Pay·As·You·Throw Tool Kit

Guidebooks

Workbook

Software

Videotape

Introduction to EPA's Pay·As·You·Throw Tool Kit

More and more communities, looking for ways to better manage solid waste, have found that pay-as-you-throw programs can make a tremendous difference. Instead of being charged indirectly for trash services, residents under pay-as-you-throw programs pay a direct fee based on the amount of waste they generate. This creates an incentive for individuals to reduce and recycle, easing pressure on both municipal budgets and waste disposal facilities.

Pay-as-you-throw programs represent a major shift in the way communities and their residents pay for solid waste collection and disposal. To be successful, a pay-as-you-throw program must be carefully considered, designed and implemented. This Pay-As-You-Throw Tool Kit contains a wide variety of useful products to help you through this process. It includes tools that will help with specific tasks, like conducting a public outreach campaign or designing your program's rate structure. It also offers resources to help you learn about pay-as-you-throw in general. This Tool Kit has been divided into several main categories to enable you to locate at a glance the specific tools you need.

Guidebooks

Two important guidebooks have been developed that you can use to help decide whether to adopt pay-as-you-throw and how to implement and promote both pay-as-you-throw and other source reduction programs in your community.

Pay-As-You-Throw: Lessons Learned About Unit Pricing

This guide provides an in-depth introduction to pay-as-you-throw and explains how to get a program started. It describes the benefits and potential barriers to pay-as-you-throw programs, helps you determine what type of system is best for your community, and provides detailed instructions on how to design and implement a successful program. The guide is based on proven, practical strategies from communities with pay-as-you-throw programs in place.

The Consumer's Handbook for Reducing Solid Waste

This guide contains a number of ideas about how to reduce and recycle many of the items residents often dispose of as trash. Since residents under pay-as-you-throw will want to learn how to reduce waste, these ideas can be incorporated into the products you develop as part of your outreach campaign.

Workbook

This supplement to *Pay-As-You-Throw: Lessons Learned About Unit Pricing* is a user-friendly, hands-on workbook. It focuses on some of the key steps involved in developing a pay-as-you-throw program, from convincing elected officials, residents, and other community stakeholders that pay-as-you-throw can work to designing a rate structure. It is divided into five sections. Each section contains the tools you need to research, design, promote, and implement a pay-as-you-throw program in your community.

Presentation Materials

Planners can conduct a presentation for community stakeholders, such as elected officials, other municipal employees, and representatives from local civic groups, to help earn their support for pay-as-you-throw. To help you deliver an effective briefing, you can adapt and use the sample agenda, pre-meeting survey of attendees, set of overhead transparency masters with talking points, and other presentation materials included in this section.

Public Outreach Materials

A pay-as-you-throw program's success often depends on a strong public outreach and education effort. To help you start developing your public outreach program, this section includes a list of outreach ideas, fact sheets and other reproducible products, and a set of clip art to help you create your own customized outreach materials.

Worksheets

A set of worksheets also are included in this workbook. These worksheets can be used to guide you through each of the major steps involved in pay-as-you-throw program development, from deciding if pay-as-you-throw is right for your community to implementing and monitoring the program.

Articles and Newsclippings

This section contains a set of articles to provide you with background information on pay-as-you-throw and how other communities have planned for and developed pay-as-you-throw programs. In addition, once you begin your public outreach program, you can add press clippings to this section to track coverage in the local media.

Bibliography

Turn to this section if you are interested in doing further research on pay-as-you-throw. It includes an annotated bibliography listing over 50 recent pay-as-you-throw publications, from articles in solid waste trade magazines to reports from universities and private institutions. You can also use this section to organize any additional publication resources you find during your research.

Software

Two recently developed electronic tools are included in this section that you can use to plan out a pay-as-you-throw program. These software packages can help you perform the calculations involved in rate structure design and learn more about source reduction, recycling, and other solid waste management issues in general.

Pay-As-You-Throw Rates Model

This comprehensive software has been designed specifically for MSW planners to use in calculating the costs of a community's pay-as-you-throw program and arriving at the optimal per-container fee. It allows users to enter choices relating to key pay-as-you-throw program development variables like container types and sizes and complementary programs. It then totals all of the resulting costs and helps planners assign prices to their containers that will allow them to cover these expenses completely.

MSW Factbook

This electronic reference manual contains more than 200 screens of useful facts, figures, tables and information about municipal solid waste. Covering an expansive range of topics, including waste generation, source reduction, recycling, landfills, and Subtitle D regulations, this software can serve as a valuable information resource for planning and implementing a pay-as-you-throw program.

Videotape

The videotape included in this section can be used to increase the impact of briefings for elected officials, presentations at town meetings, and other pay-as-you-throw events. Depending on the type of presentation and your audience, you can run the entire video or just the sections that will help you make your case.

East Central Iowa Council of Governments Unit Pricing Video

This 30-minute video provides a clear, comprehensive summary of the central concepts of unit pricing. Focusing on six communities in Iowa that have implemented pay-as-you-throw programs, it uses interviews with elected officials and residents, solid waste experts, and economists to describe the economic and environmental benefits of pay-as-you-throw. The video also shows how these case study communities were able to overcome potential barriers and implement successful pay-as-you-throw programs.

EPA's Pay-As-You-Throw Tool Kit

EPA is pleased to present its *Pay-As-You-Throw Tool Kit*. Throughout the final stages of the Tool Kit's development, we have been aware of the need to release it promptly to you and the hundreds of others that have already requested copies. We appreciate your patience and hope you find the Tool Kit helpful.

For the past two years, EPA's Office of Solid Waste has led a national initiative to promote an approach to municipal solid waste (MSW) management called *pay-as-you-throw*. Under pay-as-you-throw (also known as unit pricing) programs, households are charged for waste collection based on the amount of trash they throw away—in the same way they are charged for water, electricity, and other utilities. This gives residents a direct incentive to reduce the amount of waste they generate. To date, close to 2,000 communities nationwide have turned to these systems to help reduce waste and control MSW management costs.

At the heart of EPA's outreach initiative is a simple idea: communities considering pay-as-you-throw need answers to critical questions about how these programs work—and it's the communities that have successfully adopted a program of their own that can best provide the answers. In an effort to tap into this expertise, EPA organized a roundtable discussion bringing MSW practitioners together to discuss the strategies they used in their communities. The guide *Pay-As-You-Throw: Lessons Learned About Unit Pricing*, a complete primer on designing and implementing these systems, was a product of the roundtable meetings.

EPA has since organized other events, including a series of workshops connecting pioneering communities with planners trying to learn more about pay-as-you-throw and a satellite teleconference discussion with several program experts and community practitioners. A demonstration project also is underway designed to study the factors influencing the success of the pay-as-you-throw program in Marietta, Georgia. Through each of these projects, EPA has sought to inform communities about the full range of options and best practices to consider when deciding whether and how to implement pay-as-you-throw.

Over the course of this outreach, EPA has learned a tremendous amount about how these programs work. Perhaps the biggest lesson is that there is no one "right" way to implement pay-as-you-throw, just as there is no single compelling reason for communities to adopt this type of program. Every community

(over)

has a different story to tell, and a different lesson to teach. Some important trends have emerged, however. Nearly all communities have experienced three specific types of benefits as a result of adopting pay-as-you-throw:

It's economically sustainable. Pay-as-you-throw is an effective tool for communities struggling to cope with soaring MSW management costs. Well-designed programs enable communities to generate the revenues they need to cover all MSW program costs, including the costs of such complementary programs as recycling and composting. Residents benefit, too. Communities with pay-as-you-throw have told EPA that residents often welcome the opportunity to take control of their trash bill.

It's environmentally sustainable. Because of the incentive it provides residents to put less waste at the curb, communities with programs in place have reported significant increases in recycling and reductions in waste amounts ranging from 25 to 45 percent, on average. Less waste and more recycling means that fewer natural resources need to be extracted.

It's fair. Communities also have told us that the most important advantage of all may be the fairness pay-as-you-throw offers to community residents. When the cost of managing trash is hidden in taxes, or charged at a flat rate, residents who recycle and prevent waste end up subsidizing their neighbors' wastefulness. Under this kind of program, residents pay only for what they throw away.

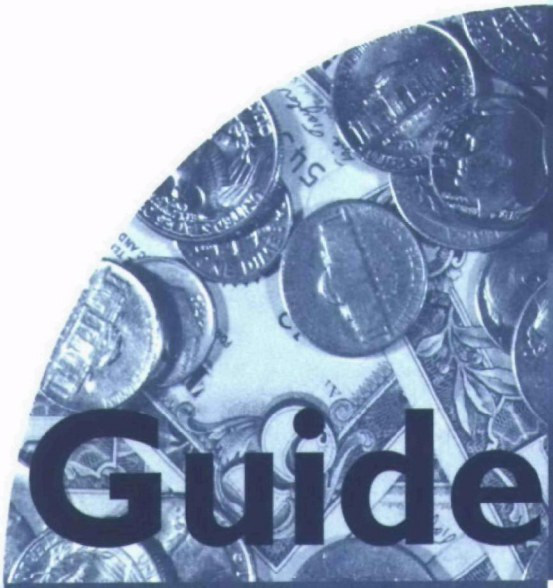
The Tool Kit you have just received is based on lessons like these, offered by the pioneering communities that have implemented and perfected pay-as-you-throw systems. EPA is proud to present this compendium of real-world information as a way to give communities access to the experts—to learn from their trials and triumphs in the search for economically and environmentally sustainable solutions to today's solid waste management challenges.

EPA's pay-as-you-throw outreach initiative is ongoing. As more and more communities introduce their own programs, new and better practices are sure to emerge. EPA hopes to continue its role as an outreach clearinghouse, enhancing communities' ability to share and use critical information about pay-as-you-throw. If you would like to order additional copies of this Tool Kit or request further information about pay-as-you-throw programs, please call the Pay-As-You-Throw Helpline toll-free at 1-888-EPA-PAYT.

Sincerely,

Jan Canterbury

Jan Canterbury



Guidebooks

Pay-As-You-Throw: Lessons Learned About Unit Pricing

The Consumer's Handbook for Reducing Solid Waste

Guidebooks

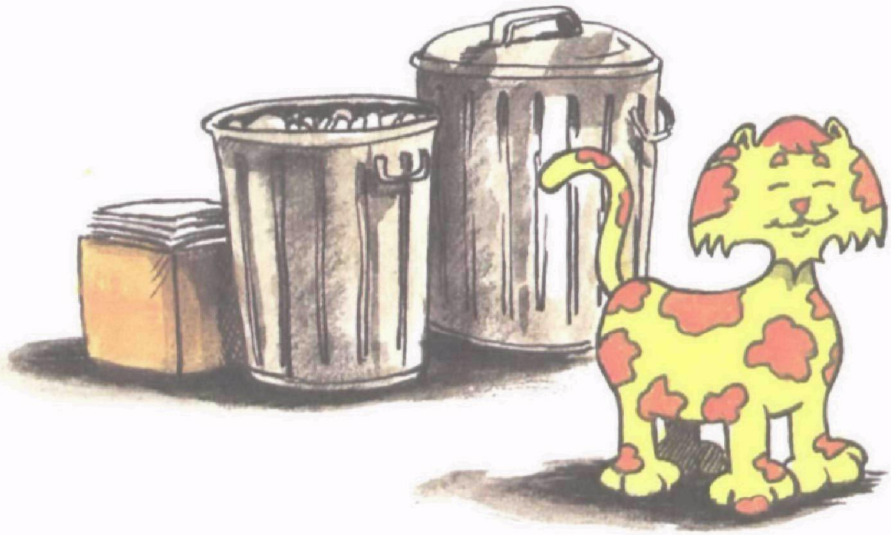
United States
Environmental Protection
Agency

EPA530-K-92-003
August 1992

Solid Waste and Emergency Response (OS-305)

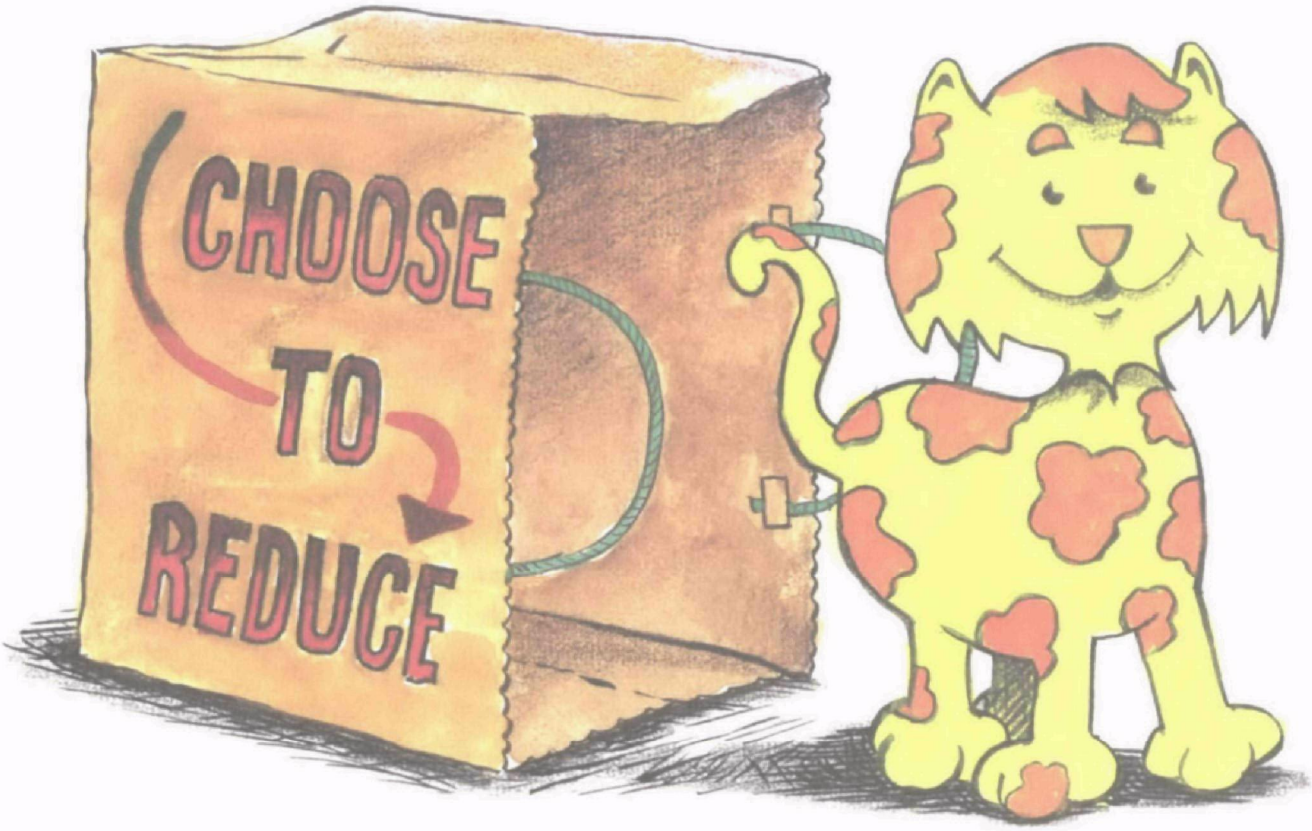
EPA

The Consumer's Handbook for Reducing Solid Waste



Printed on paper that contains at least 50 percent recycled fiber.

The Cat's Out of the Bag



• Reduce • Reuse
• Recycle • Respond

This booklet describes how people can help solve a growing problem...garbage! Individual consumers can help alleviate America's mounting trash problem by making environmentally aware decisions about everyday things like shopping and caring for the lawn. Like the story that says cats have nine lives, so do many of the items we use every day. Empty cans and jars can be reused to store many items, such as nails or thumbtacks. The baking soda bought to bake a cake also can be used to scrub kitchen counters. The container that began its life as a plastic milk jug can be washed and reused to water plants, create an arts and crafts project, or be transformed into a bird feeder. Eventually, the milk jug can be recycled to create a new plastic product.

Reusing products is just one way to cut down on what we throw away. This booklet outlines many practical steps to reduce the amount and toxicity of garbage. These aren't the only steps that can be taken to reduce waste, but they're a good start.

The Problem Is Too Much Trash

Each year, Americans generate millions of tons of trash in the form of wrappings, bottles, boxes, cans, grass clippings, furniture, clothing, phone books, and much, much, more. Over the years, we have gotten used to "throwing it away," so it's easy to understand why now there's too much trash and not enough acceptable places to put it.

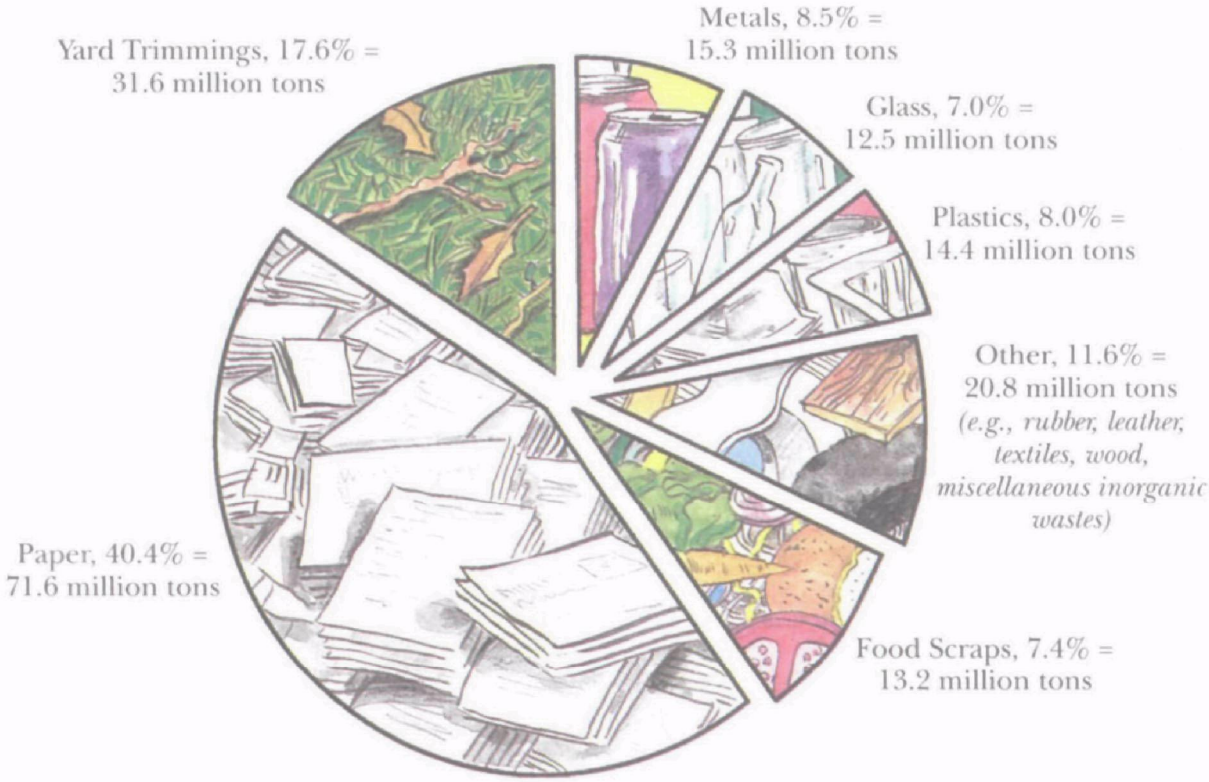
In less than 30 years, durable goods (tires, appliances, furniture) and nondurable goods (paper, certain disposable products, clothing) in the solid waste stream nearly tripled. These now account for about 75 million tons of garbage per year. At the same time, container and packaging waste rose to almost 57 million tons per year, making packaging the number one component of the nation's waste stream. Container and packaging material includes glass, aluminum, plastics, steel and other metals, and paper and paperboard. Yard trimmings such as grass clippings and tree limbs are also a substantial part of what we throw away. In addition, many relatively small components of the national solid waste stream add up to millions of tons. For example, even 1 percent of the nation's waste stream amounts to almost 2 million tons of trash each year.

Source Reduction: A Basic Solution

As a nation, we are starting to realize that we can't solve the solid waste dilemma just by finding new places to put trash. Across the country, many individuals, communities, and businesses have found creative ways to reduce and better manage their trash through a coordinated mix of practices that includes source reduction (see box on page 4).

Simply put, source reduction is waste prevention. It includes many

What's In America's Trash?



Total Weight = 179.6 Million Tons (1988 Figures)

actions that reduce the overall amount or toxicity of waste created. Source reduction can conserve resources, reduce pollution, and help cut waste disposal and handling costs (it avoids the costs of recycling, composting, landfilling, and combustion).

Source reduction is a basic solution to the garbage glut: less waste means less of a waste problem. Because source reduction actually prevents the generation of waste in the first place, it comes before other management options that deal with trash after it is already generated. After source reduction, recycling (and composting) are the preferred waste management options because they reduce the

Integrated Waste Management

Integrated waste management refers to the complementary use of a variety of practices to safely and effectively handle municipal solid waste. The following is EPA's preferred hierarchy of approaches.

1. **Source reduction** is the design, manufacture, purchase, or use of materials (such as products and packaging) to reduce the amount or toxicity of trash generated. Source reduction can help reduce waste disposal and handling costs because it avoids the costs of recycling, municipal composting, landfilling, and combustion. It also conserves resources and reduces pollution.

2. **Recycling** is the process by which materials are collected and used as raw materials for new products. There are four steps in recycling: collecting the recyclable components of municipal solid waste, separating materials by type (before or after collection), processing them into reusable forms, and purchasing and using the goods made with reprocessed materials. Recycling prevents potentially useful materials from being landfilled or combusted, thus preserving our capacity for disposal. Recycling often saves energy and natural resources. **Composting**, a form of recycling, can play a key role in diverting organic wastes from disposal facilities.

3. **Waste combustion and landfilling** play a key role in managing waste that cannot be reduced or recycled. Combustion in specially designed facilities reduces the bulk of waste and provides the added benefit of energy recovery. Source reduction and recycling can remove items from the waste stream that may be difficult to burn, cause potentially harmful emissions, or make ash management problematic. Landfilling is—and will continue to be—a major component of waste management. The portion of waste requiring incineration or land disposal can be significantly reduced by examining individual contributions to garbage and by promoting the wise use and reuse of resources.

amount of waste going to landfills and conserve resources.

Making Source Reduction Work

Putting source reduction into practice is likely to require some change in our daily routines. Changing habits does not mean a return to a more difficult lifestyle, however. In fact, just the opposite may happen. If we don't reduce waste, the economic and social costs of waste disposal will continue to increase, and communities—large and small, urban and suburban—ill face increasingly harder decisions about managing their trash.

All parts of society need to work together to change current patterns of waste generation and disposal. The federal government develops and provides information and looks for incentives to create less waste. It also helps communities plan and carry out source reduction measures. State, local, and tribal governments can create the most appropriate source reduction measures for their areas. For example, some communities already are using fee systems that require households and businesses to pay for trash disposal based on the amount they toss out.

Large consumers—manufacturers, retailers, restaurants, hotels, schools, and governments—can prevent waste in a variety of ways, including using products that create less trash. Manufacturers also can design products that use fewer hazardous components, require less packaging, are recyclable, use recycled materials, and result in less waste when they are no longer useful.

Individuals can evaluate their daily waste-producing activities to determine those that are essential (such as choosing medicines and foods packaged for safety and health), and those that are not (such as throwing away glass or plastic jars that could be reused or locally recycled). This booklet suggests many practices that reduce waste or help manage it more effectively. Adopt those that are right for you and add others that you think

of yourself. Discuss your ideas with neighbors, businesses, and other members of your community. It's important to remember that all actions will have some effect on the environment. If reusable products need to be washed, for example, there may be an increase in water use. Individual consumers, however, can substantially reduce solid waste by following these basic principles:

REDUCE the amount of trash discarded.

REUSE containers and products.

RECYCLE, use recycled materials, and compost.

RESPOND to the solid waste dilemma by reconsidering waste-producing activities and by expressing preferences for less waste.

Tips for Reducing Solid Waste

REDUCE

1. Reduce the amount of unnecessary packaging.
2. Adopt practices that reduce waste toxicity.

REUSE

3. Consider reusable products.
4. Maintain and repair durable products.
5. Reuse bags, containers, and other items.
6. Borrow, rent, or share items used infrequently.
7. Sell or donate goods instead of throwing them out.

RECYCLE

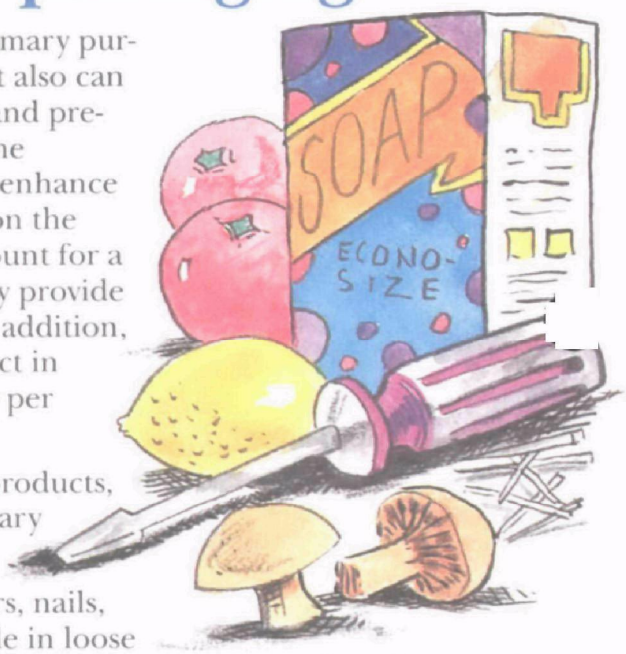
8. Choose recyclable products and containers and recycle them.
9. Select products made from recycled materials.
10. Compost yard trimmings and some food scraps.

RESPOND

11. Educate others on source reduction and recycling practices. Make your preferences known to manufacturers, merchants, and community leaders.
12. Be creative—find new ways to reduce waste quantity and toxicity.

1.

Reduce the amount of unnecessary packaging.



Packaging serves many purposes. Its primary purpose is to protect and contain a product. It also can prevent tampering, provide information, and preserve hygienic integrity and freshness. Some packaging, however, is designed largely to enhance a product's attractiveness or prominence on the store shelf. Since packaging materials account for a large volume of the trash we generate, they provide a good opportunity for reducing waste. In addition, keep in mind that as the amount of product in a container increases, the packaging waste per serving or use usually decreases.

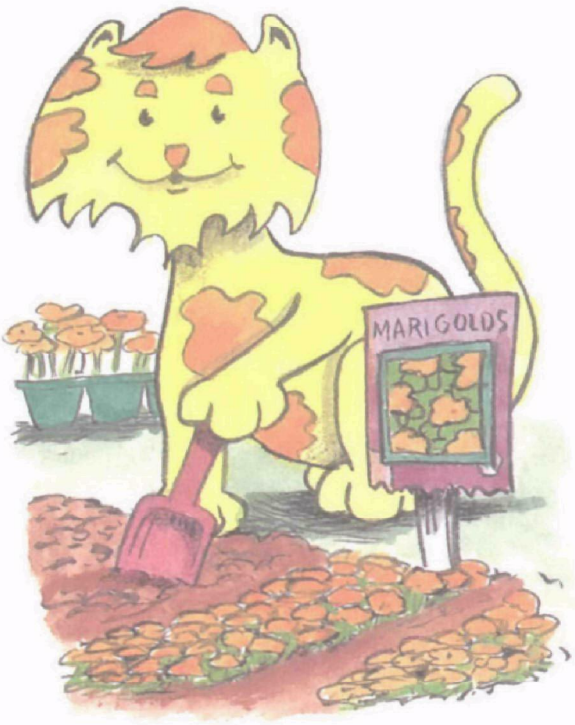
- When choosing between two similar products, select the one with the least unnecessary packaging.
- Remember that wrenches, screwdrivers, nails, and other hardware are often available in loose bins. At the grocery, consider whether it is necessary to purchase items such as tomatoes, garlic, and mushrooms in prepackaged containers when they can be bought unpackaged.
- When appropriate, use products you already have on hand to do household chores (see Appendix A). Using these products can save on the packaging associated with additional products.
- Recognize and support store managers when they stock products with no packaging or reduced packaging. Let clerks know when it's not necessary to double wrap a purchase.
- Consider large or economy-size items for household products that are used frequently, such as laundry soap, shampoo, baking soda, pet foods, and cat litter. These sizes usually have less packaging per unit of product. For food items, choose the largest size that can be used before spoiling.
- Consider whether concentrated products are appropriate for your needs. They often require less packaging and less energy to transport to the store, saving money as well as natural resources.
- Whenever possible, select grocery, hardware, and household items that are available in bulk. Bulk merchandise also may be shared with friends or neighbors.
- It is important to choose food servings that are appropriate to your needs. One alternative to single food servings is to choose the next largest serving and store any leftovers in a reusable container.

2.

Adopt practices that reduce waste toxicity.

In addition to reducing the amount of materials in the solid waste stream, reducing waste toxicity is another important component of source reduction. Some jobs around the home may require the use of products containing hazardous components. Nevertheless, toxicity reduction can be achieved by following some simple guidelines.

- Take actions that use nonhazardous or less hazardous components to accomplish the task at hand. Examples include choosing reduced mercury batteries, or planting marigolds in the garden to ward off certain pests rather than using pesticides. In some cases you may be using less toxic chemicals to do a job and in others you may use some physical method, such as sandpaper, scouring pads, or just a little more elbow grease, to achieve the same results.
- Learn about alternatives to household items containing hazardous substances. In some cases, products that you have around the house can be used to do the same job as products with hazardous components. (See Appendix A or check with local libraries or bookstores for guidebooks on nonhazardous household practices.)
- If you do need to use products with hazardous components, use only the amounts needed. Leftover materials can be shared with neighbors or donated to a business, charity, or government agency, or, in the case of used motor oil, recycled at a participating service station. Never put leftover products with hazardous components in food or beverage containers.



- For products containing hazardous components, read and follow all directions on product labels. Make sure the containers are always labelled properly and stored safely away from children and pets. When you are finished with containers that are partially full, follow local community policy on household hazardous waste disposal (see box on "Household Hazardous Waste Collection" on the next page). If at any time you have questions about potentially hazardous ingredients in products and their impacts on human health, do not hesitate to call your local poison control center.

Household Hazardous Waste Collection

For leftover products containing hazardous components, check with the local environmental agency or Chamber of Commerce to see if there are any designated days in your area for collection of waste materials such as leftover paints, pesticides, solvents, and batteries. On such days, qualified professionals collect household hazardous wastes at a central location to ensure safe management and disposal. Some communities have permanent household hazardous waste collection facilities that accept wastes year-round. Some collections also include exchanges of paints, solvents, certain pesticides, cleaning and automotive products, and other materials. Exchanges allow materials to be used by someone else, rather than being thrown away.

3.

Consider reusable products.

Many products are designed to be used more than once. Reusable products and containers often result in less waste. This helps reduce the cost of managing solid waste and often conserves materials and resources. (Remember, reusable containers for food must be carefully cleaned to ensure proper hygiene.)

- A sturdy mug or cup can be washed and used time and again. Many people bring their own mugs to work, meetings, and conferences.
- Sturdy and washable utensils and tableware can be used at home and for picnics, outdoor parties, and potlucks.
- At work, see if "recharged" cartridges for laser printers, copiers, and fax machines are available. They not only reduce waste, but also typically save money.
- Cloth napkins, sponges, or dishcloths can be used around the house. These can be washed over and over again.
- Look for items that are available in refillable containers. For example, some bottles and jugs for beverages and detergents are made to be refilled and reused, either by the consumer or the manufacturer.
- When possible, use rechargeable batteries to help reduce garbage and to keep toxic metals found in some batteries out of the waste stream. Another alternative is to look for batteries with reduced toxic metals.

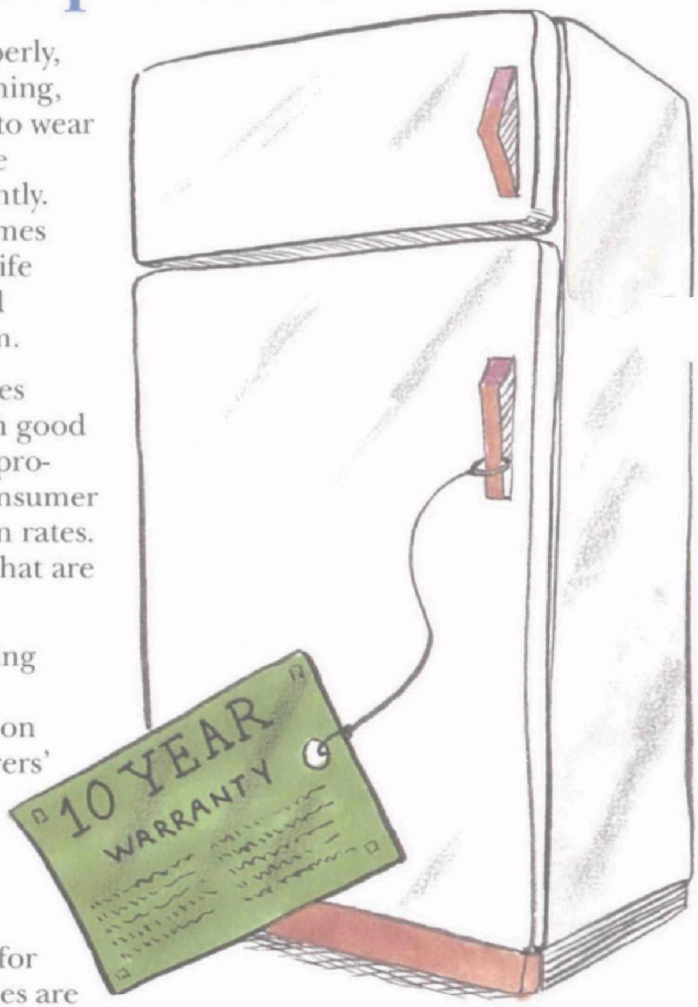
When using single-use items, remember to take only what is needed. For example, take only one napkin or ketchup packet if more are not needed.

'emember, if your goal is to reduce solid waste, think about reusables.

4.

Maintain and repair durable products.

If maintained and repaired properly, products such as long-wearing clothing, tires, and appliances are less likely to wear out or break and will not have to be thrown out and replaced as frequently. Although durable products sometimes cost more initially, their extended life span may offset the higher cost and even save money over the long term.



- Consider long-lasting appliances and electronic equipment with good warranties. Check reports for products with a record of high consumer satisfaction and low breakdown rates. Also, look for those products that are easily repaired.
- Keep appliances in good working order. Follow manufacturers' suggestions for proper operation and maintenance. Manufacturers' service departments may have toll-free numbers; phone toll-free directory assistance at 1-800-555-1212 to find out.
- High-quality, long-lasting tires for cars, bicycles, and other vehicles are available. Using them reduces the rate at which tires are replaced and disposed of. Also, to extend tire life, check tire pressure once a month, follow the manufacturer's recommendations for upkeep, and rotate tires routinely. In addition, retread and remanufactured tires can reduce tire waste.
- Mend clothes instead of throwing them away. Where possible, repair worn shoes, boots, handbags, and briefcases.
- Whenever intended for use over a long period of time, choose furniture, luggage, sporting goods, toys, and tools that will stand up to vigorous use.
- Consider using low-energy fluorescent light bulbs rather than incandescent ones. They'll last longer, which means fewer bulbs are thrown out, and cost less to replace over time.

5.

Reuse bags, containers, and other items.

Many everyday items can have more than one use. Before discarding bags, containers, and other items, consider if it is hygienic and practical to reuse them. Reusing products extends their lives, keeping them out of the solid waste stream longer. Adopt the ideas that work for you, add some of your own, and then challenge others in your school, office, and community to try these ideas and to come up with others.

- Reuse paper and plastic bags and twist ties. If it's practical, keep a supply of bags on hand to use on the next shopping trip, or take a string, mesh, or canvas tote bag to the store. When a reusable bag is not on hand and only one or two items are being purchased, consider whether you need a bag at all.
- Reuse scrap paper and envelopes. Use both sides of a piece of paper for writing notes before recycling it. Save and reuse gift boxes, ribbons, and larger pieces of wrapping and tissue paper. Save packaging, colored paper, egg cartons, and other items for reuse or for arts and crafts projects at day-care facilities, schools, youth facilities, and senior citizen centers. Find other uses or homes for old draperies, bedding, clothing, towels, and cotton diapers. Then cut up what's left for use as patchwork, rags, doll clothes, rag rugs, or other projects.
- Reuse newspaper, boxes, packaging "peanuts," and "bubble wrap" to ship packages. Brown paper bags are excellent for wrapping parcels.
- Wash and reuse empty glass and plastic jars, milk jugs, coffee cans, dairy tubs, and other similar containers that otherwise get thrown out. These containers can be used to store leftovers as well as buttons, nails, and thumbtacks. An empty coffee can makes a fine flower pot.
- Turn used lumber into birdhouses, mailboxes, compost bins, or other woodworking projects.

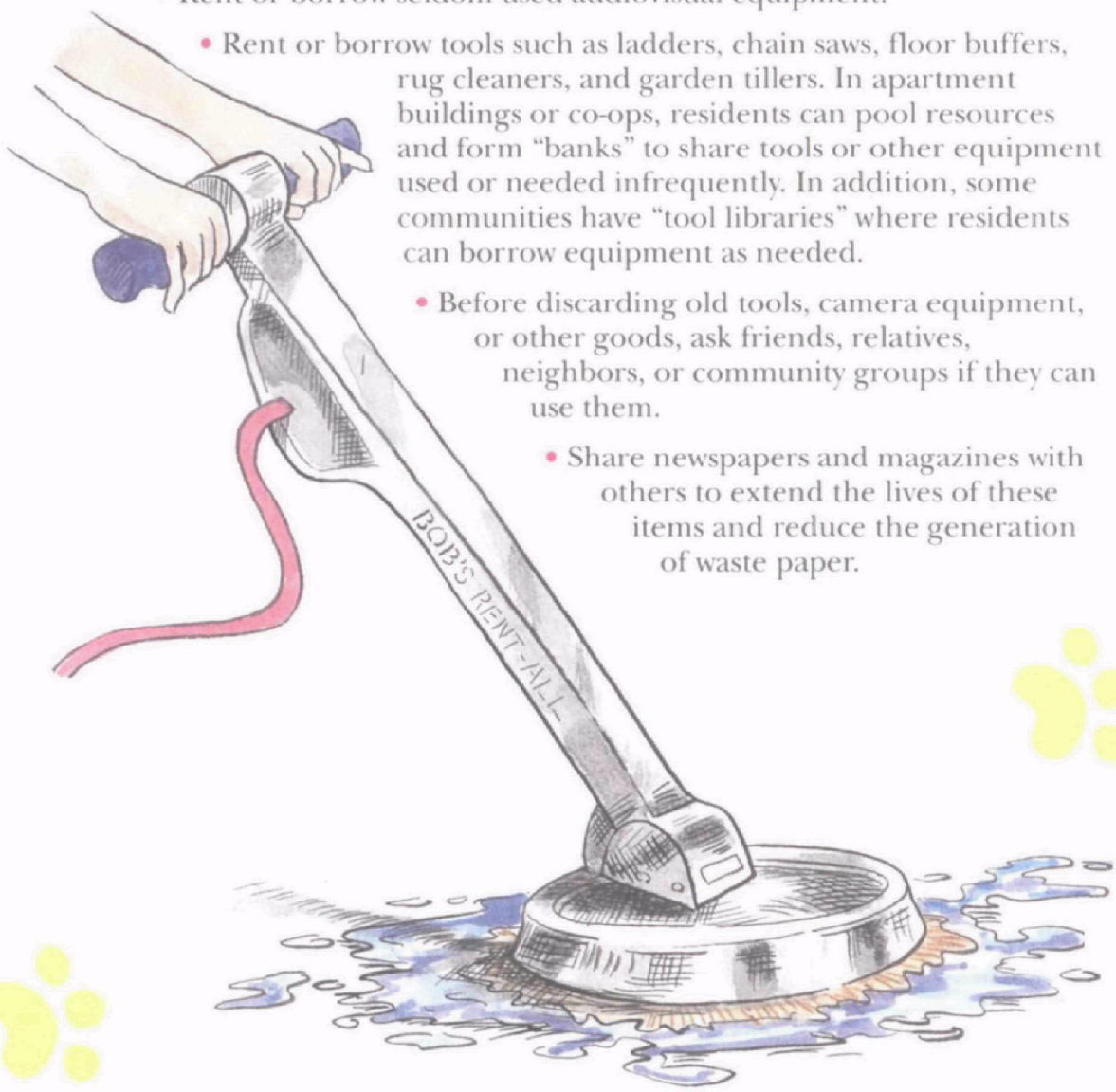
CAUTION: Do not reuse containers that originally held products such as motor oil or pesticides. These containers and their potentially harmful residues should be discarded (following manufacturers' instructions on the label) as soon as they are empty. When you no longer have a use for a full or partially full container, take it to a community household hazardous waste collection. Also, never store anything potentially harmful in containers designed for food or beverages. Always label containers and store them out of the reach of children and pets.

6.

Borrow, rent, or share items used infrequently.

Seldom-used items, like certain power tools and party goods, often collect dust, rust, take up valuable storage space, and ultimately end up in the trash. Consider renting or borrowing these items the next time they're needed. Infrequently used items also might be shared among neighbors, friends, or family. Borrowing, renting, or sharing items saves both money and natural resources.

- Rent or borrow party decorations and supplies such as tables, chairs, centerpieces, linens, dishes, and silverware.
- Rent or borrow seldom-used audiovisual equipment.
- Rent or borrow tools such as ladders, chain saws, floor buffers, rug cleaners, and garden tillers. In apartment buildings or co-ops, residents can pool resources and form "banks" to share tools or other equipment used or needed infrequently. In addition, some communities have "tool libraries" where residents can borrow equipment as needed.
- Before discarding old tools, camera equipment, or other goods, ask friends, relatives, neighbors, or community groups if they can use them.
- Share newspapers and magazines with others to extend the lives of these items and reduce the generation of waste paper.



7.

Sell or donate goods instead of throwing them out.

One person's trash is another person's treasure. Instead of discarding unwanted appliances, tools, or clothes, try selling or donating them. Opting for used and "irregular" items is another good way to practice source reduction. Such products are often less expensive than new or "first-quality" items, and using them will keep them from being thrown away.

- Donate or resell items to thrift stores or other organizations in need. Donors sometimes receive tax deductions or even cash. These organizations typically take everything from clothes and textiles to appliances and furniture. All should be clean and of respectable quality.
- Sell secondhand items at fairs, bazaars, swap meets, and garage sales.
- Give hand-me-down clothes to family members, neighboring families, or the needy. Consider acquiring used clothing at thrift or consignment shops. The condition of used clothing in these stores is screened: clothes are typically laundered and cannot have tears or stains.
- Consider conducting a food or clothing drive to help others. Where appropriate, encourage area merchants to donate damaged goods or food items that are still edible to food banks, shelters, and other groups that care for the needy.

8.

Choose recyclable products and containers and recycle them.

When you've done all you can to avoid waste, recycle. Producing goods from recycled materials typically consumes less energy and conserves raw materials. Yet, our landfills are packed with many packages and products that can be recycled.

- Consider products made of materials that are collected for recycling locally; in many communities, this includes glass, aluminum, steel, some paper and cardboard, and certain plastics. Check with appropriate community officials, volunteer groups, or recycling businesses to determine what materials are collected for recycling. If a system is not in place to return a certain type of material, that material is not easily "recyclable."
- Participate in community recycling drives, curbside programs, and drop-off collections. Call community officials, the local recycling center, or a nearby recycling business to find out if and how materials should be separated. For example, some communities require that glossy inserts be segregated from newspaper, and that different types of cans be separated. A magnet can be used to distinguish steel or bimetal cans from aluminum cans (a magnet does not stick to aluminum). Also, investigate curbside pickup schedules, determine what materials are accepted, locate drop-off sites, and find out when these sites are open.
- If a recycling program does not exist in your community, participate in establishing one. Call local salvage operators to see if they will accept or pick up materials for recycling. Work with community officials to determine the most cost-effective recycling options for your area.
- Take used car batteries ("lead-acid batteries"), antifreeze, and motor oil (saved in clean nonbreakable containers) to participating automobile service centers and other places that collect these items for recycling.
- As more businesses and organizations provide collection opportunities, take advantage of them. For example, many grocery stores collect bags for recycling.

The Degradables Debate

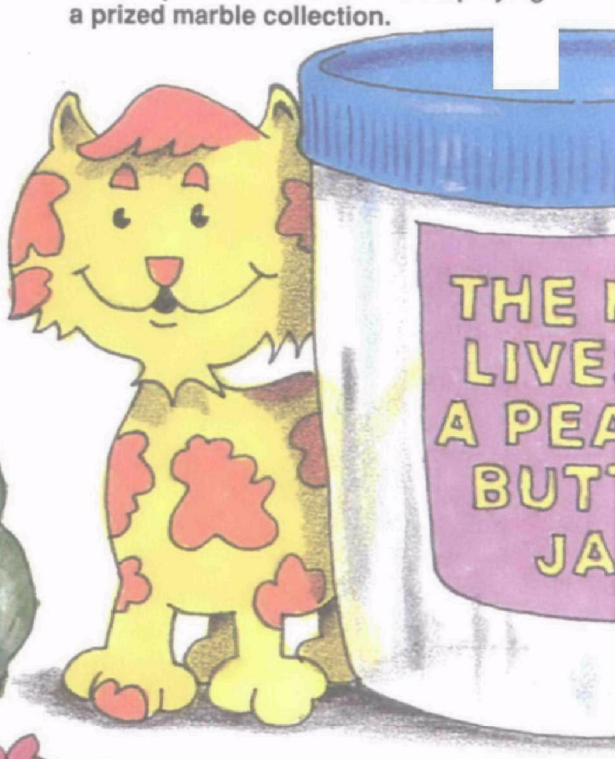
One of the biggest debates in solid waste has centered on claims that certain products such as some plastic bags, paper products, and other goods are degradable. Are such products helpful in solving the solid waste dilemma? Do they save landfill space?

In truth, degradation occurs very slowly in modern landfills. Sunlight can't penetrate, so photodegradation can't occur. Furthermore, researchers have unearthed cabbages, carrots, and readable newspapers that have been in landfills for 30 years or more. It is unlikely that products marketed as degradable would achieve better results. Even if biodegradable products do perform exactly as they are supposed to, they still use up resources that could be reclaimed through recycling.

Biodegradability of natural materials such as lawn trimmings and some foods does have a place in solid waste management. That place is composting (see tip #10). Whether in the backyard or in community facilities, composting can take advantage of degradability. This is nature's way of recycling organic material into humus that enriches soil and returns nutrients to the earth.

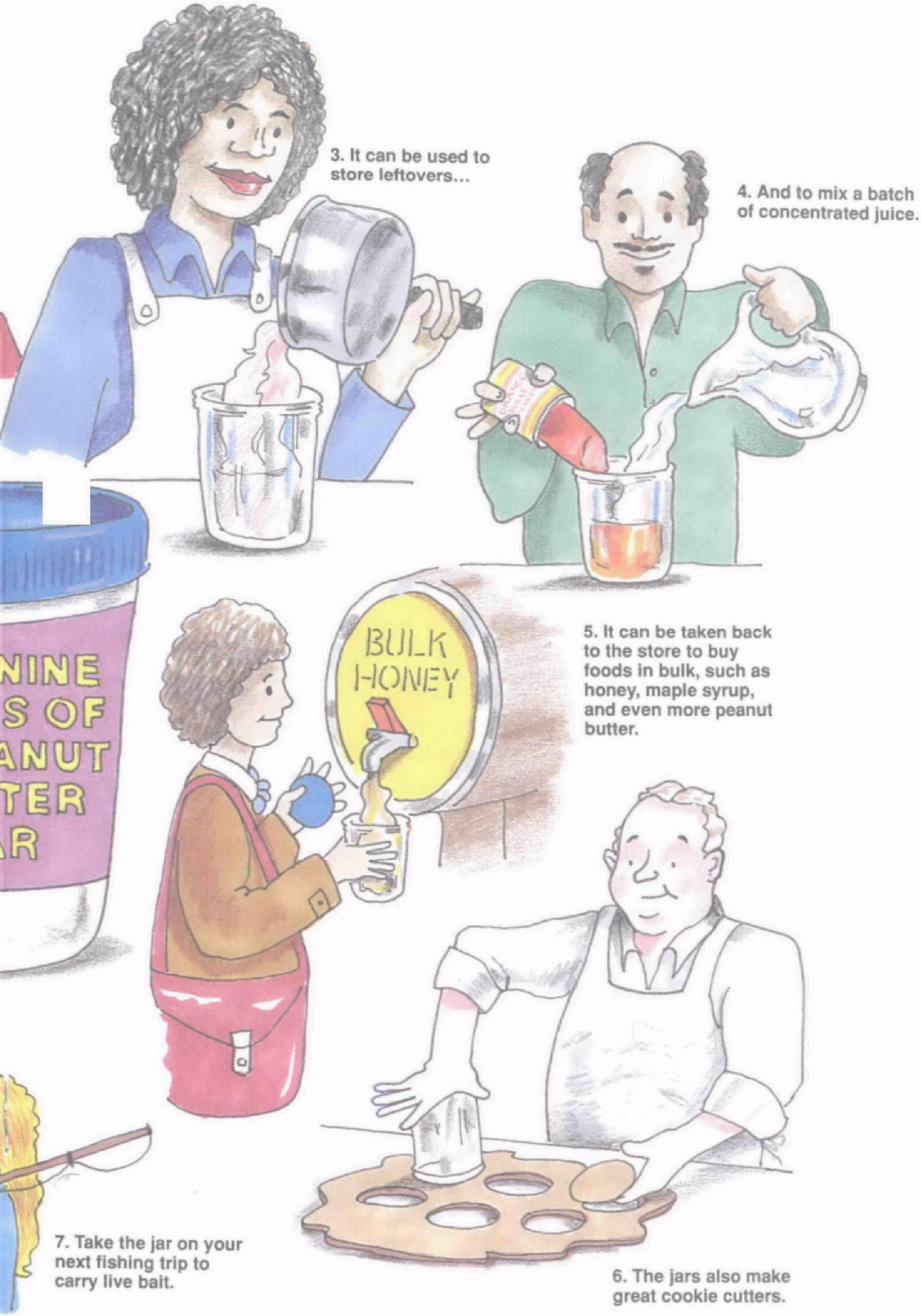
1. The life of a peanut butter jar begins on the supermarket shelf, filled with your favorite brand. When emptied and cleaned out, you and your family can use it in many practical ways.

2. It's a perfect container for displaying a prized marble collection.



9. When you collect too many peanut butter jars, be sure to recycle the extras. They may be used to manufacture new peanut butter jars or other containers.

8. Then use it to show off the beautiful flowers you picked for the dinner table when the fishing is done.



3. It can be used to store leftovers...

4. And to mix a batch of concentrated juice.

5. It can be taken back to the store to buy foods in bulk, such as honey, maple syrup, and even more peanut butter.

6. The jars also make great cookie cutters.

7. Take the jar on your next fishing trip to carry live bait.

9.

Select products made from recycled materials.

Participating in a local or regional recycling program is only part of the recycling process. For recycling to succeed, recyclable materials must be processed into new products, and those products must be purchased and used.

- Look for items in packages and containers made of recycled materials. Many bottles, cans, paper wrappings, bags, cereal boxes, and other cartons and packages are made from recycled materials.
- Use products with recycled content whenever you can. For instance, many paper, glass, metal, and plastic products contain recovered materials. Some examples are stationery, wrapping paper, computer paper, and many containers. Many of these items are available in grocery, drug, and other retail stores. Mail-order catalogues, stationers, and print shops also may stock these and other recycled items.
- When checking products for recycled content, look for a statement that recycled materials were used and, if possible, choose the item with the largest percentage of recycled content, if known. You can also call directory assistance at 1-800-555-1212 to obtain manufacturers' 800 numbers to find out how much recycled material their products contain.
- Encourage state and local government agencies, local businesses, and others to purchase recycled products such as paper, re-refined oil, and retread tires. For the federal government, guidelines already exist that mandate the purchase of these and other products.

Reducing Unwanted Advertising Mail

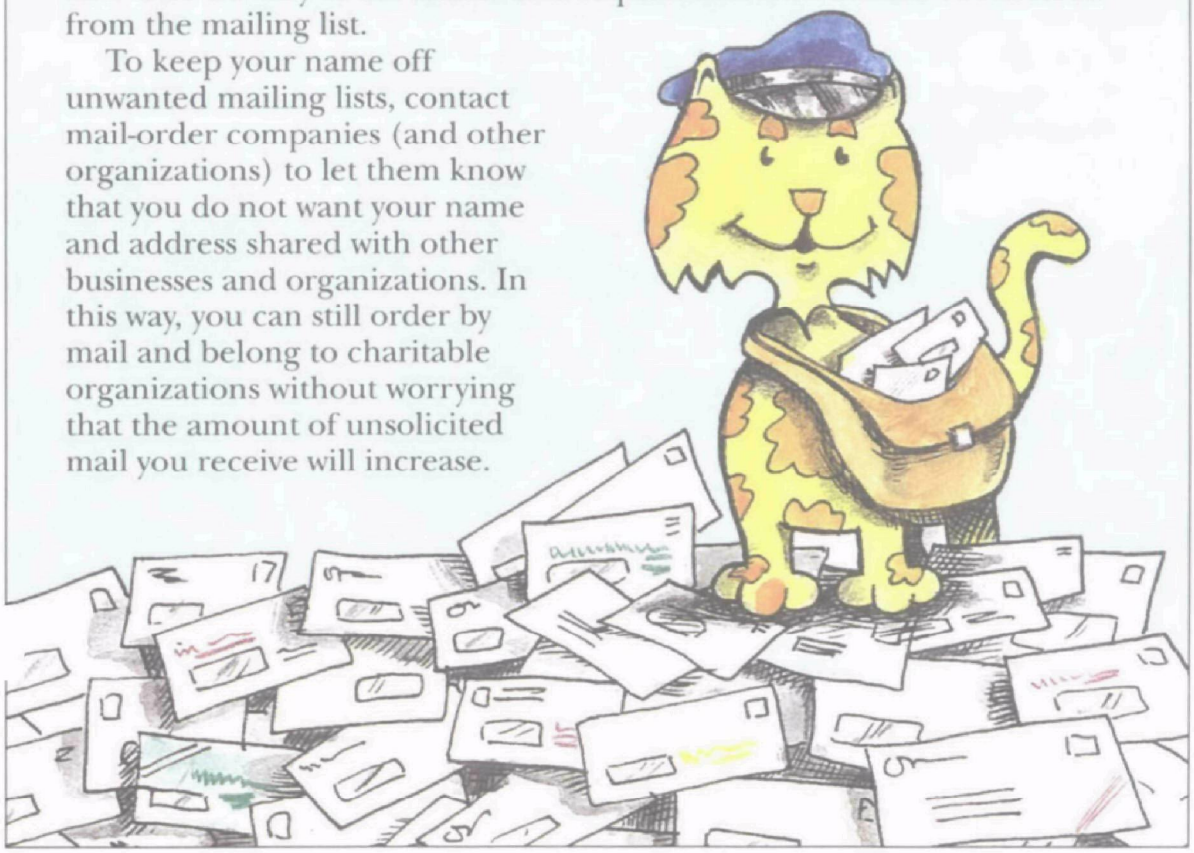
Each year, millions of Americans make one or more purchases through the mail. When people make these mail-order purchases, their names often are added to a list and marketed to other companies that do business through the mail. While many people enjoy the catalogues they receive as a result of these lists, those who would like to receive less national advertising mail can ask companies not to rent or share their names with other mailers. People who choose not to shop at home can also write to:

Mail Preference Service
Direct Marketing Association
P.O. Box 9008
Farmingdale, NY 11735-9008

The Mail Preference Service is a no-charge service that removes names from many national mailing lists. Individuals who would like to use this service are requested to provide their names and addresses (including zip code), and any spelling variations they have noticed on mailing labels, to the Mail Preference Service.

It may take a few months before there is a noticeable decrease in the amount of national advertising mail delivered. In addition, local advertising mail, such as store flyers, will not be affected. In these cases, people can write directly to the mailer and request that their names be removed from the mailing list.

To keep your name off unwanted mailing lists, contact mail-order companies (and other organizations) to let them know that you do not want your name and address shared with other businesses and organizations. In this way, you can still order by mail and belong to charitable organizations without worrying that the amount of unsolicited mail you receive will increase.



10.

Compost yard trimmings and some food scraps.

Backyard composting of certain food scraps and yard trimmings can significantly reduce the amount of waste that needs to be managed by the local government or put in a landfill. When properly composted, these wastes can be turned into natural soil additives for use on lawns and gardens, and used as potting soil for house plants. Finished compost can improve soil texture, increase the ability of the soil to absorb air and water, suppress weed growth, decrease erosion, and reduce the need to apply commercial soil additives.

- Learn how to compost food scraps and yard trimmings (see the guidelines on the next page). For more information, consult reference materials on composting, or check with local environmental, agricultural, or park services. Composting foods in highly populated areas is not recommended because it can attract rodents and other pests.
- Participate in local or regional programs that collect compostable materials. If no program is in place, contact public officials and community leaders about setting one up.
- If there's no room for a compost pile, offer compostable materials to community composting programs or garden projects near you.
- If you have a yard, allow mown grass clippings to remain on the lawn to decompose and return nutrients back to the soil, rather than bagging and disposing of them.

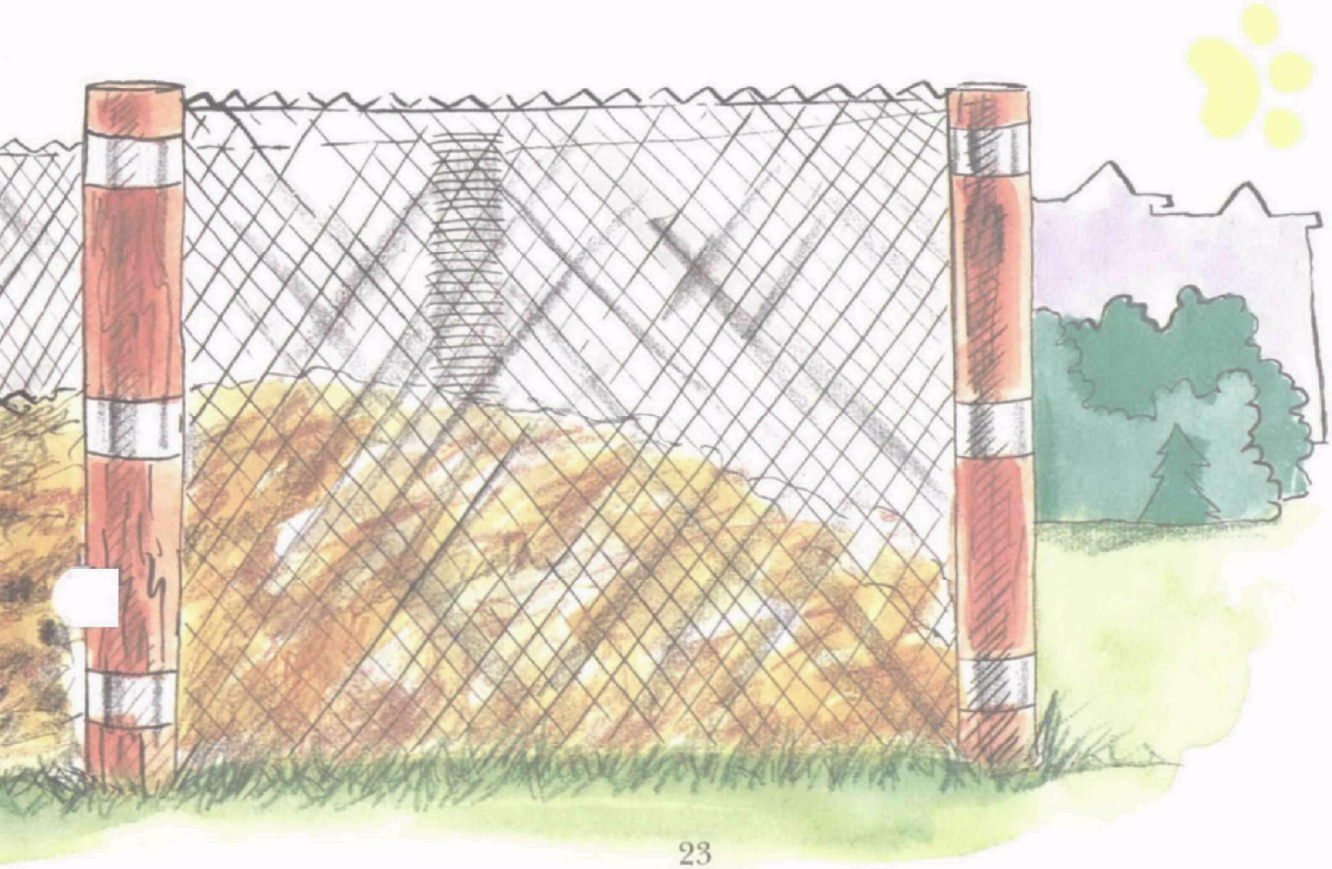
Composting Is Easy!

A compost pile can be set up in a corner of the yard with few supplies. Choose a level spot about 3- to 5-feet square near a water source and preferably out of direct sunlight. Clear the area of sod and grass. When building a composting bin, such as with chicken wire, scrap wood, or cinder blocks, be sure to leave enough space for air to reach the pile. One removable side makes it easier to tend the pile.

Many foods can be composted, including vegetable trimmings, egg shells, coffee grounds with filters, and tea bags. In addition to leaves, grass, and yard clippings, vacuum cleaner lint, wool and cotton rags, sawdust, shredded newspaper, and fireplace ashes can be composted. DO NOT compost meats, dairy foods, or any fats, oil, or grease because they can attract pests.

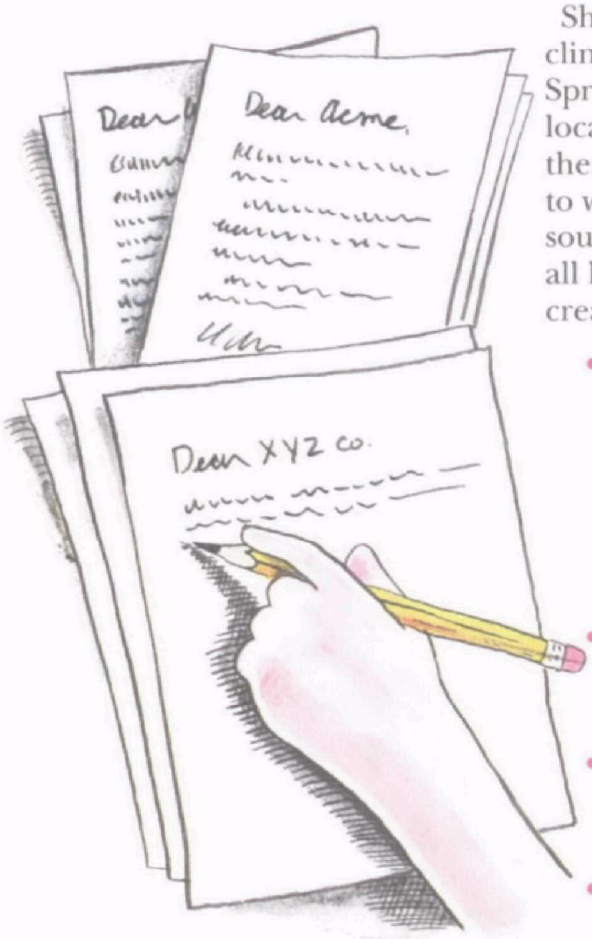
Start the pile with a 4-inch layer of leaves, loose soil, or other coarse yard trimmings. If you are going to compost food scraps (a slightly more involved process), you should mix them with yard trimmings when adding them to the pile. Alfalfa meal or clean cat litter may be added to the pile to absorb odors. In dry weather, sprinkle water on the pile, but don't get it too soggy. Turn the pile every few weeks with a pitchfork to circulate air and distribute moisture evenly. Don't be surprised by the heat of the pile or if you see worms, both of which are part of the decomposition process. Make sure children do not play in the composting pile or bin.

In most climates, the compost is done in 3 to 6 months when it becomes a dark crumbly material that is uniform in texture. Spread it in the garden or yard beds or under the shrubbery. The compost also can be used as potting soil.



11.

Educate others on source reduction and recycling practices. Make your preferences known to manufacturers, merchants, and community leaders.



Share information about source reduction, recycling, and composting with others. Spread the word to family, friends, neighbors, local businesses, and decision-makers. Encourage them to learn more about solid waste issues and to work toward implementing and promoting source reduction, recycling, and composting. We all have the power to influence others and help create the type of world in which we want to live.

