

July 30, 1996

## OLO REPORT 96-8

### VARIABLE RATE PROGRAMS FOR PRICING SOLID WASTE COLLECTION

#### TABLE OF CONTENTS

Executive Summary .....	i
I. AUTHORITY, SCOPE, METHODOLOGY, AND ACKNOWLEDGMENTS.....	1
A. Authority .....	1
B. Scope.....	1
C. Methodology .....	1
D. Acknowledgments .....	2
E. Organization of the Report.....	2
II. OVERVIEW OF ALTERNATIVE PRICING MODELS .....	2
A. Background.....	2
B. Goals of Variable Rate Pricing Programs.....	3
C. Potential Barriers to Variable Rate Programs.....	5
D. Description of Variable Rate Program Models .....	7
E. Measuring The Impact Of Variable Rate Programs.....	12
III. EXPERIENCES IN VARIOUS COMMUNITIES .....	14
A. Attention to Recycling and Variable Rates at the State Level.....	14
B. Programs Implemented by Selected Communities.....	18
C. Programs Considered or Implemented by Communities in Maryland .....	23
IV. VARIABLE RATE PILOT PROGRAM IN MONTGOMERY COUNTY .....	28
A. Description of Pilot Program .....	28
B. Approach to Measuring Results for the Pilot Program.....	32
C. Initial Results .....	32
D. Expanding the Pilot Program.....	35
V. OBSERVATIONS AND RECOMMENDATIONS.....	35
A. Observations .....	35
B. Recommendations.....	36
VI. AGENCY COMMENTS .....	37

BIBLIOGRAPHY .....	42
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#### APPENDICES:

A. Legislation and Policies on Variable Rate Pricing at the State Level .....	A-1
B. Iowa Communities That Use Variable Rates .....	B-1
C. Survey Results on Ten Communities Using Variable Rates .....	C-1
D. Variable Rate Programs in Operation by State, Reported in 1993 Versus 1995 .....	D-1
E. Evaluation Results of the Austin, Texas Variable Rate Program .....	E-1

#### CHARTS AND TABLES:

Advantages and Disadvantages of Pre-Paid Bag Pricing Systems .....	8
Advantages and Disadvantages of Pre-Paid Tag/Sticker Pricing Systems .....	9
Advantages and Disadvantages of Can-Based Pricing Systems .....	10
Advantages and Disadvantages of Weight-Based Pricing Systems .....	11
Advantages and Disadvantages of Hybrid Pricing Systems .....	11
Solid Waste Tonnages in Aberdeen, Maryland Before and After Variable Rates .....	26
Recycling Tonnages in Aberdeen, Maryland Before and After Variable Rates .....	26
Tipping Costs Paid by Aberdeen, Maryland Before and After Variable Rates .....	27
Summary of Data Collected During Variable Rate Pilot Test in Town of Chevy Chase...	34

## **Executive Summary**

In many communities, households pay for waste disposal services either through their local property taxes or a fixed fee charged by a municipality, a homeowners' association, or a private hauler. The price the households pay for waste disposal remains constant, regardless the amount of trash set out for collection.

Variable rate pricing, also known as unit pricing, is a fee system under which residents pay for waste management services per unit of trash collected rather than through a fixed fee. The pricing mechanism takes into account variations in waste generation rates by charging households according to the amount of trash placed at the curb.

Proponents of variable rate pricing point out that fixed fee systems generally price service based on the "average" amount of trash collected and disposed, with larger households paying less than their fair share and smaller households paying more. Variable rate pricing structures may provide households with an economic incentive to reduce the waste stream because residents who throw away less will be charged lower fees. Variable rate systems are also believed to provide incentives to repair and reuse items and increase recycling activities.

Many jurisdictions in the United States have implemented variable rate programs to provide economic incentives as a means to increase recycling and waste diversion activities. These jurisdictions cite benefits in reduced landfill facility requirements or lower tonnages of waste that must be transported elsewhere for disposal.

This report describes variable rate pricing models, discusses the advantages and disadvantages of each model, and provides the County Council with information on the experiences of jurisdictions throughout the country that have tested or implemented variable rates. The report also includes a section on jurisdictions in Maryland that have considered or implemented variable rates and a chapter on a test of variable rates conducted by Montgomery County in cooperation with the Town of Chevy Chase.

The Office of Legislative Oversight (OLO) found that thousands of jurisdictions in this country have implemented variable rates, and jurisdictions that have shared their experiences consistently report that:

- lower tonnages of solid waste and higher tonnages of recycled materials are collected after implementing variable rates;
- there may be an initial increase in illegal dumping, but it tends to subside after the variable rate program has been in effect for a period of time; and,
- successful implementation requires extensive public education and outreach to explain the details of the program and the waste diversion options offered.

OLO recommends that the County should: continue to refine and test different variable rate pricing models; conduct a test that includes a pre-post evaluation with a control group; and for each model being considered, project the financial effect of full implementation on each component of the County's overall waste management system.



## **I. AUTHORITY, SCOPE, METHODOLOGY, AND ACKNOWLEDGMENTS**

### **A. Authority**

Montgomery County Council Resolution No. 13-223, FY 1996 Work Program of the Office of Legislative Oversight, adopted July 18, 1995.

### **B. Scope**

This Office of Legislative Oversight (OLO) report presents alternative pricing models for charging residents for solid waste collection and disposal services. Information is provided on the advantages and disadvantages of the various alternative pricing models, such as: weight-based systems, variable sized trash can systems, and prepaid bag, tag, and sticker systems.

The report includes information obtained from existing literature on states that mandate or encourage jurisdictions to establish variable rate pricing systems, which is augmented by additional detail for selected jurisdictions that currently use variable rates. Maryland information includes detail on the City of Aberdeen's variable rate pricing program, which utilizes a sticker system, and Howard County's plans to test a weight-based system. County information includes a description and initial results of the pilot test of a can-based system implemented in the Town of Chevy Chase.

### **C. Methodology**

This project was performed under the direction of Joan M. Pedersen. The major contributors were Christopher Reeve, public administration intern and research assistant in the Office of Legislative Oversight, and Esther Bowring, Senior Planner in the Department of Public Works and Transportation, Division of Solid Waste Services. Research and other project-related activities conducted by OLO included:

- Review of located reports, studies, and newspaper and magazine articles examining variable rate pricing models, program structures, and evaluation methods.
- Interviews with U.S. Environmental Protection Agency (EPA) and state officials to discuss the potential benefits and barriers to designing and implementing a variable price program.
- Follow-up contact with administrators of selected jurisdictions to obtain information on the current status of their variable rate programs.
- Literature search at EPA to locate relevant articles and source materials on variable rate pricing structures.
- Site visit to Aberdeen, Maryland to discuss Aberdeen's variable rate program, observe implementation strategies, and collect available data.
- Site visit to the Town of Chevy Chase to discuss Montgomery County's pilot program implementation, observe trash collection and measuring techniques, and gather appropriate background information and data.

- Inquiry of the Solid Waste Association of North America to locate articles on jurisdictions in the United States that are using variable rate pricing strategies.
- Review of interim results of the County's pilot test of variable rate pricing.

#### **D. Acknowledgments**

The Office of Legislative Oversight (OLO) acknowledges the courteous cooperation received from administrators and staff in the Division of Solid Waste Services. OLO extends special thanks to Esther Bowring, a Senior Planner in the Disposal System Implementation Waste Minimization and Recycling Section of the County's Solid Waste Services Division.

#### **E. Organization of the Report**

The remainder of this report is organized as follows:

##### **Chapter II, Overview of Alternative Pricing Models**

Discusses the goals of variable rate pricing programs, potential barriers to implementing variable rates, and strategies for overcoming barriers. The chapter also includes descriptions of five variable rate pricing models and highlights the advantages and disadvantages of each model.

##### **Chapter III, Experiences in Various Communities**

Describes steps taken at the state level to mandate or encourage communities to offer variable rates, and identifies several jurisdictions in the United States that have implemented variable rate programs. The chapter also includes information on two communities in Maryland that have considered or implemented variable rates.

##### **Chapter IV, Variable Rate Pilot Program in Montgomery County**

Describes the Montgomery County pilot test of variable rates implemented in the Town of Chevy Chase, and presents initial results of the test.

##### **Chapter V, Observations and Recommendations**

Presents OLO's observations and recommendations.

##### **Chapter VI, Agency Comments**

Includes written comments submitted by the Executive Branch in response to OLO's draft report.

## **II. OVERVIEW OF ALTERNATIVE PRICING MODELS**

### **A. Background**

Between 1960 and 1993, the U. S. population increased from 180.7 million individuals to 257.9 million. During the same period, the amount of solid waste produced daily increased by nearly 70 percent, from 2.66 pounds per person in 1960 to 4.39 pounds per person in 1993.

After recovery for recycling and composting, the amount of waste disposed in 1993 was 3.44 pounds per person each day, with most of the waste discarded into landfills. The increasing amounts of waste generated by a rising population, the growing public awareness of general environmental issues, and state and locally legislated waste prevention and recycling goals, have placed tremendous demands on solid waste management systems.

As a consequence, many communities are adopting new approaches to waste management, such as: collecting materials for recycling; composting yard trimmings and other organic materials; and conducting education programs intended to help residents understand the need for waste prevention and recycling. Along with these programs, some communities are providing residents with economic incentives to encourage waste reduction and increase recycling activities. Incentive policies encourage individuals to actively practice source reduction (producing less waste in the first place) and recycling (collection, transport, and recovery of used materials). One such incentive system is variable rate pricing.

Under variable rate pricing, also known as per-unit pricing, or "pay as you throw," residents pay for municipal waste management services per unit of waste collected rather than through a fixed fee. This system takes into account variations in waste generation rates by charging households or residents based on the amount of trash placed at the curb. Variable rate pricing programs are structured similarly to pricing for utilities, which are operated on the premise that customers who use more of the services pay higher fees.

Proponents of variable rate pricing contend that successful programs can reduce the pressure on local disposal capacity and increase citizen participation in recycling, composting, and other waste diversion practices. The variable fee structures promote waste reduction at the source by encouraging citizens to repair or reuse items, and purchase products in recyclable or reduced packaging.

Per-unit pricing strategies are used in place of funding solid waste collection and disposal through taxes or fixed fees. With per-unit pricing, fees are established that allow for charging each household in accordance with the amount of trash that is set out for collection. The more trash that is set out, the higher the total charge for collection.

Hundreds of jurisdictions in the United States have adopted variable rates as a means to realize reductions in solid waste disposal levels and prolong the life of landfills by providing financial incentives directly to households. These jurisdictions also seek to change the attitudes and behaviors of homeowners concerning solid waste management by providing incentives for consumers to recycle and reuse products. Unit pricing is viewed by these jurisdictions as an equitable pricing system in which households that generate low amounts of solid waste are not forced to subsidize the cost of another household's solid waste disposal.

#### **B. Goals of Variable Rate Pricing Programs**

Variable rate pricing for municipal solid waste differs from traditional methods of charging an annual or monthly flat fee to each household for trash collection and disposal services.

These traditional types of payments provide residents with little incentive to reduce the amount of trash they produce or to recycle items from their trash because the payments are fixed regardless of how much trash is thrown away. Under a variable rate system, customers may begin to directly associate the choices they make about solid waste disposal with the amounts they pay for the disposal services used. While customers are not restricted from putting out as many cans or bags of trash as they want, they are billed additional amounts for disposal of trash that exceeds the basic service level. Proponents of variable rate programs believe the fee structure raises public awareness of the individual costs associated with generating waste.

The major goals of variable rate pricing programs are to: (1) make citizens more aware of the cost of waste collection and disposal by directly pricing use of the services, and (2) provide an incentive for individuals to reduce waste by rewarding consumers who use less of the waste disposal services. With variable rate pricing, people are encouraged to conserve, recycle, and compost waste instead of paying to dispose of the products. Waste collection and disposal services are viewed much like utilities, such as water, electricity, and telephone service, where consumers pay in accordance with the level of service received.

Conditions often found in jurisdictions that support using variable rate programs include:

- Aggressive recycling goals in the state or particular community;
- High tipping fees for dumping trash, which burden the community/hauler/budget;
- High trash disposal costs;
- Lack of or limited capacity of disposal facilities (landfills);
- Motivated and environmentally conscious citizens likely to cooperate with a variable rate program;
- A relatively high number of small households; and,
- A relatively low percentage of multi-family dwellings

Jurisdictions that have implemented variable rate systems cite the following advantages:

**1. Customer Perception of Equity.** Waste removal charges are based on the level of service the municipality provides to collect and dispose of the waste, similar to the way residents are charged for gas or electricity. Traditional waste management systems bill or tax households a fixed amount regardless of the amount of waste they generate, so households disposing of less trash are subsidizing households disposing of more. Customers view variable rate pricing as more equitable than flat fee systems because variable pricing charges households for trash collection in accordance with the amount of waste generated.

**2. Incentive to Increase Recycling.** Variable rate pricing encourages residents to maximize their recycling activities, and may lead to waste reduction behavior. Variable rate pricing and a well-designed recycling program complement one another because variable rate programs provide an economic incentive for residents to increase the amount of material recycled.



**3. Incentive to Conserve.** To take advantage of the potential savings that a variable rate pricing structure offers, residents may modify their traditional purchasing and consumption patterns to reduce the amount of waste they place at the curb. These behavioral changes have beneficial environmental effects beyond reduced waste generation that may lead to overall reduced energy usage and materials conservation.

**4. Incentive to Preserve the Environment.** A variable rate pricing structure may provide communities with a better understanding of environmental issues. Traditional waste management systems often obscure the economic and environmental costs associated with waste generation and disposal. Variable rate pricing models provide individuals with a better understanding of their impact on the environment and an economic incentive to lessen the impact.

**5. Potential to Reduce Disposal Costs.** Households are encouraged to reduce the amount of trash disposed and are charged in accordance with their conservation efforts. Reductions in trash disposed allow jurisdictions to prolong the lives of their landfills or lower the cost of transporting trash out of the area for disposal.

A successful program design for implementing variable rates includes:

- Promotion and educational materials introduced well in advance of program implementation that clearly and fully describe the program and the rate structure.
- Notification that the system is in effect by ordinance or by contract.
- Separate and distinct charges to users in the form of direct billing for certain numbers and sizes of containers or direct purchase of special bags, tags, or stickers.
- Fees based on specific volumes or weights of waste, so an increase in waste disposal results in an increase in cost to the consumer.
- Enhanced recycling and waste diversion services.
- Container weight limits to discourage “overstuffing” to avoid incremental costs.
- Strong provisions to deal with the possibility of illegal dumping and burning.

### **C. Potential Barriers to Variable Rate Programs**

There are five generally recognized barriers that must be addressed by a jurisdiction when implementing a variable rate pricing system. This section describes the barriers and offers strategies for overcoming each potential barrier.

**1. Major public relations effort required.** It may be difficult and expensive to adequately inform residents about the goals of variable rate pricing, including how the new program will be structured, and the various new opportunities to reduce waste.

*Strategies to overcome this barrier:* Early and ongoing public relations efforts are necessary, with public education to begin far in advance of implementation. Residents must be surveyed to judge attitudes and identify preferences and local barriers to be overcome. Survey results may be used to tailor the program design, set rates, and determine additional public relations activities. Advisory groups could be set up in which stakeholders are given the opportunity to help develop an acceptable program.

**2. Possibility of increased illegal dumping and burning.** Because variable rates will encourage residents to find new ways to reduce the amount of their bills, some may illegally dump trash along roadsides and in commercial dumpsters. In addition, an increase in trash burning may occur after implementing variable rate pricing.

*Strategies to overcome this barrier:* Increase public education along with an aggressive enforcement strategy. Implement significant penalties for illegal dumping and burning, and offer viable recycling alternatives. Bulk items, such as appliances and tires, are identified in many communities as a large part of the illegal dumping problem. Providing residents with a way to dispose of and/or recycle bulk items will minimize illegal dumping.

**3. Difficulty in fully recovering system solid waste costs when a jurisdiction has little experience and data to anticipate the amount of waste that will be set out under the new system.** Because variable rate programs use a price-per-unit method instead of a flat fee or property tax to fund solid waste collection and disposal and promote waste reduction, planning for a stable revenue stream can be more difficult. As the amount of waste put out by residents decreases, so does the revenue generated to cover waste management costs.

*Strategies to overcome this barrier:* Communities might consider initiating a program that charges a flat fee for a minimum amount of service, supplemented by a variable fee. The flat fee will assure a constant revenue stream, while the variable fee will encourage waste reduction.

**4. Inability to fairly charge individuals in multifamily housing units.** Residents of multifamily housing typically take their waste to a centralized location, such as a dumpster, for disposal. It is difficult to identify the waste generated by each household and charge accordingly.

*Strategies to overcome this barrier:* In general, communities implementing variable rates treat small multifamily units as single family and incorporate them into the program. Larger multi-family dwellings with dumpster service are usually excluded from the program.

**5. Higher administrative costs.** Variable rate programs often require a solid waste agency to undertake new responsibilities. The costs associated with these added responsibilities may exceed the savings generated from reduced disposal of waste.

*Strategies to overcome this barrier:* Staff must be adequately prepared for changes in workloads and changes in emphasis of work - like changing emphasis from traditional waste collection and disposal to recycling. Temporary workers and/or consultants can help deal with short-term workload increases. Some additional administrative costs may continue beyond initial startup and must be considered in setting rates.

#### **D. Description of Variable Rate Program Models**

As jurisdictions struggle to meet legislative requirements regarding waste reduction and recycling, they simultaneously face the need to maintain financial stability. Many solid waste management programs are operated as self-supporting enterprise funds. Jurisdictions must take care to consider recycling and other services to be offered along with variable pricing for trash collection and establish prices that will generate sufficient revenues to fund all the services. In addition, fees must be established at rates citizens view as economical and equitable.

Variable rate pricing models are designed to charge customers based on the increments of waste set out for collection and disposal. These increments of waste are measured and priced in terms of volume or weight. Program models based on volume include pre-paid bag, sticker, and tag systems; or pricing of certain sizes of trash cans or other containers. The weight-based model charges customers at a set fee per pound of waste put out for collection. A hybrid system may also be developed to include a base volume (usually a trash can of a certain size) with tags or stickers sold to accommodate bulk items and increments of waste over and above the base volume. The listings below contain information on each of five variable rate pricing systems.

## **PRE-PAID BAG PRICING SYSTEMS**

Pay-per-bag structures are simple, in that the customers purchase bags through retail outlets, the government, or the waste disposal service provider. Customers set out trash for collection in the specially marked bags that are priced to cover the cost of collection and disposal. Only trash packaged in official bags is collected. In addition to the volume limit of the bag, typically 20 to 30 gallons, a weight limit is often set to discourage individuals from “overstuffing” the bags.

### **Advantages:**

- ◆ Residents find this model easy to understand.
- ◆ Encourages waste diversion because fees are typically lower for disposal of smaller increments of waste.
- ◆ Accounting costs are negligible, since no special billing system is needed.
- ◆ Bags have low distribution, storage, and inventory costs when sold through retail establishments and municipal offices.
- ◆ Selling bags through retail establishments and municipal offices provides for efficient distribution.
- ◆ Bag collection tends to be fast and efficient.
- ◆ There may be an opportunity to promote other government programs or obtain revenue to offset costs by selling advertising on official bags.

### **Disadvantages:**

- ◆ The number of bags residents purchase may fluctuate from month to month causing some revenue uncertainty.
- ◆ Extra staff may be needed to administer the program and control, account for, and distribute bags.
- ◆ Residents may view the purchasing system less convenient than current annual billing.
- ◆ Special bags must be designed, produced, and stored until sold, adding expenses to the existing waste disposal program.
- ◆ Bags are not reused and add to the overall amount of the waste stream.
- ◆ Residents who currently have trash cans may object to the switch.
- ◆ Weight and integrity of bags may become a problem due to over-stuffing.
- ◆ Bags are susceptible to destruction and trash littering by animals.
- ◆ Trash inappropriately bagged will not be collected, which may cause health hazards.

## **PRE-PAID TAG/STICKER PRICING SYSTEMS**

With this pricing structure, households purchase tags or stickers, which must be attached to bags or cans of trash set out for collection. Residents may place an unlimited number of containers at curbside as long as they bear the required tags or stickers. Fees are set to cover certain sizes or weights of containers, such as 30 or 60 gallons. The official tags or stickers are made available for purchase at municipal offices and/or local retail stores.

### **Advantages:**

- ◆ Easy and fairly inexpensive for jurisdictions to implement.
- ◆ Residents find this model easy to understand.
- ◆ Provides incentive to reduce waste because fees are lower for smaller increments of waste.
- ◆ Accounting costs are negligible, since no special billing system is needed.
- ◆ Tags/stickers have low distribution, storage, and inventory costs when sold through retail establishments and municipal offices.
- ◆ The cost of producing tags or stickers is negligible.
- ◆ Selling tags or stickers through retail establishments and municipal offices provides for efficient distribution
- ◆ Distribution, storage, and inventory costs are relatively low.
- ◆ Residents may continue to bundle their trash in bags or cans as they have always done.
- ◆ Bulk item collection can be easily priced by affixing a number of tags or stickers.

### **Disadvantages:**

- ◆ Some revenue uncertainty, since the number of tags or stickers residents purchase can fluctuate seasonally.
- ◆ Extra staff may be needed to administer the program and control, account for, and distribute tags/stickers.
- ◆ The jurisdiction must establish and clearly communicate the size limits for each tag or sticker.
- ◆ Some residents will view a requirement to pre-purchase and store stickers or tags as an inconvenience.
- ◆ Tags and stickers may not adhere properly in rainy or cold weather.
- ◆ Tags or stickers affixed to trash containers may be removed by vandals or by other residents hoping to avoid paying for waste collection and disposal services.
- ◆ Tags and stickers are not as noticeable as bags or other prepaid indicators.
- ◆ Trash may be uncollected because tags or stickers are stolen, which may present a health hazard.

