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Recycling Works!

State and Local Solutions to Solid Waste Management Problems

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Recycling Works: An Overview

The average American produces more than 1,600 pounds of trash a year! As this proliferation of waste continues, we all must accept responsibility for reducing the amount of garbage we throw away. Recovery for recycling (including composting and yard trimmings) continues to be one of the most effective waste management techniques.

Recycling turns materials that would otherwise become waste into valuable resources. And, it yields environmental, financial, and social returns in natural resource conservation, energy conservation, pollution prevention, and economic expansion and competitiveness.

It is often the job of state and local governments to deal with our trash. Every state has at least one authority, agency, commission, or department responsible for managing the disposal of refuse generated by its citizens. Usually, local authorities handle collection and disposal, but private companies are also frequently hired to manage trash.

In some jurisdictions, trash appears to be a minor problem and is easily buried in a landfill. But, to cut down on the amount of trash requiring disposal, many communities have turned to recycling and discovered that it works!

This booklet provides information about successful recycling programs initiated by state and local agencies. It also describes private recyling efforts and public-private partnerships between government and businesses. Each success story provides basic information to help you as you consider recycling options for your community.

The National Picture

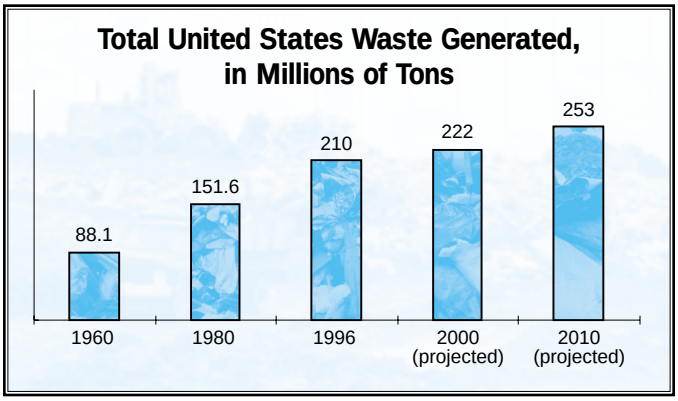
As a nation, we produce an unthinkable amount of municipal trash. Our current rate of 210 million tons per year could fill a convoy of 10-ton trash trucks nearly 90,000 miles long—enough to circle the equator nearly eight times! To make matters worse, the amount of refuse generated in the United States is projected to increase by about 16% by the year 2010.

We now recycle 30% of our municipal solid waste. This is a marked increase from the 10% recycling rate in 1990. Incineration remains between 9% and 10%. Landfilling still handles the majority of disposal at 70%, but this continues to decline from its former lion's share of 89% in 1989.[1]

It no longer makes sense to think of municipal solid waste management without considering the role of recycling. Average landfill tipping fees continue to increase nationwide.[2] More important, a sizeable portion of what we throw away contains valuable resources—metals, glass, paper, wood, and plastic—that can be reprocessed and used again as raw materials.

Integrated Waste Management

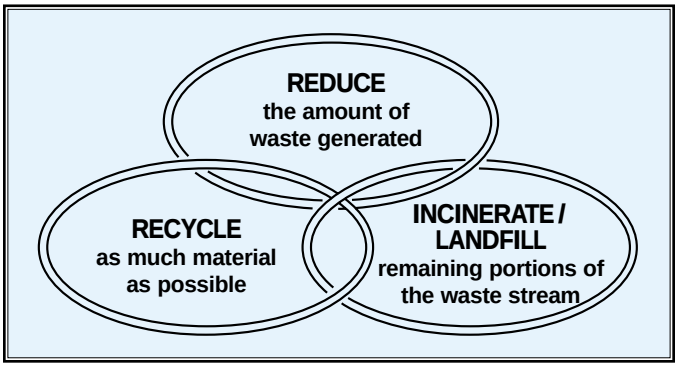
Many states and local governments have taken steps to prevent waste handling problems. Some are just beginning to evaluate the adequacy of their current waste management programs. Others have implemented an integrated solid waste management approach. As state and local governments plan for and implement integrated waste management, they usually consider a hierarchy of methods: reduce, recycle, and incinerate/landfill. Reducing waste—preventing it from needing to be dealt with at all—is generally the most favored management tool. Recycling—next in order of preference—helps to divert wastes from landfills and incinerators and provides for the reuse of resources. Incinerating/landfilling are considered co-equals and are next in the waste hierarchy. Incineration reduces volume and can recover energy, but may have some risks associated with it. Landfilling, while

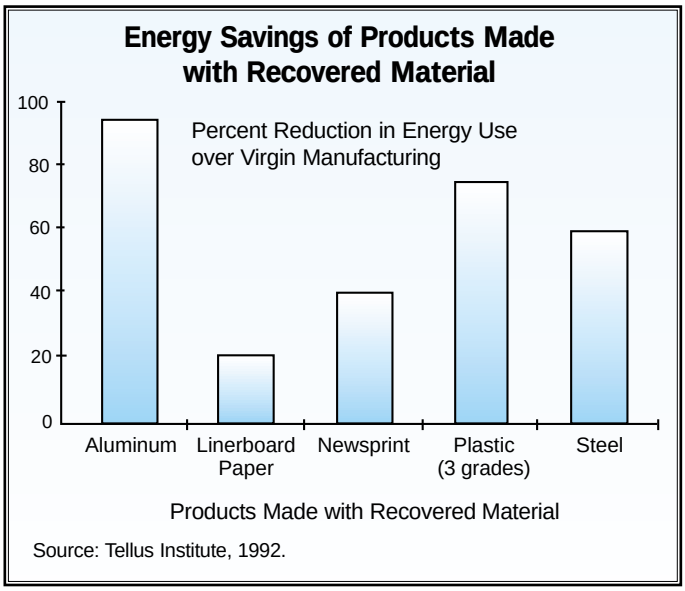


necessary to handle some wastes, can be very costly and may involve some risks. In most communities, locating landfill and incinerator sites is a problem as well.

A number of agencies have recognized the value of including recycling as part of their solid waste management programs and have developed a variety of methods to do so. In fact, by 1997, approximately 51% of the U.S. population (135 million people) had access to the nation's 8,937 curbside recycling programs. In addition, there were 12,700 drop-off centers for recyclables, and 3,484 yard trimmings composting programs. There were also 142 composting projects that handled municipal biosolids, that is, "select organics" such as separated food residuals and industrial organics.[3]

Components of construction and demolition (C&D) wastes are candidates for recycling, too. Preliminary estimates indicate that approximately 1,800 C&D recycling facilities exist in the United States. To reduce waste and cut the costs associated with building demolition, more and more companies are turning to deconstruction, which is the selective dismantling or removal of materials from buildings to be sold for reuse or recycing. Results of deconstruction projects so far indicate that the practice is a cost-effective alternative to demolition, costing an estimated 30% to 50% less than demolition. In the area of residential construction waste management, the National Association of Home Builders Research Center predicts in *A Builder's Field Guide: How to Save Money and Landfill Space* that roughly 80% of a home builder's waste stream is recyclable and that waste management costs can represent as much as 5% of profit on a home.[4]





Recycling now plays a large role in the waste management programs. However, it can play a much larger role.

Why Recycle?

Recycling pays in a variety of ways. At the local level in some localities, recycled materials are sold, benefitting the recycling program. Additionally, the business of recycling expands U.S. manufacturing jobs and increases U.S. competitiveness. For example, a study of 10 northeastern states found that processing and remanufacturing recyclable materials in the region employed more than 103,000 people and added more than $7.2 billion to the value of the materials.[5] On a national level, the total market value for recyclables in 1995 was approximately $3.6 billion. Recycling reduces the amount of waste that needs to be buried in a landfill or incinerated. This reduction in volume may result in reduced disposal costs and add to the useful life expectancy of a landfill.

In addition to providing economic benefits, recycling offers environmental benefits. By reducing our reliance on virgin materials, recycling reduces pollution, saves energy, mitigates global climate changes, and reduces pressures on biodiversity. Here's how it works!

By decreasing the need to extract and process virgin materials, recycling helps reduce or eliminate the pollution associated with the first two stages of a product's development: material extraction and processing. Further, studies show that less energy is needed to manufacture products from recovered materials than from virgin materials.[6] Conserving natural resources, reducing pollution, and saving energy also yield a reduction in the emission of the greenhouse gases that contribute to global climate change and impact biodiversity.

A Recycling Component

Adding recycling to an existing municipal solid waste system is a challenging process. To begin, your community should consider the following approaches:

- Analyze the quantity and composition of your waste.
- Learn about existing waste disposal and collection systems, including their costs and capabilities.
- Determine to what degree recycling is already being conducted in your community.
- Identify public attitudes about recycling.
- Study which recycling options might best meet your special needs.
- Explore existing markets for recovered materials and the possibility of finding new ones.

Recycling Options That Work

Recycling programs come in many shapes and sizes. The type of recycling program you choose should be designed to meet your community's needs and must consider the potential markets for materials considered for recycling. For example, consider what kind of collection system would be the most expedient, the most convenient to citizens, and ultimately the most successful. And does it make sense in your community to target specific wastes—office paper, yard clippings, plastic soft drink bottles? Can large institutions such as hospitals be encouraged to participate?

What's Recyclable in the Waste Stream?

Plastics, Drink Bottles
Reprocessed for Auto Parts, Fiberfill, Strapping

Aluminum Cans
Reprocessed for Can Sheet and Castings

Construction Waste, Tires
Reprocessed for Pressed Board, Roads, and Other Construction Projects

Food Waste
Composted and used to amend soil

Other Metals
Cleaned and Reprocessed as Scrap and Structural Products

Paper
Mixed Paper, High-Grade Paper, Newspaper, Cardboard
Reprocessed as Printing and Writing Papers, Newsprint, Tissue Products, Paperboard, Insulation, Animal Bedding

Glass
Refilled or Cullet for Jars, Bottles, Construction Material

Furnishings and Clothing
Reused by Another Person

Yard Waste
Composted for landscaping

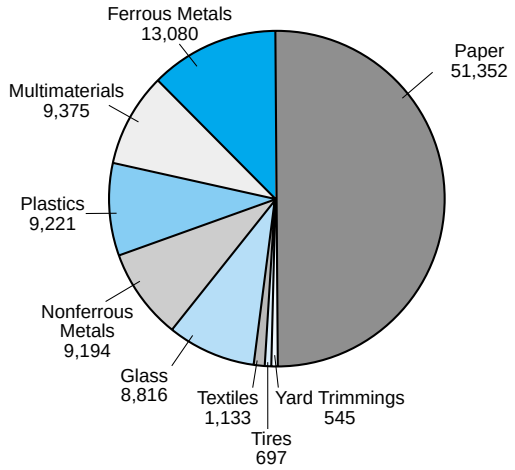
Collecting Recyclables

For citizens, the most convenient kind of collection is curbside collection. To make collection even handier, some communities provide households with special containers for recyclable materials. Some neighborhood pickups are combined with regular garbage collection; others use separate collection systems. Although curbside collection may require some additional costs, the success rate may make it worthwhile, especially in populous areas. In highly urbanized areas, apartment house and office building collection systems can work well, too.

In many communities, drop-off centers work well. These centers range from landfill locations, where people or machines sort recyclables, to "exchange corners." For example, the Wellesley, Massachusetts, drop-off site has a designated area where citizens can exchange reusable items such as books, games, and furniture. Financial incentives or contributions to charities encourage participation in other places. A number of communities locate drop-off centers in convenient spots such as shopping malls; some centers are even mobile. Often, centers are run by private groups or as joint private-public enterprises.

Obviously, most drop-off centers are less expensive to operate than curbside collection systems. However, drop-off centers typically yield less materials for reuse.

Summary of Recycling Jobs in the Northeast, by Material



Source: Roy F. Weston, 1994.

Choosing Recyclables

What is in a typical trash can in your community? If it is anything like the national average, you can expect the bulk of materials to be paper and paperboard products and yard waste. Newspapers can be recycled into a variety of materials. Yard clippings and leaves can be composted and used for landscaping. Businesses around the country are recycling computer paper and other high-grade paper, cardboard, and glass. And clean wood wastes can be processed into usable lumber or other products. Of course, metals, such as aluminum and steel, are valuable commodities as well.

Citizen Participation

Encouraging participation to increase the amount of recovered materials can be the greatest challenge to any recycling program. There are many ways to increase recovery and participation rates. Many communities have active promotional campaigns. Providing special containers for recyclables makes recycling more convenient. Some places have chosen mandatory over voluntary programs. Others rely on voluntary efforts, but use creative approaches to boost participation.

Incentives have been initiated in a number of communities. For instance, Philadelphia, Pennsylvania, has distributed over $150,000 of incentive money to community groups for the tons of materials they have diverted from the waste stream since 1993.

As recycling programs grow and ensure a steady volume of recovered materials, new markets have evolved. For example, Alabama's oil recycling program spurred development of a new multimillion dollar state-of-the-art refinery in south Alabama in 1995.