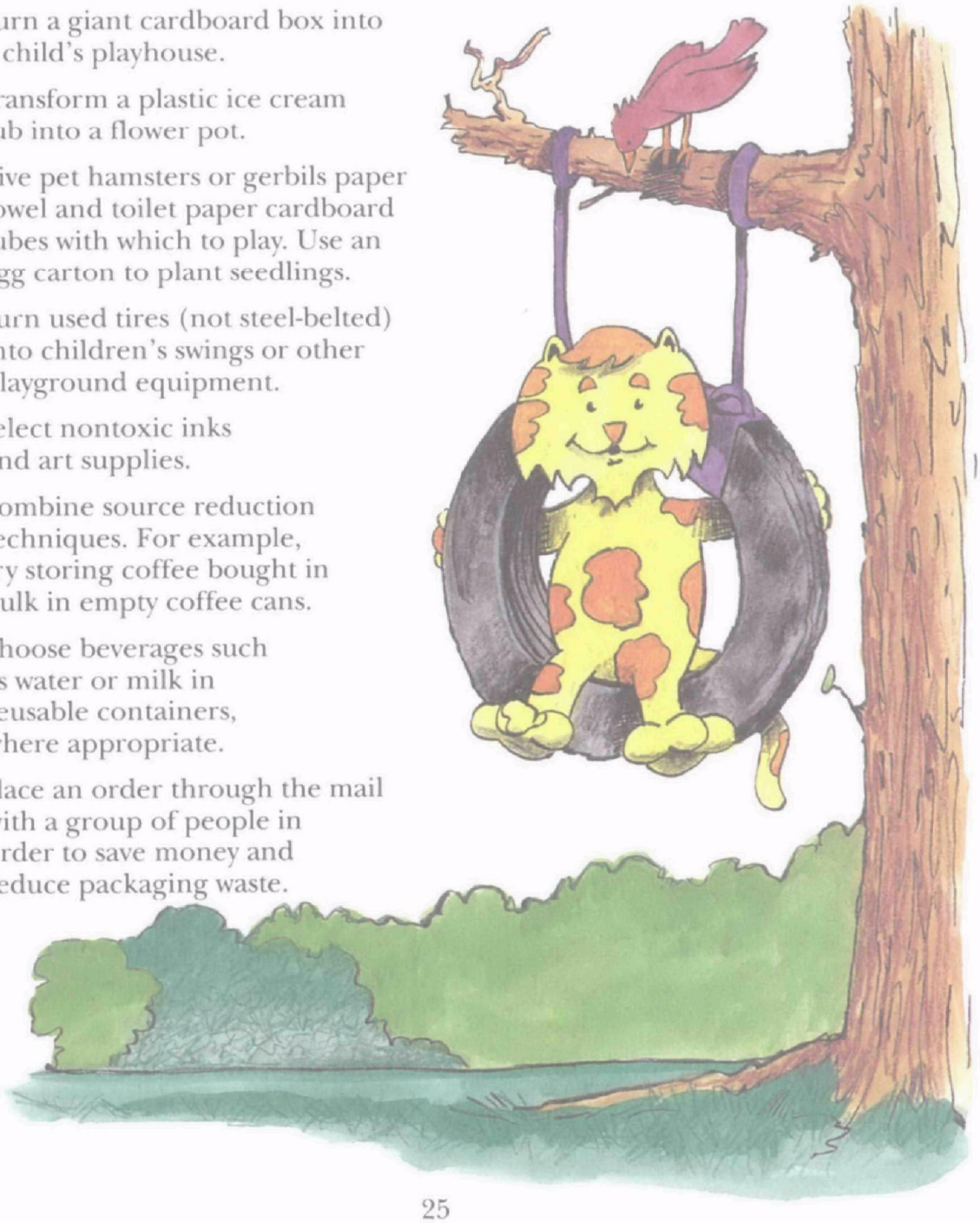
- Consider writing to companies to encourage them to reduce unnecessary packaging and the use of hazardous components in products. In addition, let companies know when they've made positive changes. Many companies offer toll-free 800 numbers you can call with these comments.
- Encourage source reduction, recycling, and composting programs for yard trimmings in the community.
- Where appropriate, encourage the use of reusable, recycled, and recyclable materials in the workplace.
- Encourage the use of efficient, long-lasting equipment.
- Urge schools to provide environmental education and to teach about source reduction, recycling, and composting.
- Support an environmentally sound waste program in your community that starts with source reduction. Your community also needs access to adequate and safe solid waste facilities such as recycling and composting centers, combustors, and landfills.

12.

Be creative—find new ways to reduce waste quantity and toxicity.

There are many ways to reduce the amount and the toxicity of solid waste. By thinking creatively, many new uses for common items and new possibilities for source reduction and recycling can be discovered. Here are just a few ideas. Now, try some of your own!

- Turn a giant cardboard box into a child's playhouse.
- Transform a plastic ice cream tub into a flower pot.
- Give pet hamsters or gerbils paper towel and toilet paper cardboard tubes with which to play. Use an egg carton to plant seedlings.
- Turn used tires (not steel-belted) into children's swings or other playground equipment.
- Select nontoxic inks and art supplies.
- Combine source reduction techniques. For example, try storing coffee bought in bulk in empty coffee cans.
- Choose beverages such as water or milk in reusable containers, where appropriate.
- Place an order through the mail with a group of people in order to save money and reduce packaging waste.



It's far better to reduce the toxicity and amount of solid waste in the first place than to cope with it after it has been created. Through source reduction, recycling, and composting, many environmental benefits and cost savings can be realized. Just remember the four "R's"....

REDUCE the amount of trash discarded.

REUSE containers and products.

RECYCLE, use recycled products, and compost.

RESPOND to the solid waste dilemma by reconsidering waste-producing activities and by expressing preferences for less waste.

Success with Source Reduction

People from small towns and big cities across America are implementing innovative source reduction programs and are realizing economic as well as environmental benefits.

You can encourage and support these changes in your community by working with civic groups, local merchants, and county boards. Through consumer education campaigns, school curricula, economic incentives, and other legislative, financial, and educational measures, your community can set the pace for new ways to reduce solid waste. Here are a few examples of how communities and businesses are reducing waste.

Model Communities

In a growing number of Illinois communities, facilities ranging from industries to schools are practicing source reduction by following the lead of community role models. The Central States Education Center (CSEC), a nonprofit environmental group, has developed a Model Community Program to help communities find ways to reduce waste, eliminate toxins, recycle, and purchase products that contain recycled materials. Through this program, businesses, organizations, and other groups serve as source reduction role models in their communities. The facilities institutionalize various source reduction strategies through in-house committees and on-going educational programs.

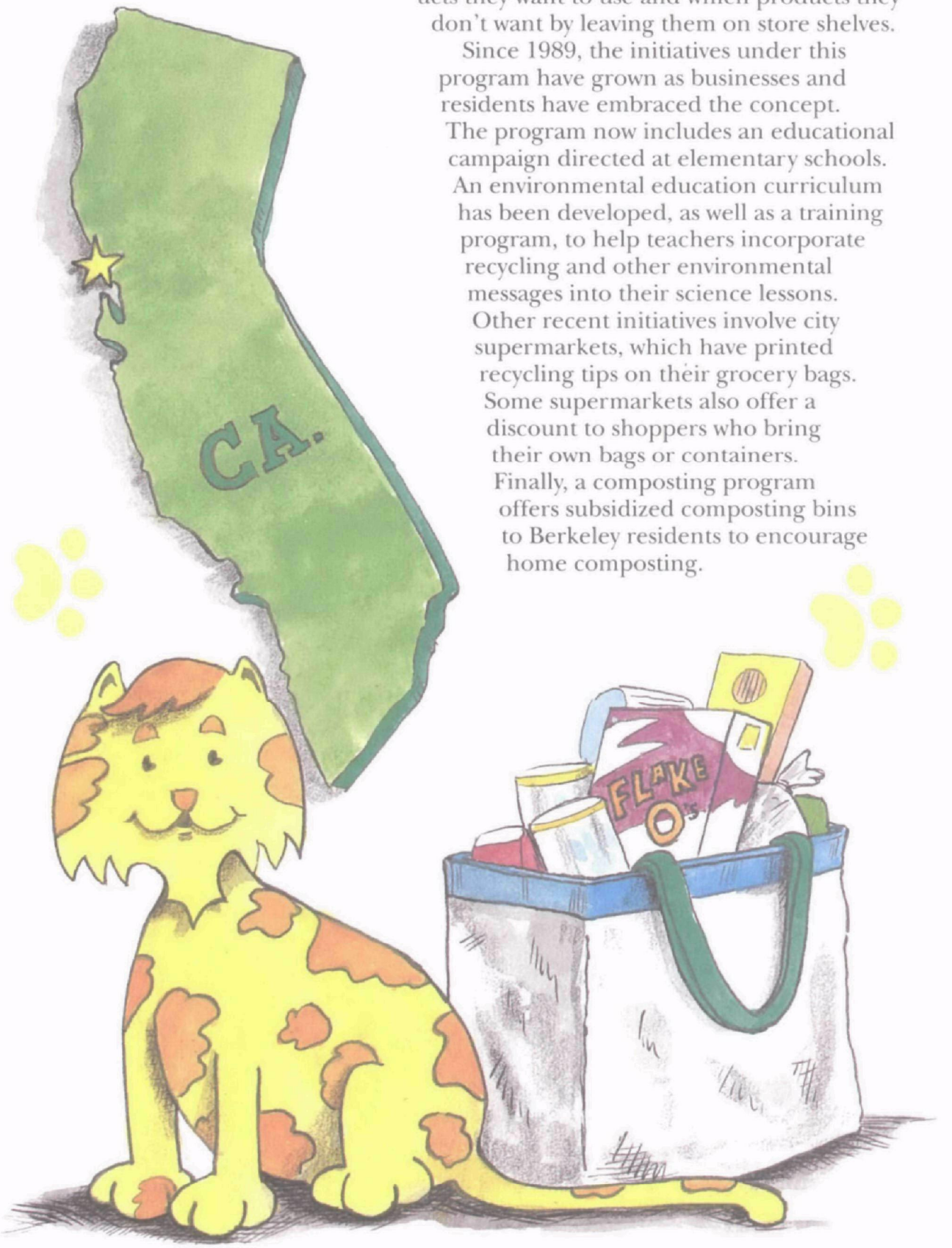
Several schools, industries, churches and other organizations participate in this program. In a model industry, for example, solvent recycling machines are used to make solvents last three times longer. Model supermarkets have a shelf-labeling program to highlight products with less packaging. Additional model facilities include churches, banks, libraries, a radio station, a utility company, newspapers, a theater, a sorority, and even a city hall. At present there are over 70 model facilities in eight different Illinois communities.

As a result of these model facilities, less waste is generated in the participating communities, and much of what is generated gets routed to the community recycling center, rather than the landfill. For example, one model school reduced cafeteria waste by 40 percent. Interest in the program is growing nationwide as communities use the model program to educate citizens and get them involved in reducing their solid waste.

Berkeley—Doing It Right from the Start

In 1989, Berkeley, California, implemented a citywide campaign to help consumers make environmentally sound decisions. The City uses catchy slogans, such as "do it right from the start," "be picky about packaging," and "overcome overpackaging," to urge shoppers to think about how products are packaged and ultimately disposed of. Consumers tell manufacturers which products they want to use and which products they don't want by leaving them on store shelves.

Since 1989, the initiatives under this program have grown as businesses and residents have embraced the concept. The program now includes an educational campaign directed at elementary schools. An environmental education curriculum has been developed, as well as a training program, to help teachers incorporate recycling and other environmental messages into their science lessons. Other recent initiatives involve city supermarkets, which have printed recycling tips on their grocery bags. Some supermarkets also offer a discount to shoppers who bring their own bags or containers. Finally, a composting program offers subsidized composting bins to Berkeley residents to encourage home composting.



Source Reduction—Savings for Business

More and more businesses, large and small, are realizing that source reduction can mean a big payoff in reduced waste and costs. For example, a small newspaper in Grand Rapids, Minnesota, the *Herald Review*, has reduced its waste by almost 30,000 pounds annually, which saves over $18,000 per year. Everyone joins in to reduce waste, from reporters switching to narrow-ruled notebooks to save paper, to photographers saving film by planning the number of exposures they need before shooting.

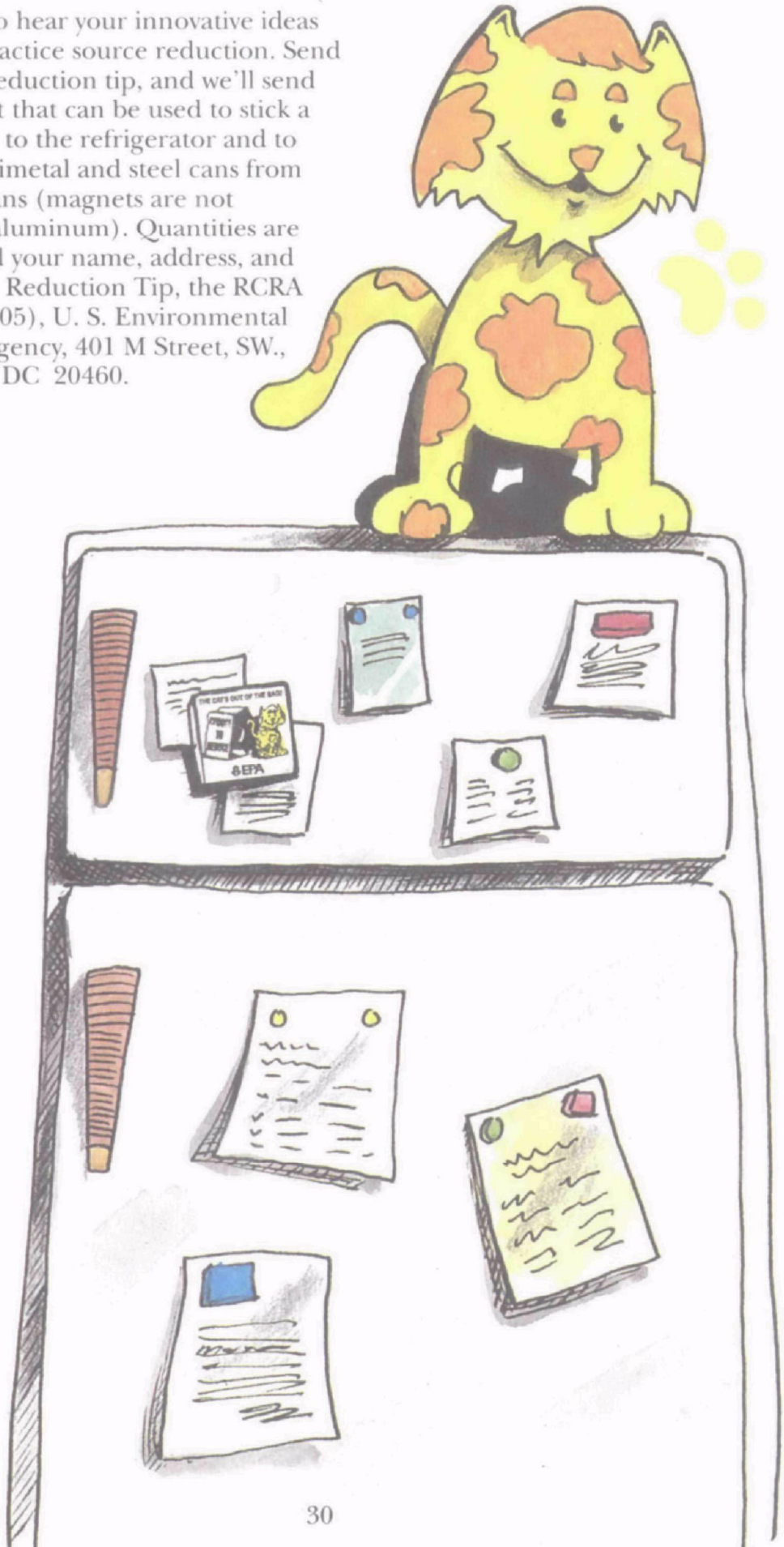
In the office, people reuse mailing labels, rebuild toner cartridges for computer printers, and print on both sides of the paper. A ceramics packaging firm has even been found to purchase the paper left over from the printing process. This "waste exchange" benefits both companies. The newspaper also has found ways to reuse waste ink, film-developing chemicals, and paste-up sheets. These innovative ideas reduce both the amount and the toxicity of the company's wastes.

Also, a large furniture manufacturer, Herman Miller, Inc. (HMI) of Zeeland, Michigan, has reaped savings of $1.4 million annually through waste prevention. It devised packaging containers that can be reused 80 to 100 times and that are made from recycled detergent and milk containers.

Another approach HMI uses is cartonless packaging. This means just placing cardboard edges on the corners of some furniture and wrapping the furniture with plastic film rather than boxing it. The cardboard edges are reused and the plastic film is recycled. This practice has saved HMI $250,000 a year for one type of product. In addition to internal efforts, HMI cosponsors an annual waste exchange fair for other businesses to share information and materials. Workshops are also held to educate attendees about waste prevention. The first fair in 1991 brought together over 300 people and was so successful that attendance tripled in 1992.

What Have You Come Up With?

We want to hear your innovative ideas on how to practice source reduction. Send us a source reduction tip, and we'll send you a magnet that can be used to stick a shopping list to the refrigerator and to distinguish bimetal and steel cans from aluminum cans (magnets are not attracted to aluminum). Quantities are limited. Send your name, address, and tip to Source Reduction Tip, the RCRA Docket (0S-305), U. S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460.



Appendix A

Source Reduction Alternatives Around the Home

Many consumers look for ways to reduce the amount and toxicity of waste around the house. This can be done, in some cases, by using alternative methods or products without hazardous constituents to accomplish a certain task. Here are just a few ideas to get you started.

Drain cleaner	Use a plunger or plumber's snake.
Oven cleaner	Clean spills as soon as the oven cools using steel wool and baking soda; for tough stains, add salt (do not use this method in self-cleaning or continuous-cleaning ovens).
Glass cleaner	Mix 1 tablespoon of vinegar or lemon juice in 1 quart of water. Spray on and use newspaper to wipe dry.
Toilet bowl cleaner	Use a toilet brush and baking soda or vinegar. (This will clean but not disinfect.)
Furniture polish	Mix 1 teaspoon of lemon juice in 1 pint of mineral or vegetable oil, and wipe furniture.
Rug deodorizer	Deodorize dry carpets by sprinkling liberally with baking soda. Wait at least 15 minutes and vacuum. Repeat if necessary.
Silver polish	Boil 2 to 3 inches of water in a shallow pan with 1 teaspoon of salt, 1 teaspoon of baking soda, and a sheet of aluminum foil. Totally submerge silver and boil for 2 to 3 more minutes. Wipe away tarnish. Repeat if necessary. (Do not use this method on antique silver knives. The blade will separate from the handle.) Another alternative is to use nonabrasive toothpaste.
Plant sprays	Wipe leaves with mild soap and water; rinse.
Mothballs	Use cedar chips, lavender flowers, rosemary, mint, or white peppercorns.
Flea and tick products	Put brewer's yeast or garlic in your pet's food; sprinkle fennel, rue, rosemary, or eucalyptus seeds or leaves around animal sleeping areas.

Although the suggested mixtures have less hazardous ingredients than many commercial cleaners and pesticides, they should be used and stored with similar caution. Please follow these guidelines for any household cleaner or pesticide.

- DO NOT mix anything with a commercial cleaning agent.
- If you do store a homemade mixture, make sure it is properly labelled and do not store it in a container that could be mistaken for a food or beverage.
- When preparing alternatives, mix only what is needed for the job at hand and mix them in clean, reusable containers. This avoids waste and the need to store any cleaning mixture.

Appendix B

Reusable Vocabulary

Bimetal - Typically refers to beverage containers with steel bodies and aluminum tops. Steel companies do recycle bimetal cans, but they are handled differently in the recycling stream from aluminum cans.

Combustion - The controlled burning of municipal solid waste to reduce volume, and, commonly, to recover energy.

Composting - The controlled microbial decomposition of organic matter (such as food scraps and yard trimmings) in the presence of oxygen into a humus- or soil-like material.

Curbside collection - A method of collecting recyclable materials at individual homes or places of business by municipal or private parties for transfer to a designated collection site or recycling facility.

Drop-off - A method of collecting recyclable materials where individuals transpor the materials to a designated collection site.

Household hazardous waste - Products containing hazardous substances that are used and disposed of by individual rather than industrial consumers. These products include some paints, solvents, and pesticides.

Integrated waste management - The complementary use of a variety of practices to handle municipal solid waste safely and effectively. Integrated waste management techniques include source reduction, recycling, composting, combustion, and landfilling.

Landfilling - The disposal of solid waste at engineered facilities in a series of compacted layers on land and the frequent daily covering of the waste with soil. Fill areas are carefully prepared to prevent nuisances or public health hazards, and clay and/or synthetic liners are used to prevent releases to ground water.

Municipal solid waste (MSW) - Waste generated in households, commercial establishments, institutions, and businesses. MSW includes used paper, discarded cans and bottles, food scraps, yard trimmings, and other items. Industrial process wastes, agricultural wastes, mining wastes, and sewage sludge are not MSW.

Pre-consumer materials - Recovered materials obtained from manufacturers.

Post-consumer materials - Recovered materials from a consumer-oriented recycling collection system or drop-off center.

Recyclable - Products or materials that can be collected, separated, and processed to be used as raw materials in the manufacture of new products.

Recycled content - The portion of a product's or package's weight that is composed of materials that have been recovered from waste; this may include pre-consumer or post-consumer materials.

Recycling - Separating, collecting, processing, marketing, and ultimately using a material that would have been thrown away.

Reuse - The use of a product more than once in its same form for the same purpose or for different purposes, such as reusing a soft-drink bottle when it is returned to the bottling company for refilling, or reusing a coffee can as a container for nuts and bolts.

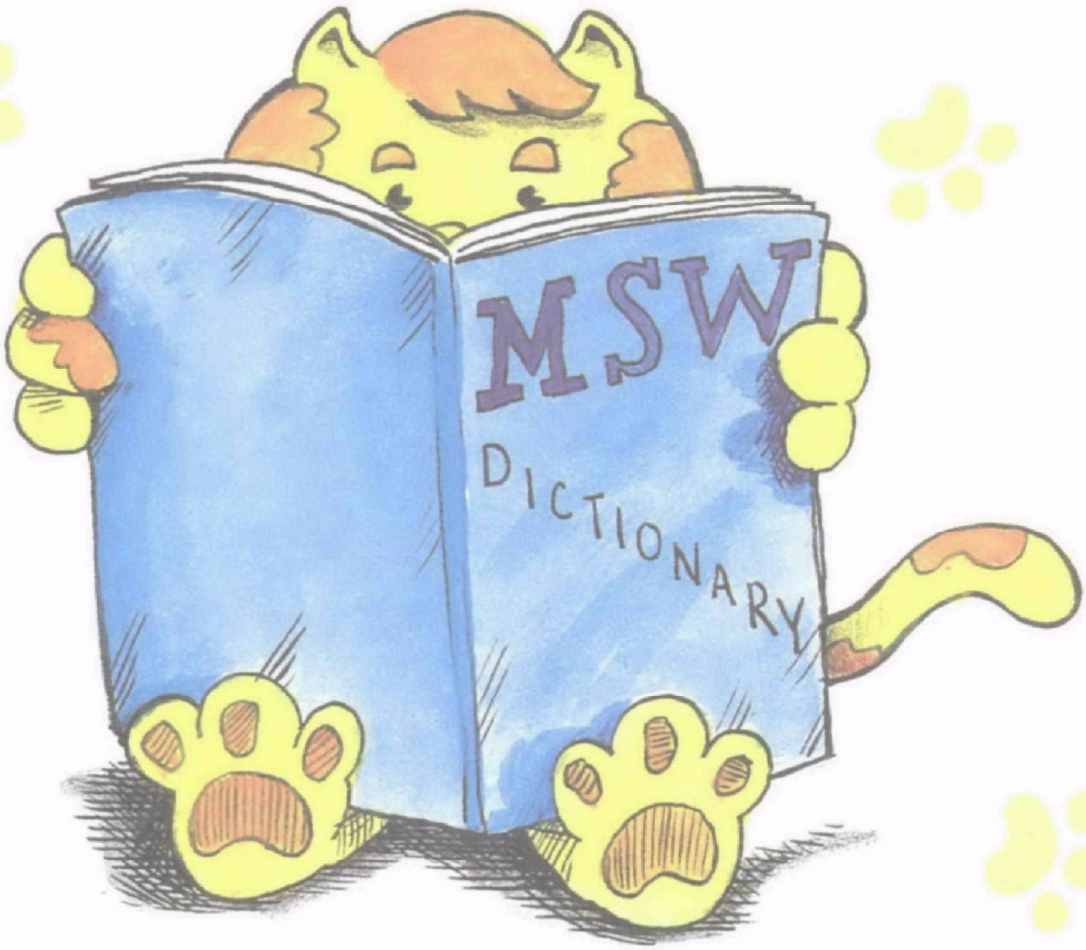
Source reduction - The design, manufacture, purchase, or use of materials to reduce the amount or toxicity of waste. Because it is intended to reduce pollution and conserve resources, source reduction should not increase he net amount or toxicity of wastes generated throughout the life of the product. Source reduction techniques include reusing items, minimizing the use of products that contain hazardous compounds, using only what is needed, extending the useful life of a product, and reducing unneeded packaging.

Source separation - Separating materials (such as paper, metal, and glass) by type at the point of discard so that they can be recycled.

Toxic - Ability (or property) of a substance to produce harmful or lethal effects on humans and/or the environment.

Virgin materials - Resources extracted from nature in their raw form, such as timber or metal ore.

Yard trimmings - The component of solid waste composed of grass clippings, leaves, twigs, branches, and garden refuse.



Appendix C

EPA Resources

The following EPA publications are available at no charge through the Agency's RCRA Hotline. Call 1-800-424-9346 Monday through Friday, 8:30 a.m. to 7:30 p.m. EST. For the hearing impaired, the number is TTD (800) 553-7672. In Washington, DC, call (703) 920-9810 or TDD (703) 486-3323.

Bibliography of Municipal Solid Waste Management Alternatives (EPA/530-SW-89-055). A listing of approximately 200 publications available from industry, government, and environmental groups.

Characterization of Municipal Solid Waste in the United States: 1990 Update (EPA/530-SW-90-042). A report characterizing the national solid waste stream in terms of products and materials and examining how these wastes are managed.

Characterization of Products Containing Lead and Cadmium in Municipal Solid Waste in the United States, 1970 to 2000 (EPA/530-SW-89-015C). A report characterizing the products that contribute to the lead and cadmium found in municipal solid waste.

Decision-Maker's Guide to Municipal Solid Waste Management (EPA/530-SW-89-072). A guide book to help policymakers understand and evaluate their current waste management problems and formulate possible solutions.

Environmental Fact Sheet: Yard Waste Composting (EPA/530-SW-91-009). A fact sheet defining composting, the composting process, and how compost can be used.

Getting at the Source: Strategies for Reducing Municipal Solid Waste, Executive Summary (1991). Excerpts from a report prepared under an EPA grant by the World Wildlife Fund & Conservation Foundation. The report examines the evolving concept of source reduction and lays out an evaluation framework that decision-makers can use to help devise effective source reduction strategies.

Methods to Manage and Control Plastic Wastes - Executive Summary (EPA/530-SW-89-051A). The summary of a report examining many issues related to plastics, including reduction, recycling, degradability, and damage to marine life.

Plastics Fact Sheets. A series of five fact sheets about plastics:

- *Plastics: The Facts about Production, Use, and Disposal* (EPA/530-SW-90-017A). A fact sheet reviewing major uses of plastics and impacts of disposal.
- *The Facts about Plastics in the Marine Environment* (EPA/530-SW-90-017B). A fact sheet summarizing the main sources and impact of plastics found in the ocean.
- *Plastics: The Facts on Source Reduction* (EPA/530-SW-90-017C). A fact sheet describing the possibilities for source reduction of different types of plastic products.
- *The Facts on Degradable Plastics* (EPA/530-SW-90-017D). A fact sheet outlining the information currently available on degradable plastics, their uses, and their impacts on people and the environment.

- *The Facts on Recycling Plastics* (EPA/530-SW-90-017E). A fact sheet summarizing the opportunities available for recycling plastics, and the current state of plastic recycling technology.

Recycling (EPA/530-SW-88-050). A concise citizen's brochure on recycling and its role in solid waste management.

Recycle Today! A series of five publications aimed at educators and students:

- *Recycle Today! An Educational Program for Grades K-12* (EPA/530-SW-90-025). A concise pamphlet explaining the goals and objectives of EPA's educational recycling program and the four resources listed below.
- *Let's Reduce and Recycle! A Curriculum for Solid Waste Awareness* (EPA/530-SW-90-005). A booklet of lessons and activities to teach students in grades K-12 about solid waste generation and management. It teaches a variety of skills, including science, vocabulary, mathematics, and creative writing.
- *School Recycling Programs: A Handbook for Educators* (EPA/530-SW-90-023). A handy manual with step-by-step instructions on how to set up a school recycling program.

  Adventures of the Garbage Gremlin: Recycle and Combat a Life of Grime (EPA/530-SW-90-024). A comic book introducing students in grades 4-7 to the benefits of recycling.
- *Ride the Wave of the Future: Recycle Today!* (EPA/530-SW-90-010). A colorful poster designed to appeal to all grade levels that can be displayed in conjunction with recycling activities or used to help foster recycling.

Recycling Works! (EPA/530-SW-89-014). A booklet describing 14 successful state and local recycling programs in the United States.

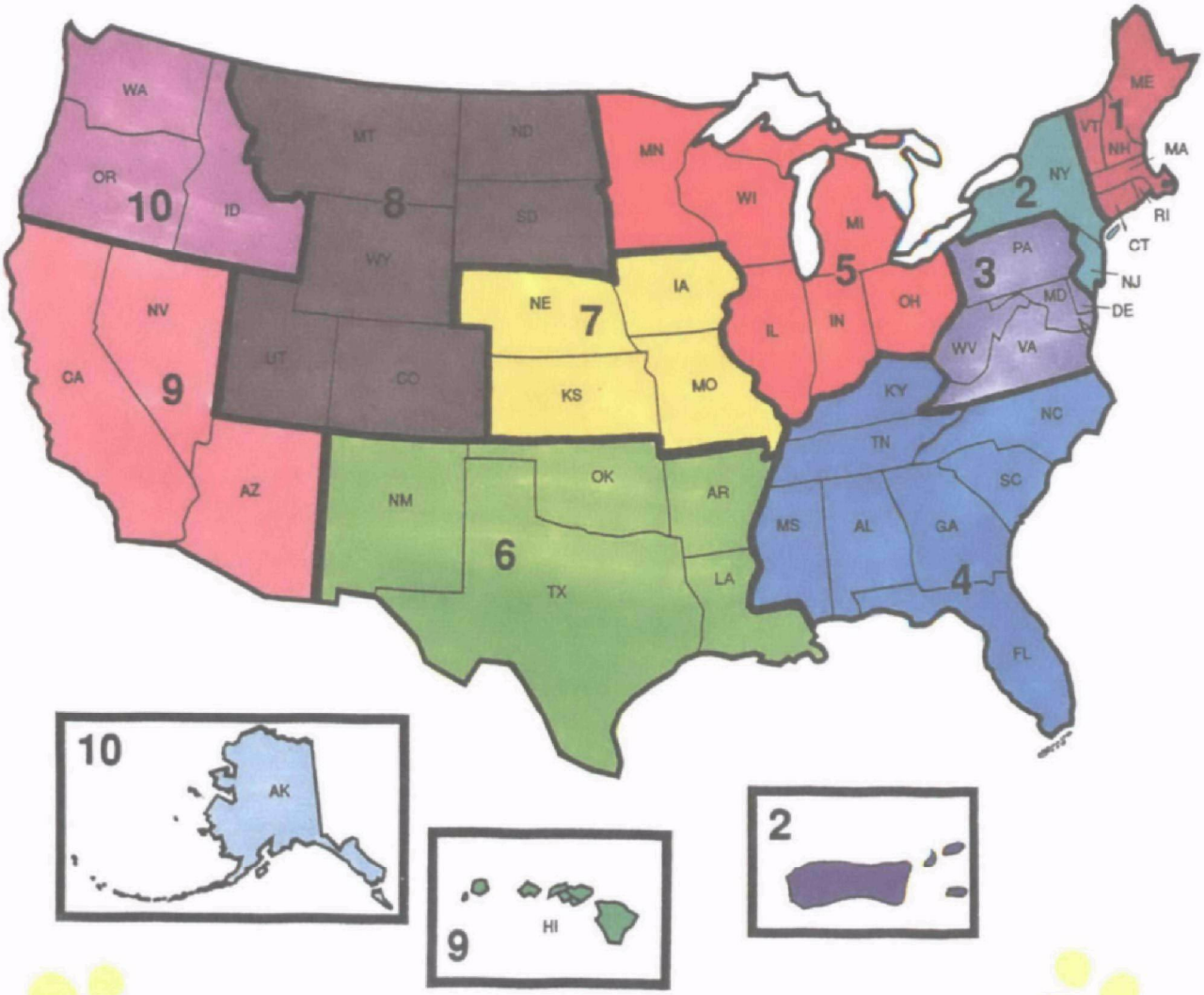
Reusable News (EPA/530-SW-90-018). A periodic newsletter covering a diverse array of topics related to municipal solid waste management, including source reduction and recycling.

Unit Pricing: Providing an Incentive to Reduce Municipal Solid Waste (EPA/530-SW-91-005). A booklet describing unit pricing systems in which customers are charged for waste collection and disposal services based on the amount of trash they generate.

Used Oil Recycling Publications. A series of three brochures and a manual on ways to recycle used oil:

- *How to Set Up a Local Used Oil Recycling Program* (EPA/530-SW-89-039A). An easy-to-follow manual for local decision-makers, environmental groups, and community organizations.
- *Recycling Used Oil: What Can You Do?* (EPA/530-SW-89-039B). A pamphlet describing how the general public can participate in used oil recycling.
- *Recycling Used Oil: 10 Steps to Change Your Oil* (EPA/530-SW-89-039C). A pamphlet describing how citizens can change their car oil.

  Recycling Used Oil: For Service Stations and Other Vehicle-Service Facilities (EPA/530-SW-89-039D). A pamphlet describing how service station owners can play a key role in facilitating used oil recycling.



EPA Regional Offices

Region 1
U.S. EPA - Region 1
J.F.K. Federal Building
Boston, MA 02203
(617) 573-5720

Region 2
U.S. EPA - Region 2
26 Federal Plaza
New York, NY 10278
(212) 264-3384

Region 3
U.S. EPA - Region 3
841 Chestnut Street
Philadelphia, PA 19107
(215) 597-9800

Region 4
U.S. EPA - Region 4
345 Courtland Street, N.E.
Atlanta, GA 30365
(404) 347-2091

Region 5
U.S. EPA - Region 5
77 West Jackson Boulevard
Chicago, IL 60604
(312) 353-2000

Region 6
U.S. EPA - Region 6
First Interstate Bank Tower
1445 Ross Avenue
Dallas, TX 75270-2733
(214) 655-6655

Region 7
U.S. EPA - Region 7
726 Minnesota Avenue
Kansas City, KS 66101
(913) 551-7050

Region 8
U.S. EPA - Region 8
Denver Place
999 18th Street, Suite 500
Denver, CO 80202-2405
(303) 293-1662

Region 9
U.S. EPA - Region 9
75 Hawthorne Street
San Francisco, CA 94105
(415) 744-2074

Region 10
U.S. EPA - Region 10
1200 Sixth Avenue
Seattle, WA 98101
(206) 442-2782

United States
Environmental Protection
Agency

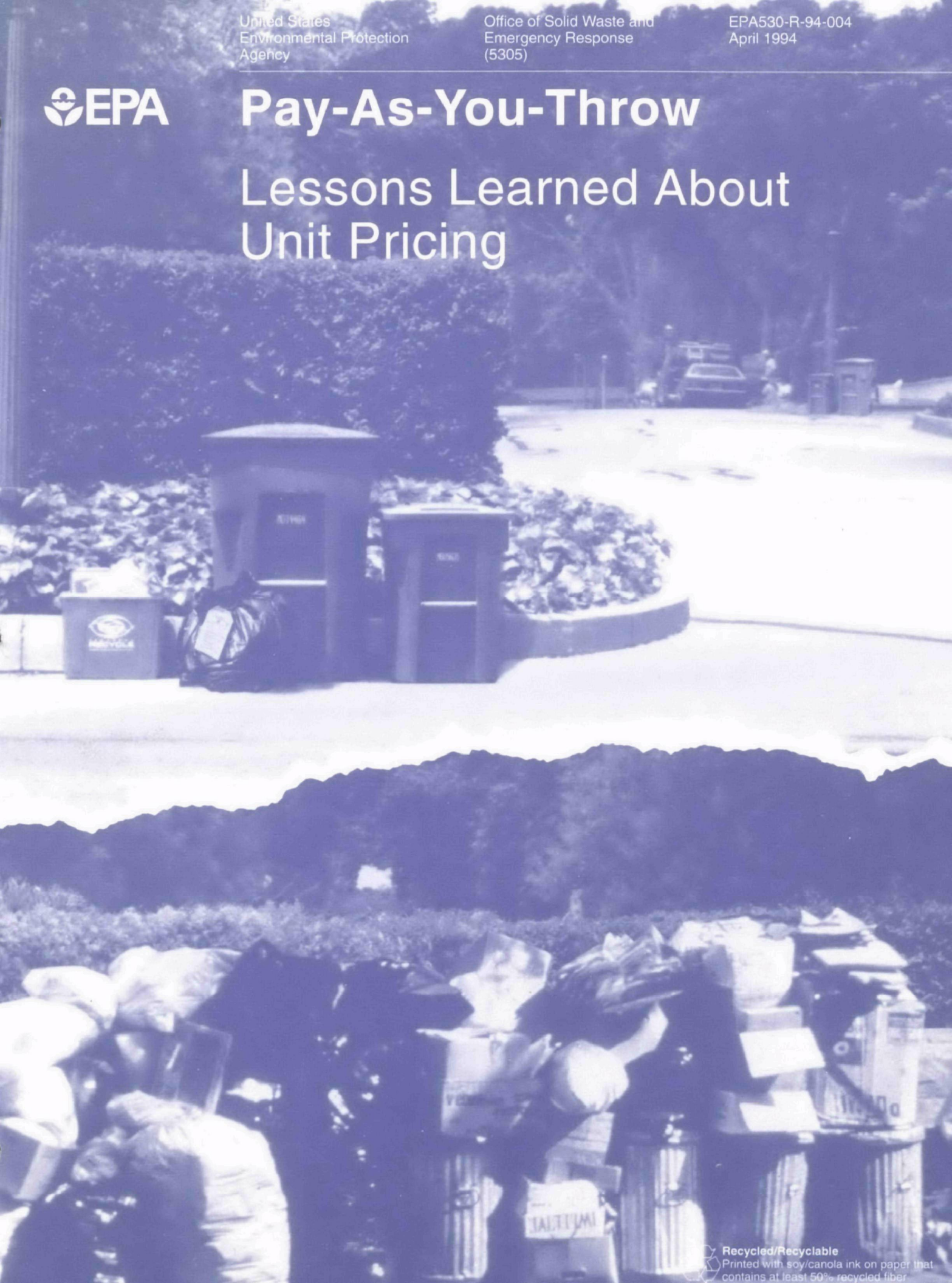
Office of Solid Waste and
Emergency Response
(5305)

EPA530-R-94-004
April 1994

EPA

Pay-As-You-Throw

Lessons Learned About Unit Pricing



Recycled/Recyclable
Printed with soy/canola ink on paper that contains at least 50% recycled fiber

Pay-As-You-Throw

Lessons Learned About Unit Pricing of Municipal Solid Waste

Prepared by

Janice L. Canterbury
U.S. EPA Office of Solid Waste

Acknowledgements

The following state, county, and local officials and private consultants contributed their expertise in unit pricing programs to EPA's Unit Pricing Roundtable and to the development of this guide:

Nancy Lee Newell, City of Durham, North Carolina
Peggy Douglas, City of Knoxville, Tennessee
Barbara Cathey, City of Pasadena, California
Bill Dunn, Minnesota Office of Waste Management
Nick Pealy, Seattle Solid Waste Utility
Jody Harris, Maine Waste Management Agency
Jamy Poth, City of Austin, Texas
Jeanne Becker, Becker Associates
Lisa Skumatz and Cabell Breckinridge, Synergic Resources Corporation
Lon Hultgren, Town of Mansfield, Connecticut
Greg Harder, Pennsylvania Department of Environmental Resources
Thomas Kusterer, Montgomery County Government, Maryland
Robert Arner, Northern Virginia Planning District Commission

Their assistance is greatly appreciated.

Contents

About This Guide vi

Key to Symbols viii

PART I: Is Unit Pricing Right for Your Community? 1

What Is Unit Pricing? 2

Potential Benefits to Unit Pricing 3

Potential Barriers to Unit Pricing 4

Types of Communities That Can Benefit From Unit Pricing 5

Making a Decision About Unit Pricing 6

PART II: Building Consensus and Planning for Unit Pricing 10

Setting Goals and Establishing a Unit Pricing Team 11

Addressing Barriers 12

Building a Public Consensus 13

Scheduling Your Planning Activities 15

PART III: Designing an Integrated Unit Pricing Program 19

The Building Blocks 20

Volume-Based Versus Weight-Based Programs 20

Container Options 22

Pricing Structures 24

Billing and Payment Systems 26

Accounting Options 26

Program Service Options 27

Multi-Family Housing 29

Residents With Special Needs 30

Putting the Blocks Together **34**

Step 1: Estimating Demand 35

Step 2: Choosing Components 36

Step 3: Estimating Costs 37

Step 4: Developing a Rate Structure 37

Step 5: Calculating Revenues 38

Step 6: Evaluating and Adjusting the Program 38

PART IV: Implementing and Monitoring Unit Pricing **45**

Implementation Activities 46

Public Education and Outreach 47

Reorganizing Your Solid Waste Agency's Administration 50

Developing a Schedule 52

Program Monitoring and Evaluation 52

APPENDIXES **63**

Appendix A: Unit Pricing Roundtable Discussion: Questions and Alternatives . 63

Appendix B: Putting the Blocks Together: Additional Examples . . . 79

Appendix C: Definitions 83

Appendix D: Bibliography 85

About This Guide

In December 1992, as part of the U.S. Environmental Protection Agency's (EPA's) efforts to disseminate information about potential solutions to solid waste management issues, the Agency organized a gathering of experts and local officials involved in unit pricing programs. The Unit Pricing Roundtable resulted in a wide-ranging discussion of the benefits and barriers associated with unit pricing programs. This guide is based on the insights gained from that meeting.

Pay-As-You-Throw: Lessons Learned About Unit Pricing of Municipal Solid Waste is designed to help local solid waste administrators and planners, elected officials, community and civic groups, environmental and business organizations, and others find an answer to the question, "Is unit pricing a viable option for our community, and, if so, how do we implement it?"

Since communities differ in size, demographics, governing jurisdiction, and other factors, this guide presents lessons learned in a variety of communities that have implemented unit pricing. As such, decision-makers can use the guide to chart a course through the issues and potential obstacles involved in launching a unit pricing program and tailoring it to meet the specific needs and goals of the community.

In addition to information drawn from the Roundtable, the guide is derived from data on dozens of existing unit pricing programs in communities of varying sizes and demographics. Case studies showcase differences in the types of collection systems, fee structures, and complementary programs that can accompany unit pricing programs. The guide also reflects information extracted from available literature, as well as direct advice from experts in the field.

The process of considering, planning, and implementing a unit pricing program is a process of moving from general to specific notions of addressing waste management issues. After considering long-term solid waste goals and options and how unit pricing might help achieve them, decision-makers must move on to broad system planning and finally to specific details. This guide is designed to mirror that process of increasing specificity. It is divided into four parts:

Part I: Is Unit Pricing Right for Your Community?

Part I offers an introduction to the concept of unit pricing, helps readers decide whether unit pricing holds enough promise for their communities to merit continued investigation and study, and provides an overview of the organization of the guide.

Part II: Building Consensus and Planning for Unit Pricing

Part II focuses on creating a framework for a successful system. It describes how to establish goals, build a consensus for change within the community, make a decision to pursue a unit pricing strategy, and perform basic planning tasks for the new program.

Part III: Designing an Integrated Unit Pricing Program

Part III introduces solid waste officials to unit pricing program options, including container type and size, pricing structures, and billing systems. It also presents a six-step process for selecting options and designing a rate structure that will best address the community's unit pricing goals.

Part IV: Implementing and Monitoring Unit Pricing

Part IV guides communities through the process of launching their unit pricing program. While implementation often requires an ongoing series of tasks, this part focuses on the central issues: providing public education and reorganizing the solid waste agency's administrative office. Part IV also discusses ways to collect and analyze data regarding the performance of the program.

To meet the needs of many decision-makers, this guide has been designed to be modular in approach. Solid waste officials with little experience with unit pricing will want to read the entire guide carefully. Decision-makers who are somewhat familiar with unit pricing might want to skim Part I, while carefully studying the remainder of the guide. Those individuals with a good understanding of the pros and cons of unit pricing might proceed directly to the design and implementation guidelines offered in Parts III and IV.

Key to Symbols

To help readers focus on key issues, symbols are used throughout the guide to indicate the themes and concepts that are central to unit pricing. These are:

TRADEOFFS

There are no universally applicable guidelines that must be followed when developing a unit pricing program. All unit pricing options offer their own set of advantages and disadvantages. When designing a unit pricing program, decision-makers need to weigh these factors and choose the course of action that best suits the needs of their communities.

EDUCATION

Involving and educating the public is key to the success of any unit pricing program.

COSTS

One of the biggest issues associated with unit pricing programs concerns the costs to design and implement a program. Residents also will be concerned about waste collection fees.

HIERARCHY

EPA has established a hierarchy identifying the preferred methods for managing solid waste. At the top of the hierarchy is waste prevention. Recycling (including composting) is the next preferred technique, used for managing the waste that cannot be prevented. Finally, landfilling and combustion can be used to dispose of the remaining waste.

BARRIERS

Decision-makers will need to address some potential hurdles to implementing unit pricing. These include recovering expenses, increased administrative costs, perception of increased costs being passed on to citizens, and illegal dumping.

PART I

Is Unit Pricing Right for Your Community?

Over the past several years, many communities across the United States have found it increasingly difficult to effectively and economically manage their municipal solid waste (MSW). Against a backdrop of steadily rising waste generation rates, many communities have seen their local landfills closing, tipping fees rising, and prospects for siting new disposal facilities diminishing. Other demands on waste management systems include growing public awareness of general environmental issues, as well as state and locally legislated waste prevention and recycling goals.

In response, many communities have begun 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. In addition, recognizing that market-based approaches are proving to be important tools in dealing with environmental issues, some communities have turned to economic incentives to encourage residents to prevent waste whenever possible and recycle or compost the remainder. One such incentive system is unit pricing.

What Is Unit Pricing?

Unit pricing is not a new concept. Berkeley, California, began its unit pricing program in 1924, and Richmond, California, launched a unit pricing program in 1916!

Traditionally, many communities in the United States have paid for waste management services through property taxes or through an annual fee charged to each household. The cost per residence remains constant regardless of differences in the amount of waste generated. This creates the mistaken impression that MSW management is free.

Unit pricing, also known as variable rate pricing or pay-as-you-throw, is a system under which residents pay for municipal waste management services per unit of waste collected rather than through a fixed fee. Unit pricing takes into account variations in waste generation rates by charging households or residents based on the amount of trash they place at the curb, thereby offering individuals an incentive to reduce the amount of waste they generate and dispose of.

Unit pricing programs can take two basic forms. Residents can be charged by:

- Volume of waste, using bags, tags or stickers, or prescribed sizes of waste cans.
- Weight of waste, with the municipality measuring at the curbside the amount of waste set out for collection.

While they operate differently from one another, these systems share one defining characteristic: residents who throw away more pay more.

By encouraging residents to prevent waste and recycle whenever possible, unit pricing is helping communities to better manage their solid waste.

If the basic concept of unit pricing is straightforward, however, the decision to adopt such a program is far from simple. To help communities considering unit pricing as a solution to their mounting solid waste management difficulties, EPA convened a Unit Pricing Roundtable, attended by representatives from communities that had implemented unit pricing or were actively considering it. EPA then organized the resulting wealth of ideas and advice to produce this guide. EPA designed the guide to help readers determine whether unit pricing is a viable option for their community and, if so, which factors to consider when planning and implementing such a program.

Potential Benefits to Unit Pricing

Communities that have adopted unit pricing programs have reported a number of benefits, ranging from reductions in waste generation to greater public awareness of environmental issues. These benefits include:

- **Waste reduction.** Unit pricing can help substantially reduce the amount of waste disposed of in a community. Some communities with unit pricing programs report that unit pricing helped their municipality achieve reductions of 25 to 45 percent in the amount of waste shipped to disposal facilities.
- **Reduced waste disposal costs.** When the amount of waste is reduced, communities often find their overall MSW management costs have declined as well. (A portion of the revenues previously spent on waste disposal, however, may need to be dedicated to recycling, composting, or other diversion activities.)

COSTS

- **Increased waste prevention.** To take advantage of the potential savings that unit pricing offers, residents typically 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, often including reduced energy usage and materials conservation.
- **Increased participation in composting and recycling programs.** Under unit pricing, new or existing recycling and yard waste composting programs become opportunities for residents to divert waste for which they otherwise would pay. Experience has shown that these programs are the perfect complement for unit pricing: analysis of existing unit pricing systems shows that composting and recycling programs divert 8 to 13 percent more waste by weight when used in conjunction with a unit pricing program.
- **Support of the waste management hierarchy.** By creating an incentive to reduce as much waste as possible using source reduction and to recycle and/or compost the waste that cannot be prevented, unit pricing supports the hierarchy of waste management techniques defined by EPA.

HIERARCHY

- **More equitable waste management fee structure.** Traditional waste management fees, in effect, require residents who generate a small amount of waste to subsidize the greater generation rates of their neighbors. Under unit pricing, 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. Because the customer is charged only for the level of

service required, residents have more control over the amount of money they pay for waste management.

EDUCATION

- **Increased understanding of environmental issues in general.** Through unit pricing, communities have the opportunity to explain the hidden costs of waste management. Traditional waste management systems often obscure the actual economic and environmental costs associated with waste generation and disposal. Once individuals understand their impact on the environment, they can choose to take steps to minimize it.

Potential Barriers to Unit Pricing

BARRIERS

While there are clearly benefits associated with unit pricing programs, there also are potential barriers. Communities considering unit pricing should be aware of the costs and possible community relations implications associated with the following issues:

- **Illegal dumping.** Some residents have strong reservations about unit pricing, believing it will encourage illegal dumping or burning of waste in their area. Communities can counter this fear with an effective public education program. Since most communities with unit pricing programs have reported that illegal dumping proved to be less of a concern than anticipated, providing residents with this information can help allay their concerns over illegal dumping.

COSTS

- **Recovering expenses.** Since unit pricing offers a variable rate to residents, the potential exists for uneven cash flow that could make it harder to operate a unit pricing program. To address this, communities must be sure to set prices at the appropriate level to ensure that, on average, sufficient funds are raised to pay for waste collection, complementary programs, and special services.
- **Administrative costs.** Effectively establishing rates, billing residents, and collecting payments under a unit pricing program will likely increase a waste management agency's administrative costs. Communities need to set waste collection prices at a level that can cover these costs.

In all unit pricing programs, residents who throw away more pay more.

- **Perception of increased costs to residents.** While a unit pricing program offers residents greater control over the cost of collecting their waste, it could initially be seen as a rate increase. An effective public outreach campaign that clearly demonstrates the current costs of waste management and the potential reductions offered by unit pricing will help to address this perception.
- **Multi-family housing.** Extending direct waste reduction incentives to residents of multi-family housing can present a challenge. Since waste generated by these residents typically is combined in a central

location to await collection, identifying the amounts of waste generated by individual residents in order to charge accordingly can be difficult. Communities must experiment with rate structures and collection systems to encourage residents of multi-family housing to reduce waste.

- **Building public consensus.** Perhaps the greatest barrier to realizing a unit pricing program is overcoming resistance to change, both among citizens and elected officials. Informing residents about the environmental and economic costs of current waste generation patterns can help overcome this resistance and build support for unit pricing.

Careful planning and design of a unit pricing program to meet specific community needs is the best solution to these potential difficulties. In particular, an effective public education program designed to communicate the need for unit pricing and address the potential concerns of residents will help meet these challenges. (Public education programs are discussed in detail in Part IV of this guide.)

Types of Communities That Can Benefit From Unit Pricing

Unit pricing programs work best when tailored to local needs. All types of communities can design unit pricing programs that will help achieve the goals of reducing waste generation and easing waste management difficulties; large, medium-sized, and small communities in every region of the country have realized these benefits. Local officials indicate that unit pricing programs also work well whether solid waste services are carried out by municipal or by private haulers.

As a result, unit pricing has grown significantly over the last few years. In the 1980s, only a handful of communities in the United States operated unit pricing programs. Now, over 1,000 communities have unit pricing programs in place. By January 1994, over 1,800 programs are scheduled to be in operation. In addition, laws in 10 states currently mandate or encourage unit pricing programs.

Unit pricing is a familiar concept for businesses. For years, many companies have been paying for waste removal services based on the size of their dumpsters and the frequency of collections.

Making a Decision About Unit Pricing

After considering this overview of the benefits and barriers to unit pricing programs, decision-makers who believe unit pricing could work in their community can turn to Part II of this guide and begin the planning process. Decision-makers should carefully consider key factors such as the types of services to offer, the associated costs, the potential for complementary programs, the level of administrative change necessary, and the extent to which residents will support or oppose unit pricing.

questions & answers

Will this guide tell me what system to use and how to implement it?

No. This guide is intended to provide essential information about unit pricing and to help you think about how well such a program would work in your community. It will provide many suggestions borne of successful programs of all types and sizes around the country. However, final decisions about whether to adopt unit pricing, what type of system to use, and how to implement it should be made based on local needs and circumstances.

How expensive is it to implement unit pricing?

The cost of implementing a unit pricing program is directly related to how complex the selected system is, how it is financed, and how different it is from the current waste removal system. Many communities have implemented unit pricing with minimal upfront and ongoing costs. Over the long term, communities with unit pricing programs have generally reported them to be cost-effective methods of achieving their waste management goals.

Our community has had significant fiscal problems. Would unit pricing be appropriate?

A community introducing unit pricing may choose to use fees either to supplement or to replace current revenue sources. While a community with a tight waste management budget may choose to use unit pricing fees to supplement current revenue sources, the public may resist such fees as simply an additional tax. Other communities stress that local acceptance of a unit pricing program is greater if current taxes, such as general or property taxes, are reduced by the amount of the new solid waste fees.

Points to **remember**

Unit pricing requires residents to **pay for each unit of waste** that they dispose of. This billing arrangement is similar to fees assessed on other essential services (such as water and electricity), where the charge is based on usage.

Unit pricing has been effective in reducing the amount of solid waste disposed of in **all types of communities** across the country.

Communities using unit pricing **in tandem with recycling** and composting programs have found these programs increase each other's effectiveness.

This guide is designed to provide **basic information** about planning and operating a unit pricing program. Decisions regarding the actual program you adopt will be based on your community's unique circumstances.

Case Studies

All Types of Communities Are Adopting Unit Pricing

Rural areas. Unit pricing is found in a number of rural communities. For example, it has been implemented in High Bridge, New Jersey, which has a population of 4,000, and in Baldwin, Wisconsin, which has a population of under 2,000.

Larger communities. While unit pricing is not yet common in the largest cities, it has been working successfully in Anaheim, Glendale, Pasadena, and Oakland, California; Aurora, Illinois; Lansing, Michigan; Seattle, Washington; and a number of other communities with populations over 100,000. In addition, state laws in Minnesota, Wisconsin, and Washington either currently or soon will require implementation of unit pricing programs in communities statewide, regardless of size (with some exceptions).

County-wide. Unit pricing also can be implemented on a county-wide basis. Tompkins County, New York; Hennepin County, Minnesota; and King County, Washington all have implemented unit pricing programs.

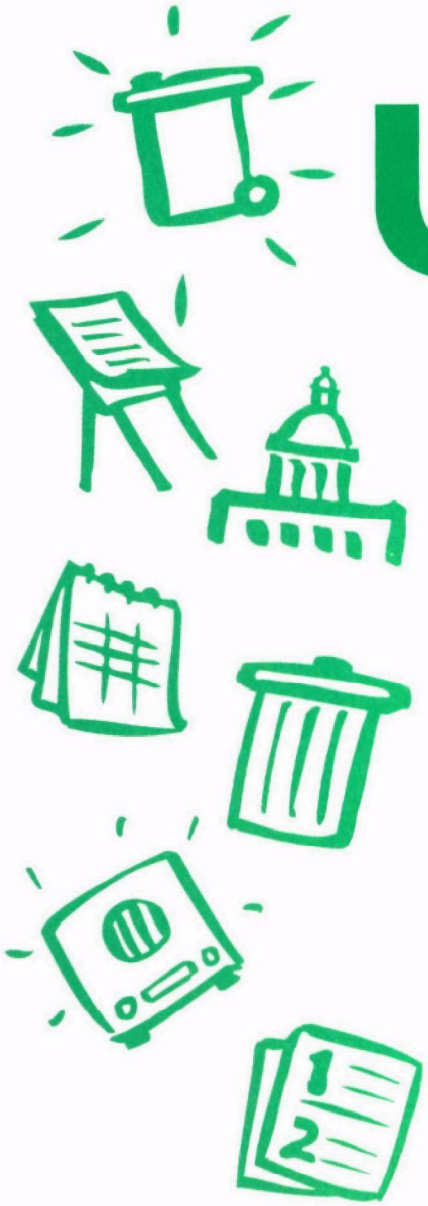
Unit Pricing Cuts Down on Waste Volume

Unit pricing can result in dramatic declines in the amount of waste set out for collection. The Village of Hoffman Estates, Illinois, noted a 30-percent reduction in waste volume after implementing a unit pricing program. Seattle, Washington, reported a decline in waste generation from an average of 3.5 waste cans to 1.7 cans per household per week after unit pricing was launched. This amount was further reduced to just one can per household per week after complementary curbside recycling and composting programs were introduced (see the discussion of complementary programs in Part III).

Most communities, however, cannot delineate what percentage of waste reduction is directly attributable to unit pricing and what percentage is due to other factors, such as new recycling programs, consumer education, or even economic recession. Nevertheless, studies conducted over the last few years indicate consistent waste reductions in unit pricing communities. For example, a study at Duke University by Dr. Daniel Blume examined 14 cities with unit pricing. The waste reductions in this study ranged from 18 to 65 percent. The average waste reduction was 44 percent.

PART II

Building Consensus and Planning for Unit Pricing



Unit pricing involves many important decisions regarding how to perform and pay for solid waste services. To be sure that their communities are choosing the best options, many solid waste agencies have initiated a planning process that helps lay the groundwork for sound decisions and coordinated implementation. This process helps clarify the community's solid waste needs and goals, identify likely barriers and methods of overcoming them, and inform and educate residents about unit pricing and how it can improve solid waste management in the community.

Setting Goals and Establishing a Unit Pricing Team

Solid waste management can be a confusing business, with success measured against standards as varied as recycling diversion rates, total costs, or even quality of media coverage. For this reason, the first step when planning for unit pricing is to determine the goals of the program based on a review of your community's solid waste management needs and concerns. While goal-setting can at first seem like an abstract exercise, clearly defined and measurable objectives for your program are invaluable when deciding which unit pricing options would work best in your community. Goal-setting can help build community consensus and facilitate efficient monitoring and evaluation of the unit pricing program's progress.

Although you will want to solicit input from local residents and other interested parties before coming up with a final list of goals, it is useful to first examine and prioritize goals internally before introducing them to the community. Consider holding an internal brainstorming session to establish a preliminary list of goals. This session could last anywhere from one hour to half a day, depending on the size and makeup of your community, the issues that need to be addressed in the session, and the needs and structure of your agency. A shorter, followup session to revisit, refine, and prioritize goals also might be useful.

Prioritizing goals also is important since the weight that you assign to goals now will help you design the rate structure for the program. (Setting rate structures is described in Part III of the guide.) In addition, achieving every objective on a community's list can be difficult. Consider the tradeoffs among program costs, citizen convenience, staffing changes, and other factors as you prioritize your goals. Circumstances often require compromise in one area in exchange for progress in another.

TRADEOFFS

Specific goals and objectives can vary significantly among communities. Examples include:

- **Encouraging waste prevention and recycling.** A community should set unit prices at levels high enough to encourage households to reduce waste generation and to recycle and compost. This helps to achieve existing recycling goals and to conserve landfill space.

HIERARCHY

- **Raising sufficient revenue to cover municipal solid waste management costs.** A unit pricing program should bring in enough revenue to cover both the program's variable costs and its more stable or fixed costs. Variable costs, such as landfill tipping fees, are the expenses that fluctuate with changes in the amount of solid waste collected. Fixed costs are costs that change only rarely, such as rent for agency offices, or that change only after large-scale waste collection changes, such as the number of collection trucks needed.

COSTS

Establishing a clear set of goals for your unit pricing program is invaluable when deciding which program options will work best in your community.

- **Subsidizing other community programs.** A community might wish to generate revenues in excess of the actual costs for solid waste collection and then use those funds to enforce antilittering or illegal dumping laws, or to improve its recycling and solid waste infrastructure.

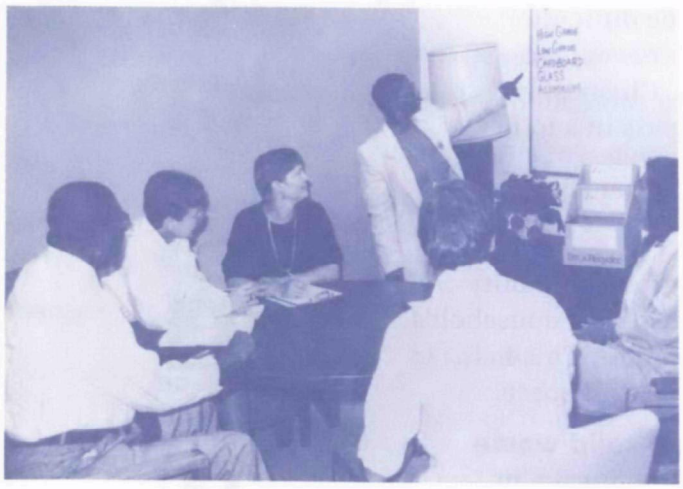
Once your agency has established a list of preliminary goals, consider setting up a unit pricing team or citizen advisory council to help you refine and prioritize these goals. A unit pricing team typically consists of solid waste staff, interested elected officials, civic leaders, and representatives from affected businesses in the community. Team members may be solicited through advertisements in local newspapers and on radio and television stations. Including these individuals in the planning process gives the community a sense of program ownership.

In addition, team members can help other residents in the community understand the specifics of the program as it evolves and can provide your agency with valuable input on residents' concerns about the program. Members of the team also can serve as a sounding board to help ensure strong community participation throughout the planning process.

Addressing Barriers

BARRIERS

The team or council also can help your agency identify potential barriers to implementing unit pricing in your community and consider ways in which these barriers can be addressed. Illegal dumping and burning of waste is one of the mostly frequently cited barriers to unit pricing. Yet participants at EPA's Unit Pricing Roundtable and communities with unit pricing programs report that illegal dumping has occurred prior to implementing a program and tends to persist at some level, regardless of the way in which residents are charged for solid waste management.



A unit pricing team composed of residents, civic leaders, and town officials can help ensure the development of a successful unit pricing program.

The key is to design a unit pricing program that significantly deters illegal dumping and burning. Public education and enforcement policies are the most effective tools in addressing this barrier. Informing residents of the experiences of communities with unit pricing and setting up fair but aggressive enforcement policies to respond to incidents of illegal dumping also are essential.

Other potential barriers to unit pricing include recovering expenses, covering administrative costs, ensuring that unit pricing is not perceived as a rate increase by residents, implementing unit pricing in multi-family buildings, addressing physical or financial difficulties for senior citizens, and overcoming resistance to changing

the status quo. (Part III of this guide provides an in-depth discussion of barriers and specific strategies for overcoming them.)

Once both the municipal solid waste agency and the unit pricing team or council have evaluated specific goals and barriers, it is time to unveil the program to the city at large. The team or council might consider developing a preliminary proposal with several program options. This proposal can serve as a basis for public discussion and help illustrate what changes might occur.

Building a Public Consensus

Public education is critical to the planning, design, and implementation stages of a unit pricing program. In fact, education is the linchpin holding all of these phases together. While educating the public might at first seem unnecessary and expensive, the experiences of communities that have implemented unit pricing programs indicate that a good public relations program more than pays for itself.

Such a program is effective at developing a general consensus among residents on the need for unit pricing. Community support is vital to the long-term success of a unit pricing program. In fact, communities that have implemented unit pricing programs are nearly unanimous in listing education and community relations as the most important elements of a successful unit pricing program. Public education can combat fears and myths about unit pricing (such as the fear of increased illegal dumping) and help avoid or mitigate many potential implementation problems.

In Austin, Texas, solid waste officials included school visits in their public outreach program.

When first reaching out to residents during the planning stage, don't be surprised if many residents react with skepticism to the idea of unit pricing. Initial opposition is often related to a perception that unit pricing will result in an additional financial burden. Opposition also might be due simply to a natural resistance to change. Resistance to unit pricing is especially prevalent in communities where solid waste management fees are hidden in general or property taxes.

To counter this opposition, municipal officials can inform residents of the current difficulties associated with waste collection and management. In particular, officials can explain the costs to residents of the current system of waste management. Next, they could present the goals for improving the management of solid waste in the community. In this context, officials can introduce unit pricing, discuss its potential for meeting these objectives, and address any questions and concerns that residents have expressed about the new program.

Winning community support for unit pricing often hinges on explaining how the program can achieve certain critical objectives. Discussions at EPA's Unit Pricing Roundtable revealed that residents tended to support unit pricing if the program achieved the waste management principles about which they cared the most. Residents often develop a sense of civic pride in programs that meet these objectives. Roundtable panelists strongly recommended that solid waste officials devotè a significant amount of attention to communicating these basic principles:

- **Equity.** The program should be structured so that people who generate more waste pay more, while residents who prevent waste, recycle, and compost are charged less.
- **Waste reduction.** The program must significantly reduce the community's generation of waste, increase the rate of recycling, and, therefore, reduce the amount of waste requiring disposal in landfills and combustors.
- **Reductions in waste management costs.** By helping to alter household waste generation patterns, the program should help reduce the cost of collecting and disposing of the community's solid waste.
- **Municipal improvements.** The program should contribute to improvements in the quality of life in the community, such as resource conservation and land preservation.

At EPA's Unit Pricing Roundtable, panelists ranked education and community relations as the most important elements of a successful unit pricing program.