## CAN-BASED PRICING SYSTEMS

Under this pricing structure, households sign up (subscribe) for collection of a specific size or number of trash containers per billing period. Fees are based on the amount of service chosen, with higher service levels costing more. Trash is collected only from the approved containers.

### Advantages:

- ◆ Revenues are fairly stable and easy to forecast.
- ◆ Cans often work well with semi-automated or automated collection equipment.
- ◆ Cans can be readily identified, which assists in enforcement.
- ◆ Residents who already own containers of the specified size(s) may be able to continue using them.
- ◆ Cans preclude scattering of trash by small animals.

### Disadvantages:

- ◆ Cans have high initial implementation costs, including the design, acquisition, and distribution of new cans.
- ◆ There is little economic incentive to put out less than the subscribed can size will hold unless the household is able to drop to the next lower size. Customers may not divert waste that will fit into cans already purchased.
- ◆ The jurisdiction may need a complex accounting system to track residents' subscription levels and bill accordingly.
- ◆ Extra staff may be needed to administer the program and manage the subscriptions.
- ◆ Storage, inventory, and distribution systems are required to provide cans to new residents and those who change subscription levels.
- ◆ Residents may need to change initial subscription level to achieve the most efficient and economical level of service and adjust as household size changes.
- ◆ Residents pay for the service level subscribed even when they generate less trash or are on extended vacation.

## **WEIGHT-BASED PRICING SYSTEMS**

Under this pricing system, residents pay a set fee per pound of trash collected. Haulers use scales and electronic identification to weigh the waste collected and bill the household. Because the system is based upon a price per pound, every pound of waste reduced will lower the household's cost.

### **Advantages:**

- ◆ More precisely measures the actual amount of waste generated.
- ◆ Provides a high recycling incentive.
- ◆ Encourages waste reduction at all waste-generation levels.
- ◆ Residents find this model easy to understand.

### **Disadvantages:**

- ◆ Weights and measures must be approved and scales calibrated.
- ◆ Special trucks, containers, and computers require extra expense.
- ◆ Time to collect trash is greatly increased because of necessity to weigh.
- ◆ Trash collectors must be specially trained to operate the equipment.
- ◆ The jurisdiction may need to acquire a more sophisticated billing system.
- ◆ Creates an economic incentive to dispose of trash in other residents' containers.

## **HYBRID PRICING SYSTEMS**

A hybrid system includes a flat fee and a variable rate component. All households are required to pay a set fee (or base rate) for a certain level of service and are charged an additional fee per container for trash disposed of above the level of service covered by the flat fee. A base rate system can be combined with one or more of the standard variable rate models.

### **Advantages:**

- ◆ No new billing system is needed.
- ◆ Can be implemented quickly, inexpensively, and easily.
- ◆ Can be replaced or modified into a full subscription, bag, or tag system.
- ◆ Mitigates revenue risk by recovering some costs through traditional financing methods.
- ◆ Offers residents a transition from the traditional financing system to a more variable rate option.

### **Disadvantages:**

- ◆ There is no economic incentive to put out less trash than will be collected within the basic service level.
- ◆ Full costs of household waste collected and disposed of are not explicitly reflected to customers.
- ◆ Residents may be confused by having two fees for trash disposal.

### **E. Measuring the Impact of Variable Rate Programs**

Program evaluations are typically performed for a variety of reasons: to determine the extent to which the original goals are being achieved; to provide information for improving program management and administration; to assess the appropriateness and efficiency of program design; to identify ways to improve the delivery of service; and to determine the adequacy of funding and accountability. An additional purpose for monitoring and evaluating a variable rate pricing program is to measure the environmental impact of the program. It is also important for solid waste agencies to determine how changes in their various programs impact the overall solid waste management plan.

Ideally, monitoring and data collection would begin about six to nine months prior to initiating the new pricing strategy. This data becomes a benchmark for comparison to data collected after implementing the program. Post-implementation data would then be collected for at least a year so that changes in waste disposal and recycling behavior can be examined over time, and seasonal fluctuations can be observed.

Evaluation of variable rate programs is usually accomplished by either measuring participation in recycling programs or measuring changes in overall tonnages of waste versus recycling materials collected. Environmental Protection Agency literature warns against measuring success solely on an increased number of households participating in recycling programs. Participation rates do not address changes in costs or intangible issues, such as the level of satisfaction among residents. A full impact evaluation requires collection and analysis of data that allows measurement of any changes in disposal and recycling tonnages.

Many communities collect separate data on the amounts of waste disposed, recycled, and composted for a period of time before and after the program's implementation. Some communities also attempt to estimate the amount of waste residents would have generated in the absence of the variable pricing program, and whether any changes occurred in the amount of material illegally dumped.

A full impact evaluation would provide the estimated waste reduction, which could be attributable to the program, indicate how the program can be improved, and provide detailed data on the program that can be used for planning. The evaluation should be designed to examine the program costs, attributable program benefits (in tonnages), and provide a credible cost-benefit comparison for the program. It also allows a determination of whether the program has actually affected waste generation and disposal behavior beyond what would normally have occurred without the program.

Regardless of the precise approach, the four major purposes of the evaluation are to:

1. determine the number of eligible participants;
2. determine whether the program significantly affects waste disposal patterns;
3. establish whether the observed effects are attributable to the program; and
4. identify the net benefit and cost-effectiveness of the program.



Two impact evaluation models for analyzing solid waste programs are: pre-post evaluation and pre-post evaluation with a control group. Each approach differs in complexity, cost, and data collection requirements. The evaluation approach undertaken depends in large part on the data available, the budget, and the anticipated use of the evaluation results. The major steps for each evaluation technique are discussed below.

#### **Pre-post evaluation:**

- Identify a representative group in the community;
- Measure relevant tonnages before and after program implementation;
- Use a survey or other method to collect data on relevant changes within the household (household size, income, etc.); and,
- Examine the results for statistically significant changes, controlling for important items that have changed.

The strengths of this approach are that customers can serve as their own control group, the analysis can be performed using relatively small test groups, and the evaluation method is not data intensive. The data collection activity needs to extend over a long enough time period to offset seasonal effects, and the survey must be designed to identify important nonprogrammatic changes, such as household size.

Although this evaluation approach is straightforward, it does not control for “natural market adoption” because it assumes all recycling behavior results from the program. The pre-post with a control group approach helps control for this problem by making comparisons with the behavior seen in a group of similar customers who did not receive the program.

#### **Pre-post evaluation with a control group:**

- Compare a group in the community that is participating (or “receiving treatment”) with a similar group that isn’t (alternatively, the comparison group could be a community with the recycling program and a similar community without a program);
- Measure tonnages before and after program implementation, and include all relevant recycled or disposed tonnages;
- Collect data to identify non-programmatic changes that occurred within the groups; and,
- Compute the significance of differences and adjust for non-programmatic changes, to determine program impact.

The difference between tonnages for the control group and the participant group would be compared in the “before” case to ensure the two groups are similar or representative. The differences in the before and after tonnages of the participant group will show the changes that occurred because of the program and all other factors. The differences in the before and after control group tonnages will show the changes that would have occurred without the program. The differences in tonnages between the two groups directly relate to the new program.

The advantages of this evaluation model are that the approach provides a simple method of estimating net impacts and adjusts for naturally occurring, or non-programmatic changes in tonnages. The disadvantage of the approach is that a truly representative control group is often very difficult to identify.

### **III. EXPERIENCES IN VARIOUS COMMUNITIES**

This chapter of the report describes legislation enacted by a number of states to require or encourage using variable rate pricing strategies for solid waste collection and disposal. Also included are several examples of variable rate programs examined or implemented by selected communities to price solid waste collection.

#### **A. Attention to Recycling and Variable Rates at the State Level**

Some states mandate or encourage using variable rate pricing strategies to fund the costs of solid waste collection and disposal. In the late 1980s and early 1990s, four states passed legislation that requires jurisdictions within their borders to implement some method of variable rate pricing. The laws in Wisconsin, Minnesota, Washington, and Iowa either directly mandate using variable rates or require using variable rates under certain circumstances. At least ten other states encourage using variable rate strategies to price trash collection. Some of these states enacted legislation that encourages variable rate pricing while others implemented public education programs. A listing of states that have directly or indirectly addressed variable rate pricing is included at **Appendix A**.

#### **⇒ Wisconsin has a funded mandate to implement variable rates by the year 2000.**

The State of Wisconsin enacted a mandatory recycling program (Recycling Law, 1989 Act 335), which includes a 5.5 percent gross receipts tax on businesses to fund recycling efforts. The tax was imposed for a limited time to fund grants to assist communities with program design and implementation. The tax is scheduled to expire in the year 2000, by which time all Wisconsin communities are mandated to implement variable fees.

Revenues from the gross receipts tax are being used to provide grants to Wisconsin communities to design and implement recycling programs, to support market development efforts, and to provide technical assistance and enhance public education efforts. Aside from the economic incentives and assistance provided by the grants, Wisconsin Act 335 includes a provision that requires communities to implement variable fees for solid waste collection if they have not achieved a 25 percent diversion rate of the solid waste collected in their regions by a certain date (originally January 1, 1995, the implementation date was recently extended to January 1, 1997).

As originally enacted, the variable rate provision required Wisconsin communities to charge user fees to cover the entire cost of solid waste management. A modification to the provision in 1993 requires that fees cover a reasonable portion of the cost of waste collection and disposal.

With this pricing strategy, user fees are to be charged based on the amount of waste collected, with higher fees being charged for the additional services involved in collecting and disposing of higher volumes of waste. The variable rate provision also effectively removes funding of solid waste collection and disposal as an element of the property tax and establishes direct user fees as the funding mechanism.

As of January 1995, nearly 300 communities in Wisconsin had variable rate programs in place. In total, variable rate fee programs were serving about 570,000 residents, or 11 percent of the State population. By the year 2000, every jurisdiction in Wisconsin must implement a fee structure for solid waste collection that is based on the amount of trash collected, as measured by volume or weight.

⇒ **Minnesota requires jurisdictions and private haulers to offer variable rates.**

Minnesota's legislature passed Sec. 115A.9301 (1993): "Solid Waste Collection; Volume- or Weight- Based Pricing." The law requires communities that provide solid waste collection services to implement variable rate pricing schemes based on the volume or weight of solid waste collected. The law specifically requires that municipalities or private contractors that bill for collection of waste must "determine a base unit size for an average small quantity generator and establish, or require the licensee to establish, a multiple unit pricing system that ensures that amounts of waste generated in excess of the base unit amounts are priced higher than the base unit price."

The law also states that the charges for solid waste collection cannot appear on non-itemized property tax or municipal service bills, but must be "visible and obvious" to the customers. This requirement encourages residents to reduce waste by providing them with constant feedback on the savings of their waste reduction efforts.

⇒ **Washington requires regulated recycling and trash companies to use variable rates.**

The Waste Not Washington Act was passed in April 1989. The law specifies that all certified recycling and trash collection companies that are regulated by the Washington State Utilities and Transportation Commission must establish variable rates for trash collection, so as to encourage recycling and discourage disposal. The legislation specifically requires regulated haulers to charge higher fees for services relating to collection and disposal for a second trash can.

City governments in Washington have authority over the incorporated areas and the law allows them to use any pricing structure within their jurisdictions for solid waste management. However, since implementation of the Act, nearly all communities within Washington have adopted variable rate pricing for solid waste collection and disposal that is based on a can system.

⇒ **Iowa requires variable rates if 50 percent waste diversion is not achieved by 2000.**

Iowa's law (Senate File 2300) is very similar to Wisconsin's, in that the law mandates the use of variable rates if a community does not reach 25 percent reduction in waste being landfilled - with an overall goal of 50 percent reduction by the year 2000. Communities are given three years in which to put a plan in place for variable rates. Variable rates were seen as the best way for Iowa to maintain current reduction levels as well as meet the remaining 25 percent reduction by the year 2000.

According to a recent survey of Iowa communities' experiences with variable rate pricing, programs are in place in 33 of Iowa's 99 counties and serve a population of approximately 236,000 residents. The largest community using variable rates is the City of Clinton, which has a population of approximately 30,000 residents.

The survey found that 39 percent of the communities which had instituted variable rates experienced some problems (e.g. increased illegal dumping) after implementing the system. Additional information on communities in Iowa that use variable rates is included at **Appendix B**.

⇒ **Oregon encourages variable rate pricing as part of its recycling act.**

Oregon Senate Bill 66, Recycling Act, became effective in 1992. The law presents variable rate pricing as one of eight options that cities, counties, and metropolitan service districts may choose when implementing mandatory recycling programs. The law describes variable rate pricing as: "Solid waste residential collection rates that encourage waste reduction, reuse, and recycling through reduced rates for smaller containers, including at least one rate for a container that is 21 gallons or less in size. Based on the average weight of solid waste disposed per container for containers of different sizes, the rate on a per pound disposed basis shall not decrease with increasing size of containers, nor shall the rates per container be less with additional containers serviced."

Oregon officials report that, while implementation of variable rates is only one of several available options, almost all Oregon communities currently use some form of variable rate pricing.

⇒ **Pennsylvania has a mandatory recycling law that encourages variable rate pricing.**

Pennsylvania recommends the use of variable rate pricing in Act 101, the "Municipal Waste Planning, Recycling and Waste Reduction Act." This law mandates waste reduction goals, recycling programs, and penalties and incentives to promote recycling. The Pennsylvania Department of Environmental Resources recommends "variable trash collection fees based on quantity discarded" as one of five desired elements in a municipal waste reduction program.

The goals of the legislation are to produce less waste per person in 1997 than was produced in 1988 and to recycle at least 25 percent of that amount. The act also states that citizens should be educated on the economic and environmental value of recycling and waste reduction and be encouraged to participate in such activities. The Pennsylvania Department of Environmental Resources has recommended variable rate pricing as the primary means to achieve the State's waste reduction goals.

⇒ **Illinois uses variable fees for licensing landfills to encourage variable rate pricing.**

Illinois uses a sliding scale licensing fee for landfills that is based on total estimated capacity. This promotes variable rates by having larger capacity landfills pay proportionally more for their licenses than smaller landfills. The theory is that the costs are passed on to the trash generators, encouraging them to reduce waste volumes in order to reduce their disposal costs.

The State also requires each city with a population of more than 5,000 or a county with more than 100,000 residents to complete a study on the feasibility of variable rates. This requirement was added in response to the failure of a bill which would have mandated variable rate pricing throughout the State. Opposition to the bill came primarily from smaller cities, which described the bill as an unfunded mandate. Other groups opposed the bill that would have required variable rates, because they felt that it was excessive State interference in local affairs.

Volume-based trash collection fees are used by some Illinois communities as a means to encourage waste reduction. In late 1990, telephone interviews were conducted with ten communities located in four Illinois counties. Survey information was collected from persons in charge of recycling or waste collection programs in each community. Questions were asked about the administration of the programs, fees charged per container, and recycling and waste reduction results. The general consensus among the ten respondents was that the variable rate fee system works.

Information on the variable rate programs used in the ten surveyed communities and detail of the survey results were presented in an article published in the March 1991 issue of Resource Recycling magazine, which is included at **Appendix C**.

⇒ **Indiana requires 20-year waste management plans that encourage variable rates.**

Indiana passed a law in 1990, which states that weight and volume based refuse fees may be implemented by solid waste management districts. Solid waste districts in Indiana coordinate solid waste management throughout the State, and each must submit a 20-year solid waste reduction, diversion and management plan. Variable rates are viewed as a means to meet these plans throughout the State.

Information on variable rate programs in operation within the various states, as reported in 1993 versus 1995 is included at **Appendix D**.

## **B. Programs Implemented by Selected Communities**

This section describes variable rate programs that have been or are being implemented by selected communities in the United States, in an effort to better manage solid waste collection and disposal. Included are examples of programs that utilize a prepaid bag system, a sticker or tag system, a special cart or can system, and a weight-based system. Information is also included on two jurisdictions in Maryland that have considered or implemented variable rates. Howard County recently considered variable rates but implemented something different, while the City of Aberdeen instituted a variable rate program using a sticker system.

Much of the information in this section was obtained from available literature, which was supplemented with telephone calls and fax transmissions to the selected communities to clarify and refine the data. In addition, OLO conducted an on-site visit to obtain information and observe the variable rate program in the City of Aberdeen, Maryland.

Information on percentage changes in trash and recycling rates contained in this section may not be comparable among the various programs discussed, since the implementing jurisdictions may have measured their results differently.

### **⇒ Clinton, Iowa established a variable rate program using a sticker system.**

The City of Clinton, Iowa has a population of approximately 30,000 residents and is located along the Mississippi River in eastern Iowa. Clinton was the first of Iowa's ten largest communities to use variable rate pricing for solid waste management.

In 1992, Clinton introduced variable rate pricing in the form of a sticker program to serve single-family households. Residents were required to purchase stickers for \$1.15 each at local grocery and convenience stores. Each container of trash set out for collection was limited to 33 gallons and 40 pounds and was required to have an official sticker attached. Curbside recycling collection was introduced at the same time to enable resident to divert portions of their waste products. In addition, "compost" bags are sold through retail outlets for packaging yard waste for removal and transport to the compost facility.

After a short period of operation, the city determined that a flat fee was necessary because revenues from the sale of the stickers alone were not sufficient to cover all the program costs, including the voluntary curbside recycling program. A flat fee of \$2.00 per month was introduced in 1993 to cover the cost of recycling and make up the shortfall in revenues. In 1994, the flat fee was reduced to \$1.50 per month. The fee is levied on all properties and is billed on a quarterly basis as a surcharge on sewer bills.

In the first year of the variable rate program, the City reported a 30 percent reduction in the amount of waste being landfilled and credited a combination of the recycling program and extensive public education for the success. Public education consisted of announcements in local newspapers and brochures distributed door to door.

The program managers found the most significant hurdle to implementing the variable rate pricing program was educating residents about "...the change from an apparently free system to a user fee." Managers reported an increase in illegal dumping and burning with the adoption of variable rates and higher overall costs of collection. The higher collection costs were attributed to the curbside recycling service that was implemented along with variable rate pricing.

As of May 1996, Clinton's variable rate program was being continued at \$1.15 per sticker, with revenues augmented by a monthly flat fee of \$1.50 that is charged to all property owners.

⇒ **Mount Pleasant, Iowa uses a variable rate tag system.**

Mount Pleasant is a community with a population of 8,400 residents located in southeastern Iowa. The City began implementing a variable rate pricing program in 1990. The program serves single family households and multi-family housing of four units or less. Residents purchase tags for \$1.00 each at grocery, hardware, and convenience stores. Tags must be placed on containers of trash which have limits of no more than 33 gallons and 50 pounds each. In addition to the costs for tags, a fixed monthly fee of \$3.00 per household is charged.

Program administrators report that variable rate pricing was generally received favorably by residents because the service was actively promoted through direct mailings, articles in the newspaper, and public service announcements. City officials also report that the program's impact was immediate and favorable. The amount of waste landfilled decreased by over 45 percent in the year following implementation of variable rate pricing, while the amount of materials that were recycled increased by over 50 percent.

The most significant problems encountered by program administrators were the initial increases in illegal dumping and the need to educate residents about the purpose of the flat monthly fee. City officials report that the incidences of illegal dumping have diminished dramatically over time as a result of the aggressive education about the program.

In May 1996, administrators of Mount Pleasant's variable rate program indicated that they are continuing the program as originally introduced, with fees set at \$2.75 monthly and \$1.00 per tag.

⇒ **Austin, Texas is implementing variable rates that utilizes wheeled trash carts.**

During 1991 and 1992, 3,000 single family households in four Austin neighborhoods participated in a Pay-As-You-Throw pilot program to test variable rate pricing for their weekly trash collection. Residents first selected from 30-gallon, 60-gallon, or 90-gallon trash container capacities that were priced at collection fees of \$6.48, \$9.72, and \$12.96 respectively per month. The city then issued and delivered wheeled trash carts of the capacities requested, five "extra garbage" complimentary stickers, and a 14-gallon recycling bin to each household in the four pilot neighborhoods. Residents who did not choose a container size received a 60-gallon cart.

When participants exceeded their trash cart capacities, they could set out additional trash in bags or other containers bearing complimentary or purchased stickers (a set of five stickers cost \$10.00). Residents who wished to change their cart size could do so once for free, after which they were charged \$15.00 to change their service.

Before implementation of the Pay-As-You-Throw program, households received twice per week collection of trash and once per week collection of recyclable materials for a flat fee of \$10.60 per month. The pilot program included weekly collection of household trash, yard waste, and recycling materials. The trash carts could be emptied by automated tippers on the back of the garbage trucks, which eliminated much of the lifting involved with trash collection. The automated equipment was added to the City's truck fleet based on the theory that the automation would provide the dual benefit of reducing worker injury and allowing the crews to be downsized from three to two persons.

During the 14 month pilot program, customers received brush/bulky items collection on five occasions. Brush/bulky collection included items like washing machines, dryers, refrigerators, large furniture, and large tree limbs and brush. This was a service the Austin customers had not had before.

Officials contacted neighborhood and civic organizations, carried out focus group surveys, and solicited feedback through a telephone voice mail system. Some residents did not understand the need for the program when they were already recycling. In response to this concern, the city began distributing newsletters with each trash collection bill. The newsletters contained educational information about pricing goals and other features of the variable rate program. Program administrators point to this as their "single best educational tool."