Marketing Recovered Material

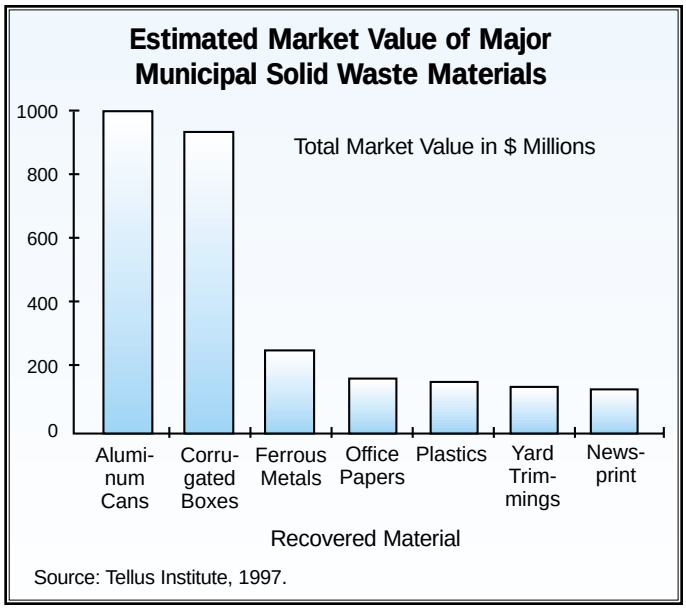
Identifying and developing markets for recovered materials is another major challenge for state and local recycling programs. A recycling market is any source of demand for recovered materials. To find the most suitable markets, many communities develop marketing plans. A typical plan may address the availability and locations of intermediate or end-use markets and the types and grades, amounts, specifications, transportation requirements, and price-setting mechanisms for a community's recovered materials. Services, such as storage and processing, may also be factors to consider. Many communities enter into contracts with purchasers, even though prices usually fluctuate. And some programs market cooperatively with neighboring programs to cut marketing costs.

In 1987, New Jersey's Office of Recycling published a guide to marketing recyclable materials. The guide has been updated several times since and can be found at http://www.state.nj.us.dep/dshw/recycle. The guide is one of several available sources of useful information on marketing recovered materials.

Developing markets is a continuing challenge to EPA, states, communities, industries, and consumers. Demand for recyclables needs to be stimulated; marketplace gluts need to be minimized; and industries, business, and household consumers need to buy products made with recycled materials. An innovative mechanism for buying and selling recovered materials that is intended to stabilize markets is the Chicago Board of Trade Recyclables Exchange <www.cbot-recycle.com>. This centralized marketplace is designed to bring the same level of price stability and quality standards to recoverd materials that have occurred with other long-standing commodities traded daily.

Recycling Works!

All around the country—in communities such as yours—recycling is working to conserve natural resources and extend landfill life. Recycling is one key part of your integrated waste management system that makes sense.



Each community has its own unique waste management problems that call for integrated solutions. A number of successful programs are described on the following pages to give you some ideas as you plan your community's recycling program. Some of the success stories take place statewide; most are local. Two describe efforts of villages and small towns to join together, forming regional recycling programs. Some success stories highlight curbside collection, and others address unique drop-off systems. Several involve private-sector sponsorship; others are totally run by private enterprises. One of the oldest volunteer used oil collection programs in the United States is highlighted as well as a new wet-dry separation program. Don't miss the Rikers Island prison food scrap compost system that produces electricity by use of solar energy. These programs may vary in size, focus, cost, and features, but their message is the same:

RECYCLING WORKS!
RECYCLING PAYS!

Alabama

Type of Program

Used oil collection.

State Overview

With the exception of Birmingham and metropolitan areas around Mobile, Montgomery, and Huntsville, Alabama is predominantly rural. About 4.3 million people live in Alabama.

Background

Only about half of the nation's used oil was recovered and reused in 1977. The other half was usually discarded, often to the detriment of the environment.

In 1977, as part of a nationwide effort to conserve energy, Project ROSE was created. ROSE stands for **Recycled Oil Saves Energy**. Alabama recognized that its citizens could collect millions of gallons of used crankcase motor oil annually. Twenty years later the program is one of the oldest volunteer used oil collection programs in the United States.

Annually, the state generates more than 18 million gallons of used automotive motor oil and 9 million gallons of used industrial oil. Most of the industrial oil is routinely recovered; however, recovering used automotive motor oil presents an ongoing challenge in a predominantly rural state. Project ROSE was originally designed to assist with collection from individual, corporate, and municipal consumers and garages and service stations for treatment by a used oil re-refiner. Today, volunteer collection sites have expanded to quick-lube facilities and automobile parts businesses. The Project ROSE collection site network has grown from two pilot programs to more than 500 around the state.

From Project ROSE, other programs have been developed to meet the needs of boating enthusiasts and the state's vast farming communities. Marina ROSE was developed as an onsite measure to control the dumping of used motor oil in waterways. Collection sites are established at area marinas to remind boat owners of their proper used oil management responsibilities. The Project ROSE Farm Management Program provides information through the Cooperative Extension Service, Soil and Water Conservation Districts, and Farmers' Cooperatives throughout the state.

Rural used motor oil is often difficult to collect in isolated areas. Project ROSE helps to establish 1-day or week-long collection periods in farming communities where significant quantities are often collected.

Program Description

Project ROSE is a nonprofit conservation program funded by the Alabama Department of Economic and Community Affairs' Science, Technology and Energy Division. The program is also sponsored and housed on campus at the University of Alabama Chemical Engineering Department.

Program goals are two-fold: to protect the environment and to conserve a valuable resource. To accomplish these goals, Project ROSE helps establish used oil collection locations in all 67 counties. A network of used oil transporter/haulers was established to collect from collection sites and to make sure the used oil was safely

delivered to re-refiners. Project ROSE also provides regulatory and technical information to used oil generators, collectors, and re-refiners.

Currently, three types of used oil programs make up Project ROSE: **curbside collection, collection centers,** and **drum placement**.

The **curbside collection program** is primarily used in, and best suited for, metropolitan areas in which consistent garbage collection is provided. Based on survey data, 70% of all respondents replied that they would save their used oil for recycling if it were collected at their homes. Currently, eight metropolitan cities provide curbside used oil collection. City garbage trucks, equipped with storage racks or tanks, are adapted to transport used oil. Used oil is stored during route collection and transferred to a holding tank at city facilities. A collector picks up this used oil and, depending on current market values, either pays or charges the city for the used oil.

Promotion through the media reminds residents of the service being provided to them by each city. The campaign also explains the hazards of improper disposal

Project ROSE is one of the oldest volunteer used oil collection programs in the United States.

and outlines the procedures used and type of storage container needed for participation in the program. Project ROSE also provides informative materials to businesses, civic groups, environmental organizations, trade associations, and state agencies.

The Project ROSE **collection center program** consists of service stations, garages, quick-lube facilities, and automobile parts stores that voluntarily accept do-it-yourselfers' used oil for recycling. These businesses have rapidly expanded in Alabama. Many use their businesses as collection sites to recruit new customers and expand their market base.

The **drum placement program** provides 55-gallon drums for do-it-yourself used oil collection. This program operates in rural areas where there are few service stations, quick-lube facilities, or other collection site locations. Drums are located on the premises of cooperating businesses and small government agencies.

What Makes Alabama's Program Unique?

Many programs based on the Project ROSE model now exist throughout the United States and several foreign countries. The Project ROSE hauler network consists of more than 20 private, independent businesses. By providing used oil collection sites and haulers with information concerning sources of used oil that are available for collection, more than 8 million gallons of used oil is collected annually. Alabama citizens and other programs replicating the Project ROSE model benefit from energy savings and the aesthetic rewards that accompany participation.

Project ROSE has demonstrated that one person can make a difference in saving energy and protecting the environment.

Obstacles Overcome

The chief obstacle is no longer convincing do-it-yourselfers to recycle but, rather, sustaining consistent funding for a strong education program. Project ROSE has proven through the years that, when funding for educational programs decreases, so do the quantities of do-it-yourself motor oil collected. Strong state support is needed to maintain a statewide used oil collection program.

Also, it is only through the enthusiastic and voluntary participation of collection site managers that used oil can move from the do-it-yourself oil changer to the re-refinery. In addition, the mere suggestion of listing used oil as a hazardous waste threatened the program's future. More than 25% of Project ROSE collection sites dropped out of the program when the question of listing was first posed. When listing was not enacted, Project ROSE rebounded and more than doubled collection sites through strong recruitment and education efforts.

Program Contact

For further information about Alabama's volunteer used oil collection program, call (205) 348-4878 or write to:

Program Coordinator
Project ROSE
Chemical Engineering Department
University of Alabama
Box 870203
Tuscaloosa, AL 35487-0203

In do-it-yourself used oil recycling programs, the direct deposit collection tank has become the program's public symbol. The more attractive, convenient, and "user-friendly" the tanks, the higher the participation from do-it-yourselfers.

Austin, Texas

Type of Program

A "pay-as-you-throw" program to encourage recycling and composting.

Community Overview

The City of Austin has approximately 130,000 households. In response to the cancellation of a proposed waste-to-energy project and concerns about the premature closing of the city's landfill, Austin passed a comprehensive recycling resolution in January 1990.

Service consists of weekly collection of garbage, recyclables, and compostables and semiannual collection of larger brush for composting and bulky items (e.g., appliances) for recycling. Citywide curbside recycling of newspaper, corrugated cardboard, glass containers, and metal cans has been in place since 1982.

Background

A "pay-as-you-throw" (PAYT) program was proposed in the summer of 1990 with the goals of conserving landfill capacity by increasing recycling and composting and creating a more equitable, consumption-based billing system. A 1-year PAYT pilot program involving 3,000 households began in July 1991. The pilot's success prompted the city to implement the program citywide over a 3-year period.

The city aggressively pursued new recycling opportunities to increase diversion, including recycling of newspaper inserts, magazines, soda bottles (PET), milk jugs (HDPE), advertising mail, and home office paper. In the fall of 1995, the use of plastic bags for yard trimmings was banned.

Program Description

Residents choose either a 30-, 60-, or 90-gallon wheeled garbage cart according to their needs. The monthly solid waste services (SWS) rate varies according to the size of the garbage cart: $11.75 for 30 gallons, $14.50 for 60 gallons, or $17.25 for 90 gallons. If residents find that the garbage cart they have exceeds their needs, there is no charge to downsize; however, there is a $15 charge for increasing the size.

Residents purchase "extra garbage stickers" ($2 each) for when their garbage exceeds their cart's capacity. These stickers are not required during the week after Christmas and during the April "Clean Sweep" week (i.e., spring cleaning). The stickers are available at most local convenience and grocery stores.

There is no charge for recyclable or compostable materials. The city provides 14-gallon bins for recyclables, and residents use paper bags or open containers for compostables.

What Makes Austin's Program Unique?

Public education was extensive and critical to the success of the PAYT program. The city notified residents of the new program (e.g., "Recycle or Pay as You Throw—It's Your Choice") through utility bill inserts, press briefings, paid newspaper ads, and billboards.

Obstacles Overcome

The city faced some criticism from citizens. Among other things, residents expressed concerns about the "higher cost of living," which single parents and the elderly might not be able to afford. In response, the city provided six complimentary stickers to all current SWS customers.

Another difficulty stemmed from the fact that the utility billing system could not implement the variable rates right away. Until variable-rate billing was implemented, those who did not have to pay extra for a 90-gallon cart received an unfair advantage, since 30-gallon customers had to buy stickers for any extra garbage. The city council temporarily postponed the sticker program while it considered this issue carefully. In the end, the sticker program was implemented before the variable-rate billing, but council insisted that the utility billing system be ready for variable billing within 6 months.

Program Contact

For further information about the City of Austin's program, contact Rick Fuszak at (512) 499-1974 or write to:

Rick Fuszak
Manager Planning and Development
City of Austin
P.O. Box 1088
Austin, TX 78767

Guelph, Ontario, Canada

Type of Program

Citywide separation of wet and dry wastes for appropriate composting and recycling of reusable materials.

Wet DRY
The Next Step in Recycling

Community Overview

Located about 100 km west of Toronto and nestled in an agricultural area, Guelph is a university city with about 100,000 residents in 33,000 households.

Background

Several years ago, the provincial government required that all cities prepare a waste management master plan with a landfill diversion program. Initially Guelph planned to use incineration; however, public outcry required the city to find another option. Looking to Europe for ideas, city officials adopted the Wet-Dry separation program as the main component of its master plan.

A pilot program had high participation rates, encouraging city officials to expand the program to include all households and industries, commercial businesses, and institutions (IC&Is). The city processing facilities became fully operational in November 1995.

Program Description

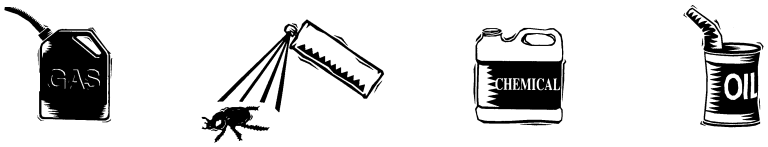
Residents and IC&Is separate their Wet waste materials (e.g., food scraps, sanitary items, soiled tissues, and disposable diapers) from the Dry materials, which include both recyclable materials and unusable waste. The city provides labels to help prevent cross-contamination. Residents purchase color-coded see-through bags—green for Wet, blue for Dry—for curbside collection. Bags are used instead of bins primarily because in the winter it is dangerous for sanitation employees to handle bins on top of snowbanks. Alternatively, residents may place their Dry waste loose in a labelled container with a lid, typically the large pails they used previously for garbage.