In addition to deciding what information needs to be communicated, solid waste officials also should consider how best to reach residents in the community. An unspecified change in waste management services scheduled to occur at some future date is not likely to capture a community's attention. The following activities represent some of the ways in which officials can explain the benefits of unit pricing:

- **Hold public meetings.** Interactive public meetings offer solid waste officials the opportunity to present the case for unit pricing. Such meetings also give citizens the sense that their concerns are being heard and addressed in the eventual program.
- **Prepare briefing papers for elected officials.** As both shapers and followers of public opinion, elected officials tend to be at the center of public policy debates. Because well-informed leadership can raise issues in such a way as to attract residents' interest, solid waste officials might want to provide elected officials with brief summaries of the issues associated with solid waste management and the likely benefits of a unit pricing program.
- **Issue press releases.** Press coverage of a change in the way that a community pays for its solid waste collection services is inevitable. Keeping key radio, television, and newspaper outlets well informed of the reasoning behind the move to unit pricing can make the press a valuable participant in the decision-making process and prepare the community for an upcoming change.

- **Work with retailers.** Grocers and other retailers in your community can help educate citizens by displaying posters and other information about the new program in their stores. In addition, retailers can help customers generate less waste by displaying information about choosing waste-reduced products.

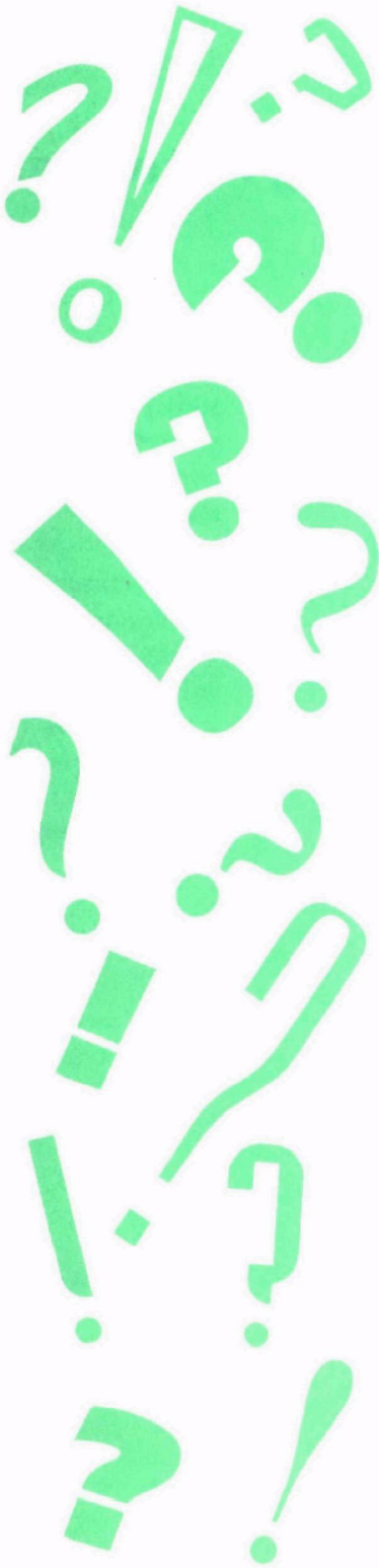
Part IV of this guide explains additional steps that communities can take to communicate their ideas to the public.

Scheduling Your Planning Activities

Even before the final decision is made to pursue unit pricing, some basic planning issues can be addressed. Chief among these are legal/jurisdictional issues and timing. Generally, states extend to local jurisdictions the authority to provide waste management services and to charge residents accordingly. During the planning process, however, many communities have the unit pricing team research the municipality's legal basis for implementing a new solid waste service pricing mechanism rather than risk discovering a problem unexpectedly during implementation.

Since unit pricing programs often involve a number of steps and some complex decision-making, consider developing a timeline for planning, designing, and implementing your program. Based on the experiences of communities that have successfully implemented unit pricing, planning for unit pricing should begin at least a year in advance of your targeted start date. You can establish goals for the unit pricing program and begin explaining the program to the community from 9 to 12 months before program implementation. Public education should continue throughout the months prior to the program and, to some extent, after the program is underway. You can identify the legal framework for the program at least six months before the start of a program. A detailed suggested timeline for a unit pricing program is provided in Part IV of this guide.

questions & answers



Everyone agrees we should prevent waste and recycle more. Why do we need to spend so much time thinking about specific goals and objectives?

It will probably be easy to get a broad consensus that some things are "good," such as saving money or reducing disposal rates. But solid waste management in general and unit pricing in particular often involve a series of tradeoffs. For example, a community may decide to sacrifice some convenience for households to cut costs or to create a stronger waste-reduction incentive. Establishing goals and priorities early in the planning process can make it easier to make difficult choices as they arise.

Why is public input so important? We have already consulted with many solid waste experts, who know a lot more about solid waste issues than residents.

Municipal officials and experts agree—no unit pricing program is going to work if local residents oppose it. Since improved solid waste management requires a good faith effort from residents to reduce the amount of waste they dispose of, it makes sense to include residents as equal partners.

Points to remember

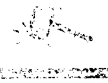
Establish **realistic goals** for your unit pricing program that address your community's most pressing waste management needs.

Involve the community in the planning process. Representatives from community organizations can increase acceptance of unit pricing and facilitate implementation.

Plan for the possibility of **illegal dumping or burning.** In addition to explaining other communities' experiences with illegal dumping, let residents know about legal alternatives for managing and disposing of solid waste. Also explain that concrete steps, such as assessing penalties for violators, will be taken.

Public education cannot be stressed enough. Promoting the strengths of unit pricing and **addressing residents' concerns is critical** to the success of your program.

Provide elected officials with information on the benefits of unit pricing programs to help them address residents' concerns. Also, **keep local officials informed** of decisions made about the program as it evolves.



Be sure to **carefully research your legal authority** to establish and enforce a unit pricing program. Based on this research and on the advice of your municipality's legal counsel, ordinances may be necessary to establish the program.

Plan ahead by establishing a timeline for your program.

Case Studies

Three Cities Report on Illegal Dumping

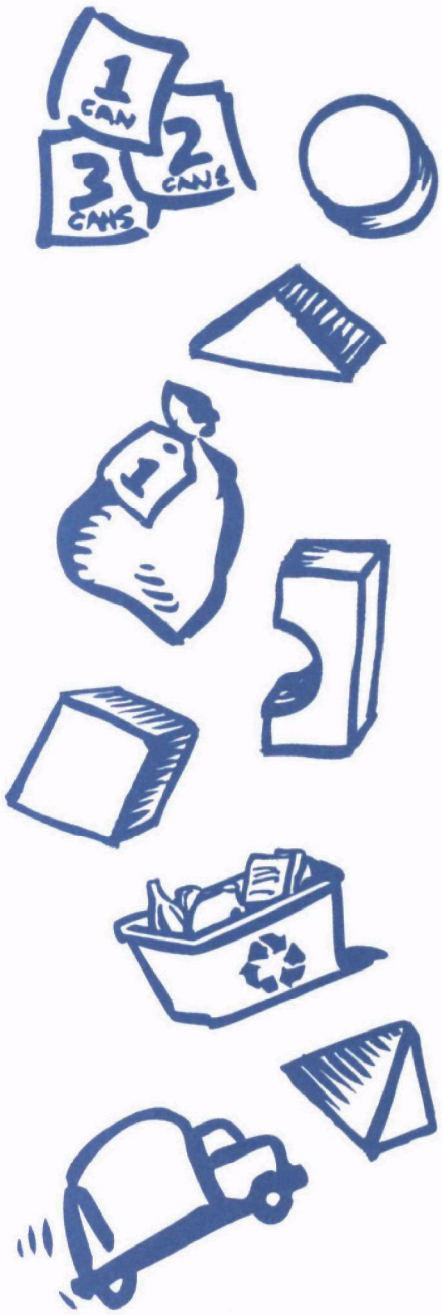
In **Mansfield, Connecticut,** officials report that illegal dumping did not increase significantly with the introduction of unit pricing. To prevent illegal dumping, Mansfield has relied primarily on public education. When necessary, however, the solid waste department also has worked with the police department to track license plates and identify violators.

In **Seattle, Washington,** unit pricing also has not been associated with an increase in illegal dumping. In fact, 60 to 80 percent of the illegal dumping incidents in the city are associated with remodeling waste, refrigerators, and construction debris—waste that the city suspects comes from small contractors who do hauling on the side and dump the refuse. Seattle officials are considering licensing these haulers or requiring remodelers to verify that their material has been properly disposed of.

The city of **Pasadena, California,** reports similar findings. A survey done at the city's landfill indicated that Pasadena was disposing of one-third more trash than was indicated in a waste generation study completed in the city. Pasadena suspects that this waste is made up of construction and demolition debris dropped off by small contractors. In the future, instead of contracting with small individual haulers, Pasadena may require those applying for a building permit to use licensed haulers to take construction and demolition materials to the landfill.

PART III

Designing an Integrated Unit Pricing Program



To this point, this guide has presented an overview of the major benefits and barriers to unit pricing, followed by suggestions on how to define the objectives of your program and begin building a consensus for unit pricing in your community. This portion of the guide introduces issues relating to the exact structure of your community's unit pricing program. The first half of Part III, "The Building Blocks," discusses the advantages and disadvantages of the specific program components and service options from which you can choose. This is followed by "Putting the Blocks Together," a six-step process to help you design a successful unit pricing program.

The Building Blocks

While unit pricing is based on the simple concept that households pay only for the waste they generate, designing a working program requires that you consider and decide on a range of specific issues. You may have already examined many of these issues, such as the potential for complementary recycling and composting programs, the types of solid waste services to offer, and the means by which you can provide these services to residents with special needs. During the development of a unit pricing program, however, viewing these issues in the context of how they might affect the success of your program is important.

The process of selecting program components and service options can begin as much as nine months before the start of a program. This part of the guide points out the kinds of decisions you need to make during this process, including:

- Choosing a volume-based or weight-based system
- Selecting containers
- Examining pricing structures
- Considering billing procedures
- Determining service options and complementary programs
- Including multi-family buildings
- Accommodating individuals with special needs

Communities also need to consider other factors, such as the remaining life of existing containers, the cost of container replacements, the preferences of customers, and the impact of assessing additional taxes or fees on households. Later in this section of the guide, a six-step process for designing an actual unit pricing rate structure is presented. This process should help you tailor a rate structure to local conditions.

Volume-Based Versus Weight-Based Programs

One of the first decisions to be made when designing a unit pricing program is to determine how solid waste will be measured. Based on your unit pricing goals, local budgetary constraints, and other factors, you need to decide whether your system will charge residents for collection services based on the weight or the volume of waste they generate. The two systems have very different design and equipment requirements.

Under **volume-based systems,** residents are charged for waste collection based on the number and size of waste containers that they use. Households are either 1) charged directly for waste collection based on the number of bags or cans set out at the curbside, or 2) required to purchase special trash bags (or tags or stickers for trash bags) that include the cost of waste collection in the purchase price.

Under **weight-based systems,** the municipality weighs at the curbside the waste residents set out for collection and bills for this service per pound. The program can either require residents to use standard, municipally supplied cans or allow them to continue using their own cans. Weight-based systems offer residents a greater waste reduction incentive than volume-based systems since every pound of waste that residents prevent, recycle, or compost results in direct savings. This is true no matter how much or how little waste reduction occurs. In addition, residents can easily understand this type of system and perceive it as fair. Weight-based systems also provide a more precise measurement of waste generation than volume-based systems.

For its weight-based unit pricing program, the city of Farmington, Minnnesota, has invested in collection trucks that weigh the waste as it is lifted . . .

On the other hand, weight-based systems tend to be more expensive to implement and operate than volume-based systems because special equipment is required and more labor typically is necessary to handle the more complex billing system. In addition, some of the equipment used to weigh the waste, record the data, and bill the customer is still experimental. Startup costs for these systems can include truck-mounted scales for weighing waste and some type of system (such as bar-coding on waste cans) for entering this information into a computer for accurate billing.

TRADEOFFS

While volume-based systems are less costly to set up and operate, a potential disadvantage associated with these systems is that residents might be tempted to compact their waste. Some residents will compact more than others, perhaps even using mechanical compactors. This reduces the ability of unit pricing to offer more equitable charges for waste collection services and complicates the task of identifying the impact of unit pricing on the community's rate of solid waste generation. Additionally, depending on the system chosen, there can be less of an incentive to reduce waste since such reductions might not translate into direct savings for the resident.

. . . and record the weight and resident information on an onboard computer for later billing.

Although over 1,000 communities nationwide have unit pricing programs in place, very few have fully implemented weight-based programs. Accordingly, the remainder of this guide focuses predominantly on the process of designing and implementing a volume-based unit pricing program.

Austin, Texas, provides residents with either 30-, 60-, or 90-gallon cans as part of its unit pricing program.

Container Options

Communities that decide to design a volume-based unit pricing program must consider the type and size of waste collection containers on which to base their rate structure and billing system. Keep in mind that choices about containers, rate structures, and billing systems all go hand in hand. In some cases, container type will dictate the rate structure and billing system. In other cases, an established billing system (that cannot be drastically overhauled) can govern container type and rate structure.

A unit pricing program can be designed around the following container options:

Large cans. Under this system, households are provided with single, large waste cans, often with a capacity of 50 or 60 gallons. Each household is then charged according to the number of cans that they use.

Small or variable cans. This system uses a set of standard, graduated can sizes, often ranging from approximately 20 to 60 gallons in capacity. Typically, these systems operate on a subscription basis, under which residents choose in advance the number and size of cans they wish to use.

Prepaid bags. This system uses colored or otherwise distinctively marked standard-sized trash bags, typically 20 to 30 gallons in capacity. Residents purchase the bags from the solid waste agency through outlets such as municipal offices and retail stores. Only waste that is placed in the bags is collected.

Prepaid tags or stickers. Residents purchase tags or stickers from the solid waste agency and affix them to their own trash bags. The tag or sticker specifies the size of bag it covers.

Each system has its own specific advantages and disadvantages related to such issues as 1) offering a system that residents view as equitable; 2) creating as direct an economic incentive for waste reduction as possible; and 3) assuring revenue stability for the solid waste agency. Other issues to consider when weighing the pros and cons of different container types include simplicity of billing, compatibility with existing waste collection services, ease of collection for work crews, sanitation and aesthetics, budgetary constraints, and community solid waste goals.

The primary benefit of a **single, large container** size is revenue stability. When communities use large containers, the number of cans set out each week tends to remain fairly constant, and so do revenues. The primary disadvantage associated with this container choice is that households that don't generate much waste have no economic incentive

to reduce waste. Such households are billed the same amount whether they fill a 60-gallon can halfway or completely.

Conversely, the principal benefit of using **variable can** sizes is that even modest reductions in waste generation (for example, one less 10-gallon waste container) can clearly translate into savings. A disadvantage of variable cans is that they can be inconvenient for customers who generate large volumes of waste. In addition, to realize savings from reduced waste generation, households must request a change in the number of cans for which they are being billed. The solid waste agency might need to establish an inventory and distribution system that could be expensive to set up and maintain. Additionally, billing for this method can be more complex in some communities.

Like variable cans, **prepaid bags** encourage greater waste reduction than large cans if the bag size is configured so that residents that generate less waste pay less. Additionally, since residents pay for waste collection through the purchase of the bags, there is no billing, which means this type of system is relatively inexpensive to implement and maintain. The primary disadvantage associated with bags is that there is greater revenue uncertainty than with can systems. An individual might, for example, buy several months' worth of bags at one time and then none for many weeks. Also, semiautomatic collection vehicles that require residents to use a rigid container might not be able to adapt to bag collection. Bags also can tear or be torn open by animals, resulting in scattered trash.

Large, clearly marked tags and stickers will help eliminate confusion and speed curbside waste collection.

Prepaid tag or sticker systems offer many of the same advantages as bag systems. Chief among these is that such systems directly encourage waste reduction, since different stickers can be used to identify different amounts of waste "set-outs" (the waste residents set out for collection). This means, however, that the solid waste agency must establish and enforce size limits for each type of sticker. As with bags, waste collection is paid for upfront, so no billing needs to be done. Also like bags, stickers or tags offer less revenue stability. In addition, stickers can fall off in rainy or cold weather, and both tags and stickers can be counterfeited or stolen.

The advantages and disadvantages of each of these container options are described in more detail in Table 3-2 at the end of this chapter. You don't have to be locked into one type of system, however, if you plan for the possibility of change. Some communities conduct a pilot program in one part of the municipality before implementing unit pricing communitywide. In this way, difficulties can be worked out early in the process, when modifications are still relatively easy.

While the details of the pricing structures used in unit pricing programs can vary greatly according to local conditions and needs, four basic types are currently in use. These pricing structures are described below.

Pricing Structures

TRADEOFFS

The main consideration in choosing among the types of pricing structures is their impact on the stability of the community's revenues and on residents' waste reduction efforts. In addition, some pricing systems are more complex than others to administer.

1. The **proportional (linear) rate system** is the simplest rate structure. It entails charging households a flat price for each container of waste they place out for collection. This rate structure provides a strong incentive for customers to reduce waste. It also is easy to administer and bill. Careful consideration is often required, however, to select a price per container that avoids cash flow difficulties that can hinder a new program. While setting too high a price will increase resistance to unit pricing, setting too low a price may cause periodic revenue shortfalls (and can lessen the waste reduction incentive). In addition, when setting rates, decision-makers should assume that some level of waste compaction will occur. They also should plan for success, since as people begin to reduce the amount of waste they set out, the solid waste agency will see a corresponding drop in revenues paid for waste collection.

Weighing the Tradeoffs When Setting Pricing Structures

Decision-makers considering such issues as container choices, rate structures, and service options quickly realize that all of these choices are closely related. Decisions in one area will influence, or even determine, how your community responds to the remaining choices.

When considering container options, for example, a smaller community with fewer resources might favor a bag-based system because of its generally lower implementation and administrative expenses. Such systems, however, have the potential for revenue gaps that the community might not be able to bridge. As a result, a community might prefer a two-tiered or multi-tiered rate structure, whose base fee would help prevent such instability.

By contrast, a larger community interested in providing a stronger incentive to reduce waste might favor a proportional or variable container rate and higher per container fees. To avoid significant revenue fluctuations, such communities might choose a can-based subscription system that ensures a steady cash flow.

There is no one best approach to unit pricing. Throughout the design process, you will need to determine the specific combination of container choices, rate structures, and service options that will maximize efficiency and enable your community to meet its solid waste goals.

2. With a **variable container rate,** a different rate is charged for different size containers. For example, a solid waste agency might charge households $2 for every 60-gallon can of waste set out and $1.25 for every 30-gallon can. While this system creates a strong incentive for residents to reduce waste, it requires that communities carefully set their rates to ensure revenue stability. Because different rates are charged, this system can be complicated to administer and bill.

3. Both of these systems use a per-container fee to cover the fixed and variable costs associated with a community's MSW management. Other unit pricing rate structures address fixed and variable costs separately. **Two-tiered rate systems** assess households both a fixed fee and a per container fee. Under this system, a monthly flat fee is set for solid waste services to ensure that fixed costs are covered; a separate, per-container charge is then used to cover the variable costs. In Pennsburg, Pennsylvania, the solid waste agency charges residents a flat $65 per year plus $1 per 30-gallon bag of waste placed at the curb for pickup. This system provides more stable revenue flows for the community but offers less waste reduction incentives than proportional or variable container rates. Some communities use the two-tiered rate structure as a transition system. Once decision-makers are able to gauge customers' response to unit pricing, a proportional rate structure could be introduced to encourage greater waste reduction.

4. **Multi-tiered rate systems** charge households a fixed fee plus variable fees for different container sizes. For example, a community might charge a basic $10 monthly service fee plus $2 per 60-gallon can, or $1 per 30-gallon bag. This rate structure offers similar advantages to two-tiered rates and also encourage waste reduction. This type of rate structure is the most complex, however, and could be difficult to administer and bill.

Table 3-1. Pricing Options

System	Rate
Proportional (linear)	Flat rate per container
Variable container	Different rates for different size containers
Two-tiered	Flat fee (usually charged on a monthly basis) **and** flat rate per container
Multi-tiered	Flat fee (usually charged on a monthly basis) **and** different rates for different size containers

Billing and Payment Systems

Traditional solid waste programs typically assess households a fixed fee, raised through property taxes or periodic equal billing of all households. Unit pricing programs use various billing/payment systems, such as direct payment for containers, actual set-outs, and payment for advance subscriptions.

With a **direct payment system,** residents pay for solid waste services by purchasing bags or tags from the solid waste agency. Containers can be sold at the courthouse or city hall, at local retail stores, or at the hauler's office. Care should be taken to ensure that a sufficient number of easily accessible outlets are available for residents.

Under **subscription systems,** residents notify the solid waste agency of their "subscription level," or the number of containers they anticipate setting out each collection cycle. The customer is then billed on a regular basis for these containers. If customers are able to reduce the amount of waste they generate, they can select a lower subscription level and save money. In many programs, these subscription fees are set at a level that covers the purchase of a designated number of additional bags or cans for any waste that a customer disposes of above their subscription level. This system offers fewer fluctuations in revenues, although the waste reduction incentive is lower because residents who reduce their waste generation rate only receive a reduction in their waste collection bill after requesting the municipality to change the number of cans for which they pay.

An **actual set-out system** bills customers based on the actual number of containers set out for collection. This approach requires the hauler to count the number of bags, tags, or cans set out and to record the information so that households can be billed later.

To address citizens' concerns about "hidden" or "double" fees, some communities that implement unit pricing either reduce the household tax rate commensurate with the unit pricing fee or decide not to raise the tax base proportionately with the revenues received from unit pricing. Meet with the citizens advisory council to work out the details for a pricing system geared to your local needs and circumstances.

Accounting Options

Regardless of how they collect payment, most communities tend to manage the finances of their solid waste activities as one item in the municipal budget. A few communities, however, are using alternative accounting approaches to complement their unit pricing programs. One such approach is the use of "full cost accounting." Using full cost accounting enables a community to consider all costs and revenues associated with a task such as solid waste management, including depreciation of capital costs, amortization of future costs, and a full accounting of indirect costs. This method can help a community

establish a unit pricing rate structure that will generate the revenues needed to cover all solid waste management costs.

Another approach that can be used in conjunction with a unit pricing program is the development of an "enterprise fund." Also referred to as special districts, enterprise funds are entities that can be used to separately manage the finances of a municipality's solid waste activities. In this way, the costs and revenues of unit pricing are accounted for under a separate budget, enabling a community to better anticipate revenue shortfalls and, when appropriate, invest surplus revenues in beneficial waste management projects that can reduce the cost of MSW management in the future.

Program Service Options

The next step is to determine which solid waste services are most important to residents. Successful programs offer an array of solid waste services that citizens need and appreciate. The goal-setting process described in Part II of this guide identifies many of these services.

Offering different services does add layers of complexity to a unit pricing program, especially to the billing component. Yet providing such service enhancements greatly increases overall citizen acceptance of the program. A carefully selected and priced service array allows a community to offer premium municipal solid waste services to households that want them, while generating sufficient revenues to support core solid waste collection services. The following sections highlight some of the most popular service options, many of which are complementary to basic trash removal.

Providing a recycling program in conjunction with unit pricing can further decrease the amount of waste your community must dispose of.

Complementary Programs

Complementary programs are those that enhance the unit pricing program and encourage residents to prevent and reduce waste. The most common complementary programs are 1) recycling and 2) collection of yard trimmings for composting. Providing recycling and composting collection services enables both types of programs to reach their maximum effectiveness. In fact, in many cases, recycling and composting are major contributors to the success of a unit pricing program.

Many communities already have some type of curbside collection or voluntary drop-off recycling program in place. Linking recycling and composting with unit pricing provides customers with an environmentally responsible way to manage their waste. In addition, since the cost of these programs can be built in to unit pricing fees, communities can recover these expenses without creating an economic disincentive to recycle. The extent of the recycling program is an important factor, as

Complementary programs can benefit from a strong public education effort.

well. A community will more fully realize the benefits of offering recycling in tandem with unit pricing if the recycling program is geared to collect a wide range of materials (although the availability of local markets can constrain the types of materials a community can accept).

Providing for removal of yard trimmings such as leaves, branches, prunings, and grass clippings, and promoting backyard composting and "grasscycling" (leaving grass trimmings on the lawn), also will enhance the unit pricing program. For example, the community of Austin, Texas, mixes the yard trimmings it collects from residents with sewage sludge to produce compost called "Dillo Dirt," which is sold to nurseries as fertilizer, and Durham, North Carolina, makes landscaping mulch from brush. Distributing "how-to" materials can help increase the amount of organic waste residents compost, and some municipalities even provide their residents with free compost bins.

COSTS

In communities where weekly recycling or composting is too costly, curbside collection can be scheduled every other week or once a month. In addition, municipalities can encourage haulers to provide recycling services by including a risk-sharing clause in their contracts. Such clauses require the municipality to share with the hauler the risk of fluctuations in the price of recyclable materials. If a recycling company requires payment to process a certain collected material whose value had dropped substantially, for example, the hauler and municipality would bear these costs together. Some communities, however, might not feel their budget would allow them to incur additional, unexpected costs.

Backyard Collections

Backyard collection of waste and/or recyclables can be considered as a service enhancement that complements a unit pricing system. With this service, haulers remove residential waste and recyclables from backyards, garages, or wherever residents prefer, rather than requiring them to haul the material to the curb. Residents might pay extra for this service. When setting a price for backyard collection services, a community should consider costs to collect waste from the curb, transport it, and dispose of it. The higher charge for backyard waste removal should reflect the added municipal resources required for such a service.

Curbside Collection of Bulky Items

Curbside collection of large items, such as refrigerators and other major appliances, is another service that complements basic trash removal. In some communities with unit pricing, residents pay extra to

have bulky items picked up and disposed of by the municipality. The disposal of bulky items, which cannot fit into most unit-pricing programs' cans or bags, can be charged for within a unit pricing system by using printed stickers or tags that are attached to the item. To establish fair prices, the solid waste agency can use the same collection, transportation, and disposal cost considerations that apply to establishing prices for standard unit pricing waste collections. The price could be set in advance of collection, based on the owner's description of the item, or after collection, based on the collection agency's observations.

Multi-Family Housing

BARRIERS

One of the biggest challenges for communities implementing unit pricing is how to include multi-family (five units or more) residential structures into the program. Such buildings can house a large portion of the population, particularly in densely populated areas. Because waste often is collected from residents of such structures per building, rather than per unit, it might be difficult to offer these residents a direct economic incentive to reduce waste with unit pricing. To compound this problem, because many multi-family buildings receive less convenient recycling services than single-family housing units, residents of multi-family buildings might have fewer avenues for waste reduction.

There are several possible options to resolve multi-family barriers. One option is to have the building manager sell bags or tags to each resident. When households use these tags or bags, those that generate more waste end up paying more for waste collection. Problems arise

Tips for Accommodating Residents of Multi-Family Households

A number of ideas were presented at EPA's Unit Pricing Roundtable to help extend to residents of multi-family households the direct economic incentives inherent in unit pricing. One suggestion was to request that building managers pass on trash collection savings to residents in the form of cash rebates, rent reductions, or some free building services, although the impact of the incentive would be diluted since it is spread over all the tenants in the building.

New technologies, such as a bar code reader to identify the tenant and a scale at the bottom of the chute to record the weight, also were suggested as possible solutions. These technologies offer the potential for accurately recording the exact waste generation for each tenant.

In addition, building codes for new and renovated buildings could be amended to require the installation of separate chutes for recycling and for garbage disposal. Residents also could be required to use a trash token or some type of identifying code to gain access to a garbage chute.

when households do not comply with this system, however. In many cases, residents can easily place waste in the building dumpster without paying for a bag or sticker. Another approach is to modify the system of placing waste out for collection in multi-family buildings. For example, dumpsters or garbage chutes could be modified to operate only when a magnetic card or other proof of payment is used. Such modifications can be expensive, though. Communities with unit pricing systems in place are experimenting with other possible solutions to the multi-family barrier. If extending unit pricing service to multi-family buildings is a concern in your community, consider contacting other cities or towns that have addressed this issue for additional ideas. (A listing of these communities is provided in Table 3-2 at the back of this section.)

Residents With Special Needs

Many communities considering unit pricing are concerned about the special needs of physically limited or disabled citizens and those living on fixed or low incomes. For example, some senior citizens and disabled residents may be physically unable to move trash containers to the curb. Communities may wish to consider offering such residents backyard collection services at a reduced rate or at no extra charge. Such special considerations should be factored in to your unit pricing rate structure.

While the fees associated with unit pricing could represent a potential problem for some residents, unit pricing systems can be structured to allow everyone to benefit. To provide assistance to residents with special financial needs, communities can reduce the per-household waste collection charges by a set amount, offer a percentage discount, or provide a credit on the overall bill. In some cases, communities with unit pricing programs offer a certain number of free bags or stickers to low-income residents. Some communities charge everyone equally for bags or tags but reduce the base service charge for low-income households. Assistance also can be offered through existing low-income programs, particularly other utility assistance efforts.

In some communities, backyard collection can be arranged as a service for disabled or elderly residents.

These techniques allow low-income households to benefit from some assistance while retaining the incentive to reduce their bill for waste services by practicing source reduction, recycling, and composting. Communities will need to determine how to identify the amount of assistance they will offer based primarily on the program's anticipated revenues. As a basis for establishing eligibility for assistance, some communities with unit pricing programs use income criteria such as federal poverty guidelines.

Table 3-2.
Advantages and Disadvantages of Unit Pricing Container Systems

	Advantages	Disadvantages	Communities Using This System
Can Systems	Revenues are fairly stable and easy to forecast. Unlike bags, cans often work well with semiautomated or automated collection equipment (if cans are chosen that are compatible with this equipment). If residents already own trash cans of roughly uniform volume, new cans might not be required. Cans may be labeled with addresses to assist in enforcement. Cans prevent animals from scattering the waste.	Cans often have higher implementation costs, including the purchase and distribution of new cans. Customers have a limited incentive to reduce waste. Since residents are usually charged on a subscription basis, there is no incentive not to fill cans already purchased. In addition, no savings are possible below the smallest size trash can. Relatively complex billing systems are needed to track residents' selected subscription level and bill accordingly. Complex storage, inventory, and distribution systems are required to provide new cans to households that change their subscription level. A method of collecting and charging for waste beyond subscription levels and for bulk waste collections needs to be established. At the outset, residents may find it difficult or confusing to select a subscription level. Nonautomated can collections tend to require greater time and effort than collecting waste in bags.	Hennepin County, MN Seattle, WA Anaheim, CA King County, WA (in unincorporated areas) Marion County, OR Pasadena, CA Glendale, CA Oakland, CA Bellevue, WA Santa Monica, CA Duluth, MN Richmond, CA Walnut Creek, CA Santa Clara, CA Auburn, WA Hastings, MN

Table 3-2 (continued).
Advantages and Disadvantages of Unit Pricing Container Systems

	Advantages	Disadvantages	Communities Using This System
Bag Systems	Residents find bag systems easy to understand. Bag systems might offer a stronger waste reduction incentive than can systems because fees typically are based on smaller increments of waste. Accounting costs are lower than with can systems, since no billing system is needed. Bag systems have lower distribution, storage, and inventory costs than can systems when bags are sold at local retail establishments and municipal offices. Bag collections tend to be faster and more efficient than nonautomated can collections. Bags can be used to indicate that the proper fees have been paid for bulky items or white goods, since fees for pickup of these items (above the subscription level) often are assessed by communities. Communities can ask residents to attach a certain number of bags to the items according to the cost of disposal (for example, two bags for a couch and three bags for a washing machine).	Greater revenue uncertainty than with can-based systems, since the number of bags residents purchase can fluctuate significantly. If bags are sold in municipal offices, extra staff time be will need to be committed. Residents might view a requirement to buy and store bags as an inconvenience. Bags are more expensive than tags or stickers. Bags often are incompatible with automated or semiautomated collection equipment. Animals can tear bags and scatter trash, or bags can tear during lifting. Unlike cans, bags are not reused, adding to the amount of solid waste entering the waste stream.	Grand Rapids, MI Reading, PA Lansing, MI St. Cloud, MN Darien, IL Carlisle, PA Quincy, IL Oregon, WI Fallbrook, CA

Table 3-2 (continued).
Advantages and Disadvantages of Unit Pricing **Container Systems**

	Advantages	Disadvantages	Communities Using This System
Tag or Sticker Systems	Tag and sticker systems are easier and less expensive to implement than can systems. Residents often find tag or sticker systems easier to understand. These systems offer a stronger waste reduction incentive than can systems because fees are based on smaller increments of waste. Accounting costs are lower than with can systems, since no billing system is needed. Selling tags or stickers at local retail establishments and municipal offices offers lower distribution, storage, and inventory costs than can systems. The cost of producing tags or stickers for sale to residents is lower than for bags. Stickers can be used to indicate payment for bulky items or white goods, since fees for pickup of these items (above the subscription level) often are assessed by communities.	There is greater revenue uncertainty than with can-based systems, since the number of tags or stickers residents purchase can fluctuate significantly. To avoid confusion among residents, the municipality must establish and clearly communicate the size limits allowable for each sticker. If tags or stickers are sold in municipal offices, extra staff time will need to be committed. Residents might view a requirement to buy and store stickers or tags as an inconvenience. Tags and stickers often do not adhere in rainy or cold weather. Extra time might be needed at curb for collectors to enforce size limits. In addition, there may be no incentive for strict enforcement if haulers are paid based on the amount of waste collected. Stickers left on trash at curbside could be removed by vandals or by other residents hoping to avoid paying for waste services. Tags and stickers are not as noticeable as bags or other prepaid indicators.	Tompkins County, NY Aurora, IL Grand Rapids, MI Lansing, MI

Putting the Blocks Together

Now that you have identified the components of unit pricing programs in general, you are ready to design a program that meets your community's specific needs and goals. "Putting the Blocks Together" presents a six-step process that can assist you in designing and evaluating your preliminary rate structure. This process should begin approximately six months before the start of your program.

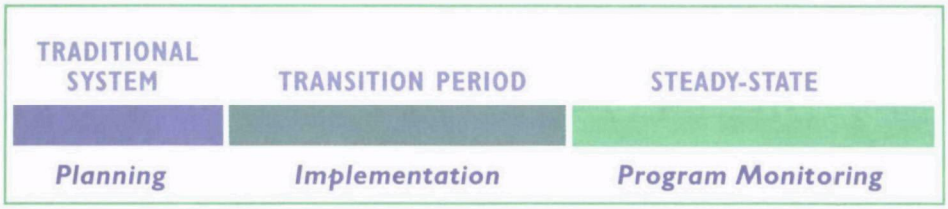
Performing the Six-Step Process

As you are completing these steps, be sure to keep a few basic objectives in mind:

- Raise sufficient revenues to cover fixed costs and variable costs.
- Possibly raise revenues beyond the cost of the program to cover other waste management costs. These revenues might be used for antilittering campaigns or to discourage illegal dumping.
- Send clear price signals to citizens to encourage waste reduction.
- Charge appropriate fees to cover the costs of 1) recycling and other complementary programs, 2) providing services (such as backyard collection) for physically limited or disabled people, and 3) any discount pricing provided to low-income households.
- Compile accurate MSW baseline data to be used when evaluating your unit pricing program.
- Design a program simple enough to keep administrative costs low and to make it easy for people to participate in the program, thereby reducing both their waste generation and their waste collection bill.
- Also, don't forget to consider your unit pricing goals, community-specific conditions, and the most promising suggestions from municipalities with existing unit pricing programs to ensure a program tailored to the waste management needs and concerns of your community.

1 STEP Demand: Estimate Total Amount of Waste Generated in the "Steady-State"

Because the amount of waste your community generates affects the level of resources (including trucks, labor, and administrative support) required to manage it, you need to accurately estimate what the community's waste generation rate will be after your unit pricing program is fully established. This period is referred to as the "steady-state." In the steady-state, residents have accepted unit pricing and reduced their waste generation rates accordingly, and the municipality's waste management operations have adjusted to new, lower waste collection requirements.



Ensuring that the revenues received under the unit pricing program will cover the program's costs is a critical factor for most communities. As a result, accurately estimating the amount of waste collected in the steady-state is an important first step in determining how much money unit pricing will actually generate. To develop such an estimate, perform the following calculations:

- **Current demand.** Using your waste hauling records, estimate the amount of waste collected from residents last year.

- **Community growth.** Next, estimate the population growth trends and other demographic patterns in your community. Use this information to estimate the demand for waste management services over the next one or two years. This information can be developed in several ways; the box entitled "Forecasting Community Growth Trends" on page 36 discusses some different approaches. (Note: If you are planning special programs for low-income, elderly, or multi-family households, you should estimate the population trends of these residents or households as well.)

- **Impact of unit pricing.** Then, estimate the likely impact (i.e., household responsiveness) of unit pricing on this demand for waste services. Other communities with unit pricing programs in place might be a good source of information on the degree of waste generation reduction to be expected. Some communities have achieved 25 to 45 percent reductions in waste generation rates, depending on such factors as the use of complementary programs, the design of the unit pricing rate structure, and the effectiveness of the public education effort. Be sure not to underestimate the potential success of your unit pricing program, especially if strong public education and complementary programs are planned. Underestimating waste reduction will cause you to overestimate potential revenues.

Use this information on current demand, community growth, and the impact of unit pricing to estimate the total amount of solid waste you expect will be generated once the unit pricing program has been established.

Forecasting Community Growth Trends

Forecasting trends in the growth of a community's population is an important step in accurately estimating the amount of waste generated under an ongoing unit pricing program. Typically, the degree of sophistication a community brings to this process will vary with the information and resources available.

For example, if your community is small and you expect no change in population trends, per capita waste generation, and commercial or industrial growth, you could use a simple trend analysis to forecast growth. Your estimation of current waste generation amounts might be based on a waste characterization assessment, historical records from collection services and disposal facilities, or estimates based on similar communities' analyses. Extending these trends can provide an estimate of future demand for solid waste services. If you base your estimates on other communities' analyses, be sure to choose communities that are similar to yours in size, population, income distribution, urban/rural distribution, and economic base. In addition, using the most recent analyses available will increase the accuracy of your estimation.

In contrast, if your community is large and you expect a change in current trends, you probably will need to use a sophisticated forecasting equation that will account for all the variables you identify. Your solid waste agency may have collected data on a number of factors that previously have influenced the amount of waste generated by the community (such as housing construction, plant closings, household income, economic growth, and age distribution of the population). You could base projections of future demand for solid waste services by introducing these data into your forecasting equation.

2 STEP Services: Determine the Components of Your Unit Pricing Program

After clarifying your community's goals and considering the pros and cons of the unit pricing program options described earlier in this section of the guide, you will be ready to determine the methods your solid waste agency will use to collect waste from residents and other details of your unit pricing program, including:

- **Containers.** After considering their practical implications, decide whether your unit pricing program would be most effective using cans, bags, tags or stickers, or some type of hybrid system. Determine the volume of the containers to be used.

- **Service Options.** While most unit pricing programs will include curbside collections, decide whether your program would benefit from such additional services as backyard collections and picking up bulky items such as white goods.

Complementary waste management programs. If your community is not already operating programs like recycling or composting, consider whether you might implement them to enhance the effectiveness of your unit pricing program and to help meet other community goals.

Residents of multi-family buildings and low-income residents. Determine how your community plans to extend the economic benefits of unit pricing to residents of multi-family buildings and to deal with the needs of low-income residents and the elderly.

3 STEP Costs: Estimate the Costs of Your Unit Pricing Program

Having determined the structure of your program and the services to include, list all associated costs. Categories of costs can include:

Start-up costs. Estimate the one-time costs your community will incur when implementing the unit pricing program, such as training personnel, purchasing new containers, and designing and implementing a new billing process.

Ongoing costs. Estimate the costs your program will incur on an ongoing basis. These costs include variable costs (such as landfill tipping fees) and more stable or fixed costs (including rent and utilities for agency offices and office supplies) that remain relatively constant despite fluctuations in the amount of waste collected. Be sure to consider any extra costs from providing special services to certain groups. (Some communities might find it useful to employ full cost accounting procedures to better understand the exact costs of the different projects planned as part of the unit pricing program.)

4 STEP Rates: Develop a Tentative Unit Pricing Rate Structure

Having determined the components of your program, you can now set a tentative rate structure. At this point, the rates should be considered merely rough estimates to be revised and refined in light of the overall revenues they will generate and how acceptable the costs will be to residents. The rates you start with can be borrowed from the figures used by neighboring unit pricing communities offering similar services or adapted from price ranges found nationally. As you work through the remaining steps in the process of setting a rate structure, you can determine whether the rates are appropriate and make adjustments accordingly. Be sure to specify any lower rates that you plan to make available to some portions of your community (such as discounts for low-income households).

5 STEP Revenues: Calculate the Revenues From Unit Pricing

You now have the information needed to estimate the revenues that your unit pricing program will generate once it has been established and residents have adjusted their waste generation rates accordingly. Divide the total amount of waste generated per month in the steady-state (estimated in Step 1) by the volume of containers, such as bags or cans, you established in Step 2. This provides an estimate of the number of containers of solid waste you expect to collect per month. Then multiply the estimated number of containers by the unit charge you have tentatively established in Step 4. This yields an estimate of the total revenues per month generated under unit pricing.

Depending on the number of services offered and the unit pricing structure itself, these calculations can be simple or complex! For example, communities using cans of varying sizes and offering additional services (such as backyard waste collection) must estimate the revenues produced by each component of their solid waste program. In addition, if low-income households are subsidized under your program, be sure to calculate the size of the subsidies and subtract from the expected revenues.

6 STEP Balance: Evaluate and Adjust Your Preliminary Unit Pricing Program

For most communities, comparing the anticipated costs of their unit pricing program (Step 3) against expected revenues (Step 5) will provide the critical indication of whether the program is viable. (In this step you must be able to rely on accurate baseline data for gauging the viability of your program.) If this comparison indicates that the costs of your unit pricing program might not be fully covered by its revenues, you need to review both the design of the program (Step 2) and the rates you plan to charge (Step 4). Several revisions of program options and rate structures may be required to achieve a unit pricing program that most closely meets the goals established by the community in the planning phase (see Part II).

Once you feel that your program strikes a working balance between costs incurred for services provided and the prices residents will be charged, it might be appropriate to submit the program design to other municipal officials or community leaders for additional input. This process of review and comment can continue until a balanced program agreed upon by community representatives has been established.

The Six Steps in Action: Designing a Rate Structure for Community A

To illustrate the steps in action, we will follow Community A, a hypothetical town, as it designs a rate structure for its new unit pricing program based on its own particular goals and concerns.

Estimating waste generation rates. Community A's records show that it collected 480,000 cubic yards of solid waste from residents last year. Municipal officials realize that the population of the town is likely to increase next year after a large multi-use building complex is completed. Based on population projections prepared by town planners, officials estimate that, at the current rate, residents will generate nearly 600,000 cubic yards of solid waste annually two years from now. Within this two-year period, however, officials hope their unit pricing program will have reached its steady-state, and residents will be generating less waste. Using data from three nearby, demographically similar towns that have established unit pricing programs, municipal officials estimate that two years after implementation of the unit pricing program the community will generate about 410,000 cubic yards of waste annually.

Establishing rates. At this stage in the design process, municipal officials in Community A decide to use the median rate of the prices charged by other communities across the country ($1.75 per 30-gallon bag). In addition, this rate is very close to the price adopted by the three nearby unit pricing communities for their 30-gallon containers.

Calculating revenues. Dividing the annual amount of solid waste Community A expects to generate in the steady-state (410,000 cubic yards) by the size of their waste container (30 gallons or 0.15 cubic yards) shows that the municipality can expect to collect over 2,733,000 bags each year. By multiplying this figure by the price per bag ($1.75), officials calculated that Community A should receive about $4,780,000 in revenues from its unit pricing program each year.

Calculating costs. Community A estimates that the annual steady-state cost of its program will include approximately $1,000,000 in fixed costs, such as public education efforts, computers and other office materials, and enforcement efforts, and approximately $2,700,000 in tipping fees and other variable costs. Combining these figures produces an annual steady-state cost of approximately $3,700,000 for the program. Additional start-up expenses also would be incurred.

Comparing costs and revenues. While recognizing that their program must cover the town's waste management costs completely, officials in Community A agreed the town should cover any start-up costs that exceeded revenues during the initial transition period. Therefore, when a comparison of the expected revenues against the costs of the unit pricing program showed that the program would generate excess revenues, municipal officials decided to lower the price charged per bag to $1.35. This new price would yield a projected $3,690,000 annually, closer to the town's actual costs of maintaining the program.

Balancing Costs and Revenues

Costs

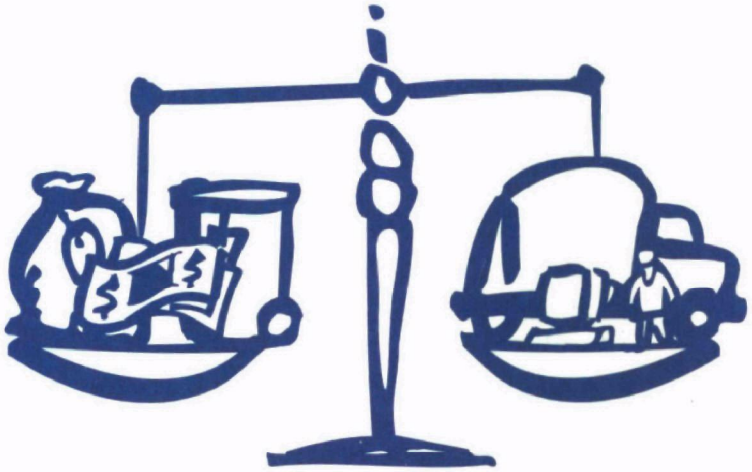
A community can select from an impressive array of service options when mapping out a unit pricing program. After estimating the demand for services in STEP 1, communities can plan for the services they will offer in STEP 2. Some communities will want to offer services such as backyard collections, comprehensive recycling programs, and assistance to residents with special needs. Bear in mind, however, that while these projects can help promote source reduction and increase citizen enthusiasm, they also can increase the cost of your program significantly. Use STEP 3 to help estimate the costs of the services you are planning to offer.

Revenues

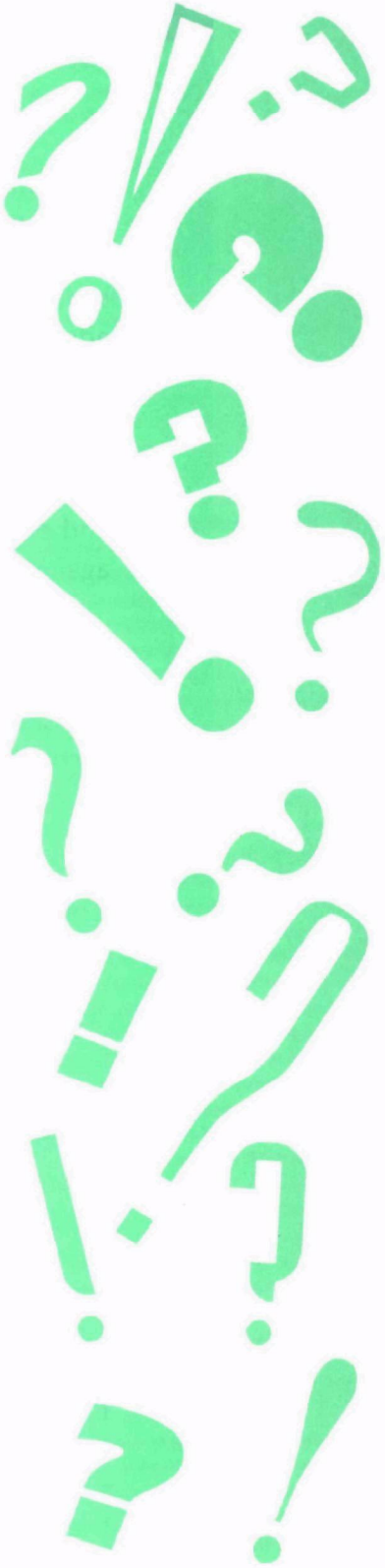
The flip side of costs is revenues. Unit pricing allows communities to generate the revenues needed to pay for solid waste management services under the new program. In fact, when developing a rate structure in STEP 4 and calculating the resulting revenues in STEP 5, communities might decide to set prices at a level above the cost of their unit pricing program. This would further encourage source reduction among residents and ensure that revenues could cover any shortfalls. Since residents will only support a program they feel charges a fair price for solid waste services, however, there are limits to this strategy.

Balance

To be successful over the long term, your unit pricing program will need to carefully balance the services you want to include against the revenues that residents provide. The exact formula will depend upon local conditions. Use STEP 6 to help you compare the costs of your planned program against anticipated revenues. Keep revising your rate structure until you feel that you have a program that offers the services you need at a price residents can support.



questions & answers



How small should our smallest can or bag be?

Unit pricing communities agree that planning for success is important during the design process. Some communities have found that cans as small as 10 to 20 gallons are needed! For example, Olympia, Washington, offers residents a 10-gallon can and Victoria, British Columbia, uses a 22-gallon can as the base service level. A number of communities using large containers (such as 60-gallon cans) are finding that these containers are too large to offer customers meaningful incentives, but purchasing and delivering new, smaller cans later in the program is very expensive. In the short run, a broader range of service can be provided by using several smaller cans. This also helps keep the system flexible for future changes.

What pricing rates are communities charging?

For bag systems in the Midwest and Pennsylvania, communities charge about $1 to $2 per 30-gallon bag. For variable can programs in the Northwest and California, towns charge $9 to $15 for the first level of service (20 to 40 gallons), with charges for additional cans of service ranging from 30¢ to $15.

We have an existing variable rate can program. How can we increase the incentive for waste reduction?

The key change to make is to base your billing on actual set-outs rather than using a subscription approach. Offer smaller cans to encourage waste reduction, and consider a bag-based system. Upgrading composting and recycling options (including plastics collection, for example, if you don't already) also will provide an incentive for customers to reduce waste. Communities also universally state that education is critical to helping customers understand and work with the system. Finally, consider a weight-based program. You might find that the cost of implementing this type of program is not prohibitive and that it can work in tandem with your existing cans.

How can we improve source separation of recyclable materials?

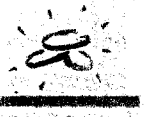
Some residents may tend to be sloppy about source separation regardless of the type of solid waste pricing system. As people learn to reduce their costs by recycling more, however, they may become more inclined to introduce nonrecyclables in their recycling bins. Many communities have found the best solution is a good education and enforcement program that creates a sense of ownership among residents, supported by peer pressure against such behavior. Some also impose a small charge for recyclable materials in their rate structure design.

Points to remember

Remember that container options, complementary programs, rate structures, and billing systems are all **interrelated.** As you consider the different options, keep in mind the need to cover costs, keep the system simple and convenient, encourage waste reduction, and minimize administrative burdens on your agency.

Tradeoffs must be considered as you make decisions about rate structures and program options. **Balance,** for example, the need to generate revenues against providing incentives for waste reduction.

Consider **complementary programs,** such as recycling and collection of yard trimmings, to increase the effectiveness of unit pricing.



Consider how to ensure that unit pricing's economic incentives to reduce waste can be extended to residents of **multi-family housing** in your community.

Design your program to be flexible enough to allow for **groups with special needs.** Discount pricing or assistance programs might be necessary to ensure that the program encourages waste reduction without imposing physical or financial burdens on handicapped or low-income members of your community.

Refer back to your **unit pricing goals** when making rate structure decisions. While information from other communities with unit pricing programs is helpful, your own community's solid waste concerns should be the overriding factor.

Case Studies

Establishing a Rate Structure

A View From Seattle

Unit pricing structure. Seattle has established a two-tiered, variable subscription can unit pricing program. To ensure support for the program from our City Council and residents in general, we needed to design a program that keeps rates low and revenues stable. To accomplish this, Seattle chose to adopt a two-tiered rate structure. The mandatory base charge (called a minimum charge) is $5.85 a month. We also charge $15 for each standard size (30-gallon) can per week. The Council pushed for this structure, believing it would keep overall rates down and send a strong environmental message to the community at the same time. There tends to be broad support for the single price per can.

We also have introduced smaller can sizes. About 30 percent of our customers use minicans (19-gallon capacity), which cost $11.50 per week, and we soon will be providing microcan service (a 10-gallon container) for $9.35 per week. After talking with customers and observing their waste disposal habits, we found a lot of customers could fit their waste into a micro can. We expect about 10 percent of all customers to use the micro cans.

Complementary services. After electing to collect yard trimmings as part of our program, we decided to set a flat fee of $3 per household per month for this service, believing that a more complicated system would only make the program's administration prohibitively costly. We offer bulky item pick-up for $25 per item. The price was set to cover hauling and administrative costs.

For waste that is generated above the subscription level, residents must attach a trash tag, marketed through local retail outlets, to garbage bags. The trash tag system has been one of our less successful programs, partly because customers just don't know about it. In addition, our haulers do not always enforce the tag system. Since they get paid per ton of waste they pick up, they have no incentive to leave the waste at the curb. We estimate we forfeit anywhere from $500,000 to $1 million dollars a year on fees not paid on this additional waste.

Tags and Stickers

A View From Illinois

One of the major advantages of tags and stickers is that, since residents pay for them at various outlets in the community, there is no billing at all. They also are applicable to different types of services, containers, and waste, and they are easy to purchase and hold on to until needed. Multiple tags or stickers can be used on bulky waste items, too.

Tags and stickers also are easy for collection personnel to use. Since every second they spend at a stop costs money, the more data collection or enforcement that a community

requires haulers to perform per stop, the less likely they are to do it. In addition, the tags and stickers are still useful even in cases where collection personnel can't read or write.

But tags and stickers are not perfect. The hauler might not be able to find them. People can steal them off other residents' garbage bags and put them on their own bags. A special problem for stickers is that they can fall off in rainy or cold weather. Furthermore, people may buy a large number of tags in January, and then none for the next several months. Not only does this create an uncertain revenue supply, it also makes predicting solid waste volume very difficult.

Experience With Weight-Based Systems

A View From Farmington, Minnesota, and Seattle, Washington

In **Farmington, Minnesota,** we worked for two years to develop and implement a weight-based unit pricing program for our town of 5,000 residents. Our new system uses fully automated trucks that require just one person per truck to hoist and weigh the garbage can. The truck's weighing system reads a bar code on the can that identifies the resident's name and address. The truck then empties the can and the information is fed automatically into the billing system through an onboard computer. This provides a reliable system for charging residents for waste collection by weight.

One issue we have to resolve is establishing an appropriate regulation for the weighing mechanism used in our 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 establishing regulations covering weighing equipment for garbage collection trucks. One issue that remains, however, is that the degree of calibration required is too precise (the same as that for grocery store scales). We are now in the process of petitioning for changes to make the regulation more consistent with practical needs.

In **Seattle, Washington,** we tested two different weight-based systems: a hand-dumped weight-based system and a semi-automated weight-based system. The hand dump system, designed around a "hook scale" and a bar code, was tested over the course of three months. The collector hung the can on the hook and used a scanner on the bar code. The weight and number were recorded in a portable calculator-sized computer and downloaded to a personal computer for calculating and mailing mock bills to customers. The second system we tested during a six-week trial used a retrofitted semiautomated tipping arm and a radio-frequency tag. The weight and customer identification number were automatically recorded during the dumping cycle. Both approaches worked extremely well. The first system took about 10 percent longer for collection; the second system operated exactly as the standard semiautomated variable can system and took no extra time. Surveys of customers participating in the hand-dump system trial showed that it was very popular. Participating residents reduced waste 15 percent by weight over the course of the testing.

In our research, we found that with the weight-based system, there are advantages to customers buying their own containers. The cost is lower and, if the garbage is hand-dumped, you do not need standardized containers. Under a semiautomated system, however, you might have to require customers to buy specific containers.

PART IV

Implementing and Monitoring Unit Pricing

Having carefully planned and designed a unit pricing program that best reflects the needs and concerns of your community, you can now get started. Implementing a unit pricing program is an ongoing process, requiring persistent attention to a wide range of details. This part of the guide focuses on the central issues concerning unit pricing implementation, including public education, accounting, and administrative changes. Suggestions also are included for collecting data and monitoring the program once it is in place.

There are two distinct schools of thought about the timing of unit pricing implementation. One maintains that unit pricing should be implemented within a specified time frame and that rate adjustments, complementary programs such as recycling, and any other changes be made all at once. The other believes that households respond better when they are asked to make changes in small, manageable increments over time.

The final decision about which path to follow is a local one based on the views of your agency, the local government, community organizations, and the households themselves. In most towns, residents will prefer to modify their habits as infrequently as possible. In this case, it might be easiest to implement a package of changes all at once, rather than ask for a series of adjustments six months apart.

Implementation Activities

Many tasks need to be performed during unit pricing implementation. While the exact activities vary from community to community based on program design and local conditions, certain tasks pertain to nearly all unit pricing programs. These include conducting public relations and reorganizing your solid waste agency's administrative office. (Both of these activities are discussed in detail below.) Other common tasks include:

- **Establishing legal authority.** Generally, to implement a unit pricing program, your solid waste agency needs the authority to set and approve waste collection rates and bill accordingly, establish an ordinance mandating the use of the waste collection service, establish penalties for illegal dumping, and spend solid waste agency funds for activities beyond those associated with traditional solid waste management services (for example, public education). If your community lacks the authority to implement and enforce any portion of the unit pricing program, the first step will be to draft the necessary ordinances in consultation with your legal counsel.
- **Procuring containers.** You also will need to purchase the necessary waste containers, bags, tags, or stickers for the program. Once the size and design specifications are established, you can seek vendors for the required materials. In some cases, a request for proposal (RFP) might be placed to solicit competing bids from several vendors. This can help you procure the necessary materials at the least cost to your agency. After a vendor is selected and an order placed, storage and distribution plans will be needed. In particular, communities planning to use local retailers to distribute bags, tags, or stickers should identify and negotiate with local merchants to arrive at a mutually beneficial arrangement. Communities developing a can-based system will need to inform residents of the can options, have residents select the number and size of cans they will use (if a variable can system is used), and distribute the cans to all residents.
- **Assisting groups with special needs.** If your community is planning to assist residents with special needs, such as multi-family, low-income, physically handicapped, or elderly residents, you will need to develop a list of qualification criteria. In addition, you might need to devise special applications and train staff to review cases. Procedures should be established for resolving any disputes or complaints that could occur during the review process. If you are planning to include multi-family residents in your program, consider planning and conducting a pilot program before you switch to unit pricing. In this way, different systems and technologies can be tested prior to launching the actual program.

- **Establishing complementary programs.** If you have decided to launch or expand recycling or composting efforts, bulky waste collections, or other complementary programs in conjunction with your unit pricing program, you will need to coordinate the many steps involved in establishing these programs. Depending on the resources available and on local conditions, these steps could include purchasing or modifying existing equipment, hiring and training collection staff, identifying local markets for recyclables, and contracting with buyers.

- **Ensuring enforcement.** Enforcement procedures could be established to address the possibility of illegal dumping or burning of waste, "borrowing" of tags or stickers from neighbors' bags, or nonpayment of fees. If necessary, enforcement staff can be hired and procedures developed for investigating incidents. In many cases, these inspectors will need to receive training, equipment, and facilities. Establishing special collections for certain wastes (such as bulky items or materials such as paints, pesticides, and other items considered household hazardous waste), combined with fines for violations, can help prevent illegal dumping or burning. Also, to help instill an environmental ethic in the community which can further reduce the potential for illegal dumping, consider establishing regular citizen cleanups, "adopt-a-highway" projects, and other programs that will gather residents together and focus their interest on maintaining and improving their community.

To ensure successful recycling or other complementary programs, team members will need to coordinate carefully the collection and marketing of recovered materials.

BARRIERS

Public Education and Outreach

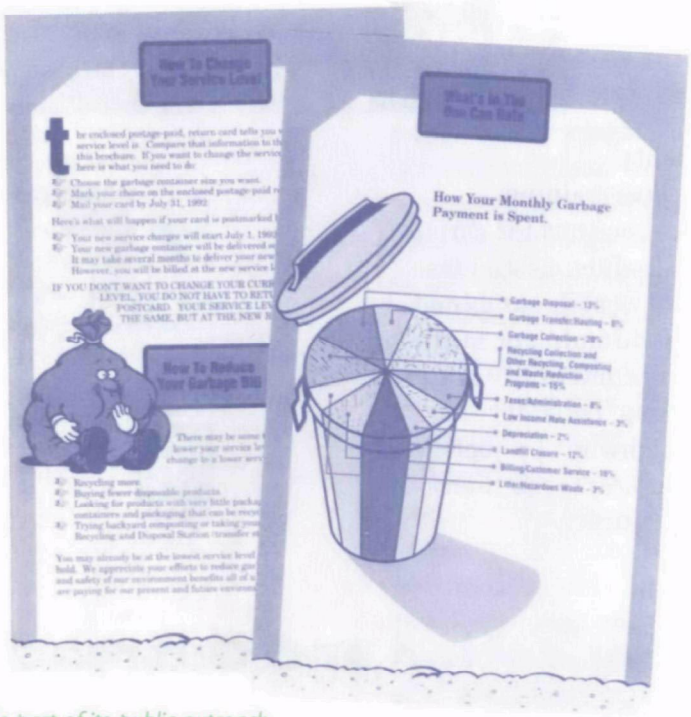
EDUCATION

As discussed in Part II, public outreach during the planning and design stages enables decision-makers to learn more about residents' waste management needs, to inform them of the benefits of unit pricing, to solicit input on the goals of a unit pricing program, and to get feedback on a tentative rate structure. Such efforts are essential for building support among residents for unit pricing.

During the implementation phase, the public outreach program should have two goals: 1) to build on earlier efforts to increase public acceptance of unit pricing and 2) to provide residents with the detailed information they need to understand and participate in the new program. Participants at EPA's Unit Pricing Roundtable agreed that well-informed residents are easier to serve and more likely to be satisfied with the new program. Building public support and providing program specifics typically begins approximately three months before program implementation. These activities are often continued in varying degrees throughout the program.

The first step is to determine the scope and content of your community relations effort. All such efforts need to convey to residents the exact structure of the new unit pricing program. Be sure to relate all essential information, including:

- The types and costs of all services offered under the new program.
- The schedule for collections.
- The means by which fees will be collected.
- The methods or outlets for purchasing cans, bags, tags, or stickers.
- The penalties for noncompliance.



As part of its public outreach program, Seattle's Solid Waste Utility is conveying important information about unit pricing using a series of engaging pamphlets.

When imparting this information to the community, make sure that all instructions are clear and simple. Explain any unit pricing concepts that residents might not understand. If you are producing written materials, consider translating the text into more than one language, depending on the makeup of your community. Use illustrations whenever possible to convey key concepts. Sometimes local copying shops or printers will donate their services to help produce these materials.

Also, be sure to discuss the waste management goals for the community and show how the new unit pricing program will help meet those goals. If you had organized a citizens advisory council or an informal gathering of community or civic groups to help you with public outreach during the planning stage, you might reconvene this group to plan your implementation outreach efforts. Such a group can help you develop an effective message and ensure that you reach all segments of the community.

Offer citizens information on how to alter their purchasing and behavior patterns to prevent and reduce waste. Tips on waste prevention options, such as reusing containers, renting seldom-used equipment, and donating unwanted items, are useful. Encouraging residents to purchase recyclable items and goods with recycled content also is important. In addition, the message is likely to have a greater impact if information on additional benefits, such as saving energy and preserving natural resources, is provided. If residents make the program's goals their goals too, they are more likely to make long-term behavioral changes.

There are many ways to convey the specifics of the program to the community. While the solid waste agency will need to decide which methods to use and how often to repeat the message, some avenues to consider include:

- Introducing the program with a flyer or letter from a local official or recycling coordinator.
- Enclosing inserts in utility bills that discuss the program and answer common questions. Direct mailings to households also can be used.
- Developing posters or flyers for distribution in stores, libraries, schools, and other public places around the community. Retail stores will be especially valuable if your program uses bags, tags, or stickers that are distributed though retail outlets. You can leave flyers, posters, newsletters, and other materials with these stores, and ensure that the retailers themselves are familiar with the program.
- Producing newsletters that discuss the need for the program, answer questions, and provide updates about the program's progress.
- Establishing a telephone hotline to provide residents with immediate answers to their questions.
- Drafting press releases and developing media spots for radio or cable television. Through the media, you can reach a broad range of residents.

Additional outreach techniques can be employed based on your community's particular conditions. For example, if you feel that a specific group of residents, such as senior citizens, are not receiving enough information to participate effectively, you might consider reaching out to senior centers, local churches, and other institutions to ensure that everyone is familiar with unit pricing.

Some solid waste agencies opt to conduct public education campaigns using existing inhouse staff. Others hire one or more qualified individuals to conduct these activities or pay outside consultants to perform public outreach. This decision is typically based on the size of your community, the scope of your program, and the available resources.

Keep in mind that public outreach is an ongoing process. A consistent flow of information, designed to answer questions, receive input, and communicate any changes made to the program after it has been implemented, will help maintain interest in the program. In addition, an ongoing campaign can continue to inform and educate citizens about new ways to prevent or reduce waste.

Reorganizing Your Solid Waste Agency's Administration

Depending on their current structure and the scope of the new unit pricing program, some solid waste agencies will not have to make significant changes in the way they administer solid waste collection services. Such communities can switch to unit pricing using only some overtime work from existing employees. Other programs, however, could require new administrative and accounting systems and staff to handle the changes in billing, tracking costs and revenues, managing operations, and maintaining customer relations. In some cases, larger communities planning more complicated unit pricing systems have found it worthwhile to hire analytical, financial, and customer service staff to handle both the transition and ongoing requirements of the program.

Getting Your New Administrative Office On Line

The keys to transforming your solid waste agency's administration into an efficient team capable of handling its new responsibilities are:

- Anticipating the level of expertise that will be necessary, both during program implementation and ongoing operation.
- Giving funding priority to areas that hold the greatest opportunity for savings or pose the greatest risk of financial problems.
- Meeting temporary needs during the transition with temporary help, rather than locking in to a level of employment that proves excessive in the long run.