Austin's variable rate program was evaluated after six months of operation to measure the program's success in meeting its goals of reducing waste, encouraging recycling, and promoting worker safety. Attitudinal surveys and direct observation by program evaluators showed that recycling increased from 50 to 80 percent in some neighborhoods. In addition, the time required for crews to collect the trash was shorter under the new trash collection method, partly because "sharing of boundaries" with neighbors was also promoted so the collection trucks would need to make fewer truck stops. Details of the evaluation results are shown at **Appendix E**.

There was one aspect of the program that users disliked: receiving a separate billing for trash collection services. Prior to implementing variable rate pricing, charges for trash collection were included on their utility bills. However, the utility's computerized billing system could not accommodate variable rate pricing and separate bills had to be produced for the variable rate program. Modifications to the billing system would have cost an estimated half-million dollars. Since the utility had planned to install an upgraded accounting and billing system during 1996, it was decided to include a requirement in the system design so that the new system would be able to apply variable rates.



After evaluation of the pilot test, the City Council passed a resolution (August 1992) to implement the Pay-As-You-Throw program in phases throughout Austin. As of May 1996, the City has completed phase-in of the operations part of the program, which includes: weekly collection of trash, yard trimmings, and recycling materials; twice yearly pick up of bulky items; and yearly collection of brush.

All trucks in the hauling fleet have been retrofitted with automated tippers and wheeled trash carts have been distributed to all customers. The City is currently charging a flat fee of \$11.64 per month for collection services, and plans to implement the variable rate portion beginning in February 1997.

⇒ **Seattle, Washington instituted variable rates using a trash can system.**

The Seattle Solid Waste Utility operates as an enterprise fund and offers a variable rate can subscription program with recycling fees embedded in the collection fees. The utility employs four finance staff, one rate-setter, and three accountants to manage the program, and spends between \$15,000 to \$20,000 annually on consulting services, mostly to assist with setting rates. The utility also employs 22 full-time customer service representatives and nine refuse inspectors help to meet the enforcement needs of the program.

Seattle also offers services that are complementary to their variable rates. Recycling pickup is included in the fees charged for the variable rate program. In addition, the City charges a flat monthly fee of \$4.25 per household to collect yard trimmings and \$26.85 per item for bulk pick-up service. These complementary services are designed to provide residents with more ways to manage their waste stream.

Seattle's variable rate pricing program is a two tiered system which combines a set fee (or mandatory base rate) of \$5.85 per month within a \$16.10 per month charge for each standard size 32-gallon can of trash collected weekly. The city also offers residents the option of using smaller cans of 19 gallons at \$12.35 per month or 10 gallons at \$10.05 per month. Residents pay for waste disposal in excess of their subscription levels through the purchase of tags which must be affixed to bags or other containers. The tags may be purchased at local retail outlets. The City bills customers \$5.00 per bundle for extra (untagged) trash that is placed on the curb. City administrators report that residents support the single price per can because it keeps overall rates reasonable.

The program includes discounted rates for low income, handicapped, and elderly residents that do not live in subsidized housing. To qualify, residents fill out forms to classify their status and receive the discount from the City's water department, which bills for solid waste, water, and drainage. Discounted households must be re-certified annually to assure that they are still qualified to receive the discount. The percentage discount can run as high as 60 percent for the lowest level of variable rate service (one can or one mini can).

Program administrators estimate that Seattle diverted over 40 percent of its waste stream in 1991 and 42 percent in 1992 through the recycling, composting, and yard trimmings programs. In comparison, in 1988, the first year curbside recycling programs were established, recycling rates were only about 24 percent, and in 1981, the first year of variable rates, the recycling rate was about 15 percent.

Based on economic analysis of the effects of fee increases placed on total solid waste disposal, the city determined that as rates increased, customers disposed of less waste either by recycling more or by more selective purchasing. The city also estimated that a ten percent increase in charges for residential collection and disposal results in about a two percent reduction in solid waste disposal - because residents have the ability to reduce what they are charged through variable rates.

In May 1996, administrators of Seattle's variable rate program indicated that they are continuing the program as originally introduced and have not increased fees since 1994.

⇒ **Wilkes-Barre, Pennsylvania charges variable rates using a trash bag system.**

The city of Wilkes-Barre (population 47,500) began a variable rate pricing program in January 1994. The program mandates that households purchase and use specially marked trash bags which are sold at local supermarkets and convenience stores. The bags are sized at 33-gallons with a 30-pound trash limit and are sold for \$1.25 each, or in packs of five for \$6.25. In conjunction with the variable rate program, the city plans to expand its recycling program to include plastics, glass, and cardboard. Households pay \$10.00 annually for recycling.

Prior to implementation of variable rate pricing, Wilkes-Barre households paid a flat fee of \$50.00 per year and could dispose of up to eight bags of trash per week. City officials believed that the low annual fee encouraged illegal dumping by residents of surrounding counties where fees were higher and bag programs were already in place. City officials report a decrease in illegal dumping since variable rates became effective.

After instituting variable rates, program administrators reported a recycling rate of slightly more than 28 percent, as compared to 21 percent for the six months prior to implementing the program. Officials point to unit pricing and waste diversion education as reasons for a decrease in municipal solid waste collected as well as the increase in the amount of materials recycled.

In May 1996, administrators of Wilkes-Barre's variable rate program indicated that the program has been widely accepted by residents because the overall cost of solid waste management has been lowered. Since implementing the variable rate program, the price charged for specially marked trash bags has remained the same. Having recently received a \$315,000 Department of Environmental Protection recycling grant, the City plans to use the funds to dramatically increase waste reduction and recycling education, to include extensive use of the media.

⇒ **Farmington, Minnesota tested and rejected a weight-based pricing system.**

The city of Farmington has a population of about 7,500 residents. After two years of planning, a weight-based pricing system was tested by the City for solid waste collection.

The program utilized fully automated trucks that enabled one person to hoist and weigh the trash cans. Each trash can had a bar code that identified the household to be charged. As the automated system on the truck weighed and emptied the trash can, an onboard computer read the bar coded information and supplied data to the billing system.

After Minnesota's Weights and Measures Agency decided it did not have the authority to verify the scales on the trucks, the State legislature adopted standardized weight and measure legislation to establish regulations covering weighing equipment for trash collection trucks. One issue that remained was that the degree of calibration of the scales was too precise (the same as that for grocery store scales). City officials determined that the regulation was not consistent with the practical needs of a weight-based trash collection system, since trash needed to be measured in larger increments and with less calibration than the scales allowed. In addition, program managers recommended that it was not in the City's best interest to continue with research and development of a program using the weight-based technology.

In May 1996, administrators of Farmington's variable rate program indicated that they have discontinued the weight-based program and are using a volume-based model. The weight-based system was found to be too complicated and expensive in comparison to other variable rate models. The City currently prices trash collection at \$11.00 per month for weekly pick up from a 30 gallon trash can, \$13.50 for a 60 gallon can, and \$16.00 for a 90 gallon can. All households are billed quarterly for trash collection unless they sign an affidavit explaining their alternate disposal method.

Approximately 50 percent of the residents are subscribed for the 60 gallon capacity trash cans. For those times when residents need to dispose of waste products above their trash can capacity, they must call to arrange for special pickup services.

Other communities that tested and rejected weight-based pricing include: Columbia, South Carolina; Durham, North Carolina; Milwaukee, Wisconsin; and Seattle, Washington.

**C. Programs Considered or Implemented by Communities in Maryland**

This section of the report describes variable rate programs that have been considered or implemented by communities in Maryland. Howard County recently considered variable rates but implemented something different, while the City of Aberdeen instituted a variable rate program using a sticker system.

⇒ **Howard County, Maryland examined but did not implement variable rates.**

In May 1996, the Howard County Council voted to implement a flat fee of \$125.00 per year for trash collection and disposal. The annual fee will become effective in July 1996 and will be imposed on owners of single-family homes and condominiums. Apartment rental complexes that currently utilize the County's trash collection program will be required to contract with private haulers.

Under the plan, residents will be more limited in the number of containers/items they may put out for weekly collection. County officials expect the new limitation to encourage residents to increase recycling activities.

Recycling and trash collection costs are currently funded through the Howard County general fund property tax. Funding for the recycling program will continue as part of the tax while trash collection and disposal will be funded by the new fee. Yard waste in unlimited quantities will continue to be collected for composting as part of the recycling initiative.

The County currently collects trash weekly and allows each household to put out up to eight bags or containers. Beginning July 1st, the number of items that may be placed at the curb will be reduced to four bags or containers per week, and a three container per week limitation may become effective the following year. The average amount of trash currently put out weekly for collection is 3.5 containers per household.

Prior to deciding to charge a flat annual fee and impose a limit on the number of trash containers that could be set out, the County considered the possibility of implementing a fee-per-bag program, as recommended by a citizen advisory board. The fee-per-bag pricing system was determined to be unfeasible after the citizens provided overwhelming negative testimony at a series of public hearings.

Although the Howard County Council voted to impose the new \$125.00 fee and limit the amount of trash to be collected, members expressed interest in further examining variable rate programs and requested that a weight-based program be tested. As a result, solid waste management administrators will develop a program and select an area of the County to conduct a pilot test in FY 97.

⇒ **Aberdeen, Maryland charges variable rates and uses a sticker system.**

The only community in Maryland known to have implemented variable rates is the City of Aberdeen, in Harford County. The City implemented a variable rate trash removal sticker program beginning on March 1, 1993. The program is based on the concept that Aberdeen's 3,600 households will equitably pay their share of the \$35.00 per ton trash tipping fee imposed by Harford County. The equity of the pricing system is based on the trash output and the size and weight of the containers that residents use.

Ordinance #402-92, passed by the City Council of Aberdeen “provides for a system of garbage, refuse and trash collections; the issuance of stickers by the Treasurer; and to require all owners, tenants or occupants of residential property to affix stickers on trash containers as issued by the Treasurer.” The ordinance requires that each container of trash has the appropriate pre-paid sticker to cover the individual tipping fee for the bag or can of trash. Stickers are designated at 40 cents for a 20 gallon sized bag or container and 80 cents for a 32 gallon size. The City Council implemented the variable rate program as a replacement to a flat rate that had previously been charged all residents because they believed the old system was not equitable.

All owners and tenants of structures containing not more than three residential dwelling units must comply with the ordinance. The ordinance further mandates that trash will not be collected unless it is affixed with a sticker issued by the Treasurer.

The primary goals for implementing the volume based trash removal program in Aberdeen were to:

- Implement a more equitable waste management fee structure: Aberdeen instituted the program with the intention of having the city’s 3,600 households equitably pay their fair share of the \$35.00 per ton tipping fee. Proponents argue that the equity of the system is based on the trash output, as opposed to trash collection and disposal being financed through a flat fee or tax.
- Increase citizen participation in recycling programs: Program administrators expected that residents would put out less trash (by recycling more), which would lessen their own fees while being more environmentally conscientious at the same time. Officials also believed that additional recycling would result in lower overall tipping charges to the waste management program and extend the life of the landfill.
- Reduce waste: Administrators believed the variable rate program would substantially reduce the amount of waste disposed. The goal was to reduce waste by 30 percent at the end of the first year of implementation. Through volume-based pricing, residents are provided an economic incentive to reduce the amount of waste they send to the landfill. By pricing solid waste collection and disposal services, Aberdeen hoped to establish a clear link between the amount of trash a household throws away and what that household pays.
- Lessen waste collection and disposal costs: City administrators hoped to lower the costs of operating the solid waste management system. Under variable rates, citizens were expected to generate less waste, which would effectively reduce tipping costs for landfill disposal and reduce collection costs as routes are more quickly processed.

Examination of trash and recycling tonnages suggests a significant program’s impact for the first year (in terms of waste reduction and increased recycling. The table below shows that trash tonnage for the nine-month period prior to implementing the program was 2,762 tons. The amount of trash collected for the same months a year later (after implementing variable rates) totaled only 1,967 tons. The difference of 795 tons represents a reduction of 28.8 percent.

Measured Before Implementing Variable Rates		Measured After Implementing Variable Rates		
Month and Year	Tons Collected	Month and Year	Tons Collected	Increase (Decrease) in Tons by Month
No info collected		March 1993	206	n/a
No info collected		April 1993	216	n/a
No info collected		May 1993	214	n/a
June 1992	292	June 1993	232	( 60)
July 1992	327	July 1993	245	( 82)
Aug 1992	334	Aug 1993	256	( 78)
Sept 1992	338	Sept 1993	247	( 91)
Oct 1992	282	Oct 1993	213	( 69)
Nov 1992	294	Nov 1993	217	( 77)
Dec 1992	330	Dec 1993	228	(102)
Jan 1993	330	Jan 1994	169	(161)
Feb 1993	235	Feb 1994	160	( 75)
Total 9 months	2,762	Total 9 months	1,967	(795)

Twelve month total = 2,603 tons

At the same time, recycling tonnages increased by 67.8 percent, as demonstrated in the table below. This table shows that, for the nine months prior to implementing variable rates, 346 tons of recyclables were collected. For a like period a year later (after implementing variable rates), 580 tons of recyclables were collected. The additional 234 tons of materials diverted from the landfill represented a 67.7 percent increase for the recycling program.

Measured Before Implementing Variable Rates		Measured After Implementing Variable Rates		
Month and Year	Tons Collected	Month and Year	Tons Collected	Increase (Decrease) in Tons by Month
No info collected		March 1993	60	n/a
No info collected		April 1993	74	n/a
No info collected		May 1993	70	n/a
June 1992	37	June 1993	81	44
July 1992	39	July 1993	65	26
Aug 1992	37	Aug 1993	63	26
Sept 1992	35	Sept 1993	61	26
Oct 1992	37	Oct 1993	61	24
Nov 1992	41	Nov 1993	68	27
Dec 1992	36	Dec 1993	67	31
Jan 1993	36	Jan 1994	59	23
Feb 1993	48	Feb 1994	55	7
Total 9 months	346	Total 9 months	580	234

Twelve month total = 784 tons

Evaluation of the program also showed that the City's tipping costs decreased because of the lower amount of trash tonnage disposed at the landfill. City tipping costs for the nine months prior to implementing the program totaled \$96,670. For the same nine months after implementing variable rates the City paid a total of \$68,742 in tipping costs. This difference represents savings of \$25,828, which represents a reduction of 26.7 percent. The table below displays the before and after figures for tipping fees.

Measured Before Implementing Variable Rates		Measured After Implementing Variable Rates		Increase (Decrease) in Total Paid by Month
Month and Year	Total Paid	Month and Year	Total Paid	
No info collected		March 1993	\$ 7,210	n/a
No info collected		April 1993	7,560	n/a
No info collected		May 1993	7,490	n/a
June 1992	\$ 10,220	June 1993	8,120	\$ ( 2,100)
July 1992	11,445	July 1993	8,575	( 2,870)
Aug 1992	11,690	Aug 1993	8,960	( 2,730)
Sept 1992	11,830	Sept 1993	8,645	( 3,185)
Oct 1992	9,870	Oct 1993	7,455	( 2,415)
Nov 1992	10,290	Nov 1993	7,595	( 2,695)
Dec 1992	11,550	Dec 1993	7,994	( 3,556)
Jan 1993	11,550	Jan 1994	5,898	( 5,652)
Feb 1993	8,225	Feb 1994	5,500	( 2,725)
Total 9 months	\$ 96,670	Total 9 months	\$ 68,742	\$ (25,828)

Twelve month total = \$ 91,002

Aberdeen residents significantly reduced their waste stream over the first 12 months of the program, by increasing their participation in the recycling and composting programs. There were no increases in the reported incidence of illegal dumping. According to Aberdeen's recycling coordinator, the variable rate pricing program also shortened the time needed to pick up trash along the routes by a daily average of slightly over two hours.

The fact that recycling efforts have increased since introduction of the program should not be overlooked. Aberdeen instituted many innovative recycling and waste diversion options for residents. One such program involves collecting scrap lumber and building birdhouses. The birdhouses are then sold to the public and the proceeds go toward planting trees in the Chesapeake Bay watershed. Another program involves holding composting workshops to educate the public on the benefits, which includes free composting bins for all who participate.

According to managers of the Recycling Center, these recycling and waste diversion options have become extremely popular since initiation of the variable rate program. The managers believe that providing residents with options other than traditional curbside recycling has led to a greater awareness of the need to recycle, which has translated into program success.

#### **IV. VARIABLE RATE PILOT PROGRAM IN MONTGOMERY COUNTY**

This chapter presents a description and preliminary results on a County-sponsored pilot test of variable rate pricing conducted through June 1996. The County's Division of Solid Waste Services worked with the Town of Chevy Chase to design the pilot test, and the Town began implementing the variable rate program on September 11, 1995. Staff in the Division of Solid Waste Services compiled the information for this chapter of the report, which covers program activities through May 1996.

##### **A. Description of Pilot Program**

The County's purposes for conducting a variable rate pilot projects were to:

- Test the viability, effectiveness, and citizen acceptance of variable rate systems;
- Collect valuable data on waste generation and recycling rates on a household level;
- Assess whether variable rate pricing can influence behavior and impact waste generation;
- Determine the administrative and other costs required to fully implement variable rate pricing; and,
- Collect needed information on mixed paper generation rates and composition in Montgomery County.

After an extensive search over a three-year period by the County for a volunteer community to conduct a variable rate and mixed paper recycling project, the Town of Chevy Chase stepped forward. The Town of Chevy Chase has a strong environmental ethic and has chosen to become a sustainable community (a community that looks for ways to grow while minimizing the environmental impact of that growth). Town officials found the variable rate concept to be very much in line with their sustainable goals. They were interested in adding mixed paper recycling to their current program and being a leader in the County on waste management and environmental issues. The Town was also anxious to obtain information on their actual waste disposal and recycling tonnages, since their current contractor does not separately weigh their trash and recyclables. This information could be useful in future collection contract negotiations. In addition, the Town wanted to take the opportunity to meet their objectives with County funding and assistance.



### **Demographics and Background Information**

The Town of Chevy Chase is located in the Bethesda area and consists of 1,028 single-family households, a Town Office, and a Community Center. The Town population (1990 Census) was 2,675 residents, with 47 percent male, 53 percent female, and an average age of 40.9 years. The average household has 2.73 persons. Over 71 percent of the households are comprised of married couple families and 97 percent are white. The median home value is \$433,800.

The community has twice-a-week back door collection of trash. The entire Town is divided into two trash routes, the East Side of Town and the West Side of Town. The East Side receives collection on Monday and Thursday and the West Side receives Tuesday and Friday collection. Recyclables are collected once a week at the curb on Wednesdays throughout the entire Town. Residents place commingled glass bottles and jars, aluminum and steel cans, aluminum foil products, and #1 and #2 plastic bottles in a green bin provided by the Town and, prior to the start of the pilot program, placed newspapers in paper bags or tied with twine next to or on top of their bins. Residents also receive twice a week curbside collection of yard trimmings, including grass clippings, leaves, and brush (and Christmas trees during January).

East Side residents receive yard trim service on Tuesday and Friday and West Side residents receive the service on Monday and Thursday. Vacuum collection of leaves is provided throughout the fall. Twice a year, the Town has a "Trash and Treasures" weekend. Residents can set out unwanted items (no regular trash) at the curb over the weekend for scavenging and whatever is left by Monday is collected during the week through a special collection. Prior to the pilot, the Town sponsored a drop-off at the Town Office for magazines and catalogs.

In January 1995, the Town Council voted to support the Town's participation in the variable rate program. An information brochure on the project, that included a ballot, was mailed to all 1,028 Town residents on March 24, 1995 asking them to decide whether to participate in the pilot project. Of the 438 households that responded, 70 percent voted to participate in the program.

Respondents most likely to benefit from the variable rate pilot project voted to participate in the pilot project in greater numbers. Ninety-four percent of respondents needing the smallest sized container voted for the program, while only six percent voted against it. Those generating an average amount of trash were still strongly in favor of the program. Seventy-nine percent of respondents who indicated they needed a 32-gallon container were in favor of the pilot, while 21 percent were against it. Of those generating the largest amount of trash, namely those who needed two or more 32-gallon containers, only 53 percent voted for the pilot while 47 percent voted against it.

### **Designing and Publicizing the Pilot Program**

After discussions with the Town and their waste hauler, a can system was selected for the pilot project. Under the can system adopted, residents chose one of three trash can sizes for the variable rate program: a 20-gallon can, a 32-gallon can, or two 32-gallon cans. Residents paid less for collection of trash when they used a small can and more with each larger size can.

The County agreed to purchase new cans for all the residents as an incentive to participate in the program, to ensure the containers were the correct size, and to assist the haulers in quick identification of the variable rate cans. The cans have pre-printed decals for easy hauler identification. However, based on resident suggestions, the program was modified to also allow residents to continue to use their own cans if they chose. Those residents were provided with decals that could be affixed to the can(s) they already owned.

Sixty-eight percent of the residents chose new cans, 24 percent of the residents chose to use their existing cans, one percent chose to use an existing and new can, and six percent did not respond to requests about can type. The residents who did not respond were provided with new cans (does not add to 100 percent due to rounding).

Each resident also received ten free excess trash tags to use when the amount of trash they had exceeded the capacity of their variable rate container. One trash tag was to be used for collection of the equivalent of 32 gallons of trash. Additional tags could be purchased at the Town Office for \$1.00 each. The \$1.00 fee was established by estimating the Town's cost to dispose of trash divided by the weight of trash in one trash can that a typical resident sets out for collection on an average set-out day.

A two-month switching period was allowed after initial program launch when residents could exchange their can for one of a different size. Only two percent of the residents actually switched container size during this period.

Mixed paper recycling was offered on residents' regular recycling day as an added incentive to participate in the test program. Residents could recycle mixed newspapers, corrugated cardboard, unwanted mail, boxboard, paper bags, office paper, magazines, catalogs, telephone books, and any other clean, dry paper. Residents set paper out in grocery bags, bundled with twine, or bagged in reusable containers with lids. For residents who chose to use containers, special "Recycle" bumper stickers were provided to affix to the cans so they were easily identifiable by the hauler.

