfied with the costs. The percent of citizens rating garbage and recycling rates as good or very good has ranged from 31 percent to 37 percent the past four years. Even though the positive ratings on costs are tending slightly upward, almost a third (29 percent) of residents consider garbage rates bad or very bad. The next two chapters will discuss factors contributing to high garbage and recycling rates.

Chapter 3 Opportunities Exist to Lower Residential Rates

Monthly garbage rates in Portland are high compared to other cities. As shown in Appendix A, of 22 jurisdictions we contacted, Portland's monthly residential rates are fifth highest. Factors that contribute to high residential rates in Portland are:

- high levels of recycling and waste diversion
- franchise collection system
- rate calculation methods
- high disposal costs

This chapter will discuss the impact that recycling, the franchise system of collection, and rate calculation methods have on rates. Chapter four will discuss the impact of Metro operations' tipping fee on monthly garbage bills.

High Level of Recycling Increases Customer Bills

According to solid waste management experts and industry research, it costs significantly more to collect recyclable materials than normal solid waste. Costs are up to three times higher because haulers must travel the same distances to collect recyclables, incurring similar labor and operating costs while only collecting about 25 percent of the material and weight of regular garbage. In addition, when

recycling increases the remaining solid waste declines, driving up the cost per ton of collecting regular garbage. Moreover, revenues from recyclable items do not, in most cases, cover collection costs and fluctuate with recycling market prices.

According to our consultant, Ecodata Inc., the low amount of waste in the regular garbage stream in Portland accounts for almost 70% of the difference between the actual cost and the predicted refuse collection costs for a city with our population and refuse characteristics.

As shown in Table 3, our survey also found a close relationship between the amount of solid waste diverted from the landfill and monthly garbage rates. As shown, Portland, San Jose, Seattle and other cities with low refuse collection amounts per household and high diversion rates per collection, have higher charges than cities with low diversion rates.

Franchise Collection System Contributes to Higher Costs

Although Portland garbage haulers are efficient, the large number of haulers franchised reduces the opportunities to achieve economies of scale and increases costs for residential customers. According to our consultant, Ecodata Inc., economies of scale begin to be gained when a collection company dispatches more than five trucks and makes over 2,500 stops per day. At this level, fixed costs are spread to a larger customer base. In our city, however, only six of the 49 franchised haulers dispatch five or more trucks each day on city routes and about two-thirds of the haulers serve fewer than 2,500 city customers. Consequently, there are too many haulers to achieve economies of scale and Portland customers may pay higher bills as a result.

Table 3 Comparison of Rates and Recycling Service Levels (highest five and lowest five diversion rates from our survey)

City	Diversion Rate (not including yard waste)	Number of Items Collected	Tons of SW Collected per HH	Rate Per month
Highest				
San Jose	33%	17	0.8	$13.95 *
Portland	28%	14	0.7	17.50
Fremont	28%	13	0.9	18.73
Seattle, WA	28%	9	1.0	20.35 ***
Lee County, FL	18%	10	1.2	16.50
Lowest				
Nashville, TN	6%	11	1.3	3.25 - 5.50
Brevard Co., FL	5%	6	4.3	6.00
Sacramento, CA	4%	7	1.8	13.24 **
Fort Worth, TX	4%	6	1.5	10.30
Denver, CO	2%	6	1.5	8.00

SOURCE: Auditor's Office survey

* San Jose's residential collection is subsidized by commercial collection.

** Rate payers cover a 10% “in-lieu” franchise fee to the general fund.

*** Includes monthly optional yard debris subscription rate of $4.25.

A research report prepared by Ecodata Inc. in 1994 also concluded that awarding franchises to haulers to collect residential garbage is generally more costly than selecting a hauler through competitive bid. Using the data base from this study, we asked Ecodata to estimate the collection costs for a single hauler collecting refuse in a city with Portland's characteristics. Ecodata's statistical estimate showed that a single contractor providing regular garbage service to the entire city could be expected to provide that

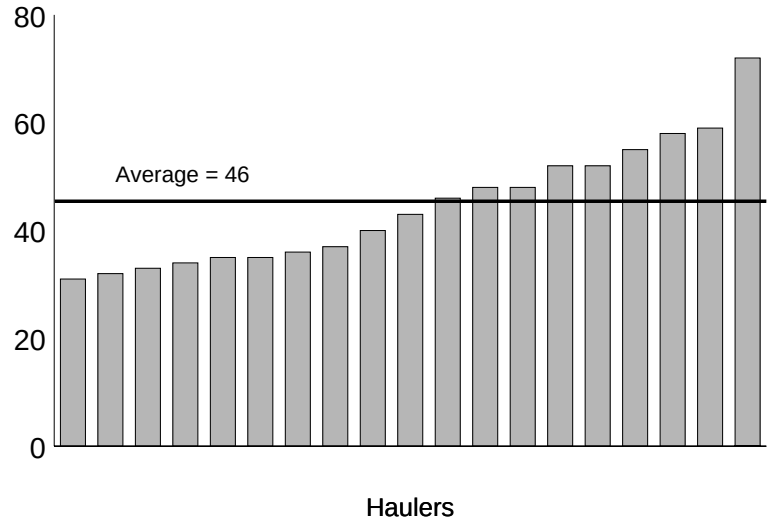
service for about $2 million less than our current costs, about $15.00 per household per year. While this does not necessarily represent the savings in total system costs available by changing to a single contractor, we believe it indicates the potential efficiency gains possible with fewer haulers.

Despite the large number of haulers in the Portland system, Dr. Stevens, from Ecodata, found that as a group Portland's franchised haulers operate efficiently. Haulers' costs are actually less than would be predicted for a system with so many haulers. However, we found a wide range of productivity levels among the haulers. For example, among the twenty haulers selected for review in 1995, the number of stops per hour ranged from 31 to 72 with an average of about 46 (Figure 8). Also, there is a wide range of hauler refuse collection costs per customer. Some Portland companies report costs as low as $110 per customer (including disposal), while others report costs of almost $190, with a system-wide average of $153 (Figure 9). Although some of the variations in cost and productivity may be due to differences in route terrain and customer service choices, it also may indicate variations in general efficiency.

The Bureau of Environmental Services has acknowledged that franchising may not be the most efficient collection system. However, in moving from a largely unregulated system in 1990 to a regulated system that emphasized recycling, the Bureau recommended a franchise system in order to ensure recycling performance, reduce contracting risks, and mitigate the disruption to the local hauling industry and their customers. In addition, BES believes that a franchise system can be regulated in a way to encourage efficiency through public incentives.

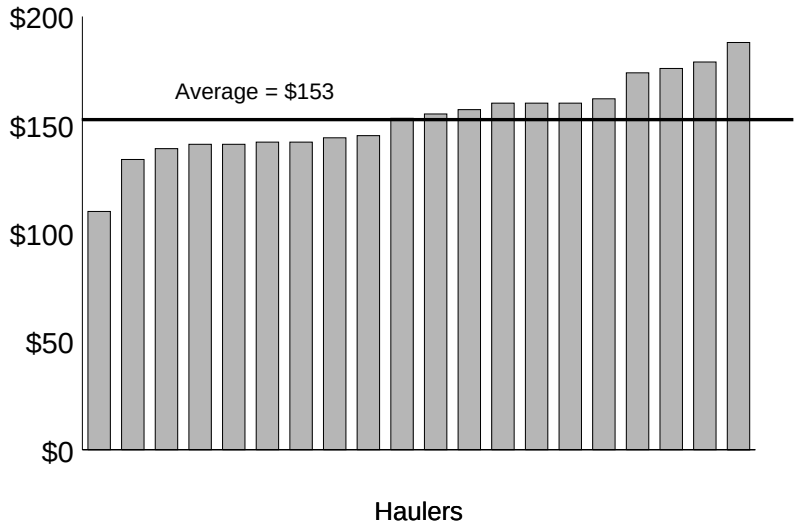
We believe that a solid waste and recycling system that involves fewer companies would help consolidate inefficient routes, more fully utilize manpower and equipment, maximize stops per hour, and minimize cost per customer. Our current franchise system was intended to encourage haulers to become more efficient in order to maximize profits. Even though the number of haulers has declined from a high of 69 when franchising began to the current number of 49, the system could benefit from further consolidation.

Figure 8 Stops Per Hour: 1995



Source: ASD analysis of bureau and hauler financial reports.

Figure 9 Cost Per Customer of Refuse Collected: Solid Waste Operating, General and Administrative Costs



Source: ASD analysis of bureau and hauler financial reports.

Franchise agreements don't adequately promote efficiency

Our analysis shows that the franchise agreements may allow too much profit for the haulers. Franchise agreements and the resulting rate model used to calculate rates include elements which we believe increase rates unnecessarily. In addition, haulers in our city earn higher profits than some haulers in other franchise systems and some private haulers of similar size.

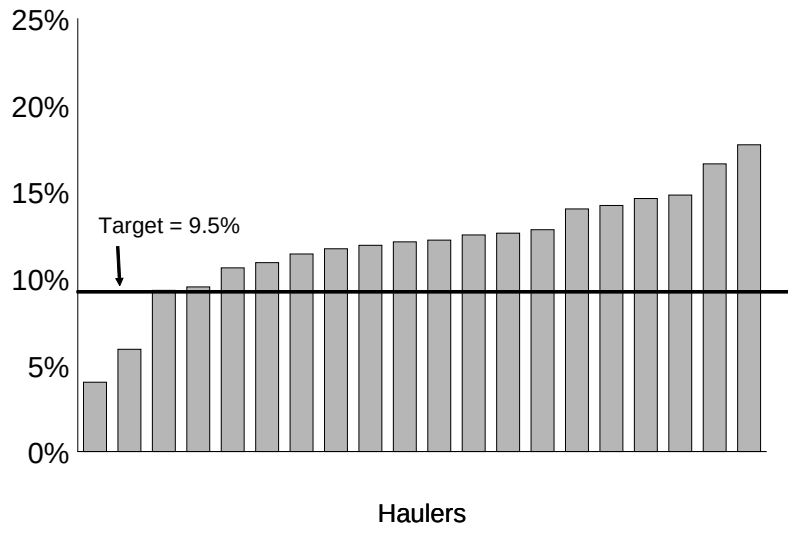
As discussed in the Introduction, the franchise rate method is intended to calculate rates that cover haulers' operating costs and provide an opportunity, but not a guarantee, for a fair profit. Because rates are based on weighted average costs for 20 randomly selected haulers, we would expect that when operating margins are reviewed as part

of the rate-setting process, the resulting actual margins would cluster around the 9.5 percent target. Some haulers would operate very efficiently and make a large profit, most haulers would make a profit around the target of 9.5 percent, and some would operate less efficiently and reap a smaller percentage of profit.

