United States General Accounting Office

GAO

Report to the Ranking Minority Member, Committee on Governmental Affairs, U.S. Senate

February 1995

SOLID WASTE

State and Federal Efforts to Manage Nonhazardous Waste

GAO/RCED-95-3

GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-256811

February 2, 1995

The Honorable John Glenn
Ranking Minority Member, Committee
on Governmental Affairs
United States Senate

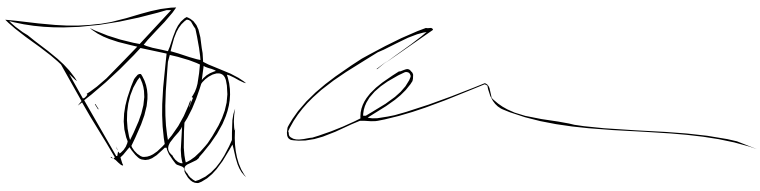
Dear Senator Glenn:

As requested, we are reporting on the status of state and federal efforts to manage solid waste, including municipal, commercial, and industrial waste. Our report contains information on how the states are addressing issues such as financing the high costs of managing solid waste and where the states see the need for a federal role in addressing solid waste issues—for example, in authorizing the states to control intrastate and interstate shipments of solid waste.

As arranged with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days after the date of this letter. At that time, we will send copies of this report to appropriate congressional committees; the Administrator, Environmental Protection Agency; and the Director, Office of Management and Budget. We will also make copies available to others on request.

This work was performed under the direction of Gerald E. Killian, Assistant Director, Environmental Protection Issues, who may be reached at (202) 512-6552. Other major contributors to this report are listed in appendix V.

Sincerely yours,



Peter F. Guerrero
Director, Environmental
Protection Issues

Executive Summary

Purpose

Americans annually generate billions of tons of nonhazardous solid waste. In 1992, 13 billion tons of waste, including 200 million tons of municipal solid waste, required some form of processing: recycling, incineration, or disposal. State and local authorities are responsible for planning for the safe management of solid waste; granting permits for landfills; and, in some cases, arranging for waste collection, recycling, incineration, and/or disposal services.

Concerned about the states' ability to manage solid waste, the Ranking Minority Member, Senate Committee on Governmental Affairs, asked GAO to examine (1) how the states are addressing solid waste issues, such as financing the high costs of managing this waste and resolving public opposition to locating waste facilities in communities, and (2) where the states see the need for a federal role in addressing solid waste management issues.

Background

The Congress addressed the need to manage our nation's solid waste in both the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, and the Pollution Prevention Act of 1990. RCRA required the Environmental Protection Agency (EPA) to establish minimum standards for the safe design and placement of municipal landfills and to develop guidelines for the federal purchase of products containing materials recovered from waste. The Pollution Prevention Act required EPA to develop and implement a strategy to promote minimizing the amount of waste generated and directed EPA to identify, as appropriate, measurable goals and tasks to meet those goals. As mentioned, state and local authorities are responsible for planning for the safe management of solid waste; granting permits for landfills; and, in some cases, arranging for waste collection and other waste management services. In part because not every municipality in this nation has waste disposal services readily available within its jurisdiction, waste has been transported to other locations for disposal, causing concern in some of the communities that receive this waste.

In 1989, EPA issued an Agenda for Action in response to concerns that the nation had no national strategy for managing municipal solid waste. This agenda calls for an integrated waste management hierarchy, beginning with reducing the amount of waste generated (source reduction), then recycling and reuse, and finally incineration and the use of landfills. The agenda set a national goal of reducing the volume of municipal waste by 25 percent by 1992 through source reduction and recycling.

Results in Brief

As of December 1994, state and/or local authorities in 46 states had either developed or were in the process of developing plans for managing solid waste to address issues such as diminishing disposal capacity, the rising costs of managing solid waste, and the difficulty of selecting sites for new waste disposal facilities given increased resistance from local residents. While the states' plans vary, some plans promote the use of EPA's hierarchy in order to conserve landfill space, propose alternate financing mechanisms to carry out solid waste management activities, and advocate alternative procedures, such as arbitration, to resolve disputes about selecting sites for facilities.

Some state officials and industry experts see the need for a federal role in waste management to assist the states and industry in their efforts to reduce and recycle waste, and to provide controls over waste shipments. These officials see a need for (1) national goals for source reduction, (2) uniform packaging standards, (3) national standards for products containing recovered material, and (4) federal assistance in developing markets for recyclable material. While EPA supports and endorses source reduction and recycling as well as efforts to develop goals and standards, the agency does not believe that it should take the lead in these activities. To provide states with control over waste shipments, the federal government would need to authorize state and local governments to restrict waste shipped in their jurisdictions. Courts have held that under the Commerce Clause of the U.S. Constitution, state and local governments cannot restrict waste shipments solely on the basis of their origin unless specifically authorized by the Congress. Legislation has been proposed in the Congress to provide the states with the authority to restrict the interstate and intrastate shipment of waste. Because solid waste is widely shipped both within and among states and internationally, any legislative action authorizing the states to control waste shipments will affect the solid waste management industry. However, data are not currently available to assess this impact.

Principal Findings

State and Local Governments' Plans to Address Solid Waste Issues

Nationwide, 46 states, including 8 of the 9 states GAO visited, have developed solid waste management plans. One of the primary reasons for developing such plans is concern over diminishing disposal capacity. To determine future capacity needs, five of the eight plans contain an

inventory of the state's waste streams and capacity to manage those waste streams. Furthermore, all eight plans recognize options for managing waste other than land disposal and incorporate recycling and source reduction as well as state goals and strategies that encourage such options.

Another reason for developing plans is concern over the rising cost of solid waste management. As alternatives to the use of general revenue funds for financing solid waste management, six of the eight plans provide for financing mechanisms such as fees for solid waste, recycling taxes, bond funds, and economic assessments. Funds from these sources are used, for example, to award grants to support local recycling programs and to pay for the costs of closing landfills. A 1992 survey of state funding found that the states are increasingly implementing special fees and/or taxes as a means of obtaining revenues for their solid waste programs. While special revenues accounted for 57 percent of all funding in 1991, this figure increased to 74 percent in 1992.

In some instances, because of local opposition, it has taken up to 12 years and millions of dollars in legal fees and contract negotiations to choose a site for and construct a solid waste management facility. To counter this opposition, two of the eight plans contain procedures for selecting sites for waste facilities. For example, in Michigan, counties must establish waste management plans that contain criteria for selecting a site, and permits must be issued if a proposed facility meets these criteria.

Federal Role in Source Reduction, Recycling, and Capacity Assurance

Some state officials and industry experts see a need for a federal role in solid waste management. They believe that the federal government can assist the states in meeting source reduction and recycling goals and provide the states with control over waste shipments. In particular, officials see the need for a federal role in (1) developing current national goals for source reduction, (2) setting packaging standards, (3) setting standards for products containing recovered material, and (4) promoting the development of markets for recyclable materials. EPA has worked to educate industry, state and local governments, and the public on source reduction and recycling and supports the work of states and other organizations. In addition, it has established some guidelines for the federal procurement of products containing recovered materials. However, the agency has no plans to set standards or goals beyond the goal, established in its 1989 agenda, to use recycling and source reduction to reduce municipal solid waste by 25 percent by 1992. The agency also

does not believe that it should take the lead in recycling or source reduction because it does not view this as a federal responsibility. About 22 percent of municipal waste was recycled in 1993, and while EPA projects that recycling rates of 25 to 35 percent may be possible by the year 2000, additional advances may have to be made to achieve these rates. Data are not available on source reduction rates, and EPA is currently studying how to measure source reduction.

The states also see a need for a federal role to ensure sufficient disposal capacity. Federal courts have ruled that the states cannot control private or commercial waste shipments within states and between states solely on the basis of the origin of the shipments because such controls would violate the Commerce Clause of the U.S. Constitution. Some state and local officials maintain that such controls are necessary to ensure sufficient local or in-state disposal capacity and to ensure that local revenues are sufficient to pay for publicly financed facilities or services. Data are not available on how much solid waste is shipped either within or between states. However, municipal waste is shipped out of or received by 47 states across the nation. Legislation introduced in the 103rd Congress would have authorized the states to control intrastate and interstate waste shipments. EPA is completing a report to the Congress on intrastate waste shipments that could provide information on the impact of authorizing states to limit these shipments. No such review is being conducted on interstate waste shipments, and without information, it will be difficult to decide how best to act on this issue.

Recommendations

GAO is making no recommendations in this report.

Agency Comments

As requested, GAO did not obtain written agency comments on this report. However, GAO discussed its contents with officials from EPA's Office of Solid Waste and Emergency Response, Municipal and Industrial Solid Waste Division, who agreed that the report accurately describes EPA's efforts.