While the process of reorganizing an administrative system for a new unit pricing program can seem daunting, performing the switch as a series of steps with clear objectives in mind will help make the process manageable. Generally, communities with unit pricing programs have found that the process of reorganizing the administrative office should take place between three and six months before the start of the program.

The first step is to define the new responsibilities the administrative office must assume once the program has reached its steady state, as described in Part III. Consider all the functions, such as public relations, customer service, economic analysis, financial management and tracking, and enforcement, that the office will need to perform. With steady-state as the goal, try to create a new office that matches these needs rather than accommodate your goals to the skills that are available. After establishing

the functions and related skills required of your new administrative office, you should then begin to reorganize the office to meet these responsibilities.

During the process of defining new responsibilities, remember that the unit pricing program will change the administrative office's functions significantly. The office will be operating a revenue recovery system that pays for the work of the solid waste agency, rather than justifying funding levels to the municipality's budget office. The office will find it has an unprecedented level of influence on customers' behavior through the price signals it sends. This brings additional responsibility for the proper design and management of these price signals. Managing these new functions requires the office to have access to a range of skills, including:

COSTS

- **Economics.** Developing the unit pricing rate structure and related forecasts of revenues, costs, and total community use of waste collection, recycling, and composting programs.
- **Public relations.** Developing outreach and education activities and managing customer service representatives. This function includes interaction with the general public, as well as local interest groups, elected officials, and the news media.
- **Financial and logistical management.** Billing households or collecting revenues from the sale of bags, tags, or stickers; developing debt management strategies; managing cash reserves; and developing a distribution system for the program's cans, bags, tags, or stickers.
- **Enforcement.** Ensuring that households pay for the level of solid waste services they receive.

In addition, several important suggestions were offered during EPA's Unit Pricing Roundtable for organizing your administrative office's financial operations. Be sure to establish access to a cash reserve to help the office cover periods of unanticipated revenue reductions. Repeated instances of revenue shortfalls, however, could signal an imbalance between the services offered and your program's rate structure.

HIERARCHY

Preparing existing administrative staff for the changes that will result from the switch to unit pricing is another important step. While the change initially might not be viewed positively by all employees, conveying the positive aspects of the switch might help ease concerns. In addition to the reorientation of the office away from traditional collection and disposal services to a new emphasis on waste prevention, recycling, and composting, employees should be informed of the opportunities for staff training and development in new areas, such as public relations and customer service, that the new program will create.

TRADEOFFS

Furthermore, when organizing the new office, communities should be aware that expanding the administrative office requires a delicate balancing of resources: while allocating too much funding to the office could cut into the savings that unit pricing programs offer, underfunding the office can result in inefficiencies and poor revenue recovery. This is

particularly true during the implementation and transition periods, before the unit pricing steady-state has been reached. During this period, using temporary labor or employees on loan from other municipal agencies might help to cover short-term budgeting, analytical, and other tasks.

Developing a Schedule

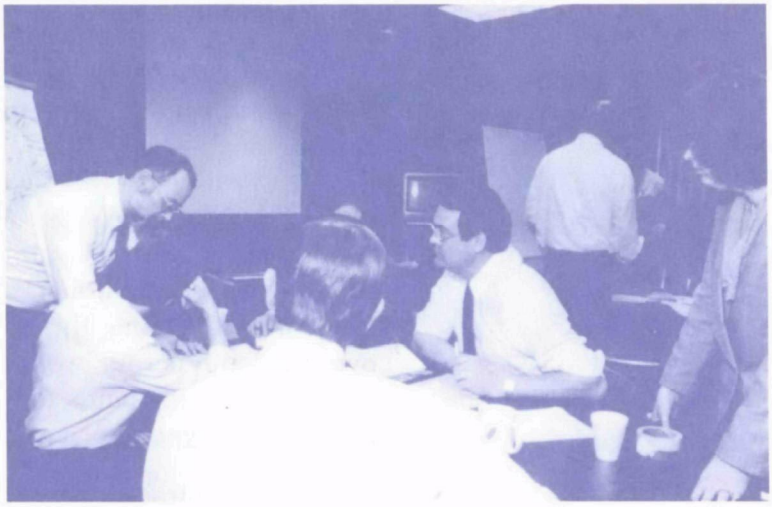
Organizing the many steps involved in planning, designing, and implementing a unit pricing program into a clear schedule is an essential step for most communities. While the exact schedule of steps should be viewed as flexible, establishing an overview of the entire process will help eliminate the possibility of any serious omissions. Table 4-1 presents a detailed timeline for your reference. (The dates listed on the timeline represent the number of months before or after program implementation each step should be initiated. Program implementation is defined as the date on which actual service changes begin.)

While the dates have been established based on the experiences of a number of communities with unit pricing programs in place, local conditions and needs will inevitably affect the exact timing of your program's development. Many factors affect how you adapt this timeline to your community's needs, including equipment changes, contractual changes, financing requirements, and employment, as well as political factors (such as the nature and structure of the local political process and the potential existence of a perceived solid waste crisis). In most cases, the level of political support is the most important variable, routinely cited by communities as responsible for either significant delays or rapid progress in the implementation of their unit pricing programs. Most of the remaining steps can be conducted fairly routinely in 3 to 12 months, depending on system choices, size of the community, and types of solid waste collection and administration systems in place.

Program Monitoring and Evaluation

As solid waste management has grown more challenging in recent years, local officials are finding that they have greater freedom to develop and implement new systems for managing waste. At the same time, however, their efforts also are subject to a higher level of scrutiny. Within the context of tightening municipal budgets and increasing demands for city services of all types, local officials must be able to discuss budget needs and priorities in a compelling way, using reliable data to support their case. Specifically, a thorough process of collecting and analyzing data about the performance of the unit pricing program will:

- Provide the facts about the cost-effectiveness of the unit pricing program that local officials need to justify the current budget.
- Enable planners to justify future budget needs by demonstrating that the new spending on the program could in fact **save** money in the long run.
- Help reassure bond rating agencies of the cost-effectiveness of the unit pricing program, thereby reducing the cost of financing it through bond sales.
- Allow planners to accurately compare the performance of any complementary programs, enabling them to reallocate resources among the programs to increase the overall effectiveness of unit pricing.
- Generate concrete, understandable, and accurate information that can help other communities considering unit pricing.



Collecting and analyzing unit pricing data will help the solid waste agency adjust its program to changing circumstances.

Moreover, this data will enable solid waste agency planners to adjust the unit pricing program to unforeseen circumstances, ensuring that the effort and attention paid to planning, designing, and implementing the program will not be wasted. Typically, program monitoring and evaluation begins about six months before the date of unit pricing implementation, when information on the old waste management system is gathered. These data will act as a benchmark against which the progress of the unit pricing program can be measured. Monitoring and evaluation begins as soon as the new program is launched and continues throughout the program.

Data collection is the first step in program monitoring and evaluation. While the exact types of data a community collects will vary from one area to another, most municipalities track:

- Changes in the community's waste generation rate
- Costs incurred, both in starting up and in operating the new program
- Revenues received under the program

Communities often begin by collecting data on the amount of waste disposed of, recycled, and composted before and after the program's implementation. Estimates of the amount of material illegally dumped can be calculated as well. To allow for a more comprehensive analysis, the waste generation rates can be tracked by month and year, and, if possible, by origin and destination. In addition, the data can be further broken down by facility, customer group (such as residential, multi-family, commercial, or industrial), and program (for example, drop-off versus curbside services). To gain a more accurate picture of the impact of their program, some communities also estimate the amount of waste that would have been generated in the absence of the unit pricing program.

The specific costs that a community might want to research include disposal costs and tipping fees; new administrative costs, including public

relations, billing and invoicing, inventory and distribution of bags, tags or cans, and additional customer service staff; and direct program and service costs such as wages, supplies, consultant services, and postage. Costs for monitoring and cleaning up illegal dumping can be included as well.

COSTS

In addition, to increase the usefulness of cost data, communities might want to attribute different expenses to specific components of unit pricing (such as administrative labor or container costs) and track these separate cost categories by month and year. Be careful, however, to distinguish between short-term expenses and long-term investments for needed facilities and equipment. During this process, take care to separate transition and startup expenses from the ongoing operational costs of unit pricing. If possible, initial capital costs should be allocated over time and across programs. Collecting data on the revenues resulting from unit pricing tends to be simpler. Communities typically track revenues by type of program and customer category.

To closely track a new unit pricing program, communities also might want to develop data on the number of subscribers or participants, broken down into type of service and program; the service and subscription levels (if a variable can program is used); the inventories of bags or tags held by distributors or manufacturers; the weight of containers set out (if possible, through surveys); and the numbers of phone calls and letters and the issues raised.

Program evaluation can yield misleading results, however. To help avoid some common data collection and evaluation mistakes, panelists at EPA's Unit Pricing Roundtable recommended avoiding focusing on participation rates as a measure of success. While a study of participation levels can help guide program modifications, they are not useful for gauging overall progress since they do not address cost issues and tend not to distinguish between casual and committed participants. Likewise, panelists recommended that communities also consider factors beyond overall waste reduction when evaluating a program. For example, intangible issues, such as dissatisfaction with the program among residents of multi-family buildings, would not be reflected in an analysis that focused exclusively on waste reduction numbers.

Tips for Data Collection and Program Monitoring

- Get data from several different angles if possible (for example, waste quantity generation rates for both collection services and disposal facilities).
- Don't simply accept the numbers as they are generated. Consider the possibility that factors such as underlying shifts in categories, definitions, or reporting might affect the accuracy of the results.
- Be sure to carefully track costs. Without accurate and attributable data, the impact of your cost-effectiveness evaluation will be reduced.

Table 4-1.
Schedule of Implementation Activities

Implementation Activities	Months Prior to or Following Program Implementation						
	9	6	3	0	3	6	Ongoing
Customer Relations							
Public outreach							
Brief management and elected officials	X						
Conduct focus groups on rate program design and issues	X	X					
Develop information materials for council and press		X					
Hold council hearings and public hearings		X					
Public relations/education							
Issue RFP for public relations firm, if needed	X						
Design educational materials, bill stuffers		X					
Review/refine educational materials			X				X
Produce educational materials			X				X
Distribute educational materials			X				X
Customer service staff							
Request customer service representative (CSR) computers and workspace, if needed	X						
Advertise for CSRs			X				
Obtain and install CSR computer equipment			X				
Hire and train CSRs			X				
Release temporary CSRs					X		
Planning and Analysis							
Hire rates analyst (part- or full-time)	X						
Determine rate setting procedure and calculate rates		X					
Refine rate structure			X				X

Table 4-1 (continued). Schedule of Implementation Activities

Implementation Activities	Months Prior to or Following Program Implementation						
	9	6	3	0	3	6	Ongoing
Containers and Enforcement							
Bags, tags, or stickers							
Set specifications for sticker or bag and design logo	X						
Issue RFP for sticker or bag manufacture	X						
Select manufacturer		X					
Negotiate with retail outlets for sticker or bag distribution	X						
Finalize sticker or bag distribution plans		X					
Begin selling stickers or bags in stores				X			
Design error tags	X						
Cans							
Issue RFP for can purchase and distribution	X						
Decide on can size and purchase containers		X					
Have residents select can size		X					
Distribute cans			X				
Replace lost, stolen, or wrong-sized cans				X			X
Enforcement							
Establish preliminary enforcement procedures	X						
Request equipment and facilities for inspectors	X						
Finalize enforcement procedures		X					
Train inspectors			X	X			
Release temporary inspectors						X	
Special Groups							
Negotiate with welfare agencies	X						
Develop exemption/discount criteria	X						
Determine responsible office	X						
Create procedures for qualification, disputes, etc.		X					
Finalize criteria and procedures		X					
Train inspectors or qualifiers		X					
Conduct qualifications			X				

Table 4-1 (continued). Schedule of Implementation Activities

Implementation Activities	Months Prior to or Following Program Implementation						
	9	6	3	0	3	6	Ongoing
Multi-Family Planning							
Evaluate level of multi-family need	X						
Evaluate multi-family pilot options	X						
Conduct pilot program, if appropriate		X	X				
Changes to Other Programs							
Determine which complementary services to offer		X					
Decide funding source for new and existing complementary programs		X					
Modify unit pricing program to cover these costs, if necessary			X				
Modify diversion program contracts and procedures as necessary							X
Ordinances							
Draft final ordinances for new program		X					
Draft ordinances, as necessary, for illegal dumping and burning, recycling, and special collections		X					
Enact ordinances			X				
Data Collection							
Analyze information needs and design reporting procedures	X						
Finalize procedures	X						
Conduct baseline data collection		X					X
Begin postimplementation data collection				X			X
Conduct data analysis and program modification					X		X

questions & answers

Is it really necessary to explain the new program repeatedly through so many different avenues?

Not all citizens find garbage fascinating, nor will they immediately understand the reasons for a new waste management program. Explaining a new program more than once is not rude or insulting—it's a courtesy to people who would like to participate but have other things on their minds. Also, because unit pricing requires that residents pay attention to details such as labeling waste containers with stickers or buying bags from the municipality, hearing the message several times increases the chance that all residents will get the information they need.

Does unit pricing require us to completely reinvent our solid waste agency?

It does require a significant review of your agency's goals and structure. But this examination of new needs and existing employees could lead to the discovery of some previously untapped skills in your agency.

Do I really need to follow this detailed timeline? Half the items in it are not likely to come up in our community.

Select what you need from the timeline. The timeline lists the many possible kinds of new activities that a unit pricing program could require. It is designed to help solid waste officials think about specific activities, thereby supplementing the broad concepts that are stressed elsewhere in this guide.

Our municipality is on a tight budget. Do we really need to spend money on data collection and monitoring?

While many of your unit pricing decisions face budgetary constraints, data collection is essential for planning and for ensuring cost-effectiveness. The right kind of information can show which types of unit pricing program and rate modifications can best meet the community's needs over time.

Points to remember

Be sure your public education campaign uses a **consistent, simple message** that clearly communicates the goals of the unit pricing program.

To ease the **administrative transition,** clearly define the responsibilities of the office, the level of expertise that will be necessary, and any new staff that need to be brought on.

Give **funding priority** to areas that hold the greatest risk of financial problems or hold the greatest opportunity for savings through effective management of limited administrative budgets.

Establish a **flexible schedule** for your unit pricing program that reflects the political, technical, and economic concerns and issues in your community.

Be sure to **evaluate** your program's progress periodically, including collecting and analyzing data on waste generation rates, costs and revenues, and the attitude of residents toward the program.

To improve your data collection, make **providing numbers** part of the contract (or franchise or license agreement) with your haulers. Ask for monthly reporting, and provide forms and definitions to ensure you receive the information you require.

Case Studies

Public Education

A View From Austin, Texas

While Austin, Texas, is a very environmentally aware community, our Environmental and Conservation Services staff realized that behavior does not always correspond to stated attitudes. To give our new unit pricing program a good chance of success, we realized a strong public outreach program was needed. Since unit pricing terms such as "variable rates" and "volume-based pricing" are not particularly user-friendly, our first challenge was to come up with a name that would convey the nature of the new program to city council members, customers, and our own solid waste service workers. The name we came up with was "Pay-as-You-Throw," which has economic as well as environmental appeal.

Then, we initiated a pilot program beginning with a three-phase marketing plan to reach out to the 3,000 participating single-family households. In the first phase, the Preimplementation Phase, we worked very hard to sell the program in the community. We lined up support from interest groups, asked city council members to talk about the program, and encouraged the media to write positive editorials.

During the second phase, the Implementation Phase, we had a more specific challenge. We have had curbside recycling in Austin since 1982 and good experiences with recycling behavior. With a well-established recycling program, however, when we brought the program to the pilot households, people were asking "Why do we need to do this when we're already recycling?" Our biggest challenge was to inform people about the need to further reduce waste and encourage them to use our unit pricing program in conjunction with recycling. After implementation, we learned from both attitudinal surveys and from direct observation of recycling bins that recycling had increased from 50 to 80 percent in some neighborhoods when unit pricing was introduced.

The third phase of our public outreach program was the Maintenance Phase. Once the program was in place, we realized it was important to continue trying to raise awareness. It was during this phase that we introduced what became our single best educational tool—a brief, colorful newsletter included with each garbage bill. Called "Waste Watch," the newsletter contains features on the garbage collectors, dates of the brush/bulk pickup in each neighborhood, discussions about our unit pricing goals, and other features. We knew that only 15 to 25 percent of our customers read the usual utility inserts. However, after we provided more sophisticated information in an appealing format, our survey results showed a rise in readership.

Administration Staffing
A View From Darien, Illinois

Darien, Illinois, with a population of 21,000, moved from a franchise flat-fee system to a franchise sticker system in May 1990. Their administrative staffing needs were unchanged: one person from the city oversees the activities of the franchise hauler. City council members and existing staff put in overtime to develop details of the new system and negotiate with the hauler during the implementation process. The hauler has reported some increased accounting complexity but no increased staffing needs. Research indicates that this level of small, temporary increases in administrative needs during implementation of a new or revised unit pricing program is typical of many smaller communities.

Administration Staffing
A View From Seattle, Washington

The Seattle Solid Waste Utility, an enterprise fund, operates a variable can subscription system with recycling fees and other charges embedded in the collection rates. Billing is performed in cooperation with the Seattle Water Department at a cost to the Seattle Solid Waste Utility of $1.9 million per year.

To manage this program, the utility employs two rate-setting staff, four finance staff, and three accountants. Another $15,000 to $20,000 per year is spent on consulting services, mostly to assist with setting rates. Additionally, Seattle's 22 full-time customer service representatives and 9 refuse inspectors help to meet the service and enforcement needs of the new program.

APPENDIX A

EPA's Unit Pricing Roundtable Discussion: Questions & Alternatives

This appendix presents a selection of proceedings from EPA's Unit Pricing Roundtable, held in December 1992. These proceedings include descriptions of different programs from around the country, experiences of solid waste officials who have spearheaded unit pricing programs, and ideas on managing program costs and challenges. The discussions provided in this appendix are organized around a number of specific questions and are divided into four general sections:

- *Getting started*
- *Exploring program options, issues, and experiences*
- *Integrating unit pricing and complementary programs*
- *Accommodating groups with special needs*

The first section explores issues involved in starting a unit pricing program, such as education, communication, and changing the status quo. The second section compares the essential components of a unit pricing program, including container choices, pricing models, and billing systems. It then moves on to financial issues, including cash flow and enterprise funds, and discusses enforcement issues. The third section focuses on integrating unit pricing and complementary programs, such as yard trimmings and household hazardous waste collection programs. The last section shares some of the Roundtable proceedings on accommodating groups with special needs, such as senior citizens, large families, and low-income households.

Getting Started

Changing the Status Quo

How do you convince citizens that unit pricing is a good idea in the first place? That has been a real obstacle.

Seattle, WA: *I think getting some good public support by working on it early is very important. Contact not only recycling groups but also community councils, people whom you might not expect to be big advocates of a unit pricing program.*

State of IL: *The public opposition question comes up for communities that currently pay for their garbage collection out of general taxes (e.g., property taxes). In a sense, that's a hidden cost, and people perceive garbage collection as a free service. But if they have a monthly bill (instead of paying through property taxes, for example), they know that garbage collection costs something and there's "no free lunch." Then, in moving to a unit pricing program, they can actually see that the cost of garbage collection comes down. Whereas if the costs are hidden as property tax or general*

Unit Pricing Roundtable Participants

The EPA-sponsored Unit Pricing Roundtable was moderated by Jan Canterbury of the EPA Office of Solid Waste and attended by over a dozen individuals who have been involved in successful unit pricing programs. The participants included:

Nancy Lee Newell of the City of Durham, North Carolina

Peggy Douglas of the City of Knoxville, Tennessee

Barbara Cathey of the City of Pasadena, California

Bill Dunn of the Minnesota Office of Waste Management

Nick Pealy of the Seattle Solid Waste Utility, Washington

Jody Harris of the Maine Waste Management Agency

Jamy Poth of the City of Austin, Texas

Jeanne Becker of Becker Associates, Illinois

Lisa Skumatz of Synergic Resources Corporation (SRC)

Lon Hultgren of the Town of Mansfield, Connecticut

Greg Harder of the Pennsylvania Department of Environmental Resources

Thomas Kusterer of the Montgomery County Government, Maryland

Robert Arner of the Northern Virginia Planning District Commission

revenue, then no matter how far waste collection costs drop, they see unit pricing as an added cost.

State of MN: *What I have found in Minnesota, and it's true with a lot of waste issues, is that we have the true believers and then we have the skeptics. The two groups are pretty much cemented before the discussion even begins. So, how do you get them to move? I'm not sure. But mandates at either the state, county, or city level can work.*

SRC: *Maybe one of the ways to help get past public opposition is to work with members of citizen groups or "green groups" to start a groundswell of support for the program. Have some success stories from other communities. This can help make it so that the politicians supporting unit pricing are going with the tide rather than bucking the system.*

Citizen Education

Did you use ad hoc citizen advisory groups, focus groups, surveys, and things of that sort before you got started?

Austin, TX: *Yes, in fact, the way we introduced the program (this takes a lot of leg work but is extremely important) is that we contacted neighborhood and civic associations, as well as our recycling block leaders. Just coming up with the list of associations was a task. We produced an eight-minute video on unit pricing and played the video at the neighborhood meetings. We had real people talking about what was about to happen. We got a lot of feedback by showing that tape. We carried out two focus group surveys, including one on larger families, an issue that many people want to hear more about. We experimented with soliciting feedback that was recorded on a telephone voice mail system. This is effective because, believe it or not, people are not that hesitant to record their views. It is also cost-effective, since we use the telephone answering tree for our other programs as well. The voice mail is a call-automated system, so the caller presses "7" to find out when our brush pick up date is or "2" to find out how to exchange carts. Many of the questions asked are just that simple. As you review your communications and outreach system, it makes sense to look into voice mail.*

Costs of Public Education

How much money was budgeted for unit pricing education? Also, in developing your outreach efforts in-house, how many staff members did you devote to education and public relations?

Austin, TX: *Our educational costs ranged from $6 to $8 per household per year in the early years. Most of those costs were start-up costs. We saved a lot of money by doing all of our work in-house—designing a user-friendly name and a regular way of communicating in our pilot program. However, this in-house approach meant that we were constrained from using mass media such as TV and radio. We did not have the capacity to develop a TV commercial that said, "Here is how you participate in the new program." I really doubt that many communities phasing in their unit pricing program will find a mass media program useful because unit pricing can require a complex explanation. Instead, we use mass media only with our generic recycling and*

yard trimmings messages—simple messages such as "Either leave it on the lawn or compost it." We had three full-time staff members for education. One person was assigned to public relations, another was a graphic artist that participated in many things, and I was the planner. Also, we utilized volunteers (such as recycling block leaders or neighborhood association presidents) who provided the leg work in getting the word out. You would be surprised how interested the volunteers are in doing something. We produced our video out-of-house because we didn't have the necessary cameras.

Seattle, WA: *Seattle spends $3.25 per household per year on public education, but that is actually high because a portion of that money goes to educating commercial and transfer stations. So it's probably under $3. But if you can piggyback some of these things, you can reduce your costs even further. Postage is very expensive, so if you can tag postage for the unit pricing message along with something else, it's even cheaper.*

Pasadena, CA: *I'd like to emphasize that it is absolutely key to put yourself on the firing line with the customers. They pay the fees. When we went to the community we assured them, "We're not taking anything away from you. We are giving you the opportunity to have more control over your costs. You cut your trash down, you cut your trash bill down." You need to listen, take the abuse, but then once the people actually experience the program, they become converts, they don't want to go back. Either you take the time up front to educate, or you take it later with operational difficulties once the program is underway.*

Getting Ready for Unit Pricing

What about communities that don't have unit pricing now?

Knoxville, TN: *My fear is that a lot of what's being discussed here may be difficult to apply to most cities in the South. In Tennessee, for example, we did a needs assessment of all the counties, and we found, first of all, that the waste composition was very different from the rest of the country. Only about 25 percent to 35 percent of the total waste stream was residential. Also, there is no city-wide curbside recycling, very little yard trimmings recycling, no household hazardous waste collection, and only one regional materials recovery facility. In addition, our landfill tipping fees average only about $25/ton even though we have adopted Subtitle D landfill regulations. Our land values are just a whole lot less than other areas of the country, for now at least. I don't think Tennessee is a lot different than most states in the South.*

EPA: *I'm glad that you raised that because one of the goals of the guide is to provide information for communities that may not yet be at the jumping off point for implementing unit pricing. Any comments?*

Pasadena, CA: *What do you mean they are not ready? What's your objective?*

Knoxville, TN: *Well, to answer the first part of your question, in our needs assessment study, we found that a third of the counties in Tennessee didn't even have collection service, period. So it's hard to talk about unit pricing or recycling. And one of the main reasons why I wanted to go to unit pricing was to be able to finance some of the extra municipal solid waste programs. I can't do it right now, because every time I try*

to get city council to increase property taxes to pay for curbside recycling, I'm competing against stormwater drain programs or something else.

Mansfield, CT: *You can start implementation with a drop-off center. Our community used the closure of the town's landfill to start paying by the bag at the transfer station. Any major facility or system change could act as a catalyst for a unit pricing system.*

Durham, NC: *Well, some of the South is ready, and it's because we have a very progressive state legislation package to push us. We have a 25 percent goal for July 1993, which not many of us are going to reach. And a 40 percent goal by 2001. We have to provide some kind of recycling for our citizens. That's spurring a lot of interest in our state, and a lot of people are looking at all the complementary programs. We are trying to give people as many options as possible (e.g., curbside recycling and garbage collection once a week, yard trimmings collection, a yard trimmings composting facility, and a bulky item pick-up). Anything other than sending it to a landfill. Our landfill is going to close, and our county hasn't been able to site another, so we're going to be shipping our waste out of the county. So we have a real big incentive to make sure we dispose of as little as possible. When you do have a crisis situation, and you have legislation that's pushing you in that direction on a state level, it can push you into the cutting edge of things, so it could be that you need to knock on your state legislature's door.*

Program Options, Issues, and Experiences

Voluntary Versus Mandatory Programs

What are some of the advantages of voluntary programs?

Northern VA: *There are communities like Plantation, Florida, that have voluntary unit pricing. Voluntary programs are more compatible with ideals of personal freedom, and the enforcement costs may be lower. On the other hand, there may be less participation in voluntary programs. A certain amount of good will is associated with mandatory programs, since everyone has to participate. Mandatory programs also provide a greater ability to cover fixed costs and less of an incentive for illegal dumping. If you have to pay for at least some municipal solid waste service, then you may be less inclined to dump your waste.*

Time Factors

Does it take less time for your crews to go down the street and get their work done with the unit-based program?

Austin, TX: *Yes. We went from manual collection to semiautomated and estimate that the collection cost savings will be $5.11 per household per year. And we also went from three collectors to two collectors. That might not sound like much on an individual household basis, but certainly there is a cost savings. Then, we promote the*

educational message of "share your boundary with your neighbor," so we can make fewer stops in your neighborhood.

Seattle, WA: *I think there are economies when you're collecting minicans as opposed to toters. Toters take 20 to 45 seconds apiece, depending on what you've got. The minican takes less time than that, so there are definitely time savings. But, I think that bags are considerably faster than either toters or minicans.*

Bag Programs

What is the largest city with a bag program in Pennsylvania?

State of PA: *Probably the largest city in Pennsylvania that has a bag system is Allentown, but it has a limited per-bag system that is only used for grass clippings. Reading has a population of 78,000, but it has a voluntary system in which haulers are required to offer a variable rate option. Wilkes-Barre has a population of around 48,500, but its program applies only to residents of apartment buildings. The largest mandatory per-bag system is probably Carlisle, which has a population of around 20,000. Carlisle is followed by South White Hall Township, with a population of around 18,000. Most per-bag systems in Pennsylvania use standard size 30-gallon trash bags. And usually they put a weight limit of around 40 pounds on the bags so you can't fill them up with bricks.*

Stickers

How are stickers working out in your unit pricing program?

State of IL: *The advantage of stickers is that there is no billing at all. They're applicable to various types of service, types of containers, and types of waste. With a simple, uniform schedule, stickers could be ordered through the mail. Or somebody could buy 50 stickers at a time from a hauler or from the local grocery store. The stickers are easy to keep and they are not going to rot. Often times, the haulers can't read and write, and so stickers are very simple. Since every second they spend at a stop is money to them, the more data collection or enforcement that you require haulers per stop, the less likely they are to do it. It's a time limit. But stickers are not perfect. The adhesive can be a problem. The hauler might not be able to find them. Stickers can be stolen off of someone else's garbage bag. And maybe the biggest problem is that people could buy a year's worth of bags in January, and then not buy anymore for the next several months. It is really hard to have to predict people's behavior in order to forecast revenue. The largest community in Illinois that has a sticker program is the City of Aurora, which has 100,000 people.*

Durham, NC: *Stickers are interesting because you can take a big bag that you got at the store and put your garbage in it and put a sticker on it. Then you are reusing that bag and not generating another waste product.*

Pricing Models

What unit pricing models have you used? And how are the variable costs of providing services kept low?

State of IL: *In Illinois, communities tend to charge what their neighbors do. The rates vary from $1 to $2 a sticker. I really think they just try it and hope that the price is in the right ballpark.*

State of PA: *Most Pennsylvania communities use a bag-based unit pricing system because they see examples in nearby communities. Carlisle adopted one about three years ago, and people in the neighboring township actually began clamoring for the same. In fact, they actually sued the township to give them a bag-based system instead of a flat-rate system. People like unit pricing because they see it as being very fair and very equitable.*

SRC: *A 30-percent impact on customer costs may be a threshold level at which people begin responding to unit pricing. In contrast, I've seen some communities offer 90-gallon cans as the smallest size and then charge a quarter or a dollar for each additional 30 or 60 gallons. That may be unit pricing in one sense, but it certainly doesn't provide much of an incentive for people to source reduce. You can also use a fairly simple model and then consider some scenarios that give you an idea of what your rates should be. You don't have to have a massive rates model; there are communities working fine with microcomputer spreadsheets.*

Subscription Service Changes

How do you handle it when people want to change their service?

Austin, TX: *Do not underestimate how many people will select the smallest cart. Right off the bat, we went $2,100 in the hole because of all the people who were going to do the "right thing" and picked 30-gallon carts. In other words, be prepared for your program to become successful. Secondly, when it comes to cart exchanges, the start-up costs for this program are really high. You really need to talk to your politicians and everyone and get it all in a nice spreadsheet and realize that you're going to bite the bullet for the first three to six months of the program. We offer a free cart exchange the first time, and then $15 subsequently. But we were estimating that a total of 15 percent ended up changing in Austin. Instead of doing any surveying up front on the carts, we had to rely on the household size for estimates.*

Pasadena, CA: *The thing that my staff keeps coming back to me about is the administrative cost of making changes. Our rule is, you can't change service levels more often than every six months. Only every six months, however, even with 27,000 customers, means that there's somebody changing every single day. We don't charge for changing service right now, but I think that we must begin to charge for changes in order to create a disincentive. Soon, if you want to change, it's going to cost you $15 to $25 to make that change.*

Billing

What elements are needed in a successful billing system?

Seattle, WA: *When you start unit pricing, determine if there are certain reports that you want to be able to generate from the billing system and make sure you get that capability integrated in your billing system right away. Later on, this type of modification can be just horrible and extremely expensive.*

Mansfield, CT: *Mansfield originally had a private system, with the haulers doing the billing. When we implemented our unit pricing program, the town took over billing. We find that one of the side benefits is that we can lien property. The haulers have liked the system very much because they know they are going to get paid every month. And that might be a way to sell it in a community that is also planning to take over the billing.*

Seattle, WA: *That's a double-edged sword for us. We do our combined billing with the city's water department and drainage and waste water utility. We do have the lien authority and essentially can turn off the water if somebody doesn't pay their bill. The problem is that we have to deal with a lot of complaints from their customers, and it doesn't always lead to the best results for us in terms of a quality billing system.*

State of MN: *In some places in Minnesota, we are using a two-tiered (fixed plus variable fee) system that is separate from the garbage collection billing system. The government collects some of the fixed costs to offset it.*

Cash Flow

How did you project your cash flow over a certain period of time?

Mansfield, CT: *We collect quarterly and in advance. That solves a lot of the cash flow problems.*

Seattle, WA: *If you're tight for cash, you need to know what's coming in and what's going out. It's very important to build in lags in your billing system. There's going to be some lag time in how people respond to unit pricing, and that tends to work to your benefit. You need to be conservative about the rate at which people reduce their solid waste, particularly customers using the extra can, especially if you have high extra can rates. And, don't underestimate the portion of the construction and demolition debris in the waste stream. Look really hard at wood waste. Wood waste typically comes to your transfer stations in small loads. It can disappear real fast if you don't flow control it or know what's going on with it.*

Enterprise Funds

What are the key advantages of enterprise funds? Do they help you in tracking costs of services? Do they make it easier to raise rates than taxes?

Austin, TX: *It's never easy to raise rates, enterprise or not, but from a marketing point of view, if we have a program that may be a little more sophisticated than what a council member had thought about doing and if we can justify that we can pay for it, certainly it's easier to get quality proposals for rate changes approved. I think that is the key: it must be performance-based and used to justify budgets.*

Pasadena, CA: *It also can be used as a point of leverage, in the sense that we can say we are an enterprise. We are a business and we have to charge full costs for our operations.*

Seattle, WA: *I think it's easier to get analytical staff, because there is a perception that if you've got big capital programs and big resource acquisition programs, then it tends to be easier to support getting people like that. The same is true with computer systems. It tends to be easier to support those, which is real helpful.*

Mansfield, CT: *Our municipal solid waste enterprise fund has grown, matured, and is now supporting other activities, such as litter control. The downside to this is that policy makers may look to healthy off-line funds for support in the struggle to fund various other community programs.*

Municipal Versus Private Haulers

Does a municipal program have more of a revenue-cost cushion than a private hauler?

Mansfield, CT: *I wouldn't say more cushion, but definitely more control over costs. We took over a private system and added recycling collection and still kept the rates the same. Our unit pricing program provided more service for the same price as the "free market" system. Mansfield contracts with two private haulers to implement its system.*

Pasadena, CA: *You can't assume that there are a lot of cushions. In Pasadena, we operate like a business and must be competitive. Now, if your municipality owns a landfill, you can find a little subsidy. But, if you do full cost accounting, then you know your true cost of operation. Then if you decide you need a cushion, that is part of the decision-making process. Another thing is, don't underestimate the sophistication of the private haulers. If you work very carefully with them, then you can learn a lot together. For example, I'm working with my commercial haulers very closely, because we have commercial recycling requirements. We're planning to adopt unit pricing in the commercial sector for the same reason—to encourage waste reduction and recycling. So commercial haulers need some help from us, but they also should be part of the process of gathering and sharing information.*

State of IL: *One of the differences between municipal systems and private haulers is that with the municipal system, you have a captive audience, and you can reach economies of scale. This is especially important for some of the programs we've talked about, such as Austin, Pasadena, and Seattle: all are larger population bases where a hauler can*

reach economies of scale. This is not the situation, however, in the Midwest. In Minnesota, Wisconsin, and Illinois, outside of the metropolitan areas, the problem is that you have much smaller communities of several hundred or a few thousand people. Second, many of these communities use multiple private haulers. The goal of some communities is to keep every hauler in business, even if it's only one guy with one truck.

State of PA: *A few months ago, I talked with a group representing waste haulers from Pennsylvania. I wasn't sure what their attitudes would be toward unit pricing. It turns out they actually like the idea, but their great fear was the uncertainty and risk from having a straight price per bag (proportional) program. They were much more favorable toward the idea of having a two-tiered system (i.e., fixed rate plus a per bag fee) that would better allow them to recover their fixed costs.*

Ways To Use Local Ordinances

How can your local government, city council, or state legislature help?

Pasadena, CA: *In order to protect business for waste haulers and recyclers, communities can pass ordinances that require a franchise to do business. In this way, local governments can help create a level playing field. We designed an ordinance that makes haulers buy franchises from the city. We put as much flexibility into the ordinance as possible, but, at the same time, established some sort of guidelines. This assures that everyone's working under the same terms and conditions, whether it's one person, one truck hauler, or a bigger hauling firm.*

Seattle, WA: *Another way to help smaller haulers is by stabilizing transfer station rates and disposal rates for reasonably long periods of time. This approach uses authority from state and local governments to insulate haulers from a lot of risk.*

State of MN: *If your goal is to encourage source reduction, you might have to employ mandates. This is especially important when budgets are tight, since both composting and recycling cost real money. As an example, in Minneapolis and St. Paul, they enacted ordinances that require food establishments to have food packaging that is either returnable, reusable, or recyclable—that's really a cutting edge area. Also, don't forget to amend your solid waste ordinance to allow for backyard composting and set up some standards and advertise them to protect against rodents and odor.*

Methods of Enforcement

Are you finding that illegal dumping is a big issue?

Pasadena, CA: *I think the key here is not to associate illegal diversion with variable rates. There is always going to be some amount of illegal dumping, especially in hard economic times. So you have a multitude of factors that are contributing to what is generally called illegal dumping. The key here is education and providing alternatives such as legal diversions (for example, recycling and composting) and constructive source reduction actions.*

State of ME: *Enforcement efforts can be made more cost-effective through publicity. It only takes one enforcement instance along with a lot of big publicity to send a loud message to people who might be thinking about illegally dumping. In Maine we had a very large investigation on private haulers who were hauling to other municipal landfills with lower fees. The investigation was blown up in the press, with nightly TV coverage. It stopped a lot of the illegal dumping in other communities.*

Mansfield, CT: *We have a part-time garbage enforcement agent who works a couple days a week on enforcement and public education.*

State of MN: *In all fairness, I want to stress that it's not unit pricing per se that is driving illegal dumping. It is also driven by growing restrictions on what you can put in the garbage can. I believe restrictions may have more effect on illegal dumping than unit pricing.*

What People Really Do With Their Trash

People say, "My neighbor is the last one who goes to work, and he's going to put his garbage in my can." I have also had professional people say that they are planning to take their trash to work. So how do we address these concerns?

Mansfield, CT: *Again, I would like to underscore that in our experience, neighbors have not put their garbage in the cans of other neighbors. We have had some calls—not many—from people who swore that their neighbor had put additional recyclables in front of the caller's bins. We investigated and found out it was the hauler who had put all the bins on one side of the street so that he could make one stop.*

Austin, TX: *We did a study that measured what households would do with garbage that could not fit in their subscription cans. Extra trash had to be labeled with stickers that were purchased for $2 each. We received 554 responses to our survey and got the following results:*

- *32 percent used the stickers and paid for their excess trash disposal.*
- *29 percent never had excess garbage and never had to use stickers.*
- *14 percent saved their excess garbage until the next trash pickup.*
- *11 percent stomped the extra garbage into their carts.*
- *5 percent threw their extra garbage out at a neighbor's or friend's.*
- *3 percent threw the extra garbage away at work.*

We also found that most excess garbage came from households that subscribed to larger, 90-gallon carts. We knew that most 90-gallon carts were purchased by households with five members or less, so we decided that excess garbage was not a problem created by large households that might not be able to reduce waste. Instead, we think some families simply choose not to respond to unit pricing—some families decide that they would rather pay more for larger carts and extra disposal than recycle or reduce waste.

Integrating Unit Pricing With Complementary MSW Programs

Yard Trimmings Programs

What's the most effective complementary program that you've used with unit pricing and would recommend?

State of IL: *Yard trimmings systems (pay-by-the-bag) can easily be implemented as programs that are complementary to unit pricing. If the household properly manages its yard trimmings by composting or keeping grass clippings on its lawns (grasscycling), it can avoid disposal costs without much effort. Second, a yard trimmings system costs almost nothing for the community, except relatively low infrastructure costs. And a yard trimmings system can reduce the total amount of residential waste by up to 30 percent, depending on where you live and how great a quantity of yard trimmings you have initially. I would say that if you had only one program to go along with unit pricing, it should focus on yard trimmings. Illinois instituted a ban on yard trimmings. Everyone thought we'd need a lot of new compost sites and thousands of bags to pick up yard trimmings. In fact, about 60 percent of all homes started grasscycling. Overnight, households just stopped picking up grass clippings, and costs for picking it up plummeted.*

Knoxville, TN: *In our little city, we generate 20,000 tons of large brush and limbs every year, but we haven't budgeted for composting equipment. Any suggestions?*

State of IL: *Instead of buying chippers, you can stockpile the brush at the compost site. It doesn't smell so you can store it for a long period of time. Also, you can rent a big chipper or tub grinder several times a year and then use your mulch for landscaping.*

Pasadena, CA: *In Pasadena, 15 to 20 percent of the population has signed up for separate collection of yard trimmings. They put out an average of 50 pounds per household per year. If I could increase my participation in this program to 30 percent and everybody put out 50 pounds, then that's a big savings on landfill tipping fees. In addition, yard trimmings are dense compared with plastic, which is light relative to its volume. If your ultimate goal is to keep tonnage out of the landfill, then, dollar for dollar, you have a lot bigger bang for the buck with a yard trimmings program.*

State of PA: *In Pennsylvania, many municipalities use their bag system to collect yard trimmings, too. In Carlisle, residents put the leaves in plastic bags and the hauler dumps them out of the bags. Then the hauler actually puts the bags back on the curb so that people can reuse the bags. And, in Allentown, they use paper bags that break down in the composting process. Some communities use a vacuum system. It varies from place to place, but plastic bags are pretty widely accepted in Pennsylvania.*

Austin, TX: *Our yard trimmings do not get burned or go into a landfill. We mix them with our sewage sludge and create a product called "Dillo Dirt" (short for Armadillo). We bag*

it and sell it at nurseries or use it for our city parks. The Dillo Dirt program is very popular. People like to know that their grass will be used to deflect program costs. It's not a big money maker, but it does do a little better than break even.

Seattle, WA: *I'm surprised that people are talking about leaving their yard trimmings on their lawns, because in Seattle that's not a real common phenomenon. Households either compost or use curbside collection. We distribute free compost bins, which could be one reason; another could be differences in climate.*

Recycling Programs

What about adding a recycling program?

Pasadena, CA: *If you don't have curbside recycling in place, you might look at other alternatives. It is extremely expensive to put in curbside recycling.*

Mansfield, CT: *Well, we found a big increase in recycling participation when we went from drop-off recycling to curbside pickup, so I don't think our unit pricing program would work as well without curbside pickup of recyclables.*

Seattle, WA: *I think that on the issue of cost of services, you need to know, as best you can, what services customers are willing to pay for. Then, if you provide a broad enough range of services at different prices and levels of convenience, you can best serve the majority of people's needs. I think people are willing to pay for convenience, and don't underestimate that.*

Also, Seattle has risk-sharing clauses built in to its recycling contract where the haulers either receive an extra payment or pay us a credit, depending on whether the economy indices and market prices are good or bad. That actually increased our financial exposure beyond what we like, but we felt that it was the appropriate thing to do, given the state of markets right now.

State of IL: *For some very rural communities it is prohibitively expensive to do curbside collection once a week. In central Illinois, communities have curbside collection of recyclables once a month, and they found that it's actually working quite well. When they went to unit pricing, they just offered refuse bag collection once a week and recyclables collection once a month.*

Household Hazardous Waste Programs

Some communities already have household hazardous waste pickup or drop-off. How can these programs work with a unit pricing program?

Durham, NC: *You may be able to share expenses with other city agencies. In addition to our yard trimmings, curbside recycling, and bulky item pickup programs, we have a household hazardous waste program. The payment for this came from our wastewater treatment department, not from our landfill tipping fee. The waste staff are just as concerned about hazardous waste going into the wastewater system as we are about it going into the landfill. We may have to change that in the future and split it, rather*

than let them pay the whole bill. But it was a cushion for some time. We are also working on a permanent collection system on a regional basis. We hope to get a four-county region together and see if we can get a price break. We would set up permanent sites and negotiate with a contractor, saying, "We're going to give you a million people's worth of household hazardous waste. Can you give us a better price than dealing with one county, or one city"? Then we can reduce our costs and provide more frequent service to more people.

Keeping the Message Simple

How do you avoid confusing your customers when you add a program to your unit pricing system?

Austin, TX: *Through mass media we talk about complementary programs such as recycling and our Dillo Dirt program. But for unit pricing, and specifically how to participate in "Pay-As-You-Throw," we targeted our audiences more directly by using direct mail, a newsletter, and doorhangers. In these, we explained how to set out your wheeled cart, where it should face, and how to share with a neighbor (i.e., go ahead and pull two carts together on a neighbor boundary at the yard so that it's fewer stops for the collector). So, we steer topical information to specifically reach the affected audience. We choose to use easy terms to promote the program. It's important to keep messages simple and clear.*

Accommodating Groups With Special Needs

Older Households

How do you cater to the needs of senior citizens?

Pasadena, CA: *Our older population began to have some concerns about their ability to actually move their trash and pay for their trash. What we came up with seems to be working well. We sent a note that said, "If you are over 62 years of age or if you are disabled, call for special rates." Almost 10 percent of our population has called and about 5 percent are on the special rates right now. The special rate for senior citizens is a 10-percent discount. They can choose any service option they want, because we found that their needs varied.*

Durham, NC: *What about the people who don't have driver's licenses, or are temporarily disabled; they broke their leg and it will be six months before they are mobile again? And, also, do you go back and check to see if the older person has died or if a young person is now living there and getting this service?*

Pasadena, CA: *First, if they don't have a driver's license, we ask for some kind of ID card or birth certificate. People send all kinds of things; they're very good about wanting to show you that they qualify. Secondly, our eligibility criteria say that if there is a younger person in the home that can roll the trash for the disabled, then that household does*

not qualify. You have to be disabled, and you can't have a caregiver who is able to do this. A lot is based on trust, although we do expect that we will do some followup, depending upon how many people subscribe to the service. As far as people with temporary needs, our basic message is if your need is less than six months, the administrative costs of making that change are greater than the actual discount that we could provide. But we do make exceptions on a one-to-one basis. Our customer service reps do a tremendous amount of talking, asking a lot of questions and dissuading people. The idea behind their asking questions is as much to help as to provide disincentives to taking advantage of the system. So we try to do it in a very courteous, polite way. After a while, most people get tired of answering the questions, but if they can answer all the questions then we do try to help them.

How large is your customer service department?

Pasadena, CA: *For 27,000 residences, we have three people. One person answers the phones out front and dispatches on the radio for very basic questions. For more detailed questions, I have two more individuals who can respond. But, if the question is very difficult, it goes up to another level.*

Low-Income Households

How do folks handle the low-income issue?

Seattle, WA: *We don't have any family rates, but we do have a low-income rate. This summer we qualified low-income, elderly, and handicapped customers for rate assistance. We include all households who are under the federal poverty line.*

Pasadena, CA: *I would concur that if you're looking for standards, try to find something that is an established standard—not something that you create for your city. That's where we had problems because Pasadena is a more expensive place to live than other places in the nation. It's difficult to defend a low-income standard if it's not already established.*

Large Households

Could you address the perception that a unit pricing program bashes the family?

SRC: *That is a very common question at conferences. I guess to me, that's an education issue. People who have larger homes pay more for electricity. People who have more people in the house pay more for water and more at the grocery store. The question is not so much aren't we going to be hurting these families but rather should small families continue to subsidize these large families? I think that you need to turn the question around.*

Inner Cities

What about our inner cities?

Seattle, WA: *Monthly reports in Seattle show that illegal dumping is more concentrated in certain areas than others, and it tends to be in lower income areas of the city.*

Mansfield, CT: *Our toughest enforcement problems are in multi-family housing because of the transient population and difficulty in communicating with individual tenants, as opposed to single-family residents.*

Pasadena, CA: *Pay special attention to any area of more transitory populations. They are going to have special needs and special demands. We may need more frequent neighborhood cleanups there.*

Seattle, WA: *Also, it is effective to use community groups, and to provide grants to community councils. Often, they can do it for less money, and there is a lot of community pride in dealing with the problem. City government is not great at doing it, but community groups can do it.*

Multi-Family Units

What has been your experience with applying unit pricing to multi-family housing?

Seattle, WA: *We've had a broad range of problems providing unit pricing to residents of multi-family housing. These include contract relations, design, enforcement, and deciding whether the city or haulers will serve these units. Also, if you're going to do unit pricing in a big city with lots of multi-family housing, you have to have a reliable billing system that the customer service reps can use. We've got 9 inspectors and 22 customer service representatives, so we've got a big staff. But we have 300,000 collections a week, so even 1 percent of that turning up as phone calls can be a problem. We get about 650 calls a day from customers, and we can deal with that.*

Pasadena, CA: *I have a problem with landlords who call me when their units are empty. They say, "I'm not using the unit because I'm remodeling it right now, so I shouldn't have to pay for trash." But I still have to have the same operation; I still have to pass by the unit. So, when you set up a unit pricing program, be sure to educate your landlords about this.*

Putting the Blocks Together: Additional Examples

In Part III of this guide, a six-step process for assembling a unit pricing program entitled "Putting the Blocks Together" was introduced. The six steps demonstrated how to combine projections of cost, demand, and service levels in order to arrive at a tentative rate structure for a unit pricing program. The six steps provided a general introduction to the process of designing a rate structure but did not demonstrate how to accommodate the specific needs of your community when designing a unit pricing program.

This appendix consists of three examples to assist decision-makers in tailoring their programs to the specific waste management goals and needs of their communities. Each of the three examples outlines a community goal and the modifications to the design and assembly process considered necessary to meet that goal. The three examples are:

- *A community that wants to keep revenues higher than costs as it moves from a traditional waste collection program to a unit pricing program (the transition period).*
- *A community that wants to provide complementary solid waste services such as a recycling collection program.*
- *A community that decides to accommodate citizens with special needs within its unit pricing program.*

Designing a rate structure that meets the particular goals and concerns of your community is important. Use the three examples to get a sense of how to customize the six-step process to better meet the demands of your community.

- **Step 1: Demand.** Estimate total amount of waste generated in the "steady-state."
- **Step 2: Services.** Determine the components of your unit pricing program.
- **Step 3: Costs.** Estimate the costs of your unit pricing program.
- **Step 4: Rates.** Develop a tentative unit pricing rate structure.
- **Step 5: Revenues.** Calculate the revenues from unit pricing.
- **Step 6: Balance.** Evaluate and adjust your preliminary unit pricing program.

Focusing on the Transition Period

During the transition from a traditional waste management program to a unit pricing program, households gradually adjust their habits to the new opportunities and costs introduced by unit pricing. The demand for services from local municipal solid waste agencies might settle to new, lower levels during this time. The result can sometimes be a drop in revenues for the local agency. Many communities introducing unit pricing need to know that revenue shortfalls, however, will not be excessive during the transition period, nor in the subsequent steady-state.

If a community requires the revenue from its unit pricing rates to cover costs during both the transition period and the steady-state period, it needs to focus on Steps 1 and 3 of "Putting the Blocks Together." During Step 1, the community needs to produce a detailed and accurate estimate of the degree to which households will reduce solid waste generation to better anticipate changes in revenues that will result from the unit pricing program. To acquire reliable estimates for this step, the community can draw on the experience of other communities that have introduced similar complementary programs, public education efforts, container options, and special services.

A detailed estimate from Step 1 will also help the community accurately anticipate the rate at which costs will settle downward. In Step 3, the community needs to look at how a reduction in waste volume will lower costs, such as transportation and tipping fees. Unit pricing planners then need to test tentative rate structures to find the correct balance between decreasing revenues and decreasing costs and to keep the local solid waste agency's revenues in line with costs during each quarter of the transition period, as well as the subsequent steady-state.

Adding Complementary Services

Communities that have a clear mandate for waste management can sometimes pursue a program that combines source reduction and recycling. For example, the citizens of a community might demand a combined program of unit pricing and curbside pickup of recyclables. To develop a rate structure that would accommodate a complementary curbside recycling program, the community would need to accurately identify all of its waste management costs and carefully weigh all of its revenue-raising options to determine if such a program was feasible.

In Step 3 of "Putting the Blocks Together," the community can explore the potential for combining equipment, crews, billing, and routes for both trash collection and recycling pickup. Careful scheduling or innovative use of equipment could significantly reduce costs. The community should also use this step to examine the financial trade-offs of the two programs; for example, a recycling pickup program could lower the total amount of waste being landfilled or combusted, reducing the community's tipping fees to help cover the costs of providing recycling collection.

In Step 4, the community is presented with a variety of pricing options. These should be examined in light of your overall goals for unit pricing. For example, if one of your primary goals is to significantly reduce household waste generation, you can consider charging for all collection services. Setting substantial per-bag charges for both trash and recyclables will encourage households to reduce waste. If, however, recycling is provided for free, citizens would have less incentive to reduce the amounts of recyclables it generates and the municipal solid waste stream (trash plus recyclables) could actually rise in volume, driving collection costs up. Another pricing option consists of setting the per-bag charge for trash higher than the per-bag charge for recyclables. This rate structure encourages households to separate recyclables from other trash, thereby reducing the portion of their household waste that the community sends to the landfill.

These examples show how important it is to treat unit pricing rates as part of a comprehensive pricing system that takes into account all solid waste services. Charging citizens for both recycling and waste removal adds complexity and cost to providing municipal solid waste services. The alternative, however, a unit pricing rate structure that does not integrate waste collection charges with those for curbside recycling, can prove expensive, inequitable, and ineffective at achieving the community's goals.

Addressing Special Needs

A community that wishes to assist low-income households that might have trouble paying for unit pricing needs to make several adjustments to the basic model to develop a rate structure that meets its goals.

In Step 1, the community must first determine how to qualify households for lower collection charges. To make this decision, the community should collect information on the number of low-income households that could qualify for lower charges. The community can use these numbers to adjust revenue estimates and finally arrive at a rate structure that provides sufficient revenue. Rates should be set to provide an incentive for source reduction in both low- and high-income households. However, the community might anticipate that lower rates for low-income households will provide less incentive to use source reduction. If this is the case, estimates of the drop in demand for waste collection services should be revised to meet the effect of the low-income rate.

In Step 3, the community needs to examine the potentially greater costs of introducing a low-income rate. Such a rate not only will decrease anticipated revenues but also require additional administrative costs to identify and separately bill low-income households. Administrative costs can be kept down if an established income cutoff is used or other local agencies have already identified the low-income households in the community. Rent assistance or income assistance programs might have already identified the low-income households in a community.

APPENDIX C

Definitions

Bulky waste items - Large items of refuse including, but not limited to, appliances, furniture, large auto parts, nonhazardous construction and demolition materials, and trees that cannot be handled by normal solid waste processing, collection, and disposal methods.

Commercial sector - Includes schools, hospitals, retail establishments, hotels, and restaurants.

Compost - Discarded organic material that has been processed into a soil-like material used as a soil amendment or mulch.

Construction and demolition (C&D) debris - Includes concrete, asphalt, tree stumps and other wood wastes, metal, and bricks. (C&D debris is excluded from the definition of municipal solid waste used by EPA and the National Recycling Coalition.)

Disposal - Landfilling or combusting waste instead of recycling or composting it.

Diversion rate - A measure of the amount of waste material being diverted for recycling/composting compared with the total amount that was previously thrown away.

Enterprise fund - An independent budget dedicated for a special purpose or activity, such as a local municipal solid waste program. The local agency becomes reliant on the revenue it raises through unit pricing or tipping fees and does not receive financial support from the general fund of the local government.

Flow control - A legal or economic means by which waste is directed to particular destinations (for example, an ordinance requiring that certain wastes be sent to a particular landfill facility).

Full cost accounting - The total accounting of all costs and revenues involved in municipal solid waste management, allowing for a standard treatment of the capital costs, future obligations, and indirect costs.

Household hazardous waste - Products containing hazardous substances that are used and disposed of by individuals, not industrial consumers. These products include, but are not limited to, certain kinds of paints, solvents, batteries, and pesticides.

Integrated waste management - The complementary use of a variety of practices to handle municipal solid waste safely and effectively. Integrated waste management techniques include source reduction, recycling (including composting), combustion, and landfilling.

Landfilling - The disposal of solid waste at engineered facilities in a series of compacted layers on land that is covered with soil daily. Fill areas are carefully prepared to prevent nuisances or public health hazards, and clay and/or synthetic liners are used to prevent releases to ground water.

Municipal solid waste (MSW) - Waste generated in households, commercial establishments, institutions, and businesses. MSW includes used paper, discarded cans and bottles, food scraps, yard trimmings, and other items. Industrial process wastes, agricultural wastes, mining wastes, and sewage sludge are not MSW.

Participation rate - The portion of households that take part in a given program. Often refers to households actively participating in a curbside collection program for recyclable materials.

Recyclables - Products or materials that can be collected, separated, and processed to be used as raw materials in the manufacture of new products. The recyclable option should be available to the majority of residents through curbside recycling programs or fixed recycling centers.

Recycled content - The portion of a package's weight (excluding coatings, ink, labels, stickers, adhesives, or closures) that is composed of postconsumer recycled material.

Residential waste - Waste from single-family and multi-family residences and their yards.

Source reduction (Waste prevention) - The design, manufacture, purchase, or use of materials to reduce the amount and/or toxicity of waste. Source reduction techniques include reusing items, minimizing the use of products that contain hazardous compounds, using only what is needed, extending the useful life of a product, and reducing unneeded packaging.

Tipping fees - The fees, usually dollars per ton, charged to haulers for delivering materials at recovery or disposal facilities.

Waste generated - Sum of waste recovered and waste disposed of.

Waste stream - A term describing the total flow of solid waste from homes, businesses, institutions, and manufacturing plants that must be recycled, burned, or disposed of in landfills; or any segment thereof, such as the "residential or recyclable" waste stream.

Yard trimmings - The component of solid waste composed of grass clippings, leaves, twigs, branches, and garden refuse.

Bibliography

Blume, D. R. 1992. Under what conditions should cities adopt volume-based pricing for residential waste collection. Washington, DC: U.S. EPA Office of Management and Budget.

California Integrated Waste Management Board. 1991. Disposal cost fee study: final report. Boston, MA: Tellus Institute.

Goddard, H. C. 1990. Integrating solid waste management: incentives for reduced waste, increased recycling, and extension of landfill life. Proceedings from the First U.S. Conference of MSW Management: Solutions for the '90s. Washington, DC.

Howard, S. 1988. Financing integrated solid waste management systems. Paper presented at the Seventh Annual Resource Recovery Conference. Washington, DC: Shearson Lehman Hutton, Inc.

Hsieh, H-N. (No date.) Cost analysis of landfill and its alternatives. Unpublished paper. Newark, NJ: New Jersey Institute of Technology.

Jacalone, D. P. 1992. Per unit pricing: an overview of operational issues. Paper presented at EPA's Second U.S. Conference on MSW Management: Moving Ahead. Washington, DC.

League of California Cities. 1992. Financing strategies for integrated waste management programs: answers for communities. Sacramento, CA: League of California Cities.

Repetto, R., et al. 1992. Green fees: how a tax shift can work for the environment and the economy. Washington, DC: World Resources Institute.

U.S. Environmental Protection Agency. 1989. Discussion and summary of economic incentives to promote recycling and source reduction. Washington, DC: U.S. EPA Office of Policy Analysis.

U.S. Environmental Protection Agency. 1990. Charging households for waste collection and disposal: the effects of weight or volume-based pricing on solid waste management. NTIS PB91-111484. Washington, DC: U.S. EPA Office of Solid Waste and Emergency Response.

U.S. Environmental Protection Agency. (No date.) Methods of predicting solid waste characteristics. Stock no. 5502-0048. Washington, DC: U.S. Government Printing Office.

U.S. Environmental Protection Agency. 1990. Variable rates in solid waste: handbook for solid waste officials, Volume 1: Executive summary. EPA530-SW-90-084A. Washington, DC: U.S. EPA Office of Solid Waste and Emergency Response.

NOTES

Workbook

Presentation Materials

Public Outreach Materials

Worksheets

Articles & Newsclippings

Bibliography

Workbook

United States
Environmental Protection
Agency

Office of Solid Waste and
Emergency Response
Washington, DC 20460

EPA530-R-96-005
September 1996

EPA

Pay-As-You-Throw Workbook

A Supplement to EPA's Pay-As-You-Throw Guidebook

Printed on paper that contains at least
20 percent postconsumer fiber.

Acknowledgments

EPA wishes to thank the Coalition of Northeastern Governors (CONEG) for its assistance in the development of this workbook and, in particular, for its contribution to the design and development of the worksheets.

Table of Contents

About This Workbook v

Section One: Presentation Materials 1

Presentation Agenda 3

Survey of Attendees 7

Evaluation Form 11

Sample Script and Overhead Masters 15

Section Two: Public Outreach Materials 91

Pay-As-You-Throw Fact Sheets 93

Other Outreach Strategies 105

Clip Art 111

Section Three: Worksheets 121

Section Four: Articles and Newsclippings 145

Section Five: Annotated Bibliography 173

About This Workbook

Today, with waste amounts and disposal costs for many communities rising, municipal solid waste (MSW) planners increasingly need to find ways to boost waste prevention and recycling among residents. Pay-as-you-throw programs, when properly designed and implemented, can help you meet this challenge. To provide a source of information about how these programs work, EPA developed a guide called *Pay-As-You-Throw: Lessons Learned About Unit Pricing*. The guide introduces pay-as-you-throw, discusses its benefits and potential barriers, and offers guidance on how to consider, design, and implement a pay-as-you-throw program.

This supplement to the guide is designed as a user-friendly, hands-on workbook. It is divided into five sections containing tools to help you plan out your program in detail, convey the results of your research in convincing presentations, and develop a strong outreach program that will help you earn the support of community stakeholders. This workbook also contains reprinted articles and reference materials that you can use to learn more about these programs. Each of the tools in this workbook are designed to be adapted as needed. To get started, review the table of contents or read the five section introductions to find the specific materials you need to make pay-as-you-throw successful in your community.

SECTION ONE

Presentation Materials

The first step in any pay-as-you-throw program is to review the benefits and potential barriers of pay-as-you-throw and learn how these systems work. MSW planners who have performed this step and decided that such a program can work in their community will then need to earn the support of key community stakeholders. In most communities, stakeholders include elected officials, municipal staff, residents, local civic groups, and, in some cases, private haulers. A pay-as-you-throw presentation at a meeting of municipal officials, a town meeting, or a citizens' advisory council meeting can be an effective first step.

Prior to your presentation, it is important to thoroughly research pay-as-you-throw and its potential advantages for your community. (Refer to the guide *Pay-As-You-Throw: Lessons Learned About Unit Pricing*, which can be found in the "Guidebooks" section of this Tool Kit, for more information about pay-as-you-throw. The worksheets in Section Three of this workbook also can help with this process.) Once you have gathered data in support of the program, you can use the following sample materials to help you organize an effective pay-as-you-throw presentation:

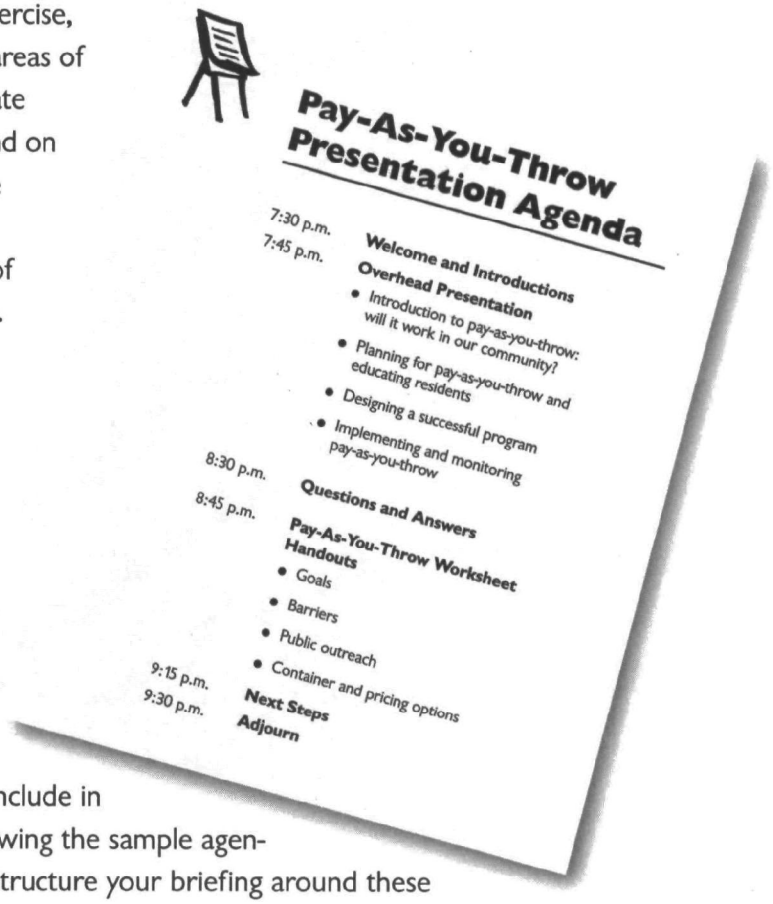
- A presentation agenda and photocopy master to help you plan out your meeting.
- A survey of attendees that you can use before your briefing to better understand your audience and its level of awareness of pay-as-you-throw.
- An evaluation form to help you gauge how successful your presentation was and decide whether further work will be needed to convince your audience about the program.

- A sample script for your presentation and overhead masters that can be photocopied onto transparencies and used to help you present the key points concerning pay-as-you-throw.

In addition, be sure to consider whether materials found in the other sections of this Tool Kit, including the pay-as-you-throw software, videotape, or guidebooks, might also help you strengthen your presentation.

Presentation Agenda

A presentation agenda will help you provide your audience with an overview of the topics you plan to cover in your talk. It will also demonstrate that you have carefully planned your briefing. In addition, preparing an agenda in advance can be an important exercise, helping you clearly identify key areas of your briefing and the approximate amount of time you should spend on each. You might want to provide your attendees with the agenda ahead of time, perhaps as part of an invitation to the presentation.