Wet (i.e., compostable) waste is heated at 60 °C (140 °F) for 3 days. The compost meets provincial safety regulations and is sold at $12 (Canadian) per cubic yard, which is the market price for topsoil. Dry waste is sorted by the city, and recyclable materials are removed and marketed. The remainder is sent to the landfill.

The recovery rate by weight is 72% for the Wet waste and 56% for Dry waste, averaging a total recovery rate of about 60%. Janet Laird, manager of Solid Waste Services for the City of Guelph, emphasizes that it is difficult to recover much more than 70%. “Thirty percent of all waste just isn’t marketable,” she says (e.g., small pieces of paper, bits of broken glass, or items that cannot be broken down into their recyclable and nonrecyclable components).

Since Guelph is a very “green” community, participation rates are extremely high, with 99% of residents separating their waste. (About 5% of waste suffers from cross-contamination.) Surveys show that most residents are enthusiastic about the program, particularly because the division of materials makes sense to them and they need not do any more separation than they did under the old program. The question has changed from “Recyclable or not?” to “Wet or Dry?”

Although there had been some concern that the process would not yield a clean enough product, these concerns were unfounded. “We have preferred-supplier status,” Dr. Laird asserts. “The prices for our products have surpassed published rates.”



What Makes Guelph's Program Unique?

There are two ways that Guelph's program is unique. First, the program uses only two waste streams—wet and dry—whereas most other programs of this type use three—wet, dry, and garbage. The city believes that using a simple two-waste system increases participation rates.

Also, the city processes essentially all waste that it collects. Anything fully or semicompostable is treated, and all noncompostable waste is sorted to remove recyclables. The only waste that goes directly to landfill is the waste from large industries that the city has determined to have a significant amount of nonrecoverable material.

Obstacles Overcome

The biggest obstacle was convincing IC&Is to participate. The city worked with the waste generators and the haulers to make it attractive for haulers to bring the waste to the city's facility. One of the ways the city did this was to limit its tipping fee to $40/tonne, compared to $60/tonne at the landfill and as much as $120/tonne at other facilities. Even if a hauler can get a better rate by crossing the U.S. border, transportation costs significantly reduce the savings. These efforts have resulted in the city receiving 60% of IC&I waste.

Program Contact

For further information about the City of Guelph's program, contact Janet Laird at (519) 837-5604 or write to:

Janet Laird, Ph.D.
Manager, Solid Waste Services
City of Guelph
59 Carden Street
Guelph, Ontario N1H 3A1

Hamburg, New York

Type of Program

Mandatory curbside pickup of separated trash.

Community Overview

The Village of Hamburg, a suburb of Buffalo, has a population of 10,500. Its mandatory program was enacted in 1981.

Background

Hamburg's recycling effort began as a voluntary program with citizens taking separated newspapers, bottles, and cans to a recycling center. From there, local firms purchased the material they recovered.

Through the efforts of a volunteer committee, residents were surveyed and public hearings were held to determine whether to make recycling mandatory. As a result, a law was passed in 1981 that required separating and recycling of waste material. Compliance with the law after 1 month was 85%; since then, compliance has exceeded 95%.

Program Description

Residents put out recyclables on regular garbage collection day. Newspapers are put into a paper bag, bottles and cans into another, and cardboard into a third bag. Garbage trucks pulling trailers for the recyclables collect all the trash on a single run. The trailers filled with recyclables are taken to a center operated by an association for the mentally handicapped. There, the material is sorted for dealer pickup.

Recyclables represent 49% of Hamburg's waste, by volume. Recycling has reduced the need for landfills by 49% and saved as much as $257,000 in tipping fees each year.

What Makes Hamburg's Program Unique?

Comply or else! While as many as 98% of Hamburg's residents cooperate, those who do not are penalized. If a household fails to separate all of its recyclables, it gets only one of its trash cans picked up. This one empty can is marked with an orange sticker, which serves as a reminder that garbage must be separated. If the problem persists, a warning letter is sent. If the household still does not comply, their garbage is not picked up for a week—a rare occurrence. Offenders can be summoned to court, but not having garbage picked up is considered a greater punishment.

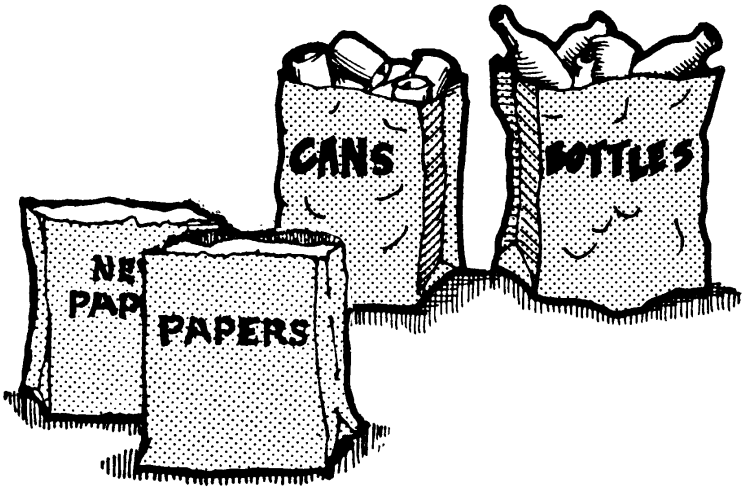
Obstacles Overcome

Hamburg has been successful in finding markets. There is, however, no assurance these markets will be steady. Securing markets is a constant challenge. For instance, when the newsprint market fell, the town continued to pick up the newspapers, taking what money they could for them. Hamburg has an agreement with Browning Ferris Industries that stipulates that the town gets $10/ton for all recyclables.

Program Contact

For further information about Hamburg's program, contact Gerald Knoll at (716) 649-4953 or write to:

Gerald E. Knoll
Superintendent of Public Works
100 Main Street
Hamburg, NY 14075



Hospital, University of Pennsylvania

Type of Program

Hospital recycling program. Includes aluminum (beverage cans), glass, corrugated cardboard, and high-grade office paper.

Community Overview

The Hospital of the University of Pennsylvania is a 725-bed medical facility with a campus of 14 buildings occupying 1.8 million square feet. The hospital annually recycles the following materials:

- Corrugated cardboard – 350 tons
- High-grade office paper – 130 tons
- Aluminum cans – 4 tons
- Glass food and beverage containers – 12 tons.

Background

Recycling corrugated cardboard was in place at the hospital prior to the 1994 recycling requirements established by the city of Philadelphia. The hospital's comprehensive recycling program was initiated in 1994 as a cost-saving venture and to comply with State regulations and city ordinances. Thirty-five departments, including the nursery, pharmacy, and many laboratories, collect corrugated cardboard, high-grade paper, clear glass, and aluminum cans for recycling under the supervision of an area coordinator.

Program Description

Recycling containers are distributed throughout the facility. Every desk has a wastebasket-sized paper recycling container, and vending and staff lounge areas are equipped with large glass and aluminum containers. Areas with copy machines are equipped with large paper containers. Desk-side, glass, and aluminum containers are emptied daily, and the collection containers are removed on an as-needed basis.

Revenue generated from recycled items is charged against the cost of removal. This amount varies from month to month due to fluctuations in waste volume and market value for recyclables.

Obstacles Overcome

At the time the program was initiated, no citywide residential recycling program was in place. As a result, hospital employees who were Philadelphia residents were slow to adapt to the concept of recycling. As the city implemented curbside recycling pickups, the hopsital's recyclable volumes increased. Storage prior to pickup has posed a problem. Vendors are unwilling to provide daily service, requiring the hospital to stockpile recyclable waste in open-top dumpsters until full. In 1996, a new building was opened on the campus with sufficient space allocated for the storage of recyclable waste.

Program Contact

For further information about the Hospital of the University of Pennsylvania's recycling program, contact Bill Jalbert at (215) 614-0212 or write to:

Bill Jalbert
Environmental Services Department
Hospital of the University of Pennsylvania
3400 Spruce Street
Philadelphia, PA 19104

Mecklenburg County, North Carolina

Type of Program

Comprehensive integrated solid waste management, which includes a solid waste management plan overseen by a citizen's Waste Management Advisory Board.

Community Overview

Mecklenburg County is a growing area, spurred by the economic development of its principal city, Charlotte. The Mecklenburg-Charlotte Metropolitan Area has a population of over 1 million people.

The City of Charlotte and the surrounding municipalities provide for the collection of waste from its citizens, while Mecklenburg County handles waste management county-wide.

Background

Mecklenburg County began recycling as a pilot project in 1987 and has since become a nationally recognized leader in recycling and waste reduction.

The county still uses landfills to dispose of much of its municipal waste and construction/demolition waste. The private landfill currently used by the county for its residential waste will stop receiving waste by July of 2001, at which time Mecklenburg County will begin sending its waste to its own regional landfill. Construction and demolition waste is currently disposed of at one landfill in the county, which is also expected to close within the next several years. There are no plans to build a new construction and demolition landfill in the county.

Locating new landfills has been difficult because of the decreasing amount of available land, unsuitable soil conditions, potential long-term environmental concerns, legal barriers, public opposition, and restrictive new permitting regulations.

As a result, the North Carolina state legislature required all localities to adopt a 10-year solid waste management plan by July of 1997. It further set a statewide goal of a 40% per capita reduction in disposal by June 30, 2001, and an even more aggressive goal for 2006.

In order to meet these goals, Mecklenburg County will need to reduce its waste production by 12% by 2001 and 20% by 2006. The county plans to achieve this goal through intensive recycling and waste reduction efforts aimed at the residential and commercial sectors with special attention paid to operations that produce construction and demolition waste. It will also concentrate on source reduction and composting.

Program Description

Mecklenburg County currently collects plastic, glass, aluminum, steel, tin, newspaper, phone books, and magazines at the curbside in towns and in Charlotte. In addition, Mecklenburg County operates seven recycling centers, three staffed, which provide additional recycling services for its residents. These centers accept an enormous variety of wastes including paper, cardboard, oil, tires, batteries, paint, and household hazardous wastes.

Despite these efforts, much of the county's waste is still landfilled. However, when the county's recycling program is fully implemented, the landfills will receive only wastes that cannot be feasibly recycled or composted.

The solid waste management plan adopted by Mecklenburg County outlines a two-phase waste reduction program to be implemented over the next 10 years. The county plans to use a number of approaches to meet these goals:

- Emphasis on source reduction
- Increasing the amount of recyclables collected at the curb by 20%
- Creating commercial recycling drop-off centers
- Amending the local zoning code to require space for collection, separation, and storage of recyclables
- Establishing construction and demolition recycling facilities
- Providing technical assistance to businesses, including waste audits or recycling program development.

What Makes Mecklenburg County's Program Unique?

Two of the county's seven recycling centers are so-called "super recycling centers" because they provide a large number of services. Here residents can drop off car batteries, oil, antifreeze, transmission fluid, tires, and other bulky wastes. They may also drop off or pick up oil-based or water-based paint. Household hazardous wastes will be accepted at three of these facilities by the end of 1999. The county has an arrangement with a licensed hazardous waste hauler to collect and store these wastes at the centers free of charge.

Additionally, the county operates two yard waste facilities that accept yard waste, compost it, and sell it to the public. These facilities will even provide home delivery on request.

Mecklenburg County has also established a Waste Management Advisory Board to oversee the implementation of their solid waste management plan. The board is composed of a diverse group of citizens including professionals from the fields of law, science, engineering, and finance. Other groups represented are the Chamber of Commerce, the utility industries, environmental groups, the Planning Commission, and the Clean City Committee. This group will review and revise the solid waste management plan every 3 years and will consider: (1) continuing the recycling program on a voluntary basis if the county is on schedule to meet its goals, or (2) making it mandatory if it is not.

Obstacles Overcome

The most difficult hurdles the recycling program has had to clear are economic inefficiencies and market fluctuations. It took several years to secure startup funding for the recycling pilot program. However, due to good planning and public support, the pilot program is now a tremendously successful regional waste management system.

A major obstacle that Mecklenburg County will have to overcome is that of finding additional landfill space. There is enough space for residential waste for the next several years, but that is not the case with construction and demolition waste. Wastes from this class represent about 33% of the county's total waste stream. If the county wants to meet its goals, it will have to maintain a sound recycling program as well as locate an adequate disposal site.

Finally, the recycling program will have to stress the use of the additional services at the recycling centers as a complement to its curbside collection program.

Program Contact

For further information about Mecklenburg County's program, contact Bobbie Campbell at (704) 336-4528 or write to:

Recycling Division
Mecklenburg County Engineering and Building Standards Department
700 North Tryon Street
Charlotte, NC 28202

New Jersey

Type of Program

Statewide mandatory recycling law.

State Overview

New Jersey has 565 municipalities with a population of nearly 8 million. The state is comprised of 22 solid waste districts and exports approximately 2.2 million tons of solid waste a year, primarily to Pennsylvania. The cost to manage trash at landfills is now market-based.