Contents

Figures

Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office
NIMBY	not in my backyard
RCRA	Resource Conservation and Recovery Act

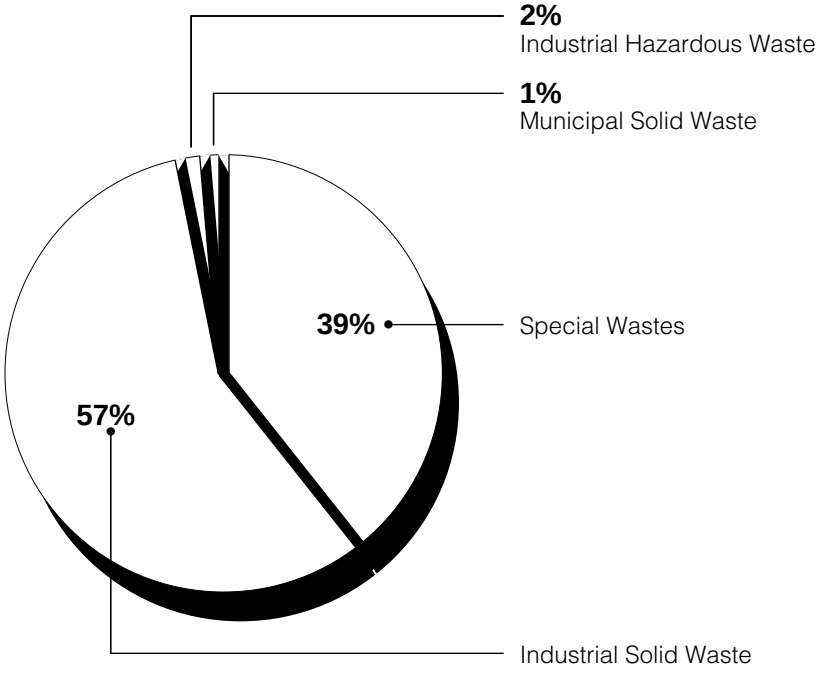
Introduction

Americans generated about 13 billion tons of nonhazardous solid waste—including 200 million tons of municipal waste—in 1992, the latest year for which data are available. All of this waste requires processing by either recycling, incineration, or disposal. State and local authorities are responsible for planning for the safe management of solid waste; granting permits for landfills; and, in some cases, arranging for waste collection and other waste management services. The Environmental Protection Agency (EPA) has developed a hierarchy of preferred methods for managing solid waste that emphasizes first, reducing the amount of waste generated (source reduction); second, recycling and reuse; and finally, incineration and the use of landfills. According to EPA, total expenditures for managing nonhazardous solid waste in 1972 were $8.4 billion, and these costs could reach $75 billion by 2000.

Amounts of Waste Generated and Disposal Methods

Of the 13 billion tons of nonhazardous waste generated in 1992, 7.6 billion tons was nonhazardous industrial waste, 5.2 billion tons was special wastes (wastes from mining, oil and gas production, electric utilities, and cement kilns), and about 200 million tons was municipal waste (both commercial and residential wastes). Figure 1.1 shows the percentage, by type, of all the waste generated in 1992. The amount of nonhazardous solid waste generated was almost 50 times greater than the amount of hazardous waste.

Figure 1.1: Distribution of Solid Waste, 1992



Source: EPA.

In 1990, we reported that more than 95 percent of industrial waste goes to surface impoundments (such as ponds and lagoons), where it is stored, treated, and released into surface water.[1] The rest is disposed of in landfills or waste piles, or applied to the land.[2] The waste management method used for special wastes varies according to the type of waste. For example, EPA estimates that in the early 1980s, about 56 percent of waste rock was disposed of in on-site waste piles and 61 percent of tailings were disposed of in on-site surface impoundments. Municipal waste is managed quite differently than industrial or special wastes. In 1993, the states reported that about 17 percent of municipal solid waste was recycled,

[1]Nonhazardous Waste: Environmental Safeguards for Industrial Facilities Need to Be Developed (GAO/RCED-90-92, Apr. 12, 1990).

[2]A landfill is an excavated area where wastes are permanently disposed of. A waste pile is a mass of waste generally placed on the ground for storage or treatment. A land application unit is an area of land where wastewater or sludge is placed on or mixed into the soil for disposal and sometimes treatment.

11 percent was incinerated, and 72 percent was sent to landfills. (App. I provides state-by-state data on the percentage of municipal waste recycled, incinerated, and sent to landfills.)

Federal Requirements for Solid Waste Management

The Resource Conservation and Recovery Act of 1976 (RCRA), as amended, establishes a cooperative framework for federal, state, and local authorities to manage solid waste in an environmentally sound manner and to maximize the use of limited resources. The act requires EPA to establish minimum criteria for facilities that may receive hazardous waste from households or from generators of small quantities, in order to ensure that there is no reasonable probability that human health or the environment will be adversely affected. It also requires states to adopt a permit program or other means of prior approval to ensure that landfills meet EPA's minimum criteria. Furthermore, EPA must establish guidelines and may provide technical and financial assistance to state and local authorities for the development and implementation of state plans for managing waste. Between fiscal year 1978 and fiscal year 1981, EPA provided funds to states to develop and implement waste management plans. Beginning in 1982, EPA eliminated financial assistance for state and local planning.

Both RCRA and the Pollution Prevention Act of 1990 (P.L. 101-508) address alternatives to land disposal of waste. RCRA advocates the use of resource recovery, either through facilities that convert waste to energy or through recycling. To promote recycling, RCRA requires federal agencies that procure goods to purchase products, such as paper, that contain recovered material. The act requires EPA to develop guidelines that identify products that are or can be produced with recovered materials and to recommend practices for agencies to follow when purchasing the products. RCRA also requires the Department of Commerce to encourage more commercialization of resource recovery technologies through (1) promoting proven technologies, (2) providing a forum for the exchange of technical and economic data on resource recovery facilities, (3) providing accurate specifications for recovered materials, and (4) stimulating the development of markets for recovered material.

The Pollution Prevention Act also promotes reducing the amount of material generated and thus reducing the amount of waste requiring recycling, treatment, or disposal. The act requires EPA to develop and implement a strategy to promote source reduction. As part of that strategy, EPA is directed to, among other things, (1) establish standard methods for

measuring source reduction; (2) coordinate source reduction activities in each office within EPA; (3) facilitate the adoption of source reduction techniques by businesses; and (4) identify, where appropriate, measurable goals, tasks necessary to achieve the goals, dates for achieving these goals, and organizational responsibilities.

In 1979, EPA issued minimum criteria for solid waste landfills. Under these criteria, waste had to be covered and protected against floodwater, and open burning of waste was prohibited. In 1988, EPA proposed new criteria for municipal waste landfills that accept hazardous waste from households or from small-quantity generators[3] because the Congress determined that the 1979 criteria may not adequately protect human health and the environment. Beginning in October 1993, the new criteria for new or expanding municipal landfills require (1) liners to prevent liquids from leaking into the groundwater, (2) collection systems to remove liquids that accumulate in the waste, (3) monitoring of groundwater for hazardous substances, and (4) plans for closing and then monitoring the waste sites. EPA projected that these regulations would reduce the number of municipal landfills in operation.

EPA has not revised its 1979 criteria for solid waste landfills other than those that accept municipal waste. As a result of a January 1994 settlement agreement between EPA and the Sierra Club, EPA is required, by May 1995, to propose rules revising criteria applicable to all nonmunicipal solid waste facilities that may receive hazardous waste from households or from small-quantity generators. The settlement agreement further requires that the rules be made final by July 1, 1996.

EPA's Agenda for Action

EPA's Agenda for Action, issued in 1989 in response to concerns over the lack of a national strategy for managing solid waste, calls for an integrated waste management system consisting of a hierarchy of waste management options: first, source reduction; then recycling and reuse; and finally, incineration and the use of landfills. EPA's strategy included a national goal of reducing solid waste through source reduction or recycling by 25 percent by 1992. No specific goal for source reduction or recycling was set beyond 1992.

[3]Under these criteria, a small-quantity generator is a generator that produces less than 100 kilograms of hazardous waste per month (or accumulates less than 100 kilograms at any one time), or one that produces less than 1 kilogram of acutely hazardous waste per month (or accumulates less than 1 kilogram of acutely hazardous waste at any one time). A kilogram equals 2.2 pounds.

In addition, the Agenda for Action identifies several objectives for municipal waste management. These objectives included increasing (1) the amount of information on waste planning and management available to states, local communities, waste handlers, citizens, and industry; (2) effective planning for municipal waste; (3) source reduction activities by the manufacturers, the government, and citizens; and (4) recycling by government, individuals, and corporations. The agenda envisions that EPA, state and local governments, industries, waste managers, and citizens will share the responsibility of educating themselves and adopting integrated waste management strategies.

Options for Managing Solid Waste

While state and local authorities are responsible for planning for solid waste management, the waste management entities or authorities that provide waste management services and the services provided vary considerably from community to community. A solid waste manager is responsible for selecting and arranging for waste management services, such as waste collection, land disposal or incineration, or recycling and composting. The services selected are those that appropriately address each component of solid waste in the most cost-effective and environmentally beneficial way. For example, recycling and reuse are appropriate for things whose physical properties make it technically and economically feasible to use them further; composting is used for organic substances; and incineration and land disposal are used for waste with little or no commercial value or for which recycling and reuse markets are poorly developed.

Ownership Options

Once the types of services needed to manage solid waste are selected, a solid waste manager must determine who will provide that service. Depending on location, the services could be provided by municipalities, private companies, large commercial firms, or the company or business needing the waste management services. For example, collection and disposal services may be owned and provided by the government, or the government may contract with commercial firms to provide these services. In some municipalities, households, businesses, and manufacturers may make their own arrangements with commercial haulers for waste collection. These haulers, in turn, may either own recycling and disposal facilities or contract to use services owned by commercial waste management companies. Other options include (1) public ownership of the infrastructure, with municipal waste collection services contracted to commercial operators, and (2) public collection, with waste taken to

privately or commercially owned and operated facilities. For example, Los Angeles and New York City both own and operate collection vehicles that dispose of residential waste at publicly owned and operated landfills. The city of Las Vegas and the surrounding county partially contract out collection and disposal services to a commercial firm. In areas of Colorado and New Jersey, homeowners must contract with commercial firms for collection because the municipalities do not provide or arrange for this service.

Ownership options for solid waste management services may also vary by the type of solid waste being managed. Local governments may provide services to households and small commercial establishments but exclude large commercial establishments and industrial firms from using those same services. Commercial waste collection and disposal companies may provide collection and disposal services to commercial establishments and industrial firms that generate nonhazardous industrial waste or construction and demolition debris. Large industrial firms may also treat, recycle, incinerate, or dispose of their own waste on-site. According to 1991 estimates by the National Solid Wastes Management Association, commercial firms served around 60 percent of all households and removed more than 90 percent of the nation's commercial refuse. According to other estimates, commercial land disposal facilities handled about 50 percent of the volume of municipal solid waste, although they represented only 15 to 30 percent of the landfills operating in 1992.

Intrastate, Interstate, and International Transportation Options

Solid waste managers must also decide whether waste can be shipped to a local private, public, or commercial landfill, incinerator, or processing facility—such as a recycling facility—or to facilities located elsewhere in the same state, in other states, or in other countries. In 1992, there were only about 170 incinerators and fewer than 5,400 landfills within the United States. However, given that there are about 40,000 county, municipal and township governments, some waste must be shipped to other locations.