The County conducted an extensive public education campaign prior to launching the pilot project. Residents received five mailings with a ballot, program details, stickers and decals, and other important information. A monthly Town newsletter was mailed to all residents and contained almost monthly articles about the program. County staff also made a presentation at the Town's Annual Meeting. Even so, a large number of residents were unaware of the program when it began. By leaving inspection notices during the first week of the program, non-compliance with program requirements dropped from ten percent to less than four percent.

From the start of the pilot project, it was the County's philosophy to develop a customized program that would meet the needs of the community. Many program design changes resulted from the collaborative development process between the County, the Town Manager, the Town Council, Town residents, and the waste hauler, each of whom had their own goals and objectives in the program.

The County was able to make many changes to the program, while maintaining the integrity of the data collection methodology and program implementation elements. In the end, the accommodations and flexibility resulted in a more effective program that was viewed positively by the residents.

### **Developing Fees for the Variable Rate Program**

The Town pays for its solid waste management services using primarily general fund revenues. General fund revenues are derived from two main sources: The Town's income tax, which is charged to residents on their property tax bill, and property tax charges. A third source of funds is used specifically for solid waste management services. Charged on the property tax bill as a separate fee, the Town's \$75.00 "dump fee" was instituted in the past to cover the rapidly escalating costs of disposal at the County's Transfer Station. Although tip fees at the transfer station have stabilized, the Town continues to charge this \$75.00 fee as an additional source of revenue to fund solid waste management services.

Under ideal circumstances, the full cost of providing trash collection and disposal services for the three different service options offered residents would have been clearly reflected in the variable pricing scheme. However, because the program was a pilot project, a number of limitations prevented this:

- A full cost accounting system for solid waste management did not exist;
- The structure of the County's property tax bill allowed only one charge to be entered for all Town residents, and the timing of the pilot project did not leave sufficient time to alter the structure of the property tax bill; and,
- The Town was charged a flat fee for service by its waste hauler, and no data existed on the tons of trash and recyclables actually generated by the Town. Attempting to price the variable rate service for full cost recovery without this important information would have been very risky.

Therefore, an alternative pricing system was developed based on the annual \$75.00 dump fee, which was the only portion of the tax bill that clearly reflected a separate charge for solid waste services. Since the County did not have the ability to vary charges using the dump fee charge, each resident was charged the full \$75.00 dump fee on their tax bills. However, residents who chose the 20-gallon can were issued a rebate of \$50.00 (for a net charge of \$25.00 per year), residents who chose a 32-gallon can were issued a rebate of \$35.00 (for a net charge of \$40.00 per year), and those who chose the maximum can size of two 32-gallon cans paid the full \$75.00 fee. Residents were informed that these charges did not cover the full cost of their solid waste services.

The cost differentials between the levels of service offered was not as great as would have been preferred, and there was some concern that an insufficient incentive for waste reduction would result. However, this did not appear to occur, since a majority of the residents chose less than the maximum service levels. Nineteen percent of the residents chose a 20-gallon container, 43 percent chose a 32-gallon container, and only 37 percent chose two 32-gallon containers.

County staff continue to work with the Town to develop a full cost accounting system they can use in the future to charge residents for the true costs of their service. In addition, the County tax bill system has been modified so that the Town can now charge one of three different rates on the dump fee line item.

#### **B. Approach to Measuring Results for the Pilot Program**

One of the most important elements of conducting the variable rate pilot project was to perform a quantitative analysis of its impact. Therefore, an extensive monitoring program was designed to collect critical information concerning the project's impact on waste generation, recycling rates, and recycling contamination rates. Data on mixed paper recycling rates were also collected to supply information to assist with plans to expand mixed paper recycling service throughout the County. In addition, attitudinal information was collected, through direct contact with residents and use of a formal survey.

Staff conducted monitoring on 106 randomly selected Chevy Chase households, or ten percent of the total households in the Town. County staff ensured that an equal number of households from the East Side and West Side were selected to reflect the Town's diversity. Four weeks of monitoring were conducted in June 1995 to establish a baseline prior to the start of the variable rate program. One week of monitoring was conducted every other month in October, December, February, and April, with a final monitoring to take place for four weeks in June 1996.

Monitoring consisted of collecting all trash and recyclables generated by each identified household and weighing the yard trimmings set out for recycling collection. The trash was sorted as refuse for disposal, commingled recyclables, and recyclable paper, with each component separately weighed. Recyclables were sorted as commingled containers, mixed paper, and contaminants. The data collected allowed staff to judge changes in recycling rates, whether residents disposed of more trash as recyclables, and whether trash generation rates were affected by the variable rate program, independent of the addition of mixed paper recycling.

#### **C. Initial Results**

Based on before and after measurements, recycling participation rates increased from 80 percent (measured in June 1995 before implementing variable rates) to 99 percent (measured from September 1995 through April 1996). In addition, the amount of refuse set out for disposal decreased by an average of 30 percent after variable rates were put into affect, and the Town's recycling rate increased from 45 percent of the total waste generated to an average of 57 percent. The table on page 34 provides a summary of data collected through April 1996 for the monitoring program.

During March 1996, all Town residents were surveyed either by mail or by telephone. One hundred six households comprised the sample for the telephone survey. The remaining households received the mail survey. The questions for both surveys were the same. A total of 485 households responded to the surveys, representing a response rate of 47 percent. A summary of the key findings is listed below:

- Prior to the launch of the program 69 percent of residents had positive feelings about participating in the variable rate program. Since the program began, 85 percent feel positive about it.
- Since the launch of the program, the percentage of residents who felt negative about the program decreased from 16 percent to 8 percent.
- Over 78 percent of respondents agreed that the variable rate program benefits their community and 81 percent said the program benefits the environment.
- Almost 70 percent of the respondents found the variable rate program to be easier than they expected.
- About 51 percent of residents **disagreed** that the new system is less convenient than the old trash collection system.
- About 75 percent of respondents agreed that they became more aware of what they throw away.
- Over 72 percent said they now have less trash to put out than a year ago.
- Nine percent of the respondents modified their shopping habits, 19 percent now look for items with less packaging, and 23 percent reuse more items than before.
- The County's public education program was regarded as informative and helpful by 83 percent of respondents.
- Almost 86 percent of the respondents had positive opinions about the mixed paper recycling program and 84 percent agreed that the program benefits the community.
- Seventy-two percent of the respondents agreed that the mixed paper recycling program is convenient.
- Seventy-eight percent of the respondents said mixed paper recycling made them more aware of the types of paper they throw away.
- Storage of mixed paper was the chief difficulty with mixed paper recycling.
- Sixty percent of respondents said once a week trash collection would now meet their needs.

Perhaps the best evaluation of the success of the pilot project comes from the Town itself. The Town has elected to continue a variable rate pricing system beyond the County's involvement in the project.

# Town of Chevy Chase Variable Rate and Mixed Paper Pilot Project Preliminary Results of Monitoring Program

**Household Averages in Pounds and Percent of Waste Generated Weekly  
(Derived from data collected on 106 households)**

	<u>BASELINE</u>		<u>MEASUREMENTS AFTER IMPLEMENTING VARIABLE RATES</u>									
	June 1995		October 1995		December 1995		February 1996		April 1996		June 1996	
	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent
<b>TRASH</b>												
Total set out for disposal	33.55	66.81%	22.20	49.96%	22.95	46.57%	23.42	52.93%	24.26	49.86%	27.06	51.04%
Recyclable mixed paper in trash	12.27	24.43%	4.88	9.44%	5.24	10.63%	4.55	10.28%	5.09	10.46%	5.41	2.32%
Recyclable containers in trash	1.31	2.61%	.62	1.20%	0.79	1.61%	.05	4.11%	0.65	1.34%	1.35	2.55%
<b>RECYCLABLES</b>												
Total set out for collection	16.67	33.19%	29.48	57.04%	26.33	53.43%	20.82	47.07%	24.40	50.14%	25.96	48.96%
Commingled containers	5.28	10.51%	6.43	12.44%	4.84	9.82%	4.82	10.90%	5.47	11.24%	5.07	9.56%
Newspaper	11.06	22.02%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mixed paper	n/a	n/a	22.82	44.16%	21.40	43.43%	15.71	35.51%	18.69	38.41%	20.50	38.66%
Paper and commingled contaminants	0.32	0.64%	0.22	0.43%	0.09	0.18%	0.29	0.66%	0.23	0.47%	0.39	0.73%
<b>TOTALS FOR TRASH AND RECYCLABLES</b>	50.22	100.00%	51.68	100.00%	49.28	100.00%	44.24	100.00%	48.66	100.00%	53.02	100.00%
<b>YARD TRIMMINGS</b>												
Total set at curb for recycling	10.89		8.65		none		none		17.70		18.08	
<b>TOTAL WASTE SET OUT</b>	<u>61.11</u>		<u>60.32</u>		<u>49.28</u>		<u>44.24</u>		<u>66.36</u>		<u>71.10</u>	

Note: Number and percentage details may not be exact due to rounding errors.

**Notes:**

- The pilot project included 1,028 households. The monitoring program collected data from 106 households.
- Data was collected on the following dates: June 6 - June 29, 1995; October 16 - October 20, 1995; December 11 - December 15, 1995; February 12 - February 16, 1996; April 29 - May 3, 1996; and June 3 - June 28, 1996.
- February set-outs for recycling may have been lower than typical due to unusually heavy snows.
- Calculations of overall recycling rates generally include yard trimmings. However, for purposes of this pilot project, yard trimmings are not included in the calculation of recycling rates because the pilot project did not impact yard trimmings behavior.

**Source: Montgomery County Department of Public Works and Transportation, Division of Solid Waste Services**

#### **D. Expanding the Pilot Program**

The County's involvement in the Town of Chevy Chase pilot project will end July 1, 1996. Although the project was considered very successful, County staff see the need to conduct additional tests in County areas, rather than municipal areas for a number of reasons:

- The Town of Chevy Chase's demographics are not representative of the County population as a whole;
- It is important to test the program with County residents, County haulers, and County administrative staff; and,
- Staff would like to test bag and/or tag systems, as these types of systems could significantly reduce administrative costs for a variable rate program.

During the next year, the County plans to conduct two additional test projects, one in the County's collection district, where the County provides contracted refuse collection service, and the other in the private collection areas. One interested community has already been identified, and work is proceeding to establish a new project in the fall.

### **V. OBSERVATIONS AND RECOMMENDATIONS**

#### **A. Observations**

1. Jurisdictions that have implemented variable rate pricing programs report high success when households are provided additional waste diversion options, such as: collection of mixed paper, newspapers, cardboard, bottles, and cans for recycling; periodic pick up of bulky items; and distribution of composting bins or collection of yard waste for composting. Some or all of the waste diversion options offered may be included in pricing trash collection services or may be priced separately.
2. When variable rate program managers are asked to explain the most important aspect of implementing a successful program, the overwhelming response is that extensive public education on the details of the program (including recycling options), and attention to customer feedback are imperative to the program's success.
3. After implementing variable rates, jurisdictions consistently report lower tonnages of solid waste collected and higher tonnages of recycled materials. Many communities also report an impression of higher incidences of illegal dumping which tends to subside after the variable rate programs have been in effect for a period of time. Since new recycling options were often implemented simultaneously with variable rates, it is unclear whether lower waste generation rates resulted solely because of variable rates.
4. Most jurisdictions that implement variable rates use a combination of pricing strategies. A fixed fee is often established to cover all or a portion of capital costs and ensure a steady income stream, and a variable rate component is used to charge each household for waste collection and disposal services according to the increments of trash that are put out for collection.

Many communities combine two variable rate pricing models. They sell specially marked bags or set fees for standard trash container sizes (such as 30, 60, or 90 gallons), and supplement the program by selling of tags or stickers to accommodate disposal of excess units of waste. These pricing models enable jurisdictions to set base container sizes at low or average levels to encourage waste diversion and recycling behavior, with the accompanying availability of tags or stickers to discourage illegal dumping or overstuffing of containers by allowing for disposal of additional increments of waste that customers really need to dispose.

5. Communities that have tested weight-based pricing programs have rejected the system because of the precise requirements of the weights and measures and cost factors relating to: complexities of the accounting and billing systems that are needed; the need to purchase specialized trucks or retrofit existing fleets; and training of collection personnel to operate and troubleshoot the automated dumping equipment and on-board computer technology.
6. Preliminary results of the County's pilot test in the Chevy Chase area indicate a high degree of acceptance of variable rate pricing by participating households.

#### **B. Recommendations**

1. The Division of Solid Waste Services should continue to refine and test different variable rate pricing models within the County.
2. The County should consider conducting a test that includes a pre-post evaluation with a control group. Under this scenario, two like groups would be offered new or expanded recycling and waste diversion programs accompanied by identical public outreach efforts, but only one group would have variable rate pricing. Alternatively, the County could use one group by implementing the various services in phases. The County could conduct measurements for several months after introducing each new service.
3. The County should continue to survey participants in the test areas to determine what they liked/disliked most about each model, to assist with determining the feasibility of implementing the various models throughout the County.
4. As part of its consideration of fully implementing variable rates, the County should:
  - a) examine the feasibility of licensing incentives to encourage private haulers that operate outside the County's collection districts to participate in any variable rate program.
  - b) consider what additional waste diversion methods or recycling services would be offered in conjunction with variable rate pricing for trash removal.
  - c) consider and price the methods and extent of publicizing the program and educating the public on all aspects of the new system.
  - d) for each model being considered, project the financial effect of full implementation on each component of the County's overall waste management system.



## VI. AGENCY COMMENTS

On June 11, 1996, OLO circulated a draft of this report to the Executive Branch for review and comment. OLO considered written comments received by July 19th and made modifications and technical adjustments to the final version of the report, as deemed appropriate. The Executive Branch comments are reproduced here in their entirety, beginning below. Page numbers referenced in the comments may differ due to adjustments made to the final report.



### OFFICES OF THE COUNTY EXECUTIVE

Douglas M. Duncan  
*County Executive*

### MEMORANDUM

Bruce Romer  
*Chief Administrative Officer*

July 18, 1996

TO: Joan M. Pedersen, Program Evaluator  
Office of Legislative Oversight

FROM: Bruce Romer, Chief Administrative Officer

SUBJECT: Office of Legislative Oversight DRAFT Report 96-8, Variable Rate Programs for Pricing Solid Waste Collection

Thank you for the opportunity to comment on the DRAFT OLO Report 96-8, Variable Rate Programs for Pricing Solid Waste Collection. Although this report provides an excellent overview of the variable rate concept and experiences in various communities in the country, it is important to note that the report characterizes charges as a "flat fee or a tax." What the County and many other jurisdictions actually do is charge a service charge which is calculated by estimating the average amount of solid waste generated by different types of households. The appeal of a variable rate is that it allows a more precise allocation of charges based upon use and also encourages households to reduce the amount of solid waste they generate.

We agree with OLO's recommendations. The County is committed to refining and testing different variable rate pricing models and is working with a community in Silver Spring for our next pilot. Within budget constraints, we will consider using a control group or phasing-in of services as we test different variable rate pricing models. During the County's pilot test in the Town of Chevy Chase, we surveyed every household and will continue this comprehensive survey approach during other pilots. Any County-wide variable rate program should include licensing incentives. It would be helpful if the report provided more information on hauler participation in these programs. As we continue to test variable rate pricing models within the County, we will continue to use mixed paper as a waste diversion and will continue to evaluate the effectiveness of the various methods for educating the public on all aspects of the new system. Finally, it is imperative to know all costs associated with each model and how the

Joan M. Pedersen, Program Evaluator  
July 18, 1996  
Page 2

program will impact the Solid Waste Fund. During the pilot in the Town of Chevy Chase, we tracked all administrative costs including the cost to purchase containers, hauler charges, and printing material.

We offer the following comments to correct or clarify the data presented in this report.

**Throughout the report:**

References to variable rate charges that cover funding for solid waste collection and solid waste disposal are used interchangeably. It might be helpful to discuss these as separate issues. A reduction in tonnages disposed may or may not have an impact on the cost required for collection. Since most solid waste collection costs are fixed, it would probably require a substantial decrease in waste set out for collection to reduce collection costs. Many variable rate systems charge a differential rate for disposal, but charge a flat fee for the collection portion of the solid waste services costs.

**Pages 1, 2, 28, and 36:**

The Division of Solid Waste Services is referred to as the Division of Solid Waste Management throughout the report.

**Page 4:**

Another advantage of variable rate programs is the potential to reduce disposal costs.

Under conditions often found in jurisdictions, should "high trash collection costs" be disposal costs, instead?

**Page 5:**

Under "Major public relations effort required," an advantage of early public education is to inform and educate residents about solid waste issues and costs in general. Giving residents a global perspective raises their awareness of the issues and the impacts on the community and on the taxpayer. Then, proposing system changes, such as variable rate, can be put in context and are viewed more positively.

**Page 6:**

Under the "illegal dumping" section, how about citing the fact that this appears to be less of a problem than most communities anticipate it will be and that such dumping diminishes over time?

Under "higher administrative costs" section, it appear that these costs are temporary "short-term workload increases." Initial implementation costs will be higher, but regardless of the system, administrative costs are likely to stay higher than prior to implementation of variable rate.

Joan M. Pedersen, Program Evaluator  
July 18, 1996  
Page 3

**Pages 8 & 9:**

Under advantages, both systems cite the fact that accounting costs are negligible since no special billing system is needed. However, with both bag and tag systems, administrative costs will be incurred to handle rebates to government agency of fees collected from retailers through the sale of bags/tags. Although likely to be less than the administrative/accounting costs with a can system, these costs can still be significant.

**Page 10:**

Under the second listed disadvantage of can systems, there is no economic incentive to reduce waste below the maximum for all can sizes, not just the smallest can size. For example, let's say the largest can size is 90 gallons and the next smaller size is 60 gallons. A resident who subscribes to the 90 gallon size has no incentive to reduce waste if they consistently generate more than 60 gallons of trash.

Another disadvantage to can systems is the resident still pays for the service for those weeks, when trash is not put out for disposal. This is in contrast to the bag and tag systems which are more elastic, allowing a resident not to pay for weeks when the service is not used.

Finally, for all three systems there could be enforcement problems at the curbside. Collectors in District B not under contract with the County may collect trash that is not marked with stickers, thereby undermining the program.

**Page 11:**

Other disadvantages of the weight-based system include limited operational experience with the newer generation of on-truck scales, containers and computers require extra expense, higher maintenance costs due to dependence on mechanical and electronic systems, and higher potential for cheating by placing trash in a neighbor's container.

It is important to note that the hybrid system is different from the other four systems. The can, bag, tag, and weight systems are methods for implementing variable rate. The hybrid system is purely a financial system variation on the way the charges are implemented.

**Page 12:**

The "Measuring the Impact of Variable Rate Programs" section is confusing. The other sections of the report were written as descriptions, without observations, recommendations or conclusions. This section, however, has a prescriptive tone that talks about how measurement should be done, describing only two options. It may be clearer if a review of different measurement techniques that have been used be included, with the recommended techniques in the conclusion section.

Joan M. Pedersen, Program Evaluator  
July 18, 1996  
Page 4

When a one-year post project measurement is recommended, it is useful to keep in mind that if national or local economic conditions have changed during the year, these may have greater impact on waste generation rates than any recycling or waste reduction technique implemented.

In the third paragraph, the explanation of why an increase in participation rates in recycling cannot be used to measure the success of variable rate pricing needs to be clarified.

**Pages 18 & 19:**

Under the Clinton, Iowa example and Mount Pleasant examples, it's unclear what changes in waste generation/disposal are attributable to variable rate and what is attributable to increases in recycling.

**Pages 20 & 21:**

The "sharing of boundaries" explanation for reduced trash collection times needs to be clarified.

For Austin's current implementation, did all residents receive the same size trash carts for \$11.64/month? If so, how will they implement variable rate?

Is there a size or weight limit for use of the \$5.00 excess trash tags in Seattle?

Do charges for "collection services" include disposal costs, if not, those costs should be reflected. In other words, was inquiry made into exactly what is included in the calculation of charges for collection services. Are there subsidies from general funds or other tax sources?

It would be useful to know in assessing the variable rate programs from other jurisdictions whether the jurisdictions provide for the collection of solid waste or whether collection is managed by private industry. This is an essential component in determining the type of variable rate program to employ.

**Page 23:**

Did the communities that rejected weight-based systems all have the same reasons as Farmington? If not, what were some of the other reasons?

**Page 35:**

When discussing experiences in various communities, it might be helpful to move the discussion from Observation #1 to the beginning of Section III. One of the major problems in assessing and comparing results of variable pricing in other communities is comparison of data. The measurement techniques used by each community varies widely. In addition, many of the communities cited in this section added recycling programs at the same time as the variable rate programs began. Therefore, it might be worth emphasizing that the impact on waste generation and disposal rates of variable rate pricing versus more widespread availability of recycling programs is not clearly differentiated by many communities. For example, in the Aberdeen example, does the 795 tons reduced after implementation of variable rate include the increased

Joan M. Pedersen, Program Evaluator  
July 18, 1996  
Page 5

234 tons recycled? Showing the information on two separate tables may confuse the reader about the total program impact of all system changes.

We appreciate the opportunity to comment on this draft report. We look forward to participating with the Council in its review of this report.