Pay-As-You-Throw Presentation Agenda

7:30 p.m. **Welcome and Introductions**
7:45 p.m. **Overhead Presentation**
- Introduction to pay-as-you-throw: will it work in our community?
- Planning for pay-as-you-throw and educating residents
- Designing a successful program
- Implementing and monitoring pay-as-you-throw

8:30 p.m. **Questions and Answers**
8:45 p.m. **Pay-As-You-Throw Worksheet**
Handouts
- Goals
- Barriers
- Public outreach
- Container and pricing options

9:15 p.m. **Next Steps**
9:30 p.m. **Adjourn**

In general, your briefing might include an overview of the pay-as-you-throw program, followed by your analysis of how it can help your community. You can refer to the materials in this section (including the Sample Script and Overhead Masters, beginning on page 15) for more ideas on what to include in the presentation. Begin by reviewing the sample agenda on this page. If you want to structure your briefing around these topics, you can use the blank agenda template found on the next page.

Or, if you prefer, you can create you own agenda that focuses on the specific topics or issues that you think would be of greatest interest to your audience.

Pay-As-You-Throw Presentation Agenda

Welcome and Introductions

Overhead Presentation

- Introduction to pay-as-you-throw: will it work in our community?
- Planning for pay-as-you-throw and educating residents
- Designing a successful program
- Implementing and monitoring pay-as-you-throw

Questions and Answers

Pay-As-You-Throw Worksheet Handouts

- Goals
- Barriers
- Public outreach
- Container and pricing options

Next Steps

Adjourn

Survey of Attendees

Your presentation will be more effective if you can address the specific issues about pay-as-you-throw that are of particular interest or concern to your audience. If you know who is likely to come to your presentation, you can prepare and send out a survey ahead of time to identify their primary concerns and what it is they would like to learn about your proposed program.

This section includes a sample survey form that you can reproduce and send out to your attendees. Or you can adapt this master copy by developing your own questions, placing them onto the page below the title, and reproducing that, instead. Once you have the survey ready, distribute it to your attendees and review the results carefully. If needed, you can adapt your agenda and the content of your presentation to address directly any trends or issues you noted in the survey results.

Survey of Attendees

Thanks for accepting the invitation to attend the upcoming presentation on our proposed pay-as-you-throw program. To help focus the presentation on the most important issues, please take a few minutes to respond to the following questions. Please return this form to the presentation organizers when you are done.

Your name: _____

Title/position: _____

How familiar are you with pay-as-you-throw?

- ☐ Very familiar
- ☐ Somewhat familiar with the concept and how pay-as-you-throw works
- ☐ Have read about/been exposed to a small amount of pay-as-you-throw information
- ☐ Unfamiliar with pay-as-you-throw

What do you think are the most important advantages of a pay-as-you-throw program for our community? (*Rank the following on a scale of 1 to 3, with 3 indicating the most important advantages.*)

- ____ Reduced waste generation amounts
- ____ Reduced waste collection and disposal costs
- ____ Greater recycling rates
- ____ Greater equity for residents (residents pay only for the waste they generate)
- ____ Increased environmental awareness among residents
- ____ Other _____

Survey of Attendees

Thanks for accepting the invitation to attend the upcoming presentation on our proposed pay-as-you-throw program. To help focus the presentation on the most important issues, please take a few minutes to respond to the following questions. Please return this form to the presentation organizers when you are done.

Your name: _____

Title/position: _____

How familiar are you with pay-as-you-throw?

- ☐ Very familiar
- ☐ Somewhat familiar with the concept and how pay-as-you-throw works
- ☐ Have read about/been exposed to a small amount of pay-as-you-throw information
- ☐ Unfamiliar with pay-as-you-throw

What do you think are the most important advantages of a pay-as-you-throw program for our community? (*Rank the following on a scale of 1 to 3, with 3 indicating the most important advantages.*)

_____ Reduced waste generation amounts

_____ Reduced waste collection and disposal costs

_____ Greater recycling rates

_____ Greater equity for residents (residents pay only for the waste they generate)

_____ Increased environmental awareness among residents

_____ Other _____

_____

What do you think are the most significant perceived barriers to a pay-as-you-throw program in our community? (*Rank the following on a scale of 1 to 3, with 3 indicating the most significant perceived barriers.*)

_____ Enforcement issues (illegal dumping, burning of waste)

_____ Potential for uneven cash flow

_____ Perception of increased costs to residents

_____ Implementation in multi-family housing

_____ High administrative costs

_____ Extending pay-as-you-throw to residents with special needs

_____ Building public consensus

_____ Other _____

_____

What specific pay-as-you-throw topics or questions do you want to see raised at the presentation?

_____

_____

_____

_____

_____

_____

Evaluation Form

Once your presentation is complete, it may be useful to perform a follow-up survey to generate feedback about the briefing and the issues that were discussed. While reactions and questions at the presentation itself will provide a good sense of the impact of your briefing, an evaluation form will allow you to gauge in greater detail the attitudes and responses of your audience toward pay-as-you-throw. The results will help you determine whether follow-up sessions will be needed and which particular aspects of pay-as-you-throw were well received—and which may require additional explanation.

Evaluation Form

Thank you for coming to this pay-as-you-throw presentation. We appreciate your attendance and participation, and would like your feedback. Please take a minute to complete the following evaluation, identifying the presentation's strong points as well as the points that warrant more attention. This information will help us improve future presentations. It also will help us learn if we need to provide more information about pay-as-you-throw or answer any additional questions. When you are done, please return this form to the presentation organizers.

Please rate your response to the following questions on a scale of 1 to 5.

1: Poor 2: Fair 3: Good 4: Very good 5: Excellent

1. Overall, how would you rate the quality of the presentation?

1 2 3 4 5

Comments:

2. How would you rate the presentation format?

1 2 3 4 5

Comments:

3. How would you rate the presentation style of the speaker(s)?

1 2 3 4 5

Comments:

Review the sample evaluation form in this section. Prior to your presentation, you can reproduce this form. If you prefer, you can adapt this master copy by developing your own evaluation questions, placing them onto the page below the title, and reproducing that, instead. Then, immediately after your briefing, distribute the form to your attendees and ask them to complete it before they leave. Review the attendees' evaluations carefully and begin planning how to incorporate what you learned into future outreach efforts.

Evaluation Form

Thank you for coming to this pay-as-you-throw presentation. We appreciate your attendance and participation, and would like your feedback. Please take a minute to complete the following evaluation, identifying the presentation's strong points as well as the points that warrant more attention. This information will help us improve future presentations. It also will help us learn if we need to provide more information about pay-as-you-throw or answer any additional questions. When you are done, please return this form to the presentation organizers.

Please rate your response to the following questions on a scale of 1 to 5.

1: Poor 2: Fair 3: Good 4: Very good 5: Excellent

1. Overall, how would you rate the quality of the presentation?

1 2 3 4 5

Comments:

_____

_____

_____

2. How would you rate the presentation format?

1 2 3 4 5

Comments:

_____

_____

_____

3. How would you rate the presentation style of the speaker(s)?

1 2 3 4 5

Comments:

_____

_____

_____

4. How would you rate the handouts/presentation materials?

1 2 3 4 5

Comments:

_____

_____

_____

5. Did the presentation meet your goals and expectations?

1 2 3 4 5

Comments:

_____

_____

_____

6. How well were your concerns or questions about pay-as-you-throw addressed?

1 2 3 4 5

Comments:

_____

_____

_____

7. What other topics or areas of discussion would you like to see addressed?

_____

_____

_____

8. Please list any other questions or comments about pay-as-you-throw or the presentation.

_____

_____

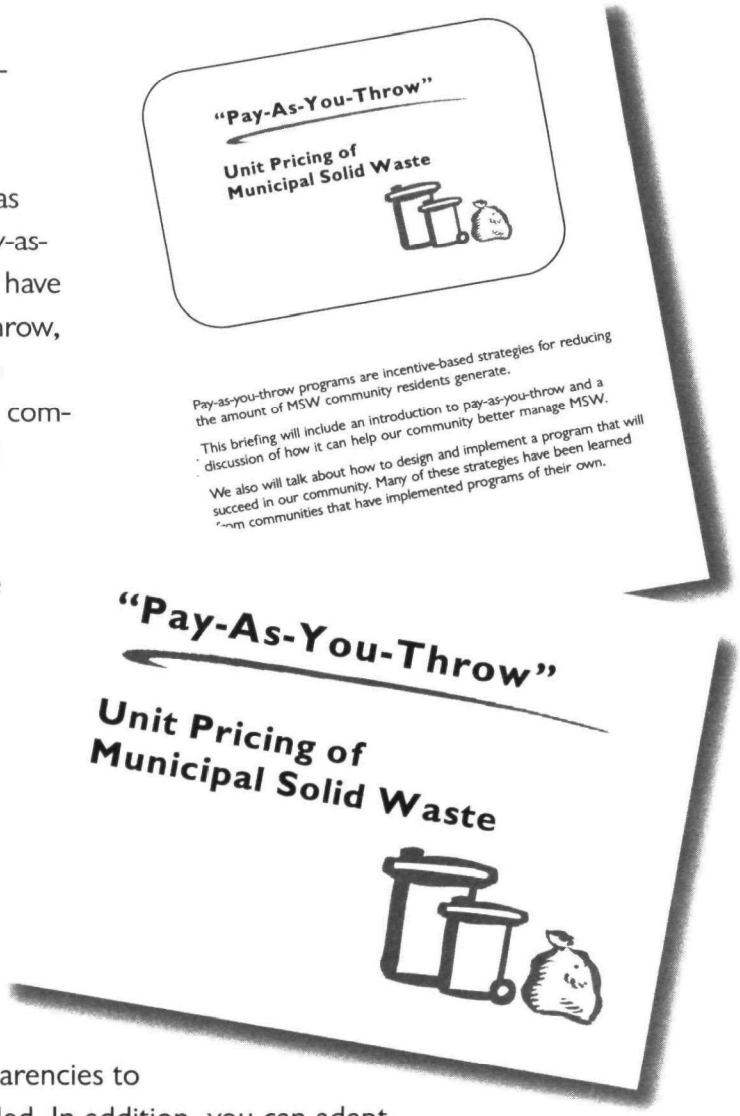
_____

_____

SECTION ONE

Sample Script and Overhead Masters

Overheads can be very helpful in conveying information about pay-as-you-throw to your presentation audience. This workbook includes a complete set of overheads designed to address the main topic areas related to pay-as-you-throw: what a pay-as-you-throw program is, what the results have been in communities with pay-as-you-throw, how these programs work, and how to design and implement one in your own community. On the following pages you will find a sample script for your overhead presentation, intended to provide a starting point for your discussion of the different pay-as-you-throw topics. The sample script is followed by a set of master overheads that can be used to create your overhead transparencies.



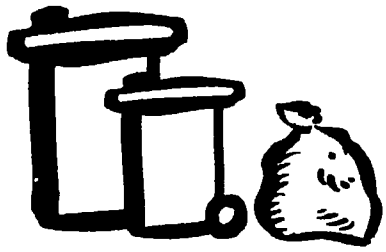
The overhead presentation is designed to be flexible. You may decide to revise the order of the overheads based on the issues you feel merit particular attention. You also can remove any overheads or include your own transparencies to provide additional information, if needed. In addition, you can adapt

the suggested script or even prepare your own to further tailor the briefing to your audience.

To prepare transparencies from the overhead masters, simply copy each of the master overhead pages onto blank transparencies (available at office or stationary supply retailers) using an ordinary photocopier. The transparencies will then be ready to use.

"Pay-As-You-Throw"

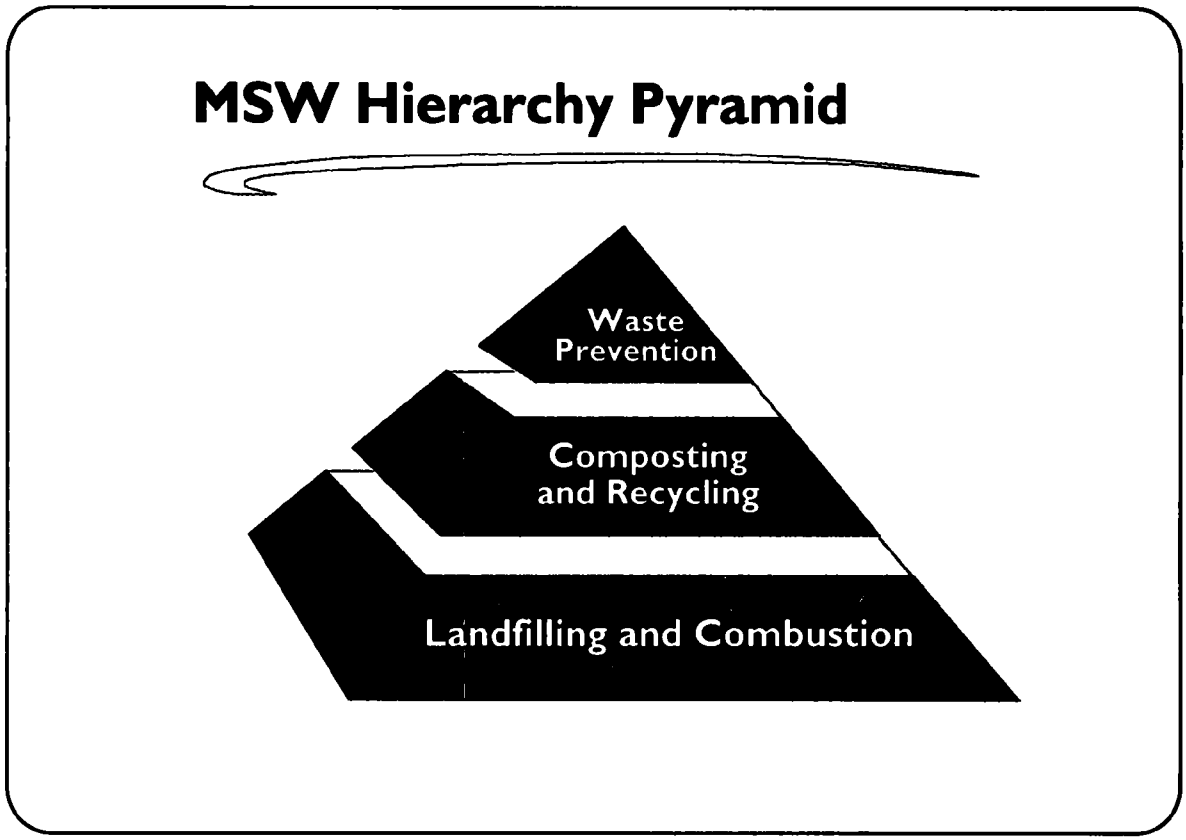
Unit Pricing of Municipal Solid Waste



Pay-as-you-throw programs are incentive-based strategies for reducing the amount of MSW community residents generate.

This briefing will include an introduction to pay-as-you-throw and a discussion of how it can help our community better manage MSW.

We also will talk about how to design and implement a program that will succeed in our community. Many of these strategies have been learned from communities that have implemented programs of their own.



Maintaining control over solid waste in the long term depends on emphasizing waste reduction.

Landfilling and combustion, while necessary, are the least desirable management methods. They occupy the bottom of the hierarchy.

Recycling, which reduces the amount of waste we have to dispose of, is preferable.

Waste prevention, which prevents materials from becoming waste in the first place, is at the top of the hierarchy.

Potential Benefits

- **Encourages the Three Rs:**
  - **Reduce**
  - **Reuse**
  - **Recycle**

Pay-as-you-throw directly supports waste prevention and recycling. Because residents pay for whatever they throw out, they tend to work harder to reduce, reuse, and recycle.

Because of this "pocketbook" motivation, it is likely that pay-as-you-throw will result in less total waste our community has to dispose of. Increased recycling rates will be a major factor in this.

In addition, when markets for collected materials are strong, greater recycling rates offer the potential for increased revenues from the sale of these materials.

Potential Benefits

- **Encourages the Three Es:**
  - **Environment**
  - **Economics**
  - **Equity**

The increased reducing, reusing, and recycling leads to further benefits, called the Three Es.

Environment: Less waste means less landfill space is needed. In addition, reduced need for manufacturing goods can result in less pollution.

Economics: For the municipality, less waste means lower collection and disposal costs. For residents, they control their costs. If they throw away less, they will pay less.

Equity: Waste management costs money, but now the costs are spread more fairly. Those residents that generate large amounts of waste will have to take financial responsibility for it.

Waste Reduction Results

■ **Perkasie, PA**	**54%**
■ **MN Town 1**	**60%**
■ **MN Town 2**	**37%**
■ **Duke University Study of 14 cities**	**44%**
6 MA Cities	
■ **Before Unit Pricing**	**1.5 - 4.5 ppd**
■ **After Unit Pricing**	**0.89 - 1.09 ppd**
■ **Cornell University, Tompkins County, NY**	**76% of residents reduced waste**

What does the evidence show? In virtually every case, communities with pay-as-you-throw report that waste generation declined. Here are some examples.

The average waste reduction reported by pay-as-you-throw communities is between 25 and 45 percent. (Results may vary, depending on such factors as current waste collection systems and options chosen for pay-as-you-throw.)

Different Unit Pricing Programs

Community	Population	Type of Program	Change in MSW	Change in recycling
Plantation, FL	64,000	Bags	*	+21%
Perkasie, PA	7,900	Bags	-54%	+50%
High Bridge, NY	4,000	Stickers	*	+18%
Illion, NY	9,500	Bags	-51%	+41%
Pasadena, CA	119,374	Can	-21%	*
Loveland, CO	31,000	Stamp	-62%	*
Austin, TX	450,000	Can	-40%	*
Dupage County, IL	668,000	Bags	-53%	*

* Data not avalilable

Those communities with existing recycling programs also show significant increases in the amount recycled.

Studies also show that waste prevention and recycling amounts increased in all the reporting communities, regardless of size or geographic location.

Deciding Whether to Use Pay-As-You-Throw

- **Will the program meet our MSW goals?**
- **Will residents support the program?**
- **Will costs and revenues balance?**

Ultimately our community has to decide about pay-as-you-throw based on three issues:

Will it meet our MSW goals? We need to compare the potential advantages of pay-as-you-throw to our MSW goals and make a judgment about whether the program will bring us closer to meeting these goals.

Will residents support it? They most likely will, if the program is well-designed and we reach out to educate them about pay-as-you-throw.

Will costs and revenues balance? The only way to determine this is to perform some detailed rate design work and evaluate the results.

Pay-As-You-Throw Goals (Examples)

- **Raise sufficient revenues**
- **Encourage MSW reduction through price signals**
- **Convey a better understanding of social costs to citizens**
- **Charge for recycling and other complementary programs**
- **Allow for the needs of special groups**
- **Keep the program simple to use and run**

Pay-as-you-throw programs can help a community meet a number of important goals. These are just a few examples.

Our goals include:

[List your community's MSW goals; discuss how well pay-as-you-throw will meet them]

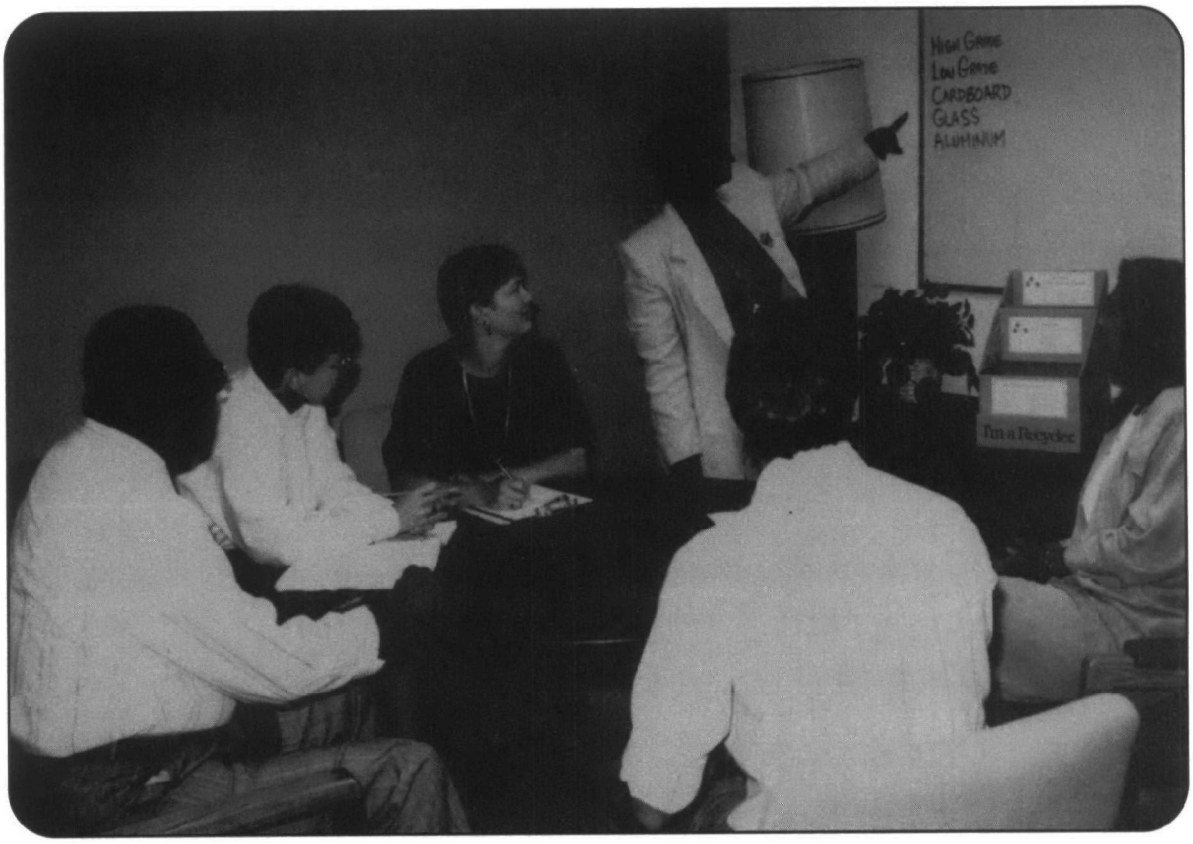
Education and Outreach

- **Need the support of residents!**
- **Build consensus with an outreach campaign**
- **Citizens' advisory council can help:**
  - **Set goals**
  - **Build consensus**

If we decide to go with pay-as-you-throw, we must earn the support of residents. A key lesson from communities with pay-as-you-throw is that such programs will not succeed without residents' approval.

To achieve this, the first step will be to initiate an outreach campaign. One goal of the campaign is to inform residents about why the new program is needed.

A second goal of the campaign is to involve residents in the actual planning for the program. Setting up a citizens' advisory council that includes civic leaders and other residents can help accomplish this.



The citizens' advisory council can assist in developing goals and in finding ways to reach out to the community about the new program. The council also can provide input on important decisions about how the program will be structured.

Building Consensus

- **Explain current MSW issues**
- **Present community's MSW goals**
- **Explain how Pay-As-You-Throw can meet these goals**
- **Residents more likely to support program when they see tangible benefits**

It is possible there may be some initial opposition to the program, since residents are going to be asked to pay for a service they may think they had been getting for free.

To overcome this, our outreach campaign could first discuss the problem. For example, we can let residents know that the increasing amount of trash is making MSW management harder and more expensive.

Then, we could relate these issues as goals. For example, we could say that a primary goal is to reduce MSW amounts.

Finally, our campaign should explain pay-as-you-throw and discuss how it can help us reduce trash and achieve other goals as well.

Techniques for Building Consensus

- **Hold public meetings**
- **Issue press releases/outreach to local media**
- **Prepare briefs for elected officials**
- **Work with retailers**
- **Enclose information with utility bills/other mailings to residents**

There are many different ways to structure the outreach campaign. Presentations could be made at public meetings on pay-as-you-throw and why it can help.

Involving local news outlets via press releases and invitations to public meetings is important. Achieving positive press coverage could go a long way toward easing residents' concerns.

Briefings for elected officials can help them better explain the program in public appearances.

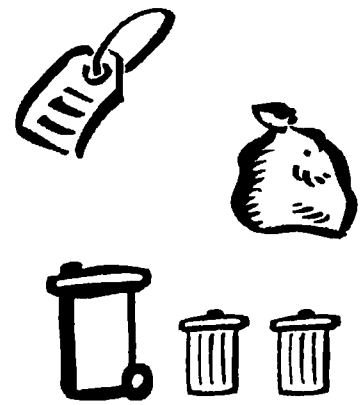
Retailers can be educated about the program and also can display materials about it in their stores. Direct outreach to residents through mailings can be effective as well.

Another effective method of generating public support is to reach out to specific groups, such as the elderly or school children.

Children in particular are an important audience. Children tend to bring the messages they receive back home to their parents, which can help pay-as-you-throw gain acceptance community-wide.

Rate Structure Container Options

- Tags
- Bags
- Cans



The next step is to design the structure of the program.

Some programs sell tags or stickers to residents to affix to their own bags. Under this system, the price of the tag or sticker includes the collection and management costs for the trash. The tag often indicates a specific size container, and alerts collection crews that the waste has been paid for.

Bags with some type of distinctive marking or color can be sold to residents at retail outlets or municipal offices. The price of the bag includes the collection and management costs for the trash.

Cans also can be used. One option is to offer a large can, and bill residents for the number of cans they fill up. Smaller size cans also could be used for any waste beyond the first large container.

Bag and tag systems tend to allow for faster collection, and no billing is needed. Residents tend to find these systems easy to understand.

There can be some revenue uncertainty, however, since residents may buy bunches of bags or tags at hard-to-predict intervals.

Can systems tend to offer greater revenue stability, and won't tear or scatter trash. Cans also often are compatible with automatic collection equipment.

A system for billing residents for their can set-outs is needed, however, which can increase administrative costs.

Rate Structure Systems for Unit Pricing

- **Proportional (linear)**

- **Variable Container**

- **Two-tiered/ Multi-tiered**

The next step is to decide how to price the containers.

Under proportional systems, a flat price is charged for each container. This provides a very simple, clear signal to residents to reduce waste, and it is easy to administer.

The variable rate is used when different size containers are available. One price is used for the large container, and different prices are set for the smaller containers residents might use.

Because revenues may fluctuate with linear and variable rate systems, some communities use two-tiered or multi-tiered systems. These options establish a monthly flat fee to cover the fixed costs of MSW management. Then, a per-container charge is set on top of that. This lessens the waste reduction signal somewhat, but minimizes any revenue uncertainty.

Because residents have an incentive to reduce waste, it makes sense to offer additional avenues to accomplish this. These options are called complementary programs.

For example, nearly all communities with pay-as-you-throw include curbside recycling collections. Recycling enables residents to divert a large percentage of the waste they have generated.

Complementary Programs

- **Recycling collections**
- **Yard trimmings collections for composting**
- **Bulky items pickups**

Yard trimmings, which comprise a large percentage of the waste stream, also can be diverted through curbside collection or by encouraging backyard composting.

Bulky items will need to be planned for. Because they cost more to collect and dispose of, many communities have established a special fee system for "white goods" or bulky items using tags or stickers. Residents often are asked to put a set number of tags or stickers on these large waste items to indicate that their collection has been paid for.

Designing a Rate Structure

- **Costs**
  - **Estimate Demand:**
    _____ cubic yards/tons MSW
  - **Determine Services**
    (curbside recycling, low-income assistance, etc.)
  - **Estimate Costs:**
    $ _____ fixed and variable costs

After making the basic decisions about the program, the next step is to create a rate structure that balances costs and revenues.

The first step is estimating the demand for services, expressed as the amount of waste you expect to collect annually. This figure should take into account possible changes in the size of our community and the waste reduction impact of the new program.

The next step is determining the services that will be offered with the program. These services might include curbside recycling, a composting program, bulky waste collection, or assistance to low- or fixed-income residents.

Next, the cost of collecting the estimated amount of waste and providing the planned services needs to be calculated.

Designing a Rate Structure

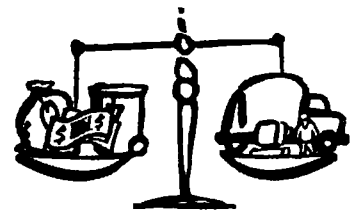
- **Revenues**
  - **Develop Rates: $ _____ per unit**
  - **Calculate Revenues:**
    _____ units MSW x $ _____ per unit = $ _____

Revenues then need to be calculated.

First, an estimated fee per container should be established. Then, this rate is multiplied by the annual number of containers residents are expected to fill. These are the revenues that the program will generate.

Designing a Rate Structure

- **Balance**
  - **Weigh costs against revenues**
  - **Adjust costs and/or revenues as needed**



$ _____ Costs **$ _____ Revenues**

Now the expected costs and the projected revenues can be compared and balanced.

It is likely that adjustments will be needed. It may be necessary to cut back on some services or raise the per-container fee to cover a shortfall.

On the other hand, if a surplus is projected, then the container fee could be lowered. A lower price also might help convince residents to support the program.

Challenges and Solutions

■ **Illegal dumping**	**Education, legal diversions, enforcement**
■ **Multi-family housing**	**Include charges in rent, bar code chutes**
■ **Low-income groups**	**Rebates, discounts**
■ **Covering costs & revenue stability**	**Two-tiered billing**
■ **Regressivity & hidden tax issues**	**Appropriate pricing and refunds**

There are a number of potential barriers we need to consider. With the appropriate planning, these barriers can be overcome.

The most commonly voiced concern when pay-as-you-throw is proposed is illegal dumping. However, experience from communities with pay-as-you-throw has shown that illegal dumping typically is less of an issue than originally feared. The key is educating residents to keep them from dumping their waste and provide them with significant opportunities (such as recycling and composting) to divert their waste legally. Strong enforcement also should be available.

Residents in multi-family housing can be difficult to service, since they often place their trash in common dumpsters. Possible solutions include adding the charges to rent or incorporating bar code readers in garbage chutes to monitor waste generation by residents.

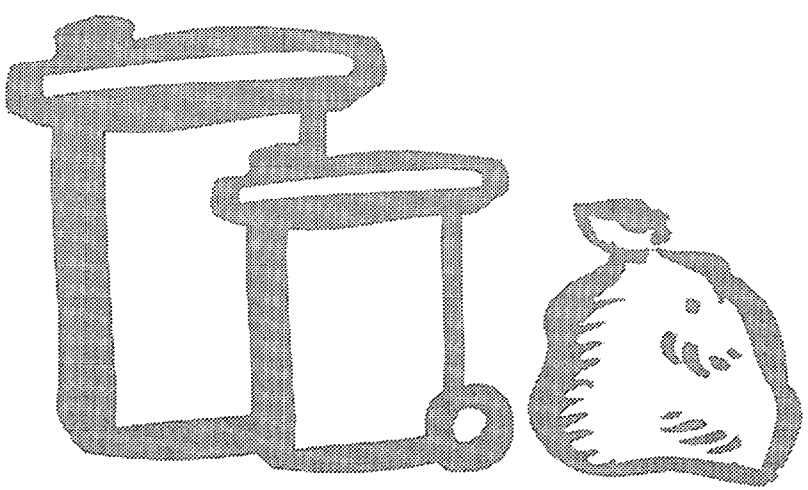
To help low-income groups participate, rebates, discounts, or other forms of assistance can be provided.

If it turns out that a major priority is to ensure that revenues will consistently cover costs, a two-tiered or multi-tiered rate structure can be used.

Residents also might be concerned about being taxed for solid waste services and then, under the new program, also being charged the variable fee. Making a point of lowering taxes by the appropriate amount or redirecting those revenues to other programs that residents support can help diffuse this issue.

"Pay-As-You-Throw"

Unit Pricing of Municipal Solid Waste



MSW Hierarchy Pyramid

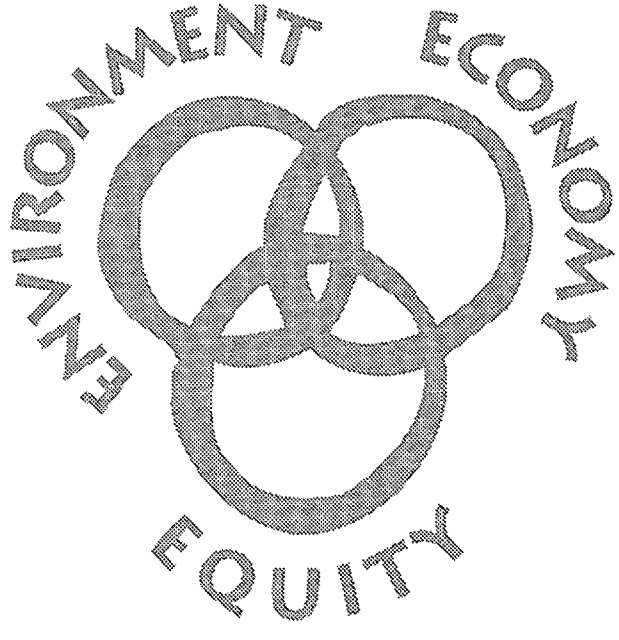
Potential Benefits

- **Encourages the Three Rs:**
  - **Reduce**
  - **Reuse**
  - **Recycle**

Gato

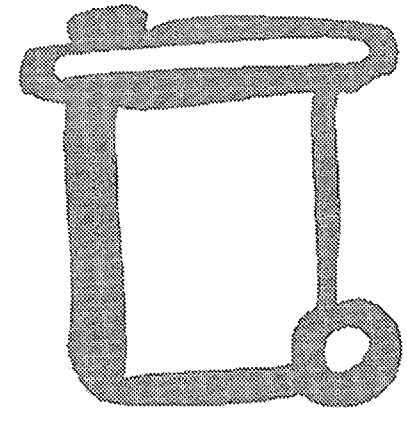
Potential Benefits

- **Encourages the Three Es:**
  - **Environment**
  - **Economics**
  - **Equity**



Waste Reduction Results

- Perkasie, PA — 54%
- MN Town 1 — 60%
- MN Town 2 — 37%
- Duke University Study of 14 cities — 44%

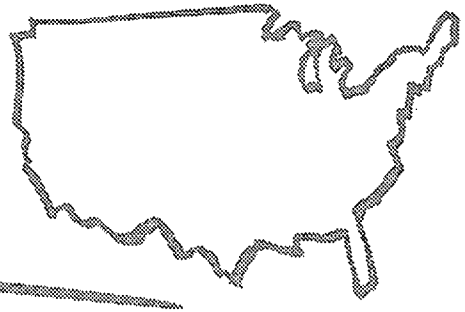


6 MA Cities

- Before Unit Pricing — 1.5 - 4.5 ppd
- After Unit Pricing — 0.89 - 1.09 ppd

- Cornell University, Tompkins County, NY — 76% of residents reduced waste

Different Unit Pricing Programs

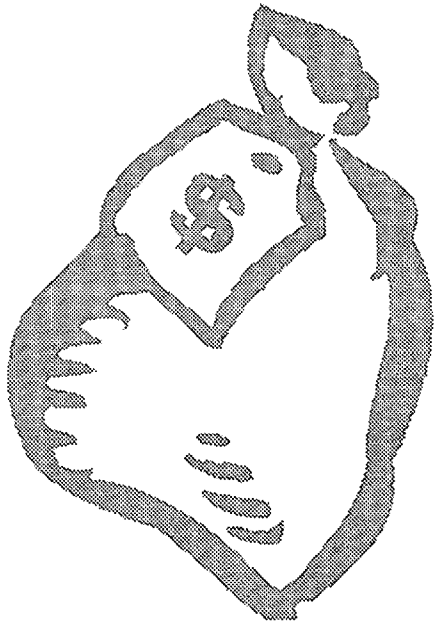


Community	Population	Type of Program	Change in MSW	Change in recycling
Plantation, FL	64,000	Bags	*	+21%
Perkasie, PA	7,900	Bags	-54%	+50%
High Bridge, NY	4,000	Stickers	*	+18%
Illion, NY	9,500	Bags	-51%	+41%
Pasadena, CA	119,374	Can	-21%	*
Loveland, CO	31,000	Stamp	-62%	*
Austin, TX	450,000	Can	-40%	*
Dupage County, IL	668,000	Bags	-53%	*

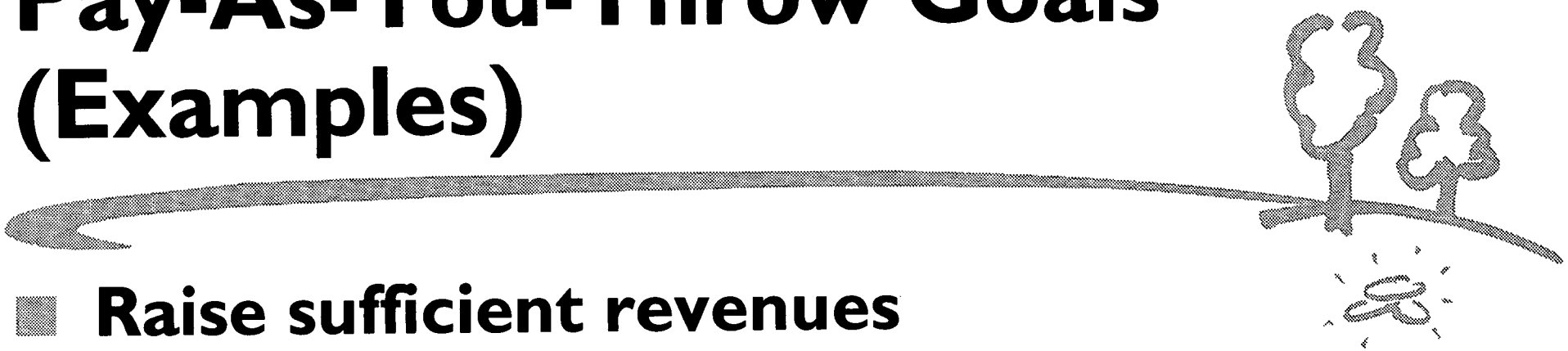
* Data not avalilable

Deciding Whether to Use Pay-As-You-Throw

- Will the program meet our MSW goals?
- Will residents support the program?
- Will costs and revenues balance?



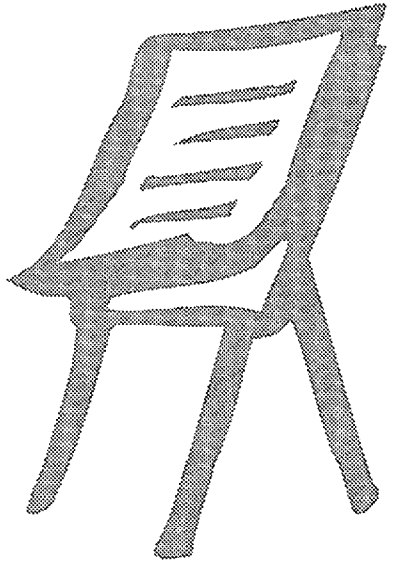
Pay-As-You-Throw Goals (Examples)

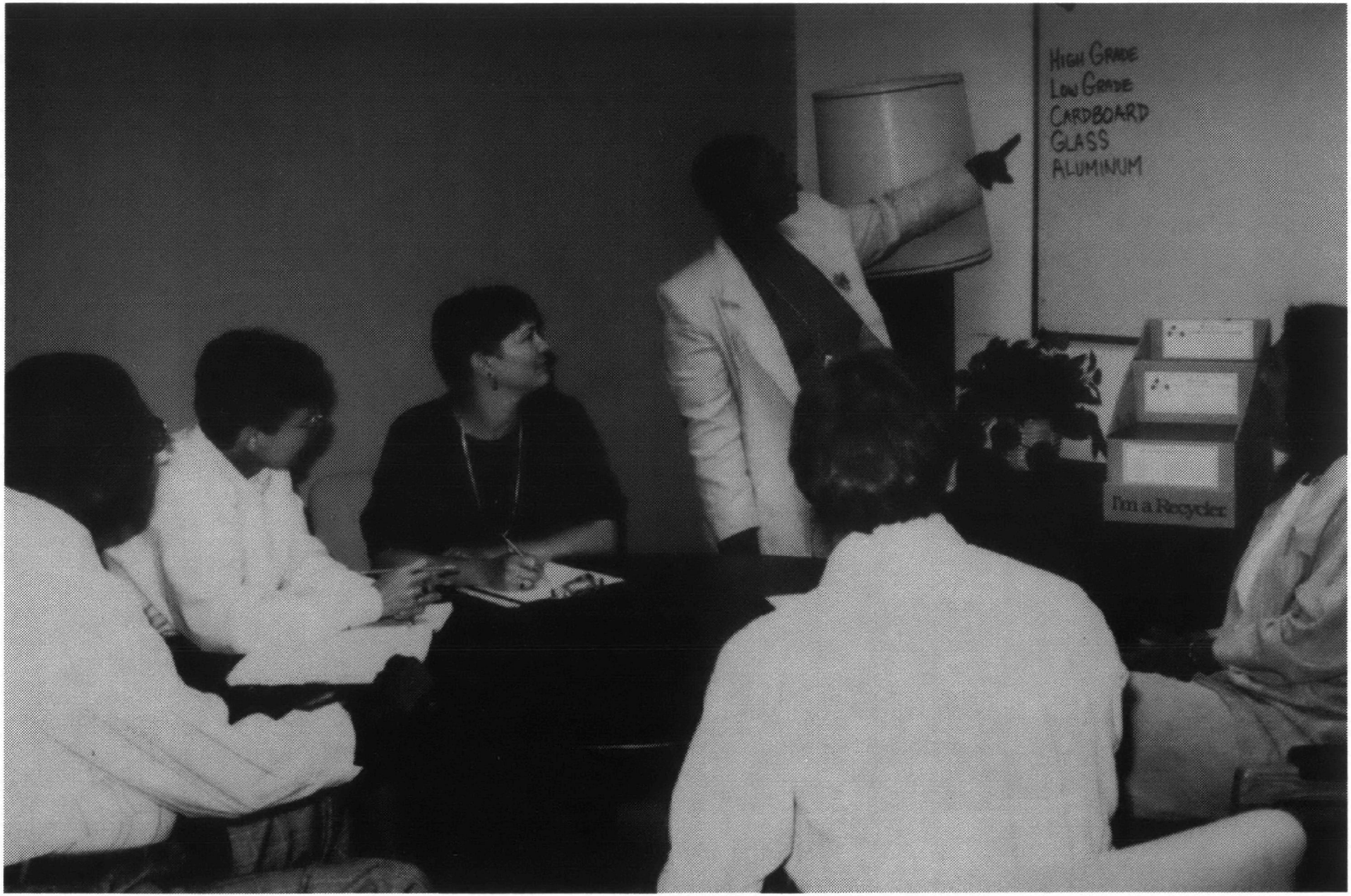


- Raise sufficient revenues
- Encourage MSW reduction through price signals
- Convey a better understanding of social costs to citizens
- Charge for recycling and other complementary programs
- Allow for the needs of special groups
- Keep the program simple to use and run

Education and Outreach

- Need the support of residents!
- Build consensus with an outreach campaign
- Citizens' advisory council can help:
  - Set goals
  - Build consensus

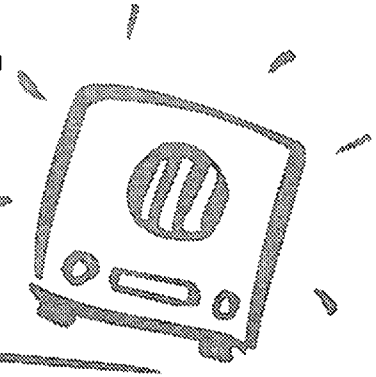



HIGH GRADE
LOW GRADE
CARDBOARD
GLASS
ALUMINUM
I'm a Recycler

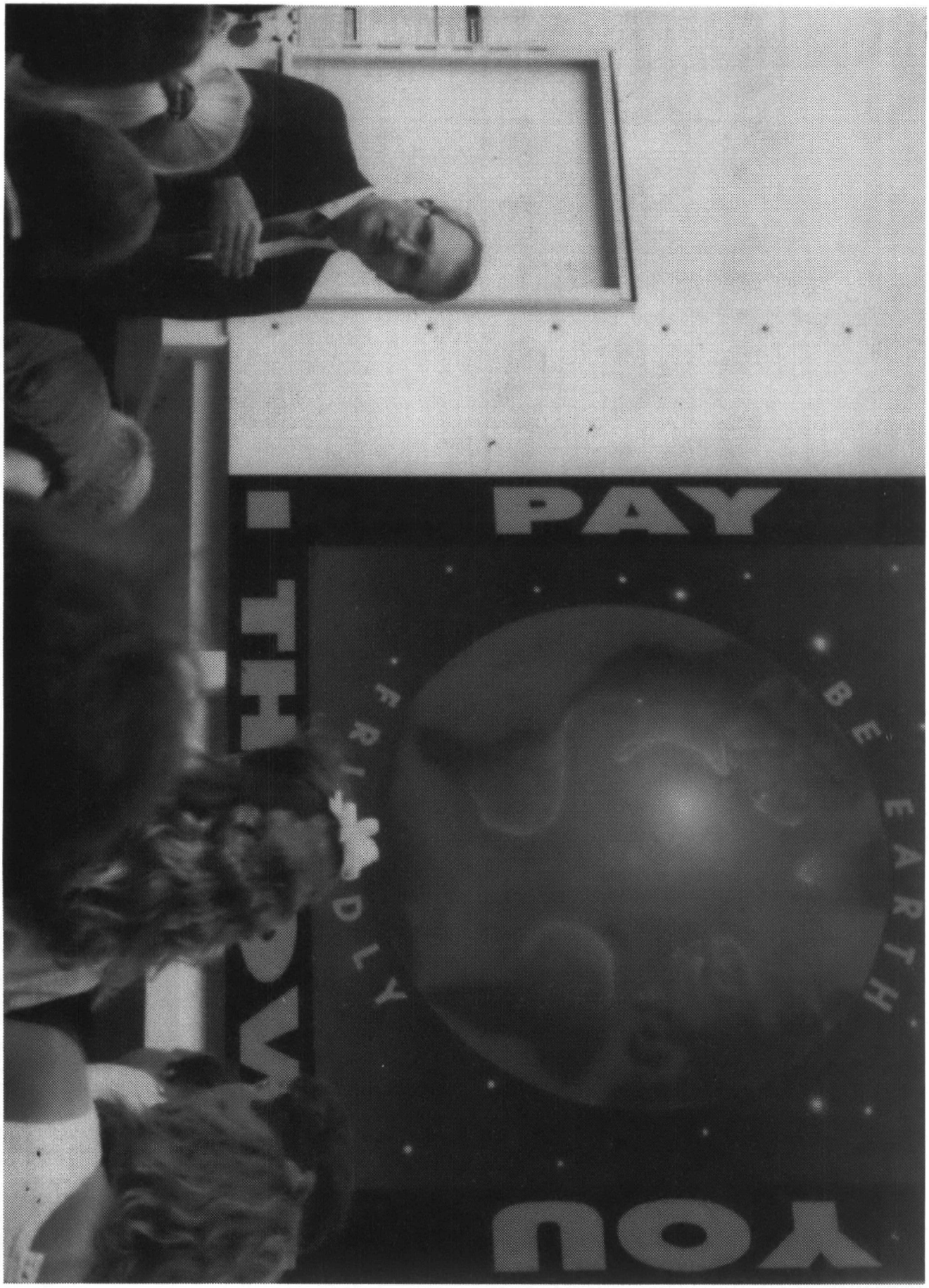
Building Consensus

- Explain current MSW issues
- Present community's MSW goals
- Explain how Pay-As-You-Throw can meet these goals
- Residents more likely to support program when they see tangible benefits

Techniques for Building Consensus



- Hold public meetings
- Issue press releases/outreach to local media
- Prepare briefs for elected officials
- Work with retailers
- Enclose information with utility bills/other mailings to residents

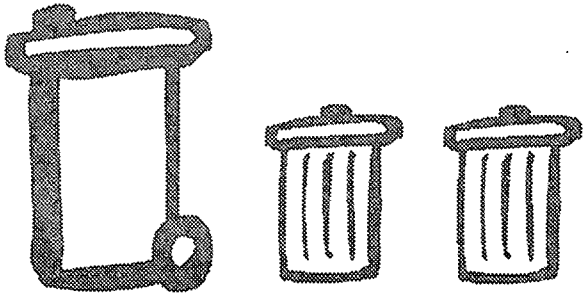

PAY
YOU
BE EARTH
FRIENDLY
I THINK

Rate Structure Container Options

- Tags

- Bags

- Cans

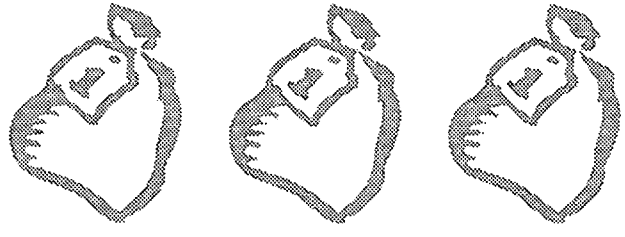


HELL

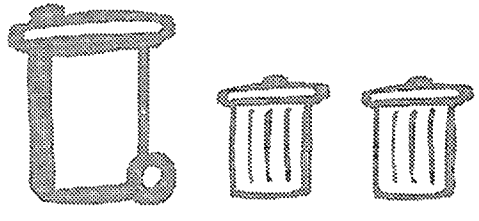
CCC

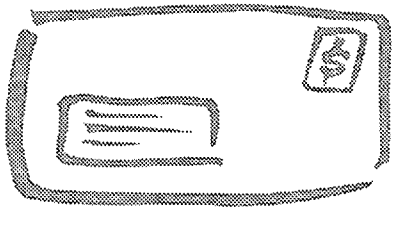
Rate Structure Systems for Unit Pricing

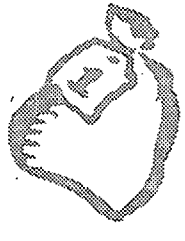
- Proportional (linear)



- Variable Container





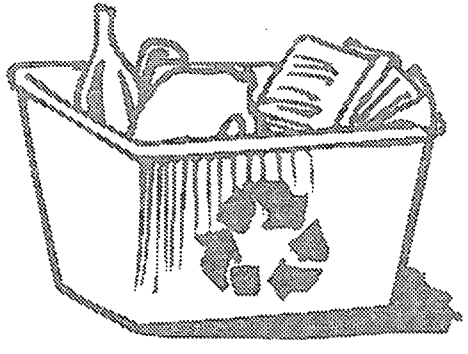


- Two-tiered/ Multi-tiered

RECYCLE

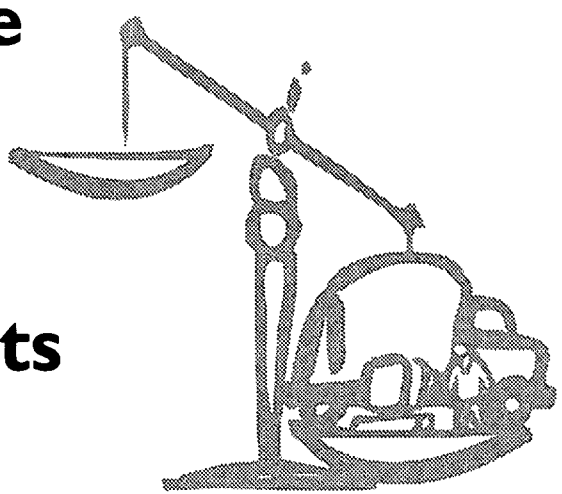
Complementary Programs

- Recycling collections
- Yard trimmings collections for composting
- Bulky items pickups



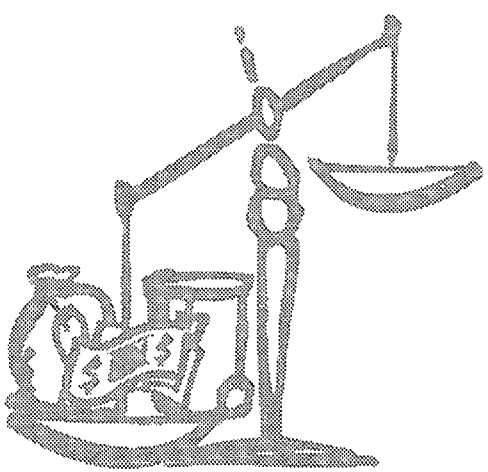
Designing a Rate Structure

- **Costs**
  - **Estimate Demand:**
    _____ cubic yards/tons MSW
  - **Determine Services**
    (curbside recycling, low-income assistance, etc.)
  - **Estimate Costs:**
    $ _____ fixed and variable costs



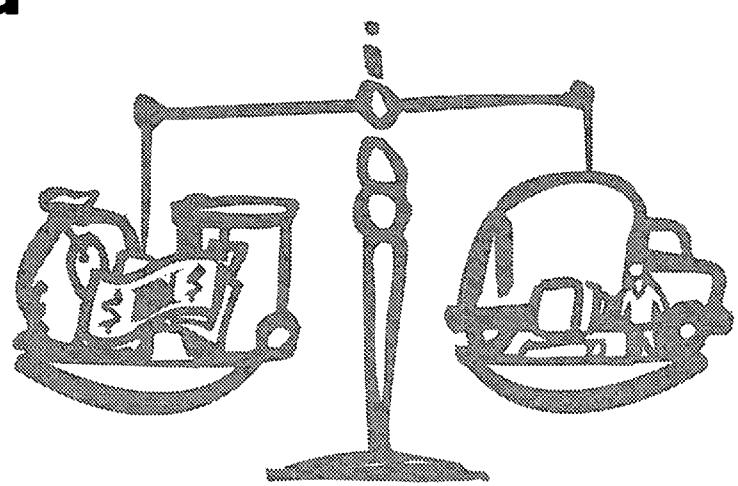
Designing a Rate Structure

- **Revenues**
  - **Develop Rates: $ _____ per unit**
  - **Calculate Revenues:**
    _____ units MSW x $ _____ per unit = $ _____



Designing a Rate Structure

- **Balance**
  - **Weigh costs against revenues**
  - **Adjust costs and/or revenues as needed**



$ _____ Costs

$ _____ Revenues

Challenges and Solutions

Illegal dumping	Education, legal diversions, enforcement
Multi-family housing	Include charges in rent, bar code chutes
Low-income groups	Rebates, discounts
Covering costs & revenue stability	Two-tiered billing
Regressivity & hidden tax issues	Appropriate pricing and refunds

SECTION TWO

Public Outreach Materials

Designing and implementing an outreach and education effort directed at residents are critical steps in the development of your pay-as-you-throw program. Achieving a broad level of public support can help ensure not only that your program will be successfully implemented, but that residents will begin responding as hoped: by increasing recycling and taking more aggressive measures to prevent waste. There is no single model or solution to this challenge. The extent of outreach necessary to get a pay-as-you-throw program up and running will vary from community to community.

This section presents several ideas for outreach materials that can help you begin to earn the support of your residents. Review the materials described below with your unique outreach needs in mind and select the tools that you think will help you effectively deliver your pay-as-you-throw message to the audiences you need to reach. The outreach materials and ideas in this section include:

- A set of five fact sheets introducing pay-as-you-throw.
- Other outreach ideas and strategies, including press releases, public meetings, newsletters, and flyers.
- A selection of clip art to help you create your own, customized outreach materials.

In general, successful public outreach efforts typically involve two components. The first component focuses on soliciting input about the program from community stakeholders prior to implementation. For example, it may be the case that your community's residents would support a pay-as-you-throw program if they considered it to

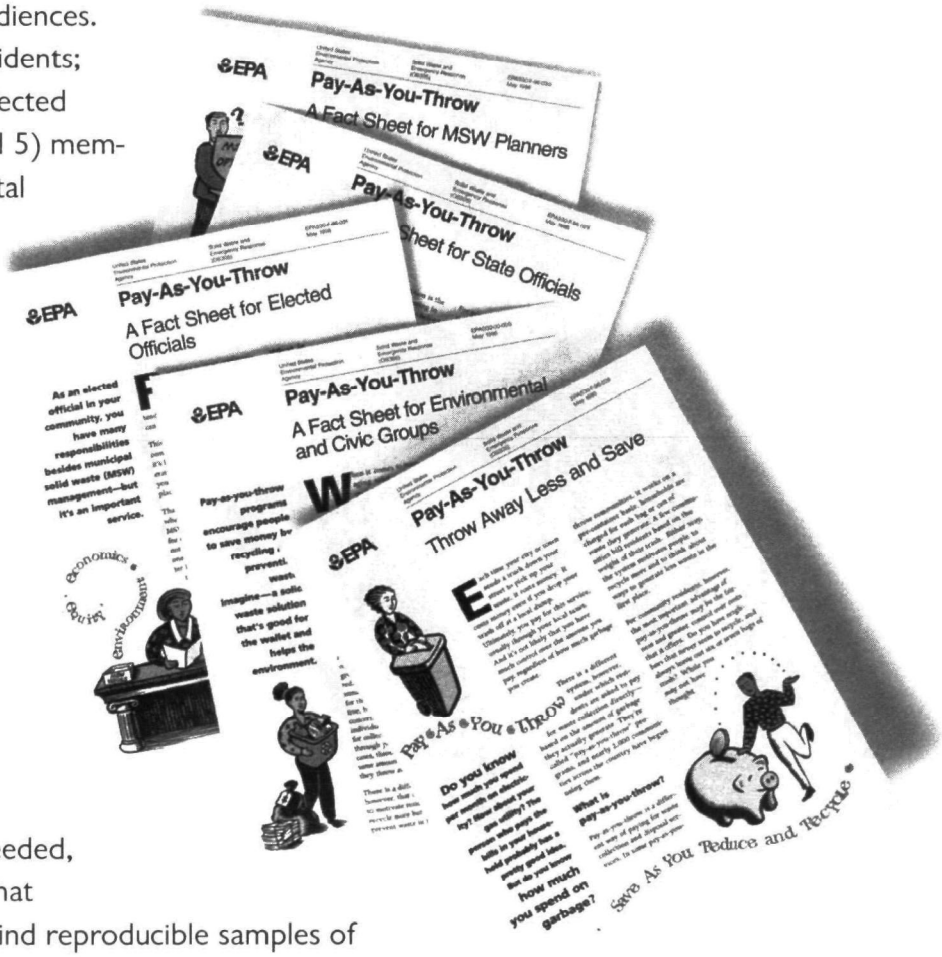
be sufficiently convenient. In this case, presenting them with possible arrangements—such as a system of bags available for purchase at local retailers versus a subscription-based system using cans—and asking them which system they would prefer can make a tremendous difference in their ultimate willingness to support the program.

The second type of outreach should take place just before and during program implementation. Once you have made a decision about the type of pay-as-you-throw system that is most appropriate for your community, you will need to clearly convey detailed information to residents about the program and how they can participate. Residents will need to thoroughly understand how the program works before they will begin to reduce and recycle more.

Review the materials in this section and decide which products can best help you solicit feedback and educate your residents about pay-as-you-throw. In addition, you might consider whether items like the videotape included in this Tool Kit and the worksheets in the next section of this workbook also can help strengthen your public outreach.

Pay-As-You-Throw Fact Sheets

Fact sheets can help community decisionmakers introduce pay-as-you-throw to local stakeholders and begin showing them why a pay-as-you-throw program might be a good idea. EPA developed the following five fact sheets to introduce pay-as-you-throw to what are, for many communities, their most important audiences. These are: 1) community residents; 2) MSW planners; 3) local elected officials; 4) state officials; and 5) members of civic and environmental organizations.



A quick and easy way to raise awareness about pay-as-you-throw, these fact sheets can be reproduced and distributed to target audiences within your community. The fact sheets also can be adapted for your own, customized outreach flyers. (See the flyers and brochures ideas found on page 109 of this workbook.) The text can be revised as needed, and, in the Clip Art section that begins on page 111, you will find reproducible samples of each of the illustrations

United States Environmental Protection Agency
Solid Waste and Emergency Response (OS305)
EPA530-F-96-028
September 1996

EPA

Pay-As-You-Throw

Throw Away Less and Save

Pay As You Throw

Do you know how much you spend per month on electricity? How about your gas utility? The person who pays the bills in your household probably has a pretty good idea. But do you know how much you spend on garbage?

Each time your city or town sends a truck down your street to pick up your waste, it costs money. It costs money even if you drop your trash off at a local dump. Ultimately, you pay for this service, usually through your local taxes. And it's not likely that you have much control over the amount you pay, regardless of how much garbage you create.

There is a different system, however, under which residents are asked to pay for waste collection directly—based on the amount of garbage they actually generate. They're called "pay-as-you-throw" programs, and nearly 2,000 communities across the country have begun using them.

What is pay-as-you-throw?

Pay-as-you-throw is a different way of paying for waste collection and disposal services. In some pay-as-you-throw communities, it works on a per-container basis: households are charged for each bag or can of waste they generate. A few communities bill residents based on the weight of their trash. Either way, the system motivates people to recycle more and to think about ways to generate less waste in the first place.

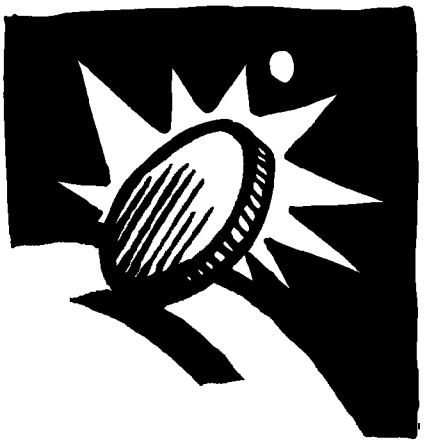
For community residents, however, the most important advantage of pay-as-you-throw may be the fairness and greater control over costs that it offers. Do you have neighbors that never seem to recycle, and always leave out six or seven bags of trash? While you may not have thought about it, right now you're

Save As You Reduce and Recycle

helping them pay for that waste. Under pay-as-you-throw, everyone pays only for what they generate—so you won't have to subsidize your neighbor's wastefulness anymore. It's only fair. With pay-as-you-throw, when you recycle and prevent waste, you're rewarded with a lower trash bill.

Because of these potential cost savings, both you and your neighbors will naturally want to reduce the amount of waste that you generate. And when people reduce waste, that can mean lower costs for your community, since it costs less to collect and dispose of everyone's trash. This might even free up funding for other municipal services you depend upon—like schools and fire and police protection.

In addition, the pay-as-you-throw incentive to put less waste at the curb can make a big environmental difference. When people generate less waste and recycle more, fewer natural resources are used and there is less pollution from manufacturing. Valuable landfill space is conserved as well, reducing the need to site new facilities.



When people generate less waste and recycle more, fewer natural resources are used and there is less pollution from manufacturing.

Are there disadvantages to pay-as-you-throw?

While there are potential barriers to a successful program, communities with pay-as-you-throw report that they have found effective solutions. Illegal dumping is a frequently raised issue. While people often assume that illegal dumping will increase once residents are asked to pay for each container of waste they generate, most communities with pay-as-you-throw have found this not to be the case. This is especially true when communities offer their residents recycling, composting for yard trimmings, and other programs that allow individuals to reduce waste legally. Others, particularly lower-income residents, worry about the amount they will have to pay. In many communities, however, coupon or voucher programs are being used to help reduce trash collection costs for these households.

What can I do?

If you're interested in pay-as-you-throw, talk to your town planner or local elected representatives! Ask them if they know about pay-as-you-throw, and whether they would consider using it in your community. If you or your town's officials want to know more about pay-as-you-throw, EPA has developed a guidebook you can use. *Pay-As-You-Throw: Lessons Learned About Unit Pricing* (EPA530-R-94-004) contains background information on the advantages of pay-as-you-throw and provides detailed information on how these programs work. To order a copy, call the EPA/RCRA Superfund Hotline at 800-424-9346 or TDD 800-553-7672 for the hearing impaired. For Washington, DC, and outside the United States, call 703-412-9810 or TDD 703-412-3323.

United States Environmental Protection Agency

Solid Waste and Emergency Response (OS305)

EPA530-F-96-030
September 1996

EPA

Pay-As-You-Throw

A Fact Sheet for MSW Planners

MSW programs today need to offer more than reliable waste collection services. In some communities, the issue is rising collection and disposal costs. Other communities are looking for ways to extend landfill capacity.

As an MSW planner, you know how important it is to reduce the amount of waste residents put out for collection (or bring to the landfill).

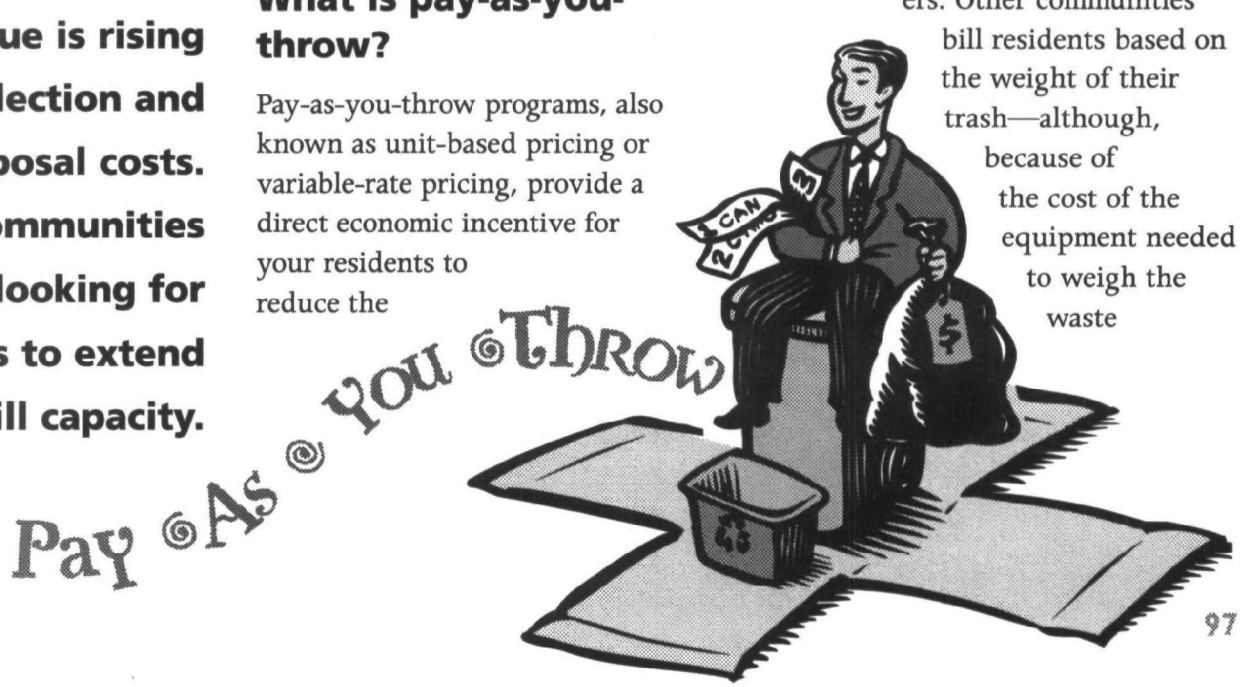
In fact, your community probably started a recycling program to help divert some of this waste from disposal. Even with a strong recycling program, however, it's likely that your residents are steadily throwing away more each year—pointing to the need for not only more recycling, but getting residents to generate less waste in the first place.