Background

In the early 1980s, New Jersey began the process of closing over 300 unsafe or unregulated landfills. This resulted in a serious shortfall of disposal capacity within the state and increased disposal costs by as much as 800%. In an effort to enlist public support for recycling, the New Jersey Legislature passed a law in 1981 that encouraged voluntary recycling. This voluntary act launched statewide recycling management as an economical and environmentally effective method of waste management. As the disposal crisis worsened, mandatory recycling in New Jersey was established through legislative amendment in 1987. The Recycling Act required New Jersey's 21 counties to mandate the recycling of at least three designated recyclable materials in addition to leaves.

In response to the recommendations of a solid waste task force convened by the governor in 1990, the Recycling Act was amended in 1992 to increase New Jersey's recycling goals so that the recycling of at least 50% of the municipal solid waste stream and 60% of the total solid waste stream was required by December 31, 1995. The state's latest goal is to achieve a 65% solid waste recycling rate by 2001.

In 1996, over 10 million tons of the approximately 17 million tons of solid waste generated in New Jersey were recycled. This represents a state recycling rate in excess of 60%. This figure includes the recycling of materials such as concrete, asphalt and scrap metal. Those recycling efforts geared toward the municipal solid waste stream, or waste stream generated by residential, commercial, and institutional premises, have also been successful in New Jersey. New Jersey's recycling efforts led to the recycling of over 3.3 million tons of municipal solid waste in 1996, which in turn represents a municipal solid waste recycling rate of 42%.

Program Description

In 1987, New Jersey's mandatory recycling law went into effect. It required each county to develop and submit a recycling plan as part of its solid waste management plan. Following approval by the New Jersey Department of Environmental Protection, each community began a recycling program that recovered a minimum of 15% of recyclable materials in the first year. After 1 year, the minimum increased to 25%. According to the law, at least three materials had to be recycled in addition to leaves. Typically, they were newspaper, aluminum cans, and glass containers. As of September 1988, leaves were banned from landfills, making composting a high priority as well.

NJ Recycling Payouts*

40%	Tonnage grants to counties and municipalities
35%	Low-interest loans to businesses for research and market development
10%	Public education and awareness programs
8%	Program grants for counties
7%	Administration

*Note: The Recycling Tax sunset December 31, 1996. The Department is currently waiting for the state legislature to reauthorize the tax. Until reauthorized, recycling payouts have been temporarily suspended.

New Jersey, with it's 65% recycling goal, also counts on waste-to-energy facilities to manage a significant portion of its waste stream. Five large-scale projects were in operation as of July 1997.

Studies have shown that recycling and energy recovery can be compatible in New Jersey. Removing recyclables from burning may increase the heat content of the remaining waste and thus reduce the ash residue. Recycling also cuts capital costs significantly because the waste-to-energy facilities could be smaller. Five facilities were in operation as of July 1997.

What Makes New Jersey's Program Unique?

New Jersey's mandatory recycling law provided for the funding of state, county, and municipal efforts through a $1.50/ton facilities surcharge. Through this, an annual revenue of $12 million was anticipated. This fund initially supported New Jersey's Office of Recycling, which received 7% of the total amount annually to run the program. Counties received 8% for program grants and also received funding for education programs. Municipalities received 40% of the fund in tonnage rebates. A market development study to focus on recyclables such as tires, paper, and plastic beverage containers was funded at about $200,000. The recycling surcharge sunset December 31, 1996.

The law encouraged industries to purchase new recycling equipment by allowing them to receive a 50% tax credit. Moreover, a number of the law's provisions helped stimulate markets for recyclables. For instance, by 1989, at least 45% of the amount of money spent for paper purchased by the state had to be spent for recycled paper. Further, the State Department of Transportation was encouraged to use recycled material in its asphalt. In addition, priority was given to using leaf compost material in maintaining public land.

Each county designates a recycling coordinator and is responsible for plan development. Municipalities have additional responsibilities. They must

- Designate a recycling coordinator
- Provide for collection
- Require source separation of its designated recyclables
- Develop recycling plans for new development
- Submit tonnage grant reports
- Publicize the recycling program at least every 6 months
- Require separate leaf collection during fall months.

By April 1990, the first report to the New Jersey Legislature documented progress under the law; and the recycling surcharge was continued until December 31, 1996. The surcharge may be reauthorized.

Obstacles Overcome

The main obstacle has been to get 100% county and municipal participation. State, county, and municipal recycling coordinators continue to work together to overcome this obstacle. This kind of network helps stimulate activity, encourages interprogram support, and promotes information exchange.

More and more county and community programs are joining the recycling effort. Before the program was mandatory, the tonnage grants provided a strong incentive to recycling. The tonnage grant program has also paid off as more complete waste data are collected, helping the state plan ahead. An ongoing challenge is to continue market development efforts to create demand for products made with recycled materials.

Program Contact

For further information about New Jersey's program, contact Guy Watson at 609-984-3438, or write to:

Guy Watson, Chief
Bureau of Recycling and Planning
New Jersey Department of Environmental Protection
401 East State Street (P.O. Box 414)
Trenton, NJ 08625

E-mail can be sent to gwatson@DEP.state.NJ or visit the New Jersey Recycling Website at http:\\www.state.nj.us.dep/DSHW/recycle

New York City

Type of Program

A leaf collection program that teams up the Department of Sanitation (DOS) and the Parks Department to restore degraded parklands and restore wildlife habitat.

Community Overview

New York City's five boroughs generate 26,000 tons per day of combined commercial, residential, and institutional waste. Compostable materials make up approximately 20% of this total (or 5,000 tons per day).

Background

The need to increase composting became crucial with the announcement in 1996 of the closure of the Fresh Kills landfill at the end of 2001. Since then, the DOS has developed several composting programs. In one such program, DOS partnered with the Parks Department to develop composting sites on a decentralized basis.

Program Description

The DOS and Parks Department are working together to create composting sites that also improve

parkland. Although the sites are officially classified as parkland, they are not usable parks. Sites are filled with household garbage, construction debris, sand dredged from the harbor, and rubble removed from postwar London and used as ballast on trans-Atlantic ships. According to Marc Matsil, director of the Natural Resources Group of the Parks Department, "Improving the soil with compost will allow the seeding of native flora, which will provide improved wildlife habitat and restore the visual integrity of the sites."

The Parks Department provides the site, and DOS provides the compost through leaf collection. As of the fall of 1997, DOS is collecting leaves in Staten Island (3,000 tons/year) and in the Bronx (1,500 tons/year). By 1999, Brooklyn and Queens will be added to the program, with projected collections of 8,000 tons and 13,500 tons, respectively.

What Makes New York City's Program Unique?

By teaming with the Parks Department, DOS can create composting sites throughout the city. This helps to reduce transportation costs because leaves collected in one borough do not need to be transferred to a composting site in another borough.

Obstacles Overcome

When a partnership such as this is proposed, there is often concern that the problem will simply be transferred from one department to another. It was important for DOS to assuage any concerns the Parks Department might have. In developing the memorandum of understanding, DOS included several provisions to reassure the Parks Department that the arrangement would serve both departments' interests.

In addition, when the city first began to undertake this program, funding had not been secured—not when the request for proposals (RFP) went out, not when the vendor was selected, and not when the contract was signed. (The contract stipulated that the arrangement was subject to available funding.) The advantage with undertaking these efforts early was that, when the funds became available about a year after the contract was signed, DOS could go forward with the program immediately. Because RFP, vendor selection, and contract processes can take up to 2 years, DOS's early legwork clearly paid off.

Program Contact

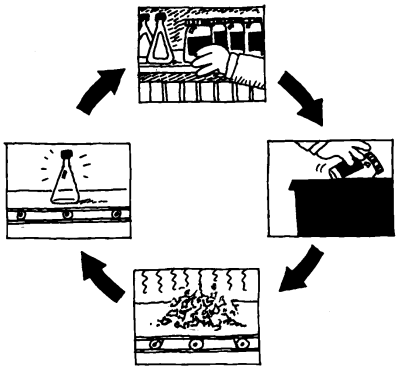
For further information about the New York City's program, contact Robert Lange at (212) 837-8156 or write to:

Robert Lange
Director, Bureau of Waste Prevention, Reuse, and Recycling
Department of Sanitation
City of New York
44 Beaver Street, 6th floor
New York, NY 10004

Oregon

Type of Program

Law requiring recycling opportunities, public education and promotion, and recycled content.



State Overview

Oregon's 3.2 million people live in small cities and towns and in the major urban area centered around Portland. For recycling program purposes, the state is divided into 35 "wastesheds," mostly along county lines. The state's strong timber industry provides a market for recycled paper and cardboard in its pulp and paper mills. Oregon has been in the forefront of environmental consciousness, with residents recycling 90% of beer and soft drink containers and 70% of newspaper and cardboard.

Background

Oregon's recycling programs are designed to offer opportunities—not requirements—for residents to recycle. The 1991 Oregon Recycling Law established recycling responsibilities for local governments beyond the requirements in the 1983 Recycling Opportunity Act, which required recycling depots, monthly curbside collection in larger cities, and public education programs.

The 1991 law also: (1) established a statewide recovery rate of 50% by 2000; (2) required wastesheds not meeting established 1995 recovery rates to implement two more recycling program elements; and (3) created recycled content levels for newsprint, directories, glass containers, and rigid plastic containers.

Program Description

Cities with populations exceeding 4,000 must provide at least three (four for cities over 10,000) recycling program elements. The elements are: provision of recycling bins to residents, weekly residential curbside collection, expanded education/promotion programs, an on-route multifamily residence program, a commercial program with regular onsite collection, expanded recycling depots, a residential yard debris collection/composting program, residential garbage collection rates that encourage waste reduction, or a commercial and institutional composting program (added in 1997).

Of the 75 communities in Oregon with a population of 4,000 or more, 95% offer residential curbside collection programs, and the remaining 5% have approved alternative programs. More than half of the communities have commercial collection programs, and one-fourth have yard debris programs. Most provide an expanded education and promotion program, and the commercial sector has begun receiving additional recycling program attention.

The state provides technical assistance to local governments and recyclers to support their efforts. Oregon also offers local governments recycling and waste reduction grants, which have been used to purchase recycling bins and drop boxes, establish recycling drop-off centers, and help with recycling education. Grants have proved

"Oregon's** residential **curbside programs are well established and effective. Commercial generators of solid waste recycle much of their cardboard and office paper, but often recycling opportunities for additional materials are more limited . . . Focusing additional program attention on the commercial side may provide more bang for our buck as we keep moving toward the state's 50% recovery goal."

Paul Slyman, Manager of the Solid Waste Policy and Program Section, Department of Environmental Quality, State of Oregon

particularly useful in rural areas. Regional staff of the Oregon Department of Environmental Quality serve as information clearinghouses and technical resources for local recycling programs throughout the state.

What Makes Oregon's Program Unique?

Oregon's recovered paper has proven to be a valuable substitute for lumber. Recovered paper combined with mill and other wood wastes has provided raw materials for the state's paper industry. Mills have made major investments in de-inking and other processes to accommodate recovered materials, enjoying a 50% state tax credit on these investments. Oregon's wood processing industry has found new uses for wood chips and urban wood, such as making high-quality fiberboard. The state's steel mills buy scrap metal, and there are ample markets for glass and aluminum. Many of Oregon's communities have easy access to local and export markets. While Oregon has the built-in advantage of good markets, the state has supplied a steady stream of recovered materials to maintain these markets.

Target recovery goals for wastesheds help maintain a high profile for recycling. Legislation passed in 1997 requires cities and counties to adopt higher target recovery goals.

Curbside collection truck operated by Sanipac, a garbage and recycling service in the Eugene and Springfield area.

Obstacles Overcome

Oregon's recycling efforts have successfully jumped many hurdles. An ongoing challenge for the mostly rural eastern two-thirds of the state is distance from major markets. State recycling grants have been used to enhance these smaller communities' abilities to prepare collected materials for market through the purchase of items such as balers, glass crushers, and storage buildings.

Although close to many markets, Oregon is distant from major plastic markets. The 1991 Recycling Act with its mandate for rigid plastic containers was instrumental in increasing opportunities for recycling plastics. The plastics industry assisted with purchases of equipment such as balers and a "plastics recovery facility" with automatic sorting capability by resin and color. Many curbside programs now include plastic milk jugs and other plastic bottles. Some programs accept all plastic bottles, and some even include all rigid plastic containers (including tubs). Oregon's recycling rate for rigid plastic containers was estimated to be around 33% for 1996.

The rigid plastic container recycling law was changed in 1995, however, to exempt food packaging (other than beverages). This has reduced industry concerns about maintaining robust plastic recycling opportunities. Several voluntary plastic recycling programs in grocery stores have closed down since then.

Program Contact

For further information about Oregon's program, contact Peter Spendelow at (503) 229-5253 or write to:

Peter Spendelow
Waste Management and Cleanup Division
Department of Environmental Quality
811 SW 6th Avenue
Portland, OR 97204

Perkasie Borough, Pennsylvania

Type of Program

A borough-run, unit-cost-based, trash and recycling program that is mandatory for residents and voluntary for businesses within the borough's limits.

Community Overview

Perkasie Borough covers 15,034 acres and is home to more than 8,000 residents. This is the area serviced by Perkasie Borough's trash and recycling crews.