**Distribution:**

Graham J. Norton, Director, Department of Public Works & Transportation  
Robert K. Kendal, Director, Office of Management & Budget  
Charles W. Thompson, Jr., County Attorney  
CAO Chron File  
OLO Report File

### **OLO Response to Executive Branch Comments**

On July 12, 1996, the Department of Public Works and Transportation (DPWT) provided OLO with their comments. On July 15th, OLO met with staff of the Division of Solid Waste Services to discuss the DPWT comments and the OLO draft report. As a result of that meeting, OLO incorporated a number of adjustments and refinements before finalizing the report. The adjustments made by OLO address the majority of comments contained in the Executive Branch response to the OLO draft report.



## BIBLIOGRAPHY

Adamec, Barbara, "Volume-based Collection Fees: A Success Story," Resource Recycling, March 1991.

Arner, Robert and Kimberly Davis, Northern Virginia Variable Rate Demonstration Project, "Pay as you throw" Interim Report, Northern Virginia Planning District Commission, May 17, 1994.

Becker, Jeanne and Marilyn Browning, "Volume-Based Garbage Collection Fees: An Analysis of 10 Illinois Programs," Resource Recycling, March 1991.

Bracken, Robert, "North Carolina County Institutes Sticker System," BioCycle, February 1992.

Canterbury, Janice L., Pay As You Throw: Lessons Learned About Unit Pricing of Municipal Solid Waste, U. S. Environmental Protection Agency, Office of Solid Waste, EPA 530-R-004, April 1994.

City of Austin, Texas, Department of Solid Waste Services, Environmental and Conservation Services Department, Solid Waste Services Business Plan, September 10, 1990.

City of Austin, Texas, Department of Solid Waste Services, Environmental and Conservation Services Department, "Issue Paper: Business Plan Update, Including Recommendations for City-Wide Implementation of Pay-As-You-Throw Pilot Program," Solid Waste Services Business Plan Update May 1992, May 6, 1992.

Cofield, Gwen, "Better by the Bag," MSW Management, January/February 1992.

Cuthbert, Richard, "Variable Disposal Fee Impact," BioCycle, May 1994.

Fiske, Gary S., "Rates: A Powerful Tool to Reduce the Waste Stream," Solid Waste and Power, March/April 1992.

Friedman, Naomi, "Recycling: Five Communities that do it Right," American City and County, October 1992.

Gruder, Sherrie, The Wisconsin Experience, National Conference of State Legislatures, July 18, 1995.

Hasson, David, Ph.D., "User Fee Potential for Proprietary Activities," Association of Washington Cities 1991 Annual Convention, Spokane, Washington, June 1991.

Johnson, Margit, "Calculating Volume Based Garbage Fees," BioCycle, February 1991.

King County Commission for Marketing Recyclable Materials, 1995 Annual Report, Seattle, WA, 1995.

Lemoine, Pam, "Recovering the Costs of Solid Waste Management," Solid Waste Issues and Answers. 1992.

Montgomery County Department of Transportation , Division of Solid Waste Services, Montgomery County Solid Waste Management System, Methodology for Calculating Solid Waste Service Charges, July 1, 1995.

Moriarty, Patrick J., "Financing Waste Collection For Maximum Diversion," BioCycle, January 1994.

Morse, Dan, "Howard Seeks New Limits on Trash Pick-ups", The Baltimore Sun, January 30, 1996.

National Conference of State Legislatures (NCSL), "Municipal Solid Waste Management Unit Pricing," NCSL Assembly on Federal Issues, July 18, 1995.

Ontario, Canada User Pay Committee, "AMRC User Program Implementation Kit," November 1993.

Pennsylvania Joint Legislative Air and Water Pollution Control and Conservation Committee, "An Assessment of Unit Pricing For Municipal Solid Waste," by Tony M. Guerrieri, Research Analyst, September 1994.

Skumatz, Lisa A., "Continued Growth for Variable Rates," BioCycle, November 1995.

..., "Garbage by the Pound: On the Streets!," Reason Foundation Policy Study 184, January 1995.

..., "How Can Low Income Programs Work? Addressing Special Populations under Variable Rate Systems," SERA Research Report Series 9508-1, August 1995.

..., "Illegal Dumping: Incidence, Drivers, and Strategies," SERA Research Report 9431-1, November 1994.

..., "Introducing the Hybrid Variable Rate System," BioCycle, November 1993.



- ..., "Model Variable Rates Legislation: Elements, Options, and Considerations in State Legislation in Solid Waste", SERA Research Report Series 9599-1 October 1995.
- ..., "The Buck is Mightier than the Can," BioCycle, January 1990.
- ..., "Variable Rates for Municipal Solid Waste: Implementation Experience, Economics and Legislation," Reason Foundation Policy Study 160; June 1993.
- ..., "Weight Based Faces an Uplifting Future," World Wastes, November 1995.
- ... and Philip Zach, "Community Adoption of Variable Rates: An Update," Resource Recycling, June 1993.
- ... and Philip Zach, "Variable Rate Initiatives at the State Level," BioCycle, December 1992.
- Striano, Elizabeth, "Maryland County's Trash Fee Limits Collection, Could Help Recycling," Waste Age, May 1996.
- Trotti, John, "Pay as You Throw...Texas Style," MSW Management, January/February 1994.
- U. S. Environmental Protection Agency, "Unit Pricing: Providing an Incentive to Reduce Municipal Solid Waste," EPA, Washington, D.C., February 1991.
- ..., "Waste Management Practices, 1960-2000," Municipal Solid Waste Factbook, Version 2.0, May 24, 1995, Washington, D.C.
- Word, Joe D., Katherine Higginbotham, and David R. Pluenneke, "Pay as you Throw - Variable Rate System Works in Texas," BioCycle, July 1992.



**1994 Survey of State Policy or Legislation  
That Encourages Variable Rate User Fee Systems**

State	Detail of Policy or Legislation Proposed/Enacted
California	Assembly Bill 939 requires that variable rates be considered as part of the Source Reduction Recycling Element process.
Connecticut	1993 proposal to waive a \$.40 per ton surcharge for communities using variable rates died in committee.
Hawaii	Bill under consideration in legislature.
Illinois	Legislature passed a requirement that all communities over 5,000 population investigate variable rate pricing; governor vetoed and asked that the Department of Energy and Natural Resources provide technical support to communities considering variable rate pricing.
Indiana	Department of Environmental Management is studying the viability of existing variable rate programs in Indiana to help establish State-supported solid waste management options in the future.
Iowa	State encourages jurisdictions to establish mandatory curbside recycling with waste diversion goals of 25 percent by 1994 and 50 percent by the year 2000.
Maine	State identifies variable rate schemes in State plans as an effective tool to reduce waste (i.e., the strategy of variable rates is encouraged by the State.
Massachusetts	No specific legislation, but the Department of Environmental Protection encourages communities to use variable rates.
Michigan	A "white paper" by Department of Natural Resources staff was written in support of legislative mandates and is being reviewed by the Natural Resources Committee.
Minnesota	A licensing system enacted in 1993 requires jurisdictions to charge for refuse on a volume or weight basis; in 1994, a new requirement was added that a service level be available for a community's average small quantity generator - 30 gallon range.
Mississippi	Proposals have been made but have not left committee.
New Hampshire	State legislation confirms that variable rate pricing is legal.
New Mexico	State advisory materials point out that variable rate systems provide waste reduction incentives but create some fiscal risk.

**1994 Survey of State Policy or Legislation  
That Encourages Variable Rate User Fee Systems**  
(continued)

State	Detail of Policy or Legislation Proposed/Enacted
New Jersey	Many communities have variable rate systems through either a contract arrangement with local haulers with extra charges applying beyond the base rate or a direct agreement between customers and "scavengers."
North Carolina	State tries to encourage variable rates, but there is no formal statutory encouragement.
Ohio	Ohio Environmental Protection Agency has encouraged examination of variable rate pricing as part of comprehensive waste planning.
Oregon	State Bill 66 (1991 Recycling Act) requires cities to adopt strategies from a list of eight basic options; larger cities must adopt additional options. One option is "directly proportional" variable rates, where collection of an additional container costs the same or more than the first container.
Pennsylvania	Mandatory recycling law.
South Dakota	State does not address variable rates, but prohibits landfilling of certain materials. This prohibition encourages jurisdictions to aggressively pursue recycling options.
Vermont	Encouraged in the State solid waste plan to be used as a guidance document for solid waste districts.
Washington	1989 legislation covers recycling and trash haulers that are regulated by the Washington State Utilities and Transportation Commission; mandates fee structure that encourages recycling and discourages disposal (higher fees must be charged for second container).
West Virginia	Cities larger than 10,000 population are required to provide recycling service.
Wisconsin	Act 335 (1989) required communities to achieve 25 percent diversion or implement variable rates by 1995; law was modified to extend deadline to 1997; methods for measuring the required 25 percent diversion rate are under consideration.

Source: 1994 Survey of Variable User Fee Systems by Skumatz Economic Research Associates; and OLO

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## Communities in Iowa with Unit-Based Pricing by Population

Municipality	County	Population	Households
Ottosen	Humboldt	71	28
Scarville	Winnebago	92	60
Martinsburg	Keokuk	156	54
Mitchell	Mitchell	170	75
Millersburg	Iowa	188	90
Stout	Grundy	192	71
Olds	Henry	205	94
South English	Keokuk	224	95
Woodburn	Clarke	240	100
Keswick	Keokuk	286	110
Kensett	Worth	298	130
Holland	Grundy	300	95
Ionia	Chickasaw	304	120
Deep River	Poweshiek	345	120
Marble Rock	Floyd	361	134
Nichols	Muscatine	375	118
Calamus	Clinton	379	165
Bennett	Cedar	395	175
Floyd	Floyd	400	139
Delta	Keokuk	409	154
Rudd	Floyd	429	156
Livermore	Humboldt	436	253
Tiffin	Johnson	460	220
Alburnett	Linn	468	123
Stacyville	Mitchell	481	190
Palo	Linn	514	225
Ely	Linn	517	195
Russell	Lucas	531	260
Burt	Kossuth	575	240
University Park	Mahaska	598	178
Agency	Wapello	616	275
Hills	Johnson	662	228
What Cheer	Keokuk	762	350
Colo	Story	771	320
Fairfax	Linn	783	273
Riverside	Washington	824	332
Rockford	Floyd	863	400
Dike	Grundy	875	345
Robins	Linn	875	292
Clarence	Cedar	936	370
North English	Iowa	944	397

## Communities in Iowa with Unit-Based Pricing by Population

Municipality	County	Population	Households
Lone Tree	Johnson	979	402
Keota	Keokuk	1000	445
Keosauqua	Van Buren	1020	433
Solon	Johnson	1050	400
St Ansgar	Mitchell	1063	425
Wellman	Washington	1155	450
Lake View	Sac	1303	586
Prairie City	Jasper	1366	464
Brooklyn	Poweshiek	1439	580
Lisbon	Linn	1454	528
Nashua	Chickasaw	1476	700
Nora Springs	Floyd	1505	510
Montezuma	Poweshiek	1651	636
Center Point	Linn	1693	604
Corning	Adams	1806	712
Kalona	Washington	1942	750
West Branch	Cedar	2008	506
Sumner	Bremer	2078	840
Sigourney	Keokuk	2111	950
Lake Mills	Winnebago	2143	973
Williamsburg	Iowa	2174	875
Grundy Center	Grundy	2491	946
Sac City	Sac	2516	1100
Rock Rapids	Lyon	2601	1100
North Liberty	Johnson	2948	1128
Osage	Mitchell	3439	1481
Monticello	Jones	3522	1470
Mount Vernon	Linn	3657	997
Camanche	Clinton	4436	1700
De Witt	Clinton	4514	1821
Hiawatha	Linn	5307	1500
Maquoketa	Jackson	6130	2568
Charles City	Floyd	7878	3100
Webster City	Hamilton	7894	3390
Mount Pleasant	Henry	8027	3000
Waverly	Bremer	8500	2700
Coralville	Johnson	11998	2800
Newton	Jasper	14789	6435
Ottumwa	Wapello	25000	9100
Mason City	Cerro Gordo	29040	11000
Clinton	Clinton	29200	11000

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Agency	1992	Residents set out one 30 gallon can/wk. at no direct charge; additional cans or bags must bear tag purchased at City Hall. Tags are good for one use (\$1.00); 3 months (\$11.50); 6 months (\$20.00); or 12 months (\$38.00). Volume limit is 30 gal/container.	\$10.25	\$1.00/tag \$11.50/sticker \$20.00/sticker \$38.00/sticker	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	neutral	mailing
Alburnett	1993	Residents set out one 40 lbs container/week at no direct charge; additional bags are purchased at grocery store. Volume limit is 33 gallons or 40 lbs/container.	\$9.00	\$1.00/bag	refuse and recycling collection only	favorable	public service announcement, notice in utility bill
Bennett	1991	Residents purchase one of three options at City Hall or grocery store: \$.85 sticker for 13 gallon bag up to 15 lbs, \$1.40 sticker for 30 gallon bag up to 30 lbs, \$1.75 tag for 30 gallon can up to 45 lbs.	\$7.50	\$.85/sticker \$1.40/sticker \$1.75/tag	refuse collection and disposal only	favorable	newspaper, public service announcement
Brooklyn	1993	Residents purchase bags bearing haulers name at the grocery store or City Hall. Bags come in rolls of ten: ten 13 gallon bags for \$10.00, ten 30 gallon bags for \$15.00.	none	\$1.00/bag \$1.50/bag	refuse collection and disposal only	very favorable	newspaper, notice in utility bill
Burt	1991	Residents purchase tags at City Hall. Volume limit is 30 gallons or 75 lbs/container.	\$4.00	\$.50/tag	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	favorable	mailing, newspaper, notice in utility bill
Calamus	1991	Residents purchase bags at convenience store. Volume limit is 55 lbs/bag.	none	\$2.00/bag	refuse collection only	favorable	notice in utility bill
Camanche	1992	Residents purchase stickers at City Hall, grocery stores, or convenience stores. Volume limit is 40 lbs/container.	none	\$2.00/sticker	refuse and recycling collection only	very favorable	mailing, public service announcement, notice in utility bill

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Center Point	1993	Residents set out 1 bag or can/week at no direct charge; additional bags or cans must bear a tag purchased at grocery or convenience stores. Volume limit is 33 gallons or 40 lbs/bag or can.	\$8.00	\$1.00/tag	refuse and recycling collection only	favorable	no response
Charles City	1992	Residents purchase tags at grocery store, convenience store, or City Hall. Volume limit is 33 gallons or 70 lbs/container.	\$6.00	\$1.10/tag	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	very favorable	mailing, newspaper
Clarence	1991	Residents set out one bag or can/week at no direct charge; additional bags or cans must bear sticker purchased at grocery store or City Hall. \$.85 for 13 gal bag up to 15 lbs, \$1.40 for 30 gal bag up to 30 lbs, \$1.75 for 30 gal can up to 40 lbs.	\$9.79	\$.85/sticker \$1.40/sticker \$1.75/sticker	refuse collection and disposal only	somewhat unfavorable	newspaper
Clinton	1992	Residents purchase sticker at grocery or convenience stores. Volume limit is 40 lbs/container.	\$1.50	\$1.15/sticker	refuse and recycling collection only	favorable	newspaper, brochures
Colo	1993	Residents purchase bags at grocery store, City Hall, or hardware store. Volume limit is 40 lbs/bag.	\$7.00	\$1.00/bag	refuse collection and disposal only	somewhat favorable	mailing, newspaper
Coralville	1991	Residents purchase bags at grocery store, City Hall, or hardware store. Volume limit is 30 gallons or 40 lbs/bag.	\$7.08	\$.50/bag	refuse collection and disposal only	favorable	mailing, newspaper, public service announcement
Corning	1992	Residents set out one 30 gallon container/week at no direct charge; additional stickers are purchased at grocery store, convenience store or City Hall. Volume limit is 30 gallons/container.	\$7.50	\$1.00/sticker	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	somewhat unfavorable	mailing, newspaper



## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Deep River	1993	Residents purchase bags at grocery store. Volume limit is 33 gallons/bag.	none	\$1.50/bag	all solid waste management costs, including program administration and education	somewhat favorable	notice in utility bill
Delta	1993	Residents set out one 30 gallon bag or can/week at no direct charge; additional stickers are purchased at convenience store. Volume limit is 30 gallons/container.	\$8.00	\$1.25/sticker	refuse collection only	favorable	newspaper
De Witt	1992	Residents purchase stickers at grocery store or convenience store. Volume limit is 33 gallons or 50 lbs/bag.	\$4.00	\$1.50/sticker	refuse and recycling collection processing/marketing	very favorable	newspaper
Dike	1989	Residents set out one 40 gallon bag/week at no direct charge; additional bags are purchased at City Hall or library. Volume limit is 40 lbs/bag.	\$4.75	\$1.00/bag	refuse collection only	very favorable	mailing, notice in utility bill
Ely	1993	Residents purchase stickers at convenience store or City Hall. Volume limit is 33 gallons or 40 lbs/container.	\$7.00	\$1.00/sticker	refuse collection and disposal only	favorable	mailing
Fairfax	no response	Residents purchase tags at local stores and City Hall. Volume limit is 40 lbs/container.	\$8.00	\$1.00/tag	refuse collection and disposal only	favorable	no response
Floyd	1993	Residents purchase tags at grocery store or City Hall. Volume limit is 35 lbs/container.	none	\$1.10/tag	all solid waste management costs, including program administration and education	favorable	mailing, newspaper, notice in utility bill
Grundy Center	1989	Residents purchase bags at grocery store, drug store, City Hall, or hardware store. Volume limit is 40 lbs/bag.	\$5.50	\$1.00/bag	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	favorable	newspaper, public service announcement

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Hiawatha	1994	Residents set out one 30 gallon or 50 lbs container/week at no direct charge; additional tags are purchased at grocery store or convenience store. Volume limit is 33 gallons or 50 lbs/container.	varies by hauler	varies by hauler	all solid waste management costs, including program administration and education	no response	mailing, newspaper
Hills	1991	Residents purchase bags at clerks office. Volume limit is 30 gallons or 25 lbs/bag.	\$7.50	\$.50/bag	refuse and recycling collection only	favorable	notice in utility bill, public meeting
Holland	1991	Residents purchase stickers at local stores. No volume limit.	\$1.00	\$1.00/sticker	refuse collection and disposal only	favorable	newspaper, notice in utility bill
Ionia	1992	Residents purchase stickers at convenience store or bank. Stickers available for \$.85 and \$1.10. Volume limit is 30 gallons/container.	none	\$.85/sticker \$1.10/sticker	refuse collection and disposal only	favorable	mailing, public service announcement, notice in utility bill
Kalona	no response	Residents purchase stickers at grocery store. Volume limit is 20 gallons or 40 lbs/container.	none	\$.75/sticker	refuse collection and disposal only	somewhat favorable	mailing, newspaper, notice in utility bill
Kensett	no response	Residents have two options: they may pay a \$9.50 flat fee with no volume limit; or a \$4.50 flat fee, set out one 30 gallon bag/week at no direct charge, and purchase additional bags at City Hall.	\$4.50	\$1.25/bag	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	no response	mailing
Keosauqua	1992	Program was in place from Dec. 92 to Dec. 93. Residents set out one 30 gallon container/week; additional containers had to bear tag purchased at City Hall. Volume limit was 32 gallons/container.	\$9.00	\$2.00/tag	refuse and recycling collection only	very unfavorable	mailing, newspaper, public service announcement, notice in utility bill

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Keota	1993	Residents purchase bags at grocery store, convenience store, or City Hall. Bags are \$.75 for 13 gallons and \$1.25 for 30 gallons. Volume limit is 30 gallons/bag.	none	\$.75/bag \$1.25/bag	refuse collection and disposal only	favorable	mailing, newspaper
Keswick	1993	Residents set out one 30 gallon container/week at no direct charge; additional containers must bear a sticker purchased at city clerk's office or bank. Volume limit is 30 lbs/bag.	\$7.95	\$1.50/sticker	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	favorable	public service announcement
Lake Mills	1994	Residents set out one 33 gallon bag or can/week at no direct charge; additional bags are purchased at grocery store or City Hall. Volume limit is 33 gallons/container.	\$3.00	\$1.00/bag	refuse collection and disposal only	no response	newspaper, notice in utility bill
Lake View	1993	Residents purchase clear plastic bags marked with 'City of Lake View' at convenience store or City Hall. Volume limit is 20 gallons/bag.	\$8.00	\$.50/bag	cost of container and disposal only	somewhat favorable	mailing, newspaper, notice in utility bill
Lisbon	1992	Residents purchase tags at grocery store, convenience store, or City Hall. Volume limit is 33 gallons or 40 lbs/container.	\$7.00	\$1.75/tag	refuse collection and disposal only	favorable	newspaper, public service announcement
Livermore	1991	Residents put out one container/week at no direct charge; additional bags are purchased at City Hall. Volume limit is 30 gallons/bag.	\$6.50	\$.20/bag	refuse collection only	favorable	mailing, notice in utility bill
Lone Tree	1991	Residents purchase tags at City Hall or restaurant. One tag for each can or bag 20 gallons or less, two tags for each can or bag larger than 20 gallons. Volume limit is 50 lbs/container.	\$4.00	\$.75/tag	refuse collection and disposal only	favorable	mailing, newspaper, public service announcement
Maquoketa	no response	Residents set out 2 bags/week at no direct charge; additional bags must bear tag purchased at grocery or convenience store. Volume limit is 35 gallons/bag.	no response	no response	no response	no response	no response