The domestic transport of solid waste is governed by state laws and regulations, which are limited by the Commerce Clause of the U.S.

Constitution.[4] The U.S. Supreme Court has ruled that state and local governments cannot ban, impose restrictions on, or place surcharges on solid waste solely on the basis of its origin. Publicly owned facilities, however, generally may restrict the solid waste they accept to waste generated within the state. The Court's reasoning was that these facilities are operating as market participants, not as regulators, and may benefit the residents who, through taxes, paid for the facilities.

Some waste is also shipped between countries. International shipments of waste between the United States and Canada and Mexico are governed by international agreements.[5] The agreement between Canada and the United States was amended in 1992 to require that the receiving country be notified before municipal solid waste is shipped for final disposal or for incineration with energy recovery. Previously, this notice was required only for hazardous waste shipments. The agreement between the United States and Mexico governs hazardous waste shipments; however, many wastes classified as industrial nonhazardous waste in the United States are classified as hazardous in Mexico.

Objectives, Scope, and Methodology

Concerned about whether the nation has sufficient capacity for the safe disposal of solid waste, the Ranking Minority Member, Senate Committee on Governmental Affairs, asked us to examine (1) how the states are addressing solid waste issues, including what efforts state and local governments are making to pay for higher waste management costs and to develop additional solid waste management capacity amid growing opposition to placing waste facilities in local communities, and (2) where the states see the need for a federal role in addressing these issues.

[4]The Commerce Clause of the Constitution grants the Congress the power to "regulate commerce among the states." The clause has been interpreted as not only granting power to the Congress but also limiting the states' power. Thus, even when the Congress has not acted, states may not pass laws that unduly burden interstate commerce. The Congress, however, may authorize states to enact laws that would otherwise not be permissible under the Commerce Clause. The U.S. Supreme Court has determined that the interstate movement of solid waste is "commerce" under the Commerce Clause.

[5]Agreement Between the Government of the United States of America and the Government of Canada Concerning the Transboundary Movement of Hazardous Waste, dated October 1986, and Annex III to the Agreement Between the United States of America and the United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area, dated November 1986. In addition, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, completed in March 1989 and signed by 53 countries, including Canada, Mexico, and the United States, requires advance notification of hazardous and solid waste shipments, prior consent to receive shipments, and tracking. The U.S. Senate consented to ratifying this convention in 1992; however, implementing legislation to carry out the convention's provisions must be enacted before the United States officially ratifies the treaty.

To address the first objective, we interviewed managers of solid waste programs, environmental specialists, or solid waste planners in each of the 50 states and obtained information about the states' plans for solid waste management. We also obtained data from a state planning survey by the Texas Natural Resources and Conservation Commission and a survey on funding of solid waste management plans by the New York Department of Environmental Conservation. We also surveyed EPA's regional solid waste officials to determine their views on problems that the states have with solid waste management and on the level of assistance provided by EPA's regional offices. We reviewed studies and surveys of states' solid waste management conducted by national solid waste organizations and editors of trade publications, such as Biocycle and the Solid Waste Report, to obtain an overview of the states' rates of generating solid waste, disposal methods, recycling programs, goals and laws, and trends and potential problems with solid waste management.

In addition, we visited nine states and two major metropolitan areas and interviewed these states' directors of solid waste programs, environmental specialists, recycling coordinators, solid waste planners, county directors of public works, city commissioners, sanitary engineers, and city directors and supervisors of solid waste. Through these interviews, we identified state and local concerns about solid waste management and determined how state and local governments planned, carried out, and regulated solid waste management. The states we selected were Colorado, Michigan, New Jersey, New Mexico, Ohio, Oregon, Pennsylvania, Texas, and Washington; the metropolitan areas were Los Angeles and New York City. We selected these states and cities on the basis of where they were located, how much waste they generated, whether they had state plans for managing waste, how much they used alternative waste management methods, whether they were net exporters or net importers of waste, and how dense their populations were.

We interviewed state and local officials in the selected states and cities to identify potential problems they had in carrying out their plans for managing solid waste and innovative approaches they used to address these problems. We asked how they had implemented EPA's hierarchy of source reduction, recycling and reuse, and incineration or the use of landfills and what obstacles they had encountered when choosing these options. We also contacted U.S. Customs officials in Washington, D.C., and the Buffalo, New York, Port of Entry; Environment Canada; the Ontario Ministry of Environment and Energy; EPA's solid waste officials at headquarters and in the regions; and state and local officials responsible

for solid waste management to obtain data on the volumes of solid waste involved in intrastate, interstate, and international shipments. We also asked about the rationale for and against restricting solid waste shipments and the potential impact of these restrictions. We reviewed interstate agreements and international bilateral agreements between the United States and Canada and the United States and Mexico. We reviewed trade literature, court cases, state regulations, and surveys on state and local efforts to control interstate and intrastate solid waste shipments.

To address our second objective, we discussed the problems of managing solid waste with state and local government officials and consulted industry experts representing solid waste associations, nonprofit environmental groups, academia, the Congressional Research Service, a solid waste management consulting firm, and a major private solid waste company. (See app. II for a complete list of these experts.) The organizations and groups were selected because they represent both solid waste practitioners and professionals, have academic backgrounds in environmental and solid waste issues, and/or represent national environmental groups active in waste management. We asked these experts to comment on the need for a federal role in addressing solid waste issues and major issues affecting the management of solid waste. We also obtained their opinions on the elements that should be included in a federal role—for example, source reduction, recycling, interstate and intrastate shipments of solid wastes, and other issues facing state and local governments in managing solid waste.

Additionally, we contacted representatives from the Canadian Council of Ministers of the Environment, Washington Retailers Association, Coalition of Northeastern Governors, Recycling Advisory Council, Northeast Recycling Coalition, and International City/County Management Association. From these organizations, we obtained and reviewed model legislation on toxic substances and on packaging, packaging guidelines, labeling standards, position papers on market development, and descriptions of peer exchange programs. We also reviewed EPA's publications on source reduction and recycling. We conducted our review between October 1992 and January 1995 in accordance with generally accepted government auditing standards.

Agency Comments

As requested we did not obtain written comments on this report from EPA. However we discussed its contents with officials in EPA's Office of Solid Waste and Emergency Response, and they generally agreed that the

information was accurate. The Chief of the office's Recycling and Implementation Branch, Municipal and Industrial Solid Waste Division, stated that the report accurately portrayed the current status of solid waste management in the United States and EPA's role in assisting the states in their efforts. These officials' comments have been incorporated where appropriate.

State and Local Governments Are Developing Plans and Solutions

In response to concerns about solid waste, states have increased their efforts to address solid waste issues within the past decade by developing solid waste management plans. State plans include regulatory and technical guidance; assessments of facilities and waste inventories; descriptions of options for managing the waste; and goals, policies and strategies for carrying out those options. Several states' plans address financing the rising costs of waste management and include funding mechanisms for paying those costs. Some states' plans also address where or how to locate new waste management facilities.

State and Local Governments Have Developed Plans to Address Concerns About Solid Waste

As of December 1994, a total of 46 states had either developed plans or were in the process of developing plans for managing solid waste. While some state plans deal narrowly with municipal waste, others deal more broadly with all solid waste, including municipal and nonhazardous industrial wastes. States are primarily developing these plans to address their concerns about protecting human health and the environment, the rising costs of disposal, and diminishing disposal capacity. Four states—Arizona, Colorado, Wyoming, and Wisconsin—do not have plans because, according to officials in these states, (1) the responsible state agencies have not initiated planning, (2) the state does not perceive that it has pressing problems in managing solid waste, or (3) the state believes that its regulations adequately address solid waste management without any formal planning document. Despite the lack of state planning requirements, at least two of these states have voluntary planning efforts at the regional and municipal level. For example, some counties in Arizona and Colorado have initiated their own solid waste management plans.

Plans Address Standards for Permits and Siting of Facilities

Of the nine states we visited, eight had solid waste management plans. Seven of these plans refer to, require, or recommend technical standards or instructions for siting solid waste facilities and issuing permits for these facilities in order to protect human health and the environment. For example, New Mexico's plan provides criteria, such as transportation routes, geology, topography, and proximity to population, that local governments must consider selecting a site for a facility. Pennsylvania requires local governments to describe their siting process in their municipal waste management plans. Ohio's plan recommends that state permits restrict certain toxic items, such as lead-acid batteries and used oil, from municipal landfills.

Plans Assess Waste Streams and Capacity

To determine future capacity needs, five of the eight plans contain an inventory of the state's waste stream and capacity to manage that waste stream. For example, New Jersey's plan describes the state's total municipal and nonhazardous industrial waste stream. It includes county-by-county breakdowns of the rates of waste generated, recycled, and disposed of. The plan estimates how much waste will be generated through 2010 and describes how the state will reduce its reliance on exporting waste out of state for disposal and reach self-sufficiency by 1999. New Mexico's plan includes a breakdown of residential, commercial, yard, construction, and agricultural waste, and further distinguishes the composition of urban and rural residential waste.

Plans Incorporate Waste Management Hierarchy With Goals and Strategies

All eight state plans we reviewed recognize options other than land disposal and incorporate either EPA's waste management hierarchy or a variation. Texas and several other states are required, by state law, to develop plans that follow the hierarchy in managing waste. Texas's goal, by the year 2000, is to reduce, reuse, and recycle 60 percent of municipal waste and to reduce industrial and hazardous waste by 50 percent or more. Washington State's plan sets forth goals and recommends courses of action to reach these goals. The state's chief goal, established by state law, is to reduce waste by 50 percent through source reduction and recycling by 1995. The law, as well as the state plan, incorporates the waste management hierarchy outlined in EPA's 1989 Agenda for Action. Michigan's overall policy is to promote waste reduction, reuse, composting, recycling, and incineration with energy recovery, while limiting the use of landfills. Its long-range goals, to be achieved by the year 2005, include reducing the solid waste stream by 8 to 12 percent; increasing composting from 8 to 12 percent of the waste, recycling from 20 to 30 percent, and incinerating from 35 to 45 percent; and sending from 10 to 20 percent of the waste to landfills.