Background

Prior to 1988, Perkasie residents had trash pickup two times each week and paid a quarterly fee. In 1988, Perkasie began its trash and recycling program under ordinance No. 598 of the Borough Council. Under the ordinance, curbside trash pickup is paid for through the purchase of special "borough bags," which are available at various locations throughout the borough.

Program Description

The purchase of a large or small bag is payment for trash placed in that bag and deposited at curbside for removal. This cost incentive is in place to promote recycling; if residents participate in the program, trash costs can be kept quite reasonable. The sale of borough trash bags provides the program's main financial support, with state grants being used to upgrade the program and its associated equipment. Market prices for recycled materials are not consistent enough to rely on as income to fully support the program.

There is no charge at this time for collection or drop-off of recyclables. Glass and aluminum are picked up curbside once a week, and newspaper and cardboard are collected curbside once a month. These recyclable materials—along with tin cans, water and milk jugs, and plastic soda bottles—can also be placed at a 24-hour drop-off site located behind the Perkasie Borough Building.

Perkasie also has a bulk trash pickup day for each household each month. Tree limb chipping is provided once a month by appointment, and leaves are collected curbside during October and November each year. Tree limb chippings are kept at a central location where residents can come pick them up. Leaves collected in Perkasie Borough's program are used for three purposes:

- A local landscape supply company uses them to make mulch for resale.
- Two local farmers use them to mulch their fields.
- Leaves from the borough's park system are ground, along with other debris, and left for borough residents to take on a first-come, first-serve basis.

What Makes Perkasie Borough's Program Unique?

Perkasie Borough's recycling effort was one of the first unit-based programs in the country. In this type of program, residents pay only for units (special trash bags) in which household trash is placed for collection, which encourages recycling.

Obstacles Overcome

Perkasie experienced some resistance to the program during the first year of its inception. Some residents would burn trash, which violates local ordinances. Recently, a few households have been noted using outside haulers for trash removal. However, the number of residents using these haulers has been minimal. It has not been necessary to fine violators in order to regulate this activity. Perkasie attributes the minimum number of violations to the educational programs it has presented from the start of its recycling effort.

Program Contact

For further information about Perkasie Borough's recycling program, contact Linda Mentzer at (215) 257-5065 to request the current trash and recycling report or write to:

Linda Mentzer
Perkasie Borough Recycling Program
311 S. Ninth Street
P.O. Box 275
Perkasie, PA 18944

Philadelphia, Pennsylvania

Type of Program

Urban neighborhood drop-off program with cash incentive.

Philadelphia Partnership Recycling Program

Community Overview

Ten urban neighborhoods scattered throughout Philadelphia participate in the Partnership Recycling Program. The Streets Department and PhilaPride, a nonprofit environmental organization, support and administer the program.

Background

The Partnership Recycling Program grew out of the block corner collection program developed in 1985 by Queen Village, a central Philadelphia neighborhood. By 1993, there were 16 neighborhoods involved, together collecting about 2,000 tons of recyclables a year. In 1993, when the city's recycling program extended curbside collection to all residential premises, the block corner program had evolved into a new community-based recycling program.

The city offered the community groups a deal: if you can beat our unit cost of collecting curbside and disposing of trash, we will pay you some of the savings. This new program was based on the premise that city savings from the very efficient block corner collection would be shared with participating community groups. Thus, Partnership Recycling was born. Three community drop-off programs joined the Partnership and became the nucleus of the program when the block corner program ended.

Program Description

On the first and third Saturday mornings of each month, residents take their mixed paper, plastics, and old clothing to designated drop-off locations in 10 Philadelphia communities. Volunteers help load the materials onto city-operated trucks or stack recyclables for city collection at the end of the drop-off period. Additionally, New Threads, a nonprofit group dedicated to job training through clothing recycling, collects old clothing from the Partnership sites.

City crews deliver the mixed paper and plastics to scrap mills. The mills may pay or charge for materials, depending on current market value.

Through PhilaPride, the city pays the community groups for the tons of materials they divert from the waste stream. Since the program began in 1993, the city has distributed over $150,000 in incentive money to community groups for their recycling efforts. The incentive funds, the cost of the city's collection service, mill charges if any, and program administration costs are derived from money the city would otherwise have spent on trash collection and disposal.

The community groups, in turn, fund local good works: street beautification and sanitation, community gardens and parks, community education and communication, public safety, and social programs. Examples

include tree plantings, purchase of playground and grafitti removal equipment, community newsletter publication, support of police mini-stations, meal and house rehabilitation programs for the homeless, nursery and afterschool programs, train station landscaping, and a tree nursery operated by school children. Program policies allow for local innovation within spending guidelines.

What Makes Partnership Recycling Unique?

The unique feature of Partnership Recycling is that tax dollars are diverted away from landfill disposal and trash collection and into good works at the neighborhood scale. Other important features include:

- Community groups earn incentives based on the cost-effectiveness of their efforts to collect and load materials. The lower the city's per-ton cost for collection, the higher the community group's per-ton cash incentive.
- Volunteers see the benefit of their efforts in the public life of their neighborhoods – both the good works funded and the increased contact between neighbors on recycling day.
- Trash is converted to scrap commodities.
- Partnership Recycling provides the city with a source of innovative ideas and volunteer energy to pilot test colletion of additional materials prior to collection in its curbside recycling program.
- Volunteers and city sanitation crews work side by side for a common purpose.

Bob Pierson, coordinator for the Partnership Recycling program, believes there is wide applicability of the program's shared savings feature to other municipalities: "Partnership Recycling is a great way for citizen volunteers to earn funds for local good works using public funds which would otherwise pay for trash collection and disposal."

The neighborhood uses the proceeds for block improvement projects.

- The program provides Philadelphia citizens with an opportunity to recycle plastics after they were dropped from the city's curbside program.

Obstacles Overcome

Recruiting new members and helping them reach cost-effective levels of recycling is a challenge. Program administrators are able to do this through technical assistance and program flexibility.

Partnership Recycling directs incentive payments to community groups, mainly in middle class neighborhoods. Program elements are now being designed to extend incentive payments to individuals to increase participation in recycling in low-income neighborhoods.

Program Contact

For further information about partnership recycling, contact Bob Pierson at (215) 925-5971 or through the internet: piersonrob@aol.com; or write to:

Bob Pierson
Partnership Program Coordinator
PhilaPride
1818 Market Street, Suite 3510
Philadelphia, PA 19103

Pitt County, North Carolina

Type of Program

A regional recycling program under partnership with a nonprofit organization serving mentally and physically challenged citizens.

Community Overview

Located in eastern North Carolina, Pitt County has a population of 110,000. The county is home to Eastern Carolina Vocational Center (ECVC), a nonprofit corporation dedicated to providing training and jobs to the mentally and physically challenged.

Background

In the mid-1980s, Pitt County residents requested that a countywide recycling program be established. Since ECVC had been involved with recycling since 1974 when it began processing newspaper and cardboard at a rate of about 1 million pounds per year, the county decided to partner with the nonprofit organization.

The partnership began with the county appropriating $25,000 to upgrade the processing capacity of ECVC's recycling programs, while ECVC agreed to double its processing rate. In 1987, the county purchased a high-density baler to increase capacity and overseas marketability. Within 4 years, the county had converted all 14 solid waste collection sites into recycling centers, seven of which also serve as transfer stations for municipalities.

In 1993, the county invested nearly $1 million to construct and supply a materials recovery facility (MRF) using existing ECVC buildings, land, and equipment.

Program Description

Trash and recyclables arrive at ECVC by different routes. Within Pitt County, the City of Greenville collects trash and recyclables and tranports them directly to ECVC. Other cities contract with waste haulers, who bring the materials to one of seven transfer sites. Citizens living in the unincorporated areas of Pitt County can bring their trash and recyclables to one of the 14 recycling centers strategically located throughout the county. The county transports the materials from the recycling centers/transfer sites to the landfill and ECVC, respectively.

Several cities outside of Pitt County also participate, with the haulers going directly to ECVC. ECVC also receives materials from its own trucks, which serve large industries and a military base.

The recycling centers accept commingled materials, including aluminum scrap, lead acid batteries, used motor oil, yard waste, used clothing, and prepared farm chemical containers. About one-third of county residents recycle consistently, while just over half participate less regularly.

The MRF operates two conveyor systems, one for handling separated recyclables and one for commingled materials. For the latter, most materials are separated by

hand; steel cans are removed using a magnet. Once completely separated, materials from both systems are baled (glass is placed in large containers) and transported to markets. The income from the recycling is used to pay the MRF's operating expenses, which are estimated at $900,000 annually. If quarterly gross revenue does not exceed $225,000, the county has committed to pay up to $100,000 per year to make up the shortfall. Because the figure is tied to gross revenue, the county will not be subsidizing inefficiency; rather, this is a safety net for ECVC if the recyclables market were to plunge.

Of its 146 employees, ECVC has 36 working in the MRF, two-thirds of whom have physical or mental impairments. They processed over 57 million pounds of recyclables in FY1995-96, reducing the county's disposal fees by approximately $840,000.

What Makes Pitt County's Program Unique?

Beside providing a simple method of recycling for all county residents at minimal costs, Pitt County's program created meaningful, productive jobs for 24 individuals who are physically or mentally challenged.

Obstacles Overcome

Extensive negotiations were required to establish an arrangement that was agreeable to both the county and ECVC. The county was going to provide over $1 million in buildings and equipment; however, if ECVC went bankrupt, those materials could be seized. As a result, ECVC deeded all of its land and buildings to the county with a 20-year lease agreement, at which time all the land, buildings, and equipment would revert to ECVC. Under this agreement, the county relinquished the right to sell the property, providing some security for ECVC.

Program Contact

For further information about Pitt County's program, contact Doug Bonds at (919) 758-4188 or write to:

Doug Bonds
Marketing Manager
Eastern Carolina Vocational Center
P.O. Box 1686
Greenville, NC 27834

Rikers Island, New York

Type of Program

Food scrap composting converted by solar panels into electricity at a municipal prison system.

Community Overview

Rikers Island, sited on a former landfill near New York City, is the largest municipal prison system in the United States. The 17,000 inmates and 7,000 officers generate more than 20 tons of food residuals per day.

Background

The need to increase composting at the prison became crucial in 1996 with the announcement that the Fresh Kills landfill, where Rikers Island disposes of its food waste, would close at the end of 2001.

Program Description

The New York City Department of Sanitation (DOS) constructed a $5 million, fully enclosed composting facility on Rikers Island. Food scraps from inmates and officers are composted using a concrete bay technology specifically designed for this type of waste. Food residuals are mixed with shredded corrugated cardboard, also generated by prison kitchens. Finished compost will be used to amend soil on Rikers Island.

Although it takes 3 months to complete composting, the project diverts from Fresh Kills at least 6 tons of food residuals per day. At least three prisons are participating now, and eventually all eight major prisons will participate. More efficient collection programs are being designed and implemented, and facility operators are perfecting the compost "recipe."

What Makes the Rikers Island Program Unique?

The compost facility installed 216 photovoltaic (i.e., solar) panels as roofing tiles. These panels generate approximately 150 kilowatt hours per day of electricity.

Obstacles Overcome

As with the City of New York's composting in parklands project, cooperation with another city department requires a recognition of that department's priorities. The DOS had to address the Department of Corrections' safety and security concerns, particularly during construction. Security issues added approximately 10% to construction costs.

In addition, the DOS suggested this project to the Bureau of Prisons at a time when the population at Rikers Island was decreasing. By the time the prison population began to increase, the land for the composting facility had already been dedicated to the project. This timing was crucial to the success of the program, as it would not have been approved when the prison population was rising.

Program Contact

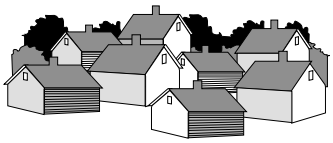
For further information about this program, contact Robert Lange at (212) 837-8156 or write to:

Robert Lange
Director, Bureau of Waste
Prevention, Reuse, and Recycling
Department of Sanitation
City of New York
44 Beaver Street, 6th floor
New York, NY 10004

Riverdale Village, Maryland

Type of Program

Demolition pilot project that used deconstruction waste diversion and recycling techniques.



Project Overview

The U.S. Department of Housing and Development (HUD) owns Riverdale Village, which, prior to deconstruction, consisted of a four-unit public housing project in an urban area of Baltimore County, Maryland. The building, erected prior to 1950, was constructed with exterior structural brick and interior stick framed with wood. An important project objective was to provide information on salvage value and labor requirements for brick and light-framed structures.

Background

Many demolition firms and private/public property owners have questions about how and under what conditions deconstruction (building disassembly and salvage) is a cost-effective alternative to demolition. HUD, the owner of Riverdale Village, supports deconstruction because of the employment opportunities it can provide public housing residents. Deconstruction creates more jobs than demolition because it is labor-intensive and relies primarily on the use of hand tools and "people power" to take buildings apart. It also presents an opportunity to teach job skills to people currently unemployed. To address these concerns, EPA and the National Association of Home Builders Research Center (NAHB-RC) conducted a pilot project at Riverdale Village.

Program Description

Deconstruction workers salvaged common building materials such as brick, framing lumber, hardwood flooring, windows, doors, and assorted fixtures. The project diverted 96.5 tons of construction materials. Salvaged items were sold at an onsite sale and earned a total of $2,440. Unsold items were donated to a construction material reuse organization in Baltimore, Maryland.