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Marble Rock	1993	Residents purchase stickers at convenience store or City Hall. Volume limit is 70 lbs/bag.	\$6.50	\$1.10/sticker	refuse collection only	favorable	notice in utility bill
Martinsburg	1993	Residents set out one 30 gallon bag or can/week at no direct charge; additional bags purchased from council members. Volume limit is 30 gallons/bag.	\$8.35	\$1.50/bag	refuse and recycling collection only	somewhat unfavorable	no response
Mason City	1993	Residents set out one 30 gallon or 50 lbs container/week at no direct charge; additional containers must bear a tag purchased at grocery store or City Hall. Volume limit is 30 gallons for bags, 32 gallons for cans, or 50 lbs.	\$5.50	\$1.00/tag	refuse collection and disposal only	favorable	mailing, newspaper, public service announcement, hand distributed brochures
Millersburg	1992	Residents purchase bags at grocery store. \$1.25 for 30 gallon bag, \$.75 for 13 gallon bag. Volume limit is 30 gallons/bag.	\$7.00	\$.75/bag \$1.25/bag	refuse collection only	favorable	notice in utility bill, public meetings
Mitchell	1992	Residents purchase tags at grocery store.	\$6.60	\$1.20/tag	refuse collection only	favorable	mailing, newspaper, public service announcement
Montezuma	1994	Residents purchase bags at grocery store or city hall. \$1.00 for 15 gallon bag, \$1.50 for 30 gallon bag. Volume limit is 30 gallons/bag.	none	\$1.00/bag \$1.50/bag	refuse collection and disposal only	favorable	newspaper, notice in utility bill, public meetings
Monticello	1991	Residents purchase clear bags marked with 'City of Monticello' at grocery and dime stores. Bags are \$.50 or \$.75.	\$6.00	\$.50/bag \$.75/bag	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	somewhat favorable	newspaper
Mount Pleasant	1990	Residents purchase tags at grocery, hardware, and convenience stores. Volume limit is 33 gallons/bag or 75 lbs/bag.	\$3.00	\$1.00/tag	refuse collection and disposal only	favorable	mailing, newspaper, public service announcement

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Mount Vernon	1991	Residents purchase tags at local stores or City Hall. Volume limit is 40 lbs/container.	\$7.00	\$1.75/tag	refuse and recycling collection processing/marketing	somewhat favorable	mailing, newspaper, public service announcement
Nashua	1992	Residents purchase tags at grocery store. Volume limit is 33 gallons/bag.	none	\$1.20/tag	refuse collection and disposal only	favorable	no response
Newton	1994	Residents set out one bag or can/week with cost covered through property taxes; additional containers must bear a tag purchased at grocery store. Volume limit is 35 gallons or 65 lbs/container.	none	\$1.00/tag	refuse collection only	no response	mailing, newspaper, public service announcements, presentations to community groups
Nichols	1992	Residents set out one 30 gallon bag/week at no direct cost; additional bags are purchased at treasurer's office.	\$8.00	\$1.10/bag	refuse and recycling collection only	neutral	mailing, notice in utility bill
Nora Springs	1992	Residents purchase tags at convenience store. Volume limit is 40 gallons or 70 lbs/bag.	\$6.25	\$1.00/tag	refuse collection only	favorable	newspaper, hand distributed brochures
North English	1993	Residents purchase 30 gallon (\$1.25) or 13 gallon (\$.75) bags at grocery stores.	\$8.00	\$.75/bag \$1.25/bag	refuse and recycling collection processing/marketing	favorable	newspaper, public service announcement
North Liberty	1992	Residents purchase stickers at grocery store, convenience store, or City Hall. \$1.00 sticker for 20 gallons, \$2.00 sticker for up to 33 gallons. Volume limit is 33 gallons or 40 lbs/bag.	none	\$1.00/sticker \$2.00/sticker	refuse collection only	somewhat favorable	newspaper, notice at bin pick-up
Olds	1992	Residents purchase bags at local contractors office, \$.75 for 13 gallon bag, \$1.25 for 30 gallon bag. Volume limit is 30 gallons/bag.	none	\$.75/bag \$1.25/bag	refuse collection and disposal only	very favorable	mailing, public service announcement, notice in utility bill, town meeting

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Osage	1992	Residents purchase tags at grocery store or municipal utility office. Volume limit is 40 gallons or 75 lbs/container.	\$7.40	\$1.20/tag	refuse collection only	favorable	mailing, newspaper
Ottosen	1991	Residents set out one 30 gallon bag/week at no direct charge; additional bags are purchased at grocery store. Volume limit is 40 lbs/bag.	\$7.00	\$2.00/bag	refuse and recycling collection only	favorable	mailing, public service announcement
Ottumwa	1992	Residents set out one 30 gallon bag or can/week at no direct cost; additional bags must bear a tag. Three month sticker (\$11.50), 6 month sticker (\$20.00), 12 month sticker (\$38.00).	\$9.00	\$1.00/tag \$11.50/sticker \$20.00/sticker \$38.00/sticker	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	favorable	mailing, newspaper, public service announcement, handbook
Palo	1993	Residents set out one 40 lbs container/week at no direct cost; additional bags must bear a tag purchased at City Hall. Volume limit is 40 lbs/container.	\$8.00	\$1.00/tag	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	favorable	mailing, newspaper, notice in utility bill
Prairie City	1991	Residents set out one 30 gallon or 50 lbs bag/week; additional containers must bear a tag purchased at hardware store, grocery store, newspaper office, bank, or City Hall. Volume limit is 33 gallons or 50 lbs/container.	\$6.75	\$1.00/tag	refuse and recycling collection processing/marketing	somewhat unfavorable	newspaper, notice in utility bill
Riverside	1993	Residents purchase bags at grocery store: \$1.00 for 20 gallon bag and \$1.25 for 30 gallon bag. Volume limit is 30 gallons/bag.	\$3.00	\$1.00/bag \$1.25/bag	refuse collection and disposal only	very favorable	mailing, newspaper, notice in utility bill
Robins	1993	Residents set out one 40 lbs bag/week at no direct charge; additional bags must bear tag purchased at City Hall. Volume limit is 40 lbs/container.	varies by hauler	\$1.00/tag	refuse collection and disposal only	somewhat favorable	mailing, public service announcement, brochure

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Rock Rapids	1992	Residents set out one 32 gallon container/week at no direct charge; additional containers must bear a sticker purchased from hauler. Volume limit is 32 gallons/container.	\$6.50	\$1.00/sticker	refuse and recycling collection only	favorable	mailing, newspaper, notice in utility bill
Rockford	1992	Residents purchase tags at grocery store, convenience store, or City Hall. Volume limit is 75 lbs/container.	\$7.60	\$1.20/tag	refuse and recycling collection processing/marketing	neutral	newspaper, notice in utility bill
Rudd	1992	Residents purchase tags at convenience store or City Hall. Volume limit is 70 lbs/bag.	\$5.25	\$1.10/tag	both flat fee and unit cost are pooled to cover all solid waste management costs, including program administration and education	favorable	newspaper, notice in utility bill
Russell	1994	Residents pay \$6.00/month for one 30 gallon (30 lbs) bag/month or \$9.00/month for two 30 gallon (30 lbs) bags/month or \$11.00/month for two 30 gallon (30 lbs) bags/week.	none	no response	no response	somewhat unfavorable	notice in utility bill
Sac City	1993	Residents purchase tags at City Hall. Volume limit is 30 gallons or 50 lbs/container.	\$11.00	\$.30/tag	disposal only	favorable	mailing, newspaper, notice in utility bill
Saint Ansgar	1992	Residents purchase stickers at grocery store and convenience store. Volume limit is 40 gallons/bag.	\$6.75	\$1.20/sticker	refuse collection and disposal only	somewhat favorable	newspaper
Scarville	1992	Residents purchase bags at City Hall. Volume limit is 30 lbs/bag.	none	\$1.40/bag	refuse collection only	no response	public service announcement
Sigourney	1992	Residents purchase tags at grocery store, hardware store, or drug store. Volume limit is 33 gallons/container.	\$4.00	\$1.00/tag	refuse collection and disposal only	somewhat favorable	newspaper
Solon	1990	Residents purchase tags at convenience store or City Hall. One tag for containers 20 gallons or less, two tags for containers larger than 20 gallons. Volume limit is 40 lbs/container.	none	\$1.00/tag	refuse and recycling collection only	somewhat favorable	newspaper, notice in utility bill

## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
South English	1993	Residents purchase bags at grocery store or restaurant/tavern. \$.75 for 20 gallon bag, \$1.00 for 33 gallon bag. Volume limit is 33 gallons/bag.	\$4.00	\$.75/bag \$1.00/bag	refuse collection and disposal only	very favorable	newspaper, public service announcements, posters, public meetings, personal meetings with elderly
Stacyville	1993	Residents purchase tags at grocery store or convenience store. Volume limit is 33 gallons/bag.	\$7.00	\$1.25/tag	refuse collection and disposal only	favorable	mailing, newspaper
Stout	no response	Volume limit is 40 lbs/container.	\$5.00	\$.60/tag	refuse collection only	neutral	no response
Sumner	1994	Residents set out one 35 gallon container/week at no direct charge; additional containers must bear a sticker purchased at grocery store, City Hall, or hardware store. Volume limit is 35 gallons/container.	\$10.00	\$1.00/sticker	refuse collection and disposal only	no response	mailing, newspaper
Tiffin	1990	Residents purchase stickers at convenience stores. Volume limit of 33 gallons or 40 lbs/container.	none	\$1.00/sticker	refuse collection and disposal only	unfavorable	mailing, newspaper, notice in utility bill
University Park	1993	Residents purchase tags at convenience store. Volume limit is 33 gallons or 70 lbs/bag.	none	\$1.25/tag	refuse collection and disposal only	somewhat favorable	mailing, newspaper, public service announcement
Waverly	1992	Residents purchase stickers at grocery stores, convenience stores, hardware stores, pharmacy, card shop, or City Hall. Volume limit is 33 gallons or 50 lbs/container.	\$5.75	\$1.25/sticker	refuse collection only	somewhat favorable	mailing, newspaper, public service announcement, town meetings



## Quick Reference Guide of Communities in Iowa with Unit-Based Pricing

Municipality	Start Date	System	Flat Fee	Unit Cost	Unit Cost Covers	Level of Satisfaction	Promotion
Webster City	1991	Residents purchase bags at grocery store. Volume limit is 30 gallons/bag.	none	\$.90/bag	refuse collection only	favorable	mailing, newspaper, public service announcement, notice in utility bill
Wellman	1992	Residents purchase bags at grocery store or City Hall. \$.75 for 13 gallon bag, \$1.25 for 30 gallon bag. Volume limit is 30 gallons/bag.	none	\$.75/bag \$1.25/bag	refuse collection and disposal only	very favorable	mailing, newspaper, notice in utility bill
West Branch	1990	Residents purchase tags at grocery store. \$.85 for 13 gallon bag, \$1.40 for 30 gallon bag, \$1.75 for 45 lbs/can. Volume limit is 45 lbs/can or 30 gallon/bag.	none	\$.85/tag \$1.40/tag \$1.75/tag	refuse collection and disposal only	very favorable	mailing, newspaper, notice in utility bill
What Cheer	1993	Residents set out one 30 gallon bag/week at no direct charge; additional bags must bear a tag purchased at City Hall. Volume limit is 33 gallons/bag.	\$8.00	\$1.25/tag	refuse and recycling collection processing/marketing	somewhat favorable	mailing, newspaper, notice in utility bill
Williamsburg	no response	Residents purchase bags at grocery store, convenience store, or City Hall. \$7.50 for ten 13 gallon bags, \$12.50 for ten 33 gallon bags. Volume limit is 33 gallons/bag.	none	\$.75/bag \$1.25/bag	all solid waste management costs, including program administration and education	favorable	mailing, newspaper, notice in utility bill
Woodburn	1984	Residents purchase tags at City Hall. Volume limit is 30 gallons/container.	none	\$1.25/tag	refuse collection and disposal only	very favorable	no response



# Volume-based garbage collection fees: an analysis of 10 Illinois programs

by Jeanne Becker  
and Marilyn Browning

Jeanne Becker is the president of Becker Associates, Inc., a solid waste planning firm located in Deerfield, Illinois. The firm assists local, county and regional governments with the development and implementation of responsible solutions for solid waste management. Marilyn Browning is a geologist with Becker Associates.

**Communities using a volume-based garbage collection fee system have higher recycling rates than communities using a flat-fee structure.**

Volume-based garbage collection fees are used by some Illinois communities as a means to encourage waste reduction and help achieve recycling goals established by recent state legislation. The pay-by-the-bag system charges residents according to the amount of garbage placed at the curb rather than on a flat fee basis.

Residents are required to purchase specially marked bags or stickers for all residential garbage. The bag or sticker fee covers the cost of collection, hauling and disposal; it also covers the cost of a recycling collection program, which is offered at no additional charge. The system provides an economic incentive to encourage waste reduction and recycling while decreasing the amount of garbage collected and disposed.

## Research methodology

The authors identified 11 Illinois municipalities that had implemented this fee system. Telephone interviews were conducted in late 1990 with 10 of the communities located in four counties.

The survey asked questions about the administration of the program, fees charged per container, and recycling and waste reduction results. It also asked respondents to rate several problems that are sometimes associated with volume-based fees. Survey results and the experience of these municipal forerunners can be used by communities considering such a program.

Survey information was collected from persons in charge of recycling or waste collection programs in each community. The respondent was usually a staff person or the area's hauler. (For a look at a fee-based system in yet another Illinois community, see "Volume-based collection fees: a success story," also in this issue.)

## Program organization

Table 1 summarizes basic information about the 10 programs. The oldest program, in Woodstock, has been in opera-

tion nearly three years. Eight of the programs have started within the last year. The number of households served by each program ranges from 2,000 to 12,500. In all cases, one or more private haulers are responsible for refuse and yard waste collection and recycling. Municipalities are not involved in collection.

## Cost and distribution of bags/stickers

The six programs in McHenry, Kane and Whiteside counties sell specially marked bags, ranging in price from \$1.01 to \$1.40 each. In two communities, yard waste bags are sold at a lower price (\$0.80 each in Harvard and \$0.95 in Algonquin). The Sterling and Rock Falls program also sells stickers for bulky items, bundles of brush and other materials not suitable for placement in bags.

The four municipalities in DuPage County sell stickers only. Survey respondents said that stickers allowed homeowners to use their own containers, offered flexibility and were easier to distribute than bags. The average sticker price for these four programs is \$1.20, slightly less than the average bag price of \$1.28; however, under the sticker program, residents must purchase their own bags or containers.

Typically, a sticker is used on a 33-gallon bag. In Wheaton, 90-gallon carts need three stickers. In Downers Grove, three stickers are required for back door collection of a 33-gallon bag. In Wheaton, which has eight haulers licensed to collect bulky items, stickers indicate the hauler responsible for collection.

Eight of the 10 programs expect an increase in price within the next year, ranging from a few cents to 20 cents per bag. At least five communities have included cost increase provisions in their hauling contracts. In Lisle, McHenry and Wheaton, the cost increase is tied to increases in landfill tipping fees. Sterling and Rock Falls project a decrease in their

■ Table 1 — Volume-based garbage collection data

Municipality	County	Date program started	Households served	Pounds collected per month for recycling	Pounds recycled per household	Direct charge for garbage			Rate increase anticipated
						Bag	Sticker	Yard waste	
Algonquin	McHenry	July 1990	4,200	244,000	58	\$1.35		\$0.95	Annual increase per contract
Darien	DuPage	July 1990	4,500	212,000	47		\$1.30	\$1.30	No increase
Downers Grove	DuPage	May 1990	12,500	700,000	56		\$1.25	\$1.25	Small increase
Harvard	McHenry	April 1989	2,000	56,000	28	\$1.25		\$0.80	Small increase
Lisle	DuPage	May 1990	4,282	220,000	51		\$1.30	\$1.30	Possible increase
McHenry	McHenry	April 1990	4,800	180,000	38	\$1.35			Yes, based on tipping fees
St. Charles	Kane	Oct. 1989	8,020	300,000	37	\$1.01		\$1.01	\$0.03 per bag increase annually
Sterling & Rock Falls	Whiteside	July 1990	8,450	131,000	16	\$1.40	\$1.40	\$1.40	No increase
Wheaton	DuPage	July 1990	12,500	548,900	44		\$0.94	\$0.97	Annual increase per contract
Woodstock	McHenry	Jan. 1988	4,500	117,000	26	\$1.35			\$0.10-0.20 per increase

bag price; these two municipalities currently have the highest bag price of the 10 communities surveyed.

The distribution of bags and stickers can sometimes be a problem. All 10 com-

munities distribute bags and/or stickers at area stores and retail establishments. Seven also sell them at the village or city hall. In three municipalities, the hauler is involved in distribution. The bags or stick-

ers are usually sold in groups of five to 10.

In some communities, such as Algonquin and St. Charles, store owners are not reimbursed for costs associated with the distribution of bags or stickers. The

store is felt to benefit due to increased patron traffic. However, without any economic incentive, some haulers report problems. Algonquin's hauler reported that some stores are slow to pay the hauler for bags that have been sold. The hauler provides the bags to the store at no charge; the store reimburses the hauler only for those bags sold. The Algonquin respondent emphasized, however, that the advantage of retail distribution is that it reduces the hauler's bookkeeping and fee collection costs.

To help cover costs associated with distribution, Lisle allows stores to keep 3 percent of the revenue from the sale of stickers. Of the \$1.30 sticker price, \$1.26 goes to the hauler and the remaining \$0.04 goes to the retail establishment. The Lisle respondent said that this has increased cooperation among the city, the hauler and the retail establishments.

Sterling and Rock Falls, in Whiteside County, use a slightly different method of distribution. In Rock Falls, \$9.75 is added to each household's monthly sewer bill for refuse collection and recycling. The resident receives five coupons to be redeemed at local stores for five refuse

bags. Additional bags can be purchased for \$1.40. Coupons can be cashed in if they are not used. The five coupons (at \$1.40) are worth \$7.00. The additional \$2.75 covers the cost of curbside recy-

cling and some fixed costs associated with refuse collection. A similar system is used in Sterling, although the \$2.75 fee is covered with general tax revenue rather than collected on residential sewer bills.

This system ensures adequate funds to operate the recycling program, reduces bookkeeping for retail establishments and provides stable cash flow.

#### Collection of recyclable materials

In all communities, there is no extra charge for collection of recyclables. The average tons collected per month by each program range from 28 to 350 tons. On a per household basis, pounds recovered per month range from 16 to 58. These figures are calculated according to total households served by the program; pounds of material recycled per participating household would be higher.

The lowest monthly recycling rate of 16 pounds is for Sterling and Rock Falls. This figure is comparable to a pilot program in Decatur that collected 16 pounds per month per household served. Lower recycling rates are typical outside of the Chicago metropolitan area because of reduced volumes of newspaper.

The nine communities in the metropolitan area with volume-based fees showed higher recycling rates than similar communities with flat rate fee structures. Recyclables collected per household aver-

aged 43 pounds per month. In contrast, in seven Will County curbside recycling collection programs with no volume-based fees, recyclables averaged 32 pounds per month per household.

Increased waste reduction is more difficult to measure than increased recycling. Some communities reported significant decreases in garbage collected: Downers Grove reported 50 percent reduction;

Lisle reported 60 percent during the first month. Downers Grove reported an 85 percent reduction in yard waste collected. According to the Illinois Office of Technology Transfer, Woodstock's program resulted in a 15 percent decrease in solid waste, from 1.53 bags per household per week in 1988 to 1.3 bags in 1989. In most communities, this information was not available because accurate records had not been kept concerning waste volumes

collected before implementation of the program.

#### Public information

All 10 communities implemented some form of public education concerning the new fee system. Brochures or flyers to explain the new program were distributed in eight municipalities. Education programs in the schools were mentioned by five and inclusion of information in the vil-

lage newsletter was mentioned by three. Algonquin and Harvard held public meetings to explain the new system, Downers Grove prepared an educational video and Lisle formed a citizen's committee. In about half of the programs, specific recommendations for household waste reduction (such as purchasing durable rather than throwaway products) were included. Other programs only stressed the importance of recycling as a way to control the number of bags used by a household.

#### Evaluation of problems

Each respondent was asked to evaluate his or her program in terms of five issues sometimes associated with volume-based collection fees. The respondents rated problems on a scale of 1 to 5, with "1" indicating definitely not a problem and "5" indicating definitely a problem. A combined average score was then calculated for each problem. In order of importance, the problems are:

	Score on scale of one to five
Illegal dumping of waste in commercial and governmental dumpsters	2.90
Insufficient revenues to cover costs of collection	2.88
Illegal dumping of wastes along roadsides, ditches, etc.	2.39
Uneven cash flow due to uneven purchase of bags and/or stickers	2.29
Excessive compaction of waste in individual bags.	1.89

In no case is the average score higher than a "3". This suggests that none of these problems could be characterized as a major deterrent to implementation of a volume-based fee system. However, individual communities, particularly the older programs in Woodstock, Harvard and McHenry, ranked these issues much higher than newer programs in the other three counties. The probable explanation is that the McHenry County communities were pioneers and had to "learn lessons the hard way." DuPage County communities learned from the mistakes of McHenry County municipalities and made adjustments in their programs.

#### Addressing the problems

Several of the issues listed above are best addressed by an ongoing public education program. If residents understand the purpose of the volume-based fee system,

they are most likely to cooperate and comply with the regulations. Introduction of volume-based fees should be accompanied by easy no-cost access to recycling opportunities and comprehensive information on waste reduction in the home. Other ways to mitigate these five potential problems are discussed below.

**Illegal dumping in available dumpsters.** Rather than purchase bags, at a price some residents may perceive as unfair, waste generators choose to place their garbage in dumpsters at local parks, grocery stores and office buildings. This problem can be controlled by installing lids and locks on waste storage bins or by placing dumpsters in areas not accessible to the public.