For MSW planners in nearly 2,000 communities, a program called "pay-as-you-throw" is helping them meet this challenge.

What is pay-as-you-throw?

Pay-as-you-throw programs, also known as unit-based pricing or variable-rate pricing, provide a direct economic incentive for your residents to reduce the amount of waste they generate. Under pay-as-you-throw, households are charged for waste collection based on the amount of waste they throw away—in the same way that they are charged for electricity, gas, and other utilities. As a result, residents are motivated not only to increase the amount they recycle but to think about ways to generate less waste in the first place.

Pay-as-you-throw programs can be structured in several different ways. Some communities charge residents based on the volume of waste they generate. Under volume-based programs, residents are charged a fee for each bag or can they fill up. Communities also can require that residents purchase tags or stickers and affix them to their own containers. Other communities bill residents based on the weight of their trash—although, because of the cost of the equipment needed to weigh the waste



and record the amount for billing purposes, weight-based programs are far less common.

What are the benefits of pay-as-you-throw?

However it is structured, pay-as-you-throw has the potential to improve MSW programs in several important ways. First, there are significant economic benefits. Because of the incentive to generate less, communities with programs in place have reported reductions in waste amounts ranging from 25 to 45 percent, on average. For many communities, this can lead to lower disposal costs, savings in waste transportation expenses, and other cost savings. Pay-as-you-throw communities also typically report significant increases in recycling. In some cases, this can yield increased revenues from the sale of collected materials.

In addition, pay-as-you-throw programs can be designed to cover the cost not only of waste collection and disposal, but also some or all of the community's complementary MSW programs (such as recycling, composting, and bulky waste collections). Of course, there often are new costs for the community when a pay-as-you-throw program is adopted, including expenditures for education and enforcement. These costs usually are not significant, however—and they can be built into a pay-as-you-throw rate structure to ensure that they will be covered.

Another advantage of pay-as-you-throw programs is the greater control over costs they offer to residents. While they may not realize it, your residents pay for waste management services. And whether they pay through their taxes or a flat fee, those residents that generate less and recycle more are paying for neighbors that generate two or even three times as much waste. With pay-as-you-throw, residents that reduce and recycle are rewarded with a lower trash bill.

This incentive to put less waste at the curb also can make a big environmental difference. When people generate less waste and recycle more, fewer natural resources are used, there is less pollution from manufacturing, and less landfill space is consumed—reducing the need to site new facilities.

Are there disadvantages to pay-as-you-throw?

While there are potential barriers to a successful program, communities with pay-as-you-throw report that they have found effective solutions. Community officials often raise the prospect of illegal dumping when they first learn about pay-as-you-throw. Most communities with pay-as-you-throw, however, have found that illegal dumping in fact did not increase after implementation. This is especially true when communities offer their residents recycling, composting for yard trimmings, and other programs that allow individuals to reduce waste legally. Others, particularly lower-income residents, worry about the amount they will have to pay. In many communities, however, coupon or voucher programs are being used to help reduce trash collection costs for these households.

How can I learn more about pay-as-you-throw?

EPA has developed a guidebook for anyone interested in pay-as-you-throw programs. *Pay-As-You-Throw: Lessons Learned About Unit Pricing* (EPA530-R-94-004) contains background information on the advantages of pay-as-you-throw and provides detailed information on how these programs work. To order a copy, call the EPA/RCRA Superfund Hotline at 800-424-9346 or TDD 800-553-7672 for the hearing impaired. For Washington, DC, and outside the United States, call 703-412-9810 or TDD 703-412-3323.

United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(OS305)

EPA530-F-96-031
September 1996

EPA

Pay-As-You-Throw

A Fact Sheet for Elected Officials

As an elected official in your community, you have many responsibilities besides municipal solid waste (MSW) management—but it's an important service.

Residents in most communities have come to expect efficient, reliable trash collection and disposal, and tend to support those officials that can get the job done.

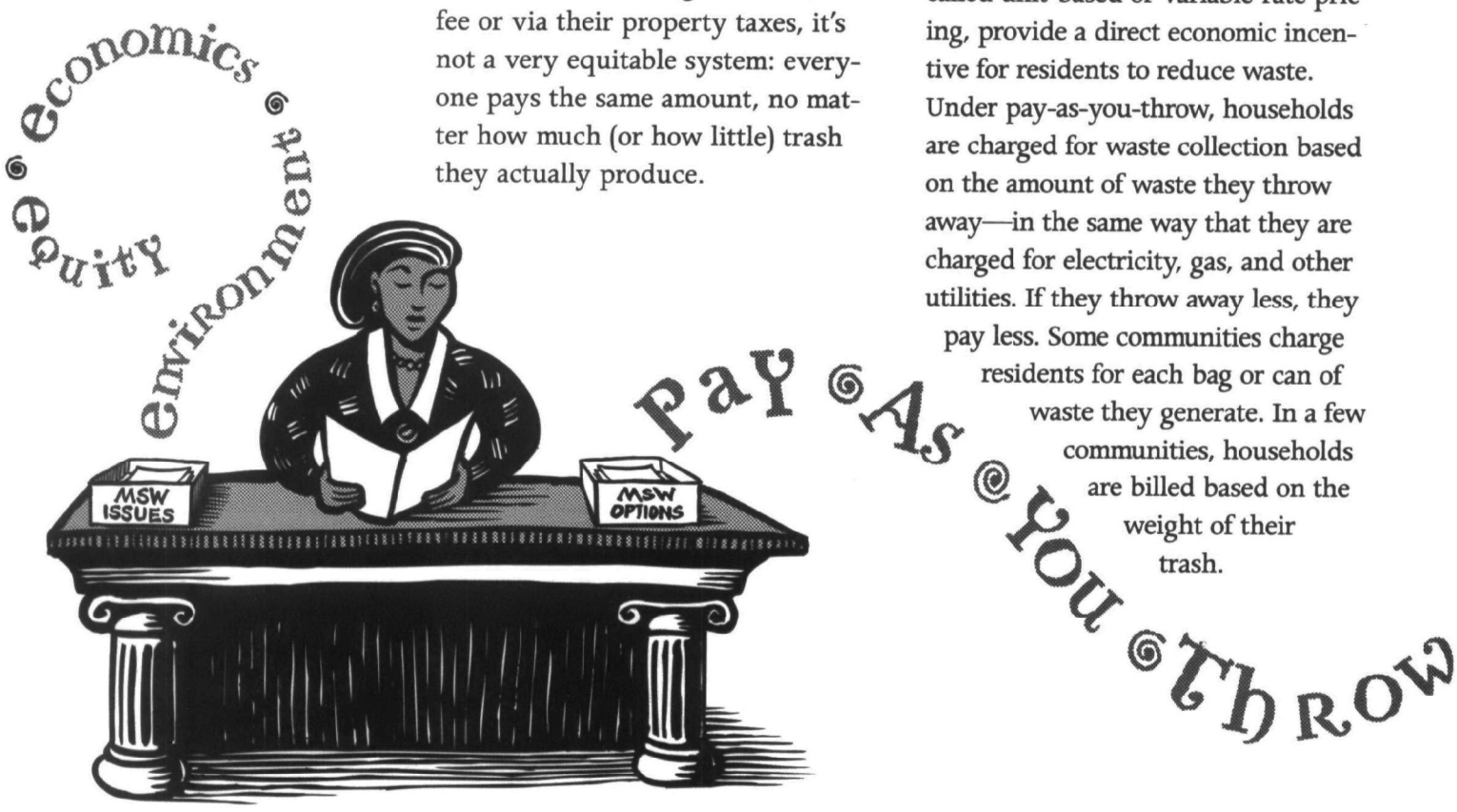
This task has been growing more complicated, however. First of all, it's likely that your residents are generating more waste each year, even if you have a recycling program in place.

That can mean escalating costs. And whether your residents pay for MSW services through a direct, flat fee or via their property taxes, it's not a very equitable system: everyone pays the same amount, no matter how much (or how little) trash they actually produce.

What is pay-as-you-throw?

Fortunately, there is a system out there that can help your MSW management personnel meet these challenges. In nearly 2,000 communities across the country, a program called "pay-as-you-throw" is offering residents a more equitable way to pay for collection and disposal of their trash—while, at the same time, encouraging them to create less waste and increase the amount they recycle.

Pay-as-you-throw programs, also called unit-based or variable-rate pricing, provide a direct economic incentive for residents to reduce waste. Under pay-as-you-throw, households are charged for waste collection based on the amount of waste they throw away—in the same way that they are charged for electricity, gas, and other utilities. If they throw away less, they pay less. Some communities charge residents for each bag or can of waste they generate. In a few communities, households are billed based on the weight of their trash.



What are the benefits of pay-as-you-throw?

Pay-as-you-throw gives residents greater control over their costs. While they may not realize it, your constituents are paying for waste management services. And, whether they pay through taxes or a flat fee, residents that generate less and recycle more are paying for neighbors that generate two or even three times as much waste. When a few residents generate more waste, everyone pays for it. With pay-as-you-throw, residents that reduce and recycle are rewarded with a lower trash bill.

As a result, households under pay-as-you-throw tend to generate less waste. Communities with programs in place have reported reductions in waste amounts ranging from 25 to 45 percent, on average. Recycling tends to increase significantly as well. And less waste means that a community might be able to spend less of its municipal budget on waste collection and disposal—possibly even freeing up funds for other essential services like education and police protection.

Because residents stand to pay less (if they generate less), pay-as-you-throw communities have typically reported strong public support for their programs. The initial reaction from residents can vary, however—some residents might feel that the program is no more than an added charge. To address this, it is important to explain to residents at the outset how the program works, why it is a more equitable system, and how they can benefit from it. Pay-as-you-throw has tended to work best where elected officials and other community leaders have reached out to residents with a thorough education campaign.

Many of the resulting programs have been highly successful, and have often attracted attention. In some cases, pay-as-you-throw has worked so well that the communities have become models in their region, demonstrating how MSW services can be improved. And within the community, elected officials can point to pay-as-you-throw as an example of municipal improvements they helped bring about.

Equity

Pay-as-you-throw is fair: residents pay only for the waste they throw away.

Economics

Residents that reduce and recycle save money—and less waste helps municipalities cut costs, too.

Environment

Fewer natural resources are used and landfill space is saved, reducing the need to site new facilities.

Are there disadvantages to pay-as-you-throw?

While there are potential barriers to a successful program, communities with pay-as-you-throw report that they have found effective solutions. Illegal dumping is a frequently raised issue. While it is often assumed that illegal dumping will increase once residents are asked to pay for each container of waste they generate, most communities with pay-as-you-throw have found this not to be the case. This is especially true when communities offer their residents recycling, composting for yard trimmings, and other programs that allow individuals to reduce waste legally. Others, particularly lower-income residents, worry about the amount they will have to pay. In many communities, however, coupon or voucher programs are being used to help reduce trash collection costs for these households.

How can I learn more about pay-as-you-throw?

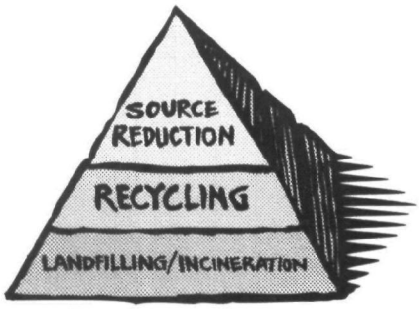
EPA has developed a guidebook for anyone interested in pay-as-you-throw programs. *Pay-As-You-Throw: Lessons Learned About Unit Pricing* (EPA530-R-94-004) contains background information on the advantages of pay-as-you-throw and provides detailed information on how these programs work. To order a copy, call the EPA/RCRA Superfund Hotline at 800-424-9346 or TDD 800-553-7672 for the hearing impaired. For Washington, DC, and outside the United States, call 703-412-9810 or TDD 703-412-3323.

United States Environmental Protection Agency
Solid Waste and Emergency Response (OS305)
EPA530-F-96-029
September 1996

EPA

Pay-As-You-Throw

A Fact Sheet for State Officials



Like most state environmental officials and planners, you've probably been emphasizing the MSW management hierarchy: recommending that communities prevent waste and recycle as much of the remainder as possible.

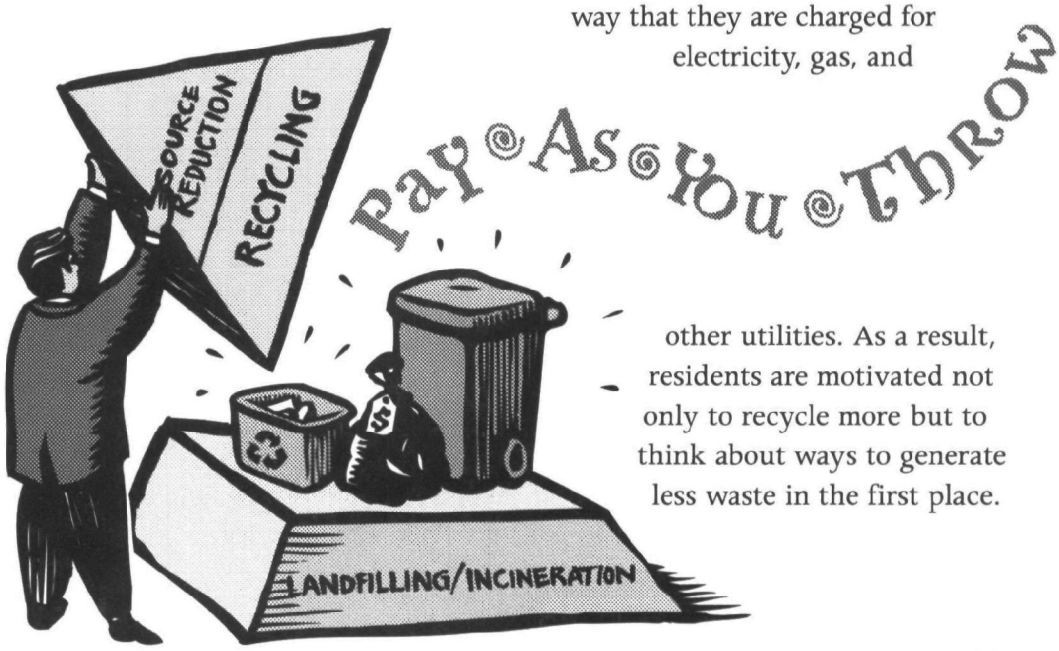
Today, the MSW management hierachy is the focus of solid waste planning in most states. This has helped recycling programs to spread quickly, and recycling markets have been developed to purchase and process the collected materials.

Source reduction, however, has fallen behind this pace. While the rate of increase is slowing, individuals in this country are continuing to generate more waste each year—and, as a result, waste management is growing more difficult. Communities in your state need programs that will do more than increase recycling: they need to encourage residents to prevent waste, too.

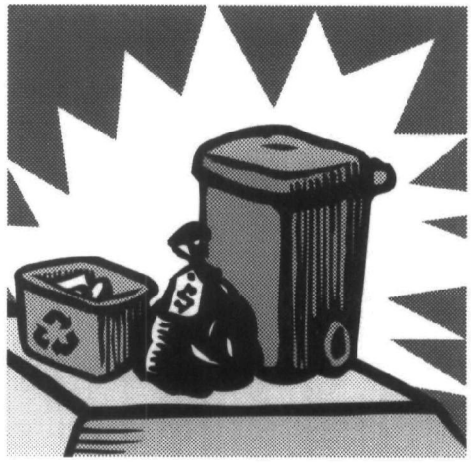
For growing numbers of communities, "pay-as-you-throw" programs are being used to achieve this goal. While fewer than 200 programs were in existence as recently as the mid-1980s, today, nearly 2,000 communities across the country are using pay-as-you-throw to better manage solid waste.

What is pay-as-you-throw?

Pay-as-you-throw programs, also known as unit-based pricing or variable-rate pricing, provide a direct economic incentive for individuals to reduce the amount of waste they generate. Under pay-as-you-throw, households are charged for waste collection based on the amount of waste they throw away—in the same way that they are charged for electricity, gas, and other utilities. As a result, residents are motivated not only to recycle more but to think about ways to generate less waste in the first place.



Pay-as-you-throw programs can be structured in several different ways. Some communities charge residents based on the volume of waste they generate. Under volume-based programs, residents pay for each bag or can they fill up. Communities also can require that residents purchase tags or stickers and affix them to their own containers. Other communities bill residents based on the weight of their trash—although, because of the cost of the equipment needed to weigh the waste and record the amount for billing purposes, weight-based programs are far less common.



What are the benefits of pay-as-you-throw?

However they are structured, all pay-as-you-throw programs share important benefits for both communities and their residents. First, households under pay-as-you-throw have more control over their solid waste management costs. While they may not realize it, residents pay for the waste management services they receive. And whether they pay through their taxes or a flat fee, those residents that generate less and recycle more are paying for neighbors that generate two or three times as much waste. With pay-as-you-throw, residents that reduce and recycle are rewarded with a lower trash bill.

In communities with pay-as-you-throw programs, this incentive has resulted in reported average reductions in waste amounts ranging from 25 to 45 percent. Recycling tends to increase significantly as well, further cutting down on the amount of waste requiring disposal. This can mean lower disposal costs, savings in waste transportation expenses, potentially greater revenues from the sale of recovered materials, and other cost savings.

And less waste and increased recycling at the local level translates into an improved solid waste management picture statewide. Increased amounts of recovered materials will become available to processors and remanufacturers, encouraging the development of increased recycling capacity and other investments in the infrastructure of recycling. The potential for lower costs can help increase the long-term economic stability of your communities' MSW programs. And less waste means fewer natural resources will be depleted, less energy used, and less landfill space consumed, helping preserve your state's environment. Because of these kinds of advantages, pay-as-you-throw has received bipartisan support at both the state and local levels. The use of pay-as-you-throw also has been endorsed by the National Conference of State Legislatures (NCSL).

Are there disadvantages to pay-as-you-throw?

While there are potential barriers to a successful program, communities with pay-as-you-throw have found effective solutions. Local officials, for example, often assume that illegal dumping will increase once residents are asked to pay for each container of waste they generate. Most communities with pay-as-you-throw have found this not to be the case, however, especially when they offer their residents recycling, composting for yard trimmings, and other programs that allow individuals to reduce waste legally. Others, particularly lower-income residents, worry about the amount they will have to pay. In many communities, however, coupon or voucher programs are being used to help reduce trash collection costs for these households.

How can I learn more about pay-as-you-throw?

EPA has developed a guidebook for anyone interested in pay-as-you-throw programs. *Pay-As-You-Throw: Lessons Learned About Unit Pricing* (EPA530-R-94-004) contains background information on the advantages of pay-as-you-throw and provides detailed information on how these programs work. To order a copy, call the EPA/RCRA Superfund Hotline at 800-424-9346 or TDD 800-553-7672 for the hearing impaired. For Washington, DC, and outside the United States, call 703-412-9810 or TDD 703-412-3323.

United States Environmental Protection Agency

Solid Waste and Emergency Response (OS305)

September 1996

EPA

Pay-As-You-Throw

A Fact Sheet for Environmental and Civic Groups

Pay-as-you-throw programs encourage people to save money by recycling and preventing waste. Imagine—a solid waste solution that's good for the wallet and helps the environment.

When it comes to managing solid waste, the goal for the past 10 years has been to reduce, reuse, and recycle. Today, thousands of community recycling programs are diverting millions of tons of valuable materials—materials that would otherwise be thrown away—for remanufacturing into useful products.

Despite the tremendous growth in recycling, however, waste generation rates among individuals continue to rise. Most of us don't give as much thought as we should to reducing the amount of waste that remains after recycling. One reason for this is we usually have no incentive, beyond a general environmental concern, to reduce waste. Because individuals in most communities pay for collection and disposal services through property taxes (or, in some cases, through a flat fee), they pay the same amount—no matter how much they throw away.

There is a different type of program, however, that communities can use to motivate residents not only to recycle more but to think of ways to prevent waste in the first place. They're called "pay-as-you-throw" programs, and nearly 2,000 communities across the country have begun using them.

What is pay-as-you-throw?

Pay-as-you-throw programs, also known as unit-based pricing or variable-rate pricing, provide a direct economic incentive for people to reduce the amount of waste they generate.

Under pay-as-you-throw, households are charged for waste collection based on the amount of waste they throw away—in the same way that they are charged for electricity, gas, and other utilities.

In some communities, pay-as-you-throw is based on volume: residents are charged for each bag or can of waste they generate. A few communities bill residents based on the weight of their trash. Either way, pay-as-you-throw gives everyone a little extra push to prevent waste. While most people want less trash, a pay-as-you-throw program helps connect their environmental concerns with their wallets.

What are the benefits of pay-as-you-throw?

Pay-as-you-throw programs have environmental and economic advantages, and are often more equitable for residents—a combination of benefits called the "Three Es." Communities with programs in place have reported reductions in waste amounts ranging from 25 to 45 percent, on average. This results in several important environmental benefits. Less waste and greater recycling means that fewer natural resources are used, less energy is consumed, and less pollution is created. In addition, landfill space is used at a slower rate, reducing the need to site additional facilities.

Pay-as-you-throw also can send an important source reduction signal to product manufacturers. When individual consumers begin to understand that their trash costs money, they are likely to adjust their purchasing habits to favor products that will result in less waste—and, therefore, cost less—when discarded. As more communities adopt pay-as-you-throw, manufacturers will have an incentive to redesign their products to appeal to this growing consumer preference.

There also are potential economic advantages, both for communities and their residents. Because they often have more recovered materials and less waste to dispose of, many communities with pay-as-you-throw find their disposal costs go down. Pay-as-you-throw also can yield savings in waste transportation expenses and potentially greater revenues from the sale of collected recyclables.

In addition, while they may not realize it, residents pay to throw away trash. And whether they pay through their taxes or a flat fee, those individuals that generate less and recycle more are paying for neighbors that generate two or three times as much waste. Pay-as-you-throw is more equitable: residents that reduce and recycle are rewarded with a lower trash bill.

Are there disadvantages to pay-as-you-throw?

While there are potential barriers to a successful program, communities with pay-as-you-throw have found effective solutions. Local officials, for example, often assume that illegal dumping will increase once residents are asked to pay for each container of waste they generate. Most communities with pay-as-you-throw have found this not to be the case, however, especially when they offer their residents recycling, composting for yard trimmings, and other programs that allow individuals to reduce waste legally. Others, particularly lower-income residents, worry about the amount they will have to pay. In many communities, however, coupon or voucher programs are being used to help reduce trash collection costs for these households.

How can our organization help?

In many cases, local officials either are not aware of pay-as-you-throw or haven't considered how it might work in their community. While pay-as-you-throw may not be appropriate for all communities, municipal planners can benefit from learning about such programs. Your organization can work with local, regional, or state government officials to make them aware of the benefits of pay-as-you-throw and how any potential barriers might be overcome.

And, once communities in your area begin to plan pay-as-you-throw programs, your organization can assist in development and implementation. By helping municipal officials plan programs that are reasonable and equitable, and educating people about the benefits of the new system, your organization can play a role in improving the way we manage solid waste in this country.

How can I learn more about pay-as-you-throw?

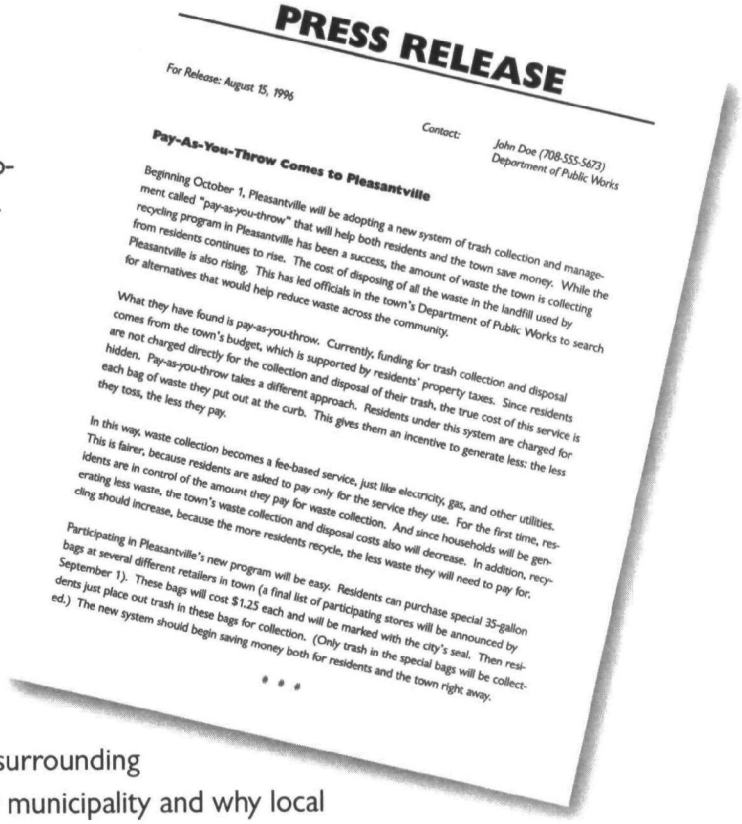
EPA has developed a guidebook for anyone interested in pay-as-you-throw programs. *Pay-As-You-Throw: Lessons Learned About Unit Pricing* (EPA530-R-94-004) contains background information on the advantages of pay-as-you-throw and provides detailed information on how these programs work. To order a copy, call the EPA/RCRA Superfund Hotline at 800-424-9346 or TDD 800-553-7672 for the hearing impaired. For Washington, DC, and outside the United States, call 703-412-9810 or TDD 703-412-3323.

Other Outreach Strategies

This section presents a number of other ideas for reaching out to residents in your community. As you review these products, keep in mind your community's specific public outreach goals and think about which combination of the following strategies might best help you meet them.

Press Releases

As you begin to develop and publicize your pay-as-you-throw program, coverage by local radio and print media outlets is likely. For MSW planners, this should be considered a public outreach opportunity. At this point, you can provide local reporters, editors, and other news professionals covering your community with the key facts concerning pay-as-you-throw. This will help ensure that they understand the issues surrounding solid waste management in your municipality and why local officials are considering a pay-as-you-throw program–before they begin to develop their stories.



PRESS RELEASE

For Release: August 15, 1996

Contact: *John Doe (708-555-5673)*
Department of Public Works

Pay-As-You-Throw Comes to Pleasantville

Beginning October 1, Pleasantville will be adopting a new system of trash collection and management called "pay-as-you-throw" that will help both residents and the town save money. While the recycling program in Pleasantville has been a success, the amount of waste the town is collecting from residents continues to rise. The cost of disposing of all the waste in the landfill used by Pleasantville is also rising. This has led officials in the town's Department of Public Works to search for alternatives that would help reduce waste across the community.

What they have found is pay-as-you-throw. Currently, funding for trash collection and disposal comes from the town's budget, which is supported by residents' property taxes. Since residents are not charged directly for the collection and disposal of their trash, the true cost of this service is hidden. Pay-as-you-throw takes a different approach. Residents under this system are charged for each bag of waste they put out at the curb. This gives them an incentive to generate less: the less they toss, the less they pay.

In this way, waste collection becomes a fee-based service, just like electricity, gas, and other utilities. This is fairer, because residents are asked to pay *only* for the service they use. For the first time, residents are in control of the amount they pay for waste collection. And since households will be generating less waste, the town's waste collection and disposal costs also will decrease. In addition, recycling should increase, because the more residents recycle, the less waste they will need to pay for.

Participating in Pleasantville's new program will be easy. Residents can purchase special 35-gallon bags at several different retailers in town (a final list of participating stores will be announced by September 1). These bags will cost $1.25 each and will be marked with the city's seal. Then residents just place out trash in these bags for collection. (Only trash in the special bags will be collected.) The new system should begin saving money both for residents and the town right away.

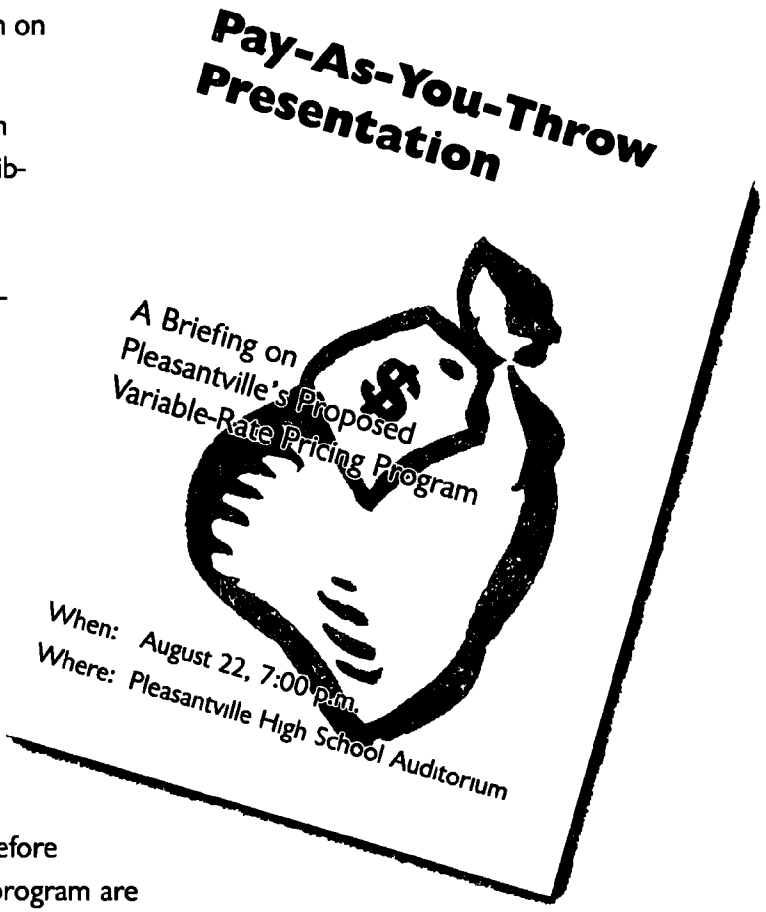
* * *

The most common way to accomplish this is to develop and submit press releases to local media outlets. The press release should briefly describe the essential information about your program: what pay-as-you-throw is, why a change in the way residents pay for trash collection and disposal is being proposed, and how residents can participate—and, if they reduce waste, save money—under the new program. Additional press releases can be developed later to announce other news, such as town meetings on pay-as-you-throw or any changes in the program.

You might also consider other ways to provide information to the local media, including developing more comprehensive press kits (in addition to press releases, these can include items such as background reports and newsclippings from other pay-as-you-throw communities in your county or state) and conducting news conferences or briefings for residents about your program.

Public Meetings

Town meetings and other public gatherings offer a good opportunity to introduce residents to pay-as-you-throw, discuss how it can help the community, and answer any questions that people might have. If you are planning such a presentation, you might want to develop an invitation flyer to promote the event. (See Section One of this workbook for more information on planning a presentation on pay-as-you-throw.)



The meeting invitation can include information describing the concept of pay-as-you-throw and its advantages and letting residents know that their community is considering such a program. It also can indicate that the meeting is being called not only to present the proposed program but to hear what residents think—emphasizing that this input will be seriously considered before decisions about the final program are made. Be sure to include space on the invitation to list the date, time, and location of the meeting, and invite residents to come ask questions and learn about the program.

Newsletters

Many communities planning for pay-as-you-throw have developed newsletters to publicize their program. Creating and distributing a small (two- or four-page) monthly, bimonthly, or quarterly newsletter offers a chance to provide more information about your program than you are likely to get in the media. Newsletters also allow you to provide periodic updates as the program is developed—in many communities, the newsletter is launched well before program implementation—and help ensure that all residents are thoroughly aware of the program. You also can provide ongoing information about your program directly to the specific stakeholders you want to target.

Your newsletter can be used to introduce residents to pay-as-you-throw and clearly describe how the program can help both residents and the municipality to reduce waste and save money. You also can use the newsletter to ask residents for their input and provide them with information about how to participate before and during implementation. To effectively reach your audience, be sure to write the newsletter articles in clear, everyday language. In addition, residents will be more likely to pick up and read a visually attractive newsletter. Refer to the Clip Art section, beginning on page 111 of this workbook, for a set of illustrations and mastheads that you can use when creating your newsletter.

PAY-AS-YOU-THROW NEWSLETTER

In This Issue

Pay-As-You-Throw Comes to Pleasantville 1
Less Trash Is Good For the Environment 2
Waste Not, Want Not 3
Recycling Tips 5
Letters To The Editor 6
Haulers Hotline 7

Pay-As-You-Throw Comes to Pleasantville

Beginning October 1, Pleasantville will be adopting a new system of trash collection and management called "pay-as-you-throw" that will help both residents and the town save money. While the recycling program in Pleasantville has been a success, the amount of waste the town is collecting from residents continues to rise. The cost of disposing of all the waste in the landfill used by Pleasantville is also rising. This has led officials in the town's Department of Public Works to search for alternatives that would help reduce waste across the community.

What they have found is pay-as-you-throw. Currently, funding for trash collection and disposal comes from the town's budget, which is supported by residents' property taxes. Since residents are not charged directly for the collection and disposal of their trash, the true cost of this service is hidden. Pay-as-you-throw takes a different approach. Residents under this system are charged for each bag of waste they put out at the curb. This gives them an incentive to generate less: the less they toss, the less they pay.

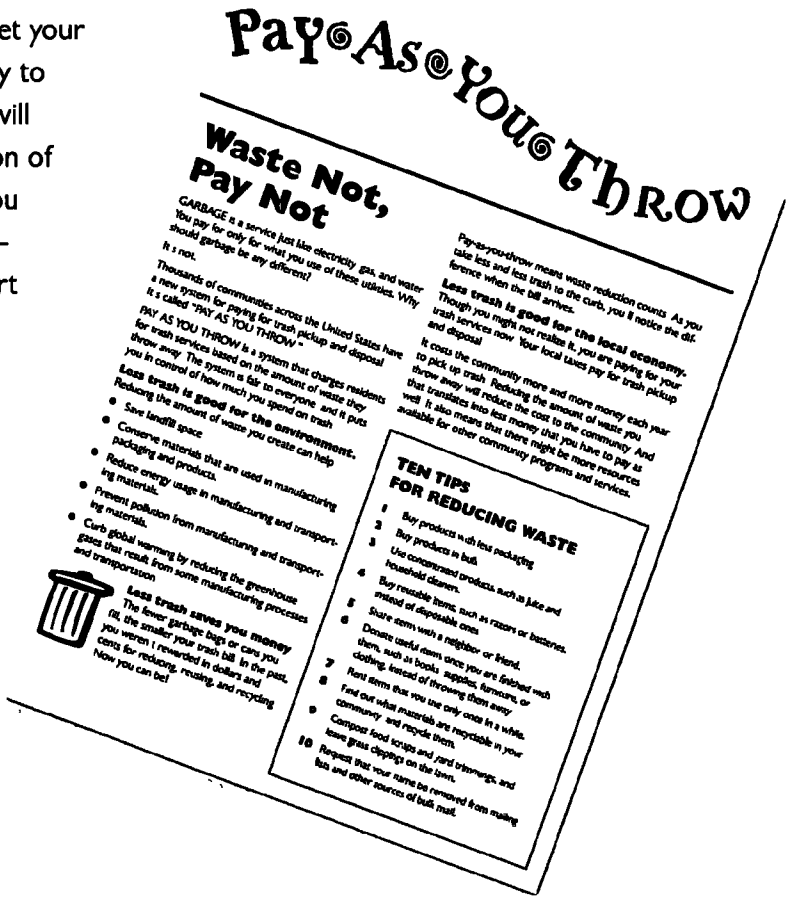
In this way, waste collection becomes a fee-based service, just like electricity, gas, and other utilities. This is fairer, because residents only are asked to pay for the service they use. For the first time, residents are in control of the amount they pay for waste collection. And since households will be generating less waste, the town's waste collection and disposal costs also will decrease. In addition, recycling should increase, because the more residents recycle, the less waste they will need to pay for.

Participating in Pleasantville's new program will be easy. Residents can purchase special 35-gallon bags at several different retailers in town (a final list of participating stores will be announced by September 1). These bags will cost $1.25 each and will be marked with the city's seal. Then residents just place out trash in these bags for collection. (Only trash in the special bags will be collected.)

Flyers and Brochures

Flyers and brochures are another way to provide pay-as-you-throw program information directly to households in your community. You can create a general flyer to introduce residents to pay-as-you-throw and its advantages or develop more specific versions that each focus on one particular aspect of your program (for example, procedures for purchasing bags or tips on how residents can reduce waste). Like newsletters, flyers and brochures can be used to deliver specific ideas about pay-as-you-throw to target audiences within your community.

An advantage to flyers and brochures is that they can be distributed through a number of different channels. They can be posted around town to advertise an upcoming pay-as-you-throw meeting or event, placed in stores and municipal offices, or direct mailed to residents individually with utility bills or in other periodic mailings. To help get your message across, try to design flyers that will attract the attention of your audiences. You can use the illustrations in the Clip Art section, beginning on page 111 of this workbook, to help create and assemble effective fact sheet designs.



Pay-As-You-Throw

Waste Not, Pay Not

GARBAGE is a service just like electricity, gas, and water. You pay for only for what you use of these utilities. Why should garbage be any different?

Thousands of communities across the United States have a new system for paying for trash pickup and disposal. It's called "PAY AS YOU THROW."

PAY AS YOU THROW is a system that charges residents for trash services based on the amount of waste they throw away. The system is fair to everyone and it puts you in control of how much you spend on trash.

Less trash is good for the environment. Reducing the amount of waste you create can help:

- Save landfill space.
- Conserve materials that are used in manufacturing packaging and products.
- Reduce energy usage in manufacturing and transporting materials.
- Prevent pollution from manufacturing and transporting materials.
- Curb global warming by reducing the greenhouse gases that result from some manufacturing processes and transportation.

Less trash saves you money. The fewer garbage bags or cans you fill, the smaller your trash bill. In the past, you weren't rewarded in dollars and cents for reducing, reusing, and recycling. Now you can be!

Pay-as-you-throw means waste reduction counts. As you take less and less trash to the curb, you'll notice the difference when the bill arrives.

Less trash is good for the local economy. Though you might not realize it, you are paying for your trash services now. Your local taxes pay for trash pickup and disposal.

It costs the community more and more money each year to pick up trash. Reducing the amount of waste you throw away will reduce the cost to the community. And that translates into less money that you have to pay as well. It also means that there might be more resources available for other community programs and services.

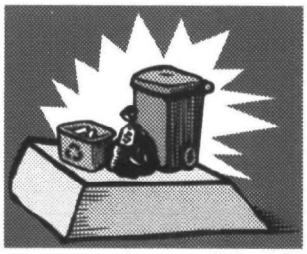
TEN TIPS FOR REDUCING WASTE

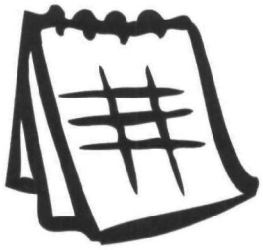
1. Buy products with less packaging.
2. Buy products in bulk.
3. Use concentrated products, such as juice and household cleaners.
4. Buy reusable items, such as razors or batteries, instead of disposable ones.
5. Share items with a neighbor or friend.
6. Donate useful items once you are finished with them, such as books, supplies, furniture, or clothing, instead of throwing them away.
7. Rent items that you use only once in a while.
8. Find out what materials are recyclable in your community and recycle them.
9. Compost food scraps and yard trimmings, and leave grass clippings on the lawn.
10. Request that your name be removed from mailing lists and other sources of bulk mail.

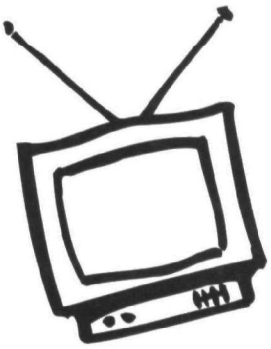
Clip Art

Outreach and education materials often need to do more than provide the facts about pay-as-you-throw. To be effective, they need to be graphically interesting. Providing eye-catching fact sheets, newsletters, posters, brochures, and other materials can help you attract the attention of your audiences and get your message across. This section includes a set of over 40 clip art illustrations that you can use to help simplify the task of putting together well-designed outreach products.

Once you have decided which public outreach products you would like to develop, turn to the clip art that follows. Select the illustrations and icons you want (be sure to photocopy the original page or pages so the masters can be used again), clip them out, and use glue or clear tape to lay out your own newsletters, flyers, or other publicity materials. If you plan to develop outreach materials on a computer and have access to a scanner, you might scan the images you want to use. The scanned clip art then can be electronically added to your computer-designed outreach materials. Or simply refer to these illustrations for ideas and develop your own clip art images–be creative! When your design is ready, use a photocopier to make as many copies as you need and distribute them to the target audiences in your community.

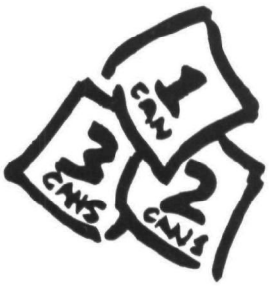




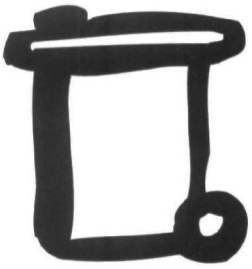


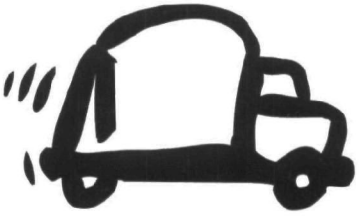
ENVIRONMENT
ECONOMY
EQUITY

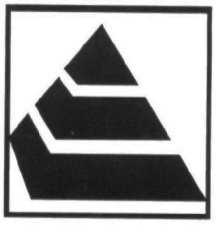
REDUCE
REUSE
RECYCLE

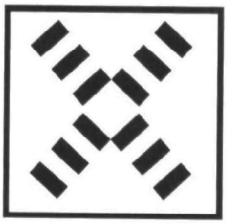

CAN
CANS
CANS

COUPON
$
$
PAY-AS-YOU-THROW





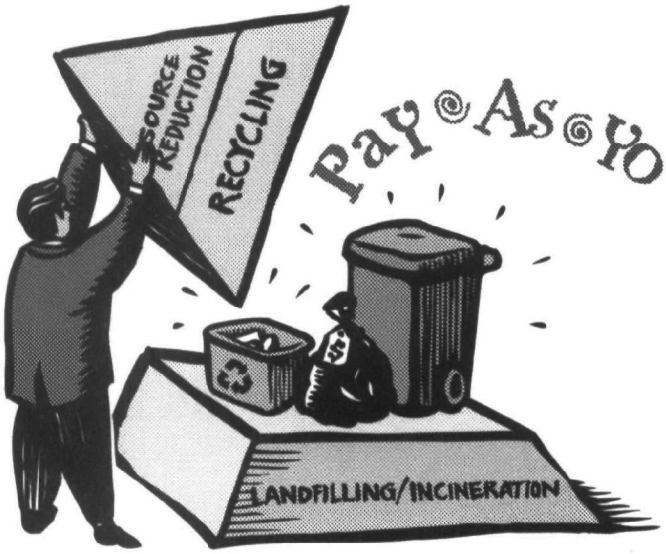




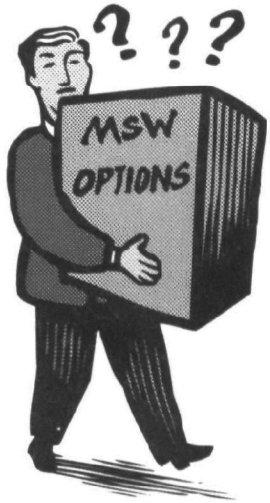
Save As You Reduce and Recycle

Pay As You Throw

Pay As You Throw



Pay As You Throw

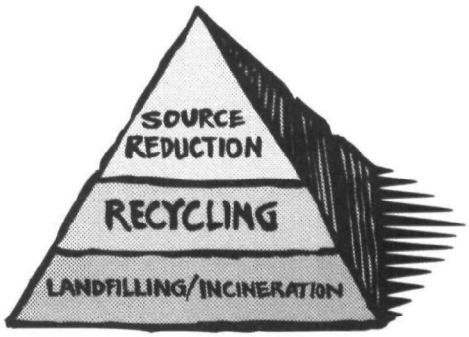


Pay As You Throw

Save As You Reduce and Recycle

Pay As You Throw

Pay As You Throw



SECTION THREE

Worksheets

Planning and implementing a pay-as-you-throw program requires careful research and consideration. In the guide *Pay-As-You-Throw: Lessons Learned About Unit Pricing* (found in the "Guidebooks" section of this Tool Kit), the key steps involved in pay-as-you-throw program development are explained in detail. The worksheets on the following pages are designed to help you apply this information to your own planning efforts. These worksheets correspond to the guide's four program development steps:

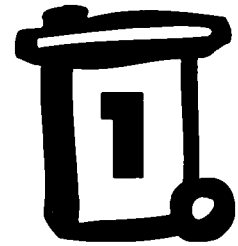
- Deciding if pay-as-you-throw is right for your community (Worksheets 1 and 2).
- Planning for pay-as-you-throw and conducting an outreach campaign (Worksheet 3).
- Designing a rate structure (Worksheets 4 and 5).
- Implementing and monitoring the program (Worksheets 6 and 7).

Completing these worksheets will help you make and record the critical decisions concerning your program's goals, the messages you will deliver in your public outreach, and the kind of container and pricing options you will use. The worksheets also will help you determine your specific program costs and the price you will need to charge per container to recover these costs. As you complete the worksheets, refer to the *Pay-As-You-Throw* guide as needed for more information on each of these program development steps.

The completed worksheets also can be used in presentations and other public outreach events or products to help you make your case for pay-as-you-throw. In a briefing for your elected officials, for example, you can use the figures developed in Worksheet 5 (Rate

Structure Design) to help convince them that a well-designed program will not result in additional costs for the community. Some of the worksheets, such as Worksheet 1 (Program Goals) and Worksheet 2 (Program Barriers), also could be used during a presentation to obtain valuable feedback from attendees about how they feel the program should be designed.

Worksheet



PROGRAM GOALS

Use this worksheet to identify and prioritize the specific goals of your pay-as-you-throw program. Begin with the goals listed below, ranking each goal on a scale of 1 to 5. A ranking of 5 means it is critical that your program meets this goal. A ranking of 1 means the goal is of minimal importance. List any other program goals that come to mind, and rank them as well.

As you think about goals, consider other stakeholders in your community—to be successful, your program also will need to have their goals in mind. To help you identify the issues other stakeholders will want addressed, copy the back of this form and use it to solicit more ideas about goals during pay-as-you-throw meetings or presentations.

Goal	Importance
Reduce the amount of solid waste generated/increase recycling rates *Notes:*	1 2 3 4 5
Reduce the total cost of solid waste management *Notes:*	1 2 3 4 5
Remove solid waste management costs from the tax base entirely (by raising sufficient revenues to cover all solid waste management costs) *Notes:*	1 2 3 4 5
Subsidize other solid waste programs (such as recycling) *Notes:*	1 2 3 4 5
Increase equity by asking residents to pay only for the waste they generate *Notes:*	1 2 3 4 5
Increase understanding among residents of solid waste issues/environmental issues *Notes:*	1 2 3 4 5

Worksheet 1 (Continued)

Program Goals: List below the different goals for the pay-as-you-throw program and rank them on a scale of 1 to 5. A ranking of 5 means it is critical that the program meets this goal. A ranking of 1 means the goal is of minimal importance.

Goal	Importance
	1 2 3 4 5
	1 2 3 4 5
	1 2 3 4 5
	1 2 3 4 5
	1 2 3 4 5
	1 2 3 4 5
	1 2 3 4 5
	1 2 3 4 5

Worksheet

POTENTIAL BARRIERS

Use this worksheet to identify barriers that might affect your program and consider how they can be overcome.

Begin by reviewing the potential barriers on the matrix below. As you review these potential barriers, be sure to distinguish between perceived problems—challenges that have solutions or do not apply in your community—and real barriers that might actually prevent you from achieving your pay-as-you-throw goals. For example, illegal dumping often turns out to be a perceived barrier. It usually can be overcome with a strong education and outreach program and effective enforcement. Multi-family housing, by contrast, may be a real barrier for some communities. A high concentration of population in multi-family housing might prevent a community from extending pay-as-you-throw to these residents.

Then, on the following page, list the barriers that you feel might apply to your community's program. For each of these, consider the ways in which you might overcome them. The second page of this form can be copied and used during pay-as-you-throw meetings or presentations to solicit other potential barriers from attendees and to brainstorm more solutions.

Sample Barriers and Solutions

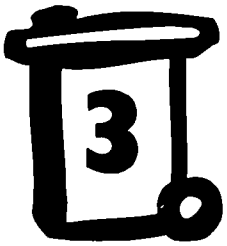
Potential Barriers	Possible Solutions
Illegal dumping/burning	- Educate residents about pay-as-you-throw - Provide several legal diversion options - Develop enforcement plan
Uneven revenues/revenue shortfalls as residents generate less waste	- Use multi-tiered pricing - Plan for reduced waste amounts in steady-state when setting prices
Multi-family housing	- Include charges in rent - Under a bag-based system, have tenants purchase bags - Use bar code readers on building garbage chutes
Perception that waste collection is free/pay-as-you-throw is a tax increase	- Educate residents about pay-as-you-throw - Set prices at levels residents will accept
Pay-as-you-throw is regressive/low-income residents feel greater impact	- Offer these residents rebates, coupons, or discounts - Offer free bags to recipients of general assistance
Overstuffing of containers	- Set weight limits on containers
Lack of support from private waste haulers	- Involve haulers in the planning process - Pass ordinance mandating haulers offer variable rates

Worksheet 2 (Continued)

Potential Barriers: List below potential pay-as-you-throw barriers and consider whether each is actually relevant to your community. For each potential barrier you feel may impact your program, list any possible solutions that come to mind.

Potential Barriers	Possible Solutions

Worksheet



PUBLIC OUTREACH

Use this worksheet to identify specific public outreach goals for your program and consider ways to achieve them. This worksheet will help you plan for the two distinct parts of public outreach: A) soliciting feedback about pay-as-you-throw during the planning stage and B) educating the community during implementation about the program's final design and informing residents about how to participate (for example, where to buy bags and how to handle bulky items). (Refer to the "Public Outreach Materials" section beginning on page 91 of this workbook for more ideas on how to generate feedback and educate your community.)

Part A Soliciting Feedback

Using this table, consider how you will obtain input during the planning stage about the proposed pay-as-you-throw program. Begin with the audiences from whom you are seeking feedback. Then, consider possible methods of achieving this. In the last column, list when you should begin each of the different strategies for gathering input.

Audience	Outreach Methods	Schedule
EXAMPLE: Retailers/other businesses	- Direct visits to local retailers to discuss the program and ask them about distributing or selling bags in stores - Invite retailers to public pay-as-you-throw meetings - Include retailers in your citizens' advisory council or other planning organization	About 6 months before program implementation
EXAMPLE: Residents	- Develop a pay-as-you-throw fact sheet introducing the program and asking for feedback - Issue press releases to the local media to get media coverage - Hold public meetings on pay-as-you-throw - Invite community residents to join your citizens' advisory council or other planning organization	About 6-9 months before program implementation
EXAMPLE: Elected officials	- Hold a briefing for elected officials to introduce the program and ask for their input - Include elected officials in the citizens' advisory council or other planning organization	About 6 months before program implementation

Soliciting Feedback: For each of the audiences listed below, consider possible outreach methods and a schedule of when to begin these strategies. Copy this page as needed to consider ways of reaching additional audiences.

Audience	Outreach Methods	Schedule
Retailers/other businesses		
Residents		
Elected officials		
Media		
Solid waste staff		
Private haulers		
Other:		

Part B Educating the Community

Use the table below to consider how to educate your community about pay-as-you-throw. Begin by considering which audiences you will need to reach. For each audience, list the specific goals of the outreach effort and the message you will use to reach that group. In the last column, indicate what products you could develop to accomplish this.

Audience	Goal	Message	Products
EXAMPLE: Residents	- Show residents that pay-as-you-throw is needed - Convince residents the program is fair and not an added tax - Explain how to use the new bag-based system	- The current MSW program ultimately is not sustainable - The program will save you money, if you reduce waste (include details about how to reduce waste) - Participating is easy—just buy bags for your trash at area retailers (include details on prices, recycling, etc.)	- Flyers posted around town - Public meetings - Press releases - Invite participation through the citizens' advisory council - Brochure mailed to all households
EXAMPLE: Media	- Generate positive media coverage of pay-as-you-throw - Convince media that the program is needed and will work	- The current MSW program ultimately is not sustainable - Pay-as-you-throw has multiple benefits: it will give both residents and the municipality money, reduce waste, and is fairer to residents - More and more communities are adopting pay-as-you-throw	- Press release/press kit - Briefings for reporters - Invite reporters to town meetings/other pay-as-you-throw presentations
EXAMPLE: Civic groups	- Convince community and business leaders that pay-as-you-throw is needed and will work - Show that the municipality's long-term financial health will be compromised if no change is made - Involve these leaders in the development of the program and in selling it to residents	- The current MSW program is not sustainable - Pay-as-you-throw will help both residents and the municipality to save money - The municipality is interested in getting help from community groups in developing the program	- Briefings for civic groups at their meetings - Public meetings - One-on-one meetings with civic group leaders

Educating the community: For each of the audiences listed below, consider the goals of your outreach effort, the specific message of your outreach to that audience, and the products you might develop to accomplish this. Copy this page as needed to consider ways of reaching additional audiences.

Audience	Goal	Message	Products
Residents			
Civic groups			
Media			
Retailers/other businesses			
Private haulers			
Other:			

Worksheet

CONTAINER AND PRICING CHOICES

Use this worksheet to compare the advantages and disadvantages of the different container and pricing choices and select the best system for your program. In Part A, rank in terms of importance the characteristics of the main container and pricing combinations: bags or tags/stickers that are sold at retail stores or municipal offices; cans under a "pay as you go" pricing system (under which residents are billed based on the number of cans they set out for collection); and cans under a subscription system. (Another pricing option that can be used in combination with any of the container and pricing choices is a two-tiered system, which uses a per-container fee for variable MSW costs while retaining a monthly flat collection charge for fixed MSW costs. This helps prevent revenue fluctuations).

After ranking the different container and pricing combinations, review your work and record a preliminary system choice in Part B. Be sure to consider the overall program goals you established in Worksheet 1 when making this choice.

Part A Container and Pricing System Characteristics

Consider the different advantages and disadvantages of the container and pricing systems and how relevant they are to your program. Rank each characteristic on a scale of 1 to 5. (A ranking of 5 means the issue is extremely important for your program. A ranking of 1 means the issue is of minimal importance.)

System	Advantage/Disadvantage	Importance
Bag Systems	***Advantages***	
	Stronger waste reduction incentive than can systems	1 2 3 4 5
	No billing system needed, so accounting costs lower	1 2 3 4 5
	Residents find bag systems convenient and easy to understand	1 2 3 4 5
	Lower implementation costs than can systems	1 2 3 4 5
	Faster, more efficient collections than cans	1 2 3 4 5
	Easy to monitor compliance	1 2 3 4 5
	Easy to adapt for bulky item collections	1 2 3 4 5
	Disadvantages	
	Greater revenue uncertainty than subscription can systems	1 2 3 4 5
	Bags must be purchased and made available to residents in stores or municipal offices	1 2 3 4 5
	Staff time required for purchasing, storing, and selling bags in municipal offices	1 2 3 4 5
	Residents might find buying and storing bags inconvenient	1 2 3 4 5
	Often incompatible with automated/semiautomated equipment	1 2 3 4 5
	Animals can tear bags, and bags can tear during lifting	1 2 3 4 5

System	Advantage/Disadvantage	Importance
Tag or Sticker Systems	***Advantages***	
	Stronger waste reduction incentive than can systems	1 2 3 4 5
	No billing system needed, so accounting costs lower	1 2 3 4 5
	Residents find tag/sticker systems convenient and easy to understand	1 2 3 4 5
	Lower implementation costs than can systems	1 2 3 4 5
	Cost of purchasing tags/stickers is less than bags	1 2 3 4 5
	Easily adapted for different size containers	1 2 3 4 5
	Easily adapted for bulky item collections	1 2 3 4 5
	Disadvantages	
	Greater revenue uncertainty than subscription can systems	1 2 3 4 5
	Tags/stickers must be purchased and made available to residents in stores or municipal offices	1 2 3 4 5
	Staff time required for purchasing, storing, and selling tags/stickers in municipal offices	1 2 3 4 5
	Residents might find buying and storing tags/stickers inconvenient	1 2 3 4 5
	Municipality must communicate size limits to residents, and collection crews must monitor size-limit compliance	1 2 3 4 5
	Tags/stickers can fall off in rainy or cold weather or be stolen by other residents	1 2 3 4 5
Can Systems (Pay As You Go)	***Advantages***	
	Residents have flexibility to set out as few or as many containers each week as needed	1 2 3 4 5
	New cans may not be required if residents already own cans of roughly uniform volume	1 2 3 4 5
	Cans are reusable and prevent animals from scattering waste	1 2 3 4 5
	Cans can work with automated/semiautomated collection systems	1 2 3 4 5
	Disadvantages	
	Greater revenue uncertainty than subscription can systems	1 2 3 4 5
	Smaller waste reduction incentive if large cans are used	1 2 3 4 5
	Complex tracking and billing system needed to count set-outs at each stop and bill accordingly	1 2 3 4 5
	Billing system creates lag time between collecting waste and receiving payment for the service	1 2 3 4 5
	Greater implementation costs if purchase, inventory, and distribution of cans is required	1 2 3 4 5
	Collection time greater than with bag systems	1 2 3 4 5
	Alternate system needed for collection of bulky items	1 2 3 4 5

System	Advantage/Disadvantage	Importance
Can Systems (Subscription)	***Advantages***	
	Revenues are stable and easy to forecast	1 2 3 4 5
	Simplified collection process for collection crews	1 2 3 4 5
	New cans may not be required if residents already own cans of roughly uniform volume	1 2 3 4 5
	Cans are reusable and prevent animals from scattering waste	1 2 3 4 5
	Cans can work with automated/semiautomated collection systems	1 2 3 4 5
	Disadvantages	
	Reduced waste reduction incentive, since residents have no incentive to reduce waste below their minimum service level	1 2 3 4 5
	Complex tracking and billing system needed to track residents' subscription level and bill accordingly	1 2 3 4 5
	Billing system creates lag time between collecting waste and receiving payment for the service	1 2 3 4 5
	Greater implementation costs if purchase, inventory, and distribution of cans is required	1 2 3 4 5
	Collection time greater than with bag systems	1 2 3 4 5
	Alternate system needed for collection of bulky items	1 2 3 4 5

Part B Choosing a Container and Pricing System

After ranking the different system characteristics, review your work to see which system offers the most relevant advantages and the fewest disadvantages. If you are very concerned about revenue instability or uneven cash flow, consider whether you should use a two-tiered pricing system.

Next, go back to the prioritized list of program goals you created in Worksheet 1. Consider which container and pricing system would best enable you to achieve your community's goals. If needed, use the table below to help you consider your options. List your program goals in the first column and consider the impact of each container/pricing system choice on the goals.

Program Goal	Container/Pricing Systems				
	Bags	Tags/ Stickers	Cans (Pay As You Go)	Cans (Subscription)	Two-Tier Pricing
EXAMPLE: Reduce MSW as much as possible	Bags tend to be smaller, creating a stronger waste reduction incentive	Tags/stickers for smaller containers create a strong waste reduction incentive	Cans tend to be larger, reducing waste reduction incentive	Cans tend to be larger, reducing waste reduction incentive	Flat fee in combination with variable rate reduces waste reduction incentive
EXAMPLE: Minimize program costs	Low accounting costs, since no billing system needed	Low accounting costs, since no billing system needed	Billing system can increase costs	Billing system can increase costs	Potential for reduced administrative costs
EXAMPLE: Achieve revenue stability	Uneven cash flow possible	Uneven cash flow possible	Uneven cash flow possible	Steadier cash flow	Steadier cash flow

With the different system characteristics and your overall program goals in mind, make a preliminary container and pricing system choice and record it below.

Container and pricing system: _____

Worksheet

RATE STRUCTURE DESIGN

Use this worksheet to design a rate structure for your program. In Part A, estimate the amount of waste you will be collecting under pay-as-you-throw. In Part B, estimate your pay-as-you-throw program costs and the cost of any complementary programs. Then, estimate the per-container price needed to meet your program's costs in Part C. Complete this worksheet by considering whether this price strikes the right balance between costs and revenues.

Part A Waste Collection Forecast

Perform the following calculations to estimate the amount of MSW that will be collected from residents under your pay-as-you-throw program. Begin by estimating the amount of MSW collected in the year before program implementation (the "base year"). Then, revise this figure to reflect MSW collections two years after program implementation (the "projection year"). This is also called the steady-state, when residents' reductions in waste generation due to pay-as-you-throw have stabilized.

1. Current Waste Collection

_____	÷	_____	=	_____
Tons of MSW collected in the base year		Current number of community residents in the base year		Tons of MSW collected per resident in the base year

2. Community Growth

_____	x	_____	=	_____
Tons of MSW per resident in the base year *[from A-1]*		Estimated number of residents in the projection year		Annual MSW tonnage expected in the projection year without pay-as-you-throw

3. Waste Collection Under Pay-As-You-Throw

100 —	_____%	=	_____	x	_____	=	_____
	Percentage decrease in MSW expected under pay-as-you-throw		MSW reduction multiplier		Annual MSW tonnage expected without pay-as-you-throw *[from A-2]*		Annual MSW tonnage expected under pay-as-you-throw

_____	÷	12	=	_____
Annual MSW tonnage expected under pay-as-you-throw				Tons of MSW expected per month under pay-as-you-throw

Part B Program Costs

In this section, estimate your monthly MSW curbside collection and disposal fixed and variable costs under pay-as-you-throw in the projection year. Then estimate monthly fixed and variable costs for your new (or existing) recycling program in the projection year. Be sure to take into account your residents' reduced MSW set-outs when estimating costs. (For composting/yard waste collections or other complementary programs, copy this page and use it to estimate their costs.) If you contract out for some or all of these services, enter this cost under the "contractor fees" line. Combine these costs at the end of this section to estimate the total cost of pay-as-you-throw and any complementary programs.

1. Fixed MSW Collection and Disposal Costs per Month

Physical facilities (e.g., maintenance, mortgage, utilities)	$ _____
Salaries and benefits (labor costs that remain fixed regardless of quantity of MSW collected)	$ _____
Vehicle amortization	$ _____
Vehicle maintenance (vehicle maintenance costs that remain fixed regardless of quantity of MSW collected)	$ _____
Vehicle operating costs (vehicle operating costs that remain fixed regardless of quantity of MSW collected)	$ _____
Contractor fees (if any)	$ _____
Other fixed costs	$ _____
Total fixed MSW collection and disposal costs per month	**$ _____**

2. Variable MSW Collection and Disposal Costs per Month

Salaries and benefits (labor costs that vary with amount of MSW collected)	$ _____
Vehicle maintenance (vehicle maintenance costs that vary with amount of MSW collected)	$ _____
Vehicle operating costs (vehicle operating costs that vary with amount of MSW collected)	$ _____
Contractor fees (if any)	$ _____
Tipping fees	$ _____
Other variable costs	$ _____
Total variable MSW collection and disposal costs per month	**$ _____**

3. Total MSW Collection and Disposal Costs per Month

_____	+	_____	=	_____
Total monthly fixed MSW collection and disposal costs *[from B-1]*		Total monthly variable MSW collection and disposal costs *[from B-2]*		Total monthly MSW collection and disposal costs under pay-as-you-throw

4. Fixed Recycling Collection and Processing Costs per Month

Physical facilities (e.g., processing equipment amortization, utilities)	$ _____
Salaries and benefits (labor costs that remain fixed regardless of quantity of recyclables collected)	$ _____
Vehicle amortization costs	$ _____
Vehicle maintenance costs (vehicle maintenance costs that remain fixed regardless of quantity of recyclables collected)	$ _____
Vehicle operating costs (vehicle operating costs that remain fixed regardless of quantity of recyclables collected)	$ _____
Contractor fees (if any)	$ _____
Other fixed costs	$ _____
Total fixed recycling costs per month	**$ _____**

5. Variable Recycling Collection and Processing Costs per Month

Salaries and benefits (labor costs that vary with amount of recyclables collected)	$ _____
Vehicle maintenance costs (vehicle maintenance costs that vary with amount of recyclables collected)	$ _____
Vehicle operating costs (vehicle operating costs that vary with amount of recyclables collected)	$ _____
Equipment costs (e.g., baler, compactor, Bobcat operations) (equipment costs that vary with amount of recyclables collected)	$ _____
Contractor fees (if any)	$ _____
Other variable costs	$ _____
Total variable recycling costs per month	**$ _____**

6. Total Recycling Collection and Processing Costs per Month

_____	+	_____	=	_____
Total fixed recycling costs per month *[from B-4]*		Total variable recycling costs per month *[from B-5]*		Total monthly recycling costs under pay-as-you-throw
_____	−	_____	=	_____
Total monthly recycling costs under pay-as-you-throw *[from B-6]*		Net revenue from sale of recyclables per month		Adjusted total monthly recycling costs under pay-as-you-throw

7. Total Cost of Pay-As-You-Throw and Complementary Programs

Total monthly MSW collection and disposal costs under pay-as-you-throw *[from B-3]*	$ _____
Adjusted total monthly recycling costs under pay-as-you-throw *[from B-6]*	$ _____
Other monthly complementary program costs, if any	$ _____
Total monthly cost of pay-as-you-throw and complementary programs	**$ _____**

Part C Program Revenues

Use this section to estimate the per-container price needed to meet your program's costs. If you plan to use more than one size container, estimate the amount of waste you will collect in each size container per month (you might contact planners in pay-as-you-throw communities for help with this estimate). Then perform the calculations in this section separately for each container. If you are uncertain about how to convert your container's capacity from volume to weight, refer to the report *Characterization of Municipal Solid Waste in the United States: 1995 Update*. You also might check with planners in other communities or weigh a random sampling of several filled containers and use the average weight for this calculation.