By volume, 70% of all materials from the building were salvaged or recycled. The research team documented the time required to manually disassemble and salvage/recycle/dispose of 25 different building materials. Commodities that have wide application, such as framing lumber, were relatively easily sold for approximately 50% of full, new retail value. However, the pilot found that the more finished and use-specific materials, such as windows, have a much lower proportion of retail value and require more intensive and targeted marketing. The research team also documented the time required to manually disassemble and salvage/recycle/dispose of 25 different building materials. It was determined that approximately half of the labor was spent on disassembly and half was spent on "processing" (denailing, sorting, stacking). Therefore, manual disassembly of light-frame (low-rise residential) buildings represents an excellent opportunity to identify and develop low-skilled workers with an aptitude and interest in the building trades. The environmental benefits of deconstruction were calculated as decreased disturbance to the site, conserved landfill space, energy saved by reused materials replacing new building

materials, and decreased airborne lead, asbestos, and nuisance dust at and around the job site.

What Makes the Riverdale Program Unique?

By using Riverdale as an example, the pilot project was able to lay out a wide range of environmental, regulatory, worker, and logistical issues that must be addressed prior to the start of deconstruction work. Additionally, it addressed issues that affect the overall process of building removal.

Obstacles Overcome

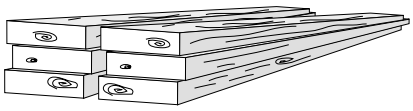
It is not possible for a single case study to comprehensively address each of the issues the building removal industry faces. However, the Riverdale pilot project was designed to address, to the fullest extent possible, the issues that affect the overall process of building removal. The Riverdale pilot project report lays out recommendations for future work on deconstruction in general and on the Riverdale project in particular.

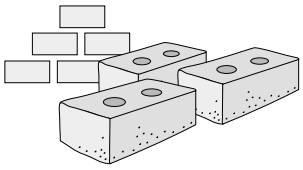
Program Contact

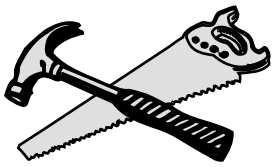
A hard copy of the Riverdale case study can be obtained by calling the HomeBase Hotline at the NAHB-RC (1-800-898-2842). The Riverdale pilot project case study can also be downloaded from the EPA Internet site <www.smartgrowth.org>. For further information about the Riverdale project and other deconstruction projects, contact Robin Snyder by telephone at (202) 260-8331 or write to:

Robin Snyder (2127)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460

E-mail can be sent to
<snyder.robin@epamail.epa.gov>







San Jose, California

Type of Program

Integrated waste management includes curbside collection of recyclables and yard trimmings, privatized commercial garbage and recyclables collection, programs to promote recycling at city facilities, and economic incentives to reduce waste generation.

SAN JOSE
CAPITAL OF SILICON VALLEY

Community Overview

San Jose is a major metropolitan area of approximately 845,000 people that lies at the southern end of San Francisco Bay. Although four landfills currently handle San Jose's waste, the city has a long-standing tradition of commitment to the environment. This commitment grew in response to a disposal crisis in the early 1980s and highlighted the need for the city to diversify its waste management strategy.

Background

The city of San Jose administers one of the largest waste management programs in the nation. Their integrated waste management program is designed to conserve natural resources and protect public health. It is also designed to meet the State of California's requirement to reduce the amount of landfilled waste by 50% by 2000.

The city has pursued this goal through curbside collection of traditional recyclables, yard trimmings, furniture, appliances, motor oil, corrugated cardboard, and much more. Residents are also charged a volume-based collection fee, thus providing an economic incentive to recycle.

Efforts have certainly paid off. In fiscal year 1996-1997, the city diverted 44% of its waste stream from landfills and is well on its way to meeting the State's goal of 50% by 2000.

Program Description

San Jose's waste management program consists of intensive recycling efforts in the residential, commercial, and civic sectors. This is combined with source reduction, outreach efforts, and technical assistance to businesses.

In the residential sector, the curbside program reaches 188,000 single-family households and 80,000 multiple-family households. Under San Jose's **Recycle Plus** program, which started in 1993, it is possible for residents to recycle up to 80% of their waste stream. As a result of such intensive recycling efforts, the city collected over 80,000 tons of recyclables in fiscal year 1995-1996 alone.

Participants in the commercial sector can choose any of a number of private haulers to handle their solid waste. These haulers must be permitted by the City, but otherwise may operate without any restrictions on their hauling districts or rates. Recylables collection works on the same principles.

San Jose, unlike many other municipalities, allows recyclables haulers to charge their commercial customers for their services. The city, however, assesses additional fees on commercial solid waste collection but not on recyclables collection. Thus, the price of recycling is still lower compared to garbage collection, providing a financial incentive for businesses to recycle.

The city's waste management staff also provides technical assistance to encourage businesses to recycle and to assist those who decide to do so. This same staff also manages San Jose's **Recycling Market Development Zone** program. Its purpose is to increase the number of manufacturers who make new products from collected recyclables.

For city-owned facilities, the city has established contracts with waste haulers, which provide flexible rate schedules and service levels for all city departments. The

city has also established the **Recycle at Work** program to increase the amount of material recycled at city workplaces, increase awareness of solid waste issues, and reduce the city's overall cost for garbage collection and disposal.

What Makes San Jose's Program Unique?

San Jose's intensive recycling program, **Recycle Plus**, has accounted for much of its success in the residential sector. As a part of outreach, the **Recycle Plus** program will undertake several new projects including greater emphasis on source reduction, establishing a web page, producing a promotional video, and conducting a campaign to thank its participants.

The **Recycle Plus** program has largely been about educating residents concerning the need to reduce waste; but, as it reaches maturity, the outreach program is shifting its efforts to educate residents about source reduction of waste. Recycle Plus has implemented several new outreach efforts such as using recycled materials at holiday gift wrapping tables at local malls and shopping cart "waste prevention assessments" at local supermarkets. Beginning in fiscal year 1997-1998, Recycle Plus will begin a campaign to show residents how they can lead more sustainable lifestyles.

A pilot program is also under way to increase the efficiency of the curbside yard waste program. The program will use compostable bags for waste collection.

Obstacles Overcome

Through a carefully constructed strategy implemented over several years, San Jose has successfully changed its entire waste system from one that relied solely on landfilling to one that emphasizes recycling and waste reduction as primary goals.

The main problem with such a large and diverse stream of recyclables is finding markets for them. The city has itself undertaken projects to find markets for food waste and mattress components. Other projects have been funded by grants to institutions such as San Jose State University.

Funding of the expanded waste management program as a whole is also a major concern. Because many of San Jose's contract payments are based on the number of households served, the growing population will increase the cost of providing garbage and recycling services.

Although the costs of all of the city's programs are currently being met, steps have also been taken to ensure their long-term financial security. The city has passed on much of the responsibility for many public education activities to its contracted waste haulers. This has permitted a 65% decrease in the actual public education budget. In addition, the city has renegotiated its contract with its waste haulers, resulting in a $12 to $16 million dollar savings over the next 7 years.

With its progressive and efficient integrated waste management program, San Jose will undoubtedly continue its role as a leader in waste management innovation.

Program Contact

For further information about San Jose's program, contact Jo Zientek at (408) 277-5533 or write to:

Jo Zientek
Environmental Services Department
777 North First Street,
Suite 450
San Jose, CA 95112

Santa Monica, California

Type of Program

"Recycling zones" and other strategies to offer convenient recycling options for residents of multifamily dwellings.

Community Overview

Santa Monica is a city of 87,000 people, 83% of whom live in multifamily housing. The city encompasses an area of about 8-1/2 square miles along southern California's coastline.

Background

Santa Monica's recycling efforts began in the early 1980s with California Waste Management Board grants. After funding a feasibility study and preliminary design for the recycling program, the state provided a second grant for purchasing equipment, improving existing recycling sites, and starting a public relations campaign.

Santa Monica uses four facilities to dispose of its nonrecycled refuse. Most trash goes to a county-owned landfill whose capacity is increasingly limited. Two other disposal facilities are privately owned, and the fourth is a municipally operated waste-to-energy facility.

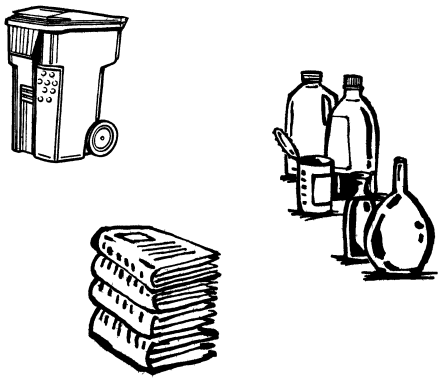
State law requires all cities to reduce the amount of refuse disposed at landfills by 50% of 1990 levels by the year 2000. To meet this mandate, the city has implemented a variety of waste reduction programs.

Program Description

Although Santa Monica provides curbside recycling for its single-family and low-density multifamily households, the large number of residents living in high-density multifamily dwellings required the city to make it convenient for them to recycle.

As part of the solution, the city developed its "recycling zone" concept. Recycling zones are sites that offer a set of 2-cubic-yard bins for recyclable cans, glass and plastic, newspapers, and mixed paper. Initially located in public alleys throughout the city, recycling zones have since been placed at city hall, the civic center, public parks, beach parking lots, and several private housing developments. The zone program began with 40 sites but has expanded to more than 110 sites, serving the 35,000 high-density, multifamily households.

The recycling zones are serviced by municipal crews. A frontloader truck collects materials from approximately 60 bins per day. Zone materials, as well as curbside recyclables, are taken to the Santa Monica Community Recycling Center, whose operations the city has privately contracted. Materials are sorted, baled, and prepared for shipment to end users. The recycling center also operates a buy-back and drop-off center that is open to the general public.



Other noncurbside recycling efforts include the refuse and recycling transfer station, which accepts scrap metal, refrigerators, green waste, wood waste, and automobile tires. The city has contracted with a labor agency that employs homeless individuals to salvage materials from the transfer station. Four parks join the transfer station in collecting 6,000 trees for the annual Christmas Tree Recycling Roundup. A household hazardous waste collection center accepts paint, thinners, solvents, pesticides, motor oil, batteries, pool acids, household cleaners, and similar types of waste from residents at no charge. Unused paints are made available free to the public.

Other efforts to reduce refuse in Santa Monica include a fee-for-volume billing system for refuse collection and selling subsidized backyard composting bins. In addition, a concrete and asphalt crushing operation annually recycles more than 100,000 tons of municipal and private contractor debris and sells it as base aggregate for construction purposes.

What Makes Santa Monica's Program Unique?

A unique feature of Santa Monica's program is that it is pervasive. In a small area—not even 9 square miles—over 100 recycling zones are available to the general public. No resident in a multifamily dwelling is farther than one-third of a mile from a recycling zone, and many are less than two blocks. The city has also begun to provide 68-gallon carts in individual buildings, making recycling even easier for those in multifamily residences.

This success is due in part to the city's layout. As an old city, Santa Monica has many alleys, where most recycling zones are located. According to a city official: "Without all the alleys, we couldn't do it to the extent we have." Recycling zones are not limited to alleys, however. By putting them in the parking lots for city parks and other public locations, Santa Monica further increases citizen participation in recycling programs.

Obstacles Overcome

Since implementing its recycling program, Santa Monica has had to contend with scavengers. The challenge is to make it easy for the public to deposit materials while making it difficult for scavengers to remove them. To help overcome the problem at recycling zones, the city modified the bins several times to help deter scavenging. (To deter scavenging in the curbside collection areas, the city plans to allow residents to commingle their recyclables in a single container.)

Illegal dumping has been a problem at some of the recycling zones. Some residents leave miscellaneous items at the recycling bins, presumably because they believe the items will be recycled. This requires the city to monitor the sites closely and dispatch cleanup crews to ensure that debris does not accumulate.

Program Contact

For further information about Santa Monica's recycling program, contact Santa Monica Recycle at (310) 458-2223 or write to:

City of Santa Monica
Santa Monica Recycle
2500 Michigan Avenue
Santa Monica, CA 90404

For further information about Santa Monica's household hazardous waste program, contact (310) 458-8227 or write to:

City of Santa Monica
Environmental Programs
200 Santa Monica Pier
Santa Monica, CA 90401

Seattle, Washington

Type of Program

Two-zone recycling, curbside collection, and drop-off centers utilizing private-sector collectors.

Community Overview

A city surrounded by the Cascade and Olympic mountain ranges and Puget Sound, Seattle is home to about 530,000 people. Its port is also central to a large international shipping industry.

Background

In 1988, the City Council established a goal of recycling 40% of all commercial and residential waste generated within the city by 1991. This goal increased to 50% by 1993 and 60% by 1998. Seattle's residential solid waste is managed by a city utility and financed through an enterprise fund. Rates are the source of revenue. For years, Seattle managed all parts of the garbage system, from collection contracts to transfer stations to long-haul transfer to city-owned and -operated landfills. But by 1986, both of the city's landfills had to be closed because they had explosive levels of methane gas migrating offsite and were subsequently listed as Superfund sites. The city had no choice but to contract with surrounding King County for landfill disposal. Disposal rates rose from $11 a ton to $31.50 a ton. In addition, closure of the two old landfills would cost $76 million. These skyrocketing costs were the bane of the old-style solid waste management system, but a boon to a system that incorporates waste reduction, recycling, and composting. Thus, the ground was laid for Seattle to begin its plan for recycling. In addition, the city completed a comprehensive planning initiative that included a 10-volume environmental impact statement on waste reduction, recycling, and disposal alternatives.