**Inadequate revenues.** This problem is associated with the fixed costs of collection, including labor and equipment. The more successful a program is at attaining waste reduction, the less revenue there is to cover the costs of collecting the remaining waste. One way to address this issue is to charge all households a minimal fee to cover the cost of collecting one weekly bag of garbage and providing the recycling program. For example, Sterling and Rock Falls charge a basic household fee of \$2.75 per month.

**Roadside dumping.** This is a difficult problem to address. One suggestion is to increase police observation of roadside and popular dumping areas, particularly during the early months of the program. If bags of refuse are found, the address of the responsible party frequently appears in mail in the garbage. This can be used to trace and reprimand the party.

**Uneven cash flow.** Program cash flow is difficult to predict in volume-based programs. A monthly base fee, as described above, is one way to correct this problem.

**Excessive compaction.** While this a

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### **Recycling rates were higher in the communities with volume-based fees than similar communities with flat-rate fees.**

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minor problem overall, several communities report that some residents try to stuff too much in a bag in order to reduce the number of bags used. To control for this problem, Woodstock has set a 60-pound limit per bag, and Algonquin's bags are marked with a 50-pound limit. Enforcement is difficult; as with the other issues, public education is the most effective approach.

#### **Conclusions**

Volume-based garbage collection fees are implemented in order to achieve one or more of the following objectives:

■ Increase recycling

- Increase waste reduction activities
- Increase resident awareness of the solid waste problem
- Provide an equitable fee structure so that each household pays only for the amount of garbage it generates
- Reduce the amount of waste disposed.

The 10 programs surveyed for this study have achieved these objectives. Therefore, the authors conclude that volume-based fees are a success and should be considered by other communities.

A successful program includes the following elements:

- An ongoing public education program
- Easy access to no-cost recycling opportunities
- Distribution of waste reduction information
- A method for paying for the fixed costs associated with refuse collection and recycling
- A bag or sticker distribution network that is accessible to residents and that fairly reimburses distributors for their costs
- Methods for resolving potential illegal dumping problems
- Enforceable weight limits on bags and/or containers.

In summary, volume-based garbage collection fees have been used in Illinois for nearly three years. During that time, most operational problems have been solved. The general consensus among the 10 respondents to this survey is that this fee system works. The authors recommend that other communities consider this approach.

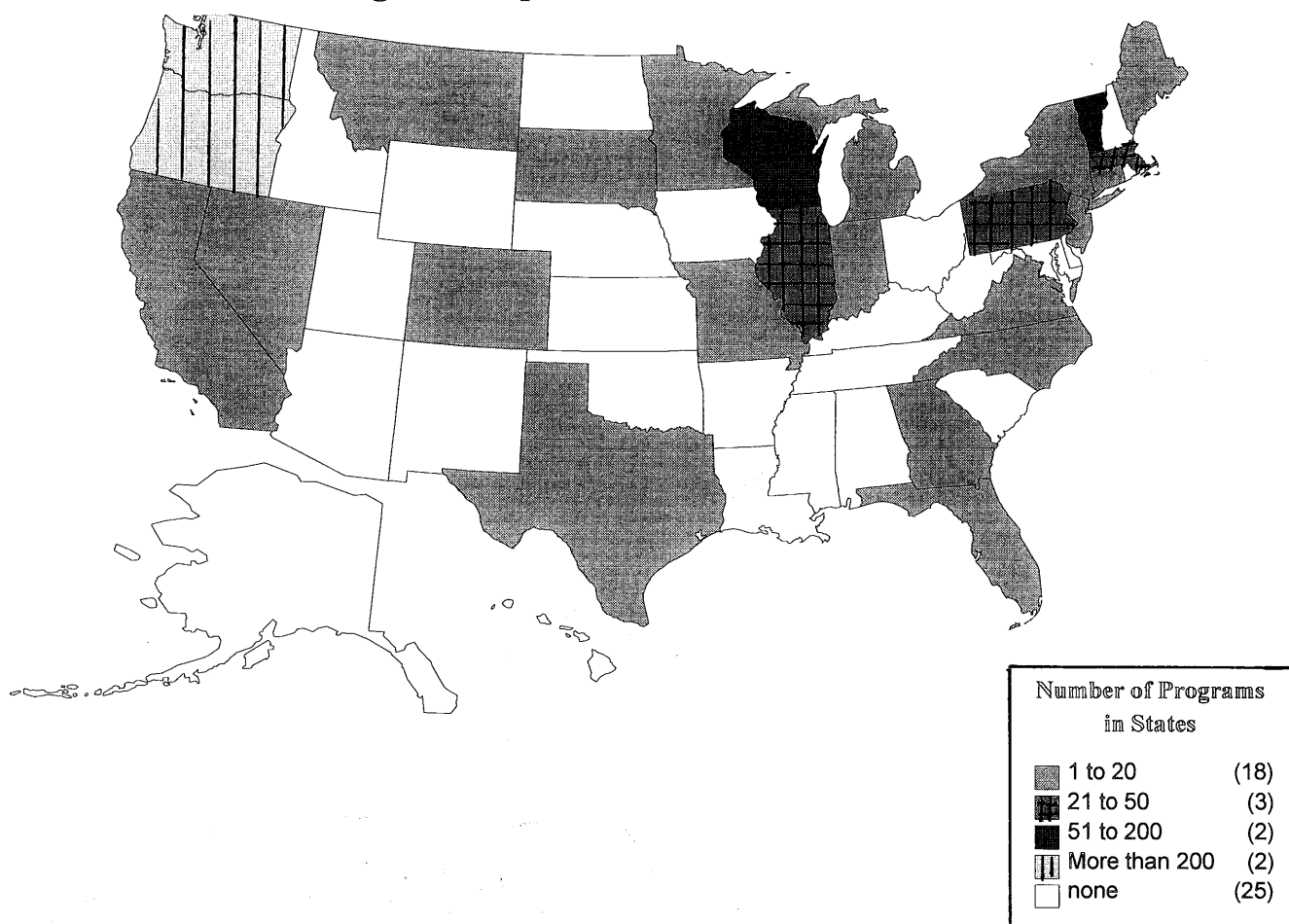
**RR**

## Variable Rate Programs Reported in 1993 Versus 1995

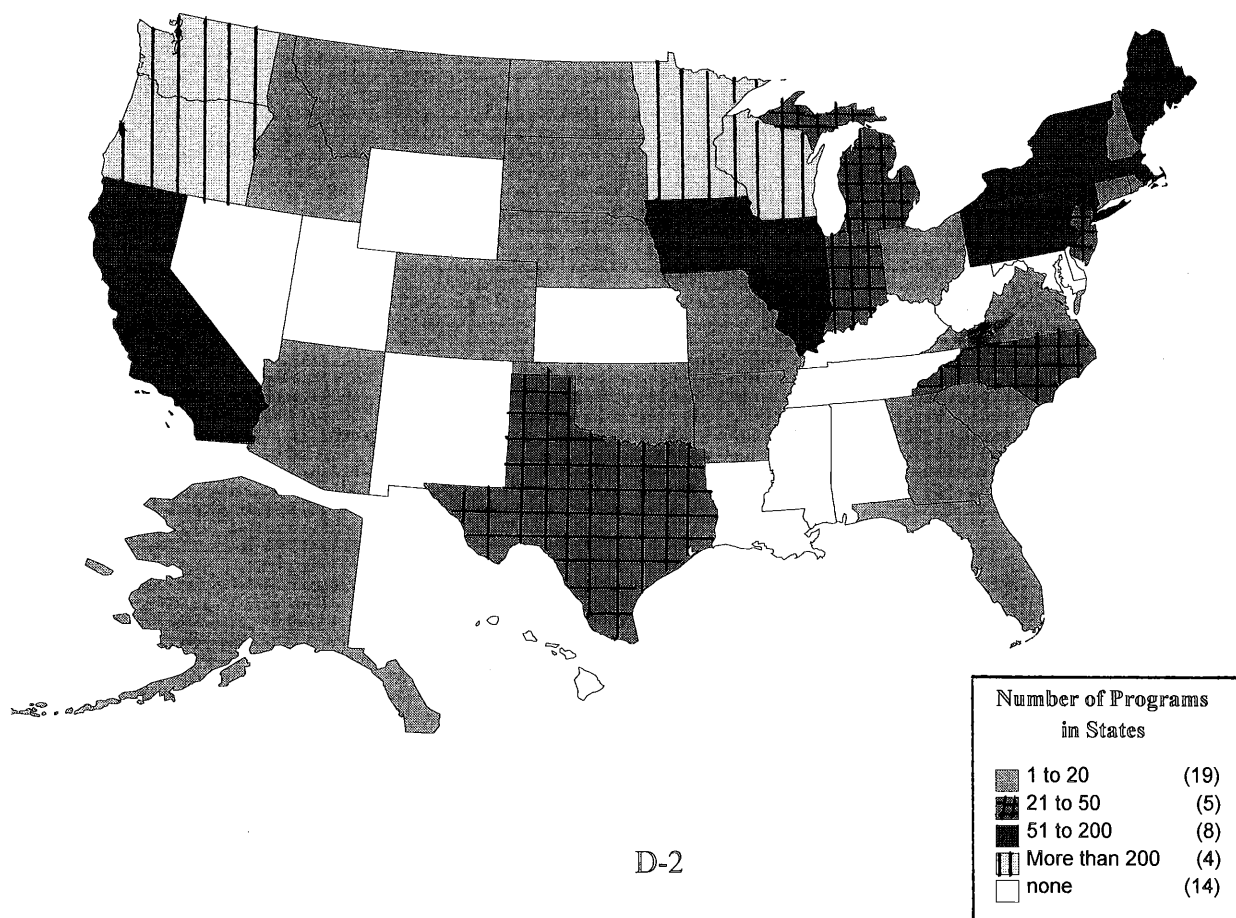
<u>State</u>	<u>Number of Programs Reported</u>		
	<u>In 1993</u>	<u>In 1995</u>	
Arizona	none	1 to 20	clear increase
Arkansas	none	1 to 20	clear increase
Alabama	none	none	clear increase
Alaska	none	1 to 20	clear increase
California	1 to 20	51 to 200	clear increase
Colorado	1 to 20	1 to 20	
Connecticut	1 to 20	1 to 20	
Delaware	none	none	
Florida	1 to 20	1 to 20	
Georgia	1 to 20	1 to 20	
Hawaii	none	none	
Idaho	none	1 to 20	
Illinois	21 to 50	51 to 200	clear increase
Indiana	1 to 20	21 to 50	clear increase
Iowa	none	51 to 200	clear increase
Kansas	none	none	
Kentucky	none	none	
Louisiana	none	none	
Maine	1 to 20	51 to 200	clear increase
Maryland	none	none	
Massachusetts	21 to 50	51 to 200	clear increase
Michigan	1 to 20	21 to 50	clear increase
Minnesota	1 to 20	More than 200	clear increase
Mississippi	none	none	
Missouri	1 to 20	1 to 20	
Montana	1 to 20	1 to 20	
Nebraska	none	1 to 20	clear increase
Nevada	1 to 20	none	
New Hampshire	none	1 to 20	clear increase
New Jersey	1 to 20	21 to 50	clear increase
New Mexico	none	none	
New York	1 to 20	51 to 200	clear increase
North Carolina	1 to 20	21 to 50	clear increase
North Dakota	none	1 to 20	clear increase
Ohio	none	1 to 20	clear increase
Oklahoma	none	1 to 20	clear increase
Oregon	More than 200	More than 200	
Pennsylvania	21 to 50	51 to 200	clear increase
Rhode Island	none	1 to 20	clear increase
South Carolina	none	1 to 20	clear increase
South Dakota	1 to 20	1 to 20	
Tennessee	none	none	
Texas	1 to 20	21 to 50	clear increase
Utah	none	none	
Vermont	51 to 200	51 to 200	
Virginia	1 to 20	1 to 20	
Washington	More than 200	More than 200	
West Virginia	none	none	
Wisconsin	51 to 200	More than 200	clear increase
Wyoming	none	none	

Sources: Synergic Resource Corporation, 1993 (as published in Resource Recycling magazine, June 1993), and 1995 SERA, Inc. survey (Skumatz Economic Research Associates, Seattle, Washington).

## Variable Rate Programs Reported in 1993



## Variable Rate Programs Reported in 1995





**ENVIRONMENTAL AND  
CONSERVATION SERVICES  
DEPARTMENT  
SOLID WASTE SERVICES**

**PAY-AS-YOU-THROW  
SIX MONTH PROGRESS REPORT TO  
THE AUSTIN CITY COUNCIL**

**FEBRUARY, 1992**

**Austan S. Librach  
Director, ECSD**

**Joe D. Word, P.E.  
Assistant Director**

## Executive Summary

This report presents the first six months of findings from a year long pilot program which may greatly change the way garbage is collected in Austin. Known as Pay-As-You-Throw, the program is designed to minimize waste sent to the landfill, maximize recycling, and promote worker safety. The new program reflects the City of Austin's Solid Waste Advisory Commission's recommendations.

The Pay-As-You-Throw program includes a variable rate garbage fee, integrated recycling and garbage collection, use of semi-automated garbage carts, separate weekly yard waste collection and quarterly brush and bulky item collections.

Key results from first six months include:

- o Increased participation in the City's curbside recycling program from about 50% to over 80%.
- o Increased the amount of recyclable materials collected.
- o Increased the amount of waste diverted from the landfill to 34%
- o Established successful yard waste and brush/bulky item collections.  
Yard waste collected from the pilot areas results in 18% of the total waste diverted from the landfill. Ninety-one percent of the customers commenting on the brush/bulky service judge it to be Fair to Good.
- o Increased worker safety by reducing accidents and injuries to collection personnel. During the first six months of the program, no injuries occurred to crew members in the pilot area. Subsequently, a single injury occurred. Among the manual collection crews, 134 injuries were recorded during the 1990-1991 period.

Other significant findings include:

- o Full implementation of the semi-automated cart program is projected to reduce collection costs by \$5.11 per household per year when compared with manual collection.
- o Expensive and extensive education efforts are required to help customers understand the variable rate concept. Almost \$7.00 per household has been spent on a variety of efforts.

- o Of those customers who have commented on the program, 74% express a high degree of satisfaction with the program because of the combination of services and the ability to feel as if each household can personally help to resolve the dilemma of declining landfill space. (See Appendix D and E).
- o Those customers expressing their dissatisfaction (8 to 14%) perceive that there is a strong degree of coercion associated with limits on the volume of waste that can be set out without incurring an additional charge. (See Appendix D and E.)

### The Pay-As-You-Throw Program

In August 1990, the Austin City Council endorsed a new solid waste strategy that emphasizes minimizing waste and maximizing recycling. This new strategy was implemented in response to the growing solid waste crisis in the U.S. and reflects the recommendations of the City's Solid Waste Advisory Commission.

Shrinking landfill space and new federal regulations regarding landfill operation and siting will make the disposal of solid waste increasingly expensive. With the goal of controlling disposal costs and promoting environmentally sound disposal practices here in Austin, the new strategy was adopted.

The keystone to the new strategy is an innovative residential collection program, called Pay-As-You-Throw. The new program offers a variety of services designed both to save landfill space and encourage recycling. In addition to these goals, the new program will increase worker safety and efficiency. A pilot of the new program began in July 1991 in four neighborhoods throughout the city. The neighborhoods are: (1) the Cherrywood/Willow neighborhoods in east Austin; (2) the Walsh Tarlton neighborhood in west Austin; (3) the Scenic Brook/Windmill Run Neighborhood in southwest Austin; and (4) the North Austin Civic Association in north Austin. Services the pilot neighborhoods receive are highlighted below.

**Weekly semi-automated household garbage collection.** Household garbage is collected once a week in the Pay-As-You-Throw program. The weekly garbage collection utilizes **semi-automated garbage carts**, which are emptied by a tipper on the back of the garbage truck. The use of the tippers and carts eliminates much of the lifting involved with trash collection, allowing the crew size to be reduced from 3 persons to 2 persons and reducing worker injury. Appendix A offers a brief history on customer cart ordering and initial delivery. Appendix C explains the current procedure for cart delivery and exchanges.

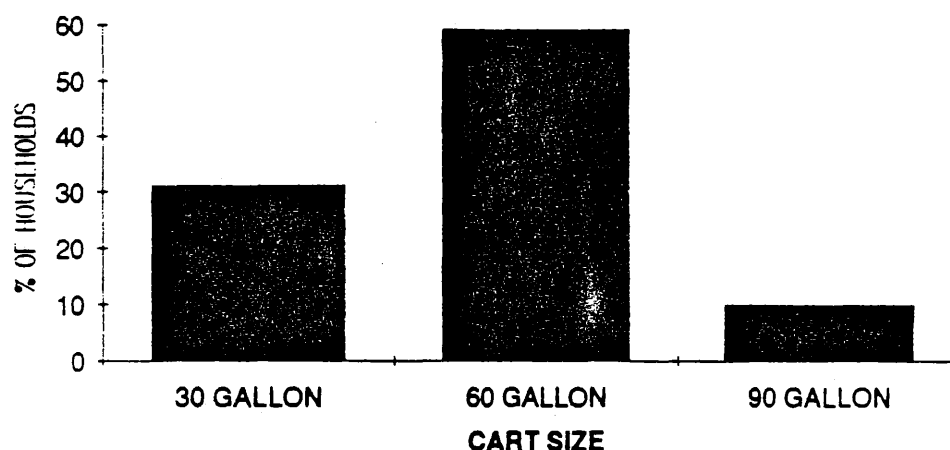
**Weekly yard waste collection.** Yard waste (leaves and grass clippings) is collected every Monday in the Pay-As-You-Throw program. Collected yard waste is no longer buried in the landfill. It is taken instead to the Hornsby Bend Waste Water Treatment Facility. There it is mixed with sewage sludge and composted, producing Dillo Dirt, a natural fertilizer. The expected addition of a shredder for the composting facility will enable the city to expand the yard waste collection to include brush and other organic material.

**Weekly recycling collection.** Austin currently offers weekly recycling collection service to all its residential customers. In the Pay-As-You-Throw program, customers are provided with 14 gallon recycling bins, and their recycling is collected on the same day as their trash. These additions make recycling more convenient for the customer and greatly increase participation in the recycling program.

**Brush and bulky item collection.** In addition to the three weekly collections, special brush and bulky item collections are scheduled every three months. This is a new service in Austin. Currently, customers must arrange for private haulers to remove large items.

**A variable rate.** Basing a customer's monthly rate on the amount of garbage set out offers a financial incentive for recycling and waste reduction. The Pay-As-You-Throw program utilizes three sizes of garbage carts, one of which is provided to each household. Customers choose the size garbage cart appropriate for their household. The size of their garbage cart is the basis for their monthly garbage fee.

#### CUSTOMER CART SIZE CHOICES



Because the customer pays only for the volume of garbage that fits in the cart, **extra garbage stickers**, which are affixed to excess bags or containers, are sold for use when a customer has extra garbage.

#### How Pay-As-You-Throw Has Worked

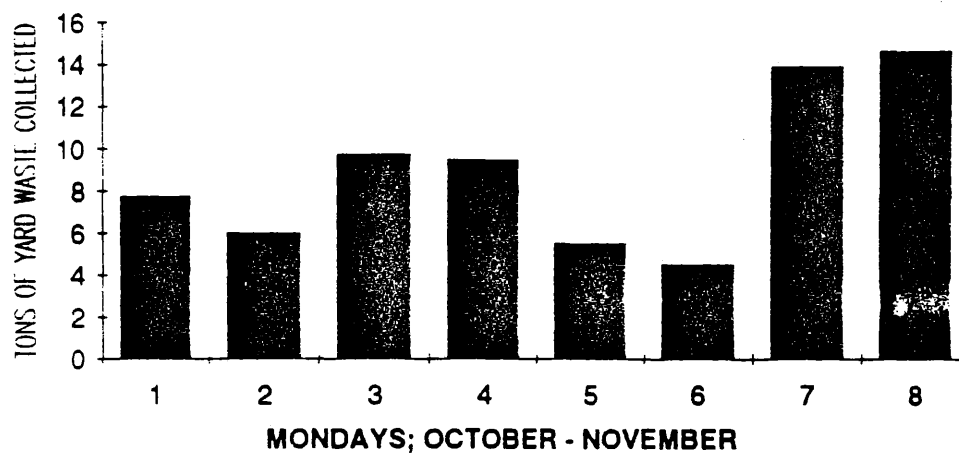
The pilot for the Pay-As-You-Throw program was fully implemented by July 1991. From its inception various studies have been conducted to measure the program's success in meeting its goals; reducing waste, encouraging recycling and promoting worker safety. Results for the first six months of the program are highlighted below.

**REDUCING WASTE.** The program has successfully reduced the amount of waste going to the landfill in three ways.

1. Diverting yard waste from the landfill.

Every Monday an estimated average of 9 tons of yard waste is collected in all four pilot areas. This is an estimated 18% of the total waste collected in the pilot program. A city wide collection program with separate yard waste collection would save an estimated 95,680 gate yds. of landfill space each year. At the current rate of \$3.33 per compacted cubic yard, this represents a value of \$318,614.