However, under the current rate structure, almost all haulers make profits in excess of the 9.5 percent target operating margin. In 1994, 16 of the 20 reviewed haulers made more than the target and one made 9.5 percent. Only three haulers made less than the target (Figure 10). During calendar year 1995, 17 of the 20 haulers reviewed made more than the target profit rate (Figure 11). In addition, the average for all reviewed haulers has gone up each of the past four years, from 10.08 percent in 1992 to 13.7 percent in 1995 (Figure 12). According to our analysis, even some relatively inefficient haulers were able to make profits in excess of the target. Some haulers with both high solid waste costs and low number of stops per hour made profits above the target rate.

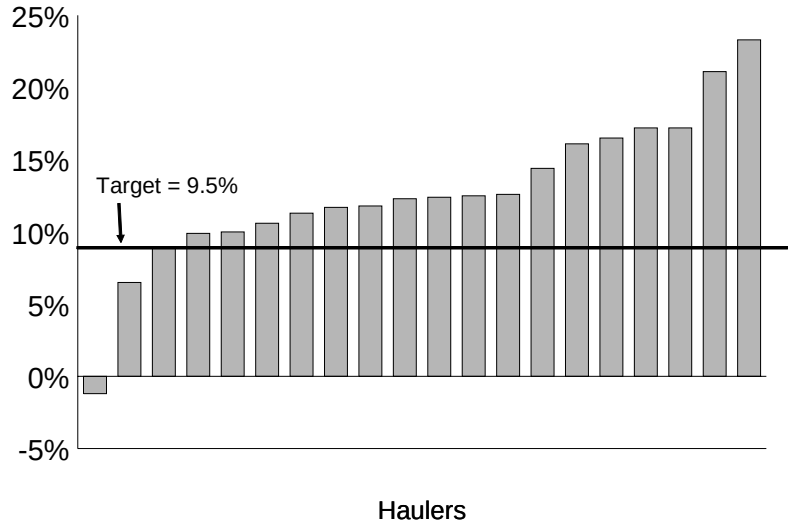
We believe there are several main reasons for high hauler profits. One important factor for higher than expected hauler profit in 1994 and 1995 was an unusually strong recycling market. These markets are out of the control of BES and thus are difficult to predict from year to year. Some discussions have been held with the Portland Utilities Review Board and the Solid Waste Advisory Committee concerning possible ways to stabilize the effects of these market fluctuations on customer rates.

Figure 10 1994 Operating Margins: 20 Reviewed Haulers



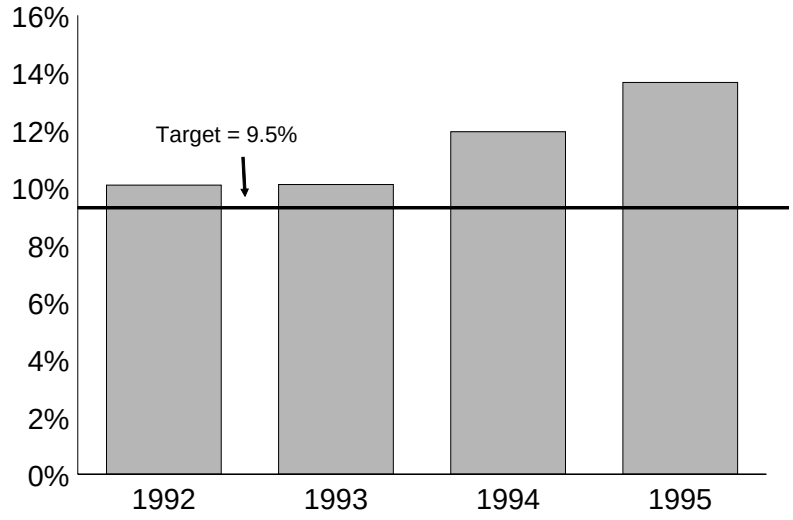
Source: Hauler financial reports to BES

Figure 11 1995 Operating Margins: 20 Reviewed Haulers



Source: Hauler financial reports to BES

Figure 12 Average Operating Margins: Reviewed Haulers



Source: Hauler financial reports to BES

In addition, hauler revenues are affected by several rate calculation methods.

Profits Allowed on Pass-through Disposal Costs

Franchise agreements allow haulers to earn 9.5 percent profit on tipping fees paid to Metro regulated transfer stations. However, haulers simply pass these fees on to customers in monthly bills. Haulers make no investment and take virtually no risks in the disposal system. As a result, haulers make a profit of $0.37 per customer per month, or $4.44 per year for a typical 32-gallon container on tipping fees – regardless of how efficiently the haulers collect refuse. We estimated that additional profits made by Portland haulers in 1995 on the Metro tip fee ranged from about $2,000 to almost $50,000 per hauler.

We believe, as does our consultant and others we spoke with in the industry, that haulers should make a fair profit based on their actual costs, investments and risks, but should not make additional profits on costs that are simply passed along to customers. We recognize that the haulers first pay tipping fees to Metro and later collect reimbursements from customers, and that slow payments, or customers who don't pay their bills expose the haulers to some risk. However, haulers are protected from total risk because the model includes an allowance for bad debts which is also built into the rate. Moreover, hauler financial records indicate that bad debts are not a significant problem – amounting to only $59,000 on total revenues of $19.6 million in 1995 (0.3 percent of total revenues).

Rate Model Allows Additional Profit

The current franchise agreement treats hauler operating margins and the City franchise fee as revenue to the hauler for the purposes of calculating customer bills. In other words, the operating margin and the franchise fee are considered to be a cost of service. However, this method allows the hauler and the city to earn revenues on an amount already included in the calculation. In effect, haulers make a profit on the profit, and the City collects franchise fees on the franchise fees. This has the effect of making the real operating margin based on a cost of service on a 32 gallon can 10.9 percent and the franchise fee 4.6 percent. According to our analysis, on a typical 32 gallon container, the rate payer pays about $0.22 per month extra for the operating margin and $.04 per month extra in franchise fees because of this provision. While BES correctly interpreted the language of the current franchise agreements, we believe the operating margin should be

calculated on service costs, not on total revenue, and franchise fees should be based on service costs plus the operating margin only. We understand this change means less revenue to the Bureau's solid waste program and we do not recommend reducing the program's service levels. However, basing the franchise fee on the cost of service, rather than total revenue, is needed to ensure accountability to the rate payers. To retain its current program service level the Bureau may need to increase the franchise fee from its current level of 4 percent. The fee was reduced from 5 percent to 4 percent this fiscal year.

The rate impact of allowing profits on costs and operating margin is shown in Table 4. The first column is the current method and second column shows the rate if double counting of operating and franchise fees, and profits on tipping fees, were eliminated.

Table 4 Garbage Rate Calculation Methods (32 gallon container, once per week)

Current Method		**Alternative Method**	
Collection Charge	$6.60	Collection Charge	$6.60
Recycling Charge	3.10	Recycling Charge	3.10
Yard Debris Charge	1.55	Yard Debris Charge	1.55
Disposal Charge	3.89	***Subtotal***	**11.25**
Operating Margin	1.66	Operating Margin	1.07
Franchise Fee	.70	***Subtotal***	**12.32**
		Disposal Charge	3.89
		Subtotal	**16.21**
		Franchise Fee	.65
Total	**$17.50**	**Total**	**$16.86**

SOURCE: Audit Services Division calculations

Operating Margin Needs Review

The current 9.5 percent operating margin allowed Portland haulers needs review to ensure profit levels are fair to ratepayers. Although the current 9.5 percent base operating margin appears similar to what other cities allow, Portland haulers consistently earn higher profits. Specifically, Portland haulers have earned average profit of 11.4 percent the last four years and 13.7 percent in 1995. While some of these additional profits have occurred because of the increased recycling revenues earned by haulers, we believe operating margins earned by haulers may exceed what is fair to Portland ratepayers.

The base operating margin was established by BES based on a survey of municipalities and private sector haulers by the firm of Hilton, Farnkopf and Hobson (HF&H). We contacted the eight original cities used in that study to determine if operating margins had changed. We found that five continued to allow operating margins between 9.5 and 10 percent, and two cities set profit margins significantly below Portland's. One city's system is no longer comparable to Portland. For the seven cities with comparable systems, haulers are allowed an average margin of 9.4 percent.

We also obtained an update of the Robert Morris Associates survey of private hauler profits. Haulers of similar size to Portland's franchisees earned actual operating margins between 7.7 and 9.7 percent.

As shown in Table 5, Portland haulers earned a significantly higher average operating margin than haulers in the private sector. In fiscal year 1995, all but three franchised haulers in Portland earned more than the 9.5 per-

Table 5 Comparison of Operating Margins

	Low	High	Average
City Regulated Companies (1) (Allowed margin)	7.75 *	10	9.4
Similar Sized Private Companies (2)			
$0 to $1 million revenues	---	---	9.7
$1 million to $3 million revenues	---	---	7.7
Actual Operating Margins for Portland Haulers - 1995 (20 haulers reviewed)	-1.2	23.3	13.7

Sources: (1) Audit Services Division Telephone Survey of seven cities
(2) Robert Morris Associates survey
* Base margin is 4.75% with up to three additional points added for meeting incentives.

cent targeted profit margin, for an average earnings of 13.7 percent. We believe that operating margins for Portland haulers should be critically reviewed to ensure they are fair to ratepayers. Fair but lower profit margins could encourage consolidations of franchises and produce lower total costs for customers.

Large and small can incentive needs adjustment

The large and small can incentive charges is another minor factor affecting rates that may need adjustment.

To encourage customers to recycle and reduce the amount of solid waste, the City has established rates for smaller cans that are less than the actual cost of service. In addition, a disincentive fee is added to the rates for larger cans to discourage their use. This results in a rate that is more than the actual cost of collection. While this may be an appropriate approach to encouraging waste reduction, it

also results in providing some haulers more revenue without providing more service. Depending on the mix of small and large cans, a hauler who collects more in large can revenue than is offset by his losses from small can collection is not required to make corresponding offset payments to the City. Over the past five years haulers have received an additional $700,000 in revenue due to the large can disincentive fee.