Nationwide, 42 states have adopted all, or some variation, of EPA's waste management hierarchy in order to reserve disposal capacity. New Jersey ranked recycling higher than source reduction since recycling is a key waste management option. Other states, like Nebraska, rank the use of landfills over incineration because of concerns about air pollution.

A majority of states have also adopted goals and/or strategies for waste management. Approximately 41 states have reduction and/or recycling goals; these goals range from 15 to 70 percent by the year 2000. In about 35 states, the recycling goals are legislated.

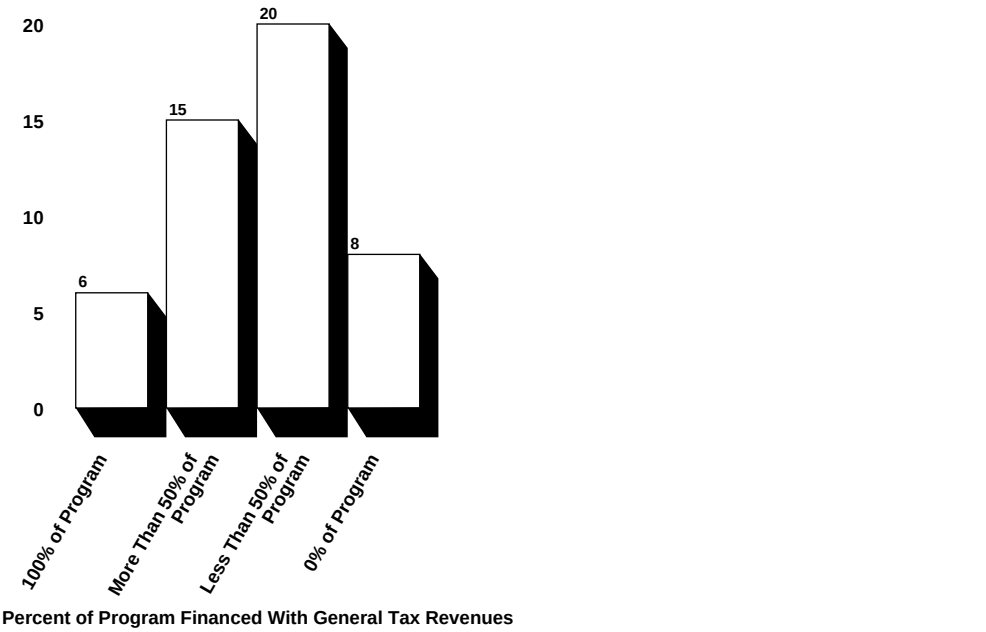
Several States Are Addressing the Rising Costs of Financing Waste Management

Localities pay over 95 percent of the more than $18 billion that EPA estimated was spent on managing municipal solid waste in 1991. Given the high and rising costs of solid waste management, alternatives to using general tax revenues are becoming increasingly important. Unless other sources of funding are available to augment limited general tax revenues, the plans that states have developed may not be carried out. Several states have addressed the need for additional funding, and their plans include options for funding mechanisms.

Alternative Funding Mechanisms Are Needed to Pay Rising Costs of Waste Management

Nationwide, a majority of states continue to rely on general revenue funds to finance the majority of their solid waste management planning and programs. As shown in figure 2.1, six states were using only general tax revenues to fund their programs while eight states used no general tax revenues, as of November 1992. The remaining states used various percentages of general tax revenues. States not using general tax revenues to finance all or a portion of their programs used other sources of revenue, such as special fees levied on waste and permits.

Figure 2.1: Number of States Funding Solid Waste Programs With General Tax Revenues, November 1992



Note: Alaska was not included in the survey.

Source: GAO's illustration based on New York State Department of Environmental Conservation's Survey of State Funding for Solid Waste Management Programs, November 1992.

We reported on the need for additional sources of funding for solid waste management as early as July 1981.[6] At that time, we stated that no long-term funding was available for waste programs at the federal, state, or local levels. More recently, EPA noted the need for more state funding for environmental protection in its 1993 report on state capacity.[7] For example, EPA estimates that local governments will have to spend 65 percent more for environmental protection by the year 2000 than they did in 1988 just to maintain their current level of effort. In addition, EPA estimates that local governments will need to raise 32 percent more money

[6]Solid Waste Disposal Practices: Open Dumps Not Identified, States Face Funding Problems (CED-81-131, July 23, 1981).

[7]Report of the Task Force to Enhance State Capacity: Strengthening Environmental Management in the United States, EPA-270-R-93-001 (July 1993).

just to cover operating and debt service costs. The report identified over 80 financing mechanisms, in 11 major categories, that state and local governments could use, including fees, grants, bonds, loans, credit enhancements, public-private partnerships, economic incentives, special districts, environmental finance centers, and taxes. Other financing mechanisms can be used to finance a wide variety of capital and operating costs. For example, bond financing is well suited to financing recycling centers or landfills, and fees are suitable to pay ongoing program costs, such as the costs of curbside trash removal services.

States Are Implementing Other Financing Mechanisms

Even though 41 states are still relying, to some extent, on general revenue funds to finance their programs, a 1992 survey of state solid waste funding showed that special sources of revenue are becoming a larger and more significant source of funding than general revenues.[8] Of the 32 states responding to the survey that had knowledge of special revenue funding, special revenues accounted for 74 percent of total funding for solid waste. This was a significant increase since 1991 in the proportion of funding supplied by special revenue sources. In the 1991 survey, 45 states responded that special revenues accounted for 57 percent of total funding for solid waste. The 1992 survey also found that special revenue funding varied widely by state: Some states used no special revenues to fund their programs, while other states funded 100 percent of their programs with special revenues.

Of the nine states we reviewed, six use alternatives to general revenue funds to finance a portion or all of their costs because general revenue funds are increasingly insufficient to finance the growing costs of waste management. For example, New Jersey funds its program through solid waste fees, recycling taxes, bond funds, and economic assessments. In addition, New Jersey assists local governments through a number of grant and loan programs financed by a per-ton levy on waste disposed of in-state, general revenue appropriations, and taxes on solid waste generation and disposal.

Ohio uses fees rather than the state's general revenue fund to pay its waste management costs. Even so, Ohio officials are still concerned that the fees, as currently structured, are not sufficient to cover the costs of managing their program.

[8]Survey of State Funding for Solid Waste Management Programs, New York State Department of Environmental Conservation (Revised November 1992).

Pennsylvania requires its counties to establish trust funds to finance the costs of closing landfills and implementing any measures that must be taken after closure. The amount paid into the fund is a tonnage surcharge based upon the estimated cost of closing the landfill and the weight of waste to be disposed of at the landfill before it is closed.

Texas levies a $1.50 surcharge on each ton of municipal solid waste disposed of in the state. A portion of the funds collected is used to finance the state's solid waste planning and management efforts. The state also allocates half of the funds for grants that local governments and eligible organizations can use for programs that save or recover resources, minimize the amount of waste generated, or improve the operating efficiency of waste facilities.

Washington authorizes local governments to collect taxes and fees, such as a fixed collection fee, a $1 purchase fee on tires, and a $5 fee on the purchase of car batteries. In addition, the state provides grants and loans for, among other things, planning by local governments and the development of recycling facilities.

Some States Are Using Innovative Techniques for Locating New Facilities

Public opposition to new and expanding landfills has intensified in recent years and is causing difficulties in ensuring sufficient capacity for managing waste in some locations. Local officials continually face the not-in-my-backyard (NIMBY) syndrome, in which residents oppose locating a waste disposal facility in their communities. At best, it can take years to select a site for a facility. At worst, a site may never be selected, and the locality may be faced with the alternative of shipping waste long distances.

Local Opposition Is Intense

A study by the International City/County Management Association found that local opposition can add years to the time it takes to obtain a site and construct a solid waste facility.[9] In Claremont, New Hampshire, it took nearly 10 years to obtain a site for a waste-to-energy facility. According to the project manager, the delay resulted in expenditures of $1.2 million in legal fees and contract negotiations, disenchantment on the part of the citizens, and the loss of political goodwill. The association reported on seven cases in which local governments sited facilities; these cases are summarized in table 2.1.

[9]Siting Solid Waste Facilities: Seven Case Studies, International City/County Management Association, Management Information Service Report, vol. 24, no. 10 (Oct. 1994).

Table 2.1: Length of Time Local Governments Took to Site Facilities

Location	Project	Years to complete
Fairfax County, Va.	Drop-off center	1
New Hampshire and Vermont	Waste-to-energy facility	10
	Ash monofill	7
Suffolk, Va.	Regional landfill	12
Arlington Co. and Alexandria, Va.	Waste-to-energy facility	6
Columbia Co., Wis.	Materials recovery facility	11
	Compost plant	11
Pasco Co., Fla.	Waste-to-energy facility and landfill	6
Maricopa Co., Ariz.	Regional landfill	4

Source: Based on data from the International City/County Management Association.

In contrast, Los Angeles County, when it identified unoccupied canyons as potential landfill sites, was thwarted in its efforts when environmental groups purchased land on the canyon floors. The county is now considering whether it must ship waste, via interstate rail, to a landfill located 200 miles away in Utah. New York City has attempted to build a waste-to-energy incinerator in the vacant Brooklyn Naval Yard, but local opposition has delayed the project since 1978. According to an official in the New York City Department of Sanitation, as a result of this opposition, the cost for this project has escalated into the millions of dollars, and construction has not yet begun.

Innovative Siting Techniques Are Being Tried

Not all local governments are having difficulty siting facilities and thus ensuring sufficient capacity for their waste. Of the nine states we reviewed, one state is trying innovative techniques to address citizens' opposition. We also identified other innovative techniques being tried in states not included in our detailed review.

In Michigan, counties must establish siting criteria in their solid waste management plans before receiving a state permit to construct new capacity. Citizens, elected officials, and environmental groups are invited to participate in developing the plan. After a county's plan is approved, the county must grant a permit to a facility if it meets the conditions outlined in the plan.