Program Description

Early in 1988, Seattle began residential curbside collection, servicing 147,000 households—all single-unit through four-unit residences in the City utilizing private-sector collectors. Two different collection strategies are being tested.

In the south, residents can recycle mixed paper, tin and aluminum cans, glass jars and bottles, cardboard, plastics, ferrous metals, and aluminum foil with the curbside and alley program just by signing up. Participating households receive a sturdy plastic container on wheels that has a lid and is suitable for outdoor storage. A free calendar tells them which day to wheel their carts to the curb or alley for emptying.

The program, serving 78,500 households, is run by Recycle Seattle, a subsidiary of Rabanco, Inc., a large, locally owned waste management company. Recyclables are collected in old rear-loading trucks, then processed in a new recycling facility. This 80,000-square-foot facility processes both commercial waste with a high percentage of recyclables and the commingled material collected from curbside.

North of the ship canal, Recycle America, a division of Waste Management, Inc., serves 69,800 households. Four stacking containers are provided: one for glass containers and aluminum and tin cans, a second for mixed scrap paper, a third for newspaper, and a fourth for number one and two plastics. Cardboard is set out next to the containers. A compartmentalized recycling truck collects the material. Recycle America separates the glass, aluminum, and tin with a combination of hand and mechanical sorting. Seattle paid $89.15 per ton in 1996. The payment is based solely on markets for secondary material. As markets improve, the City pays less; as markets worsen, the City pays more. In 1995, when markets were up, the City paid $50.22 per ton.

Seattle has an active household hazardous waste collection program. There are two permanently staffed drop sites open a total of 36 hours a week.

The city requires mandatory yard waste separation from household trash. Yard waste represents 20% of the generated residential waste stream. The city will pick it up at the curb or alley for $4.25 a month and take it to a composting facility. Grass clippings, leaves, branches, brush, and sod are accepted. At transfer stations, the utility accepts clean yard waste in a program called Clean Green. The brush, grass, and leaves are transferred to a private composting facility for processing.

The utility also provides recycling drop boxes at its two transfer stations, receiving all the traditional materials from aluminum cans to cardboard to used motor oil to white goods to some not-so-traditional materials such as mattresses.

What Makes Seattle's Program Unique?

Seattle's experiment with two different collection systems for recyclables should provide some interesting information and lessons for other cities. Both programs are voluntary.

The two-zone program began in February 1988. By August, 2,600 tons of material were being collected each month, a significant amount of material for such a new program. By the end of October, 72.1% of the eligible households had signed up in the north end; 48.7% had signed up in the south end. The city-wide signup rate is over 90%.

Obstacles Overcome

Successful implementation of such a large program in such a short time required both extensive promotion and responsive customer service representatives in the city's solid waste utility. The utility manages all promotional efforts but carries them out in conjunction with the two contractors.

Two all-city mailings kicked off the program. Customers were asked to sign up to receive a recycling container. Public service announcements were also run on television. Once the initial rush of signups was over, there was a continuing effort to advertise and promote the program to encourage more participation. The utility staffs booths at street fairs, works crowds at festivals, and will soon have bus placards around the city. The utility regularly creates media events to get coverage.

After overcoming initial obstacles such as a city fire code that did not allow plastic garbage containers and insufficient staff to handle calls during the initial signup period, Seattle is very pleased with the results of its program.

Today, Seattle's residential recycling rate is nearly 50%, and it is writing a new comprehensive plan that will guide efforts to reach the 60% goal. Recycling is a significant part of Seattle's solid waste management system.

Program Contact

For further information about Seattle's program, contact:

Seattle Public Utilities
Resources Planning Division
710 2nd Avenue
11th Floor
Seattle, WA 98104

or visit the website at www.panci.seattlewa.us/util

University City, Missouri

Type of Program

Leaf collection and composting yielding market demand.

Community Overview

University City, located just outside of St. Louis, MO, is a diverse cultural community widely known for its abundance of deciduous trees. The city's population is approximately 41,000.

Background

Throughout its history, University City has maintained a strong commitment to the environment. The city is very proud of its proactive involvement in this arena. Examples of the city's achievements date back to the early 1970s, when one of the country's first curbside newspaper recycling programs was initiated. Shortly thereafter, the city built its own transfer station in an effort to defer the rising costs associated with landfilling material. At the same time, studies showed that leaves represented an estimated 15% of the waste stream. Armed with this information, University City once again responded by establishing a comprehensive yard waste recycling program. Since that time, the city's recycling program has evolved to include its own Materials Recovery System, allowing the city to better market a wide variety of materials, and a biannual leaf collection program and compost facility.

Program Description

The University City leaf collection and composting program, which was established in 1983, set out to accomplish two very distinct goals:

- To decrease the amount of material entering the landfill
- To raise the awareness of residents concerning responsible yard waste management practices.

The collection of leaves is handled by city crews and a private hauler. The program lasts for 9 weeks in the fall and 3 weeks in the spring. Annually, 20,000 to 25,000 cubic yards of leaves are collected. The leaves are then transported to a 1.5-acre tract of unimproved park land and placed in windrows located adjacent to the city golf course and many residential and business properties.

When the material has decomposed sufficiently, it is made available to the city's residents and the city's own operations. The material is also available to commercial landscaping companies for a modest fee of $6 per cubic yard.

What Makes University City's Program Unique?

The city, with its rich history and focus on environmental concerns, will continue this commitment well into the 21st century. Always seeking to provide quality service in the most convenient and cost-effective ways, the city's recycling program continues to explore new avenues. Currently, efforts are being made in the marketing of the compost to aid in farming and as a control for land erosion. The city's curbside recycling program, which includes both single and multifamily households, is being expanded to offer the same services to all of the city's public schools.

Research has shown that, through responsible solid waste management techniques, not only is valuable landfill space spared but a large cost to the city can be prevented. University City estimates that the city saves $110,000 annually by separating yard waste from the waste stream and composting it.

Obstacles Overcome

Due to the size and location of the facility, decomposition rates and odor control can be concerns for the city. Close monitoring of factors such as the carbon/nitrogen ratio, wind direction, and proper turning of the compost piles has thus far eliminated any major problems.

Program Contact

For further information about University City's program, contact Moses Head at (314) 862-6767, ext. 264, or write to:

Moses Head
Environmental Coordinator
Department of Public Works
6801 Delmar Boulevard
University City, MO 63130

1.

This shows a vacuum loader towed behind a truck, picking up leaves from the street gutter. The loader blows leaves through a flexible connection into a box mounted on the towing vehicle.

Allan Dieckgraefe, Director of University City's recycling program, believes there's a strong need for compost to prevent the loss of topsoil. "In this age of high tech, it's comforting to know that a low-tech process, such as composting, can help solve a critical problem."

2.

When the 17-cubic-yard box is filled, the truck disconnects from the loader and hauls the shredded leaves to a processing area on unimproved park land. The truck then returns to a route, where it is reconnected to the original or another loader.

3.

An aerator/pulverizer mounted on a wheel loader further shreds and piles leaves in the processing area. The machine uses 3-foot-diameter paddles on a horizontal shaft 7'6" long.

4.

Windrows are created, 8 to 10 feet high and 20 to 35 feet at the base. The piles are turned periodically to restore oxygen for bacterial composting action

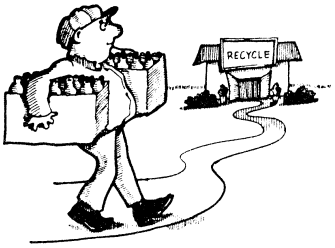
5.

This shows that after approximately 6 months of processing there is a dark, rich, peat moss-like material immediately below the surface ready for use as a soil amendment or stabilization.

Wellesley, Massachusetts

Type of Program

Voluntary, source-separation, drop-off recycling center.



Community Overview

Wellesley is a town of 27,000 people, located about 25 minutes from downtown Boston. It is primarily a suburban residential community.

Background

Wellesley's recycling program was started in 1971 by local environmentalists and the Department of Public Works when the town incinerator failed to meet air emission standards. Unlike many of the earlier recycling centers around the nation, Wellesley's is still in business and is thriving. Located at the town Recycling and Disposal Center, the operation has grown from collecting materials in 55-gallon drums to using 40-cubic-yard, open-top, transfer-haul containers plus a dual ram baler. It is now run by the town public works department and consists of a recycling facility, transfer station, and yard waste composting site.

Wellesley has never had municipal curbside garbage collection. Its residents—at least 83% of them—take their refuse to the Recycling and Disposal Facility (RDF), which is free only to residents. Wellesley hauls its refuse to a private sanitary landfill 25 miles away that charges more than $50 a ton in tipping fees.

Materials Collected and Sorted at Wellesley Recycling and Disposal Facility

Paper – newspaper, cardboard and corrugated, brown paper bags, mixed paper–magazines, advertising mail, office paper

Glass – clear, green, brown

Cans – aluminum, steel, bimetal

Plastic – high-density polyethylene containers, PET and #3-7

Oil – engine

Tires

Batteries – automotive, wet cells

Metals – iron, steel, aluminum, brass, copper

Wood – logs provided free for firewood, kindling free to townspeople, wood chips for mulch or compost

Leaves, grass, and yard wastes – composted—available to town residents

Returnable bottles and cans – all types—5 cent refund goes to the town

Books – people can take and leave books free at the "Book Exchange"

Clothing, small equipment, etc. – donated to Goodwill Industries

Miscellaneous reusable items: "Take it or leave it" area – usable furniture, equipment, and miscellaneous articles are left by residents and taken free by other residents

Program Description

Town residents bring both separated recyclables and regular garbage to the town recycling and disposal facility. There are drop boxes there clearly marked for glass, newspaper, corrugated cardboard, mixed paper, tin cans, aluminum, batteries, nonferrous and ferrous metal, used oil, plastic bottles, yard waste, firewood, and tires.

There is also a reusable items corner for the exchange of books, games, toys, appliances, furniture, and clothes. In addition, there is an area for composting leaves, grass, and other yard wastes. The RDF is a redemption center under the Massachusetts Bottle Bill as well.

About 90% of Wellesley residents who use the RDF also recycle. Newspaper, glass, cardboard, ferrous metal, and aluminum are the primary metals recycled. In addition, cardboard, metals, glass, and returnable containers are taken from the tipping floor of the transfer station, which is used for residential bulky waste and commercial refuse.

In 1997, more than 46% of the 19,757 tons of waste processed at the RDF was recycled. Recycling net benefits were about $251,648 for 1997. This includes sales of recyclables, avoided hauling and landfill costs, and recycling expenses.

What Makes Wellesley's Program Unique?

The Wellesley drop-off center evolved from a town incinerator site to a multipurpose recycling center. The center is proud of its park and social gathering setting. Picnic tables, well-maintained lawns, trees, flowers, and a circular drive contribute to the site's popularity for Girl Scout cookie sales as well as political events.

The center is also unique in its wide acceptance by townspeople and its dedicated staff. Further, the Wellesley recycling center sponsors a recycling education program aimed at all Wellesley residents, including a curriculum for third graders in Wellesley public and private schools. "Recycle. Join the Team" is its theme. The center also actively promotes other recycling in the community. For instance, it helps spread the word about community-sponsored rummage sales.

At the recycling center, a wide range of services can be found: a redemption center for bottles donated as a source of revenue for the center, a yard waste composting operation, and Goodwill depots. The book exchange is also a popular gathering place for residents.

Net recycling benefits for 1988 were about $186,000.

Obstacles Overcome

The Wellesley recycling program works, and it has always worked! Nonetheless, there are the complaints that recycling takes too much time and that separate storage bins take up too much space in the home. To overcome these complaints, the center relies on its information and education program. Not only does the public works staff go to the schools, they provide community presentations and promote recycling regularly.

Program Contact

For further information about Wellesley's program, contact William Tim Bailey (617)235-7600 or write to:

W. T. Bailey
Director, Wellesley Department of Public Works
455 Worcester Street
P.O. Box 81364
Wellesley, MA 02181

Wilton, New Hampshire

Type of Program

Multijurisdictional, mandatory material separation at drop-off center.

Community Overview

Wilton and the towns of Greenfield, Greenville, Lyndeborough, Mason, and Temple, New Hampshire, built the Wilton Recycling Center in 1979. It serves nearly 80% of the 10,876 residents of this rural area. The center requires residents to drop off their separated trash free of charge or pay for curbside pickup.

Background

A stone quarry in Wilton evolved from an old swimming hole to an unpleasant dump. By 1976, the town acknowledged that something needed to be done. With its neighboring towns, Wilton cleaned up the dump and created the Recycling Center on its site.

Opened in 1979, the Recycling Center cost about $360,000 to construct. The 4-acre site is set up with stations receiving a variety of recyclables. The facility recycles 37% of the waste, burns 42% in an onsite incinerator, and landfills the remaining 21%, including combustion ash.