In addition, haulers make a profit of 9.5 percent, and the City makes a 4 percent franchise fee on this large can disincentive fee. For example, from a customer with a 90-gallon rollcart who pays an extra $1.25 a month, the hauler makes about $.12 per month more profit and the City makes about $.05 more per month in franchise fees. Consequently, haulers have a profit incentive to market the larger cans to customers, which is contrary to the City's policy objectives.

BES Solid Waste Management staff recognized these anomalies and began reducing the small and large can rewards and penalties. The small can incentive was reduced from $1.32 in FY1993-94 to $0.55 in FY1996-97, and the 90-gallon rollcart penalty was reduced from $2.97 to $1.25 during the same period. While we realize it is important to maintain price differentials to encourage waste reduction, we do not believe that allowing haulers to keep profits on these differentials is fair to the ratepayers. Elimination of these two charges altogether should be considered and the staff should research other types of incentives as a replacement. As shown in Appendix C, even without the incentive/disincentive fees, the mini-can service would still cost $1.87 less than the 32-gallon container.

Near the conclusion of our audit, BES told us they recently asked HF&H to develop a proposal to analyze various aspects of the solid waste program. HF&H was asked to provide advice on some of the recommendations in this report, plus other operational issues.

Chapter 4 Explore Opportunities to Coordinate Better with Metro

The second largest component of the monthly garbage bill is the cost to dispose of waste in Metro regulated transfer stations. The "tipping fee" or disposal charge paid by haulers, and eventually by rate payers, is one of the highest in the nation. Most of this charge covers the cost of operating the transfer stations, trucking waste to the landfills, and operating the landfills. However, over $17 of the $75 per ton fee supports Metro's general government operations and solid waste and recycling programs. Our preliminary analysis indicates that there may be opportunities to reduce the cost impact of these activities on residential garbage rates through better intergovernmental coordination and internal analysis of the solid waste excise tax.

High Disposal Charges

All waste collected in the tri-county region must be taken to Metro regulated transfer stations and recycling centers. Transfer stations charge haulers $75 per ton to dispose of waste. As shown in Table 6, the disposal charge, or "tipping fee," is composed of four parts: transportation to and operation of the landfill, operation of the transfer stations, Metro regional programs, and state DEQ and local host fees.

Table 6 Components of Metro's Solid Waste Tipping Fee

Transfer Station and Disposal Operations**	$16.70
Transport & Disposal at Landfill	39.25
Regional Programs	17.50 *
DEQ Fees	1.05
Host Fee	.50
Total	**$75.00**

* Supports regional solid waste and recycling efforts.

** Includes fixed costs of station operation, transport, and disposal.

Source: Metro Code 5.02.

The largest component of the disposal charge is the $39 per ton for transportation and landfill charge related to Metro's long-term contract with Oregon Waste Systems Inc. This contract provides for the disposal of at least 90 percent of the region's waste in the Columbia Ridge landfill through the year 2010. About $14 of this amount pays for trucking the waste from transfer stations to the Columbia Ridge landfill in Arlington, Oregon. The $16.70 transfer station charge supports two regional transfer stations located in Multnomah, Clackamas. The $17.50 for regional programs supports general administrative costs, engineering, and Metro's solid waste and recycling programs. Metro's 7.25 percent excise tax for general government and legislative operations is spread across the rate components resulting in a flat per-ton disposal rate. DEQ fees pay for monitoring local compliance with state plans and goals, and the host fee helps mitigate the impact of disposal facilities on host communities.

Based on our survey of solid waste disposal fees (Appendix A), this region's $75 per ton disposal charge is almost 80 percent higher when compared to the average tipping fees in seven jurisdictions in our survey who use transfer stations. However, differences in operating schemes make comparison very difficult. For example, many governments own or regulate landfills and subsidize their operation through general property taxes. Consequently, disposal charges are much lower than the actual cost of operation. In addition, other areas may not incur costs for transfer stations or waste transportation because landfills may be more plentiful or closer to the collection area.

Metro's long-term contract for transportation and landfill disposal with Oregon Waste Systems Inc. has also been criticized by some as excessive. However, according to a recent report by the Metro Auditor, Metro has no effective options for reducing costs under the contract. The contract contains no provisions for rate relief, nor has either party significantly breached provisions of the contract. Moreover, while Metro's tipping fee remains high, the major increases took place in the early years of the contract and have remained stable since 1993. Conversely, tipping fees in other western states have increased 35 percent from 1992 to 1995. Nationwide, tip fees are projected to rise about 7 percent per year as federal regulations lead to closure of smaller landfills in favor of larger ones.

Need for Internal Review of Metro Impact on Residential Rates

Our preliminary analysis of Metro budgets and program information indicates that there may be opportunities to reduce the impact of Metro operations on residential garbage bills. We believe that a thorough internal review of

Metro operations might 1) reveal ways to better balance the cost and benefit of solid waste excise taxes for residential rate payers, and 2) identify opportunities to streamline government regulation of solid waste and recycling activities in the region.

Assess Use and Level of Solid Waste Excise Tax

In accordance with the provisions of the Metro Charter, Metro is authorized to levy an excise tax on the users of Metro facilities. The excise tax constitutes Metro's primary source of general fund revenues and is set at 7.25 percent, down from 7.5 percent from FY 1994-95 to September 1996. The excise tax collected on solid waste totaled $5 million in FY1995-96, and represents about 75 percent of all excise taxes collected by Metro. The excise tax is the only source of funds for general government operations, including the Office of the Executive and Council Offices. Excise taxes also support other Metro activities that lack a defined source of revenue, such as growth planning, regional parks and open space management, and administration of spectator facilities.

Although authorized by law for general purposes, we believe there is a need for Metro to critically assess the size, use, and rationale of the excise tax on solid waste. To the extent that the tax is paid by garbage customers, but used for purposes unrelated to solid waste, it appears unfair. In addition, given that Portland garbage bills are among the highest in the nation, it may be appropriate to reduce the existing tax rate on solid waste and seek financial support for activities unrelated to solid waste from another source. Moreover, the different goals and competing interests of the solid waste program versus the other programs that rely on the excise tax on solid waste make

such a tax an unreliable source of ongoing revenue for these and other programs. Specifically, the regional goal of encouraging recycling will result in less waste disposed of and a decline in excise tax revenue available for Metro's general government and other important programs. Metro is forecasting that tipping revenue will decline by about 11 percent from FY 1994 levels due primarily to increased diversion of waste from landfills.

Metro staff, including the Executive's Office, are aware of the policy conflicts and revenue generation problems with using the excise tax for ongoing general government purposes. Staff will be developing alternatives for funding general government activities to present to the Metro Council later this fiscal year.

Review Size and Duties of Solid Waste and Recycling Staff in Local Government

While a detailed analysis and comparison of staffing and workload was beyond the scope of this report, it appears from our surveys that the metropolitan region has a relatively large number of staff assigned to solid waste planning and recycling efforts, compared to other jurisdictions surveyed. Metro has approximately 25 staff working on these efforts while the City has a staff of ten. In addition, other counties and cities in the region have staff who manage and administer solid waste and recycling collection efforts.

By contrast, 11 of the 18 jurisdictions that responded to this specific question had five or fewer full time dedicated staff assigned to solid waste planning and recycling. Two had between six and ten full time staff. No jurisdiction had more than 15.

Differences in staffing levels may result from very different laws and policy objectives. As discussed earlier, our region's emphasis on recycling and waste diversion may require significantly more staff to plan and implement. However, the difference in staff sizes appears so significant that additional study is warranted.

Despite the apparent large number of staff dedicated to solid waste management and recycling, we found duplication of effort between Metro and the City in only two small areas: responding to telephone inquiries and investigating illegal dumping.

Both the City and Metro handle similar telephone calls from citizens needing information on solid waste and recycling. In 1995, the City's Curbside Hotline handled over 22,000 calls from citizens. Thirty-seven percent of the calls were to identify a customer's garbage hauler, while most other calls concerned how to recycle items, inclement weather schedules, or commercial and multi-family service. The City's Solid Waste Division devotes 1 FTE to the hotline. Metro's Recycling Information program answered 106,000 calls in FY 1995-96 and is staffed by about 5.0 FTE. About half the calls received by Metro are from City of Portland residents. Over half the calls are for information about transfer stations and drop off centers. About 12 percent of the calls are from people needing information on their hauler or on curbside recycling collection. Metro staff told us that they can answer almost any question about individual haulers in the Portland area, such as who their hauler is, how to prepare recyclable items for collection, etc.

We realize that consolidating information services may mean contracting with Metro to answer City-related calls. This should only be done if Metro can offer the service at lower cost than our present system.

Metro and the City also expend effort regulating illegal dumping. Metro is attempting to coordinate illegal dumping remediation activities within the region as part of its Regional Solid Waste Management Plan. A Metro planner has formed a committee to draft a proposal to clarify the roles of local governments. The current system to locate, investigate, and clean up illegal dumps often crosses jurisdictional lines. Metro has one planner who, along with three Multnomah County deputies, is assigned to investigate illegal dumps. The City's Solid Waste Division has one staff person who spends about half his time on illegal dumping investigations and other related activities. He investigates illegal dumps, attends the Metro committee meetings, and sends warnings to offenders.

Even though we did not find significant duplication of City and Metro efforts, there may be opportunities to consolidate solid waste and recycling activities to avoid the costs of multiple layers of government handling the same types of problems. The current system requires significant coordination among agencies to ensure local agencies comply with rules developed by the State and Metro. For example, virtually every facet of Metro's Regional Solid Waste Management Plan has elements of local government coordination. Some consolidation of recycling and waste reduction efforts between Metro and local governments could reduce the need for professionals at both the local and regional levels to coordinate planning and program implementation.

Chapter 5 Recommendations

The Bureau of Environmental Services through the efforts of the Solid Waste and Recycling Division should continue their strong performance in achieving recycling and waste diversion goals. In order to moderate the cost of residential garbage rates, we recommend that the City Council and the Bureau take the following actions:

1. ***Continue franchised garbage collection system but modify franchise agreements and rate setting methods in order to reduce overall system costs and lower residential rates. Specifically, the Bureau should:***

    a. ***Exclude disposal costs from the calculation of operating margin.***

    b. ***Derive operating margin as a percent of cost of service, not total revenue.***

    c. ***Eliminate large and small can incentive/ disincentive rate differentials. Exclude large can disincentive revenues from operating margin and franchise fee calculations until they are fully eliminated. Staff should research other types of incentives for waste reduction as a replacement.***

d. Study existing operating margin levels to ensure they are equitable to ratepayers. Consider introducing incentives to earn back lost margin based on improved service performance.

e. Calculate franchise fees as a percent of cost of service and operating margin.