Wisconsin takes a different approach. Local governments form a committee to negotiate with the waste facility's developer over the economic and operating terms of a proposed landfill. If the parties are unable to reach an agreement, a 1981 Wisconsin law mandates binding arbitration by the state's Waste Facility Siting Board. Only two cases have gone through arbitration since the law was enacted, indicating that developers and local governments are able to establish new facilities in Wisconsin.

In another successful technique, owner/operators offer financial incentives to the local government in exchange for permission to locate the facility within the community's jurisdiction. For example, Gilliam County in eastern Oregon is the site of a privately owned landfill. The landfill owner pays the county government $1.25 per ton of waste disposed of in the landfill, or about $875,000 annually. Given that the county's population is only about 2,000, this source of revenue is substantial. Other benefits that landfill owner/operators can offer to host communities include (1) environmental guarantees ensuring water quality; (2) contingency funds in case of contamination; (3) protection of property values; and (4) the provision of recreational, health, or other facilities.

States See a Federal Role in Waste Reduction, Recycling, and Planning for Capacity

Because the states' progress has been slow towards meeting goals and objectives for source reduction and recycling and towards ensuring that waste disposal capacity is sufficient, state and industry officials believe the federal government has a role in (1) developing current national goals for source reduction, (2) setting standards for packaging, (3) setting standards for products containing material recovered from recycled goods, and (4) promoting the development of markets for recyclable materials. States also see the need for a federal role in determining whether they can control the intrastate and interstate flow of waste and hence better plan for capacity. State laws aimed at limiting interstate movements of waste by imposing bans or higher disposal fees have been found to violate the Constitution's Commerce Clause, but a number of legislative proposals that address the states' desires to limit or control waste imports from other states have been introduced in the Congress.

States Are Supporting Source Reduction and Recycling

As discussed in chapter 2, 42 states incorporate EPA's waste management hierarchy—in which source reduction and recycling are preferred to waste disposal—in their solid waste management plans. Source reduction is aimed at reducing the amount of waste generated, including the amount and toxicity of packaging, while recycling is aimed at using waste as a resource. To achieve their goals and objectives for source reduction, some regions and states are trying to develop packaging standards, educate consumers, and limit the toxicity of packaging. To achieve their goals and objectives for recycling, they are developing markets for recyclable materials (secondary markets), identifying uses for material recovered from recycled goods or recovered material, and developing standards for products containing recovered material. While some efforts are aimed solely at municipal waste, other efforts are also aimed at industrial nonhazardous waste.

States Are Making Some Progress in Reducing Amounts of Waste

State officials identified source reduction as a key element in reducing their future needs for capacity and as a central tenet in their solid waste management plans. Some regions and states are taking actions to carry out their plans. For example, the Coalition of Northeastern Governors' Source Reduction Council,[10] which has representatives from state governments, public interest organizations, and industry, developed voluntary guidelines in 1989 to reduce packaging waste. The guidelines call for industry to (1) eliminate packaging whenever possible; (2) minimize the amount of

[10]The coalition was formed in 1976 to address issues such as energy, economic development, employment, and the environment. The member states are Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

material used in packaging; (3) design packages that are returnable, refillable or reusable; and (4) produce packages that can be recycled and use recovered material in packages. Although these guidelines are voluntary, as of August 1993, 8 of the top 40 retailers in the country have endorsed them. For example, Sears, Roebuck and Company adopted these guidelines and is working with its private-label manufacturers to reduce the packaging used for appliances and clothing. The company had eliminated 1.5 million tons of packaging by September 1994.

The coalition also developed model legislation that establishes standards for packaging sold or distributed in the Northeast. The legislation was developed to make the individual states' legislative initiatives to achieve source reduction more effective and, at the same time, to minimize economic disruptions by having a regional (if not a national) approach. The model legislation would (1) formalize and codify the coalition's 1989 guidelines on preferred packaging; (2) provide industry options for achieving, by January 1996, a 15-percent reduction in the amount of packaging used; and (3) encourage industry to take additional actions to reduce packaging. In addition, the legislation sets a goal of reducing solid waste by 50 percent by the year 2000 and calls for an evaluation to determine if more stringent packaging standards should be adopted to achieve that goal.

Some states have also initiated source reduction efforts aimed at consumers and industries. In Washington, the Department of Ecology developed a program to help consumers practice "smart shopping" to reduce waste. For example, one brochure urges consumers to avoid buying disposable products, use durable shopping bags, and purchase recyclable products. Similarly, in Colorado, EPA Region VIII and the Colorado Office of Energy Conservation produced a public service video urging citizens to reduce, reuse, and recycle waste. The Pennsylvania Department of Environmental Resources offers an award for innovative projects to minimize waste, giving preference to industries and municipalities that prevent waste from being generated. The state also requires those who generate 2,200 pounds or more of nonhazardous industrial waste annually to file a document identifying ways to reduce the weight or toxicity of their waste.

The states and others are also developing their own approaches to reduce the toxicity in packaging as well as the use of toxins in manufacturing. In addition, the Coalition of Northeastern Governors developed model legislation for reducing toxicity in packaging, which has already been

adopted in 14 states. Furthermore, as of 1991, more than a dozen states had enacted laws that promote reducing the use of toxic substances in manufacturing. For example, the law in Massachusetts has a target of reducing the use of certain chemicals by 50 percent by the year 1997.

States Are Encouraging Recycling

One key to successful recycling is to ensure ready markets for products that can be recycled as well as markets for products containing recovered material. According to the National Conference of State Legislatures, as of 1990, 31 states had undertaken studies on developing markets for products that are recyclable. For example, the Council of Great Lakes Governors[11] launched a multistate effort to purchase recycled copy paper and rerefined oil. In Washington, the state legislature established and funded the Clean Washington Center in 1991 to develop and expand markets for materials and products containing recovered material, develop the necessary infrastructure, and eliminate barriers to using recovered materials. Under the program, the center has distributed a directory of products as a guide for individuals and/or companies seeking to purchase products made from recovered materials. It also identified additional uses for recycled glass and spent $1.5 million to help retrofit pulp and paper mills to include old newsprint in their production processes.

Some States Seek National Goals and Standards and Federal Help in Developing Secondary Markets

Officials in some of the states included in our review said that they are having difficulty meeting their source reduction goals or objectives because of the lack of national (1) goals for reducing the volume and toxicity of packaging and (2) packaging standards. They also said they are having difficulty meeting recycling goals or objectives because there are few national standards for products containing recovered material and because of the lack of markets. Industry experts also support these views. EPA does not believe that it should take the lead in promoting source reduction or recycling because it views solid waste management, for both municipal and industrial nonhazardous wastes, as primarily a state responsibility.

States Have Concerns About Source Reduction and Recycling

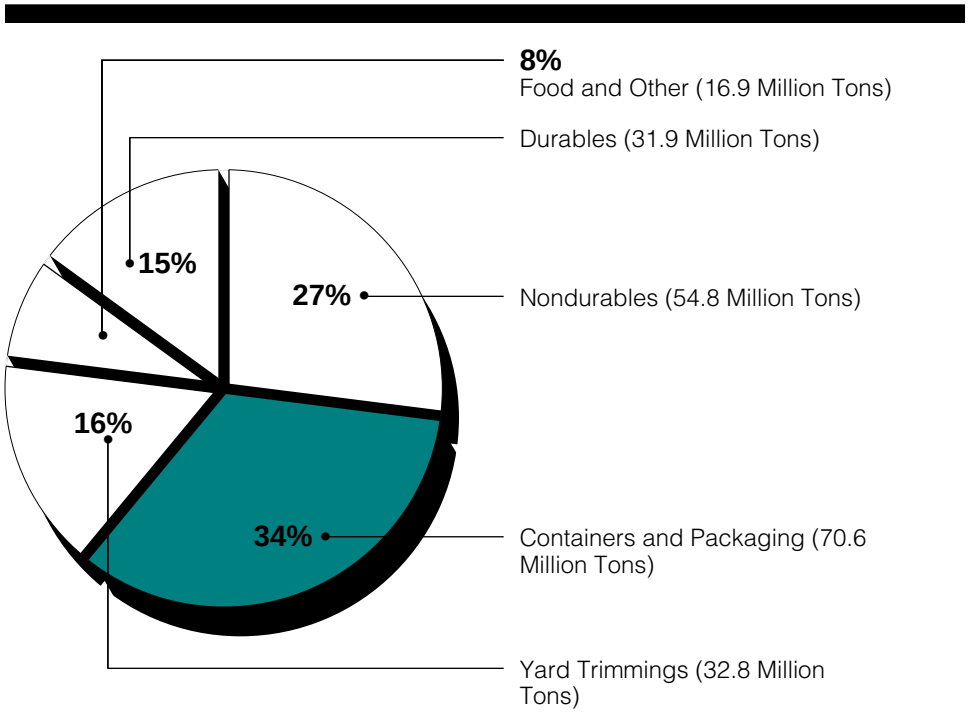
State officials said that source reduction is difficult to address on a state-by-state basis because manufacturers might encounter numerous different goals and standards across the nation, and the potential impact on production costs could be significant if manufacturers have to produce

[11]The council comprises Indiana, Minnesota, Pennsylvania, New York, Michigan, Illinois, Wisconsin, and Ohio.

different products for different markets. State and local officials told us that the interstate commerce in consumer products discourages them from legislating goals for reducing the toxicity and volume of packaging or packaging standards. A state official also said that states cannot individually influence industry's predisposition for built-in product obsolescence. Other officials noted the lack of a coordinated national policy that clarifies the roles of governments, industry, and consumers in reducing waste.

Changes in packaging offer significant opportunities for reducing the amount of waste generated. Figure 3.1 shows the amount, by weight, of containers and packaging in the municipal waste stream. The total weight of 34 percent is the percentage before any recycling occurs. After recycling, containers and packaging still make up 32 percent of all discarded waste.