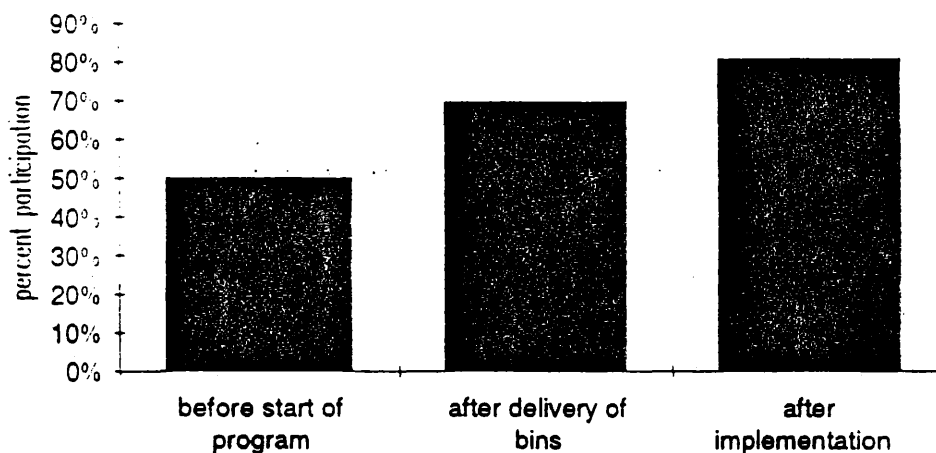
**YARD WASTE DIVERTED**



## 2. Increasing recycling participation.

Increasing the number of people participating in the city's curbside recycling program reduces the amount of waste taken to the landfill. Before the beginning of the pilot program, the overall participation rate in the City's recycling program was just over 50%. After the distribution of recycling bins, a concerted education effort and the consolidation of garbage and recycling schedules, the participation rate within the pilot areas increased to 69.5%. Six months after the full implementation of the Pay-As-You-Throw program pilot area participation rate had reached 80.6%.

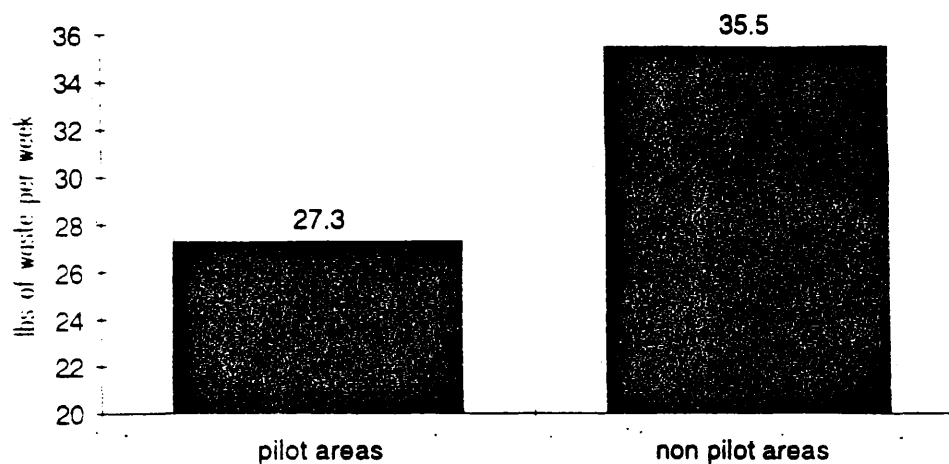
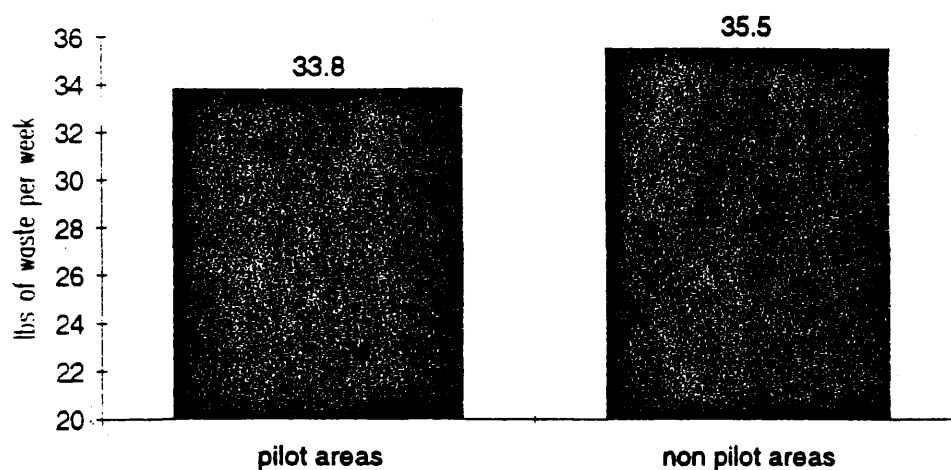
**increase in recycling participation**



## 3. Promoting household waste reduction through education.

An important element of the pilot program has been education. Customers received a flurry of informative brochures and handouts at the beginning of the program. Since then, customers in the pilot program have received a monthly newsletter that provides information on recycling, special collection schedules and hints on household waste management. The one drawback to this intensive education effort has been cost. So far, Solid Waste Services has spent an average of \$6-\$7 per household for customer education. Although much of this expense is for one-time items, the cost per household for education must be lowered before attempting city wide implementation.

Six months after the start of the pilot program, a study was conducted comparing the average amount of waste per household generated in the pilot areas to the average amount of waste per household generated in similar neighborhoods. The households in the pilot areas generated 23% less waste than households outside the pilot program. Eighteen percent (18%) of this reduction can be attributed to the separate yard waste collection. However, this leaves a 5% real reduction in waste per household. This results in additional total savings of \$16,484 when projected city-wide at current costs. Apparently, educational efforts have had a positive effect on household waste habits.

**waste per household w/o yard waste****waste per household w/ yard waste**

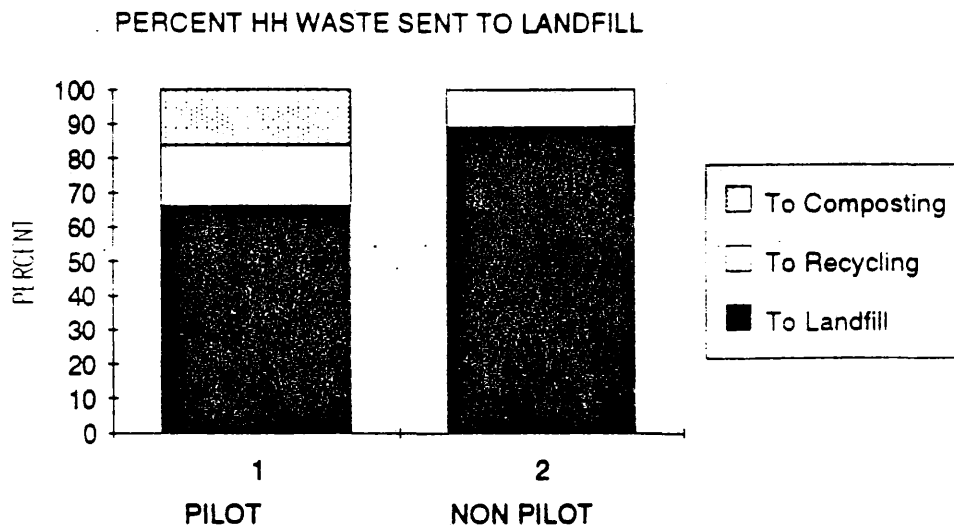
### ENCOURAGING RECYCLING

The pilot program encourages recycling both by making it more convenient and by offering a financial incentive for reducing waste. Customers in the pilot program have their recycling collected the same day as their garbage. This reduces the number of trips to the curb. They have received attractive standardized city recycling bins and by actively recycling, the variable rate offers a chance for customers to reduce their monthly garbage rate.

The increase in recycling participation rates cited above show that the program has been successful in getting more customers to recycle.



Additional studies are planned to determine if customers are **recycling more**. Preliminary studies show that they are. The chart below shows the results of a micro-study that breaks down the disposition of waste in an average pilot neighborhood household compared to an average non pilot household. This study only uses data from three weeks in late November. For these weeks a full 34% of household (HH) waste from the pilot areas was diverted from the landfill. Additional studies using more data are currently being conducted.



### PROMOTING WORKER SAFETY

There were no injuries related to garbage collection on the semi-automated routes during the first six months.

By contrast, during the same six month period, the department continued to experience significant costs due to worker injury or accident. For example. Depending on the seriousness of injury, employees injured on the job are assigned to Light Duty status or No Work status. Between July and December 1991 there were 4112 hours of Light Duty and No Work combined. This figure only includes injuries that occurred within this six month period and does not include workers injured before July and that have remained on Light Duty or No Work status. Of these hours, 2776 or roughly 68% can be attributed to injuries incurred by manually lifting garbage containers and bags. Based on an average hourly wage of \$7.32/hour these workers were paid an estimated \$20,320 in wages for this six month period. These are wages paid to employees no longer performing the duties for which they were hired. Moreover, this figure doesn't include fringe benefits, medical costs, etc., or estimate the compounding effect of long term injuries and settlements. The use of semi-automated garbage carts eliminates the

heavy manual labor involved in garbage collection and should greatly reduce these costs.

## CUSTOMER ATTITUDE

Several methods are being utilized to evaluate the customer's attitude toward the Pay-As-You-Throw pilot program, including scientific surveys, informal questionnaires, customer input, etc.

The City contracted with NuStats, Inc. in June, 1991, to conduct attitude surveys regarding the Pay-As-You-Throw pilot program. The first survey was conducted in June, 1991, after the distribution of the Pay-As-You-Throw program information and the recycling bin, but before delivery of the garbage cart and implementation of the variable rate.

Five hundred Pay-As-You-Throw customers were randomly selected and contacted by telephone. Some major key findings included:

More than 85% of the respondents thought the Pay-As-You-Throw program was a good idea and most were aware of a change to their garbage service, more specifically of the recycling bin and the garbage cart. They knew they would receive a cart, have once a week household garbage collection and their monthly fee would be based on the amount of garbage produced.

Another method used to determine customer attitude is the informal survey. A survey which asked general questions about the Pay-As-You-Throw program was included in the September issue of the Waste Watch Newsletter, which customers receive monthly with their statement. Out of approximately 3000 surveys mailed, 136 customers responded. (See Appendix D for detailed results of this survey.) Customers were asked to rate the program services and overall quality by using a scale of Excellent, Good, Fair and Poor. Findings of this survey include:

The majority of the customers responding to the survey are generally pleased with the program.

An average of 82% of the respondents judged the program services to be Good to Excellent.

The majority of the positive comments support important aspects of the program: the cart, the variable rate and recycling.

The majority of the negative comments reflect dissatisfaction with the once a week household garbage collection, and the separate billing system. [For the first six months of the program, billing services were provided by a private contractor. At the end of those six months the contract was ended and the billing function taken over by ECSD. The number of complaints about billing has greatly decreased. During the peak periods just after customers received their statements while under contract, Solid Waste Services received an average of 62 calls per day concerning customer accounts. This figure dropped by 84% (an average of 10 calls per day) after ECSD provided the billing service (See Appendix B - Billing)]

A second informal survey was mailed in January through the Waste Watch Newsletter, primarily examining recycling practices of the Pay-As-You-Throw customers. Once again, the majority of respondents indicate they are pleased with the program. An average of 84% judge the overall quality of the program to be Fair to Excellent. Generally, customers comment that the program allows them to contribute to the good of the environment. They would like plastics to be added to recycling collection. Customers continue to be displeased with the separate billing and the problems associated with the accounting. (See Appendix E for specific results.)

In addition to this second informal survey, at the end of the program NuStats, Inc. will conduct another scientific telephone survey. The results of this survey will be combined with the results of the first NuStats survey and a final objective report submitted to ECSD.

Customers in the program sometimes call in to let us know their opinion of the program. These comments can also be used to determine customer's attitudes. They are not, however, fully representative of all customers. This fact shows the value of the NuStats survey work.

Calls from customers with complaints and concerns can often result in improvements to the system. For example, one customer called the City Manager's office to complain about the holiday pickup for Christmas Eve. He suggested garbage in his area be collected on the Monday before the holiday, instead of the following Saturday. The suggestion made sense and was immediately acted on. A postcard was mailed to the customers in that area and garbage was picked up on the Monday before Christmas Eve.

Some areas identified by the customer for improving the program include:

Billing on the utility statement

Billing accuracy

Returning the cart to the same place it was set out.

Once-a-week garbage collection causes odor and insect problems.

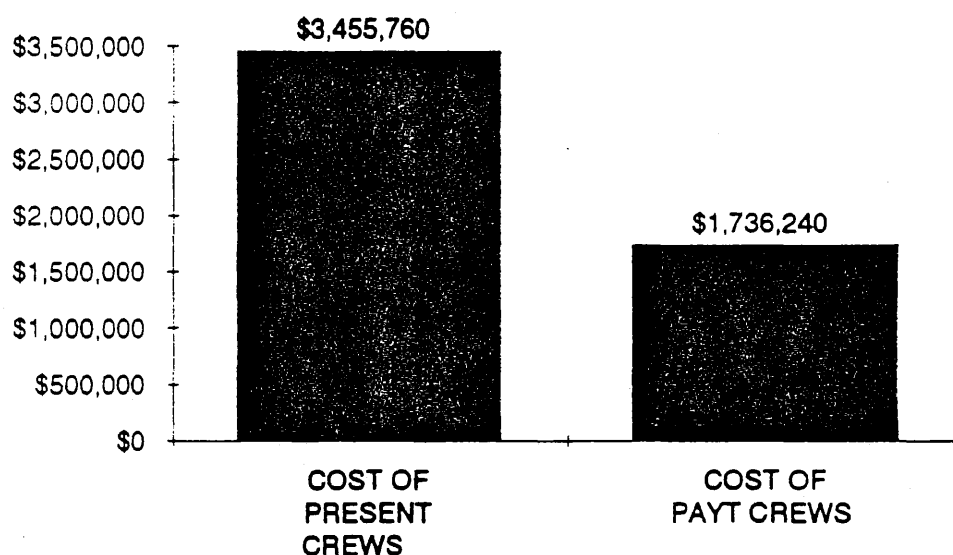
## COST INFORMATION

## 1. Cost of carts by size (including cost of maintaining inventory)

<u>Cart Size</u>	<u>Individual Cart Cost</u>	<u>Total Expended On Carts</u>
30 gallon	\$37.83	\$ 37,541
60 gallon	\$40.95	\$ 98,448
90 gallon	\$43.95	<u>\$14,244</u>
TOTAL INVENTORY COSTS		\$150,233

## 2. Cost of employees

The garbage collection crew for the Pay-As-You-Throw program consists of one driver and one helper. A driver's salary ranges from \$16,744 to \$23,899 annually (\$8.05 to \$11.49 per hour) and a helper's salary ranges from \$13,728 to \$19,198 annually (\$6.60 to \$9.23 per hour). Significant savings will be achieved in reducing crew size from a three person crew to a two person crew. Currently a three person crew costs the City an average of \$62,832 in salaries and benefits. A two person crew would only cost \$43,406. At present there are 55 three person crews. The Pay-As-You-Throw program implemented city wide would only use 40 two man crews as a result of the reduction to once a week household garbage collection. The chart below compares present total crew costs with projected Pay-As-You-Throw crew costs.



3. Cost of lifter ranges from \$4000 to \$5000 per truck, which includes installation.

#### 4. Cost of maintaining the program

A certain level of customer service will be required to maintain the program. Cart exchange records indicate an exchange rate of .9% per month. Therefore, we can expect approximately 1000 exchanges per month for a city-wide program. This number would not include initial cart deliveries or delivery of recycling bins. Currently, pilot program employees make the exchanges. With a number as great as 1000 per month, additional people would need to be hired to perform this duty.

The level of service currently performed is to deliver a clean cart to the customer. To maintain this level of service, additional employees would need to be hired to clean the returned carts. Light duty personnel are being trained to provide cart cleaning and delivery. This may be one way to handle this service in the future.

Each cart has a serial number printed on it. For purposes of tracking and billing, these serial numbers are entered into the program's data base. If serial numbers are kept for the city-wide project, additional personnel would be required for this purpose.

Additional personnel would need to be hired for the city-wide program until cart delivery and program implementation is completed. Experience has shown that after delivery of literature, bins, carts, etc., we can expect 10 % of the customers to call the same or next day. The number of calls then tapers off. After delivery and implementation is completed, some staff would need to be retained to provide customer assistance over the telephone to answer customer inquiries.

#### 5. Cost per household

a. The customer's monthly fee for the Pay-As-You-Throw program is determined by the size cart they are using.

	Per Month	Tax	Total
30 gallon =	\$ 6.00	\$.48	\$ 6.48
60 gallon =	\$ 9.00	\$.72	\$ 9.72
90 gallon =	\$12.00	\$.96	\$12.96

b. All household garbage must fit inside the cart for it to be collected. If a customer has extra garbage, an Extra Garbage Sticker needs to be attached to the excess. For instance, the sticker must be placed on the top item of the extra container, or on the plastic bag. Every customer was given one set of

Extra Garbage Stickers at no charge. New customers are also given one free set. Additional stickers can be purchased for \$10.00 per set of 5 stickers.

Customers requesting more than one exchange are charged for additional exchanges at \$15.00 per exchange. The first exchange is free of charge. During the first six months, there were no \$15.00 charges for cart exchanges. Subsequently, one \$15.00 charge occurred in April.

c. An additional cost must be associated with the change of behavior the customer must make in maintaining this program in their daily lives. This requires managing the household's waste stream: separating recyclables from the regular garbage; rinsing the metal and glass recyclables; adjusting to the cart; separating yard waste; retraining those responsible for handling garbage, etc. It would be difficult to put a price on a behavioral change, because every household may require a different amount of change.

d. Differences in cost of operation under Pay-As-You-Throw should be compared to costs under manual collection for a complete understanding of the value of the semi-automated initiative. Costs shown are annual costs per customer.

	PAYT	MANUAL COLLEC.
Customers per crew per week	2,800	2,045
Cart (amortized over 7 yrs. at 9% interest)	\$8.14	
Crew PAYT -- 2 persons, \$43,406 total	15.50	30.72
Manual -- 3 persons \$62,832		
Truck amortization and maintenance	4.52	5.73
Compost facility amortization and maintenance	3.00	
Increased admin/public education	4.08	
Reduced accident cost	-1.90	
Reduced future landfill cost	-2.00	
	<u>\$31.34</u>	<u>\$36.45</u>

## FUTURE STUDIES

Additional data will be collected during the second six month cycle in order to refine our understanding of several key variables. These include the extent to which an increased volume of recycling can be attributed primarily to the variable rate as opposed to the recycling bin.

A final report with staff recommendations will be submitted to the City Council at the conclusion of the pilot program.

## APPENDIX A HISTORICAL INFORMATION

The Austin City Council passed an ordinance on April 25, 1991, instituting the Pay-As-You-Throw Pilot Program.

A cart order form was delivered to each household in the four Pay-As-You-Throw neighborhoods on May 13. The order forms were collected the next day, and for several days thereafter. The customer indicated the size garbage cart they wanted for their household and their address on the form.

A lot map of each area indicated the address and the size cart ordered at each address. The number of 30, 60 and 90 gallon carts was determined for each area. The 60 and 90 gallon carts were delivered beginning June 24 through June 27. The 30 gallon carts were delivered July 9, 10 and 11. The carts were placed at a holding facility, loaded onto a truck and delivered to the neighborhood, where they were distributed to the address.

A total of 2755 carts were initially delivered: 809 thirty gallon, 1775 sixty gallon and 171 ninety gallon. Approximately 25% of the total number of customers did not select a cart size. Those households not selecting a size were given a 60 gallon cart based on average household set out practice data previously collected by Solid Waste Services.

## APPENDIX B BILLING

The variable rate aspect of the Pay-As-You-Throw program requires a more sophisticated billing and customer support system than the city currently has. At present all residential customers are charged a flat rate for garbage service. The current rate is \$10.60 per month and is included with the customer's monthly electric and water statement. It was originally envisioned that the billing for the pilot program would remain with the UCSO billing and accounting system. Solid Waste Services would provide UCSO with monthly billing information for each resident and they would be billed accordingly. However, at this time, the UCSO computer system cannot bill a variable rate. Because of this, an alternative billing system was devised.

The alternative plan was to contract out the billing and accounting to a private contractor. An invitation for bids was issued and a contract awarded to Publisher's Marketing, a local firm. Publisher's Marketing produced and received payments for the first six months of the contract. However, because of problems that arose it was impossible to provide the high level of customer service that citizens of Austin expect and deserve. The billing and



## M E M O R A N D U M

TO: Austan S. Librach, Director  
Environmental and Conservation Services

FROM: Kathy Higginbotham, Conservation Technician  
Solid Waste Services  
Environmental and Conservation Technician

DATE: January 8, 1992

SUBJECT: PAY-AS-YOU-THROW SURVEY RESULTS

A survey which asked general questions about the Pay-As-You-Throw Program was included in the September issue of the Waste Watch Newsletter. In the survey, customers were asked to rate the following services: cart ordering, cart delivery, household garbage service, yard waste service, brush/bulky service, the Waste Watch Newsletter and the overall quality of the program. The rating scale was Excellent, Good, Fair, Poor. Of approximately three thousand mailed, one-hundred thirty six surveys were returned to Solid Waste Services (5% of the total customers). The table below shows the percentages of the ratings in each category.

SERVICE	EXCELLENT	GOOD	FAIR	POOR
Cart Ordering	50.4%	34.1%	5.7%	9.8%
Cart Delivery	39.7%	38.1%	11.1%	11.1%
Household Garbage Collection	53.8%	27.7%	7.7%	10.8%
Yard Waste Collection	53.8%	27.9%	7.7%	10.6%
Brush/Bulky Collection	36.2%	29.8%	13.8%	20.2%
Waste Watch Newsletter	53.1%	36.9%	5.4%	4.6%
Overall Quality of Program	51.6%	22.7%	12.1%	13.6%

Written comments were made on 82% of the surveys responding to the questions "What do you like most/least about the program?" The top three written positive comments which comprise 64% of the "what I like most" are as follows:

- 23% like the cart and how it makes the neighborhood cleaner and neater.
- 21% support the program because it encourages recycling and is good for the environment
- 20% advocate the variable rate