2. The City Council should request that Metro thoroughly analyze opportunities to reduce the impact of their operations on residential garbage bills.

Specifically, Metro should assess the fairness to rate payers of the solid waste excise and assess its appropriateness as an ongoing revenue source for Metro operations and programs. In addition, Metro should study staffing levels, tasks, workload of the solid waste and recycling programs of all jurisdictions in the region and identify opportunities to reduce duplication and consolidate efforts.

3. The Bureau of Environmental Services should develop and report more complete information on the performance and efficiency of franchised haulers.

The Division should periodically report to Council the operating margins of haulers. This will help City Council in assessing trends in hauler profit and effectiveness of the rate model in achieving its objectives of fairness to both the haulers and the ratepayers.

The Division should also develop a set of performance measures for franchised haulers that would give indications of hauler productivity and performance. These measures should be publicly reported and used to assess the overall efficiency of the franchise program. Measures could include costs per ton, households served per labor hour, and tons collected per crew member.

4. The Bureau should develop and present for City Council approval new goals for the recycling program to replace the 60 percent by 1997 goal.

The goal should be reasonable, realistic, measurable, based on the best data available, and meet state and regional goals and objectives.

Appendix A
Audit Services Division Survey of Other Jurisdictions

Appendix A Survey

Methodology

To compare Portland's residential solid waste and curbside recycling rates and services, we surveyed 26 jurisdictions and collected information on costs, revenue, and program elements. Jurisdictions were selected from three different sources. The Audit Services Division's annual Service Efforts and Accomplishments report was used to identify six jurisdictions previously identified as comparable to Portland. Ten jurisdictions selected had responded to a previous Bureau of Environmental Services survey. The remaining jurisdictions were selected with the assistance of Dr. Barbara Stevens of Ecodata, Inc. Dr. Stevens, a nationally recognized expert in the field of solid waste, was hired as a consultant in developing, implementing, and analyzing the survey.

Twenty three of the 26 jurisdictions responded fully or partially for an 88 percent response rate. All jurisdictions were contacted by telephone and then a survey was mailed to an identified recipient. The jurisdictions then received follow-up calls.

Jurisdiction	1990 Census Population	Responded to Survey
Austin, Texas	465,622	Yes--partially
Babylon Township, NY	202,889	Yes
Berkley, California	102,724	No
Brevard County, Florida	398,978	Yes
Charlotte, North Carolina	395,934	No
Cincinnati, Ohio	364,040	Yes--partially
Dade County, Florida	1,937,094	Yes--partially
Denver, Colorado	467,610	Yes
Duval County, Florida	672,971	Yes
Fort Worth, Texas	447,619	Yes
Fremont, California	173,339	Yes
Islip Township, NY	299,587	No
Kansas City, Missouri	435,146	Yes (no curbside recycling program)
Lee County, Florida	335,113	Yes
Milwaukee, Wisconsin	628,088	Yes
Nashville, Tennessee	488,374	Yes--partially
Oakland, California	372,242	Yes
Oklahoma City, Oklahoma	444,719	Yes
Omaha, Nebraska	335,795	Yes--(limited by new recycling program)
Phoenix, Arizona	983,403	Yes
Portland, Oregon	437,319	Yes
Sacramento, California	369,365	Yes
San Jose, California	782,248	Yes
San Francisco, California	723,959	Yes
Seattle, Washington	516,259	Yes--partially
Tucson, Arizona	405,390	Yes--Recycling only

Results

Results of the survey responses and telephone contacts indicated that no two jurisdictions used the same system to provide solid waste and recycling services. Jurisdictions have implemented a variety of unique solid waste programs. For example, the City of Portland encourages recycling by providing literature and other assistance to residents about diverting material from the waste stream. They also provide weekly solid waste and recycling collection and provide incentives for the use of smaller garbage cans. In other jurisdictions, there appears to be less emphasis on diverting solid waste as evidenced through twice weekly solid waste collection, recycling collection every other week, and no variable cost for the amount of garbage set out. One jurisdiction allowed residents to place an unlimited number of plastic bags of garbage curbside every week. For those jurisdictions that did share some solid waste system characteristics, the combination of how the programs were put together varied. Following is a summary of the variations:

- The jurisdictions ran residential solid waste, recycling, and yard debris collection through contract, franchise, and/or municipal systems. Twenty-seven percent used contractors, 14 percent used a municipal system, 9 percent were franchise, 41 percent used a combination of contractors and municipal systems, and 9 percent had some other combination of systems.

- Of the jurisdictions that used contractors or franchisees solely or in combination with municipal systems, none had more than 3 contractors or franchisees at a time. Portland

was the only exception with 49 franchisees. One jurisdiction with only one contractor reported to be at a great disadvantage in managing the solid waste collection system and data collection due to a lack of competition and a resulting inability to enforce sanctions.

- Seventy-eight percent of jurisdictions collected solid waste once per week and 22 percent collected twice a week.
- Seventy percent of jurisdictions collected curbside recycling once per week, 15 percent collected every other week, and 15 percent collected less than every other week.
- Only one jurisdiction collected 16 or more recyclable items at the curbside, 59 percent collected 10 to 15 different items, and 36 percent collected less than 10 items. Recyclable materials included items such as newspaper, glass, steel cans, aluminum, plastic bottles, cardboard, mixed waste paper, scrap metals, and motor oil.
- The division of revenue from the sale of recycling materials varied across the jurisdictions. Some allowed the hauler or vendor to keep all revenue, some jurisdictions kept all revenue, others split the revenue by an agreed upon percentage, and some had a formula or other system for distributing the revenue.
- Seventy-one percent of the jurisdictions offered curbside yard debris collection, 12 percent had depots or drop-offs, and 18 percent had some other or no program for yard debris.

- Enterprise funds were reported most frequently (43%) as the funding type for residential solid waste collection and curbside recycling programs. Nineteen percent used the general fund, 19 percent used a combination of funding sources, and 19 percent used some kind of special funding source (i.e., state grants).

The variations in solid waste systems among jurisdictions made it difficult to compare efficiency measures. However, when analyzing data on a broader scale, a pattern was apparent between the rate charged per collection and the diversion rate (the amount of solid waste diverted from the landfill into recycling). In other words, the higher the diversion rate, the higher the cost for collection.

RESIDENTIAL WASTE PROGRAM COMPARISON SURVEY

					SOLID WASTE				RECYCLING		
City	**Service Provider**	**Number of Households (HH) Served**	**Funding Type**	**Curbside yard debris program? Frequency?**	**Annual Tons Collected**	**Frequency of Collection**	**Monthly Rate of Usual Container Size**	**Tipping Fee per Ton**	**Annual Tons Collected**	**Frequency of Collection**	**Number of Recyclable Materials**
Portland, OR	**Franchisees**	**127,000**	**Enterprise Fund**	**Yes 1/ 2 weeks**	**94,210**	**1/week**	**$17.50 for 30-33 gallon**	**Transfer Station $75.00**	**37,466**	**1/week**	**14**
Austin, TX	Municipal	125,300	Enterprise Fund	DNR	114,067	1/week	$11.64	$13.50	22,732	1/week	9
Babylon, NY	Contract	48,000	DNR	Yes 1/week	100,000	2/week	$27.52 for 1 or 2 30-33 gallon containers (TB)	None	9,431	1/week	9
Brevard County, FL	Contractors	160,000	Enterprise Fund	Yes 1/week	687,000	2/week	$6.00--unlimited size (TB)	DNR	34,829	1/week	6
Cincinnati, OH	Combination Contractor & Municipal	150,000	General Fund	DNR	114,000	1/week	$11.93 (TB)	Landfill $18.95	12,000	DNR	11
Dade County, FL	Combination Contractor, Municipal, & Permitees	275,000	Enterprise Fund	DNR	650,000	2/week	$29.08	Landfill only $59.00-- non-contractor. & $45.00--contractor Transfer Station addl. $9.00	50,000	DNR	11
Denver, CO	Municipal	162,000	General Fund	No	239,303	1/week	$8.00--unlimited size (CS)	Landfill $7.00 Transfer St. $5.70 Private trans. St. $12.00	3,812	1/ 2 weeks	6
Duval County, FL	Combination Contractors & Municipal	120,000	General & Enterprise Funds	Yes 1/week	DNR	1/week	No direct user fee--unlimited size	Landfill $59.00	DNR	1/week	10
Fort Worth, TX	Combination Contractor & Municipal	129,863	Enterprise Fund	No	192,294	2/week	$10.30--unlimited plastic bags (CS)	Landfill $7.44	7,672	1/week	6
Fremont, CA	Franchise	42,989	Enterprise Fund	Yes 1/week	36,691	1/week	$18.73 for 60 gallon	Landfill $25.37	13,938	1/week	13
Kansas City, MO	Combination Contract & Municipal	150,000	General Fund	Seasonal (once in spring & fall)	135,000	1/week	No direct user fee--unlimited bags	$11.80	No Curbside Recycling		
Lee County, FL	Contractors	88,000	Enterprise Fund	Yes 1/week	110,000	1/week	$16.50--unlimited	Transfer Station $62.51 (includes $12.90 surcharge)	24,505	1/week	10

NOTE:
DNR=Did Not Respond
TB=included in annual property Tax Bill
CS=Cost of Service only