Figure 3.1: Percentage Distribution of Municipal Solid Waste by Type and Weight, 1993



Source: Based on EPA's data.

Some of the states included in our review also have difficulty recycling because of the lack of national standards for products containing recovered material. According to state and local officials and industry experts, national standards requiring products to contain specific amounts of recovered material are needed to encourage markets. In their view, such standards are needed because manufacturers cannot be expected to conform to many different standards across the states.

State officials also said that the lack of nearby markets for recovered material affects the states' recycling efforts. For example, while citizens in New Mexico are interested in recycling, the nearest markets for glass, plastics, and paper are in bordering states and Mexico. Because of the high cost of shipping materials, recycling programs are cost-effective only in communities with a high population density.

According to state and local officials and industry experts, recycling efforts need to be coordinated and initiated at the national level if significant increases in recycling rates are to be achieved. A 1991 study by the Congressional Budget Office found that states' attempts to develop markets have only a slight effect on demand for recovered material because such material is exchanged in markets extending beyond individual state boundaries.[12] Similarly, minimum content standards, if established on a state-by-state basis, would have only a slight effect because markets extend across state lines.

Nationally, efforts to recycle other types of solid waste need to be initiated if recycling rates are to increase. About 7 percent of all municipal solid waste was recovered for recycling and composting in 1960. This proportion increased to 22 percent in 1993. EPA projected in 1994 that recycling rates of between 25 and 35 percent may be achievable in 2000. To achieve the recycling rates that EPA projects, however, 50 percent or more of some wastes may have to be recovered. Some types of waste are easier to recycle than others. For example, composting of yard trimmings could be substantially increased. While food, yard, and miscellaneous inorganic wastes accounted for nearly 24 percent of the total municipal solid waste generated in 1993, as table 3.1 shows, only 13.1 percent of these wastes were recovered for recycling or composting.

[12]Federal Options for Reducing Waste Disposal, Congressional Budget Office (Washington, D.C., Oct. 1991).

Table 3.1: Recycling Rates for Municipal Solid Waste, 1993

Material	Volume generated (millions of tons)	Volume recycled (millions of tons)	Percent recycled
Paper and paperboard	77.8	26.5	34.0
Glass	13.7	3.0	22.0
Metals	17.1	5.2	30.4
Plastics	19.3	0.7	3.5
Rubber and leather	6.2	0.4	5.9
Textiles	6.1	0.7	11.7
Wood	13.7	1.3	9.6
Other	3.3	0.7	22.1
Food, yard, misc.	49.7	6.5	13.1
Total	206.9	45.0	21.7 (average)

Source: Based on EPA's data.

To achieve higher recycling rates, industry would need to continue to invest in plant and equipment to use recovered materials, most citizens would need access to recycling programs, and markets for recycled materials would have to grow.

EPA Has Encouraged but Not Led Source Reduction Efforts

EPA has no specific congressional mandate to take the lead in developing a program to reduce the volume of solid waste generated, and it has not achieved significant advances in source reduction for solid waste. EPA has largely focused on encouraging states and industry to act; it has not set current goals for reducing the volume and toxicity of packaging or packaging standards.

According to the Chief of EPA's Waste Reduction and Management Branch, Source Reduction Section, because the agency has no specific legislative authority to take a more proactive approach, it relies on voluntary participation from business, federal agencies, state and local governments, and the public at large. To foster source reduction among business, EPA launched a Waste Wise Program that promotes waste prevention and recycling in industry. About 300 companies have agreed to participate in the program. Under the program, EPA suggests approaches, such as reusing products and supplies, reducing the amount of packaging, and using and maintaining durable equipment and supplies. EPA has also published two

documents to help businesses design and implement waste reduction programs in their facilities.

To foster source reduction in state and local governments, EPA is participating in a conference sponsored by the National Recycling Coalition promoting procurement practices among state and local agencies that emphasize purchasing durable products; EPA is supplying a guide for setting up a program for exchanging solid waste materials at the state and/or local level. In addition, EPA sponsors regional meetings that promote meetings among solid waste professionals and unit pricing for residential trash collection whereby, for example, households are charged according to the number of bags of trash collected. It has also awarded a grant to develop educational materials on composting for local governments.

To foster source reduction among the public, EPA has awarded grants to (1) the Smithsonian Institution to create a traveling exhibit on source reduction, (2) the League of Women Voters to train community volunteers to conduct workshops on source reduction, and (3) the National Audubon Society to develop a public service announcement on source reduction.

While the Pollution Prevention Act requires EPA to develop and implement a strategy to promote pollution prevention through such means as source reduction and recycling, EPA has not yet developed this strategy. A strategy for municipal solid waste had already been issued in EPA's 1989 Agenda for Action, before the act's passage. Furthermore, while the act also directs that strategies are to identify, where appropriate, measurable goals and the tasks necessary to achieve the goals, EPA's agenda does not. Rather, the agenda sets a national goal of 25 percent for source reduction and recycling by 1992. However, the agenda includes no goals beyond 1992 and no specific tasks to meet its goals. The Chief of EPA's Source Reduction Branch said that data are not available on the amount of solid waste that has been reduced through source reduction, largely because source reduction is very difficult to measure and is not highly visible. However, EPA has contracted with a private firm to develop a process to measure the nation's progress in reducing the amount of solid waste generated. We concur that source reduction is difficult to measure and that EPA will need measurable goals before it develops a source reduction strategy as called for in the Pollution Prevention Act.

Federal Efforts to Encourage Recycling and Develop Markets Have Been Limited

EPA also does not believe it is responsible for taking the lead in establishing recycling goals, encouraging recycling, or developing markets for recycled materials. However, RCRA did assign limited responsibilities to EPA for encouraging the use of recycled materials through federal purchasing power by having EPA (1) designate which products containing recovered material should be purchased by federal agencies and (2) develop guidelines for such purchases. Lacking a federal mandate, EPA views recycling as primarily a state responsibility and supports the states' recycling efforts through grants and other assistance. Furthermore, RCRA assigns the Department of Commerce, not EPA, several responsibilities to encourage the development of such markets.

EPA has published guidelines for federal purchases of products containing recovered material. The agency has established minimum standards for the amount of recycled material in five classes of products: paper and paper products, lubricating oils, retread tires, building insulation products, and cement and concrete containing incinerator fly ash. However, in our May 1993 report on EPA's progress in implementing the program,[13] we reported that EPA took 17 years to develop these standards because of the lengthy process it uses to develop standards and the low priority accorded the program. We recommended that EPA complete a strategy for developing procurement guidelines that includes a streamlined process for developing guidelines. In April 1994, EPA proposed standards for another 21 items.

EPA also provides financial or technical assistance for recycling efforts. For example, the Recycling Advisory Council, composed of representatives of environmental and public interest groups, the recycling industry, business, and the public sector, is partially funded by an EPA grant. The council was established to build consensus on public policies and private initiatives to increase recycling and to make recommendations on the basis of its findings. EPA also provided (1) technical assistance to the Federal Trade Commission to develop labeling guidelines in 1992 and (2) financial and technical assistance to the Environmental Defense Fund to support a recycling campaign.

The Department of Commerce, which is responsible under RCRA for stimulating the development of markets for recycled material, has done little since 1982. RCRA requires Commerce to, among other things, (1) provide accurate specifications for recovered materials, (2) stimulate

[13]Solid Waste: Federal Program to Buy Products With Recovered Materials Proceeds Slowly (GAO/RCED-93-58, May 17, 1993).

the development of markets for these materials, (3) promote proven methods for recovering resources, and (4) provide a forum for exchanging technical and economic data on resource recovery facilities. As we reported in May 1993,[14] because of competing priorities Commerce has done little to stimulate market development. In 1982, Commerce terminated the limited work it had conducted because it believed that it had carried out its responsibilities under RCRA. However, since 1982, the lack of markets for recycled material has created an oversupply of recyclable material.

In our report, we recommended that Commerce establish a program to support the recycling industry and stimulate the demand for recycled materials. While Commerce did not implement our recommendation, it did designate a senior official to help industries develop expertise in domestic environmental technologies for preventing pollution, minimizing waste, and recycling and improve their ability to compete internationally in these areas. H.R. 1821, which was introduced but not passed in the 103rd Congress, would have required Commerce to study markets for recovered materials from discarded consumer waste and establish an office of recycling research and information. The office would make grants for studies and scientific research on recycling materials from discarded consumer waste and conduct a public outreach program.

To assist in the development of markets for recycled materials, the Recycling Advisory Council, partially funded with an EPA grant, is addressing such topics as market development initiatives and economic incentives to promote recycling. According to the Recycling Advisory Council's Program Coordinator, the group has studied policy options for increasing the demand for recovered materials, and the council's 5-year strategic plan incorporates several recommendations and policy options for the council to carry out its vision for recycling in the year 2000.

States Are Concerned That Waste Shipped From Other States and Countries Could Affect Their Disposal Capacity

Currently, 47 states ship waste to and receive waste from other states and countries, and these shipments are increasing. Some states are concerned that waste shipped in from other states could use up their disposal capacity if such shipments are not controlled.

[14]GAO/RCED-93-58.

Interstate Waste Shipments

According to the National Solid Wastes Management Association, interstate movement of solid waste increased by 54 percent between 1990 and 1992. Solid waste is routinely shipped between 47 states; shipments between neighboring states account for 66 percent of the total interstate movement of waste. According to the report, these figures may be underestimated because 10 states—Colorado, Georgia, Maryland, Mississippi, Nebraska, North Dakota, South Carolina, South Dakota, West Virginia, and Wyoming—reported that although they believe waste is being exchanged between neighboring states, they lack quantifiable data. According to the National Solid Wastes Management Association, about 19 million tons of municipal waste, or about 9 percent of the total 200.6 million tons generated, was moved in interstate commerce during 1992. Data are not available on what percentage of the remaining 13 billion tons of nonhazardous solid waste is shipped.