Program Description

The Recycling Center accepts all household wastes except liquid wastes. Cans, glass, paper, plastic, and metal are recycled as well as motor oil. Trash categorized for incinerating, landfilling, and composting must be kept separate. There is a charge to dispose of some items, such as tires, demolition waste, appliances, and furniture. Compost and wood chips prepared at the center are offered for sale.

Workers at the "low-tech" center compress and bale papers and cans. Glass is crushed, and plastic jugs are ground up. Industries in the area purchase most of these materials.

Joe Paro states, "Since I have been working here I am dumbfounded by the amount of material we have been able to divert from the landfill."

The Wilton district spends about $70 a ton to dispose of its waste. In 1996, the district sold $67,000 worth of recycled material.

What Makes Wilton's Program Unique?

Six towns agreed to share expenses as well as revenues, based on population. They also passed ordinances in 1978 requiring the separation of waste prior to its being left at the center. Most of the residents were already dropping off their trash.

To make recycling easier for consumers, the center has widely distributed a list of materials with information about how to get them ready to take to the center. This information also helps cut down on the need to monitor the recyclers.

Obstacles Overcome

Getting people to understand the importance of recycling is a challenge. To help convince people about the value of recycling, the center has developed an easy and accurate system for compiling data that show what costs are avoided through recycling. Persuading citizens to comply with the mandatory source separation policy is a further challenge.

Through a public education program including brochures handed out to the public and group tours of the center, the Wilton Recycling Center has met these challenges. But education never stops. It is the key to continuing success.

Program Contact

For further information about Wilton's program, contact Joe Paro at (603) 654-6150 or write to:

Joe Paro
Wilton Recycling Center
Box 83
Wilton, NH 030865

Notes

[1] Glenn, Jim. The State of Garbage in America, Part 1. *BioCycle*. April 1998 (hereinafter *BioCycle*), pp. 32-34, 36.

[2] *BioCycle*. p. 32.

[3] *BioCycle*. p. 43.

[4] *A Builder's Field Guide* and other information can be obtained by calling the HomeBase Hotline at the National Association of Home Builders Research Center (1-800-898-2842).

[5] Roy F. Weston, Inc., 1994. *Value Added to Recyclable Materials in the Northeast*. Prepared for the Northeast Recycling Council, Brattleboro, VT.

[6] Tellus Institute, 1992. *Energy Implications of Integrated Solid Waste Management Systems*. Prepared for New York State Energy Research and Development Authority. Boston, MA.

Information

For more information about recycling and for additional copies of *Recycling Works!*, call the EPA Solid Waste Hotline at 1-800-424-9346. In the Washington, DC, metropolitan area, call 703-412-9810.

Following is a list of state recycling offices:

Alabama
State Recycling Coordinator
Alabama Department of Economic and Community Affairs
P.O. Box 5690
Montgomery, AL 36103-5690
(334) 242-5336
(334) 242-0552 FAX

Alaska
Department of Environmental Conservation
Pollution Prevention Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-7586
(907) 269-7600 FAX
www.state.ak.us

Arizona
Department of Env. Quality
Solid Waste Section - Recycling Unit
3033 North Central Avenue
3rd Floor Tower
Phoenix, AZ 85012
(602) 207-4133
(602) 207-2383 FAX
www.adeq.state.az.us

Arkansas
Department of Pollution Control and Ecology
Recycling Division
8001 National Drive
Little Rock, AR 72219
(501) 682-0812
(501) 682-0880 FAX

California
Department of Conservation
Recycling Division
801 K Street
Sacramento, CA 95814
(916) 323-3836
(916) 327-2144 FAX
www.consrv.ca.gov/dor/recycle.html

Colorado
Office of Energy Conservation
1675 Broadway, Suite 1300
Denver, CO 80202
(303) 620-4292
(303) 620-4288 FAX
1-800-659-2656 TDD

Connecticut
Connecticut Recycling Program
Department of Environmental Protection
709 Elm Street
Hartford, CT 06106
(860) 424-3022
(860) 424-4081 FAX
www.dep.state.ct.us

Delaware
Department of Natural Resources and Environmental Control
89 Kings Highway
Dover, DE 19901
(302) 739-4793
(302) 739-2296 FAX
www.state.del.us

District of Columbia
Department of Public Works and Solid Waste Management
2750 Capital St. SE
Washington, DC 20032
(202) 645-0747
(202) 645-3131 FAX

Florida
Department of Environmental Protection
2600 Blairstone Road
Tallahassee, FL 32201
(904) 488-0300
(850) 921-8061 FAX
www.dep.state.fl.us/waste/programs/rbac/index.htm

Georgia
Department of Community Affairs
60 Executive Park South
Atlanta, GA 30329
(404) 679-4940
(404) 679-0572 FAX
www.dca.state.ga.us

Hawaii
Litter Campaign
Governor's Committee for a Beautiful Hawaii
Honolulu, HI 96813
(808) 538-3166
(808) 536-0547 FAX

Idaho
Division of Environmental Quality
Air and Hazardous Waste
1410 North Hilton
Boise, ID 83706
(208) 373-0502
(208) 373-0169 FAX

Illinois
Illinois EPA
Bureau of Land
P.O. Box 19276
1021 N. Grand Ave E
Springfield, IL 62794-9276
(217) 782-6761
www.epa.state.il.us/land/recycle/htm

Indiana
Office of Solid and Hazardous Waste Management
Department of Environmental Management
100 North Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 232-8883
(317) 232-3403 FAX
www.ai.org/idem

Iowa
Department of Natural Resources
Waste Management Division
Wallace State Office Building
Des Moines, IA 50319
(515) 281-8176
(515) 281-8895 FAX
www.state.ia.us/dnr

Kansas
Department of Health and Environment
Bureau of Waste Management
Bldg 740 Forbes Field
Topeka, KS 66620
(913) 296-1594
(913) 296-1592 FAX
www.state.ks.us/public/kdhe

Kentucky
Resource Conservation and Local Assistance
Division of Waste Management
14 Reilly Road
Frankfort, KY 40601
(502) 564-6716
(502) 564-4049 FAX
www.state.ky.us/agency/nrepc/waste/dewmhome.htm

Louisiana
Louisiana Department of Environmental Quality
Office of Solid and Hazardous Waste
P.O. Box 82178
Baton Rouge, LA 70884-2178
(504) 765-0261
(504) 765-0617 FAX
deq.state.la.us

Maine
Office of Energy
Department of Economic and Community Development
State House Station #59
Augusta, ME 04333
(207) 287-2656
(207) 287-8070 FAX
www.econdev.maine.com

Maryland
Solid Waste Administration
2500 Broening Highway
Building 40
Baltimore, MD 21224
(410) 631-3343
(410) 631-4133 FAX
www.mde.state.md.us

Massachusetts
Division of Conservation and Transportation
Department of Environmental Protection
One Winter Street, 4th Floor
Boston, MA 02108
(617) 292-5962
(617) 556-1049 FAX
www.state.ma.us/dep/bwp/dswm/dswmhome.htm

Michigan
Waste Management Division
Department of Environmental Quality
P.O. Box 30241-4909
608 West Allegan
1st Floor Hannah
Lansing, MI 48933
(517) 373-2730
(517) 373-4797 FAX
www.deq.state.mi.us

Minnesota
Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155
(612) 296-6300
(612) 297-8697 FAX
www.pca.state.mn.us

Mississippi
Non-Hazardous Waste Section
Office of Pollution Control
Department of Environmental Quality
P.O. Box 10385
2380 Highway 80 West
Jackson, MS 39209
(601) 961-5047
(601) 354-6612 FAX

Missouri
Department of Natural Resources
Hazardous Waste Program
P.O. Box 176
Jefferson City, MO 65102
(573) 751-3176
(573) 751-9869 FAX
www.state.mo.us/dnr
Federal Express:
1738 East Elm Street
Jefferson City, MO 65101

Montana
Solid Waste Program
Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901
(406) 444-4400
(406) 444-1723 FAX
Federal Express:
1520 E. 6th Avenue
Helena, MT 59620

Nebraska
Litter Reduction and Recycling Programs
NE Department of Environmental Quality
1200 N Street/P.O. Box 98922
Lincoln, NE 68509
(402) 471-4210
(402) 471-2909 FAX

Nevada
Nevada State Energy Office
1050 E. William, Suite 435
Carson City, NV 89710
(702) 687-5975
(702) 687-4914 FAX
dparson@state.nevada.us

New Hampshire
Waste Management Division
Department of Environmental Services
6 Hazen Drive / P.O. Box 95
Concord, NH 03301
(603) 271-2900
(603) 271-2456 FAX
www.state.nh.us/des/descover.htm

New Jersey
Bureau of Recycling and Planning
Department of Environmental Protection
P.O. Box 414
401 E. State Street
Trenton, NJ 08625
(609) 984-3438
(609) 777-0769 FAX
www.state.nj.us/dep/dshw/recycle

New Mexico
Environment Department
Solid Waste Bureau
Harold Runnels Bldg.
1190 St. Francis Drive
Santa Fe, NM 87503
(505) 827-0197
(505) 827-2902 FAX

New York
Bureau of Waste Reduction and Recycling
Department of Environmental Conservation
50 Wolf Road, Room 212
Albany, NY 12233-7253
(518) 457-7337
(518) 457-1283 FAX
www.dec.state.ny.us

North Carolina
North Carolina Department of Environment, Health & Natural Resources
Division of Waste Management
ATTN: Solid Waste Management Branch
401 Oberlin Road, Suite 150
Raleigh, NC 27605
(919) 733-0692
(919) 733-4810 FAX
www.wastenot-ehr.state.nc.us/swhome/swhome.htm

North Dakota
North Dakota Department of Health
Division of Waste Management
P.O. Box 5520
Bismarck, ND 58506-5520
(701) 328-5166
(701) 328-5200 FAX
www.ehs.health.state.nd.us
Federal Express:
1200 Missouri Avenue, Room 302

Ohio
Ohio Department of Natural Resources
1889 Fountain Square Court, Building F2
Columbus, OH 43224-1331
(614) 265-7061
(614) 262-9387 FAX
www.dnr.state.oh.us.odnr/recycling

Oklahoma
Solid Waste Division
Department of Environmental Quality
1000 N.E. 10th Street
Oklahoma City, OK 73117-1212
(405) 745-7100
(405) 745-7133 FAX
www.state.ok.us/deq

Oregon
Department of Environmental Quality
811 S.W. Sixth
Portland, OR 97204
(503) 229-5913
(503) 229-6977 FAX
www.deq.state.or.us/wmc/cleanup/clean.htm

Pennsylvania
Recycling and Market Section
Division of Waste Minimization and Planning
Department of Environmental Protection
P.O. Box 8472
400 Market Street, 14th Floor
Harrisburg, PA 17120
(717) 787-7382
(717) 787-1904 FAX
www.dep.state.pa.us

Rhode Island
Strategic Policy and Planning Office
Department of Environmental Management
235 Promenade Street
Providence, RI 02908
(401) 222-3434
(401) 222-2591 FAX
www.state.ri.us/dem

South Carolina
Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201
(803) 734-5300
(803) 734-5216 FAX
www.state.sc.us/dhec/recpg/htm

South Dakota
Energy Office
206 West Missouri Avenue
Pierre, SD 57501
(605) 773-5027
(605) 773-6035 FAX
www.state.sd.us/state/executive/denr/des/waste%20mgn/recycgu.htm

Tennessee
Department of Environment and Conservation
Division of Solid Waste Management
401 Church Street, 5th Floor
Nashville, TN 37243
(615) 532-0780
(615) 532-0886 FAX
www.state.tn.us/environment/permits/handbook/regs.htm

Texas
Texas Natural Resource Conservation Commission
Division of Solid Waste Management
12100 Park 35 Circle
Autsin, TX 78753
(512) 239-1000
(512) 239-6717 FAX
P.O. Box 13087
Austin, TX 78711-3087
www.tnrcc.state.tx.us

Utah
Division of Solid and Hazardous Waste
Department of Environmental Quality
P.O. Box 144880
Salt Lake City, UT 84114-4880
Federal Express Address:
288 North 1460 West
Salt Lake City, UT 84116
(801) 536-6170
(801) 536-6715 FAX
www.eq.state.ut.us

Vermont
Agency of National Resources
103 S. Main Street, North Building
Waterbury, VT 05676
(802) 241-3770
(802) 241-3287 FAX

Virginia
Virginia Department of Environmental Quality
629 East Main Street
Richmond, VA 23219
(804) 698-4000
(804) 698-4500 FAX
www.deq.state.va.us

West Virginia
Division of Natural Resources
Conservation, Education, and Litter Control
1900 Kanawha Blvd. E
Charleston, WV 25305
(304) 558-3315
(304) 558-2768 FAX

Washington
Tom Fitzsimmons
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
(360) 407-6000

Wisconsin
George E. Meyer
Wisconsin Department of Natural Resources
101 S. Webster
Madison, WI 53703
(608) 266-2621
(608) 267-3579 FAX
www.dnr.state.wi.us

Wyoming
Solid Waste Management Program
Department of Environmental Quality
Herschler Building
122 W. 25th Street
Cheyenne, WY 82002
(307) 777-7752
(307) 777-5973 FAX
www.state.wy.us/state/gov/state_gov/html

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Washington, DC 20460

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