RESIDENTIAL WASTE PROGRAM COMPARISON SURVEY

					SOLID WASTE				RECYCLING		
City	**Service Provider**	**Number of Households (HH) Served**	**Funding Type**	**Curbside yard debris program? Frequency?**	**Annual Tons Collected**	**Frequency of Collection**	**Monthly Rate of Usual Container Size**	**Tipping Fee per Ton**	**Annual Tons Collected**	**Frequency of Collection**	**Number of Recyclable Materials**
Portland, OR	**Franchisees**	**127,000**	**Enterprise Fund**	**Yes 1/ 2 weeks**	**94,210**	**1/week**	**$17.50 for 30-33 gallon**	**Transfer Station $75.00**	**37,466**	**1/week**	**14**
Milwaukee, WI	Municipal	243,309	50%general fund & 50% state business gross profit tax	Brush only by telephone appointment	272,000	1/week	No direct user fee--90 gallon for all customers	Transfer Station $33.00--solid waste $26.00--recycling	34,657	1/month	14
Nashville, TN	Combination Contractors & Municipal	120,000	Tip Fees subsidized by general fund	DNR	160,000	1/week	$3.25 to $5.50 (TB)	$38.00 for non-municipal	10,000	DNR	11
Oklahoma City, OK	Combination Contractor & Municipal	152,641	Enterprise Fund	Yes 1/week	134,585	1/week	$9.17 for 40 or 90 gallon	Landfill $24.60	11,816	1/week	8
Omaha, NE	Contractor	105,214	General Fund	Yes 1/week	131,396	1/week	No direct user fee	$18.31 solid waste $15.00 yard debris	Not available--new program	1/week	9
Phoenix, AZ	Combination Contract & Municipal	300,000	Enterprise Fund	Yes 3/year	442,539	1/week	$12.50 for 90 gallon	Landfill or Transfer Station $22.00	33,276	1/week	13
Sacramento, CA	Municipal	109,000	Enterprise Fund	Yes 1/week	200,000	1/week	$13.24 for 90 gallon	Landfill $21.00 Transfer St. $37.75	8,693	1/ 2 weeks	7
San Jose, CA	Contractors	186,000	Special Fund--subsidized by commercial	Yes 1/week	150,500	1/week	$13.95 for 30-33 gallon	Landfill $29.45	75,455	1/week	17
San Francisco, CA	Combination Contract & Permit	325,000	Impound acct. from refuse collection--subsidized by commercial	No	DNR	1/week	$10.86 for 30-33 gallon (includes 1.3% surcharge for special reserve fund)	DNR	47,176	1/week	11
Seattle, WA	Contractors	150,000	Enterprise	Yes (by subscription) DNR	146,181	1/week	$20.35 for 30-33 gallon (includes yard debris)	Transfer Station $75.37	55,678	1/week	11
Tucson, AZ	Combination Contractor & Municipal	DNR	DNR	No	161,000	2/week	DNR	DNR	12,848	1/ 2 weeks	10

NOTE:
DNR=Did Not Respond
TB=included in annual property Tax Bill
CS=Cost of Service only

Appendix B
Report from Ecodata, Inc.
Dr. Barbara Stevens

ECODATA INC.

97 Compo Road North, Westport, Connecticut 06880

Tel: (203) 454-1700
Fax: (203) 227-5289

MEMO TO: Ken Gavette
Senior Management Auditor
Audit Services
1220 SW 5th Avenue Room 120
Portland, OR 97204
via fax: 503-823-4459
tel: 503-823-3540

FROM: Barbara Stevens

RE: Estimating Portland's Residential Refuse Collection Costs

DATE: July 18, 1996

I. INTRODUCTION

This memorandum presents the estimated refuse collection costs for a city with Portland's characteristics, based on an econometric model of refuse collection costs estimated by Ecodata. The model is described briefly in Section II. Section III presents the estimated costs for Portland, and presents expected changes in costs which could be associated with a change in the average territory of a collector.

II. DESCRIPTION OF THE MODEL

The model is estimated on a sample of 60 randomly selected cities located throughout the United States. Included in the sample of 60 cities are 30 with municipal collection and 30 with private contract collection. The contract cities all have collection by a private firm serving an exclusive territory, paid by the municipality.

The econometric model takes the form of estimating the expected costs, based on factors outside the control of management, including:

- Scale of operation, measured as tons collected;
- Level of service, measured as pickups per week and percentage of pickups at the backyard;
- Prevailing conditions, including prevailing wages (the driver's annual wage), and route density, measured as population per curb mile and the tons of refuse per household per year.

These six factors are independent variables in a regression equation with total costs of refuse collection (excluding disposal) as the dependent variable. A second specification of the model includes the number of complaints, an inverse measure of quality of service, as an additional independent variable. The estimating equation explains over 90% of the variance in the costs of refuse collection.

III. ESTIMATED COSTS FOR PORTLAND

Exhibit 1 presents the average values of the independent and dependent variables included in the model. Portland's values are presented as well in this column. It should be noted that Portland generated 94,210 tons of residential refuse in calendar year 1995, but that this is divided among 49 franchisees, yielding an average franchise size of 1923 tons. Actual data reveals that 20 franchisees services about 75% of the customers, so these firms average 3533 tons per year, and the remaining 29 franchisees average 812 tons per year.

Exhibit 1: Model Variables and Values		
Item	Value for:	
	Ecodata Sample	City of Portland
Dependent variable: Cost of Residential Refuse Collection	$2,047,986	$12,962,890
Independent variables:		
Scale: Tons collected	48,673	94,210*
Service: Pickups/week	1.35	1.00
% at backyard	9.5%	8.0%
Conditions: Tons/households	1.33	0.74
Population/curb mile	141	169
Annual driver wage	$24,416	$31,200
Additional independent variable: Complaints/year/1000 households	86	15

NOTES: Scale variable is for all of Portland; estimates are based on average tons per firm, multiplied by number of firms. See text. Complaints are those received by the city, which averaged 56 for cities with contract service and 140 for cities with municipal service; most complaints go directly to the private firm in cities with contract service.

The estimating equation was re-calibrated, using Portland's values of the independent variables and the estimated regression coefficients. Three estimates were made: 1) assuming 20 franchisees serve 75% of the market and 29 franchisees serve 25% of the markets; 2) assuming 49 equal sized franchisees; and 3) assuming a single franchise. The estimates presented are independent of organizational arrangement, falling in between the estimates for contract service (lower than the figures presented) and municipal service estimates. Exclusive franchise service, the type found in Portland at present, can be expected to achieve costs close to that of the contract system. Contract estimated costs are generally expected to be about 17% less than the average collection costs presented in Exhibit 2, and about 29% less than municipal collection costs.

Exhibit 2 presents the estimated collection costs for Portland. The present residential refuse collection costs are $13,000,000. The estimated costs for an average city with Portland's characteristics ranges from a low of $11,300,000 for contract service with a single entity to $18,300,000 for service with 49 equal sized franchises. Contract service with 20 franchisees serving 75% of the market and 29 franchisees serving 25% of the market is estimated to cost almost 50% more than the single franchise system -- $16,800,000. As this system is closest to the actual system in Portland, it offers perhaps the best comparison for purposes of assessing the efficiency of the existing system. Portland's actual refuse collection costs are less than the estimated costs, by about 18%. Thus, the present system appears to be relatively efficiently operated.

While the present system appears to be relatively efficient in Portland, savings could be obtained by changing the system from one with many franchisees to one with a much smaller number of franchisees. With a single franchisee, costs are estimated to be about $2,000,000 million less than today's prevailing costs. This would translate to about $15.74 per household per year.

The present distribution of franchises territories does not result in particularly significant cost savings over a system with the same number of equally sized franchises. Having 20 franchisees service 75% of the households saves only about 2% of collection costs. In other words, the extent of concentration which exists in Portland at present is not sufficient to allow capture of economies of scale.

In sum, residential collection costs in Portland are quite efficient, given the size distribution of franchises. Costs are increased due to relatively small quantities of refuse per household (attributable to the high diversion rate from recycling) and the relatively higher than average wage rate. This means that the per ton collection cost in Portland is higher than the national average, at $138 compared to $54. However, this cost difference is accounted for by the factors unique to Portland, including franchise size, refuse per household, and prevailing wages, and the difference in unit costs is not to be interpreted as indicative of inefficiency in service delivery.

Exhibit 2: Estimated Residential Refuse Collection Costs for Portland, Oregon Actual costs = $13,000,000 ($138 per ton)		
Number of Franchises	Estimated Annual Collection Cost	
	Contract Service	Average of Contract & Municipal Service
Single Franchise	$11,300,000	$13,700,000
20 Franchisees -- 75% of market 29 Franchisees -- 25% of market	$16,800,000	$18,000,000
49 equal sized Franchisees	$17,200,000	$18,300,000

Exhibits 3A to 3C, below, show the computations for estimating average collection costs in Portland.

Exhibit 3A: Estimated Collection Costs Portland, Oregon Single Franchise Area				
Variable	Value	Model Value	Model Coefficien	Product (Val*Coef)
Intercept	1	1	5.085	5.0850
Tons	94210	11.4533	0.926	10.6057
Tons/HH	0.742	-0.2984	-1.101	0.3285
Pickups/wk	1	0.6931	0.295	0.2045
% Backyard	0.08	0.0770	0.915	0.0704
Pop/curb mile	169	5.1299	0.03	0.1539
Annual Driver Wage	31200	10.3482	-0.017	-0.1759
Complaints/1000HH	15	2.7081	0.06	0.1625
Total Value		Natural Logarithm		16.4346
		Dollars/year		$13,724,000

Exhibit 3B: Estimated Collection Costs Portland, Oregon 20 Franchisees with 75% of Work 29 Franchisees with 25% of Work				
Variable	Value	Model Value	Model Coefficien	Product (Val*Coef)
Intercept	1	1.0000	5.085	5.0850
Tons	3532.875	8.1699	0.926	7.5653
Tons/HH	0.742	-0.2984	-1.101	0.3285
Pickups/wk	1	0.6931	0.295	0.2045
% Backyard	0.08	0.0770	0.915	0.0704
Pop/curb mile	169	5.1299	0.03	0.1539
Annual Driver Wage	31200	10.3482	-0.017	-0.1759
Complaints/1000HH	15	2.7081	0.06	0.1625
Total Value	Natural Logarithm			13.3942
	Dollars/year/franchisee			$656,000
	Times 20 franchisees			$13,120,000
Intercept	1	1.0000	5.085	5.0850
Tons	812.1552	6.6997	0.926	6.2039
Tons/HH	0.742	-0.2984	-1.101	0.3285
Pickups/wk	1	0.6931	0.295	0.2045
% Backyard	0.08	0.0770	0.915	0.0704
Pop/curb mile	169	5.1299	0.03	0.1539
Annual Driver Wage	31200	10.3482	-0.017	-0.1759
Complaints/1000HH	15	2.7081	0.06	0.1625
Total Value	Natural Logarithm			12.0328
	Dollars/year/franchisee			$168,000
	Times 29 franchisees			$4,872,000
GRAND TOTAL COST PER YEAR				$17,992,000