1. Container Selection and Capacity

Container selection: _____ (cans, bags, tags, or stickers)

Volume of selected container: _____ gallons

Convert container capacity to weight: _____ tons

2. Estimated Per-Container Price

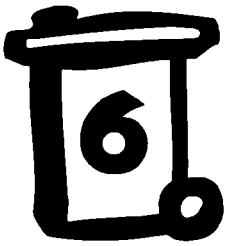
_____	÷	_____	=	_____
Tons of MSW expected per month under pay-as-you-throw *[from A-3]*		Weight per container in tons *[from C-1]*		Number of containers expected per month
_____	÷	_____	=	$ _____
Total monthly cost of pay-as-you-throw and complementary programs *[from B-7]*		Number of containers expected per month		Estimated price per container

Part D Program Balance

At this point, you have developed a price per container that will help you cover your estimated costs. Remember, however, that your per-container price is based on program costs in the projection year (once your program has reached the steady-state). Prior to the projection year, you can expect greater waste collection amounts. This will result in greater revenues, but also greater costs. You might consult with planners in nearby pay-as-you-throw communities for data on whether their costs were greater or less in the two years before reaching the steady-state. If needed, adjust your per-container price to strike a balance between reasonable fees and covering your costs completely. Also consider whether your fee sends a strong enough waste reduction price signal to residents. Enter the revised per-container price below.

Revised price per container $ _____

Worksheet



IMPLEMENTATION CHECKLIST

Use this worksheet to review the different potential pay-as-you-throw program implementation activities and check off the relevant ones as they are completed. This checklist is divided into three sections. All planners should use Section A, which contains a checklist of specific implementation activities suggested for any pay-as-you-throw program. Then, select and use either Section B or C, depending on whether you plan on using a bag- or tag-based systems or a can-based system.

Part A All Container Systems

- ☐ Draft and enact any necessary ordinances to charge a variable rate for waste collection.
- ☐ Draft and enact any additional needed ordinances:
  - O Banning waste dumping and/or burning
  - O Limiting container weights
  - O Mandating recycling
  - O Prohibiting unauthorized containers
- ☐ Define enforcement responsibilities (work with the police and health department).
- ☐ Reassign collection and management staff as needed to new roles in outreach, enforcement, and administration.
- ☐ Prepare staff to address residents' concerns and questions.
- ☐ Plan your education and outreach campaign. Develop outreach materials and schedule briefings and presentations.
- ☐ Consider working with the business community to ensure that they lock their dumpsters to prevent midnight dumping.
- ☐ Develop and implement policies for accommodating low-income residents and physically handicapped and elderly residents.
- ☐ Develop and implement policies for accommodating residents of multi-family units.

- ☐ Develop and test your rate structure and your budgeting and tracking systems.
- ☐ Develop procedure for gathering and analyzing data on waste generation amounts and costs. Conduct baseline data collection.
- ☐ Develop a phase-in strategy (e.g., collect all wastes for several weeks, but leave "error tags" where needed to educate customers that only correctly paid and packaged trash will be collected in the future).

Part B Bag- or Tag-Based Systems

- ☐ Determine weight limit for bags or size limit for trash that is tagged and the number of bags or tags to purchase.
- ☐ Identify vendors, develop specifications and RFPs, solicit bids, and purchase bags or tags.
- ☐ Plan and develop a distribution network (e.g., using town offices or local retailers).
- ☐ If distributing through retailers, arrange distribution logistics (e.g., delivery and invoice schedule and marketing agreements). Assign and train staff as necessary.
- ☐ If distributing through municipal offices, develop and implement inventory management system. Assign and train staff as necessary.
- ☐ Develop an education program informing residents how to participate (e.g., the location of bag or tag sales outlets and the procedures for bulky wastes).
- ☐ Develop and implement plans for bulky items, including pricing.

Part C Can-Based Systems

- ☐ Evaluate whether residents can use their own cans or if the town will supply cans.
- ☐ Determine the container size and number of cans to purchase.
- ☐ Identify vendors, develop specifications and RFPs, solicit bids, and purchase cans.
- ☐ If you have a subscription system, develop and provide information to residents that allows them to estimate their trash set-out and select a subscription level.
- ☐ If residents will use one large can, develop plans for extra waste (e.g., supplement with bags or tags). Purchase necessary items and educate residents.
- ☐ Develop and implement plans to distribute new cans (for new residents, replacements for stolen containers, or changes in service level for subscription can systems).
- ☐ Distribute containers and maintain an inventory of extra containers.
- ☐ Develop and implement billing system.
- ☐ Develop and implement plans for bulky items, including pricing.

Worksheet 7

MONITORING AND EVALUATION

Use this worksheet to monitor waste generation amounts and the amount of material recycled and composted. For the first year after program implementation, enter base year data in the first column and data from the program's first year in the second. For monitoring the program after the first year, enter the previous year's data followed by the current year being evaluated. This information can be tracked over time to demonstrate the waste reduction impact of pay-as-you-throw and help inform decisions about potential changes in the program's scope or structure.

Part A Waste Collection Amounts

	Base Year	Current Year
Tons of MSW collected:	_____	_____

Part B Recycling Amounts

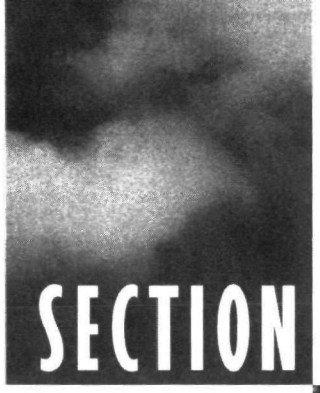
Tons of recyclables collected:	Glass	_____	_____
	High-Grade Paper	_____	_____
	Mixed Paper	_____	_____
	Corrugated Cardboard	_____	_____
	Newsprint	_____	_____
	Aluminum	_____	_____
	Plastic	_____	_____
	Steel	_____	_____
	Other	_____	_____
Total tons of recyclables collected:		_____	_____

Part C Composting Amounts

	Base Year	Current Year
Tons of organic materials collected for composting:	_____	_____

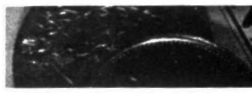
Part D Costs

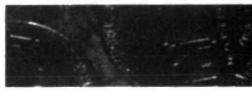
Tracking the costs incurred and the revenues recovered under pay-as-you-throw is an important process. At least once a year, refer back to Worksheet 5, "Rate Structure Design," and re-calculate program costs and revenues. This information can be used to evaluate the program's economic sustainability on an ongoing basis. It also can be used to demonstrate the cost-effectiveness of the program to elected officials or planners from other communities interested in pay-as-you-throw.



SECTION FOUR

Articles and Newsclippings





Within the last several years, pay-as-you-throw has begun to receive increasing attention in the print media. A variety of solid waste management publications and newspapers serving communities with pay-as-you-throw have published articles about these programs. This section includes a few samples of recent coverage of pay-as-you-throw, including an article reviewing six communities with successful programs, an examination of unit pricing in rural and urban settings, and an article presenting strategies for overcoming potential barriers to pay-as-you-throw.

In addition to providing you with useful background information on pay-as-you-throw, this section can assist in organizing any articles about your community's program that appear in print. Over the course of implementing pay-as-you-throw in your community, it is likely that the program will be covered in your local media. (See Section Two, Public Outreach Materials, for ideas on how to encourage positive coverage by the media.) It might be helpful to keep track of this coverage.

As articles about your program appear, you can three-hole punch the clippings and add them to this section for later reference. This will help you gauge the effectiveness of your overall outreach and education effort and, in particular, the impact of your outreach to the media. In addition, tracking local press coverage can help you identify areas or issues on which you may need to focus greater attention. It also can provide you with another measure of success, an important resource you might use when asked about your program's performance.

UNIT PRICING:

A Viable Option for MSW Managers

MICHAEL SHAPIRO

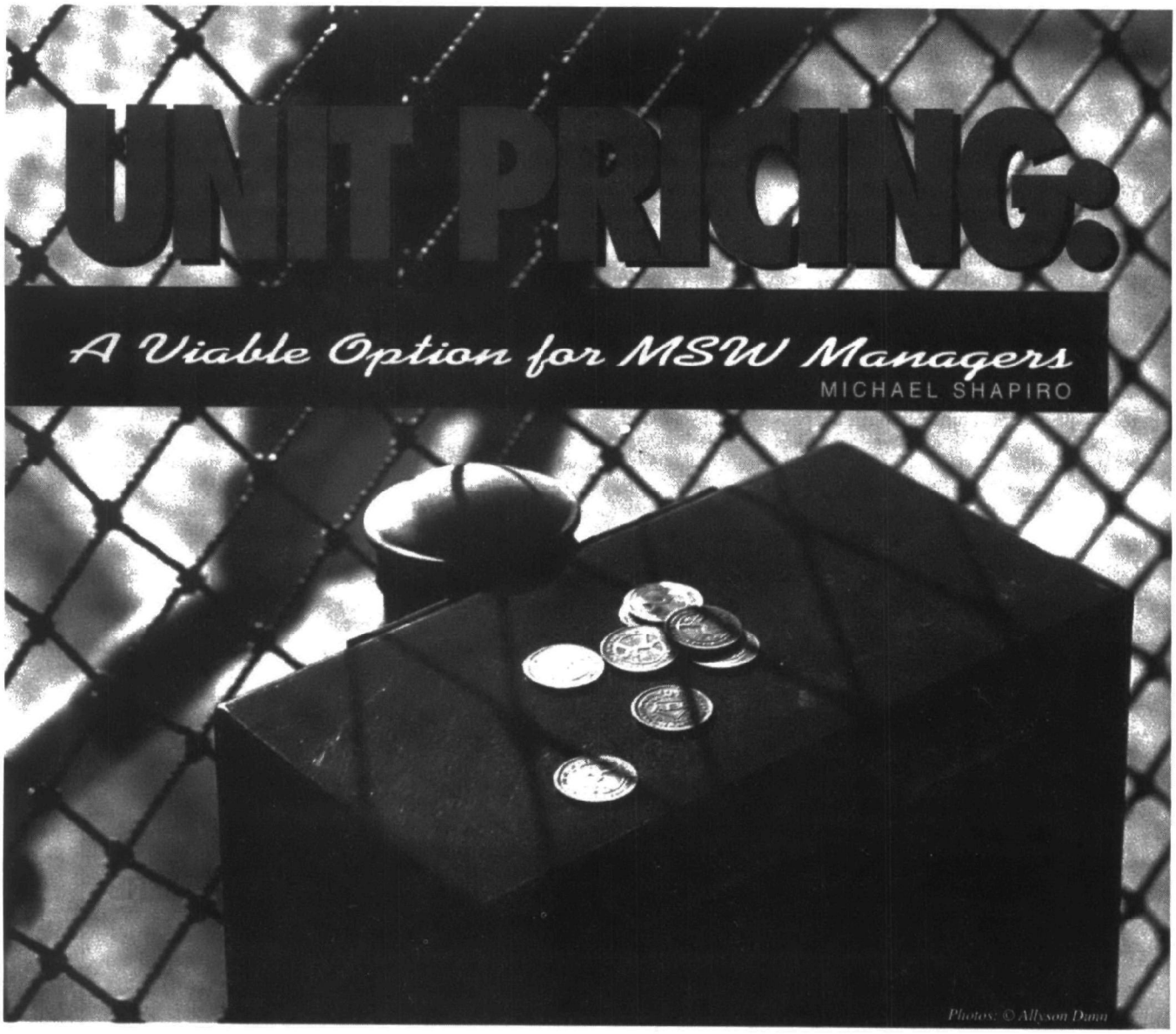


Photo: © Allyson Dunn

After starting recycling, composting, and public education programs, are waste generation rates and MSW management costs still high? Give residents an economic incentive to reduce waste.

Let's say that each week your crews are collecting newspaper, glass, aluminum, steel, and plastics at the curbside for recycling. You're also collecting brush and leaves for composting. Households are doing their part, and the amount of waste you're disposing of is decreasing—but not as much as you'd like. Tipping fees are still high, and you're having a hard time covering the costs of providing service. What alternatives do you have?

One option is to consider a "unit pricing" program, also called "pay-as-you-throw" or "variable rate pricing." Unit pricing is a fee-for-service system in which residents pay for MSW management services per unit of waste collected rather than through taxes or a fixed fee. The system creates a direct economic incentive for people to prevent waste generation, to recycle, and to compost. With such a system some communities have seen significant decreases in waste disposal and increases in the amount of material recycled.

These advantages are only part of the story. In addition to helping achieve waste reductions (and cost savings), by encouraging residents to think about waste generation, unit pricing often leads to a greater understanding of environmental issues in general. Residents also tend to welcome unit pricing, viewing it as a more equitable way to pay for solid waste services than traditional flat fees, which, in effect, require households that reduce and recycle to subsidize their more wasteful neighbors.

All sizes and types of communities can realize benefits through unit pricing programs. These programs also work well whether solid waste services are carried out by municipal or private haulers.

Setting the Stage

The first step is to establish the groundwork for unit pricing. Adopting an effective program requires making a series of decisions about how to best offer a variable rate to residents. To be sure you are making the right decisions, organize a team or council that can determine the goals of your pro-

Reprinted with permission from March/April 1995 MSW Management © Forester Communications, Inc. All rights reserved.

gram and how to achieve them.

Establish an advisory team. A unit pricing team typically consists of solid waste staff, interested elected officials, civic leaders, and representatives from affected businesses in the community. Including these individuals in the planning process gives the community a sense of program ownership. Team members can help other residents in the community understand the specifics of the program as it evolves, and can provide your agency with valuable input on residents' concerns about the program. In addition, members of the team can serve as a sounding board to help ensure strong community participation throughout the planning process.

Set goals. Determine the goals of the program based on a review of your community's needs and concerns. Specific goals can include encouraging waste prevention and recycling, raising sufficient revenue to cover MSW management costs, and subsidizing other community programs. Once you've come up with a list of preliminary goals, the team can help refine and prioritize them.

Consider legal/jurisdictional issues. Generally, states extend to local jurisdictions the authority to provide waste management services and to charge residents accordingly. Taking the time to determine if this is the case in your state, however, is better than risking discovery of it during implementation.

Involve and educate the public. The experiences of communities that have implemented unit pricing programs indicate that a good public relations program more than pays for itself. Public education can combat fears and myths about unit pricing (such as the fear of increased illegal dumping), and can help avoid or mitigate many potential implementation problems. It is critical to devise ways to involve and educate the community during the planning process, including holding public meetings, preparing briefing papers for elected officials, issuing press releases, and encouraging retailers to display posters and other information about the program.

To help organize some of these activities, consider developing a timeline or schedule. Planning for unit pricing should begin at least a year in advance of your targeted start date. Begin explaining the program and its goals to the community between 9 and 12 months before program implementation. Public education should continue throughout the months prior to the start of the program and, to some extent, after the program is under way. Identify the legal framework for the program at least six months before the start of the program.

Drafting a blueprint. The next step is to determine the features of your program. Designing a working program requires that you consider and decide on a range of specific issues. The process of selecting program components and service options can begin as much as nine months before the start of your program.

Volume-Based versus Weight-Based

One of the first decisions to be made when designing a unit pricing program is to determine how solid waste will be measured. Under volume-based systems, residents are charged for waste collection based on the number and size of waste containers that they use. Under weight-based systems, the hauler weighs at the curbside the waste that residents set out for collection. Households are then billed based on the pounds of trash generated. Weight-based systems offer a greater waste reduction incentive, since every pound of waste that residents prevent, recycle, or compost results in direct savings. Residents can easily understand this kind of system, and the system itself is more precise. In addition, under a weight-based program, residents are not tempted to compact their waste, which can occur with volume-based systems.

Weight-based systems offer a greater waste reduction incentive, since every pound of waste that residents prevent, recycle, or compost results in direct savings

On the other hand, weight-based systems typically are more expensive to implement and operate than volume-based systems. To operate a weight-based system, communities often need to use specialized collection trucks with on-board scales to weigh and record the weight of the waste from each household. A computerized system for charging residents also is needed, and more solid waste administrative agency personnel often are required to manage the billing system. Most of the unit pricing experience and data come from volume-based programs. Many of the design and implementation issues presented below, however, apply to both of these systems.

Containers, Rate Structures & Billing

Communities that decide to design a volume-based program must consider the type and size of waste collection containers on which to base their rate structure and billing system. A program can be based around large cans, small or variable cans, prepaid bags, or prepaid tags or stickers. Each system has its own specific advantages and disadvantages related to such issues as offering a system that residents view as equitable, creating as direct an economic incentive for waste reduction as possible, and assuring revenue stability for the agency.

Large cans. Households are provided with single, large cans, which are typically 50 to 60 gallons in capacity. Each household is then charged according to the number of cans it uses. The primary benefit of offering a single container size is revenue stability. The waste reduction incentive is somewhat diluted, however, since households pay the same amount whether they fill their container halfway or completely.

Small or variable cans. Communities also could provide households with graduated can sizes, typically ranging from 20 to 90 gal. in capacity. Such systems allow residents to realize savings from even modest reductions in waste generation. Tracking the amount of waste generated and charging households accordingly can be more complicated.

Prepaid bags. Standard-sized, distinctively marked trash bags, often 20 or 30 gal. in capacity, are used. Residents purchase the bags from the solid waste agency through such outlets as municipal offices and retail stores. Bag systems are less expensive to implement and maintain, since there is no tracking and billing required. Since residents might buy large numbers of bags and then none for an extended period, revenue fluctuations may occur.

Prepaid tags or stickers. Tags or stickers specifying certain bag sizes can be sold to residents through municipal offices or retail stores. These systems offer many of the same advantages as bag-based systems.

In addition to container choices, MSW planners need to decide on the rate or pricing structure. There are four basic rate structures: proportional (linear), variable container, two-tiered, and multi-tiered. Pricing and container choices are closely related. The types of containers selected often dictate the rate structure and billing system to

use. In other cases, an existing billing system that cannot be overhauled could govern container type and rate structure.

A proportional (linear) rate system, the simplest rate structure, entails charging households a flat price for each container of waste they place out for collection. A variable container rate can be used by communities interested in offering a greater waste reduction incentive to residents. Under this system, communities charge varying rates for different size containers.

Communities also might opt for a two-tiered rate structure under which households are assessed both a fixed fee and a per-container fee. The fixed fee helps ensure that revenues will never drop below a certain level, while the per-container fee provides a strong waste reduction incentive. This rate structure is the most complex and, therefore, is difficult to administer and bill.

Linking recycling and composting with unit pricing lets communities recover these expenses without creating economic disincentives to recycle

Designing a unit pricing program also requires that a community choose from among three types of billing systems: direct payment, subscription, and actual set-out systems. Direct payment systems typically are used with bag-, tag-, or sticker-based programs. Residents pay for MSW services by purchasing bags, tags, or stickers from the solid waste agency. They are then affixed to containerized waste placed out for collection. Under subscription systems, residents select in advance a specific subscription level (the number of containers they anticipate setting out each collection cycle). The customer is then billed on a regular basis for these containers. If customers are able to reduce the amount of waste they generate, they can select a lower subscription level and save money. Under an actual set-out system, the solid waste agency bills customers based on the actual number of containers set out for collection.

Choosing Important Services

The next step in planning a unit pricing program is to determine which solid waste services are most important to residents. A carefully selected and priced service array allows a community to offer the different waste collection services that residents feel are important, while generating sufficient revenues to support core services.

Some services can contribute significantly to the overall effectiveness of unit pricing. Recycling and collection of yard trimmings for composting enhance the program's waste reduction goals. Linking recycling and composting with unit pricing provides residents with an environmentally responsible way to manage waste. In addition, since the cost of these programs can be built into unit pricing fees, communities can recover these expenses without creating economic disincentives to recycle.

Other services are viewed as important conveniences, or even necessities, by some residents. Incorporating them can add to enthusiasm for your new program. For example, backyard collection of waste and/or recyclables can be an important service for elderly or disabled residents. Backyard collections also can be offered to other residents at a higher cost to reflect the added service resources required.

Special Collection Needs

One of the biggest challenges facing communities implementing unit pricing is how to include multi-family (five units or more) residential structures in the program. Because waste often is collected from residents of multi-family structures on a per building rather than per unit basis, offering these residents a direct economic incentive to reduce waste with unit pricing may be difficult. One way to resolve multi-family challenges is to have the building manager sell bags or tags to each resident. Another approach is to modify the system of setting out waste for collection in multi-family buildings so that only waste that has been paid for can be left for collection. Systems that employ technological solutions, such as using magnetic cards to open garbage chutes, usually are expensive.

Many communities considering unit pricing are concerned about ensuring that the waste reduction incentives of unit pricing can be brought to residents living on fixed or low incomes. Communities may wish to consider providing assistance to residents with special financial needs by reducing the per-household waste collection charges by a set amount, offering a percentage discount, or providing a credit on the overall bill. Assistance also can be offered through existing low-income programs, particularly other utilities' efforts.

Launching the Program

There are two distinct schools of thought about the timing of implementation. One maintains that unit pricing should be implemented within a brief period of time. The other believes that households respond better when asked to make changes in small, manageable increments over time.

Regardless of your schedule of implementation, a number of tasks need to be performed. They include educating the public about the new program and organizing your solid waste agency to be able to effectively administer the new program. Other common tasks include establishing legal authority for charging a direct variable fee for waste collection services, procuring containers, designing and launching complementary programs, and ensuring enforcement (including developing ways of preventing illegal dumping).

Once your program is under way, begin the process of monitoring and data collection. Data collecting will help you determine how successful the program is. Just as it will take some time for residents to get used to paying a variable rate for their trash, your program itself will necessarily go through an adjustment period. Staying on top of its problems and progress will allow you to make needed changes quickly, helping to ensure an effective program. **MSW**

*Guest author **Michael Shapiro** is director of Office of Solid Waste, EPA.*

Getting Some Help

More and more communities are trying to find new and better ways to manage their MSW in response to factors such as increasing waste generation and tipping fees. EPA recognizes that in this climate waste prevention will play an increasingly important role. For some communities, charging a variable rate for waste collection can be a wise strategy.

To help communities learn whether unit pricing might work for them, EPA organized the Unit Pricing Roundtable, a gathering of experts and representatives from communities with variable rate programs in place. EPA then organized the wealth of information resulting from the meeting's discussions into a 90-page guide.

Pay-As-You-Throw: Lessons Learned About Unit Pricing (EPA530-R-94-004) provides detailed technical information on unit pricing based on the experiences of communities with variable rate programs in place. The free manual can be ordered directly from EPA by calling the RCRA Hotline at (800) 424-9346 or by writing to USEPA, RCRA Information Center (5305), 401 M Street S.W., Washington, DC 20460.

RESIDENTS FAVOR USER FEES

Since the program began, 51 percent of county households surveyed recycle more, 15 percent compost more, and almost 40 percent pay more attention to product packaging.

Sarah Stone and Ellen Harrison

A TRASHTAG program was implemented in Tomkins County, New York in March, 1990, requiring residents to purchase a tag for each container of garbage put out for collection. The user fee program is one part of an overall waste reduction effort during the last two years in the county (pop. 94,000). Other aspects include curbside pickup of recyclables, a central recycling/trash baling processing facility, a home composting program, and a yard waste composting program.

The trashtag and curbside recycling programs are designed to work together, with the trashtag program creating economic incentive for people to reduce their household waste while the recycling program provides a convenient method for people to do so. An extensive educational effort which included working with citizens, municipal governments, and waste haulers, was another vital part of this strategy.

Before the trashtag program was adopted, waste disposal costs were embedded in property taxes. Because of this institutional framework, some of the big users of the county's landfill, including Cornell University and Ithaca College, did not have to pay for waste disposal due to their tax exempt status. Furthermore, it was believed that a direct charge for waste disposal would create an incentive for households to recycle and to reduce the amount of garbage they produce. Using property taxes to handle disposal costs created no such incentive since the cost was essentially hidden.

The trashtag program is a cooperative effort between private haulers, municipal haulers, and the county. Tags are sold by both municipal and private haulers. Each can add administrative and collection fees to the county's per tag charge. While some opted to incorporate all their fees into the tag, others have chosen to make these two separate charges.

Tags are weight based. A "large tag," which allows for the collection of up to 30 pounds of trash costs $1.08 each. A "small tag," costing $.62 can be used for up to 15 pounds. The county also developed a subsidy program for low income families that provides each eligible person 12 tags per year.

SURVEY CONDUCTED

Last year the County's Solid Waste Management Division, in cooperation with the Cornell Waste Management Institute and Cornell's Department of Consumer Economics & Housing, conducted a survey of Tompkins County residents to determine how they felt about the trashtag and recycling programs. The objectives of the survey included an assessment of attitudes about how future increases in waste disposal should be handled, determining the public's attitude concerning trashtags and the recycling programs, and whether behavior has changed as a result of the trashtag program.

The survey was sent to a random sample of 3,034 Tompkins County residents in September of 1990. Those who didn't respond to the first mailing were sent a second survey. The overall response rate was approximately 49 percent. The final sample obtained compared favorably with the known population of Tompkins County both in terms of geographic distribution and demographic characteristics.

The results of the survey indicate that respondents not only feel that the trashtag program is the best of possible alternatives in terms of paying for waste disposal, but that the trashtag program has also aided other waste reduction behavior.

USER FEES

Overall, respondents indicated that they felt favorably towards the trashtag program. Sixty-three percent said that they are very much in favor or somewhat in favor of the trashtag program, 15 percent somewhat oppose the program, 11 percent oppose the program, and the rest either didn't care one way or the other (8 percent), weren't aware of the program (1 percent) or didn't respond to the question (3 percent).

Since it is expected that waste disposal costs will increase in the future, residents were asked how they would like to see these increases handled. The largest percentage of respondents felt they would like to see increases in waste disposal costs handled through higher trashtag fees (48 percent). This was followed by higher flat rate fees paid to waste haulers (18 percent), higher property taxes (9 percent), higher sales tax (8 percent), and higher income tax (4 percent). Fifteen percent

Reprinted with permission from BioCycle For sample copy of publication, contact BioCycle, Journal of Composting and Recycling, 419 State Avenue, Emmaus, PA 18049. 610-967-4135.

of the respondents chose not to answer this question.

One of the key questions in volume or weight-based fees is how it affects household waste reduction behaviors, such as recycling, composting, and precycling? Nearly 51 percent of the respondents claim to recycle more since the trashtag program began, 16 percent claim to compost more and nearly 39 percent believe they pay more attention to product packaging when they shop since the trashtag program began.

EFFECT ON RECYCLING

The Tompkins County recycling programs include either curbside pickup of recyclables in certain towns and villages, or drop off centers for recyclable materials. Full County-wide curbside collection will be implemented this summer. Nearly sixty percent of the respondents use the curbside service, whether once a week (26.7 percent), once every two weeks (17.6 percent), or less frequently (14.5 percent). Almost seventeen percent of the respondents bring all of their recyclables to a dropoff center, while almost 32 percent bring some of their recyclables to a dropoff center.

This final figure has some overlap between those who use the curbside service and those who use a dropoff center. This may be due to the fact that curbside pickup in most areas does not include the collection of plastic or cardboard. Therefore, some respondents may use curbside for glass, newspaper, and metal cans while using a dropoff center for plastic and cardboard.

Table 1 shows the high recycling rates in Tompkins County, as well as the impact that the trashtag program has had on recycling rates for each material. Overall, less than half of the sample claims to recycle the same amount of garbage (40.2 percent), while about half (51.2 percent) claim to recycle more.

The questionnaire also tried to identify reasons why some don't recycle. Almost 28 percent of the respondents have storage space for recyclables but still find it inconvenient. Almost 19 percent said that they do not have enough space for recyclables. Three percent of the respondents said that they don't bring any recyclables to a dropoff center because they don't have transportation.

Beyond the recycling program, another means of reducing the amount of trash set out is composting. Based on the survey, after the trashtag system was put in place 47.2 percent of the respondents composted, versus 39.6 percent prior to it. Approximately 15.5 percent claim to compost more now than before the program was put into effect. About 96 percent of all respondents that compost do so at home.

PURCHASING BEHAVIOR

According to the study, citizens claim to be placing more emphasis on buying products with less packaging. When asked if they try to reduce the amount of household garbage by buying products with less packaging, 31.5 percent said "yes" and 44 8 percent indicated they did so occasionally. Only 22.7 percent said "no" Additionally, 38 9 percent claim to pay more attention to packaging.

Table 1. County Recycling Rates

Materials	Newspaper	Glass	Cardboard	Plastic	Metal cans
Do you recycle?					
Yes	80 2%	80.2%	47 8%	63 4%	61 1%
No	19 1%	19 1%	50 8%	35 7%	37.2%
Did you recycle (before the trashtag program)?					
Yes	55 6%	44.9%	23 9%	27 5%	n/a
No	42 8%	54 0%	73 8%	70 7%	n/a
Do you recycle (since the trashtag program)?					
More	25 0%	35 9%	19 8%	35 2%	n/a
Less	2 0%	9%	1 3%	2 2%	n/a
Same	53 1%	43 5%	29 0%	27 4%	n/a
Don't recycle	18 0%	18 0%	46 5%	32 8%	n/a

The percentage of people who responded affirmatively to trying to reduce their household waste by reducing the amount of packaging is very high: 76.3 percent answered "yes" or "occasionally" to this question, while almost 40 percent of the respondents claim to pay more attention to packaging since the trashtag program went into effect.

Beyond these methods of reducing the amount of material, 25.2 percent of the respondents identified additional ways of reducing household garbage. Among the more popular were reusing containers, using cloth grocery bags, buying bulk foods, stopping junk mail, sharing magazine and newspaper subscriptions and giving away unwanted items.

POSITIVE RESULTS

The results of the survey were positive and should encourage other municipalities to adopt user fees. Respondents seem interested and willing to participate in the county's efforts to reduce the waste stream Fifty one percent claim to recycle more since the trashtag program, 15 percent compost more and approximately 39 percent pay more attention to product packaging since the trashtag program. Additionally, residents favor user fees over alternative methods of handling waste disposal costs. The enthusiasm was even more evident in the write-in sections of the questionnaire where many respondents voiced support for the county's programs. Many respondents also expressed their willingness to do even more in terms of waste reduction if they knew how. ■

Residents say the trashtag program is the best way to pay for waste disposal, and that it has also aided other waste reduction behavior.

Sarah Stone recently completed her graduate work at Cornell University's Department of Consumer Economics and Housing. Ellen Harrison is Associate Director of Cornell's Waste Management Institute. *The authors would like to acknowledge the contribution and assistance of Barbara Eckstrom and Susan LaBarre of Tompkins County Solid Waste Management Division and Jeanne Hogarth and Jim Reshovsky, both Assistant Professors, Consumer Economic and Housing, Cornell University, in putting this article together.*

COLLECTION

Volume-Based Program Succeeds In Urban Setting

Worcester, Mass., officials were uncertain if a volume-based collection program combined with curbside recycling could work in a large, urban area with a diverse population. Undaunted, they decided to try.

With 170,000 residents, Worcester is the second largest city in New England. The population of this central Massachusetts community encompasses all socio-economic backgrounds. Housing is equally divided between single- and multi-family dwellings.

Until July 1993, the property tax funded approximately 50 percent of the city's municipal solid waste (MSW) collection and disposal services. However, the Department of Public Works (DPW) competed with the school, police and fire departments for limited funds. After repeated cuts in its tax levy budget, DPW decided to evaluate alternative collection and disposal options rather than decrease its services.

Worcester officials considered a flat user fee and volume-based collection. The flat fee was dismissed because it requires all users to pay an equal amount, regardless of the amount of waste generated. In addition, flat fees offered no incentive to participate in recycling. Instead, Worcester opted for a curbside recycling program with a fee requiring residents to purchase specific bags for refuse disposal.

Bright yellow bags, priced at 50 cents each, have been printed with the program's logo "Pay a Little, Save a Lot." The bags are sold at 115 retail outlets. DPW also developed an extensive public education and awareness campaign including brochures in three languages, newspaper, radio and airplane advertisements, bumper stickers, billboards and radio talk shows.

Enforcement methods to encourage compliance and to avoid illegal disposal include fines and two notification stickers. The first, a bright orange "warning" sticker, is placed on non-program bags and informs residents of the new, official bags. Residents are allowed 24 hours to remove the bag and must comply with the program by the following week. The second sticker is placed on bags that weigh more than 30 pounds or contain recyclables mixed with refuse. If residents fail to respond to these stickers, DPW enacts a progressive fining system starting at $25 and increasing to $100.

Since late 1993, the program has effectively reduced the amount of MSW sent to landfills (see table). For example, solid waste tonnages have declined nearly 45 percent. The city's recycling rate is slightly more than 37 percent and has remained at that level during most of the program. When yard wastes are included, Worcester diverts more than 50 percent of its solid waste to recycling and composting.

Program compliance among the 50,000 participating households has been 99.9 percent, allowing the city to reduce the amount of MSW collected and incinerated by more than 40 million pounds. With less trash on the curb for city crews to collect, the DPW has reduced its collection crews by 33 percent. Two-person crews, rather than the previous three, now collect garbage on the city's 11 routes. Savings from the reduced crew sizes and tipping fee costs have allowed the department to re-allocate more than $1 million to other public works programs.

In addition, a free bulk and hazardous waste collection day has been re-instituted. Public response to these services has been positive and, as a result, illegal dumping has been reduced.

The program has been modified further for public convenience. For example, small recycling bins with handles were introduced for those residents who find the large recycling bins too cumbersome. Small

Worcester, Mass., Solid Waste And Recycling Collection

	Before Program	After Program
Average Tons Per Week		
MSW	766	424
Recycling	15	252
Tons Per Year		
MSW	39,816	22,046
Recycling	771	13,103
Percent Of MSW Recycled	2%	37%
With Yard Waste	N/A	50%
Collection Crew Employees	33	22
Pounds Collected Daily Per Employee	13,922	15,417
Average Pounds Per Household Per Year*		
MSW	1,625	900
Recycling	31	535
Annual Disposal Fee		
MSW	$1,312,733	$659,893
Recycling	N/A	$0
Cost Of Collection And Disposal Per Household*		
MSW	$72.26	$50.83
Recycling	N/A	$12.43
Bulk Waste Collection		
Number Of Pickups	0	14,000
Tons	0	757

*Based on 49,000 Households.

Source: City Of Worcester Department Of Public Works

Reprinted with permission from World Wastes, copyright Intertec Publishing Corp., A K-III Media Company, May 1996

half-size trash bags also are available for residents who do not fill a 30-gallon bag on a weekly basis.

The results of Worcester's solid waste program have shown officials that volume-based programs can succeed in an urban area.

— Robert L. Moylan Jr.
Worcester DPW

Congress Attempts To Stem The Tide Of New Regs

The new Congress seems bent on fundamentally changing the degree to which federal regulations affect businesses and consumers.

Three types of reform proposals are under way: shutting the door on new federal regulations; limiting federally-imposed unfunded mandates on state and local governments; and scrutinizing the economic costs and benefits of proposed laws and regulations.

The House-passed moratorium on new regulations would likely be difficult to enforce — even if the Senate went along with the House bill. At press time, a Senate committee had approved its own rule-blocking bill. The Senate version is somewhat more moderate than the moratorium passed by the House. For example, it would exempt all regulations that cost the economy less than $100 million a year.

Even when Republican appointees controlled federal agencies, it seemed that nothing could stem the tide of new regulations. President Bush ordered a 90-day moratorium during which agencies were supposed to find ways to streamline and improve their output. Despite several promising concepts that emerged from the exercise, the overall nature and number of regulations were unaffected.

A Congressionally-mandated halt to regulations, which the Executive Branch uses to implement Congress's laws, cannot promise better results than a moratorium dictated by the President himself. Indeed, the conservative House majority that voted for the moratorium also created a sizable loophole. Any agency would be able to issue a regulation in response to an "imminent threat to health and safety."

One branch of Congress is now in the awkward (not to mention legally suspect) position of telling the Executive Branch not to carry out its constitutional function: implementing the laws that Congress passes. A more direct — and obvious — solution would be to change the laws themselves.

Of course, the 104th Congress will say that it can't be blamed for the "sins" of previous Democrat-dominated legislative sessions. Putting the brakes on the Executive Branch, as the current leadership might argue, is making the best of a bad situation. Still, the regulatory reform measures in the works are likely to have very significant impacts.

For its part, the House has clearly stated that it wants to slow the

Advertisement

VARIABLE DISPOSAL FEE IMPACT

Six case studies provide a good overview of what happens when variable fees are in place for at least one year.

Richard Cuthbert

VARIABLE curbside disposal fees have received increasing attention as a means to fund refuse services while promoting waste reduction and recycling. Variable fees — also referred to as variable can rates or bag-and-tag fee systems — are assessed directly on users and reflect, to some degree, the cost of service. They contrast with fixed fees and tax-based systems, where the customer sees no direct financial incentive to minimize the level of service.

To more fully understand the use and extent of variable curbside disposal fees, R.W. Beck and Associates conducted a survey in 1993 of 80 cities and counties nationwide. The survey used a random sample of 40 large cities and counties (populations greater than 100,000) and 40 medium-sized communities (populations from 50,000 to 100,000).

In 68 percent of cities surveyed, a public or governmental authority is responsible for residential solid waste collection, with the remaining 32 percent served by private haulers. Household refuse pickup is usually provided weekly (for 91 percent of those surveyed) and waste collection containers are furnished in 44 percent of the communities.

Fees for disposal are charged in 65 percent of the communities; 35 percent use property taxes or other indirect means. One quarter of the cities with fees — 13 communities, or 16 percent of those surveyed — report some type of variable disposal fee for residential households in 1992.

Funding for recycling and yard trimmings programs also were explored. Recycling programs for residential households were reported in 80 percent of the communities, and of these, more than 80 percent indicated that curbside collection services are provided. Yard trimmings programs were reported by 46 percent of the communities, and about 80 percent of those included curbside service. Large cities generally report having a recycling and yard trimmings program; nearly 90 percent offer some form of recycling. Medium-sized cities were less likely to have each of these services; only 70 percent provide recycling services.

Less than 18 percent of the municipalities surveyed indicated that they charge a specific fee for collection of recyclables, and less than 13 percent reported a fee for yard trimmings service. Large cities are twice as likely to charge for recycling services as medium-sized cities, but were only half as likely to charge for yard trimmings collection. Additionally, six communities (eight percent) report some form of financial rebate for participation in a recycling program and three communities (four percent) reported a rebate for participation in their yard trimmings program. The rebates may come as a surprise because in most cases, programs cost more than can be offset by revenues from the sale of collected materials, at least in the short run.

Each of the communities was asked what factors influenced its decision to implement recycling and yard trimmings programs. A legislative mandate was reported by 80 percent of those surveyed while local interest or disposal problems were cited by 36 percent.

Measuring the effectiveness of variable curbside disposal fees in promoting waste reduction is complicated by the difficulty of isolating the specific role of the collection and disposal fee from the other elements of waste reduction programs, as well as from other elements of the economy in general. In addition, many communities do not have adequate disposal data, either for their current situation or for the time before the implementation of waste reduction programs. A scientifically rigorous analysis of the causes of solid waste reduction would be time-consuming, costly and, in the end, perhaps impossible. Thus, only anecdotal information on the effectiveness of variable curbside disposal fees is available. The following six case studies provide a good overview of what happens when variable fees are in place for at least one year.

PORTLAND, OREGON

In Portland, 61 independent collection companies provide residential disposal services; most have had variable can rate structures in effect for more than 10 years. Before February, 1992, residential collection rates and service territories were unregulated. A new franchise system provides for mandatory variable curbside rates, weekly recycling services on the same day as garbage services and recycling containers. In 1987, monthly curbside residential recycling collection was implemented throughout the city, and in early 1992 this

Reprinted with permission from BioCycle For sample copy of publication, contact BioCycle, Journal of Composting and Recycling, 419 State Avenue, Emmaus, PA 18049 610-967-4135

Seattle estimates that a 10 percent increase in charges for residential collection and disposal results in an approximately two percent reduction in overall solid waste disposal.

service was increased to weekly recycling curbside collection. The city also implemented monthly curbside yard trimmings collection in April, 1992.

During the last 10 years, landfill disposal costs in the Portland area rose from $17/ton to $75/ton. In response to this increase, collection rates for single can service more than doubled, from approximately $7.50/month to $17.50/month. In early 1992, a rate increase of about 25 percent was implemented in conjunction with new recycling services, including a less expensive 20 gallon mini-can service level. Eighteen percent of residents chose the mini-can. As a combined result of the higher collection fees and availability of recycling services, Portland residents increased their recycling levels from 740 tons/month in 1988 to 2,583 tons/month in 1992 — more than tripling the recycling tonnages over five years.

SEATTLE, WASHINGTON

Seattle has had variable curbside collection rates since 1981. Before that, residents paid a fixed fee charge for unlimited solid waste disposal. Both the structure and level of the city's rates changed numerous times between 1981 and 1992, with the cost of single can service more than doubling from $6.40 in 1981 to $14.98 in 1992. Between 1985 and 1987, rates increased by 82 percent as the city sought to cover the costs incurred from closing its landfills. Subscription levels for single-can service rose from approximately 18 percent of the city's households in 1981 to almost 65 percent of households by 1988, when residential curbside recycling and yard trimmings programs were implemented. By 1992, more than 89 percent of customers shifted to either a one can or half can subscription level.

Seattle estimates that it recycled 40 percent of its waste stream in 1991 through recycling, composting and yard trimmings programs. This compares to a 24 percent recycling rate in 1988 when curbside recycling programs were first established, and a 15 percent recycling rate before the introduction of variable can rates in 1981. In 1992, the city estimated that more than 88 percent of Seattle residents participated in the curbside recycling programs, and 67 percent in the curbside yard trimmings collection program.

Seattle has studied the effects of the fee increases on total solid waste disposal, as well as the interactive effects of other factors on disposal fees. The Seattle Solid Waste Utility has produced several studies and reports since volume-based rates were first introduced in 1981. Among other things, the city has quantitatively estimated both price and income elasticity factors for its system. Holding all other factors constant, it was determined that as rates increased, customers disposed of less waste either by recycling more or by more selective purchasing. Based on the city's past experience, the Solid Waste Utility estimates that a 10 percent increase in charges for residential collection and disposal results in approximately a two percent reduction in solid waste disposal — because residents have the ability to reduce their overall charges through variable rates.

The city also has determined that increases in household size and income can disguise and even counteract the price elasticity effects of its rate programs. For instance, household size and income levels were positively related to solid waste disposal. The city estimates that with every 10 percent increase in household real income, roughly 5 9 percent more solid waste is disposed.

TACOMA, WASHINGTON

Tacoma has had variable curbside disposal rates for solid waste collection for more than 20 years. The city is converting its residential solid waste collection program from cans to 60 gallon and 90 gallon containers; more than two-thirds of all Tacoma residents are now provided containers. In recent years, solid waste rates have increased significantly as disposal costs have continued to rise. For instance, in 1990 the one can/60-gallon container rate was $7.10 a month. It rose to $8.05 in 1991, and to $10.10 in 1992 — a 42 percent increase in two years. The two can/90-gallon container rate also jumped 42 percent over the same time period, from $10.35 to $14.75.

Concurrent with the implementation of these rate increases, Tacoma also began several residential recycling programs. Curbside yard trimmings service and recycling was started in 1990, both offered at no extra charge. Yard trimmings collection increased from 6,000 tons in 1990 to 7,237 tons in 1991, while the amount of recyclables collected jumped three-fold during the same period, from 507 tons to 1,854 tons.

Some of the effects of these rate increases and waste diversion programs can be seen in the landfilling data. Disposal at Tacoma's municipal landfill fell six percent between 1989 and 1991 (from 200,593 tons to 188,449 tons), despite significant population growth in the area. The city attributes some of the decrease to its refusal to accept large loads of demolition materials beginning in 1989. Tipping fees also have risen significantly. The fee for city residents rose from $22/ton in 1990 to $32/ton in 1992. At the same time, the tipping fee charged to noncity residents rose from $64/ton in 1990 to $80/ton in 1992.

WILKES-BARRE, PENNSYLVANIA

Wilkes-Barre operates a residential volume-based rate program that differs significantly from the other case studies. The city first introduced a voluntary bag program for multifamily (five units or more) customers in 1988. The bags cost $1 each and are sold to residents in packages of eight. With this program, the city estimates that the average household living in a multi-

family residence spends $95.90/year for solid waste and recycling services. Currently, 50 percent of all multifamily households participate in the bag program, while the other 50 percent contract with private haulers for solid waste collection services. Single family households (four units or less) are charged an annual flat fee of $50/household. However, the city hopes to expand its bag program to include the single family residences in the future because the program has proven to be popular.

During the first year of the multifamily bag program, there was a 15 percent reduction in the total amount of waste collected city-wide. Recycling services for all residential customers have been increasing each year since 1985 as new programs are added and others expanded. Wilkes-Barre now has both curbside recycling and yard trimmings collection, as well as a home composting program. The recycling participation rate reached 65 percent in 1992, and residents are now diverting an estimated 20 percent of the waste stream. Between the bag and recycling programs, the city has seen more than a 25 percent decrease in total solid waste disposal at the local landfill. Tipping fees at the landfill increased six-fold since 1985, climbing from $8.65/ton to $51/ton by 1992.

BOTHELL, WASHINGTON

Before February, 1991, the suburban Seattle community of Bothell charged a flat fee for disposal services of $8.11/month. Then the city implemented curbside recycling and yard trimmings collection programs and, to support them, set variable curbside collection rates. The rates were implemented at $10 for one can, $14 for two, $18 for three, and $24 for four. These covered all collection services, including recycling and yard trimmings. This choice was made in lieu of an increase in the monthly flat fee to approximately $13 to cover the same services.

When the programs were first started, initial subscription levels in Bothell were 71 percent at the one can level, 28 percent at the two can level, and less than one percent using three or four cans. One year later, subscription levels were at 78 percent for one can, 21 percent for two, and less than one percent using more than two cans.

Significant waste reduction resulted from the program. Initially, an estimated 40 percent of Bothell's residential waste stream was collected in the curbside recycling and yard trimmings programs, leaving 60 percent going to disposal. By 1992, the two programs were collecting 48 percent of the residential waste stream.

MINNEAPOLIS, MINNESOTA

Minneapolis charges a flat fee for unlimited residential solid waste collection but has a rebate for participation in its curbside recycling program. Residents were not specifically charged for solid waste collection services until October, 1987, when the city instituted a $5 monthly fee for solid waste collection and disposal. The original fee was a direct result of rising disposal costs. In 1982, disposal costs were $21/ton; by January, 1988, the tipping fee was $38/ton. With an increase to $42/ton in January, 1989, the residential charge was increased to $7/month. When forced to respond to a $75/ton tipping fee in June, 1989, the city increased the residential fee to $12/month, and added a recycling rebate of $5/month to stimulate the waste reduction program that had begun in 1983. Further increases in the tipping fee that resulted in higher residential costs were mitigated by increases in the residential recycling rate. The 1992 tipping fee of $99.55/ton was supported by a $17.50 monthly residential fee, accompanied by a $7 monthly recycling rebate.

As disposal costs rose in the 1980s, Minneapolis began making additions and refinements to its recycling programs that complemented the rebate. The first curbside recycling pilot program began in 1982, when 1,026 tons of recyclables were collected, less than one percent of the total of 131,995 tons of solid waste. A yard trimmings program was added in 1987, and the city began collecting large metal items (such as major appliances) in 1990. By 1992, the participation rate in the curbside recycling program reached 90 percent. More than 40,375 tons of recyclables, including yard trimmings and major appliances, were collected in 1992 (approximately 28 percent of the waste stream), and solid waste disposal dropped 21 percent from the 1982 level to 104,561 tons.

To be fair, the city's recycling efforts are one factor in this reduction: A large drop in tonnage occurred between 1989 and 1991 when the city changed from cans to carts. A number of people stored their cans under the driplines of their garages, causing them to gather water and snow that made the waste heavier. Switching to covered carts reduced the amount of water collected, which the city estimates lowered tonnages significantly.

Portland residents increased their recycling levels from 740 tons per month in 1988 to 2,583 tons per month in 1992 — more than tripling the tonnages.

CONCLUSIONS

Taken together, these case studies provide evidence that variable curbside disposal fees do assist and support waste reduction efforts. Although the specific effects depend on social, demographic and economic factors where they are implemented, communities that have variable disposal fees tend to be enthusiastic about them. Most of these communities report that the variable fee structures have supported other waste reduction activities and have consequently helped reduce solid waste disposal levels. ■

Richard Cuthbert is an executive economist with R.W. Beck in Seattle, Washington, where he conducts demand forecasting, financial impact analyses, rate studies and statistics for electric, water and solid waste utilities nationwide.

Clearing Hurdles in Switching to Variable Rate Pricing

Attracted by the benefits of solid waste unit pricing but concerned about some of the potential drawbacks? An understanding of potential problems and how to overcome them may help your community's decision-making when exploring unit pricing—and ease the transition if such an approach is adopted.

By Michael Shapiro

Unit pricing programs offer communities an impressive lineup of benefits: greater attention by residents to waste reduction; increased participation by households in recycling and composting programs; reduced disposal costs; and a more equitable waste management fee structure. Unlike traditional pricing systems, where every household pays the same—regardless of how much trash is set out on collection day—unit pricing programs charge residents only for the waste they discard. The less residents toss, the less they pay.

The benefits certainly have attracted many communities. More than 1,600 communities have switched to some form of variable rate pricing for solid waste collection services in recent years. (See Table 1). In addition, several state legislatures now either encourage or mandate use of variable rate pricing for solid waste.[1]

The result for many communities with unit pricing programs has been significantly less waste, lower costs, and improved service. Table 2 lists several communities that have implemented variable rate pricing programs and shows some of the waste reduction and recycling rate increases. For communities concerned about getting squeezed between growing waste generation rates and shrinking disposal options, unit pricing might provide the margin their waste management programs need.

However, the switch from traditional pricing to unit pricing worries some MSW planners. While change is rarely simple, local officials may be concerned that restructuring the way the community conducts and administers its waste collection program might be more than they want to take on. In the experience of communities with variable rate programs, however, potential barriers to implementing unit pricing can be overcome with some advance preparation. These barriers include:

—Building a consensus in the community about the goals of the program and the need for changes that unit pricing may bring.

—Establishing prices that cover the costs of waste collection and that residents feel are fair.

—Obtaining participation of the entire community, including residents of multi-family housing.

—Ensuring that illegal dumping does not increase significantly after implementing unit pricing

Table 1: Variable Rate Pricing Programs in Local Governments, By State[1]

California	18	Nevada	2
Colorado	1	New Jersey	18
Connecticut	2	New York	3
Florida	7	North Carolina	4
Georgia	2	Oregon	250[3]
Illinois	38	Pennsylvania	36
Indiana	3	South Dakota	1
Maine	13	Texas	1
Massachusetts	40	Vermont	70
Michigan	5	Virginia	1
Minnesota	855[2]	Washington	243
Missouri	3	Wisconsin	75
Montana	1	Total	1,692

[1] States not listed do not have variable rate pricing programs.
[2] Minnesota regulations required the use of variable rate fees for solid waste collection in all 855 communities beginning in 1993; however, some were exempted or granted delays in implementation.
[3] Estimate from Peter Spendelow of the Oregon Department of Environmental Quality

Source. Synergic Resources Corporation, 1993

Consensus First: Is Change Needed?

Switching to unit pricing means changes for both residents and the municipality administering the program. Concern, even resistance, can accompany these changes. To win support for unit pricing, the municipality needs to think of residents as customers whose satisfaction is critical to the program's success. This means developing an effective pricing program and supporting it with a strong public education effort.

When Long Beach, California, began planning its variable rates program in 1991, residents were skeptical. According to Jim Kuhl, manager of the city's Integrated Resources Bureau, "People were saying 'Garbage has been collected the same way for a hundred years. Why fix something that's not broken?'" Overcoming the sense that no changes were

Mike Shapiro is director of the Office of Solid Waste for the U.S. Environmental Protection Agency.

Reprinted with permission from Solid Waste Technologies Magazine, Adams/Green Industry Publishing, Inc

Table 2: Selected Communities With Unit Pricing Programs

Community	*Population*	*Program Type*	*MSW Reduction*	*Recycling Change*
Mansfield, CT	22,500	Subscription can		+40%
Seattle, WA	500,000	Subscription can	25%	+39%
San Jose, CA	740,000	Subscription can	46%	+42%
Pennsville, NJ	13,500	Stickers		+43%
Bound Break,NJ	10,000	Stickers	30%	
Antigo, WI	8,500	Stickers	50%	
Charlemont, MA	1,200	Bags	37%	
Plains, PA	11,200	Bags	49%	+56%
Mt. Pleasant, MI	30,000	Bags	44%	+41%
Du Page County, IL	668,000	Bags	53%	
Plantation, FL	64,000	Bags		+21%
Perkasie, PA	7,900	Bags	59%	+50%
High Bridge, NY	4,000	Stickers		+18%
Illion, NY	9,500	Bags	37%	+41%

needed was Kuhl's biggest hurdle.

Educating residents about solid waste challenges in Long Beach—and the ways in which unit pricing could help—was critical to building support for the program. California had passed a law mandating specific recycling levels. Failure to meet these levels carried potential fines of up to $10,000 per day—money that ultimately would come from community taxpayers. Through presentations at town meetings and gatherings of civic and private groups, distributing flyers, and meeting with the city's elected officials, Long Beach showed how the plan's waste prevention incentives offered a cost-effective way to boost the city's recycling rate, enabling it to meet the states mandate, and avoid costly fines.

In addition, the city showed how the program would save a significant amount of money for those residents who already were generating less waste. To help drive home this point, Long Beach officials compared the rates for waste collection with the other utility services residents receive. This argument made sense to residents, said Kuhl: "People understand that no one can just go to a gas station and buy 20 gallons for the price of 5—residents have to pay for the amount of service they use." Through its public education program, the city convinced residents that waste reduction incentives would help the city succeed in its overall solid waste program. In turn, residents supported unit pricing.

Mailing Trash
When a unit pricing systems was started in Loveland, Colorado, residents were asked to buy trash bags for 75 cents apiece at retail outlets. Residents soon complained, apparently comparing the cost of the trash bags with other plastic bags they could buy for pennies. To make the connection between the cost of the bags and collection and disposal service, the city changed to bag tags, and compared the tags to stamps. Now, to "mail" their garbage to the landfill, Loveland residents afix one 75-cent stamp on each 30-gallon bag they put out for collection. A 40-cent stamp is good for a 13-gallon bag, and a sofa will set you back about 13 stamps.

At What Price?

Switching to unit pricing also often means convincing residents about *their* bottom line results. Cases in Mansfield, Connecticut, and Loveland, Colorado, illustrate the point.

Before implementing its variable rate program in 1990, the town of Mansfield worked to find a price structure that residents would consider fair. Lon Hultgren, Director of Public Works, said his department began by designing a subscription-based program to replace the private waste collection service residents had previously used. (Under the old system, residents paid a flat fee of about $20 per month for unlimited service). For the new program, the town decided to offer four service levels: one, two, and four cans per week, plus a "mini" service level of just one bag per week. The town established prices for each level that would, in the aggregate, cover all program costs.

Next, since the amount set for the most common service level was about 10 percent higher than the flat fee residents were paying previously for waste collection services, planners lowered it to a figure they felt was closer to what the market would bear. The result was a fee of $20.75 per month for two-can service (with each can 35-gallons). The prices of other service levels were adjusted slightly to maintain the costs-revenues balance. The price was set at $14.50 per month for one-bag service, $17.50 for one-can (or two bag) service, and $26.50 for four cans.

The city overcame what Hultgren described as the "classic resistance" to a user-fee system, and the program is now well accepted. With customers getting used to it, there has been a general trend of residents subscribing for lower level service.

Mick Mercer, the Streets and Solid Waste Manager in Loveland, Colorado, agrees that price concerns are key. Despite good intentions, "most people don't pay much attention to solid waste issues. Pocketbook concerns are what really matter." The key, said Mercer, is to design a program that will cost about the same or save money.

In Loveland, the switch to variable pricing began with a pilot program serving about 2,000 households three years ago. Loveland took the program citywide (14,000 households) in April 1993.

Table 3: Effect of Variable Rate Pricing on Illegal Dumping and Recycling Rates

City	Population	Residential Landfill %Change	Recycling % Change
Cities with notable problems			
Harvard, IL	5,600	-34% to -31%	
113%			
Ithaca, NY	35-40,000	-31%	63%
Woodstock, IL	15,000	-31%	NA
Mt Pleasant, MI	30,000	-44%	141%
Cities with minor problems			
Downers Grove, IL	46,000	-49%	88%
Perkasie, PA	7,000	-54%	156%
Lisle, IL	19,500	-53%	NA
Cities with no apparent problems			
High Bridge, NJ	3,600	-18%	3%
Charlemont, MA	1,200	-37%	NA
Antigo, WA	8,500	-50%	146%
Ilion, NY	8,800	-51%	141%
Rock Falls-Sterling, IL	29,500	-65%	NA
Seattle, WA	495,900	**	**

** Seattle reported no apparent problems with illegal dumping, but did not report changes in waste generation or recycling changes NA=no applicable data

Source "Under What Conditions Should Cities Adopt Volume-Based Pricing for Residential Solid Waste Collection?" Daniel Blume, Master's Memo Study, Duke University, May 1991

City planners estimated that most residents would probably use one 30-gallon bag per week, down from the previous two to three bags per week A year into the full program, studies verify that the average set out is now about 0 88 bags per household per week

Under the old program, residents were paying $5 75 per month for unlimited waste collection services; the city wanted to be sure not to come in too much over this for those households that were able to increase their waste prevention and recycling.

The city decided that a rate of 75 cents per 30-gallon bag would encourage residents to reduce and recycle while keeping per-household costs at a reasonable level. Adding the cost for households that set out one bag per week ($3 25/month) to the fixed monthly fee for curbside and yard waste recycling services ($3 40/month), the total refuse and recycling service costs each household $6 65/month—only 90 cents per month more than the old program.

The system was started by selling bags at retail outlets for 75 cents each Despite some education efforts preceding the switch, residents began complaining almost immediately about the cost of the bags. They compared them to supermarket bags that cost just pennies apiece Loveland officials realized they had to find some way to help residents make the connection between the cost of the bags and the town's waste collection services

Loveland solid waste planners accomplished this by changing from bags to tags and comparing the new tags to stamps—in effect, asking residents to "mail" their waste to the landfill A single "trash stamp" costs 75 cents and covers one 30-gallon bag. A 40 cent stamp also is sold to those households that need just a 13-gallon bag.

The stamp program helps handle bulky items, too To dispose of a couch, for example, residents are asked to call the solid waste office, describe the item, and are told how many stamps it will cost. A standard-sized sofa takes about 13 stamps—about $9 75

The adjustment the city made to meet criticism paid off After the first year of operation, a survey showed that 87 percent of residents gave the program a mark of good or excellent.

Getting Some Help

To help interested communities learn more about the process of planning, designing, and implementing unit pricing programs, the U.S. Environmental Protection Agency has prepared a guide, "Pay-As-You-Throw: Lessons Learned About Unit Pricing." This guide provides detailed technical information on unit pricing based on the experiences of 11 communities with programs in place. The manual (EPA 530-R-94-004) is free; to order, call the RCRA Hotline at (800) 424-9346, or write to U.S. EPA, RCRA Information Center (5305), 401 M Street S.W., Washington, DC 20460.

All in the Family

Another potential barrier for communities implementing unit pricing is to design a program that extends the waste reduction incentive to residents of multi-family housing. In multi-family residences (buildings with five units or more), tenants typically are asked to bring their waste to a central dumpster for collection. Since their garbage is combined, identifying the amounts of waste that individual residents discard in order to charge accordingly can be difficult

Mansfield, Connecticut, faced such a challenge Home to University of Connecticut, Mansfield has a large student population living in multi-family housing But the town has come up with a strategy to help extend unit pricing to these residents. The town charges the landlords of multi-family housing a variable rate for the waste collected from their tenants Since these costs are included in the rent, residents do not see what they pay for waste collection. So, Mansfield officials sought ways to show residents of multi-family buildings that waste reduction could bring them potential cost savings

For example, when a 60-unit condominium complex switched from its private waste hauling services to Mansfield's unit pricing program, town officials reviewed its waste management costs. It found that the complex was overpaying for waste collection services The officials showed how the complex could actually save money under the program, if everyone cut down on waste generation and began recycling, the complex could actually save money under the program. And these savings could lead to a reduction in the condominium fees charged to residents, or at least prevent them from going up

Another strategy to extend unit pricing to multi-family units is simply to include as many residents of multi-family housing as possible in your standard program In Long Beach, California, for waste collection purposes, the city considers residents in developments with 10 or fewer units to be single-family residences. These units are given the same containers and rate options as all other single-family households Kuhl, from the city's resources board, reports that tenants had few difficulties making the transition to the can-based unit pricing program, even in cases where these developments previously used a

central waste dumpster.

Illegal Dumping: Enemy No. 1?

When a community introduces the possibility of unit pricing to its residents, one concern frequently mentioned is whether residents might dump waste illegally to avoid paying fees. According to Henry Fisher, the Solid Waste Manager for McHenry County, Illinois, the first thing that should be understood is that illegal dumping has always occurred. In addition, although this is difficult to gauge, there is no evidence of a large-scale increase in illegal dumping due to of variable rate programs.

McHenry County's experience is similar to that of many communities that have adopted variable rate pricing. A report by the Reason Foundation cited several multi-community studies that show illegal dumping is not a significant problem.[1] Another study covering 14 cities reported no problem in six cities, minor problems in four cities, and notable problems in four cities.[2] Table 3 shows the effect of illegal dumping on recovery in these 14 cities. Since these communities do not use a standard methodology for gauging changes in waste generation and recycling rates, these data should be considered estimates. The extent of illegal dumping in the communities had either no effect or only a marginal effect on the effectiveness of the programs. Another study of eight cities show no dumping problems in seven of the eight cities.[1,2]

Advertisement

Tempering the Temptation

Difficulties with illegal dumping can be addressed through a combination of enforcement and public education. One method McHenry County's Fisher suggests is to reduce residents' incentive to dispose of waste outside the system by adopting a multi-tiered rate structure that includes a flat rate for a basic level of service and a modest per-unit charge for any additional waste collected. In this way, residents pay a direct price that is less than if the program relied entirely on per-unit charges for program revenue. And households also receive a certain level of trash collection they might perceive as free. (Residents pay for this basic service, of course, in the traditional manner—via taxes or flat fees.) With this combination, individuals who might otherwise be tempted to dump waste believe the new prices are reasonable and are more inclined to participate.

Loveland's Mercer agrees that illegal dumping is "perceived as a bigger problem than it really is." Where it does occur, illegal dumping in Loveland typically takes the form of individuals leaving trash in commercial or apartment building dumpsters. To prevent this, Mercer's office conducted extensive public education about all aspects of unit pricing, including illegal dumping. The office also works hard to investigate complaints of violations. Where illegal dumping is suspected, the office often finds the name and address of the violator in mail found in the trash. The individual is notified of the finding and warned that any additional violations will result in prosecution. "We haven't had any repeat violations yet," said Mercer.

Other Forms of Beating the System

When illegal dumping occurs, it commonly takes the form of roadside

dumping or citizens dumping their trash in commercial dumpsters. Sometimes, residents cut back on waste by dropping nonrecycable materials into recycling bins

Long Beach, California, found an increase in contamination of recyclables soon after implementing its variable pricing system for trash. To correct the behavior, the city did not collect the materials from any recycling bins containing nonrecyclable materials. Instead, collection crews attached notes to the bins that listed the program's recyclable materials and explained that residents could remove the nonrecyclables and call the city to reschedule the pickup—often on the same day. Since implementation of the policy, contamination of recycling bins has dropped dramatically.

Another way residents have found to beat unit pricing systems is to compact their waste to fit as much trash into fewer bags or smaller cans Loveland dealt with this potential problem by establishing a 50-pound maximum weight for trash bags set out for collection Besides providing more accurate estimates of waste collected, this protected sanitation workers. When overstuffing does occur, the collection crew leaves a note for the resident, explaining why it didn't collect the waste and inviting the resident to call with any questions.

Changes in the Office

Some communities find that changing to unit pricing for solid waste also brings increased administrative demands, including the need for additional personnel or equipment Communities can structure programs to minimize these demands. In Loveland, one reason why planners decided upon the "postage stamp" concept was the low overhead in such a system Several stores in town agreed to sell the stamps with no mark-up As a result, the city has few additional expenses associated with stamp sales and distribution. Loveland simply bills the stores monthly for the stamps they sell. Only one additional person has been hired—a customer service person used to answer questions that come in by phone.

Making the Move

To make the move to unit pricing, communities should take steps ahead of time to deal with potential barriers—before they become a problem In addition to the issues discussed here, there inevitably will be other, community-specific concerns that need to be addressed. According to communities with variable rate programs, however, these issues are manageable and that switching to unit pricing is worth investigating ■

Inquiries about this article should be directed to the RCRA Hotline, (800) 424-9346.

Notes:

[1]Skumatz, L , "Variable Rates for Municipal Solid Waste Implementation Experience, Economics, and Legislation," June 1993, Reason Foundation, Los Angeles, California

[2]Blume, D., "Under What Conditions Should Cities Adopt Volume-Based Pricing for Residential Solid Waste Collection?" Master's Memo Study, Duke University, May 1991.