These movements represent partnerships between and among states, municipalities, and commercial waste managers. Waste can be transported out of state for processing or disposal if (1) the nearest processing center or landfill is in another state, (2) the in-state capacity is insufficient, (3) the costs of managing and disposing of waste within the state exceed the costs of disposing of waste in another state, or (4) it is not feasible to ensure local capacity because of either political or environmental opposition. Some localities use interstate shipments as a solution to their local problems with waste disposal. For example, commercial haulers of business waste in New York City export about 3 million tons annually for disposal because the publicly owned landfill raised its rates for commercial waste to the point that it was less expensive to transport and dispose of waste out of state. New York City officials raised the commercial rates in an effort to conserve the disposal space for residential waste in their only remaining landfill.

Interstate shipments have also been attributed to new and stricter federal criteria for landfills; increasing state regulation; economic and environmental factors, such as the increasing privatization of municipal solid waste management; and trends towards building larger and better but fewer landfills for municipal solid waste. Also, as a result of stricter federal and state regulations, the cost of constructing small locally owned and operated solid waste management facilities has exceeded the resources of many governmental bodies. Thus, intrastate and interstate transport of waste becomes a viable option for containing costs because wastes can be combined at a single location to achieve economies of scale.

According to the report by the National Solid Wastes Management Association, in 1992 only three states—Hawaii, Montana and South Carolina—reported that they did not ship waste to other states, while five states—Alaska, California, Colorado, Idaho, and New Jersey—reported that they did not receive waste from other states. All other states both export and import waste. While some state officials told us that their state is becoming a dumping ground for other states, these states also export waste. For example, Texas imports from Arkansas, Louisiana, and New Mexico and exports to these same three states plus Oklahoma. Pennsylvania imports from 8 states and the District of Columbia, while exporting to 10 states. Ohio imports from 20 states and exports to 6 states. While some states ship relatively small amounts of waste, others are major exporters. For example, Illinois, Pennsylvania, New York, and New Jersey exported more than 1 million tons of municipal solid waste in 1992. In contrast, Ohio, Michigan, New Mexico, and Washington State exported between 0.1 and 1 million tons in 1992.

International Waste Shipments

According to data from the U.S. Bureau of the Census, Canada, Mexico, Japan, Italy, Germany, Finland, Sweden, and Austria shipped waste into the United States in 1992. However, these data do not specify whether these exports are destined for disposal or recycling. This waste includes unsorted paper or paperboard, glass, waste plastic, and rubber. In total, about 322,000 tons are received. (App. III provides detailed information on the volume of waste the United States receives.)

The majority of waste shipped to the United States comes from bordering countries, particularly Canada. Tipping fees[15] in Canada average about $3,000 per truckload[16] at a landfill, while such fees in the United States average about $600. Between 1984 and 1992, tipping fees for commercial waste in metropolitan Toronto increased from $18 to $150 per ton to finance local recycling efforts. As a result, landfills in Pennsylvania, New York, Ohio, and Michigan attracted Canadian solid waste because their fees, plus transportation costs, ranged between $56 to $140 per ton. (App. IV compares the costs of disposing of waste in Ontario landfills with the cost of transporting and disposing of waste in the United States.) Table 3.2 shows the amount of waste that five states received from Canada in 1993 through Buffalo, New York.

[15]A "tipping" fee is the amount paid by the hauler per ton to dispose of waste at a waste processing facility.

[16]On average, a truckload contains 20 tons of waste/garbage.

Table 3.2: Destination of Solid Waste Imported Into the United States From Canada Through Buffalo, N.Y., 1993

Destination state	Tons of waste	Percent of total shipped[a]
Pennsylvania	265,824	56.8
New York	142,740	30.5
Ohio	58,500	12.5
Michigan	936	0.2
New Jersey	<468	<0.1

[a]Percentages do not add to 100 because of rounding.

Source: U.S. Customs Service, Buffalo District.

Waste imported through Buffalo from Canada was not being shipped for recycling and reuse but was destined for disposal facilities.

Along the U.S.-Mexican border, American companies operating in Mexico are required, under a bilateral agreement between the two countries, to return any waste the Mexican government defines as hazardous, which includes more wastes than EPA defines as hazardous. For example, Mexico considers used lubricants as hazardous, while EPA does not. About 6,000 tons of waste that Mexico considered hazardous were received from Mexico in 1993. According to an EPA Region VI official, this waste includes waste that EPA defines as nonhazardous solid waste. About 12 percent of this waste is recycled in the United States. Data maintained by EPA to track imported waste shows that Texas and California are the final destinations for the vast majority of this waste. Other states that receive waste from Mexico include Arizona, Arkansas, Louisiana, Nevada, New Mexico, and Oklahoma.

The United States also exports solid waste to other countries, including materials to be recycled. For example, North Dakota exports white goods (such as household appliances), crushed autos, and scrap metals to Canada; Massachusetts exports wood waste to Canada. However, national data are lacking on solid waste exported from the United States.

Concerns About Out-Of-State Waste

Some state authorities do not want to continue receiving waste from other states and/or countries because of concerns about the impact on local disposal capacity, among other things. Some state officials said that imported waste affects a state's ability to plan for sufficient disposal

capacity for in-state waste and discourages citizens from recycling because their efforts only serve to make room for waste from other states. Oregon officials said that although the state's disposal capacity is expected to be sufficient for 100 years, the state should be compensated through surcharges placed on imported waste. This surcharge should be based on the costs incurred for (1) managing solid waste, (2) issuing new and renewal permits for solid waste disposal sites, and (3) funding environmental monitoring, groundwater monitoring, and waste facility closure and post-closure activities. Some state officials were concerned that imported waste might present additional risks. For example, officials in Ohio were concerned that imported waste destined for nonhazardous landfills would contain hazardous materials and that this waste could go undetected if the shipments are baled or shredded.

Some See the Need for a Federal Role to Ensure Sufficient Disposal Capacity

Some states, because of concerns that out-of-state waste threatens their disposal capacity, have passed laws aimed at controlling such shipments. However, the Supreme Court has held that these statutes violate the Commerce Clause of the Constitution. Federal courts have also struck down state laws aimed at ensuring sufficient revenues for their publicly financed waste facilities. As a result, some state and local governments believe that the federal government should authorize them to act to protect their disposal capacity. Several legislative proposals to provide the states with more control over waste have been introduced in the Congress.

Courts Have Struck Down States' Laws and Fees on Imported Waste

At least 41 states have enacted legislation or issued executive orders to control interstate shipments of solid waste, either by banning, setting limits on, or imposing higher fees on waste imports. The purpose of these laws is to conserve capacity at in-state private or commercial landfills. However, since the Congress has not authorized states to enact such measures, the U.S. Supreme Court has struck down several of these statutes, holding that they violate the Commerce Clause. Because the Congress has not provided the states with authority to limit interstate shipments of waste, some state and industry officials state that federal action is needed to provide them with this authority.

In one instance, in City of Philadelphia v. New Jersey,[17] the state enacted legislation that banned importing most solid waste that originated outside the state. New Jersey argued that the ban was intended to preserve existing landfill space in order to protect the health, safety, and welfare of

[17]437 U.S. 617 (1978).

the state's citizens. The Court held that a state may not discriminate against waste coming from outside the state based solely on its origin. The Court stated that the law was discriminatory because it "imposes on out-of-state commercial interests the full burden of conserving the state's remaining landfill space."[18] The Court held that the New Jersey statute was unconstitutional.

States' attempts to impose a differential fee structure on out-of-state waste also have been struck down. On April 4, 1994, in Oregon Waste Systems v. Department of Environmental Quality,[19] the U.S. Supreme Court struck down an Oregon statute that imposed a surcharge on the disposal of solid waste from outside the state, ruling that the charge violated the Commerce Clause. The Court stated that "it is well established . . . that a law is discriminatory if it taxes a transaction or incident more heavily when it crosses state lines than when it occurs entirely within the state."[20]

States also may not curtail the movement of solid waste through the subdivisions of a state. A Michigan statute generally prohibited private landfill operators within a county from accepting solid waste originating outside the county where the facility is located. Michigan had enacted the statute to help counties plan for the disposal of solid waste. In Fort Gratiot Sanitary Landfill, Inc. v. Michigan Department of Natural Resources,[21] Michigan claimed that the statute was constitutional because it treated waste from other Michigan counties the same as waste from other states. The Supreme Court disagreed and held the statute unconstitutional. The Court stated that Michigan could attain its planning objective without discriminating by limiting the amount of waste a landfill may accept each year regardless of the source of the waste.

State and local authorities can generally ban, restrict, or impose surcharges on out-of-state waste received at publicly owned facilities without being in conflict with the Commerce Clause. In these cases, state and local authorities are acting as market participants rather than as regulators. Publicly owned facilities currently account for about 86 percent of the land disposal facilities operating. However, the commercial industry owns about 50 percent of the available landfill capacity. Data are not available on the types of waste being shipped

[18]437 U.S. at 628.

[19]114 S. Ct. 1345 (1994).

[20]114 S. Ct. at 1350.

[21]112 S. Ct. 2019 (1992).

between states and whether these shipments are destined for private, commercial, or publicly owned facilities.

Courts Have Overturned Laws Aimed at Controlling Waste Flow and Resulting Revenues at Public Facilities

Local governments are enacting laws to ensure a sufficient amount of waste, and thus sufficient revenues, to pay the costs associated with financing and/or operating publicly arranged services. These laws (1) direct that all municipal waste be disposed of at specific sites for specific disposal fees, thus prohibiting the shipment of waste to another facility, or (2) establish a private party as the exclusive provider of waste management services. Thus far, the courts have struck down several of these laws on the grounds that they also violate the Commerce Clause.

It is estimated that ordinances to control the flow of waste to specific companies or facilities, commonly referred to as flow control laws, exist in about 41 states. However, data are not available on the amount of waste subject to flow control laws or the number of publicly financed facilities or services that rely on flow control to repay public debt or finance the service. According to state and industry officials, flow control provides the financial assurance that investor communities and bond rating agencies require by guaranteeing, over the life of a waste management facility, contracts for a specified amount of solid waste and/or recyclable materials, for which the facility will receive a specific revenue. Most local governments have "put or pay" contracts with solid waste management facilities: If a specified amount of solid waste and/or recyclable material is not delivered, the local government must pay the shortfall.