Exhibit 3C: Estimated Collection Costs Portland, Oregon 49 Equal Sized Franchise Areas				
Variable	Value	Model Value	Model Coefficien	Product (Val*Coef)
Intercept	1	1.0000	5.085	5.0850
Tons	1922.653	7.5615	0.926	7.0019
Tons/HH	0.742	-0.2984	-1.101	0.3285
Pickups/wk	1	0.6931	0.295	0.2045
% Backyard	0.08	0.0770	0.915	0.0704
Pop/curb mile	169	5.1299	0.03	0.1539
Annual Driver Wage	31200	10.3482	-0.017	-0.1759
Complaints/1000HH	15	2.7081	0.06	0.1625
Total Value		Natural Logarithm		12.8308
		Dollars/year/franchisee		$374,000
		Total Dollars/Year		$18,326,000

Exhibit 3D: Estimated Collection Costs
Portland, Oregon
2 Franchisees

Variable	Value	Model Value	Model Coefficien	Product (Val*Coef)
Intercept	1	1.0000	5.085	5.0850
Tons	47105	10.7601	0.926	9.9639
Tons/HH	0.742	-0.2984	-1.101	0.3285
Pickups/wk	1	0.6931	0.295	0.2045
% Backyard	0.08	0.0770	0.915	0.0704
Pop/curb mile	169	5.1299	0.03	0.1539
Annual Driver Wage	31200	10.3482	-0.017	-0.1759
Complaints/1000HH	15	2.7081	0.06	0.1625
Total Value		Natural Logarithm		15.7928
		Dollars/year/franchisee		$7,223,000
		Times 2 franchisees		$14,446,000
GRAND TOTAL COST PER YEAR				$14,446,000

Appendix C
Current Rates and Savings Estimates

Appendix C Rate and Savings Calculations

Five Most Popular Service Levels

	FY 1996-97 Rate Calculation Method	Recommended With no change in Operating Margin %	Recommended With a reduced Operating Margin %
Operating Margin Percentages	9.5%	9.5%	8.5%
20 Gallon Mini-Can			
Collection Costs	6.48	6.48	6.48
Recycling Costs	3.10	3.10	3.10
Yard Debris Costs	1.55	1.55	1.55
Small can discount	(0.55)	0.00	0.00
Subtotal	10.58	11.13	11.13
Operating Margin	1.40	1.06	0.95
Subtotal	11.98	12.19	12.08
Disposal Charge	2.23	2.23	2.23
Subtotal	14.21	14.42	14.31
City Franchise Fee	0.59	0.58	0.57
Total Service Charge	$14.80	$14.99	14.88

Customer Savings Calculations:		
Customer (cost) or savings per month	($0.19)	($0.08)
Times the number of customers	24,000	24,000
Total (cost) or savings per month	($4,657)	($1,879)
Times 12 months per year	12	12
Total (cost) or savings per year	($55,885)	($22,548)

Standard 32 Gallon Container			
Collection Costs	6.60	6.60	6.60
Recycling Costs	3.10	3.10	3.10
Yard Debris Costs	1.55	1.55	1.55
Subtotal	11.25	11.25	11.25
Operating Margin	1.66	1.07	0.96
Subtotal	12.91	12.32	12.21
Disposal Charge	3.89	3.89	3.89
Subtotal	16.80	16.21	16.10
City Franchise Fee	0.70	0.65	0.64
Total Service Charge	$17.50	$16.86	16.74

Customer Savings Calculations:		
Customer savings per month	$0.64	$0.76
Times the number of customers	62,000	62,000
Total savings per month	$39,860	$47,114
Times 12 months per year	12	12
Total savings per year	$478,318	$565,366

Appendix C Rate and Savings Calculations

Five Most Popular Service Levels

	FY 1996-97 Rate Calculation Method	Recommended With no change in Operating Margin %	Recommended With a reduced Operating Margin %
Operating Margin Percentages	9.5%	9.5%	8.5%
35 Gallon Rollcart			
Collection Costs	6.60	6.60	6.60
Recycling Costs	3.10	3.10	3.10
Yard Debris Costs	1.55	1.55	1.55
Depreciation	0.63	0.63	0.63
Interest	0.32	0.32	0.32
Maintenance	0.15	0.15	0.15
Subtotal	12.35	12.35	12.35
Operating Margin	1.81	1.17	1.05
Subtotal	14.16	13.52	13.40
Disposal Charge	3.99	3.99	3.99
Subtotal	18.15	17.51	17.39
City Franchise Fee	0.76	0.70	0.70
Total Service Charge	$18.90	$18.21	18.09

Customer Savings Calculations:		
Customer savings per month	$0.69	$0.81
Times the number of customers	12,500	12,500
Total savings per month	$8,578	$10,183
Times 12 months per year	12	12
Total savings per year	$102,933	$122,199

60 Gallon Rollcart			
Collection Costs	6.60	6.60	6.60
Recycling Costs	3.10	3.10	3.10
Yard Debris Costs	1.55	1.55	1.55
Depreciation	0.99	0.99	0.99
Interest	0.5	0.5	0.5
Disincentive Premium	0.29	0	0
Maintenance	0.15	0.15	0.15
Subtotal	13.18	12.89	12.89
Operating Margin	2.15	1.22	1.10
Subtotal	15.33	14.11	13.99
Disposal Charge	6.61	6.61	6.61
Subtotal	21.94	20.72	20.60
City Franchise Fee	0.91	0.83	0.82
Total Service Charge	$22.85	$21.55	21.42

Customer Savings Calculations:		
Customer savings per month	$1.30	$1.43
Times the number of customers	10,000	10,000
Total savings per month	$12,965	$14,305
Times 12 months per year	12	12
Total savings per year	$155,576	$171,663

Appendix C Rate and Savings Calculations

Five Most Popular Service Levels

	FY 1996-97 Rate Calculation Method	Recommended With no change in Operating Margin %	Recommended With a reduced Operating Margin %
Operating Margin Percentages	9.5%	9.5%	8.5%
90 Gallon Rollcart			
Collection Costs	6.60	6.60	6.60
Recycling Costs	3.10	3.10	3.10
Yard Debris Costs	1.55	1.55	1.55
Depreciation	1.06	1.06	1.06
Interest	0.53	0.53	0.53
Disincentive Premium	1.25	0	0
Maintenance	0.15	0.15	0.15
Subtotal	14.24	12.99	12.99
Operating Margin	2.63	1.23	1.10
Subtotal	16.87	14.22	14.09
Disposal Charge	9.88	9.88	9.88
Subtotal	26.75	24.10	23.97
City Franchise Fee	1.12	0.96	0.96
Total Service Charge	$27.85	$25.07	24.93

Customer Savings Calculations:		
Customer savings per month	$2.78	$2.92
Times the number of customers	6,000	6,000
Total savings per month	$16,691	$17,501
Times 12 months per year	12	12
Total savings per year	$200,289	$210,016

Total Savings with Recommended Changes	$881,231	$1,046,695

Responses to the Audit

CITY OF
PORTLAND, OREGON
OFFICE OF PUBLIC UTILITIES

Mike Lindberg, Commissioner
1220 S.W. Fifth Avenue
Portland, Oregon 97204
(503) 823-4145
FAX: (503) 823-3017

October 17, 1996

MEMORANDUM

TO: Barbara Clark
City Auditor

FROM: Commissioner Mike Lindberg
Office of Public Utilities MDL

RE: **Solid Waste Program Audit Report**

Thank you for the thorough Solid Waste Program Audit Report. I have reviewed the document and particularly appreciate the highlighting of issues which we and BES have also identified for examination prior to final development of a new franchise document.

I appreciate Audit Services' acknowledgment of the excellent results produced by the franchise system. The high participation in recycling, low pounds disposed per household, high customer satisfaction, and stable rates are testimony to the performance of the system.

I do endorse the cost of service approach that the Bureau of Environmental Services uses in setting rates. Cost of service or full cost accounting on a customer household basis is definitely the trend nationally in determining the cost effectiveness of regulated service delivery. It is also what is important to the ratepaying customer as well.

Through discussions with BES and my staff , I understand that the team in Audit Services has been very responsive and flexible in bringing this report to conclusion for use in the Five-Year Franchise System Review process. Please convey my personal thanks to Dick Tracy and his team.

I have directed BES to work with the Audit Services Division in reporting progress on the matters raised in your report. You may expect a report in six months. Thank you for your assistance.

MDL:eabj

cc: City Council

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

1120 SW Fifth Avenue, Room 400, Portland, Oregon 97204-1972 (503) 823-7740, FAX (503) 823-6995 Dean Marriott, Director

October 17, 1996

TO: Barbara Clark, Office of the City Auditor

FROM: Susan D. Keil, Business Services Group Manager Susan D. Keil

SUBJECT: Bureau response to Report #224 from the Audit Services Division regarding the City's Franchised Residential Solid Waste and Recycling Program

Thank you for the opportunity to provide a response to the Solid Waste Program Audit Report #224. As you are aware, BES Solid Waste and Recycling program staff have been working with staff in the Audit Services Division since last December, providing data for this program audit. City Council and the Bureau have been anticipating receipt of this report, particularly the survey of other jurisdictions, for use in the five year review of the Franchised Residential Solid Waste and Recycling Program. We greatly appreciate the responsiveness of your staff in working with BES to bring this report to conclusion. We fully appreciate the amount of work entailed in an audit of this size.

We also appreciate your recognition of the effectiveness of the franchised residential program and support for its continuation, as well as the added emphasis the program audit provides to the process we have already begun to analyze the composition and level of the rates for service. We will be providing copies of this program audit to members of the PURB and Solid Waste Advisory Committee as they work with Bureau staff in framing a new agreement for providing residential solid waste and recycling service.

Although we agree with a number of the recommendations, we disagree with the interpretation of some of the data in the report. In that light, we have divided our response to the Program Audit Report into two parts. First, we will respond to some broader issues raised in the report, and second, we will address the specific recommendations.

We look forward to continuing to work with the Audit Services staff and updating the Audit Services Division on our progress in six months.

PART I - RESPONSES TO SPECIFIC ASPECTS OF THE PROGRAM AUDIT

Perhaps the most enticing assertion in the program audit report is the one stating that Portland ratepayers would save $1.25 per month if collection efficiency was as projected by a consultant's statistical model. We believe it is misleading to infer system-wide savings from a single component of the rate without considering all the other services provided.