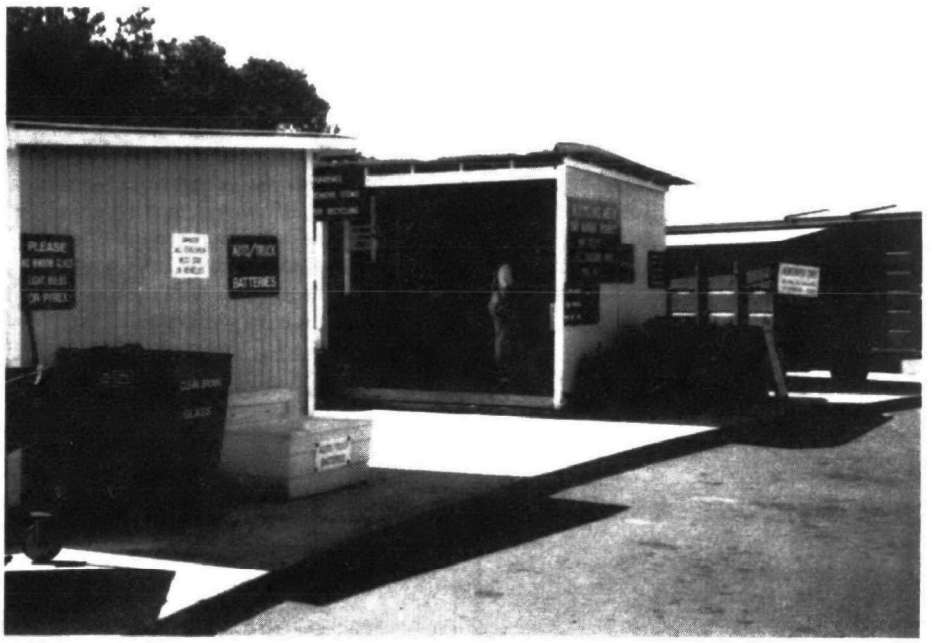
Advertisement

Using volume-based user fees in rural areas:

How do they work?

Implementing volume-based user fees in rural locales is easier, and more successful, than conventional wisdom would have us believe.

by William M. Park



As the "solid waste crisis" has unfolded over the last five to 10 years, most attention has been focused on urban and suburban areas, where huge volumes of solid waste and recyclables must be managed. Naturally then, discussions of the role of user fees in solid waste management, particularly volume- or weight-based fees, have centered on their implementation within a context of door-to-door garbage and recycling collection. But in some sense, collection of solid waste and recyclables in rural communities through a drop-off system poses an even greater challenge, particularly from the standpoint of financing this public service and providing incentives for source reduction and recycling.

Historically, rural communities have faced relatively low solid waste management costs that in most cases were funded by general property taxes. But times have changed. Federal landfill regulations and state mandates for more comprehensive collection systems and diversion of materials from landfills through recycling or other means have changed the situation dramatically, exacerbating the inherent difficulties of small total population bases and low population densities that rural communities face.

Costs have risen to the point that they represent a major claim on rural community budgets. Rural counties, often tagged as the "responsible unit of government" in state solid waste management legislation, are in a particularly difficult situation. Because low population densities limit the incentive to private haulers to serve residents in outlying areas, many rural counties have gotten into the collection business by converting old landfill sites to transfer stations primarily for self-haulers or by implementing what is typically called a "convenience center" system. Such a system involves a number of conveniently located sites with access controlled during open hours by an attendant, where residents can drop off their household garbage and perhaps separate out a number of recyclable ma-

William M. Park is professor of Agricultural Economics and is affiliated with the Waste Management Research and Education Institute at the University of Tennessee in Knoxville. The research was conducted while the author was a visiting professor in the Western Rural Development Center at Oregon State University, in conjunction with the National Rural Studies Committee, a project sponsored by the Kellogg Foundation.

Reprinted by permission from Resource Recycling, P.O. Box 10540, Portland, OR 97296-0540. 503-227-1319.

terials. As such, the question naturally arises about whether volume-based user fees (VBUFs) could, or should, be implemented within such a system

According to conventional wisdom, the answer to this question is, "No." Rural solid waste managers and elected officials may readily acknowledge the two basic arguments in support of volume-based user fees, namely the equity of households paying in proportion to the amount of solid waste they generate and the incentive such fees offer for source reduction and recycling. However, most would be equally quick to point out that volume-based fees may encourage some residents to employ inappropriate disposal methods, e g , illegal dumping or on-site burning or burying They would also likely express concern about other possible political and administrative impediments.

Volume-based fees: A recycling incentive

- ✔ Residents can reduce volume-based user fees by separating recyclable materials from waste.
- ✔ Backyard composting allows residents to control their user fees.
- ✔ Special wastes (yard debris, white goods, furniture, tires, etc.) are usually accepted at drop-off sites at a nominal cost, or none at all.

This conventional wisdom is reflected as well by the absence of any explicit attention to the rural drop-off collection context in the several local decisionmaker guides to unit pricing that have been published in recent years The purpose of the research reported upon in this article is to call into question this conventional wisdom by assessing the experience of several rural communities that have implemented volume-based user fees within a drop-off collection context

The first step involved identification of what are considered to be successful examples A June 1993 article in *Resource Recycling* ("Community adoption of variable rates: An update") indicated the number of "variable rate pricing" programs by state as of early 1993. Contact was made with state agency personnel in those states with the highest number of programs, as well as other persons knowledgeable about rural solid waste management across the country

Eventually, this process yielded six examples within a drop-off context that varied with respect to geographic and demographic characteristics of the jurisdiction, as well as characteristics of the user fee system. Once this set of six was finalized, a five-page questionnaire was sent to the person most closely involved with administration of the solid waste management system and was used as an outline for an extensive telephone interview

Contact was also made with elected officials or others in each community who could provide some perspective on either the political and administrative considerations in implementing the user fee system or the impacts of the system, both positive and negative. This article provides a summary of comparable information from all six case studies. More detailed information on each case study will be included in a comprehensive report to be published later

Characteristics

Information on the basic geographic and demographic characteristics for each jurisdiction is presented in Table 1 This information demonstrates the wide variation across the jurisdictions with respect to land area, population, population density, and the estimated percentage and number of residents who use the drop-off system.

The jurisdictions portrayed here considered user fee systems for a few months to more than two years before they were implemented Before user fee systems were implemented, waste management was funded

Advertisement

Advertisement

Table 1 Geographic and demographic characteristics

Jurisdiction	Dubois	Houston	Lane	Monroe	Tift	Weathersfield
Type of jurisdiction	County	County	County	County(1)	County	Town
State	Indiana	Minnesota	Oregon	Wisconsin	Georgia	Vermont
Area (square miles)	433	576	4,620	915	269	50
Total population	36,600	18,500	298,000	37,300	35,000	2,700
Population density (per square mile)	85	32	65	41	130	54
Population, percent using drop-off sites	50%	35%	50%	20%	45%	75%
Total population using drop-off sites	18,300	6,500	149,000	7,500	15,800	2,000

(1) Volume-based user fees implemented by 11 towns within Monroe County.
Source: William M. Park, 1994.

by general property tax revenues in four cases, a serial property tax levy in one case and a flat per parcel assessment in the other. Although the administrative and political aspects of the consideration and implementation period vary across the cases, and in every case represent an interesting story, space limitations do not permit a detailed discussion of each one. A common element, however, was a concerted effort to publicize plans to implement the user fee well ahead of time and to educate residents as to the need and logic for it

Another commonality was that significant changes were made in the solid waste management system at the time user fees were implemented. Dubois County, Indiana and Tift County, Georgia converted an existing waste collection drop box system to a convenience center system, and recycling opportunities were initiated. In Houston County, Minnesota, collection of solid waste and recyclable materials was provided by the county for the first time In Lane County, Oregon, existing transfer sites were secured, recycling was expanded and a recycling credit was introduced. In general, towns in Monroe County, Wisconsin implemented user fees at the time small individual town dumps were closed and were converted to transfer stations When the Town of Weathersfield, Vermont initiated user fees, it also expanded its set of recyclable materials collected.

The basic characteristics of each user fee system are summarized in Table 2. All except Lane County were implemented between 1990 and 1992. In terms of the "type" of system, two require purchase of a special bag, two require purchase of a token or sticker to attach to the residents' own bag, and two require cash payment at the drop-off site for the residents' own bags. Converting the fees to a consistent basis indicates a range of $0.50 to $2 00 per 30-gallon bag Although none of the systems charge for recyclables, Hous-

Table 2 User fee systems: Basic elements

Jurisdiction	Dubois	Houston	Lane	Monroe	Tift	Weathersfield
Date initiated	April '91	Oct. '91	July '80	'90-'92	Oct. '92	July '91
Type of bag	Own	Own	Own	Purchased	Purchased	Own
Fee mechanism	Sticker	Cash	Cash	Bag	Bag	Token
Fee per unit of volume	$.75/45-gal.	$1.30/30-gal.(1)	$2.00/32-gal.(2)	$1.10/33-gal.	$1.50/38-gal.(3)	$1.00/30-gal.
Minimum fee	$0.75	$1.30	$6.00	$1.10	$0.45	$1.00
Credit or payment for recyclables	No	Buy-back for aluminum	$1.50 credit for 10 lbs. +	No	No	No
Fee paid at drop-off sites	Yes	Yes	Yes	Yes	No	No
Fee paid at municipal offices	Yes	No	No	Yes	No	Yes
Fee paid at stores	No	No	No	No	Yes	Yes
Percentage of total cost covered by fee	33%	26%	100%(4)	Variable	63%	57%
General property tax funding	Yes	Yes	No	Yes	Yes	No
Flat assessment	No	$.75/HH/month	No	No	No	$25/parcel/year

Gal. = Gallon.
HH = Household.
(1) Or $.07 per pound.
(2) Other rates: $12 per pickup load or $5 per cubic yard.
(3) Other bag sizes and fees: $.45 per 8 gallon and $.75 per 16 gallon
(4) Although the solid waste management system is self-supporting overall, the rural drop-off collection component is "subsidized" to some extent by other system components.
Source: William M. Park, 1994.

ton County buys back aluminum and Lane County offers a $1.50 credit for users who separate out at least 10 pounds of recyclables per visit.

With regard to overall solid waste management system financing, only Lane County covers all of its solid waste management system costs with user fees, although landfill tipping fees do, to some extent, subsidize the system of drop-off sites that serve primarily rural self-haulers. VBUFs in the other systems cover from 26 to 63 percent of the total solid waste management system cost, with the remainder covered by ad valorem property taxes in three cases, an annual per parcel assessment in one case, and a combination of property taxes and a monthly per household assessment in the other. These "hybrid" financing strategies allow per bag fees to be kept at the relatively modest levels noted above, thus limiting the incentive for inappropriate disposal.

Recyclables and special wastes

Discussions of volume-based user fee systems typically emphasize the importance of providing households with an opportunity to reduce their costs by separating materials for recycling. Together with source reduction options such as backyard composting, VBUFs allow residents some degree of control over their "garbage bill" and can contribute to public acceptance of a user fee system.

The six programs presented here accept a wide variety of recyclable materials. The basic five materials — aluminum cans, glass containers, steel cans, old newspapers and old corrugated containers — are accepted in all of the systems, and five systems accept plastics, magazines and at least one additional type of paper.

Since 1980, Lane County, Oregon has charged user fees and given recycling credits at its rural transfer stations, such as this one in Creswell.

Given the variation across the jurisdictions with respect to land area and population, one would expect variation as well in the operational characteristics and technologies used within the systems. As indicated in Table 3, this is indeed the case, with the number of sites ranging from one to 15, the number of hours open ranging from about 10 to 80, and the tonnage of recyclable materials handled per site in 1993 ranging from 43 to 275 tons. Technologies used for collecting and transporting materials and arrangements for processing and marketing also vary widely, as does the role of private sector firms in relation to these activities.

Advertisement

Table 3 Recycling system characteristics

Jurisdiction	Dubois	Houston	Lane	Monroe	Tift	Weathersfield
Number of drop-off sites	8	5	15	1 per town	7	1
Hours open per week	14-32	12	10-60	8	36-80	11
Average tons of recyclable materials per site in 1993	52	N.A.	275	Variable	43	220
Containers for recyclables	4 cy. dumpsters	20 cy. closed top w/compartments	90 gal. wheeled carts	Variable	Trailer with compartments	Bunkers and Gaylords
Transportation of recyclables	County trucks	County trucks	Private contractors	Private haulers	County trucks	Variable
Processing and marketing of recyclables	Local salvage yard	County MRF	Private firms	Private firm	County MRF	Town baler

N.A. = Not available. Cy. = Cubic yard. MRF = Materials recovery facility.
Source: William M. Park, 1994.

Recommendations by solid waste management professionals regarding treatment of special wastes such as yard debris, white goods, furniture and tires generally emphasize the importance of providing timely, convenient and low-cost options for disposal Although the ways these special wastes are handled varies across the six systems, most accept them at no or nominal cost at one or more drop-off sites, thereby limiting any incentive for residents to do something inappropriate with items or materials of these sorts.

Positive impacts

While volume-based user fees are often justified on equity grounds, one would certainly hope that they would reduce the amount of solid waste requiring disposal, as a result of the incentives provided for separation and source reduction efforts on the part of residents. Although the information available on this subject was somewhat uncertain and difficult to interpret in most cases, there is a good bit of evidence to suggest that the incentives provided by these user fee systems are making a significant difference.

While definitive "before and after" figures isolating the effect on solid waste tonnages requiring disposal were lacking, there was evidence of small absolute reductions in three cases In one other case, solid waste tonnage stayed roughly constant even though significant economic and population growth was taking place. Reported increases in tonnage of recyclables collected account for part of the decreases in disposal tonnage, but it is impossible to know how much of the remain-

Advertisement

der of the decreases were due to actual source reduction efforts motivated by the VBUFs and how much was due to other factors.

Although it was difficult to calculate a valid diversion or recovery rate for the rural drop-off systems alone, as noted in Table 4, three counties had computed countywide rates for state reports that ranged from 20 to 34 percent. In addition, information from the Town of Weathersfield indicated a diversion or recovery rate of about 29 percent.

Table 4 Measures of impact on recycling

Jurisdiction	Dubois	Houston	Lane	Monroe	Tift	Weathersfield
Participation in recycling (1)	65%	95%	75%	N.A.	80%	85%
Recyclables recovered (2)	45	146	59	98	38	148
Diversion/recovery rates (3)	N.A.	34%	28%	20-25%	N.A.	29%

N.A. = Not available.
(1) Percentage of residents using drop-off sites for garbage disposal who separate out some recyclables, based on careful head counts in Dubois and Tift counties and rough approximations elsewhere.
(2) In pounds per capita in 1993. For typical set of residential materials, including aluminum and steel cans, glass, plastic and various forms of paper. For Houston and Monroe counties, only countywide tonnage figures were available. Thus, tonnage is divided by total county population, including residents served by curbside recycling collection programs. In the other four jurisdictions, tonnage collected only from drop-off sites is divided by the estimated population using the sites.
(3) In percent in 1993. These diversion/recovery rates are jurisdictionwide and thus include materials collected in curbside recycling collection programs as well as items like white goods and yard waste. Exactly what is counted may differ somewhat across cases.
Source: William M Park, 1994.

Per capita amounts of recyclables collected were computed in four of the cases, based on rough estimates of the number of people using the drop-off systems. For Dubois, Lane, and Tift counties, annual recovery ranged from 40 to 60 pounds per capita. For the Town of Weathersfield, approximately 150 pounds per capita were collected in 1993. For Houston and Monroe counties, only a countywide generation rate could be computed, which thus included recyclables from curbside recycling collection in some municipalities. Annual pounds per capita were 146 for Houston and 98 for Monroe.

Finally, perhaps as useful an indicator as any of the impact of VBUFs in these case studies is the level of participation in the separation of recyclables, measured in percent. In two of the cases, participation had been carefully monitored or tracked over a long period of time; in three others, an estimate was made on the basis of general observations by attendants and solid waste managers. The range across the five cases was 65 to 95 percent, with the average at 80 percent, which is relatively high compared to previous estimates for drop-off recycling systems elsewhere without volume-based user fee systems.

Problems

As noted in the introductory section, conventional wisdom has it that user fee systems in a rural drop-off collection system context

Advertisement

are likely to generate serious problems in the form of increased illegal dumping and burning, as well as less serious ones such as excessive compaction, use of private commercial collection containers and out-of-jurisdiction disposal. Although at least one of these problems was noted as minor in each of the systems studied, in no case did solid waste managers or elected officials view any problem as serious enough to undertake a fundamental reconsideration of the user fee system. It is good to keep in mind, however, that these assessments are admittedly subjective and are based on interviews with people closely involved with each system who may have some vested interest in portraying their system in the best light.

In several cases, where an increase in illegal dumping occurred, a show of willingness to enforce applicable ordinances was apparently sufficient to reduce the illegal dumping fairly quickly to more usual levels. A typical approach has been to identify the responsible party from mail in household garbage and send a letter stating that cleanup is required by a certain date, with the threat of a modest fine if it is not done. Some counties have published names in the newspapers or required citizens to appear before a county judge. The increased burning in some cases was not necessarily looked upon as a problem, because burning of clean wood or paper is allowable in some rural areas, although concern was expressed in some cases about burning of other materials. To avoid any problems with excessive compaction, Houston County instituted a weight limit of 30 pounds per bag from the beginning. In several cases, minor problems with use of private commercial collection containers were eliminated with the use of locks. Tift County initially had some problem with residents going across the county line to use unattended containers at a waste collection drop box system in a neighboring county, but those containers were soon relocated away from the county line.

Another concern expressed often is that administration of a VBUF system in a rural drop-off context might be infeasible or prohibitively costly. Although minor administrative adjustments have been made along the way in all of the systems, in no case were the basic administrative changes major impediments. In addition, in most cases administrative costs were not increased substantially, because the commitment had already been made, quite separately from the VBUF question, to have attended drop-off sites. Costs associated with sale of the bags, stickers or tokens have been minimal, and no billing system is required in any of the systems.

Conclusions

Although VBUFs may not be the most appropriate financing strategy for all rural areas, the experience of these rural counties and towns warrants the following conclusions. Implementing a volume-based user fee system in a rural drop-off context appears feasible across a wide range of geographic and demographic conditions, as well as a wide range of system characteristics, without prohibitive administrative problems or costs.

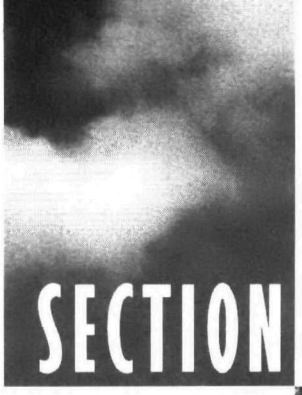
Most residents appear willing to support (or at least accept) a volume-based user fee system if they are well informed of the need for and logic of the system in advance, and are given reasonable options for gaining some measure of control over their total bill. Hybrid financing strategies allow per-bag fees to be kept at modest levels. Support comes more easily if VBUFs are initiated at the time of a significant enhancement of the collection system.

VBUFs within rural drop-off collection systems appear capable of motivating relatively high levels of participation in the separation of recyclables, thus contributing to relatively high per capita generation rates for typical recyclables and countywide diversion or recovery rates

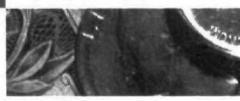
At least minor problems with increased illegal dumping and burning can be expected, but a show of willingness to enforce ordinances against such practices can lead to fairly quick subsidence. **RR**

Advertisement

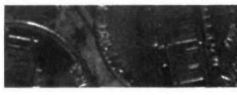
Circle 203 on RR service card

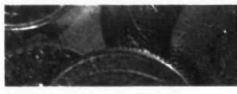


SECTION FIVE



Annotated Bibliography





Planners considering pay-as-you-throw may want to conduct additional research to help them learn more about how these programs work. This section includes an annotated bibliography and an additional list of references to help facilitate your research. Compiled in the following bibliography are over 50 recent articles that appeared in a variety of publications, from solid waste trade magazines to reports from universities and private institutions.

The entries in this bibliography were selected to help provide a comprehensive review of the economic, environmental, and legislative issues surrounding pay-as-you-throw. A number of articles analyze the impact of pay-as-you-throw on waste reduction amounts and recycling rates. Other studies examine the financial benefits of pay-as-you-throw as a solid waste management strategy for municipalities. A few articles identify successful public outreach and education mechanisms used by particular communities when instituting their pay-as-you-throw programs. In addition, if you find additional resources on pay-as-you-throw in the course of your research, you can three-hole punch a sheet of paper with those references and add it to this section.

This bibliography was developed by Marie Lynn Miranda of Duke University as part of a research project on the impact of pay-as-you-throw programs.

Pay-As-You-Throw Annotated Bibliography

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

A review of the unit pricing program in Lisle, Illinois. The community's variable rate system has successfully increased recycling participation and reduced waste generation without significant problems. The author based her conclusions on a survey of 100 residents. She divided the respondents into four socio-economic groups and found that recycling participation was high across all groups, but that average set-out levels seemed to roughly increase with income. She also found that the average decrease in garbage from 1989 to 1990 was 53 percent, with 63 percent in the highest month (August) and 38 percent in the lowest (October). The average loss in total volume was 31 percent, with 46 percent in the highest month (August) and 8 percent in the lowest (October).

Albrecht, Oscar W. "An Evaluation of User Charges for Solid Waste Collection and Disposal." Resource, Recovery and Conservation. Vol. 2. 1976/1977.

An early introduction to the concept of user fees for waste collection services. Variable rates, like effluent charges for air and water pollutants, provide a pricing incentive to reduce the amount of garbage generated. A University of California study estimated the price elasticity of demand for solid waste service at 0.44, and an analysis by the City of Chicago found that waste production had a per capita income elasticity of 0.53. The key question with unit pricing is: will it result in lower system costs and higher net benefits than other pricing systems. Other questions include: does unit pricing lead to other disposal activities, including burning and littering; and, does unit pricing affect household choices of service levels?

Alderden, Jim. "Volume-Based Rates, Dream or Nightmare?" Recycling Today. November, 1990.

Unit pricing has been shown to encourage recycling and reduce the amount of municipal waste collected. Communities utilizing variable rates have reported an average reduction in garbage of 28 percent, with a range of 25 percent to 50 percent. It is also fairer to those that produce less waste. The downside of unit pricing is that it can encourage illegal dumping, especially at the beginning of the program, and lead to insufficient revenue for waste haulers. McHenry County, Illinois, had problems with residential garbage being thrown into commercial dumpsters. Blazier Disposal in Harvard, Illinois, set its rates based

on an estimated pickup of 1.6 bags per household and it only got 1.2 bags, leaving it short of revenue. Issues to consider include the demographic mix of the community, whether it is urban or rural, the level of community environmental awareness, the recyclables that will be collected, whether adequate revenue will be generated, and whether the program will be voluntary or mandatory.

Andresen, Katya. "Communities Weigh Merits of Variable Rates: Residents' Fees for Garbage Disposals." World Wastes. November, 1992.

A review of volume-based programs, experiments with weight-based fees, and technological innovations in waste collection. The author spoke with several solid waste professionals and academics who have studied variable rates, including Lisa Skumatz and Glen Morris. She summarized different system options, and reported on the success of unit pricing in Santa Maria, California, Seattle, Washington, Perkasie, Pennsylvania, and Ilion, New York. Weight-based systems have been tested in Seattle, Washington, Farmington, Minnesota, and Durham, North Carolina. Charging by weight, while more difficult to implement, would provide a more accurate pricing signal to residents than volume-based fees. Illegal disposal is a significant concern with unit pricing, but the problem can be headed off by providing free drop-off days, locking commercial dumpsters, and strictly enforcing anti-dumping ordinances. Technological developments, like bar coding cans, make waste collection easier and cheaper. Concerns about accuracy can be addressed by high standards and hauler education.

Bender, Rodd; Briggs, Wyman; De Witt, Diane. Toward Statewide Unit Pricing in Massachusetts; Influencing the Policy Cycle. Master's Degree Project. John F. Kennedy School of Government. January, 1994.

The Massachusetts Executive Office of Environmental Affairs advocates unit pricing for municipal solid waste collection, but the decision to implement variable rates is up to localities. This study is an effort to judge community perceptions of unit pricing. The authors found that financial concerns (such as the cost of waste disposal or the solvency of the collection service), a desire to encourage recycling and reduce waste, and grassroots lobbying efforts are all factors that can put unit pricing on a community's agenda. The study showed that the three biggest problems with unit pricing are: citizen perceptions that trash service should be free, failure to recognize the benefits of unit pricing, and fears about negative side effects, such as illegal dumping and customer resistance. The Massachusetts Department of Environmental Protection and MassRecycle support unit pricing at the community level by, among other things, functioning as information clearinghouses and addressing community concerns in statewide seminars.

Blume, Daniel. Under What Conditions Should Cities Adopt Volume-Based Pricing for Residential Solid Waste Collection? Master's Memo, Institute of Policy Sciences and Public Affairs, Duke University. May, 1991.

A study of 14 communities with unit pricing programs. The study showed that these systems reduced the amount of garbage produced in those cities and increased recycling activity with few significant problems. The paper also explored different features of unit pricing and their effectiveness, and assessed factors that would determine whether unit pricing was appropriate for a given community.

Browning, Marilyn; Becker, Jeanne. Volume-Based Garbage Collection Fees: An Analysis of Ten Illinois Programs. A Report Prepared by Becker Associates, Inc. November, 1990.

A summary of the structure and components of 10 unit pricing programs in Illinois. A survey of solid waste officials in each of the 10 communities found that the use of commercial dumpsters for residential waste was, on average, the most significant problem, receiving an average score of 2.9 on a scale of 1 to 5. The next most significant problem was insufficient revenue, followed by roadside dumping, uneven cash flow, and excessive garbage compaction. These problems can be addressed through better citizen education, locks on commercial dumpsters, the use of a minimum fee to cover fixed expenses, tougher enforcement of anti-littering provisions, and strict limits on the weight of a prescription container or bag.

Canterbury, Janice. Pay-As-You-Throw: Lessons Learned About Unit Pricing of Municipal Solid Waste. EPA Office of Solid Waste. EPA530-R-94-004. April, 1994.

In December 1992, the EPA's Unit Pricing Roundtable met to discuss variable rates for waste collection. The result of that meeting is this guide for communities considering unit pricing. Before adopting variable rates, a community needs to consider its waste management needs and whether the potential benefits of unit pricing, reduced waste, increased recycling, pricing equity, and greater environmental awareness will meet those needs. A community also must be aware of potential problems with unit pricing, including illegal dumping, higher costs, service to multi-unit housing complexes, and citizen resistance. When designing a unit pricing system, a community must decide among container options, set a pricing structure, create a billing system, and design program options. Implementation of unit pricing must be accompanied by public educational and outreach, and program monitoring. The report contains a number of brief case studies and information about specific programs, and a roundtable discussion with a number of unit pricing experts.

Cargo, Douglas R. Solid Wastes: Factors Influencing Generation Rates. Research Paper No. 174. Chicago, IL, University of Chicago Department of Geography.

The author analyzed the 1968 National Survey of Community Solid Waste Practices to determine actual amounts of waste generation. The survey assessed household and commercial waste generation. Cargo found that the actual amounts of waste generation were larger than EPA estimates. After employing regression analysis to determine the effects of socio-economic variables on waste generation, he found that "greater solid waste generation rates occur in areas with large populations, with high densities, and occupied by lower-income groups." While generation rates increase with city density and city population size, they decrease with income.

Chua, Dale H.H.; Laplante, Benoit. Litter and Waste Management: Disposal Taxes, User Charges, and Penalties. April, 1991.

The authors expand upon Ian Dobbs' 1991 report, which recommended a combination of disposal fees on commercial products that would incorporate the potential cost of littering and of refunds for proper disposal of product waste. This report advocates the addition of penalties for littering to further encourage the proper disposal of waste. It is a completely theoretical piece that bases its findings on an economic model.

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

Six case studies of unit pricing programs in Portland, Oregon, Seattle and Tacoma, Washington, Wilkes-Barre, Pennsylvania, and Bothel and Minneapolis, Minnesota. The article described the structure of each program. The case studies were the result of a random 80-city survey conducted by the author. Forty of the survey cities were large (100,000+) and 40 had populations between 50,000 and 100,000. Sixty-eight percent had city-run waste service, and 32 percent contracted out to a private hauler. Thirty-five percent financed their service from property taxes. The other 65 percent used fees, and 13 of those, or 16 percent of the survey group, had variable rates. The general conclusions of the case studies were that unit pricing encourages waste reduction, that residents were accepting of the variable rate systems, and that variable rates supported other waste reduction activities, such as recycling.

Dinan, Terry. "Solid Waste: Incentives That Could Lighten the Load." EPA Journal. May/June, 1992.

Faced with increasing per capita waste generation and growing waste disposal costs, the United States should consider pricing systems that provide an incentive to reduce garbage. Unit pricing and disposal taxes are two such systems. Unit pricing enables

households to save money by limiting the amount of garbage they put out for collection. A study of three variable rate programs in Perkasie, Pennsylvania, Ilion, New York, and Seattle, Washington found that the amount of waste landfilled or incinerated could significantly decrease. The author provided no specific figures.

Dobbs, Ian M. "Litter and Waste Management: Disposal Taxes Versus User Charges." Canadian Journal of Economics. February, 1991.

An examination of user charges and disposal taxes as waste management techniques. The author recommends a strategy that employs a combination of each. A user fee would recover the marginal cost of waste disposal, while a disposal tax with a refund for proper disposal would significantly reduce the potential for illegal dumping. The article is completely theoretical and bases its conclusions on an economic model.

Efaw, Fritz; Lanen, William. Impact of User Charges on Management of Household Solid Waste. Report prepared by Mathtech, Inc. August, 1979.

The authors conducted case studies of five communities (Burbank and Sacramento, California, Provo, Utah, Grand Rapids, Michigan, and Tacoma, Washington) to determine the effect of particular pricing systems for solid waste collection on waste generation. The report contains in-depth descriptions of each community's systems, three of which, those in Sacramento, Grand Rapids, and Tacoma, have some variable rate component. The authors concluded that while choices between types and levels of sanitation service may be sensitive to price, the quantity of waste generated at the household level may not be sensitive to price. In Tacoma, residents had a high price elasticity of demand with respect to the number of cans or the choice of backdoor pickup, but because of the availability of waste drop-off centers, the price elasticity of garbage production was not significantly different than zero. The same was true in Grand Rapids and Sacramento. The report also found that as household income increases, so does the quantity of garbage produced.

Emmer, Terri; Neidhart, Jim. An Analysis of the Effects of Volume-Based Waste Disposal Fees on Consumer Behavior. Department of Resource Economics, University of New Hampshire.

The authors of this report surveyed residents of Dover, New Hampshire, to determine the effect of Dover's variable rate system on consumer behavior. The report concluded that unit pricing led to higher recycling participation rates and lower waste generation in Dover. The survey also found that while there was initially a wide range of consumer attitudes about recycling, 6 months into the program there was a convergence of attitudes and a more uniform level of commitment to the program's goals.

Enos, Gary. "Residents Clean Up With Waste-Cutting Incentive." City and State. February 25, 1991.

A study of three areas (Bellevue, Washington, Lansing, Michigan, and the state of Rhode Island) that have either implemented or are considering implementing a variable rate system. Bellevue and Lansing reported success with their systems. In Bellevue, more residents switched to a smaller can, and in Lansing, the amount of waste sent to the city landfill fell by nearly 20 percent. The only difficulties with the system in either city involved setting the rate structure and concern that if too many customers reduced their waste too much, the waste haulers would not receive enough revenue to operate.

Fletcher, Jeff. "Why Unit Pricing Makes Sense for Solid Waste: U.S. Environmental Protection Agency Project." Nation's Cities Weekly. October 19, 1992.

This article concerned EPA's plan to run a unit pricing demonstration project. At that time, the Agency was looking for communities interested in participating. The author contends that variable rates send a more accurate pricing signal to waste generators than traditional flat rate systems and encourage garbage reduction. They are also fairer than flat rate systems, because residents that produce less garbage pay lower collection costs.

Folz, David H. "Recycling Program Design, Management, and Participation: A National Survey of Municipal Experience." Public Administration Review. May/June, 1991.

The author conducted a survey of 264 recycling coordinators to determine what factors influence citizen participation in recycling programs. The study identified eleven specific operational policies, of which variable rates for garbage collection was not one. The survey showed that allowing public input during the planning and design process, mandating recycling participation, providing curbside service and free bins, and utilizing public education programs all contributed to higher participation rates. Same-day recycling and garbage pickup, and permitting commingling did not seem to significantly impact participation rates.

Fullerton, Don; Kinnaman, Thomas. Garbage, Recycling, and Illicit Burning or Dumping. National Bureau of Economic Research Working Paper # 4374. May, 1993.

Analysis of an economic model of household waste disposal behavior shows that given three disposal options, collection, recycling, and illicit disposal, a unit fee would lead to some burning or dumping. However, a disposal tax on products, coupled with rebates for proper waste disposal, would encourage legal disposal of garbage. The study is purely theoretical and involves no empirical data.

Fullerton, Don; Kinnaman, Thomas. Household Demand for Garbage and Recycling Collection with the Start of a Price per Bag. National Bureau of Economic Research Working Paper # 4670. March, 1994.

A survey of a random sample of 75 Charlottesville, Virginia, households measured household garbage generation before and after the city implemented a unit pricing system. The survey found that while recycling increased 15 percent and the volume of garbage was reduced by an average of 37 percent, the weight of garbage was only reduced 14 percent. The authors concluded that residential trash compaction accounted for the difference between the volume reduction and the weight reduction. The survey also showed that approximately 28 percent of the total reduction was accounted for by illegal disposal. The authors based this figure on respondents that indicated they used "other means," as opposed to recycling, composting, and demanding less packaging at stores, to reduce their waste.

Goldberg, Dan. "The Magic of Volume Reduction." Waste Age. February, 1990.

Unit pricing has led to reduced levels of garbage and increased recycling participation in several communities that have adopted the pricing system. In St. Paul, Minnesota, household participation in the recycling program increased on average from 15 percent to 32 percent. In Olympia, Washington, there was a 50 percent increase in the number of residents utilizing a smaller can. Illegal dumping is a potential concern with a unit pricing system, but it has not been a problem in Perkasie, Pennsylvania, or Seattle, Washington. Generally, problems with the system appear when it is first implemented, and they can be quickly corrected. Finally, 93 percent of Perkasie residents who were asked their opinion of unit pricing approved of the system. It has met with similar citizen satisfaction in other communities.

Harder, Greg; Knox, Linda. "Implementing Variable Trash Collection Rates." Biocycle. April, 1992.

Variable rate systems in 36 Pennsylvania communities have shown success at reducing garbage generation and encouraging recycling. Citizen education at the outset of a unit pricing program is a critical element of the system. Communities should also be aware of the potential for backyard burning or illegal dumping, and take proactive steps to prevent such behavior. Other problems common to the 36 municipalities in this report were: bags that tear or are attacked by animals, tags that fall off, illegal grass dumping, service to apartments, and the use of counterfeit bags. The authors present case studies of Carlisle, Perkasie, and Forest City. They also describe the failure of unit pricing in Nanticoke, which lost 68 percent of its municipal customers when it switched to variable rates. The failure seemed largely due to the lack of a curbside recycling program in the town.

Hayes, Jeffrey. "Let the Market Replace the Madness: How to Control Rising Solid Waste." Public Works. December, 1992.

The author advocates variable rate pricing as a tool to reduce waste. Variable rates not only encourage recycling, but they also induce garbage reduction, a preferable waste management strategy. Under unit pricing, Somersworth and Dover, New Hampshire, have reduced their residential waste by 50 percent. The structure of variable rate systems vary with different receptacles and different pricing schemes.

Hong, Seonghoon. An Economic Analysis of Household Recycling of Solid Wastes: The Case of Portland, Oregon. Ph.D. Dissertation. Department of Agriculture and Resource Economics. Ohio State University. November 21, 1991.

The author designed a model of household waste generation behavior and applied it to Portland, Oregon, to see how a marginal pricing system, as well as other socio-economic factors, affect recycling behavior and the demand for garbage collection services. The analysis showed that increasing the price of collection increased household recycling participation, but did not significantly reduce demand for garbage collection services. Education level and value of time were also significant factors influencing households' degree of recycling participation. Income was a determinant of total waste generation, but demand for collection services was inelastic with respect to income.

Jenkins, Robin. The Economics of Solid Waste Reduction. Edward Elgar Publishing, Ltd., 1993.

This book grew out of Jenkins' dissertation on the same subject. The author presents a model for residential waste generation that shows that user fees can have a significant impact on the level of waste generation, and that society's welfare gain from switching to unit pricing is substantial. The book also looks at commercial generation of solid waste and concludes that increasing already existing unit fees can have a significant impact on waste generation levels. The book contains a literature review, models of household and firm waste generation behavior, demand equations for residential and commercial waste collection services, descriptions of the elements of the model, and the results of manipulating the model. The author studied five unit pricing communities (San Francisco, California, Estherville, and Highbridge, New Jersey, and Seattle and Spokane, Washington) and four flat fee communities (Hillsborough County and St. Petersburg, Florida, Howard County, Maryland, and Bernalillo County, New Mexico).

Kemper, Peter; Quigley, John M. The Economics of Refuse Collection. Ballinger Publishing Company, Cambridge, MA. 1976.

The authors provide a general overview of the economic issues in waste collection. Chapter five surveys the issues involved in a system employing user charges. They compare user charges to two other financing mechanisms: general revenues and service fees. The chapter addresses efficiency in theory, equity, federal income tax deductibility, revenue from tax-exempt institutions, and efficiency in practice. The authors note that "true user charges are rare" and do not provide much empirical evidence of the issues they discussed.

Lambert, Abigail F. Rate Proposal for a Weight-Based Pricing System for Residential Waste Collection in Durham, North Carolina. Master's Project, School of the Environment, Duke University. 1991.

The author contends that the city of Durham, North Carolina, which currently funds residential garbage collection through general property tax revenues, ought to consider implementing weight-based rates to finance its collection service. Weight-based rates would send a more accurate pricing signal to city residents and might reduce waste and encourage recycling. Five issues that the city would need to be aware of before implementing a variable rate system are the need for political support and aggressive public education, the impact of variable fees on low-income residents, potential problems with illegal dumping, and necessary departmental changes. Lambert conducted an economic analysis of Durham's waste management system, considering collection costs, disposal costs, the added costs of a weight-based system, and estimated environmental and social costs. Based on this analysis, Lambert presented five options for a weight-based rate structure. She recommended a system that uses variable fees to cover landfill disposal costs, including environmental and social costs, and continues to finance the other costs of waste collection through property taxes. Such a system would give some price incentive to residents, but would still provide a stable revenue stream for the collection system. The author also recommended reduced rates for lower-income residents.

Lewis, Thomas A. "Waste Not, Want Not." National Wildlife. June/July, 1993.

As landfills across the country approach capacity, disposal costs rise, and per capita waste generation continues to increase, source reduction has become a top priority for solid waste managers. Recycling is gaining popularity, both among solid waste officials and private citizens. Unit pricing provides an inducement to recycle, and to reduce the amount of waste put out for collection. Seattle, Washington, and Perkasie, Pennsylvania, have both had successful variable rate systems.

Menell, Peter S. "Beyond the Throwaway Society: An Incentive Approach to Regulating Municipal Solid Waste." Ecology Law Quarterly. Vol. 17, 655. 1990.

Traditional pricing systems for garbage collection do not provide incentives for reducing waste or manufacturing products that produce less waste. The authors use an economic framework to analyze a variety of policy options for correcting this market distortion. The article provides an overview of the waste stream and available technologies for collecting and regulating waste, describes traditional flat rate or tax financed systems for funding waste disposal, and examines alternative methods, including curbside charges, retail disposal charges, and two-tier charges. According to the economic model, variable rate pricing and/or retail charges based on the disposal cost of different products are the best waste management strategies. They provide an accurate pricing signal to households and product suppliers. Local governments are best suited for designing the ideal solid waste regulatory system for their specific localities. The federal government can provide information and correct macroeconomic distortions, and the states can coordinate various local policies. The article is primarily theoretical, although it does briefly describe unit pricing systems in Seattle, Washington, and Perkasie, Pennsylvania.

Miedema, Allen K. "Fundamental Economic Comparisons of Solid Waste Policy Options." Resources and Energy. Vol. 5. 1983.

The author developed a macroeconomic model to analyze the effects of several waste management policy mechanisms. Miedema compared user fees, recycling subsidies, disposal charges, and litter taxes to the status quo (i.e., none of these policy mechanisms were in effect). He analyzed the real income effects, net waste effects, waste generation and resource recovery effects, and recycling rate effects for these four policy tools given three different policy scenarios (the scenarios varied according to hypothesized changes in the diseconomies of scale for recycled materials suppliers and virgin materials suppliers). He found that user fees and litter taxes always had the same effects. The disposal charge always had a larger real income effect and the smallest net waste collected and disposed. In two out of the three simulations, the disposal charge had the highest recycling rate, while the recycling subsidy had the highest recycling rate in the simulation characterized by greater diseconomies of scale for virgin materials suppliers.

Miller, Chaz. "Pay as You Throw: Less Weight? More Stuffing!" Waste Age. September, 1993.

Unit pricing has been touted as a way for municipalities to encourage higher recycling participation and reduce household waste generation. However, the system can also encourage overstuffing of garbage receptacles, illegal burning and dumping, and contamination

of recycling receptacles with nonrecyclable material. Can-based systems have complicated billing requirements. On the other hand, bags can tear and tags can be separated from set-outs. Furthermore, variable rates may be unfair to lower-income residents, and political support for unit pricing is lacking in many areas. The author contends that there is no conclusive evidence that variable fees reduce residential waste generation. He bases most of his conclusions on anecdotal evidence and interviews with a few solid waste professionals.

Minnesota Pollution Control Agency. State Solid Waste Policy Report: A Focus on Greater Minnesota.

A review of Minnesota's waste management system. The report examines historical and contemporary statewide programs, county initiatives, industrial and residential waste generation trends, waste collection and transportation systems, and collection system costs. The report also highlights public education efforts, and waste reduction, recycling, composting, waste-to-energy, and land disposal programs. Unit pricing is reviewed briefly, and St. Louis Park, a unit pricing town, is mentioned in the report.

Miranda, Marie Lynn; Everett, Jess W.; Blume, Daniel; Roy, Barbeau A., Jr. "Market-Based Incentives and Residential Municipal Solid Waste." Journal of Policy Analysis and Management. Vol. 13, No. 4. 1994.

The authors gathered waste generation data from 21 unit pricing communities. The data showed municipal waste generation before and after the implementation of variable rates. The average reduction in tonnage of waste landfilled was 40 percent, with a high of 74 percent and a low of 17 percent. Recycling increased, on average, by 126 percent, with a high of 456 percent and a low of 3 percent. The average reduction in overall waste generation was 40 percent, with an average recycling rate of 19 percent. Even accounting for illegal disposal and measurement error, the authors concluded that some of the waste reduction must have resulted from source reduction behavior. There were few problems among the 21 municipalities with illegal dumping. Burning was a problem in three of the cities, but it seemed to only account for about 20 percent of the total waste reduction. Burning stopped in Perkasie, Pennsylvania, when the city adopted an antiburning ordinance.

Moriarty, Patrick. "Financing Waste Collection for Maximum Diversion." Biocycle. January, 1994.

Illinois has set a statewide waste diversion mandate of 25 percent by 1996. The author surveys 23 municipalities in the Chicago area to determine how localities are responding to the mandate. Seven of the 23 communities have changed their rate structures since 1988,

six of them adopting some form of variable collection fees. The average fee among the flat rate communities was $11.60, while the average per-bag fee in Downers Grove, Hoffman Estates, and LaGrange Park was $1.40. Thus, members of a household that put out less than two bags of garbage per week under the variable fee systems would spend less for waste collection than they would have under a flat rate system. The unit pricing communities also had higher recycling participation rates than the flat fee communities, and higher percentages of total waste recycled. The average tonnage recycled for flat fee communities was 18 percent, while for Hoffman Estates it was 31 percent and for Downers Grove it was 28 percent. The author also provided a case study of Hoffman Estates that described that community's program.

Morris, Glenn E.; Holthausen, Duncan M., Jr. "The Economics of Household Solid Waste Generation and Disposal." Journal of Environmental Economics and Management. Vol. 26. 1994.

The authors designed a model of household waste disposal behavior, taking into account various disposal options (including garbage pickup, recycling, and source reduction) and fee levels, both flat and variable. The simulation showed that households' elasticity of demand with respect to price for solid waste collection services varied significantly with the price of that service. Supported by actual waste and demographic data from Perkasie, Pennsylvania, the model showed that a typical household's utility was higher with variable rates than with a fixed rate system. Furthermore, as the user charge increased, households responded with greater waste minimization behavior and less recycling. Emphasizing one type of disposal option, recycling, for example, could dampen households' incentive to pursue another type, such as source reduction.

"New Jersey Town Weighs in on Trash by the Pound: Mendham, New Jersey." World Wastes. February, 1993.

This article presents an interview with the recycling coordinator of Mendham Township, New Jersey. Mendham switched to variable rates after its successful recycling program reduced residents' need for garbage collection services. The town went from two collections to one each week and its households each saved an average of $200 annually. Recycling increased 83 percent, garbage was reduced 55 percent, and the town has saved money. The town has not experienced dumping or other significant problems. According to the coordinator, before adopting unit pricing, a municipality should consider whether a majority of residents will benefit financially from the system. The community might also want to consider having a base charge to cover fixed collection costs, and basing the variable rates on the city's disposal costs.

Norris, James L. "Recycling and Computerized Garbage Tracking Cut City's Costs." Public Works. February, 1994.

Athens, Ohio, facing a state-mandated 25 percent waste reduction goal, adopted a multi-tiered rate system for garbage collection to induce greater participation in the town's recycling program. Since its inception in 1982, the curbside recycling program has already reduced waste by as much as 50 percent. Athens also has a computerized billing system that keeps track of the amount of garbage each resident puts out for collection each week. The system is easy to use and has eliminated inaccuracies resulting from human error.

Owen, Melissa. "Integrated Waste Minimization (With Composting)." Biocycle. April, 1994.

Plano, Texas, has an aggressive yard waste diversion program. The program includes a "Don't Bag It" Lawn Care Plan, which reduced yard trimmings collection by 50 percent from 1991 to 1993, a backyard composting program, and biodegradable collection bags (20 for $5). Collected yard waste goes to a centralized composting facility. Plano's waste management system also includes a higher garbage collection fee for household waste in excess of the city-provided 95 lb container.

"Pay-As-You-Throw Shows Rapid Growth." Biocycle. August, 1993.

A recent Reason Foundation study shows that over 1,000 communities have adopted some form of variable rate pricing for garbage collection, and the number is rapidly increasing. Moreover, the towns report average reductions of 25 percent to 45 percent in the amount of waste sent to disposal facilities.

Project 88 - Round II. Incentives for Action: Designing Market-Based Environmental Strategies. A Policy Symposium Sponsored by Senator Timothy Wirth and Senator John Heinz. May, 1991.

The symposium explored market-based solutions to environmental problems. Unit pricing was examined as a way to reduce waste generation by providing a better pricing signal to residents than traditional flat rate systems. While variable rates are implemented at the local level, the federal government can act as an information clearinghouse and can facilitate local efforts to implement unit pricing. Seattle, Washington, and Perkasie, Pennsylvania, have both experienced success with unit pricing, and problems like illegal dumping and the disparate impact of variable fees can be alleviated with proactive efforts on the part of the municipality. Perkasie reduced billing costs by using bags instead of varying prescription can sizes.

Reschovcky, James D.; Stone, Sarah E. "Market Incentives to Encourage Household Waste Recycling: Paying for What You Throw Away." Journal of Policy Analysis and Management. Vol. 13, No. 1. Winter, 1994.

Unit pricing, which sends a more accurate pricing signal to households than traditional flat collection fees, has reduced waste and encouraged recycling in cities like Seattle, Washington, and High Bridge, New Jersey. There are, however, practical concerns with unit pricing: rates are difficult to set, revenues are hard to predict, illegal dumping could occur, administrative costs may be high, variables fees could have a regressive impact on low-income residents, common receptacles in multi-unit housing complexes preclude application of variable rates, and politicians may be unwilling to risk unpopularity. The authors studied unit pricing in Tompkins County, New York. They surveyed 3,040 random households and performed a statistical analysis of the survey results. They found that curbside service had the greatest impact on recycling participation. While variable rates alone seemed to have only a minor impact, the combination of unit fees, curbside service, and mandatory recycling had the largest impact on participation. The survey was unclear on the potentially regressive impact of variable fees, and it found no evidence that the pricing system encouraged illegal dumping, although 51 percent of the residents surveyed said littering had increased, and 20 percent said they burned their trash. Two-thirds of the respondents said they favored unit pricing.

Richard, Bill. "Recycling in Seattle Sets National Standard but Is Hitting Snags." Wall Street Journal. August 3, 1993.

The author contends that Seattle will have trouble reaching its 60 percent recycling goal. According to the article, most avenues for increasing the rate of recycling have been exhausted, and it will require draconian measures to make 60 percent. The article also questioned the savings the city was receiving from recycling, and said there was a glut in the market for recyclables. Finally, the author provided anecdotal evidence that residents were stomping on their garbage, rather than actually reducing it or recycling more.

Richardson, Robert A.; Havlicek, Jr., Joseph. "Economic Analysis of the Composition of Household Solid Wastes." Journal of Environmental Economics and Management. Vol. 5. 1978.

The authors analyze the social and economic factors that affect the quantity and composition of the household solid waste stream. The weekly per capita and per household quantities of eleven household waste components were analyzed: clear glass, green glass, brown glass, aluminum, other metals, newsprint, other paper, textiles, plastics, grass, and garbage/other. Waste generation is positively correlated with income, age, and

household size, and negatively correlated with ethnic background (percentage of black households in a census track). Results indicate that if glass, plastics, textiles, paper, and metals were recovered through recycling and incineration for energy production, around 53 percent of the summer household waste stream could be diverted from landfills. The economic feasibility of such resource recovery was not discussed.

Savas, E.S.; Baumol, Daniel; Wells, William. "Financing Solid Waste Collection." The Organization and Efficiency of Solid Waste Collection. Lexington Books. 1977.

This is a chapter in Savas' book. The authors examined the effect of different methods of financing solid waste collection on the amount of residential waste generated and the cost of the collection service. They relied on a survey of private citizens living in communities with a variety of collection systems. According to the survey, variable rates had little effect on either the amount of waste generated or the level of service requested. They also found that unit fees, whether flat or variable, increased billing costs for municipalities. Finally, they found that because local taxes are deductible from federal income tax returns, there was an incentive for communities to raise taxes to pay for garbage collection rather than institute user fees. These findings were based on comparisons of waste generation figures, service levels, and collection costs across tax financed, flat fee, and variable fee collection systems.

Scarlett, Lynn. Mandates or Incentives? Comparing Packaging Regulations with User Fees for Trash Collection. Reason Foundation. Publication No. 158. May, 1993.

U.S. and Massachusetts solid waste management policy is beginning to address the nation's growing garbage crisis by stressing source reduction and recycling. Massachusetts is considering a state-level initiative that would set recycled content requirements for consumer products and require reusable, reduced, or recycled packaging. An alternative market-based solution is unit pricing for residential waste collection. Unit pricing would create an incentive among consumers to source reduce, and that would cause producers to respond with reduced or recyclable packaging and products. The author reviews problems with recycling markets and reports on the success of unit pricing in communities like Perkasie, Pennsylvania, and Seattle, Washington. She identifies illegal disposal, garbage compaction, citizen resistance, and the impact of variable fees on low-income residents as outstanding issues. The author conducts a cost-benefit comparison of packaging mandates and user fees for trash collection. She compares the reduced waste benefits of each system and their implementation costs. The author concludes that unit pricing can have a greater impact on the waste stream than packaging mandates, and it would be $210 to $215 cheaper per household each year.

"Seattle Engineers Say: Variable Can Rate Encourages Recycling." Waste Age. November, 1985.

Since the start of unit pricing in Seattle in 1980, recycling tonnage has increased 60 percent. Also, the city's per capita waste generation rate climbed more slowly than other cities' rates. Moreover, 80 percent of the city's residents favor the system, and it had a 91.5 percent compliance rate.

"Seattle Stomp." Garbage. Spring, 1994.

A short description of the "Seattle stomp" phenomenon. Residents in Seattle and other unit pricing communities compact their trash to avoid higher collection fees. The author makes no effort to quantify the problem. Strategies to combat the "stomp" include weight-based fees and instructing haulers to not collect receptacles that are overloaded.

Shanoff, Barry. "Communities Switch to By-the-Bag Billing System." World Wastes. October, 1992.

A report on the successes of unit pricing in several communities with variable rate systems. Utica, New York, Chester Township, New Jersey, Stonington, Connecticut, and Seattle, Washington, have all adopted unit pricing. Each community's system has different features and different fee schedules. Proponents of variable rates argue that it is fairer than flat fees: those that produce less trash should be able to pay less. In some unit pricing communities, residents that reduce their waste pay significantly lower garbage collection fees than they did under a flat rate system. Unit pricing can also encourage illegal dumping, but localities have responded by locking commercial dumpsters.

Sherman, Steven. "Local Government Approaches to Source Reduction." Resource Recycling. September, 1991.

In recent years, solid waste management policy has emphasized source reduction as a waste management strategy. Decreased solid waste generation can be accomplished by: reduced product weight or volume, reduced packaging, increased product durability, alterations in consumer purchasing patterns, greater efficiency in manufacturing processes, composting and other organic waste reduction techniques, and changes in the waste stream making it less hazardous. Strategies available to local governments to encourage waste reduction include public education, economic incentives, legislative mandates, on-site composting, and hazardous waste reduction. One of the economic incentives the author mentions is unit pricing. Unit pricing can be implemented by using metered bags or tags, or subscription containers. It provides a clear pricing signal to households that can lead to source reduction and increased recycling participation. It also influences consumer behavior, which will cause producers to respond with reduced product packaging.

Skumatz, Lisa A. Variable Rates for Municipal Solid Waste: Implementation Experience, Economics, and Legislation. Reason Foundation. Publication No. 160. June, 1993.

Unit pricing programs have a variety of different features. They can use bags, tags, or prescription cans, they may be city-run or contracted out to a private hauler, they are often accompanied by various complementary programs, including curbside recycling and backyard composting, and they sometimes have special features for servicing multi-unit housing or helping low-income residents. Successfully implementing unit pricing requires political support, the involvement of all concerned parties, citizen education, and program flexibility. Variable rates in cities like Seattle, Washington, and Perkasie, Pennsylvania, have reduced landfilled waste and increased recycling participation. Concerns about the program include illegal dumping, backyard burning, and unstable hauler revenues. Three states, Washington, Minnesota, and Wisconsin, have laws requiring variable fees for waste collection. Indiana, Oregon, Pennsylvania, Missouri, Vermont, Illinois, and Montana all encourage local authorities to use unit pricing. The author lays out four steps for evaluating the performance of a unit pricing program: 1) determine the level of participation, 2) measure any changes in residential waste disposal patterns, 3) assess the linkage between variable rates and the observed changes in disposal behavior, and 4) identify the net benefit and cost effectiveness of the program.

Skumatz, Lisa; Van Dusen, Hans; Carton, Jennie. "Garbage by the Pound: Ready to Roll with Weight Based Fees." Biocycle. November, 1994.

Several communities across the country have run weight-based pricing pilot programs. They include Seattle, Washington, Columbia, South Carolina, Durham, North Carolina, Milwaukee, Wisconsin, and Farmington and Minneapolis, Minnesota. Residents participating in Seattle's program reduced their waste, by weight, an extra 15 percent. Collection times did not increase in Columbia during its pilot study. The scales used in Durham's test did not meet some accuracy standards, but those deficiencies have since been corrected by the manufacturer. Milwaukee was scheduled to run a test in the fall of 1994, and Farmington and Minneapolis, though their pilot studies went well, have put plans to fully implement weight-based rates on hold. Though weight-based systems incur high initial costs, communities can achieve long-term savings from reduced waste.

Skumatz, Lisa A.; Zach, Philip A. "Community Adoption of Variable Rates: An Update." Resource Recycling. June, 1993.

Spread across 26 states, variable rate systems are often adopted in response to increasing tipping fees, a desire to increase recycling efforts, and statewide or regional diversion requirements. Some of the issues involved with implementing a variable rate system include its compatibility with the existing collection system, the size of the community, illegal dump-

ing, and multi-family housing facilities. Political support for the system is crucial, design planning is important, and the system should include a strong citizen education effort.

Sproule, Kimberly A.; Cosulich, Jeanne M. "Higher Recovery Rates: The Answer's in the Bag." Resource Recycling. November/December, 1988.

The authors surveyed 12 per-unit fee systems, and the article describes five of them: Holland, Michigan, Perkasie, Pennsylvania, Woodstock, Illinois, Newport, New York, and High Bridge, New Jersey. It also provides basic information, such as container type, fee, and complementary programs offered, for all 12. The five cities described in the article all reported success with their systems, although reduction rates are not given for all of them.

Stavins, Robert N. "Market Forces Can Help Lower Waste Volumes." Forum for Applied Research and Public Policy. Spring, 1993.

In response to tougher federal regulations and the need for more effective waste management strategies, communities have experimented with a number of innovative systems. They include different pricing schemes for waste collection services, including unit pricing, retail disposal charges and virgin material charges, tradeable permits for industry-wide recycling mandates, and a deposit/refund system for discouraging illegal disposal of waste. The author uses Seattle's unit pricing system as an example.

Stevens, Barbara. Pricing Schemes for Refuse Collection Services: The Impact on Refuse Generation. Research Paper No. 154. Columbia University Graduate School of Business. January, 1977.

A variable rate pricing scheme is administratively feasible, and it would convey to consumers the true cost of waste disposal. The author uses an economic model of household waste generation behavior to predict the effect of variable rates for refuse collection on the demand for those services. She also conducted a survey of 93 cities with variable fee systems. She found that for a 10 percent increase in the price of collection, demand for service went down 9 percent. However, refuse generation only decreased by 0.5 percent to 1.17 percent.

Stone, Sarah; Harrison, Ellen. "Residents Favor User Fees." Biocycle. August, 1991.

Tompkins County, New York, has a county-wide unit pricing program for waste collection. The authors surveyed 3,034 randomly selected households in the county and received a 49 percent response rate. Sixty-three percent of the respondents were "very much in favor" or "somewhat in favor" of the county's variable fee system. Fifty-one percent said they recycled more because of the program, 16 percent said they composted more, and 39 percent said they were more attentive to product packaging when they shopped.

"Taking the Innovative Approach to Waste Hauling." Biocycle. July, 1993.

Tom Kraemer Sanitation Co. provides collection service to a half-dozen small towns in Minnesota near St. Cloud. The hauler charges a flat base rate and sells tags for each 30-gallon container put out for collection. It also uses a truck-based co-collection system for garbage and curbside recycling. The hauler saves money from reduced disposal costs, and brings in increased revenue from the sale of recyclables.

U.S. Conference of Mayors. A Primer on Variable Rate Pricing for Solid Waste Services. June, 1994.

An introductory brochure for municipalities considering a unit pricing system. Unit pricing passes variable waste disposal costs onto the household producers of garbage. It encourages waste reduction and increased recycling. It is fair, it helps to conserve landfill space, and it increases collection efficiency. Unit pricing systems can use prescription cans, bags, or tags, and can be based on weight, volume, or a hybrid of flat rates and variable rates. Implementation issues include ensuring sufficient revenues, the impact on poor residents, illegal dumping, public acceptance, recycling contamination, and service to multi-unit housing. To develop a successful program, localities must clearly define their goals, develop a complete plan, start with a pilot study, obtain political support, and develop a public education strategy.

U.S. EPA. "EPA Probe of Household Waste Reduction to Focus on Per Volume Charge." Inside EPA. August 10, 1990.

This article concerns EPA's evaluation of the pros and cons of variable rate pricing to determine if the Agency should recommend it as a waste reduction incentive. The EPA study involved weighing the costs and benefits of unit pricing, as compared to flat rate pricing for garbage collection service. Unit pricing provides a clearer pricing signal to households, but it could also lead to illegal waste disposal and higher administrative costs. The Agency is unlikely to seek national unit pricing legislation, but may incorporate variable rates into its waste reduction guidelines for localities.

U.S. EPA. Waste Prevention, Recycling, and Composting Options: Lessons Learned from 30 Communities. EPA530-R-92-015. February, 1994.

This report focused on various strategies for municipalities to reduce net waste through composting, recycling, and education. The report details approaches to increase levels of composting and recycling, as well as improving materials recovery from commercial activities and construction. The report provides a brief overview of variable refuse rates, and further comments on the positive effects of variable pricing on recycling participation

and source reduction. Three additional volumes provide case studies on rural areas, suburbs and small cities, and urban areas.

Wertz, Kenneth. "Economic Factors Influencing Households' Production of Refuse." Journal of Environmental Economics and Management. Vol. 2. 1976.

The author uses a series of economic models to determine the impact of several waste collection service options on the level of household garbage generation. He also surveys six communities in the Detroit area and studies the collection system in San Francisco. There is an economic externality associated with traditional flat rate pricing systems for waste collection. Flat rates do not take into account the marginal disposal cost of incremental levels of garbage. Increasing flat rates somewhat decrease waste generation, but only through an income effect. There will be no substitution to lower waste generating behavior. However, variable rate pricing will more directly encourage waste reduction. The author also concluded that waste generation increases with income, with more frequent municipal collection service, and with less convenient collection sites (i.e., curbside rather than backdoor).

Zimmerman, Elliott. Solid Waste Management Alternatives: Review of Policy Options to Encourage Waste Reduction. A Report to the Illinois Department of Energy and Natural Resources, Energy and Environmental Affairs Division. February, 1988.

Waste reduction should be a top priority for the state of Illinois. Unit pricing is one financial incentive that could be used by localities to encourage households to reduce garbage put-outs and increase waste reduction and diversion efforts. There are three potential drawbacks to this pricing method. First, a 1979 EPA study found no statistically significant relationship between variable rates and garbage generation, so unit pricing might not have an impact on residential waste. Also, user fees, unlike property taxes, are not deductible from federal tax returns, so residents could lose money in increased tax payments. Finally, federal revenue sharing arrangements do not take into account user fees as local tax revenue, so municipalities could lose federal support by lowering property taxes in favor of variable rates.

Additional Sources of Information

Angelo, James J. Should Brevard County, Florida Adopt a Unit Pricing Program for Municipal Solid Waste? Undergraduate Honors Project; Sanford Institute of Public Policy, Duke University. April, 1993.

Felton, Mary K. "A Snapshot of Waste Generation and Recovery." Resource Recycling. January, 1995.

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

Franklin Associates, Ltd. The Role of Recycling in Integrated Solid Waste Management to the Year 2000. Prepared for Keep America Beautiful, Inc. September, 1994.

Guerrieri, Tony M. An Assessment of Unit Pricing for Municipal Solid Waste. A Report for the Pennsylvania Joint Legislative Air and Water Pollution Control and Conservation Committee. September, 1994.

Hong, Seonghoon. An Economic Analysis of Household Recycling of Solid Wastes: The Case of Portland, Oregon. PhD Dissertation. Department of Agriculture and Resource Economics, Ohio State University. November 21, 1991.

Jenkins, Robin. Municipal Demand for Solid Waste Disposal Services: The Impact of User Fees. PhD Dissertation. Department of Economics, University of Maryland. 1991.

Miranda, Marie Lynn; Aldy, Joseph E. Unit Pricing of Residential Municipal Solid Waste: Lessons from Nine Case Study Communities. School of the Environment, Duke University. 1995.

Skumatz, Lisa A. "Introducing the Hybrid Variable Rate System." Biocycle. November, 1993.

Toomey, William A. "Meeting the Challenges of Yard Trimmings Diversion." Biocycle. May, 1994.

Software

Pay-As-You-Throw Rates Model

MSW Factbook

Software

Notice

For planners considering pay-as-you-throw, establishing an effective rate structure—one that generates enough revenues to cover the costs of MSW services—can be a real challenge. There are several different methods, however, that you can use to come up with the right container prices.

If you're in a community with a complex array of MSW services or need to ensure that all program costs are completely covered, the Pay-As-You-Throw Rates Model software (now called the Pay-As-You-Throw RateMaker) may be a useful tool for you. Designed to enable planners to input all relevant costs and arrive at the optimal per-bag or per-can fees, **RateMaker Version 1.0 is currently under development. If you would like to receive a copy of this tool when it becomes available, please complete and return the order form at the bottom of this page.**

Some communities may opt for a different approach. If you're in a smaller community or are not required to cover all costs with your per-container fees, you might simply consult with neighboring cities and towns (or communities elsewhere in the country with similar demographics) that already use pay-as-you-throw, adjusting their prices as needed to arrive at an appropriate rate structure.

Other options for developing a rate structure are included in this tool kit. In the Guidebooks section, you can refer to Part III of *Pay-As-You-Throw: Lessons Learned About Unit Pricing* for information and advice on rate structure design. In addition, the *Pay-As-You-Throw Workbook* in the Workbook section of this tool kit contains worksheets (beginning on page 121) that can help you arrive at rates based on local demographic and solid waste generation data.

EPA is continuing to develop materials for communities that have or are considering implementing a pay-as-you-throw program. Be sure to visit our homepage at www.epa.gov/epaoswer/non-hw/payt for the latest information.

Pay·As·You·Throw

RateMaker

To obtain your copy of RateMaker, please complete and fax or mail this order form to:

Yes, please send me _____ copies of RateMaker Version 1.0 as soon as it becomes available.

Note: RateMaker is an application for PC-compatibles running Microsoft Excel for Windows.

U.S. EPA Pay-As-You-Throw
110 Hartwell Avenue
Lexington, MA 02173
Fax: 617-674-2851

You can also order by phone.
Call the Pay-As-You-Throw
Helpline toll-free at 1-888-EPA-PAYT.

Name: _____ Title: _____

Organization: _____

Address: _____

City/State/Zip _____

Phone: _____ Fax: _____