Because some state and local flow control ordinances have been held by federal courts to violate the Commerce Clause, several state and industry officials believe that federal action is needed to provide states and localities with the authority to control the flow of waste. Furthermore, the U.S. Supreme Court has more recently ruled against a local flow control ordinance. In Minnesota, counties that had built a new composting facility required all compostable solid waste generated in those counties to be delivered to the new facility. The county ordinances were intended to ensure an adequate supply of waste to the facility and thus finance the debt incurred in building the new facility. Previously, waste had been disposed in an Iowa landfill. In Waste Systems Corp. v. County of Martin,[22] the U.S. Court of Appeals for the Eighth Circuit held that the county ordinances violated the Commerce Clause by discriminating against companies that dispose of waste outside of Minnesota. More recently, the

[22]985 F.2d 1381 (8th Cir. 1993).

Supreme Court struck down, on the grounds that it violated the Commerce Clause, a local flow control ordinance.[23] An ordinance in Clarkstown, New York, required all nonrecyclable solid waste generated within the town be processed at a designated facility before being shipped elsewhere for disposal. The town had argued that the ordinance did not affect interstate commerce because, after treatment, the waste still had to be shipped out of town because there is no local landfill.

Several Bills Introduced in the Congress Would Provide States With Control Over Waste Shipments

In response to the states' desires to see federal action that would provide them with authority to control interstate shipments and the flow of intrastate waste, several bills that would allow states to limit or restrict waste received from out of state and to impose controls over intrastate shipments have been considered, but not passed, by the Congress. The Congress has also directed EPA to conduct a study on flow control.

From 1991 through 1994, more than 30 bills were introduced in either the U.S. Senate or the House of Representatives that would authorize the states to impose restrictions on out-of-state waste; however, none of these bills were enacted. The bills varied considerably in (1) who was authorized to restrict waste and under what conditions, (2) whether higher fees could be imposed on out-of-state waste, (3) what types of waste could be restricted, and (4) whether exemptions from restrictions could be obtained.[24] Some of these bills allowed the states to place a surcharge, or a differential fee, on such waste. Several of the bills specified that restrictions can only be placed on municipal waste; others imposed restrictions more generically on all solid waste. Three bills also allowed exemptions from the restrictions; for example, landfills that accepted out-of-state waste in 1991 and that complied with state design and operation laws would not be subject to restrictions.

Several bills have also been introduced that would provide state or local governments with control over shipments of waste within the state or locality. One bill specifically exempts flow control contracts entered into before January 1994, but requires state and local governments to have recycling programs in place before entering into new contracts after that

[23]C & A Carbone Inc. v. Clarkstown, 114 S. Ct. 1677 (1994).

[24]For example, of the bills introduced in the 103rd Congress, H.R. 963 would have authorized local governments to approve the receipt of out-of-state waste at landfills or incinerators unless the governor determined that this waste was using capacity needed by the local jurisdiction. S. 439, H.R. 1076, and H.R. 2848 would have authorized governors to limit the disposal of municipal solid waste from outside of the state. H.R. 1052 and S. 822 would have allowed the states to restrict such waste, but only if they had EPA-approved solid waste management plans.

date. Another bill allows communities to continue to adopt flow control arrangements; however, facilities would have to compete against each other to qualify for entering into a flow control arrangement.

Impact of Intrastate and Interstate Regulation Is Unclear

While state officials and industry experts told us that congressional intervention is needed to resolve the issue of interstate and intrastate waste shipments, there is insufficient information to determine the benefits or potential negative impacts of such action on the economics of waste management and waste management options, such as ownership. While a congressional conference committee report directed that EPA study issues associated with flow control, the Congress has not directed a study on issues associated with controls over interstate waste shipments.

Allowing state and local governments to restrict the waste received at private and commercial facilities could have some benefits, including (1) an improved ability to plan and project capacity needs and (2) an extended life for existing landfills, thereby delaying the need to build new capacity in specific locations. According to state officials and industry experts, bans or limits would also allow the state to address citizens' concerns that

- the state is being used as a dumping ground for other states less willing to make decisions about solid waste management,
- the imported waste may contain hidden environmental and health hazards,
- the imported waste adversely affects local recycling efforts by discouraging some citizens from recycling because they believe their local capacity will be used for out-of-state waste, and
- increased traffic will result in additional costs for maintaining publicly financed roads.

Likewise, allowing state and local governments to control the flow of waste to certain facilities could benefit those communities that have made major financial commitments in waste management operations, either through "put or pay" contracts or through construction funded by public debt, by providing those communities with more certain financing for these efforts.

However, allowing state and local authorities to limit or restrict waste received at private or commercial facilities, or to control where waste must be taken, also has potential negative consequences. First, competition could be impeded, opening the way for potential

inefficiencies that drive up the costs to the public. Second, the number of options that state and local authorities, households, commercial firms, and manufacturers have for managing their solid waste could decrease if the waste cannot be shipped across state lines, thus possibly raising the cost to those who pay for the services. Third, communities with insufficient capacity could be required to make significant outlays as they attempt to finance and construct local waste management capacity because they would no longer be able to use out-of-state facilities. Fourth, land disposal facilities that may not comply with EPA's revised criteria on landfills could continue to be used because options to ship waste out of their jurisdictions would have been precluded. Finally, communities that could be precluded from shipping waste out of their jurisdictions might be required to construct new facilities locally, where land and water resources could more easily be compromised, thus posing a potential threat to human health and the environment.

The conference committee report accompanying EPA's fiscal year 1993 appropriating legislation directed EPA to provide the Congress with a review of flow control laws and an analysis of their effect on health and environmental protection, state and local management capacity, and source reduction, reuse, and recycling. EPA estimates that its study will be provided to the Congress by early 1995. According to EPA solid waste officials, the study will compare states that have flow control with those that do not to determine the impact that flow control has on planning, interstate shipments of solid waste, and recycling. However, according to one official, EPA does not have a position on flow control. It is not known if EPA's study will provide sufficient information to determine whether legislative action to address flow control is necessary.

Federal legislation that was proposed but not acted upon during the 103rd Congress on the interstate shipment of waste addressed a number of issues, but that Congress did not direct EPA to conduct a study, similar to the one currently being conducted on flow control, to review state laws affecting interstate waste shipments and the impact these laws have on waste management issues. While we attempted to obtain data useful to the Congress to address interstate shipments of solid waste, we were unable to identify sources for that data. This lack of data makes it difficult to determine the impact of legislative action that places restrictions on interstate waste shipments.

States' Methods for Managing Solid Waste

State	Percent recycled	Percent incinerated	Percent sent to a landfill
Alabama	12	8	80
Alaska	6	15	79
Arizona	7	0	93
Arkansas	10	5	85
California	11	2	87
Colorado	26	1	73
Connecticut	19	57	24
Delaware	16	19	65
Florida	27	23	49
Georgia	12	3	85
Hawaii	4	42	54
Idaho	10	0	90
Illinois	11	2	87
Indiana	8	17	75
Iowa	23	2	75
Kansas	5	0	95
Kentucky	15	0	85
Louisiana	10	0	90
Maine	30	37	33
Maryland	15	17	68
Massachusetts	30	47	23
Michigan	26	17	57
Minnesota	38	35	27
Mississippi	8	3	89
Missouri	13	0	87
Montana	5	2	93
Nebraska	10	0	90
Nevada	10	0	90
New Hampshire	10	26	64
New Jersey	34	21	45
New Mexico	6	0	94
New York	21	17	62
North Carolina	4	1	95
North Dakota	17	0	83
Ohio	19	6	75
Oklahoma	10	8	82

(continued)

State	Percent recycled	Percent incinerated	Percent sent to a landfill
Oregon	23	6	71
Pennsylvania	11	30	59
Rhode Island	15	0	85
South Carolina	10	5	85
South Dakota	10	0	90
Tennessee	10	8	82
Texas	11	1	88
Utah	13	7	80
Vermont	25	3	72
Virginia	24	18	58
Washington	33	2	65
West Virginia	10	0	90
Wisconsin	24	4	72
Wyoming	4	0	96
Average	17	11	72

Note: States include different waste types in their calculations. For example, at least 12 states include some industrial waste in their figures.

Source: Biocycle, May 1993.

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Volume of Waste Material Imported Into the United States

Table III.1 shows the amounts of waste that various countries shipped to the United States during 1992. This waste includes generally unsorted paper or paperboard, glass cullet or scrap of glass or waste plastic or rubber.

Table III.1: Volume of Waste Imported Into the United States by Country of Origin, 1992 (Tons)

Country	Paper	Glass	Plastic/ rubber
Belgium	4	17	8,240
Canada	111,537	23,231	40,608
China	2	30	3,357
France	125	0	10,217
Germany	39	0	22,912
Italy	40	4	16,478
Japan	31	93	2,242
Mexico	22,366	4,213	14,549
United Kingdom	1,040	0	8,534
All others	582	1	31,751
Total	**135,766**	**27,589**	**158,888**

Source: U.S. Bureau of the Census, National Trade Data Bank.

Comparative Costs of Disposing of Waste in Ontario Versus the United States

Table IV.1 compares the cost of disposing of waste in local landfills in Ontario with the cost, including transportation, of shipping waste from these locales to the closest landfills in the United States with the most competitive tipping fee.[25]

Table IV.1: Comparison of Commercial Waste Tipping Fees in Ontario With Disposal Costs in the United States, 1992

Ontario location	Tipping fee per ton	Closest U.S. location	Disposal cost per ton, including hauling
Durham (Brock West)	$152	New York	$85
Hamilton-Wentworth	180	Pennsylvania	108
Region of Peel	150	Michigan	76
York Region	152	Ohio	72
Essex County	45-77	Michigan	56
Waterloo Region	65	Michigan	56
Peterbourgh	150	New York	140
Peterbourgh	150	Michigan	76

Source: Ontario Ministry of Environment and Energy.

[25]A "tipping" fee is the amount a hauler pays per ton to dispose of waste at a waste management facility.

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