Efficiency

Efficiency and the benefits from increasing it are a key part of this report; however, the term is never defined. One would infer from reading the report that 'efficient' means 'cheap' or 'low-cost' in the sense that the most efficient system is the cheapest system. We think that a broader definition is preferable, one which recognizes the level of service provided. For example, we might say that a solid waste and recycling system is efficient if no reorganization of the system would yield *the same level of service* at lower cost. This definition makes the choice of service quality a part of the discussion, as it should be. It is almost always possible to reduce cost if one is prepared to accept lower levels of service.

The cost per customer and stops per hour data used to show differences in efficiency among haulers on pages 23 and 24 are not persuasive. Not all routes are equal: some are relatively flat, grid routes with high customer density. Others are hilly, non-grid routes with lower customer density. A large portion of hauler costs are fixed, involving getting the truck to the route and driving the length of the route. If the customer density on the route is lower, stops per hour and cost per customer will naturally be higher. Since routes differ, some variation in cost per customer and stops per hour is natural *even if all haulers are operating efficiently.* In order to make useful comparisons between haulers, route characteristics should be adjusted for. The report does not do this.

Economies of Scale

The potential efficiency gains from consolidation are a recurring theme in the report. The theoretical argument is that larger haulers can spread fixed costs over a greater number of customers, and that there are potential cost reductions from combining and re-aligning routes.

We take issue with the report's implication that these inefficiencies are relatively large in Portland. First, this economies of scale argument is one-dimensional: it infers total system cost savings by looking at residential refuse collection, which is only one element of the system. It completely ignores other potential sources of efficiency, such as the vertical integration of the individual franchised haulers into maintenance, administration, customer service, and all other aspects of the solid waste and recycling business. In addition to driving the route and collecting refuse, the individual hauler may perform maintenance on the truck, answer calls from customers, and do billings. In addition, many haulers with small numbers of residential customers are able to utilize their trucks fully because they

also provide yard debris and commercial refuse service with the same vehicles. In other words, they're bigger than they look based on the residential numbers.

Second, while the theoretical argument is reasonable as far as it goes, there may also be diseconomies of scale. For example, central dispatching of trucks to collection routes all over the city (the one large firm case) may involve more drive time than dispatching of trucks from various points (the several smaller firms case). The point here is that while there may be additional economies of scale from further consolidation, we cannot simply *assume* that they are large when total system costs are considered, and we cannot simply *assume* that total system cost savings are equivalent to theoretical collection cost savings, as the report appears to do.

Finally, total cost data for Portland haulers are not consistent with the report's economies of scale argument. Cost per customer from the sampled and reviewed hauler financial reports shows little if any scale effect. Any statements about the possible cost savings from an alternative organization of haulers should be based on a careful examination of the data. We do not think that the report provides this. For example, the auditor's survey data for Seattle and San Jose (two cities with many characteristics similar to Portland's), if properly adjusted for differences in service levels and the effects of program subsidies, show similar rates despite both cities' employing large contract haulers.

The Ecodata Analysis

The Ecodata analysis appears to be the primary support for the potential cost savings argument. We think that the report results are interesting, but great care should be taken in making any inferences about potential cost savings in Portland based on this work, for several reasons.

First, as mentioned previously, the savings estimates are for only one part of total system costs. If the report is suggesting that Portland ratepayers could save this amount of money by moving to a contract system, we think that it is potentially misleading.

Second, the report's conclusions are based on analysis of cities that apparently aren't very similar to Portland. The analysis uses a randomly selected sample of cities, none of which has franchised haulers. Portland appears considerably larger than the average city for the sample, while Portland's tonnage collected per household is little more than half as large as the average city in the sample. Based on these comparisons it seems as if Portland is an "outlier," with characteristics not typical of cities in the sample.

The savings estimate of $1.25 per month presented on page ii is a statistical estimate. Such an estimate depends on many assumptions. This is important because the estimates of potential refuse collection cost savings in Portland may well depend on the particular way the Ecodata study represents costs. The statistical model used in the estimate does not merely allow lower collection costs for higher tonnages, it *requires them at all tonnages*.

In other words, it does not permit us to know whether cost per ton first decreases as hauler size increases, but later levels out or even increases. It simply *requires* that the larger the hauler, the lower the cost per ton. It is no wonder that a single contractor appears to be more attractive than multiple franchisees. No other possibility is allowed.

Once again, the reader should check these results by comparing Portland's overall rate with (properly adjusted) rates in cities offering similar levels of service. The benefits of a single contractor are not immediately apparent.

Operating Margin and the Rate of Consolidation

The assertion that lowering the rate of return would speed the process of consolidation is at best questionable, for two reasons. First, the economic incentive for haulers to consolidate is at least as strong when earnings are high as when they are low. Cost savings occur regardless of what revenues happen to be at the time. Any cost savings will increase earnings. Therefore, if one hauler can operate more effectively than two, earnings will increase with combination, regardless of what they happen to be at the time. Second, the rate of combination seems to be at least as high when earnings are strong; it is certainly easier to obtain financing for acquisitions at those times.

Survey Of Other Jurisdictions.

Regarding the survey data, (referenced in Appendix A and throughout the document), we wish to emphasize a few additional points:

Rates paid by Portland customers are not subsidized by any other source of revenue. We are aware from the Auditor's report as well as from our own research, that many other jurisdictions provide some other support to residential rates. Subsidies come from several sources including general fund, state grants to support policy objectives such as recycling goals, and franchise fees from commercial solid waste collection.

The City of San Jose is one example of a jurisdiction which readily reports its rate is subsidized from commercial franchise fees. Other jurisdictions, including some cities and counties in the Portland metropolitan region, indicate rates for residential solid waste and recycling service are subsidized from other sources, consequently absolute comparisons are difficult.

Based on the survey data, we also believe it is inconclusive that contract system, or a system with fewer haulers would be any less expensive to ratepayers. The City of Seattle, for example, has a contract system for residential solid waste and recycling collection, and is similar to Portland in services offered, tip fee and access to recycling markets. Seattle residents pay $20.35 monthly for 32 gallon can service and optional bi-weekly yard debris collection while Portland pays $17.50. Seattle is a contract system and their rates certainly do not appear to be any less than what Portland's customers pay. As such, any reliable comparison is difficult due to program differences.

"Review Size and Duties of Solid Waste and Recycling Staff in Local Government"
The program audit states on page 39 "that the metropolitan region has a relatively large number of staff assigned to solid waste planning and recycling efforts, compared to other jurisdictions surveyed."

It does not appear that there was full reporting of staff levels in other jurisdictions in the survey. For example, like Portland, solid waste and recycling program activities in Seattle involve governments on a regional level. In addition to Seattle's own solid waste utility, other agencies involved include the King County Solid Waste Division and the King County Commission for Marketing Recyclable Materials.

The City of Portland residential program has a total of 6.3 FTE as allocated in the FY 1996-97 budget. The 10 FTE referred to in the program audit includes staff to residential, commercial and multifamily. The residential program staff duties are far broader than solid waste planning and recycling; including customer information services, field inspection and enforcement activities, public education, illegal dumping prevention, franchise system management and program development.

While we believe it is appropriate that Metro evaluate the resources they have committed in this area, part of the success of this region's programs is due to regional planning efforts undertaken by Metro.

PART II - RESPONSE TO PROGRAM AUDIT RECOMMENDATIONS

1. ***Continue franchised garbage collection system but modify franchise agreements and rate setting methods in order to reduce overall system costs and lower residential rates. Specifically, the Bureau should:***

   a. ***Exclude disposal costs from the calculation of operating margins.***

   This is an issue which we have identified as needing analysis in our discussions with the PURB Solid Waste Sub-Committee and the Bureau's Solid Waste Advisory Committee. As mentioned in at the end of Chapter 4 of the program audit, we have asked the consulting firm of Hilton, Farnkopf and Hobson (HF&H) for data and advice on this matter. We will be bringing that information forward to Council as a new contract (franchise) document is being developed.

b. ***Derive operating margin as a percent of cost of service, not total revenue.***

This, again, is a matter we have discussed and addressed for consultant consideration and recommendation.

c. ***Eliminate large and small can disincentive and incentive rate differentials. Exclude large can disincentive revenues from operating margin and franchise fee calculations until they are fully eliminated. Staff should research other types of incentives for waste reduction as a replacement.***

Staff agrees with the elimination of the incentive and disincentive premiums as structured today. We believe the fairest way to set rates is to base them on cost of service, while creating rate incentives for recycling. The City's rate structure permits this by offering a variety of can sizes to suit individual customer needs, while at the same time encouraging customers to generate less garbage and save money by downsizing to a smaller can. Results of this variable pricing strategy have been very positive as evidenced by the recycling performance of the system, the shift of customers to smaller can sizes and decreasing amounts of garbage disposed. Elimination of the incentives and disincentives will not affect the ability of the City to offer lower rates for smaller garbage can services than the larger container sizes. Smaller containers will always be priced lower than larger ones in a cost of service system.

Additionally, we have asked the consultant to send us any information available on other methods of providing incentives for customers to reduce their waste.

d. ***Study existing margin levels to ensure they are equitable to ratepayers. Consider introducing incentives to earn back lost margin based on improved service performance.***

We have asked HF&H for data and advice on these issues.

e. ***Calculate franchise fees as a percent of cost of service and operating margin.***

We have asked HF&H for data and advice on these issues.

2. ***The City Council should request that Metro thoroughly analyze opportunities to reduce the impact of their operations on residential garbage bills.***

   This is an issue which City Council should address directly, rather than through BES.

3. ***The Bureau of Environmental Services should develop and report more complete information on the performance and efficiency of franchised haulers.***

   BES staff will be happy to work with staff from the Auditor's Office in developing some additional performance measures such as cost per customer, or stops per hour, etc.

4. ***The Bureau should develop and present for City Council approval new goals for the recycling program to replace the 60 percent by 1997 goal.***

   The Bureau concurs with this recommendation, and will bring this matter forward to the City Council in the near future.

REGIONAL SERVICES

600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232 2736
TEL 503 797 1700 | FAX 503 797 1797

METRO

October 17, 1996

Barbara Clark, City Auditor
City of Portland
Office of the City Auditor
1220 SW Fifth Avenue, Room 120
Portland, Oregon 97204

Dear Ms. Clark Barbara

Thank you for the opportunity to review your report, *Residential Solid Waste: Recycling Efforts are Effective, but Opportunities Exist to Lower Rates* (Final Draft, October 1996). I offer you my comments in this letter.

My compliments on a report that I found, on the whole, to be well-balanced. Your findings are consistent with our understanding at Metro that a number of factors affect the cost of residential solid waste collection. As identified in your report, these include: (1) the fact that recycling is more expensive than disposal, and that the region's success at achieving high rates of recycling have implications for the residential cost at the curb; (2) the large number of individual haulers that make it difficult to achieve economies of scale; (3) that the objectives of your residential rate-setting model can affect the customer's cost at the curb; (4) the role of the disposal rate ("tip fee"). As we have long known, all of these factors combine to affect the residential rate.

I will direct my comments to a number of points you raise in Chapter 4, "Explore Opportunities to Coordinate Better with Metro" and to the discussion of Metro's tip fee, including the data and analysis of Appendix A, "Audit Services Division Survey of Other Jurisdictions." I wish to direct my comments to four areas you raise in regarding Metro in these chapters: staffing levels, excise tax, apparent duplication of services, and the tip fee.

Staffing

You claim that Metro has 25 staff working on solid waste planning and recycling efforts, and recommend additional study because this appears to be a large number in comparison with the 18 national jurisdictions you surveyed. I agree with your statement that "[d]ifferences in staffing levels may result from very different laws and policy objectives" and that examination of these laws and policies is necessary to compare apples-and-apples. Let me offer some observations that will help clarify these issues:

First, the number of people apparently working on waste reduction and recycling may be more appearance than reality. In addition to its waste reduction staff, Metro's Waste Reduction & Planning Services Division also houses a 4-person planning section, and a Technical Services division. These 8 persons assist with waste reduction programs, but also work on a variety of tasks not limited to recycling or to the Regional Environmental Management department. These include planning capital improvements, facilities

management, the illegal dumping plan, a variety of regulatory issues, data base, forecasting, mapping, and other services.

Second, an additional 8 of the 25 staff you cite are involved in full-time direct provision of service to citizens of the region. As a case in point, Metro's Waste Reduction Education Program (2 persons) is a response to Oregon's Recycling Opportunity Act requirement for "a recycling and waste reduction component in a required curriculum for all Oregon students in grades kindergarten through 12" [Section 35]. We provide education services to schools on a cooperative, non-duplicative basis, including all of School District #1. The City or the school district would be required by Oregon law to provide these services if Metro did not, with potential adverse impact on our already-strapped education budgets.

Finally, many of the remaining 9 staff persons provide direct services in addition to planning and management activities. Our Compost Coordinator conducts seminars, maintains demonstration sites, and acts as a technical resource to citizens and businesses region-wide. Our Waste Prevention Services Planner provides industry-wide assistance to local businesses on waste prevention methods and implementation of recycling systems.

In summary, the break-out of the 25 staff you cited is as follows:

Program	Staff
Planning	4
Technical Services	4
Waste Reduction Education	2
Metro Recycling Information	6.15
Manager	1
Waste Reduction & Composting	4
Recycling System Development	4
TOTAL	25.15

When direct services and non-recycling functions are factored out, Metro's waste reduction staffing appears right in line with the levels that you found in your survey of other national jurisdictions.

Little Duplication

Metro strives to avoid duplication of services, and I agree with your finding that there is currently little duplication of City and Metro efforts. You found a "small" overlap in the area of illegal dumping, and noted that Metro is already moving to clarify roles in this area. In fact, our draft plan for coordinating efforts was released to Metro's Solid Waste Advisory Committee on October 16. At that meeting, representatives from Washington County and the City of Portland testified in favor of this plan. I welcome opportunities to continue exploring areas where local governments and Metro can work to improve efficiencies in this manner.

Excise Tax
Singling out Metro's excise tax in the report both overstates its impact on residential garbage bills and ignores the parallels with the City's own taxes and interfund charges.

Metro's excise tax is levied on all activities which generate user fees and charges. The same rate is applied whether it is an admission fee at the Zoo, a rental charge at the Oregon Convention Center or a disposal charge at a solid waste transfer station. Seventy-five percent of all excise taxes are derived from solid waste fees because those charges represent 75 percent of total Metro user fees and charges. Even if Metro were to eliminate entirely its excise tax, its effect on the residential customer would be approximately 27¢ per month, based on the rate you list in Table 1 [p.9] of your report.

As the report states, the excise tax is Metro's only source of general-purpose revenue. Like the City of Portland's series of taxes, the excise tax funds those programs and activities which either do not have dedicated sources of revenue or are unable to generate any or much revenue on their own. Just as the City levies property and other taxes to support general government activities so does Metro levy excise taxes for the same purpose. The only difference are the proportions. In FY 1996-97, taxes constitute 32 percent of the City's total current revenues while taxes (including property taxes for debt service) represent less than 18 percent of Metro's total current revenues.

Of note is that the City's own interfund charges to solid waste programs are a higher percentage of its solid waste program operating costs than the combined total of Metro excise taxes and comparable interfund charges is of Metro's solid waste operating costs. In FY 1996-97, City interfund charges on its solid waste programs are 17 percent of program operating costs. In the same year, the combined total of Metro excise taxes and comparable interfund charges on its solid waste programs represents 15 percent of program operating costs.

Tip Fees
You claim that Metro's tip fee is among the highest in the nation. You rightly point out that "differences in operating schemes make comparison very difficult." A full analysis of these differences would take us too far afield here. However, solid waste rate payers should keep the following issues in mind when comparing tip fees in other regions across the country:

1. How many solid waste costs are included in the tip fee, versus being subsidized from the general fund? At Metro, all costs of managing the integrated solid waste system are part of the tip fee, including landfill closure costs, hazardous waste management, recycling planning and information—as well as the cost of disposal operations. In many jurisdictions, these costs may be covered by property taxes or other revenue sources.

2. Are the tip fees in line with modern environmental waste management standards? Many apparently low-cost jurisdictions may still be utilizing an old local, leaking landfill and may not be collecting fees for the eventual cost of closure and post-closure stewardship. These costs are fully reflected in Metro's tip fee.

3. The table, "Residential Waste Program Comparison Survey" (Appendix A) is misleading. Metro's tip fee is shown as $75 per ton, but for 10 of the 18 respondents, the tip fee is the "Landfill Only" portion. These other tip fees are as high as $59 per ton, but most range in the mid-$20 range. The "landfill-only" portion of Metro's rate is about $24 per ton—right in line with most other jurisdictions cited. However, the juxtaposition with Metro's $75 implies that these are "apples-to-apples" comparisons, which is not true.

4. In the same table, one of the tip fees (Babylon NY) is ***zero***. This clearly demonstrates how far governments are able to "subsidize their operation through general property taxes" and consequently "disposal charges are much lower than the actual cost of operation." [p.37, your report]. However, including these numbers in Appendix A without the accompanying caveat serves to further mislead the reader.

5. Metro is constantly striving to decrease its tip fee. We have held the $75 line for five years now, meaning our tip fee is declining in real-dollar terms. We are also conducting a pilot study to separate dry waste from general garbage at Metro Central in order to take advantage of lower-cost disposal options for Portland rate payers.

My staff is providing a list of corrections and clarifications—mostly minor—under separate cover.

Once again, thank you for the opportunity to review your report on residential solid waste collection in the City of Portland, and allowing me to clarify some of your points regarding Metro.

Sincerely,

Mike Burton
Metro Executive Officer

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REGIONAL SERVICES

600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232 2736
TEL 503 797 1891 | FAX 503 797 1799

METRO

OFFICE OF THE AUDITOR

October 17, 1996

Honorable Barbara Clark, CPA
City of Portland Auditor
1220 SW Fifth Avenue, Room 120
Portland, Oregon 97204

Dear Auditor Clark:

I appreciate your staff sharing with me your draft report *Residential Solid Waste: Recycling Efforts Are Effective But Opportunities Exist to Lower Rates.* I welcome the opportunity to coordinate efforts with you to review size and duties of solid waste recycling staff in local government.

Your suggestion to formally review Metro operations to identify (1) better ways to balance the cost and benefit of solid waste charges to residential rate payers and (2) opportunities to streamline government regulation of solid waste and recycling activities in the region is very timely. The Metro Auditor's Office shortly will be issuing an analysis of a current study by Metro on solid waste rate reform. You will receive a copy of that report. Also, we stated our intention to evaluate the effectiveness of Metro's waste reduction program in our recently issued preliminary audit plan for the coming year. Coordination of this project with you would surely benefit Portland citizens as well as all citizens Metro-wide.

Citizens should find comfort in the fact that you found no significant duplication of efforts by the city of Portland and Metro in your preliminary analysis. We are glad that you cited Metro's efforts to coordinate illegal dumping remediation activities within the region as part of its Regional Solid Waste Management Plan. During our review of Metro's Solid Waste Enforcement Unit (report issued February 1996), we

found that City staff asked Metro staff to help clean up dumpsites, investigate illegal dumping, and cite illegal dumpers. In response to recommendations made in our report on the Unit, Metro's Solid Waste Enforcement Unit led efforts relating to developing the illegal dumping plan to be included in the Regional Solid Waste Management Plan. At the October 16, 1996 Metro Solid Waste Advisory Committee meeting, the illegal dumping plan and the cooperative efforts of all of the jurisdictions were highly praised by Sue Keil, Business Services Group Manager for City of Portland Bureau of Environmental Services, and a number of others in attendance.

Your observation that differences in operating schemes make comparisons with other jurisdictions extremely difficult is very true. Differences in laws and policy objectives as well as geography, system age, and economic growth also contribute to the inability to make meaningful comparisons from data independent of relevant environmental factors. It is equally difficult to draw sound conclusions from preliminary analysis of budget documents exclusive of management information reports, interviews with staff and customers, and other methods used to obtain evidence in accordance with generally accepted government auditing standards. At best, any such conclusions derived from incomparable or incomplete data are speculative. As you know, our professional standards require audit reports to be complete, accurate and objective. Clearly, more audit work must be done to develop truly meaningful findings and recommendations. I look forward to working with you on such a project.

Thank you for the opportunity to review and respond to this report.

Best Regards,

Alexis Dow, CPA
Metro Auditor

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